Table 6.1(i) Summary of Landscape Capacity, Cumulative Effects and Guidance for Future Wind Energy Development: Lowland Loch Basin

LANDSCAPE CHARACTER TYPE TAY 15: LOWLAND LOCH BASIN																			
Key: ○ No Capacity ○ Low Capacity ○ Medium Capacity ○ High Capacity **Turbine Size: Small/Medium=15-<30m; Medium=30-<50m; Medium/Large=50-<80m; Large=80-<125m; Very Large=125m+**																			
BASE LANDSCAPE CAPACITY (i.e. not taking account of current wind energy development)									**CURRENT CONSENTED DEVELOPMENT**		**PROPOSED LIMITS TO FUTURE DEVELOPMENT (i.e. proposed acceptable level of wind energy development)**								
Landscape Sensitivity to Wind Energy Development				**Landscape Capacity** (Related to turbine size)					**Existing/ Consented Developments**	**Current Wind Energy Landscape Type(s)**	**Future Wind Energy Landscape Type(s)**	**Remaining Landscape Capacity** (Related to turbine size)					**Current Applications**	**Analysis & Guidelines** (Refer to Detailed Guidance for Further Information on Siting and Design)	
Landscape Character Sensitivity	Visual Sensitivity	**Landscape Sensitivity**	**Landscape Value**	**S/M**	**M**	**M/L**	**L**	**VL**				**S/M**	**M**	**M/L**	**L**	**VL**			
Landscape Character Areas: ***Montrose Basin***																			
Med/ High	Med/ High	**Med/ High**	**Med/ High**	○	○	○	○	○	3 small/medium and one medium turbine within the LCA. Several small/medium and medium turbine in close proximity, particularly on higher ground to the north.	***Lowland Loch Basin with Occasional Wind Turbines/ no Wind Turbines***	***Lowland Loch Basin with Occasional Wind Turbines***	○	○	○	○	○	No current applications	**Landscape Analysis:** Montrose Basin is an uncommon landscape type, set between slightly more elevated areas of farmland and providing a setting for the town of Montrose. Some turbines could be accommodated in the farmland area. However due to wide visibility across the basin, modest elevation of enclosing landform (ca. 100m) and extensive areas of designed landscape around Kinnaird Castle, turbines taller than 50m would not be appropriate. **Comments on Consented and Proposed Turbines:** Consented turbines are within the capacity of the landscape. A proposal for two very large turbines at GSK Montrose was recently dismissed on appeal due to visual impacts on the setting of Montrose and on nearby residential properties. Although located within the urban area, this proposal would have affected views of the town seen across the basin.
											Max. Numbers in Group	*1-3*	*1-3*						
											Min Group Separation Distances (km)	*2-4*	*3-5*						

6.3 Overall Assessment of Capacity and Cumulative Development

6.3.1 Summary of Landscape Character, Sensitivity and Underlying Capacity

(Refer to Figures 6.1a-f for details of landscape capacity for turbines of different sizes).

The landscape of Angus is characterised by a transition from coastal landscapes in the southeast progressing northwest through agricultural lowland and lowland hills, thence to highland landscapes in the north. The bulk of the population lives in small towns and villages in the lowland area, through which the main transport routes pass.

The transition between highland and lowland is particularly dramatically presented in the form of the Highland Boundary Fault separating the broad valley of Strathmore from the Grampian Mountains, and is key in determining the underlying capacity of the landscape to accommodate wind turbines.

The Highland Boundary fault provides a sharp transition between the fertile settled lowlands of Strathmore and the wild scenery of the Grampian Mountains in the north of Angus

The openness of Strathmore and the ever present backdrop of the Grampian Mountains and Angus Glens is more simply and dramatically expressed as the key landscape feature of Angus than in the more extensive neighbouring areas of Perthshire and Aberdeenshire. This makes the highland area including the transitional foothills very sensitive to wind turbine development due to elevated levels of visual sensitivity and landscape value.

The assessment has determined that there is no capacity for wind turbine development in the highest mountain areas of the highland area, the *Highland Summits and Plateaux,* and that the capacity elsewhere in the highlands is limited to single or small groups of smaller turbines. This conclusion is in contrast with the current upland predominance in the pattern of Scottish wind energy development. Whilst the landscape character type in Angus has some suitable characteristics of scale, simplicity of landform and lack of small scale development; their landscape importance, visual prominence and status as a popular recreational and visitor location severely limits capacity.

The limitation in the highlands notwithstanding, there is varied underlying capacity for wind energy development throughout much of the lowland and hills area. In areas suitable for development, the differing landscape characters could accommodate different turbine sizes, groupings and spacings.

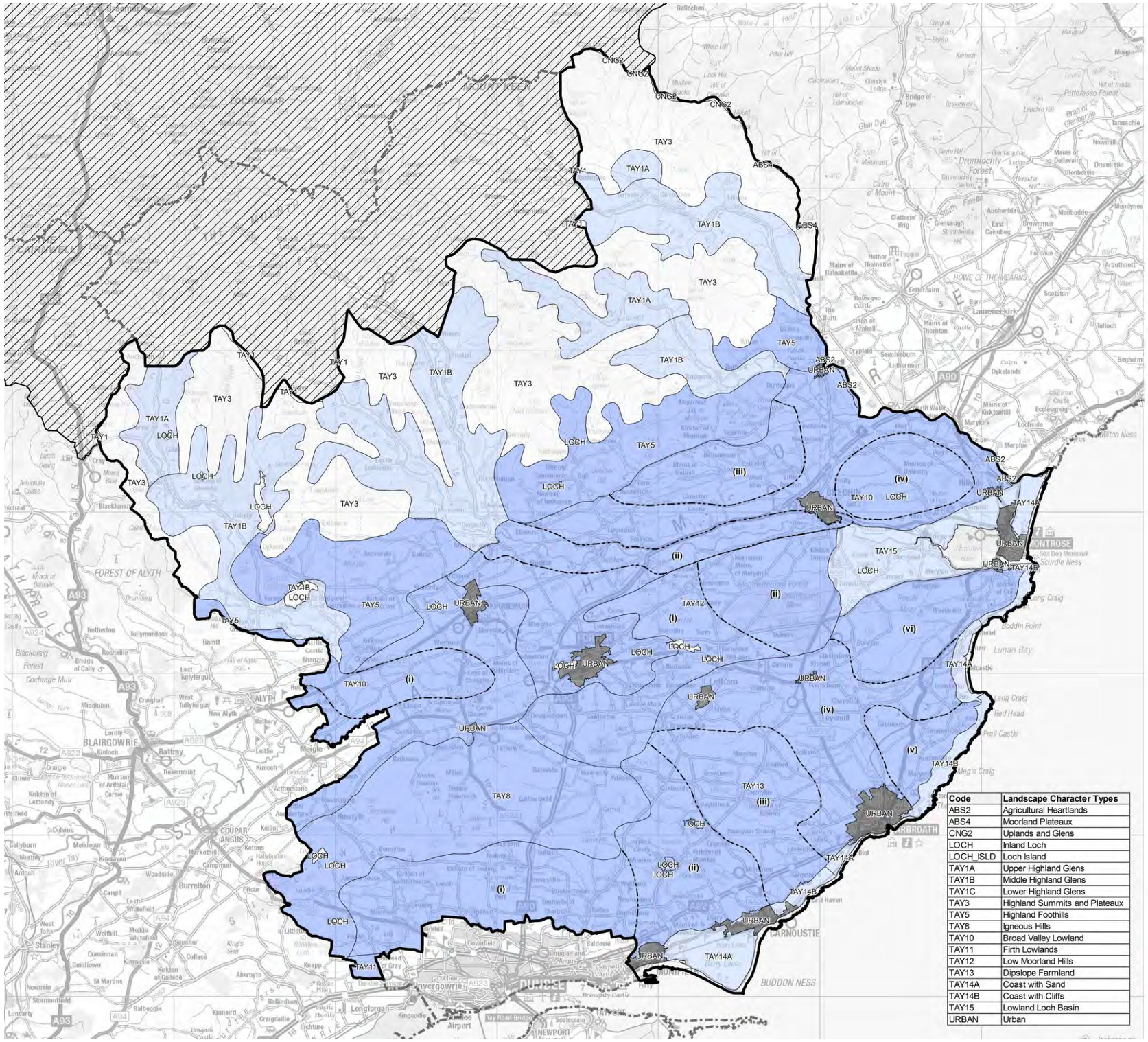
In Angus the lowland landscape represents the best opportunity for wind energy development. Two LCTs (*Broad Valley Lowland* and *Dipslope Farmland*) cover very extensive areas, with a medium or medium/large scale simple landscape pattern of arable fields, roads and plantations. These lowland LCTs are the hinterland for most of the principal towns of Angus and are influenced in places by urban fringes, industry, mineral extraction and major transport routes. These areas therefore have many of the characteristics that are considered compatible with wind turbine development and have underlying capacity for larger turbines in some locations.

The higher more open areas of Dipslope Farmland can accommodate larger turbines

However they also have the sensitivities of a substantial local residential and travelling population and domestic scale landscape features such as houses and trees. There are also areas of more complex and smaller scale landform. This restricts the potential size and extent of development compared with other parts of Scotland that have, for example, extensive unpopulated moorland plateau areas developed with large windfarms and turbines.

Other lowland landscape types within Angus (*Igneous Hills* and *Low Moorland Hills*) are smaller in extent and higher in elevation, with generally more complex patterns of landform and landuse. However there are open ridges in the Sidlaw Hills which have capacity for a modest scale of windfarm development with turbines up to about 80m blade tip height, as exemplified by Ark Hill. The relatively flat Montreathmont Forest area has potential capacity for small groups of larger turbines. However the neighbouring Forfar Hills are more sensitive due to the prominent modestly scaled hills, often with hillforts or viewpoints, providing a setting for the town of Forfar and there is no capacity for larger turbines.

The main coastal types (*Coastal with Sand; Coast with Cliffs*) have some of the landscape characteristics considered suitable for wind turbine development. However these areas are limited in extent, being particularly narrow, and have very modest landforms and a low tree cover. They are visually sensitive, as turbines would stand out clearly against sea and sky and only smaller turbines can be accommodated. The *Lowland Loch Basin* of Montrose Basin has a slightly greater underlying capacity in its farmland, but the open basin is visually sensitive, limiting capacity.



Code	Landscape Character Types
ABS2	Agricultural Heartlands
ABS4	Moorland Plateaux
CNG2	Uplands and Glens
LOCH	Inland Loch
LOCH_ISLD	Loch Island
TAY1A	Upper Highland Glens
TAY1B	Middle Highland Glens
TAY1C	Lower Highland Glens
TAY3	Highland Summits and Plateaux
TAY5	Highland Foothills
TAY8	Igneous Hills
TAY10	Broad Valley Lowland
TAY11	Firth Lowlands
TAY12	Low Moorland Hills
TAY13	Dipslope Farmland
TAY14A	Coast with Sand
TAY14B	Coast with Cliffs
TAY15	Lowland Loch Basin
URBAN	Urban

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March 2014 7933 ANC 132

Legend

- Study Area
- Scottish Local Authority Boundaries
- Cairngorms National Park
- Landscape Character Type / Area Boundary (see Table 3.1 for list)
- (i) LCA Sub Areas (Ref. Table 6.1)

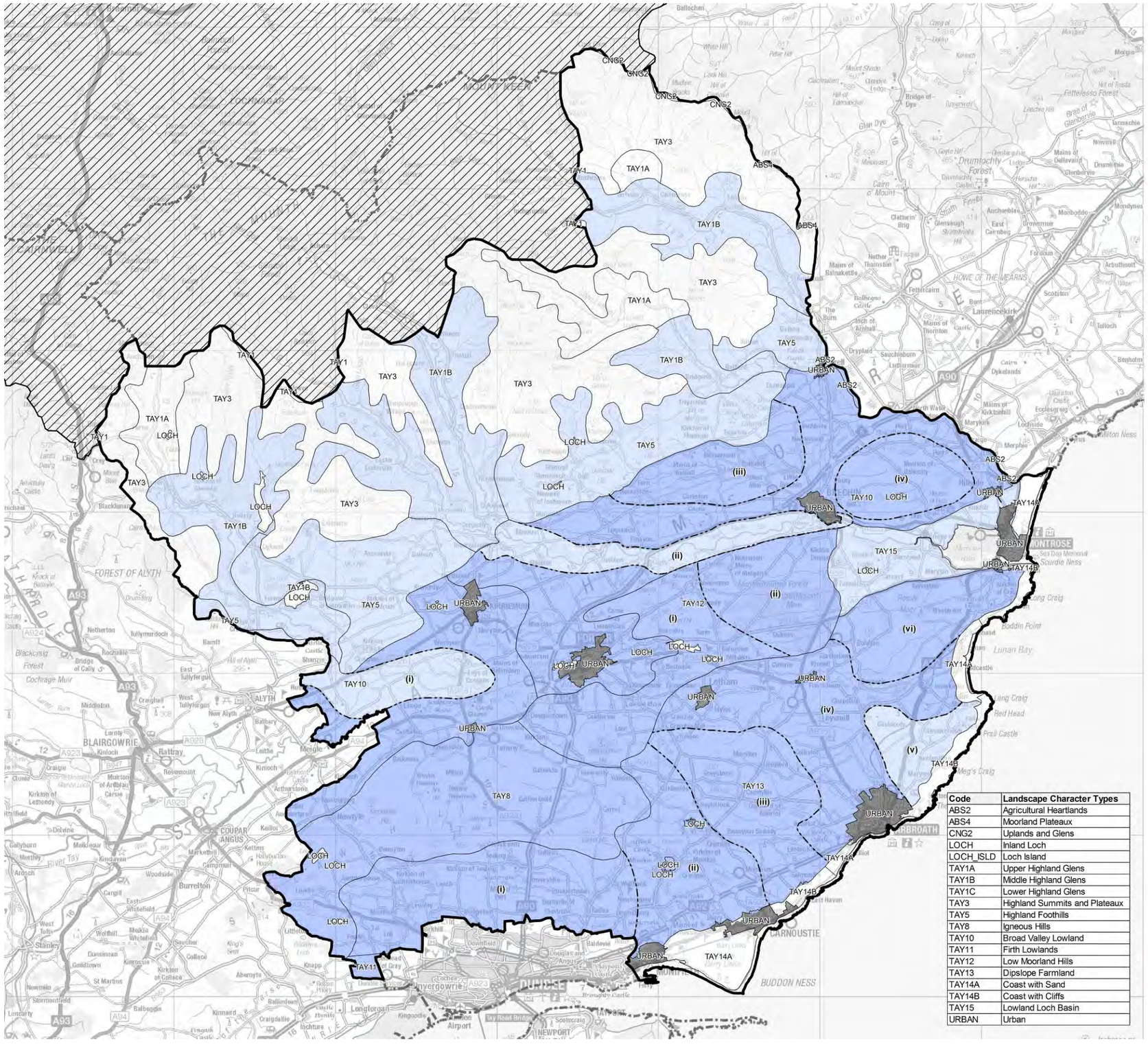
Capacity

- High Capacity
- Medium Capacity
- Low Capacity
- No Capacity
- Urban

Figure 6.1a

Underlying Landscape Capacity (15 to 30m Turbines)

N 0 2.5 5 10 Km



Code	Landscape Character Types
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ABS4	Moorland Plateaux
CNG2	Uplands and Glens
LOCH	Inland Loch
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TAY8	Igneous Hills
TAY10	Broad Valley Lowland
TAY11	Firth Lowlands
TAY12	Low Moorland Hills
TAY13	Dipslope Farmland
TAY14A	Coast with Sand
TAY14B	Coast with Cliffs
TAY15	Lowland Loch Basin
URBAN	Urban

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March 2014 7933 ANC 133

Legend

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- Cairngorms National Park
- Landscape Character Type / Area Boundary (see Table 3.1 for list)
- (i) LCA Sub Areas (Ref. Table 6.1)

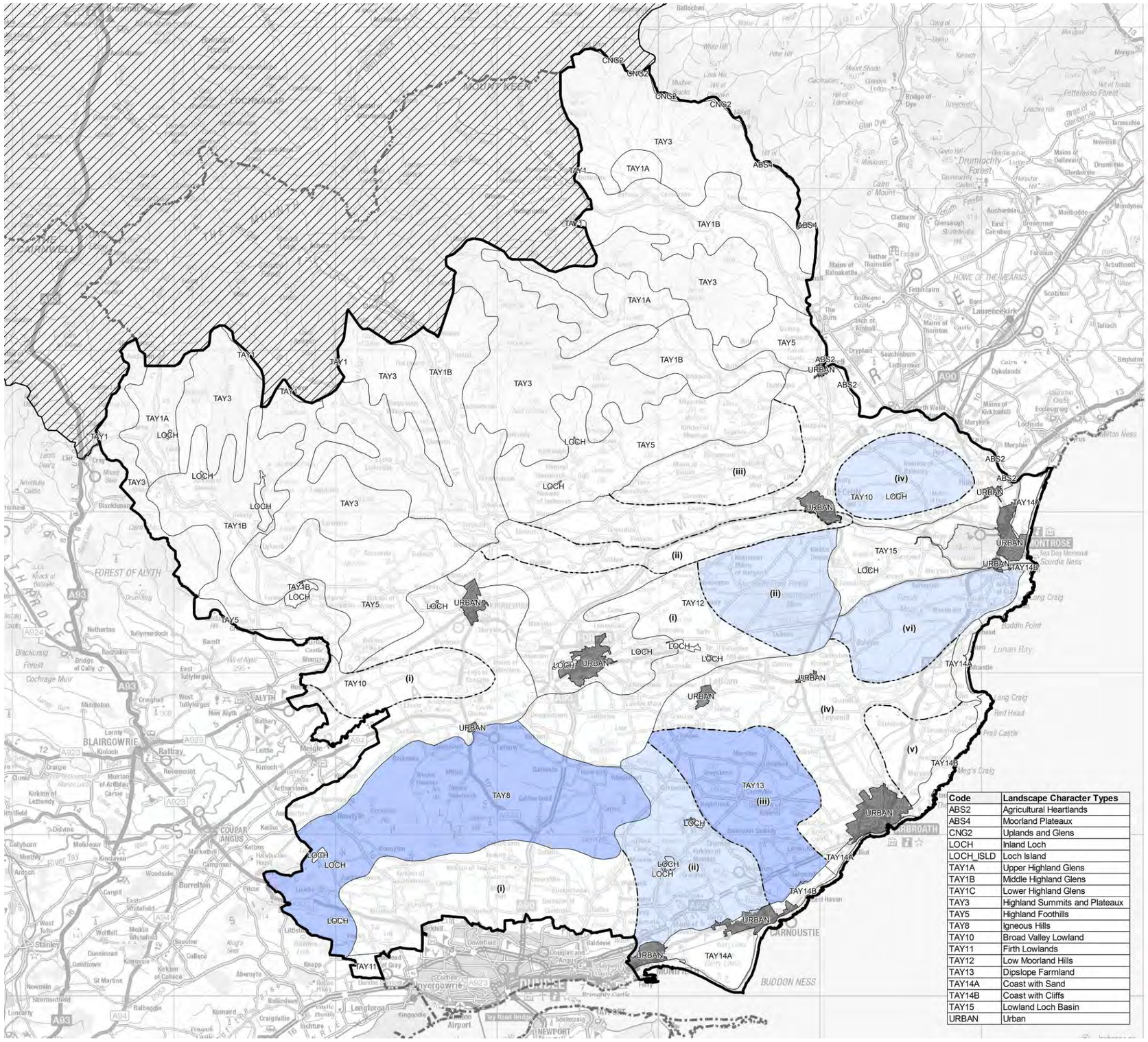
Capacity

- High Capacity
- Medium Capacity
- Low Capacity
- No Capacity
- Urban

Figure 6.1b

Underlying Landscape Capacity (30 to 50m Turbines)

N 0 2.5 5 10 Km



Code	Landscape Character Types
ABS2	Agricultural Heartlands
ABS4	Moorland Plateaux
CNG2	Uplands and Glens
LOCH	Inland Loch
LOCH_ISLD	Loch Island
TAY1A	Upper Highland Glens
TAY1B	Middle Highland Glens
TAY1C	Lower Highland Glens
TAY3	Highland Summits and Plateaux
TAY5	Highland Foothills
TAY8	Igneous Hills
TAY10	Broad Valley Lowland
TAY11	Firth Lowlands
TAY12	Low Moorland Hills
TAY13	Dipslope Farmland
TAY14A	Coast with Sand
TAY14B	Coast with Cliffs
TAY15	Lowland Loch Basin
URBAN	Urban

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March 2014 7933 ANC 134

Legend

- Study Area
- Scottish Local Authority Boundaries
- Cairngorms National Park
- Landscape Character Type / Area Boundary (see Table 3.1 for list)
- (i) LCA Sub Areas (Ref. Table 6.1)

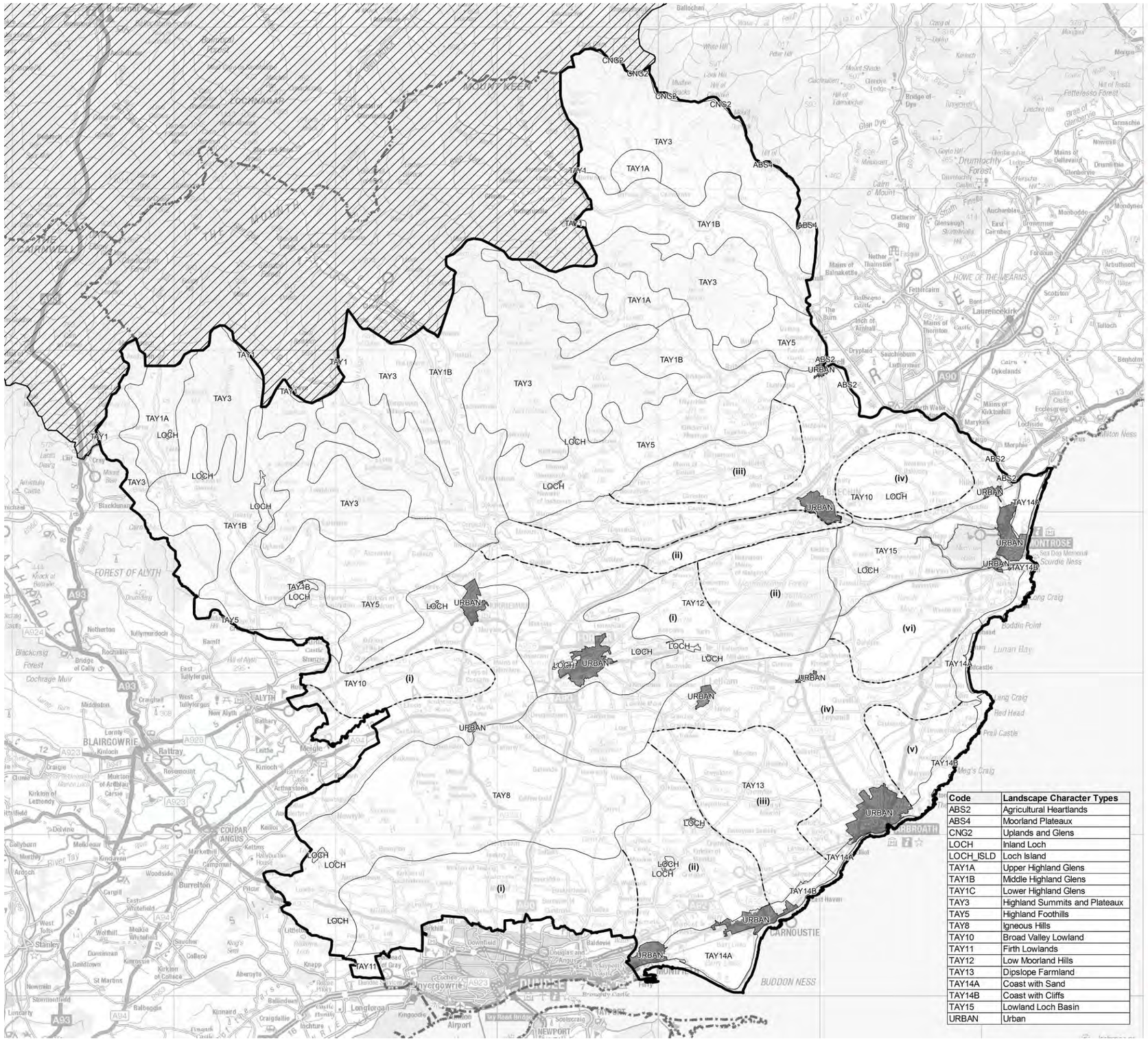
Capacity

- High Capacity
- Medium Capacity
- Low Capacity
- No Capacity
- Urban

Figure 6.1c

Underlying Landscape Capacity (50 to 80m Turbines)

N 0 2.5 5 10 Km



Code	Landscape Character Types
ABS2	Agricultural Heartlands
ABS4	Moorland Plateaux
CNG2	Uplands and Glens
LOCH	Inland Loch
LOCH_ISLD	Loch Island
TAY1A	Upper Highland Glens
TAY1B	Middle Highland Glens
TAY1C	Lower Highland Glens
TAY3	Highland Summits and Plateaux
TAY5	Highland Foothills
TAY8	Igneous Hills
TAY10	Broad Valley Lowland
TAY11	Firth Lowlands
TAY12	Low Moorland Hills
TAY13	Dipslope Farmland
TAY14A	Coast with Sand
TAY14B	Coast with Cliffs
TAY15	Lowland Loch Basin
URBAN	Urban

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March 2014 7933 ANC 135

Legend

- Study Area
- Scottish Local Authority Boundaries
- Cairngorms National Park
- Landscape Character Type / Area Boundary (see Table 3.1 for list)
- (i) LCA Sub Areas (Ref. Table 6.1)

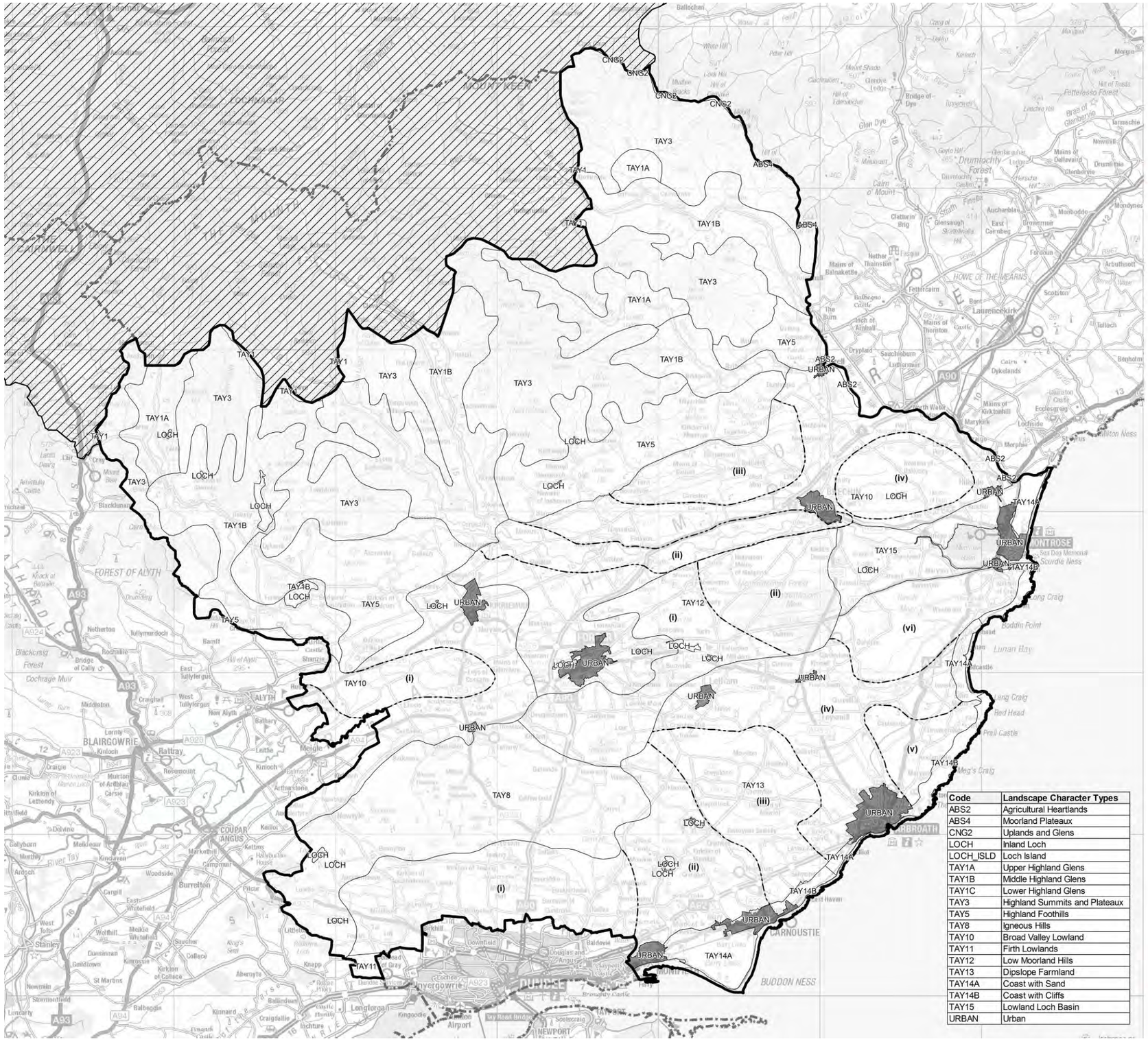
Capacity

- High Capacity
- Medium Capacity
- Low Capacity
- No Capacity
- Urban

Figure 6.1d

Underlying Landscape Capacity (80 to 125m Turbines)

N 0 2.5 5 10 Km



Code	Landscape Character Types
ABS2	Agricultural Heartlands
ABS4	Moorland Plateaux
CNG2	Uplands and Glens
LOCH	Inland Loch
LOCH_ISLD	Loch Island
TAY1A	Upper Highland Glens
TAY1B	Middle Highland Glens
TAY1C	Lower Highland Glens
TAY3	Highland Summits and Plateaux
TAY5	Highland Foothills
TAY8	Igneous Hills
TAY10	Broad Valley Lowland
TAY11	Firth Lowlands
TAY12	Low Moorland Hills
TAY13	Dipslope Farmland
TAY14A	Coast with Sand
TAY14B	Coast with Cliffs
TAY15	Lowland Loch Basin
URBAN	Urban

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March 2014 | 7933 ANC 136

Legend

- Study Area
- Scottish Local Authority Boundaries
- Cairngorms National Park
- Landscape Character Type / Area Boundary (see Table 3.1 for list)
- (i) LCA Sub Areas (Ref. Table 6.1)

Capacity

- High Capacity
- Medium Capacity
- Low Capacity
- No Capacity
- Urban

Figure 6.1e

Underlying Landscape Capacity (125m+ Turbines)

N

0 2.5 5 10 Km

The offshore area of Angus comprises the Firth of Tay in the south, opening out to the North Sea east of Buddon Ness. Developments in this area have the potential to affect the coastal landscape types, potentially limiting capacity in areas closer to the coast.

6.3.2 Existing and Consented Wind Turbines in May 2013

At 116 turbines, mostly below 50m to blade tip, the level of operational and consented development on shore in May 2013 is very modest compared with many areas in Scotland. Whilst there is a large number of individual schemes, almost all are small scale, involving single or small clusters of small/medium to medium/large size turbines. There are nevertheless concentrations of consented turbines which are leading to significant cumulative change in some areas of Angus:

1) Drumderg and Welton of Creuchies windfarms and several smaller turbines in the Alyth Foothills on the border with Perthshire

2) Ark Hill windfarm and Scotston turbine in the central Sidlaw Hills.

3) A concentration of single and paired small/medium to large turbines in the *Dipslope Farmland* between the Sidlaw Hills and Dundee

4) A concentration of small/medium to medium/large turbines on an elevated area of *Broad Valley Lowland* to the east of Brechin

There are a few other areas in the lowlands and the *Highland Foothills* with single larger turbines or smaller concentrations of varied turbines. Elsewhere, locations throughout lowland Angus have scatterings of single predominantly small/medium or medium size turbines.

There are currently no, or minimal numbers, of wind turbines in the *Highland Summits and Plateaux* and the *Highland Glens* and the coastal LCTs. However, some limited areas of these are influenced by close proximity of turbines in other LCTs.

There are significant numbers of consented turbines in the 30km buffer area beyond Angus. Some of these developments (such as Drumderg in Perthshire and Tullo in Aberdeenshire) have an influence on the landscape character of, or views out of Angus. There is one consented offshore windfarm lying to the south east of Angus, just on the 30km edge of the study area.

6.3.3 Proposed Wind Turbines in May 2013

At May 2013 there were 51 further proposed turbines within Angus and many more beyond in Perth, Aberdeenshire and offshore, some of which may have significant effects on the Angus landscape:

1) A large windfarm at Nathro in the *Highland Summits and Plateaux* above Glen Lethnot

2) Seven further large turbines in Tullymurdoch windfarm on the Perthshire side of the Alyth Foothills.

3) Two offshore windfarms at 15km and 50km from the Angus coast.

4) Two closely spaced small/medium windfarms of large turbines in the eastern Sidlaw Hills.

5) A further large turbine adjacent to a consented large turbine in the Menmuir Foothills.

There are no or minimal numbers of proposed turbines in the rest of the *Highland Summits and Plateaux* and the *Highland Glens* and the coastal LCTs. However, some limited areas of these would be influenced by the close proximity of turbines in other LCTs and local authority areas.

Applications for turbines continue to be submitted and there is no indication of a diminution of wind related activity. Proposed turbines are generally of a larger size distribution than the consented turbines, with the majority of the single turbines in the medium or medium/ large categories rather than small/medium (see chapter 5 for details).

There are two proposed offshore windfarms lying to the south east of Angus, one at Inchcape15km offshore and the other at Neart na Goaithe just on the 30km edge of the study area.

6.4 Landscape Capacity and Cumulative Landscape Effects

Refer to Figure 6.2 for a map of current cumulative wind turbine landscape types and Figure 6.3 for a map illustrating the proposed future limit to wind turbine landscape types, as described in Table 6.1 and summarised in the sections below.

6.4.1 Summary of Capacity and Cumulative Development in the Highlands

The Highland area in Angus comprises four LCTs: *Upper Highland Glens; Mid Highland Glens; Highland Summits and Plateaux* and *Highland Foothills.*

The assessment of Highland LCTs has determined that this area of Angus mostly has a low or no underlying capacity for wind turbine development despite extensive areas of large scale open landscapes. This is primarily due to the highland area's high landscape value, both as a backdrop to the lowland area of Angus and as an extensive area of scenic and dramatic landscape with areas of remote and wild land qualities. The latter is underlined by the draft Core Area of Wild Land designation that covers a significant part of this area in Angus. The highland area is an important recreational and visitor destination and a substantial proportion of it lies within the Cairngorms National Park and a National Scenic Area that overlaps with Angus and extends further north into a wider area of higher mountains and wilderness.

It is recommended that no turbines are located in the high hills of the *Highland Summits and Plateaux.* Within the *Highland Glens* and *Highland Foothills* there would be only limited opportunities for smaller scale developments, with single turbines under 30m in the *Upper Highland Glens* and single or small groups of turbines under 50m height elsewhere. Turbines should preferably be located in suitable areas screened by topography or trees and away from sensitive receptors such as the Caterthun hillforts and Airlie Monument.

Restricting development in upland areas is counter to the development pattern that has taken place elsewhere in many other areas of Scotland. Nevertheless it reflects the sensitivity and value of all the LCTs within this area; their particular contribution to the

overall landscape character of Angus and their continuity with the Cairngorms National Park.

In May 2013 there were no operational or consented developments within the *Highland Summits and Plateaux* of Angus, although the 16 turbines of Drumderg in Perth & Kinross are within 3km to the west. Mid Hill in upland Aberdeenshire is over 15km to the northeast. As Drumderg lies within a *Highland Summits and Plateaux* landscape area crossing the local authority boundary a small part of the Angus highland area is effectively a *Highland Summits and Plateaux with Wind Turbines* landscape. *Highland Foothills* nearby would similarly be affected. Most of the rest of the highland area is remote enough from windfarms or screened to remain virtually unaffected. There are a few small/medium and medium turbines consented in the *Highland Foothills* and one or two in the *Mid Highland Glens*, creating areas of *Occasional Wind Turbine,* with one large turbine in the Menmuir Hills creating a small area of *Highland Foothills with Wind Turbines.*

Most of the proposed wind turbines are located in or near the *Highland Foothills* and would not lead to a significant change on the current situation. However the proposed seventeen 134m tall turbines at Nathro in the *Highland Summits and Plateaux* would lead to a *Wind Turbine Landscape* in the surrounding area including parts of the West Water Valley, Glen Lethnot and the Menmuir Hills; as well as significant effects on views of the Highland Boundary Fault seen from the Lower South and North Esk Valley and the Forfar Hills further to the south.

6.4.2 Summary of Capacity and Cumulative Development in the Lowland and Hills

The Lowland and Hills area comprises four LCTs: *Igneous Hills; Broad Valley Lowland; Low Moorland Hills* and *Dipslope Farmland.*

The assessment has determined that the lowland landscape of Angus has overall a medium underlying capacity for wind turbines of up to 50m tall, with medium or low underlying capacity for medium/large turbines in more limited locations such as the Sidlaw Hills; parts of the *Dipslope Farmland* and *Broad Valley Lowland* and Montreathmont Moor. Conversely some smaller scale areas of more complex landform and enclosed character in the *Broad Valley Lowland* and the hilltops of the *Low Moorland Hills* have relatively little or no capacity.

The landscape is generally of a medium scale and visually sensitive due to widespread settlement (including a number of towns and villages) and transport routes (including the A90 trunk route); together with openness of much of the landscape. Nevertheless, unlike the highland area, this is a mainly a settled, working agricultural landscape, with some medium scale hills. There are significant areas of sufficient scale and simplicity in landform and landcover pattern to accommodate some degree of wind turbine development.

The overall character means that smaller scale developments including single turbines are appropriate, with relatively little capacity for medium windfarms and no capacity for large scale windfarms such as may be found in many upland areas of Scotland. Developments should be sufficiently separated to ensure the landscape does not exceed a *Landscape with Occasional Wind Turbines* over most of the lowland LCAs, with some areas of *Landscape with Wind Turbines* in the largest scale most open and least populated areas. It is worth noting that a number of proposed developments in the lowlands with large or very large turbines have been refused consent and/or dismissed at appeal. This suggests a turbine height limit of ca. 80m (i.e. up to medium/large) can be acceptably accommodated in the areas with the largest scale and simplest landforms, subject to detailed assessment.

Currently the only consented windfarm development in Angus is for eight 81m turbines (borderline large in size) at Ark Hill within the Sidlaw Hills, within the lowland area. Other developments within the lowlands are predominantly for single turbines, which are scattered across the lowlands with the greatest concentrations in the northeast of Strathmore and the *Dipslope Farmland* to the north of Dundee. Outside Angus there are two large operational turbines in Dundee close to the *Dipslope Farmland*; a number of single turbines in the Howe of Mearns in Aberdeenshire at the northeastern end of Strathmore, and a windfarm at Tullo 10km to the NE of the lowland area. Extensive areas of the lowlands are a *Landscape with no Wind Turbines.* Areas mainly in the northeast and southwest are a *Landscape with Wind Turbines* or *Landscape with Occasional Wind Turbines.* Further isolated areas of *Landscape with Occasional Wind Turbines* or *With Wind Turbines* are scattered across the lowlands between the main areas.

The current extent of development lies mainly within the capacity of the landscape to accommodate wind turbines. Nevertheless cumulative development in some areas is beginning to significantly reduce residual capacity for further wind turbines. This is discussed further in section 6.5 below.

The currently proposed developments comprise mainly single or paired turbines scattered across or close to the lowland areas. These would not in general lead to a significant adverse level of development. Currently proposed turbines and/or windfarms in the *Igneous Hills* may lead to an significant adverse level of cumulative impact due to the number and size of turbines and juxtaposition of differing layouts.

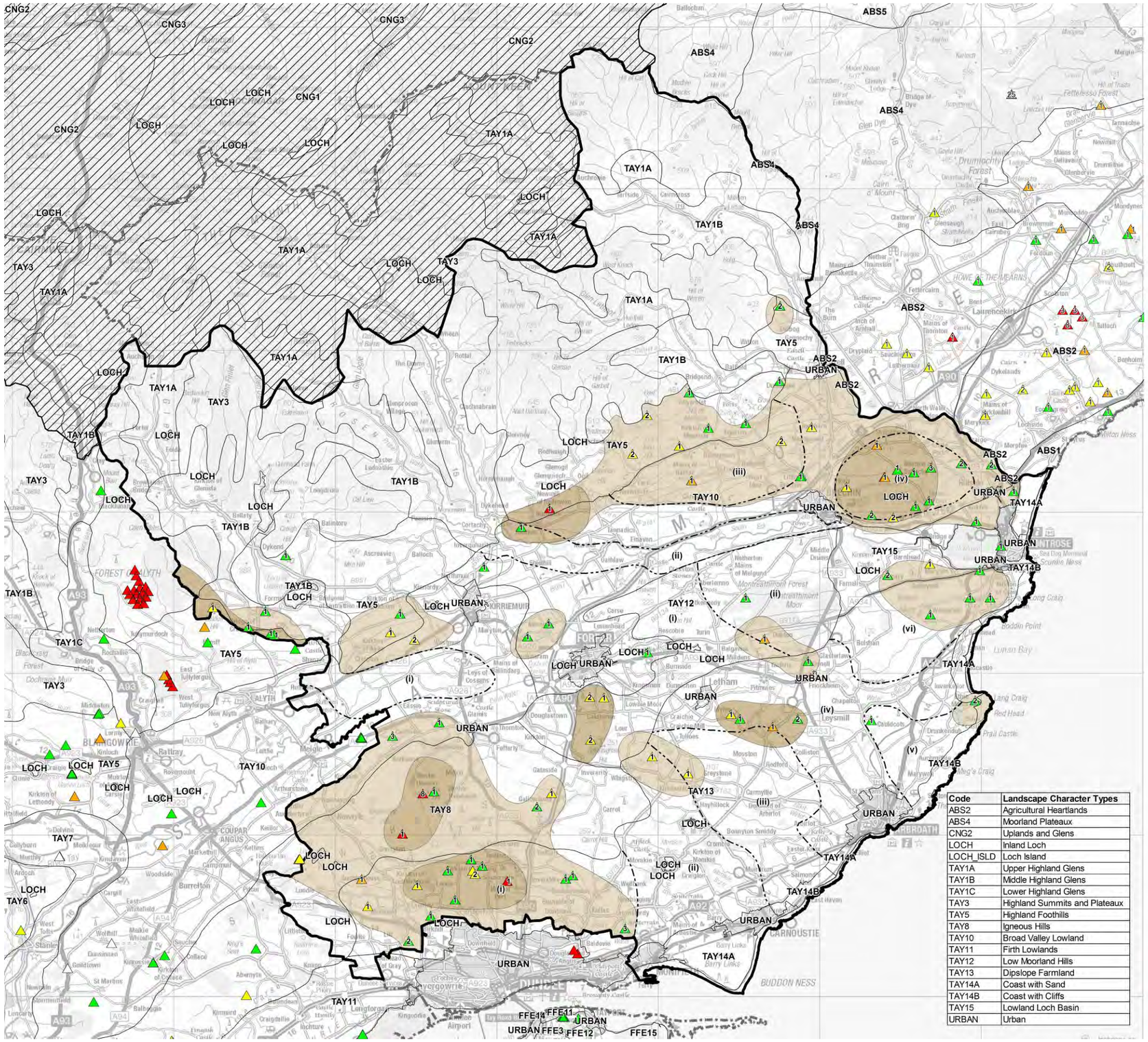
6.4.3 Summary of Capacity and Cumulative Development in the Coast

The Coastal Landscapes comprise three LCTs: *Coast with Sand; Coast with Cliffs* and *Lowland Loch Basin.*

The Coastal LCTs in Angus have a low capacity for wind turbine development due to their open character, relatively small extent and scenic coastal character of cliffs and sand together with the unique tidal basin at Montrose. The predominantly narrow strips of *Coast with Sand* and *Coast with Cliffs* can accommodate single turbines up to 30m as a *Coast with Occasional Wind Turbines* and the *Lowland Loch Basin* around Montrose can accommodate occasional turbines below 50m tall.

Currently there are two small/medium wind turbines in the coast areas and six small/ medium and one medium consented within the Montrose Basin LCA, making small areas of coastal landscapes *Landscape with Occasional Wind Turbines.*

There are no current proposals within the coastal area. Two proposed 137m turbines at GSK in Montrose that would have adversely affected the landscape of adjacent areas, exceeding proposed acceptable capacity, have recently been dismissed at appeal.



Code	Landscape Character Types
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CNG2	Uplands and Glens
LOCH	Inland Loch
LOCH_ISLD	Loch Island
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TAY5	Highland Foothills
TAY8	Igneous Hills
TAY10	Broad Valley Lowland
TAY11	Firth Lowlands
TAY12	Low Moorland Hills
TAY13	Dipslope Farmland
TAY14A	Coast with Sand
TAY14B	Coast with Cliffs
TAY15	Lowland Loch Basin
URBAN	Urban

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Legend

- Study Area
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- Scottish Local Authority Boundaries
- Landscape Character Type / Area Boundary (see Table 3.1 for list)
- (i) LCA Sub Areas (Ref. Table 6.1)

Typology

- Landscape with no Wind Turbines
- Landscape with Occasional Wind Turbines
- Landscape with Wind Turbines
- Wind Turbine Landscape

Consented Turbines:

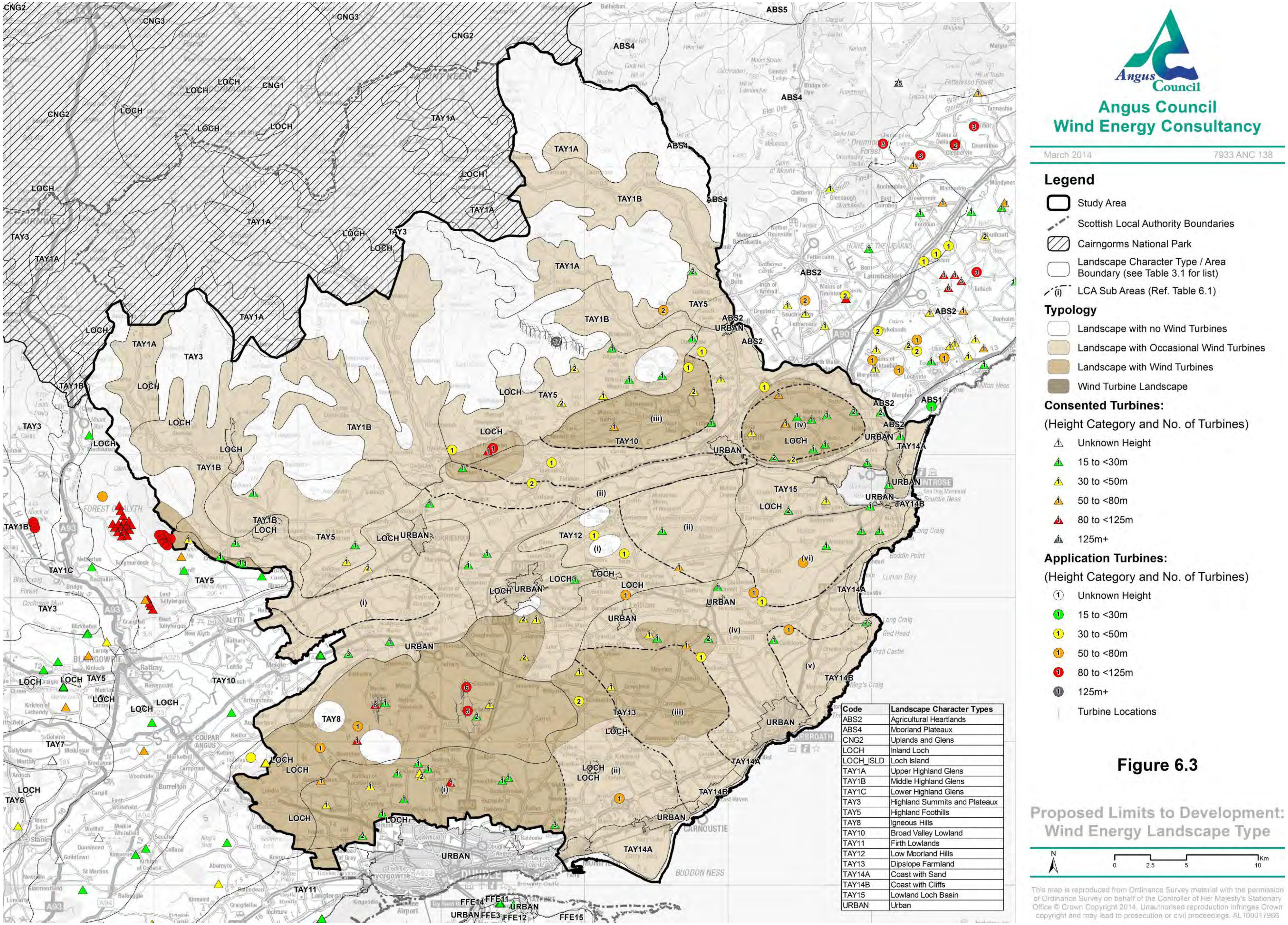
(Height Category and No. of Turbines)

- Unknown Height
- 15 to <30m
- 30 to <50m
- 50 to <80m
- 80 to <125m
- 125m+

Figure 6.2

Current Consented Development: Wind Energy Landscape Type

N 0 2.5 5 10 Km



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TAY12	Low Moorland Hills
TAY13	Dipslope Farmland
TAY14A	Coast with Sand
TAY14B	Coast with Cliffs
TAY15	Lowland Loch Basin
URBAN	Urban

Figure 6.3

6.5 Residual Capacity for Further Development

This assessment has demonstrated that the landscape of Angus has the underlying capacity to accommodate wind energy development of an appropriate type and extent. Appropriate development relates to the varied characteristics of the landscape; the visual sensitivities of the population spread across lowland Angus and the higher value or sensitive context of some areas of landscape, in particular the extensive large scale, open, unpopulated upland areas north of the Highland Boundary Fault and contiguous with the Cairngorms National Park. The particular characteristics of Angus means there is no scope for the larger scale of windfarm development seen elsewhere in Scotland.

The main underlying capacity for development lies within some of the larger scale more extensive lowland areas which can accommodate larger turbines sizes, but not the largest sizes and not in large groupings. Other areas have a more limited underlying capacity, which would not be appropriate for larger turbines sizes, and some areas have very limited or no capacity for wind energy development.

At current levels of development there is residual capacity in Angus for further appropriate wind energy development in most areas that have underlying capacity. Future development in each landscape type or area should follow the guidance given in Table 6.1 and following in order to remain within the proposed wind turbine landscape types set out in Figure 6.3. The aim of the guidance is to ensure that the acceptable capacity for development in terms of turbines sizes, group sizes and spacing between turbines and groups is not exceeded, and that other issues guiding or limiting development are taken into account.

Some of the residual capacity would be fully used and could be exceeded if all current proposals were implemented. The main opportunities and limitations on capacity are discussed below and the areas concerned illustrated in schematic form in Figure 6.4.

6.5.1 Areas with Highest Underlying Capacity

Figure 6.4 identifies in dark green four areas which have the highest underlying capacity in Angus for wind energy development. By this it is meant that they have the capacity to accommodate larger sizes of turbine and/or greater numbers and concentrations relative to other areas of landscape in Angus. This is based on a combination of one or more factors including suitable larger scale simple landforms and landscape patterns; existing development/ land use affecting character; lower visual sensitivity and lower landscape value. Not all of these factors are present in every area identified and the analysis and guidance in Table 6.1 and following should be followed.

The main areas are:

1) Careston Broad Valley Lowland to the north west of Brechin.

2) Muir of Pert Broad Valley Lowland to the east of Brechin.

3) Montreathmont Forest and farmland to the south of Brechin.

4) The Sidlaw Hills with contiguous areas of Dipslope Farmland to the south and east and Low Moorland Hills south of Forfar.

Wind turbines are already located in some of these areas, utilising some of the underlying capacity and therefore reducing residual capacity. The limitations resulting from this are discussed in 6.5.4 below.

6.5.2 Areas with Limited Underlying Capacity

Most of the remaining lowland and coastal areas of Angus have some underlying capacity for wind energy development but are generally not suited to larger turbines, large groupings or extensive concentrations of wind turbine development. The areas are shown in light green in figure 6.4. Capacity varies from the ability to accommodate only very occasional small/medium wind turbines in some of the *Upper Highland Glens* to more frequent medium turbines across much of the *Highland Foothills, Broad Valley Lowlands* and *Dipslope Farmland*. Some areas of the *Dipslope Farmland* may be able to accommodate occasional single medium/large turbines subject to detailed assessment of local characteristics.

Currently there are limited numbers of existing, consented and proposed smaller scale developments (mainly single small/medium and medium size turbines). Guidance in Table 6.1 is intended to steer future development in these areas to an acceptable level.

6.5.3 Areas with No Underlying Capacity

Significant areas of Angus have no underlying capacity for wind turbine development. These are left uncoloured in Figure 6.4:

1) All of the *Highland Summits and Plateaux* LCAs, due to their importance to the Angus landscape, connectivity with the Cairngorms National Park, high visual prominence, high relative wildness and recreational value;

2) Some upper parts of *Highland Glens* and *Highland Foothills* which extend into the Lochanagar and Mount Keen draft Core Area of Wild Land and are contiguous with the *Highland Summits and Plateaux.*

3) Some prominent summits, viewpoints and hillforts in the Sidlaw Hills, *Highland Foothills* and *Low Moorland Hills*.

It is recommended that these landscape types and areas remain undeveloped with turbines to protect their character, avoid widespread visibility, protect key viewpoints and features and particularly to protect the key feature of the Highland Boundary Fault and its backdrop of the Grampian Mountains.

When assessing the acceptability of larger turbine proposals in neighbouring landscape character areas, proximity to the sensitive areas described above should be taken into account.

6.5.4 Areas Where Cumulative Impact Limits Further Development

As described above, a number of landscape types and areas in Angus have an underlying capacity to accommodate wind energy development. However, existing and consented development in or nearby some of these areas means that further significant development may exceed the acceptable cumulative capacity of the landscape. The areas where current

cumulative impact limits capacity for further development are shown as hatched areas in Figure 6.4.

1) Alyth Foothills / Glen Clova

2) Menmuir / Hill of Ogil

3) Brechin and Muir of Pert

4) Letham to Firth Muir of Boysack

5) Central Sidlaws and Tealing

The areas are defined by the following criteria:

1) The developed areas of windfarms and turbines (operational and consented) and the cumulative extent of their impacts on the surrounding landscape;

2) The underlying landscape capacity within the LCAs and for those surrounding them;

3) The extent of area within which further significant development should be limited to avoid extending cumulative landscape and visual impacts between the groups of turbines within the cumulative area and other turbines outside the area.

The boundaries shown in Figure 6.4 are indicative. They are described in more detail for each area in Table 6.2 below, together with the main objectives for limiting further development. In the case of specific development proposals there should be an assessment relating to the detailed criteria.

6.5.5 Development within Built up Areas

Whilst it is recognised that some parts of built up areas and settlements may be able to accommodate wind turbines, and indeed do, they have not been included in this landscape character based capacity assessment. Factors specific to townscape and urban planning are likely to guide location. Consequently urban areas have been left out of the constraints and opportunities map in 6.4, Table 6.1 and the guidance.

Nevertheless it is noted in this study that the setting of settlements and the presence of settlements within a wider landscape type has a bearing on landscape character and on capacity for development.

6.6 Guidance for Small Turbines

This cumulative assessment and capacity study has detailed the current distribution of all sizes of wind turbines of 15m or greater blade tip height. The strategic guidance above therefore applies to turbines 15m and greater in height when determining capacity for further development. This is because the smallest turbines below 15m have a similar scale to built structures and trees found commonly throughout the landscape and do not have the same eye-catching prominence and extensive visibility of larger turbines. They do not therefore have the same issues of wide scale cumulative effects across extensive landscape areas.

The issues relating to design and siting of small turbines concern mainly their localised effects on the area in which they are sited rather than wider cumulative effects on landscape character. Small wind turbines should be judged on their own merits, assessed against the criteria that apply to most other domestic or farm scale built structures. Landscape and visual considerations may include the following:

- Effects on designations including landscape quality designations, SAMs, listed buildings, conservation areas;
- Location in relation to scenic viewpoints;
- Relationship to skylines and seascapes;
- Relationship to other structures and buildings;
- Location in relation to approaches to and setting of settlements;
- Type and appearance of towers, rotors and nacelles;
- Proximity to residential properties;
- Localised cumulative effects including potential for visual confusion or cluttering areas with significant numbers of small turbines and/or close proximity to other similar larger structures including taller wind turbines and electricity pylons.

Larger wind turbines are more often than not seen against the sky. The approach to colouring has been to adopt a neutral light grey colour relating to the sky colour most likely to be encountered as a backdrop. Small wind turbines are often fully or partially backclothed against landforms and/or trees, giving a closer relationship to the ground than the larger structures. It may therefore be appropriate to consider colouring small wind turbines a darker grey, green or brown to reduce their visibility when seen against backdrops, or close to buildings.

Angus Council
Wind Energy Consultancy

March 2014 7933 ANC 139

Legend

- Study Area
- Scottish Local Authority Boundaries
- Cairngorms National Park
- Landscape Character Type / Area Boundary (see Table 3.1 for list)
- (i) LCA Sub Areas (Ref. Table 6.1)
- Settlements
- Areas with Highest Underlying Capacity:
  1. Careston Farmland
  2. Muir of Pert
  3. Montreathmont Forest
  4. Sidlaw Hills and Dipslope Farmland
- Areas with Limited Underlying Capacity
- Areas with No Underlying Capacity
- Areas where Cumulative Impact Limits Development:
  1. Alyth Foothills / Glen Clova
  2. Menmuir / Hill of Ogil
  3. Brechin and Muir of Pert
  4. Letham to Firth Muir of Boysack
  5. Central Sidlaws and Tealing

Code	Landscape Character Types
ABS2	Agricultural Heartlands
ABS4	Moorland Plateaux
CNG2	Uplands and Glens
LOCH	Inland Loch
LOCH_ISLD	Loch Island
TAY1A	Upper Highland Glens
TAY1B	Middle Highland Glens
TAY1C	Lower Highland Glens
TAY3	Highland Summits and Plateaux
TAY5	Highland Foothills
TAY8	Igneous Hills
TAY10	Broad Valley Lowland
TAY11	Firth Lowlands
TAY12	Low Moorland Hills
TAY13	Dipslope Farmland
TAY14A	Coast with Sand
TAY14B	Coast with Cliffs
TAY15	Lowland Loch Basin
URBAN	Urban

Figure 6.4

Wind Turbine Development Opportunitites and Constraints

N 0 2.5 5 10 Km

Table 6.2: Areas Where Cumulative Impact Limits Further Development: Description and Key Objectives (see Figure 6.4 for Map)

1. Alyth Foothills and Glen Clova	
Description The boundaries of this area include: • The Angus/ Perthshire boundary between Black Hill in the north and Airlie Castle to the south; • The crest of Black Hill and Hill of Fernyhirst though Little Kilry to the River Isla at Bridge of Craigisla; • The course of the River Isla to Airlie Castle	**Development Situation and Key Objectives** The Alyth Hills on the boundary with Perthshire are *Highland Foothills with Wind Turbines* due to the presence of Drumderg Windfarm in Perthshire and several small/medium to medium/large turbines along the border within the Alyth Hills LCA and Glen Isla. Several further large turbines are proposed at Tullymurdoch in Perthshire on the border with Angus. The objectives governing the area are: 1) Retaining sufficient spacing between individual windfarms and turbines to maintain the *Landscape with Wind Turbines* character and avoid a *Wind Turbine Landscape* character in the *Highland Foothills*; 2) To prevent further extension of the *Landscape with Wind Turbines* onto the floor of Glen Isla; 3) To protect the skyline ridge to the southwest of Glen Isla from over-development with turbines; 4) To protect the setting of and views from visually sensitive locations including Reekie Linn, Airlie Castle and Designed Landscape and small settlements in Glen Isla.
2. Memus and Hill of Ogil	
Description The boundaries of this area include: • the *Highland Foothills* LCA between the Noran Water and Glen Clova, including Hill of Ogil and Den of Ogil; • *The Broad Valley Lowland* south of Hill of Ogil east of the Cortachy policies and the River South Esk to Shielhill Bridge and thence northeast across farmland to Meikle Couil and the Noran Water at Milton of Ogil;	**Development Situation and Key Objectives** Currently this area has a single large turbine consented at Memus and a small/medium turbine near Cortachy. The visual influence of the large turbine creates an area of *Highland Foothills with Wind Turbines* on the south side of Hill of Ogil, extending south into the *Broad Valley Lowland* A further medium size turbine is proposed near Cortachy. The objectives governing the area are: 1) Avoiding further extension of the *Landscape with Wind Turbines* character into the *Highland Foothills, Broad Valley Lowland* and *Mid Highland Glens* 2) Retaining sufficient spacing between turbines so as not to exceed the *Landscape with Wind Turbines* character and avoid areas of *Wind Turbine Landscape* character in the *Highland Foothills* and *Broad Valley Lowland*; 3) To prevent development of or influence of large turbines on the north side of Hill of Ogil and into Den of Ogil; 4) To protect the setting of and views from Cortachy designed landscape; 5) To support an organised pattern of development by maintaining sufficient spacing/ screening between groups of larger and smaller turbines. 6) To prevent potential cumulative visual clutter by proximity of turbines to the electricity transmission line crossing the hills in this location.
3. Broad Valley Lowland: Brechin and Muir of Pert	
Description The boundaries of this area include: • The A90 between Brechin and the North Esk • The North Esk east to Hillside Village • The edge of Hillside, the House of Dun and the A935 from Mains of Dun to Brechin • The northeastern edge of Brechin	**Development Situation and Key Objectives** Currently this area has consents for eleven small turbines, three medium turbines and two medium/large turbines, creating an extensive area of *Broad Valley Lowland with Wind Turbines*. There is a proposal for a further medium turbine. The objectives governing the area are: 1) Avoiding coalescence with the *Landscape with Wind Turbines* in Aberdeenshire by minimising development in the North Esk corridor; 2) Retaining sufficient spacing between individual turbines to maintain a *Landscape with Wind Turbines* and avoid a *Wind Turbine Landscape* character; 3) Avoiding excessive skylining of larger wind turbines to the crests of the escarpments which important but modestly scaled backdrops to the A90, Brechin and Montrose Basin; 4) To support an organised pattern of development by maintaining sufficient spacing/ screening between groups of larger and smaller turbines; 5) To prevent unacceptable proximity of larger turbines to settlements and other visually sensitive locations including Brechin, Hillside, Craigo, House of Dun and the Caledonian Railway.

4. Dipslope Farmland Between Letham and Firth Muir of Boysack	
Description The boundaries of this area include: • The village of Letham to the northwest and the small settlement of Firth Muir of Boysack to the southeast • The course of the Lunan Water between Letham and Friokheim • The A933 between Friockheim and Colliston • A line south of the hill crests between Hillhead, Boath Hill and West Grange of Conon.	**Development Situation and Key Objectives** Currently this area has one medium/large turbine, three small turbines and one medium turbine creating a small area of *Dipslope Farmland with Wind Turbines*, with proposals for a further medium size turbine. The objectives governing the area are: 1) Retaining sufficient spacing between individual turbines to maintain a *Landscape with Wind Turbines* and avoid a *Wind Turbine Landscape* character; 2) Avoiding excessive skylining of larger wind turbines to the crest of the farmland either side of Boath Hill which forms an important but modestly scaled backdrop to lower ground in the north and east; 3) To support an organised pattern of development by maintaining sufficient spacing/ screening between groups of larger and smaller turbines; 4) To prevent unacceptable proximity of larger turbines to settlements and other visually sensitive locations including Letham, Colliston and the smaller scale more settled landscape surrounding the Lunan Water.
5. Central Sidlaw Hills and Tealing Farmland	
Description The boundaries of this area include: • The *Igneous Hills* between the B954, Newtyle to Glamis; A928 to Milton of Ogilvie and Gallow Hill Ridge descending to Tealing; • The *Dipslope Farmland* south of the Igneous Hills between Auchterhouse, Dronley, Bridgefoot and the A90 north to Tealing;	**Development Situation and Key Objectives** Ark Hill Windfarm and Scotston with large size turbines creates a *Landscape with Wind Turbines* in the central Sidlaw Hills. There are several turbines consented in the *Dipslope Farmland* between Tealing and Auchterhouse including a large turbine at former Tealing Airfield. There are proposals for two other medium/large turbines in the central Sidlaw Hills. The objectives governing the area are: 1) Retaining sufficient spacing between individual windfarms and turbines to maintain the *Landscape with Wind Turbines* character and avoid areas of *Wind Turbine Landscape* character in the *Igneous Hills* and *Dipslope Farmland*; 2) To prevent development of turbines on the southern escarpment and skyline of the Sidlaw Hills which is prominent from areas to the south of Dundee; 3) To protect the setting of and views from the prominent hillforts and hilltop viewpoints of Kinpurney Hill, Auchterhouse Hill and Balluderon Hill; 4) To support an organised pattern of development by maintaining sufficient spacing/ screening between groups of larger and smaller turbines; 5) To prevent unacceptable proximity of larger turbines to settlements and other visually sensitive locations. 6) To prevent potential cumulative visual clutter by proximity of turbines to other structures prevalent in this area including transmitter masts, electricity transmission lines and the Tealing substation.

GLOSSARY

Acceptability The likely acceptability of a proposed level of development determined by considering it against the underlying capacity of the landscape and other policy criteria and objectives.

Cumulative Impacts Additional changes caused by a proposed development in conjunction with other similar developments, or as the combined effect of a set of developments, taken together.

Cumulative Wind Turbine Development Typology A gradated landscape typology that defines terms of reference for increasing levels of development with turbines; describing their effect on landscape character and the experience of those living in or travelling through the landscape.

Designated Landscape Areas of landscape identified as being of importance at international, national or local levels, either defined by statute or identified in development plans or other documents.

Key Characteristics Those combinations of elements which are particularly important to the current character of the landscape and help to give an area its particularly distinctive sense of place.

Landscape An area, as perceived by people, the character of which is the result of the action and interaction of natural and/or human factors.

Landscape Accommodation A degree of change that does not fundamentally alter key landscape characteristics and visual resources.

Landscape Capacity The degree to which a particular landscape character type or area is able to accommodate change without significant effects on its key characteristics, or overall change of landscape character type. Capacity is likely to vary according to the character of the landscape and nature of change being proposed.

Landscape Change **L**arge amounts of change that may fundamentally alter key landscape characteristics and visual resources.

Landscape Character A distinct, recognisable and consistent pattern of elements in the landscape that makes one landscape different from another, rather than better or worse.

Landscape Character Areas (LCAs) These are single unique areas which are the discrete geographical areas of a particular landscape type.

Landscape Character Types (LCTs) These are distinct types of landscape that are relatively homogenous in character. They are generic in nature in that they may occur in different areas in different parts of the country, but wherever they occur they share broadly similar combinations of geology, topography, drainage patterns, vegetation and historical land use and settlement pattern, and perceptual and aesthetic attributes.

Landscape Protection Maintaining existing landscape character.

Landscape Quality (Condition) A measure of the physical state of the landscape. It may include the extent to which typical character is represented in individual areas, the intactness of the landscape and the condition of individual elements.

Landscape Value The relative value that is attached to different landscape by society. A landscape may be valued by different stakeholders for a whole variety of reasons.

Perception Combines the sensory (that we receive through our senses) with the cognitive (our knowledge and understanding gained from many sources and experiences).

Residual Landscape Capacity The remaining landscape capacity of an area for a specific type of development, determined by considering the extent to which current levels of this development already occupies the underlying landscape capacity. This can vary according to the amount of underlying capacity and extent of consented development.

Sensitivity A term applied to specific receptors (eg. landscape or visual), combining judgements of the susceptibility of the receptor to the specific type of change or development proposed and the value related to that source.

Susceptibility The ability of a defined landscape or visual receptor to accommodate the specific proposed development without undue negative consequences.

Underlying Landscape Capacity The inherent capacity of a landscape to accommodate a type of change (eg. wind energy developments) without significant effects on its key characteristics; specifically not accounting for levels of the same type of change that have already taken place in that landscape.

Visual Effects Effects on specific views and on the general visual amenity experienced by people

Visual Receptors Individuals and/or defined groups of people who have the potential to be affected by a proposal

Visibility Analysis An assessment of the potential visibility of a development or area of land from an identified viewpoint or viewpoints. It is often accompanied by an analysis of the number of people of different types who are likely to see it and the scope to modify visual impacts of the specified development by appropriate mitigation.

Wild Land An area which has physical attributes which evoke a range of perceptual responses (such as a sense of solitude, risk and of fulfilment from physical challenge), which people experience as a ‘sense of wildness’, namely:

i. A high degree of perceived naturalness in the setting and in the natural processes affecting the land, as well as little evidence of contemporary human uses of the land;
ii. The lack of any modern artefacts or structures;
iii. Landform which is rugged or otherwise physically challenging; and
iv. Remoteness and/or inaccessibility.

REFERENCES

Angus Council (2012) Renewable Energy Implementation Guide

Angus Local Plan Review (Adopted 2009)

ERM (1998) South and Central Aberdeenshire Landscape Character Assessment. SNH Review No. 102

Glasgow Caledonian University and others (March 2008). The Economic Impact of Wind Farms on Scottish Tourism. A report for the Scottish Government

Ironside Farrar (2008) Angus Windfarms Landscape Capacity and Cumulative Impacts Study.

Land Use Consultants (1999) Tayside Landscape Character Assessment. SNH Review No. 122

Landscape Institute and Institute of Environmental Management & Assessment (2002) Guidelines for Landscape and Visual Impact Assessment (Second Edition)

SNH (2002) Policy Statement No 02/03: Wildness in Scotland's Countryside

SNH (2004). Commissioned Report No.042 Landscape capacity study for onshore wind energy development in the Western Isles (ROAME No. F02LC04)

SNH (2008). Natural Heritage assessment of small scale wind energy projects which do not require formal Environmental Impact Assessment (EIA).SNH Guidance.

SNH (2009). Siting and Designing Windfarms in the Landscape

SNH (2012) Assessing the cumulative impact of onshore wind energy developments: March 2012

SNH (March 2012) Siting and Design of Small Scale Wind Turbines of between 15 and 50 metres in height

SNH (January 2012) Mapping Scotland's Wildness, Wildness Map

SNH (April 2013) Core Areas of Wild Land in Scotland

SNH and The Countryside Agency (2002). Landscape Character Assessment Guidance for England and Scotland Topic paper 6: Techniques and Criteria for Judging Capacity and Sensitivity.

TAYplan Strategic Development Plan (Approved 2012);

The Scottish Government (2010). Scottish Planning Policy

The Scottish Government (Aug 2012).Process for preparing spatial frameworks for wind farms (Web Guidance)

The Scottish Government (July 2013).Onshore Wind Turbines (Web Guidance)

The Scottish Government (2013). Scottish Planning Policy Consultation Draft

APPENDICES

APPENDIX 1: CURRENT POLICY AND GUIDANCE FOR ONSHORE WIND ENERGY

1.1 National Policy and Guidance

1.1.1 Scottish Planning Policy

National policy in relation to renewable energy development is expressed in SPP with related web-based guidance reflecting the Scottish Government's commitment to greatly increasing the amount of energy produced by renewable sources. Inevitably it focuses on land based wind power as, at least in the short term, the most available resource suitable for expansion.

SPP is thus very positively disposed to renewable energy production and directs all councils to create development plan policies that encourage renewable energy generation capacity, including onshore wind power.

SPP and published guidance recognise that wind energy developments are likely to have significant impacts on the environment, including the landscape. SPP therefore underlines the need to ensure that developments do not have *unacceptable* impacts. In this respect Government describes the need for local authority development plans to set out a Spatial Framework for windfarms of more than 20MW capacity. Web based guidance lists the criteria that should be considered in the location of windfarms. It suggests the extent to which developments below the 20MW capacity are considered in this way would depend on the scale of the development proposed.

SPP is to be updated and has undergone a consultation process. The proposed policy continues the strong support for onshore wind energy and the development of spatial frameworks. Key proposed changes in emphasis compared with the 2010 SPP include:

- Inclusion of all scales of wind energy development in spatial frameworks, not just those above 20MW
- Further clarification on the hierarchy of constraints to wind energy development.
    - Group 1: national parks and national scenic areas as an absolute constraint;
    - Group 2: Areas of Significant Protection as a secondary but high level of constraint, including many national designations; a 2.5km area around settlements; Core Areas of Wild Land and Areas where cumulative impact limits further development, including areas identified in capacity studies as having reached their carrying capacity;
    - Group 3: Many local constraints including local designations and areas identified as high or medium constraints in landscape capacity studies placed in a third category;
    - Group 4: areas where wind energy development is likely to be supported.

1.1.2 Scottish Government Guidance

Scottish Government provides frequently updated web based guidance on onshore wind energy:

http://www.scotland.gov.uk/Resource/0042/00427805.pdf

and the process for preparing spatial frameworks for windfarms:

http://www.scotland.gov.uk/Resource/0040/00400726.pdf

The guidance highlights the issue of cumulative impact.

1.1.3 Scottish Natural Heritage Guidance

Scottish Natural Heritage provides comprehensive guidance on most aspects of onshore wind energy development and the landscape:

- Assessment of landscape and visual impacts and visual representation of wind turbines;
- Siting and design guidance;
- Assessment of cumulative impacts.

This information can be found on the SNH website:

http://www.snh.gov.uk/planning-and-development/renewable-energy/onshore-wind/landscape-impacts-guidance/

1.2 Development Plan Policies

1.2.1 Angus Development Plan Context

Planning legislation indicates that planning decisions should be made in accordance with the development plan unless material considerations indicate otherwise.

The development plan in Angus comprises: -

- TAYplan Strategic Development Plan (Approved 2012);
- Angus Local Plan Review (Adopted 2009)

1.2.2 TAYplan Strategic Development Plan

TAYplan sets out policies where development should be over the next 20 years and how to shape better quality places by the location, design and layout of development from the outset. At its heart are sustainable economic growth and a better quality of life through a stronger and more resilient economy, better quality places, reduced resource consumption and better resilience to climate change and peak oil.

Policy themes cover 1 Location Priorities; 2 Shaping Better Quality Places; 3 Managing TAYplan's Assets; 4 Strategic Development Areas; 5 Housing; and 6 Energy and Waste Resource Management Infrastructure; 7 Town Centres; and 8 Delivering the Strategic Plan.

The general policies of TAYplan provide the strategic context for energy infrastructure including wind. There is no location framework or areas of search the strategic level.

Further information on TAYplan can be viewed at www.tayplan-sdpa.gov.uk/publications

1.2.3 Angus Local Plan Review

The Local Plan Review provides the policy framework to guide future development, land use and investment in Angus. It provides a range of policy relating to Building Sustainable Communities and Environment and Resources.

There is a specific chapter dealing with Energy including policies on Energy Efficiency (ER33); renewable Energy Developments (ER34) and Wind Energy Development (ER35). In terms of wind energy the section sets out broad locational guidance based on Tayside Landscape Character areas identifying three basic areas as follows (1) Highland; (2) Lowland and Hills; and (3) Coast as illustrated in Fig 3.4 (Geographic Areas) of the Local Plan Review.

Further information on the Angus Local Plan review can be viewed at www.angus.gov.uk/localplan

Implementation Guide for Renewable Energy Proposals (June 2012)

Subsequent to this the Council also prepared and published an Implementation Guide for Renewable Energy Proposals (June 2012) which explains and clarifies for developers and the general public the existing Angus Local Plan Review policy base that will be used by Angus Council in determining renewable energy planning applications. It also provides links to a wide range of related information sources.

Further information on the implementation guide can be viewed at http://www.angus.gov.uk/renewableenergy/

Angus Local Development Plan

Angus Council is currently progressing with a new Local Development Plan to replace the Local Plan Review. A Main Issues Report (MIR) was published in November 2012 and a Proposed Plan is expected in spring 2014. The MIR preferred option indicates a spatial framework for wind turbines including a map based approach to considering cumulative impacts would be prepared. The Landscape Capacity Assessment for Angus will be a key input into the development of refreshed policy and spatial framework/guidance. Further information on the Landscape Capacity Assessment can be viewed at www.angus.gov.uk/renewableenergy

APPENDIX 2: CUMULATIVE IMPACT AND LANDSCAPE CAPACITY ASSESSMENT METHODOLOGIES

1.0 Background

Cumulative environmental impact is the impact that results from incremental changes caused by past, present or reasonably foreseeable actions. Scottish Government Guidance on wind energy states:

> *'Assessing the cumulative impact of a number of wind turbines or a number of wind farms involves considering the combined effects of siting proposals in proximity to each other'.*

Cumulative impact is a critical consideration in the case of landscape and visual impacts of onshore wind turbines and windfarms in Scotland due to the current number of existing and consented developments in the landscape, proposed developments in the planning system and the long term implications of national policy that encourages the development of onshore wind energy generation.

The characteristics of wind turbines that lead to cumulative impacts include:

- The large scale and striking visual appearance of wind turbines and windfarms in most landscapes;
- The great extent of their visibility and the potential for intervisibility between wind turbine developments and as seen by receptors;

The larger modern turbines are prominent, large scale, man-made features and there are few other precedents in terms of scale, height and appearance in most landscapes. Topography aside, they are much taller than any natural features such as trees or most buildings and other structures. Of similar built structures in rural landscapes, electricity pylons are significantly smaller than the largest turbines and although broadcasting masts are often taller they are usually singular and infrequent, whereas wind turbines are built in multiples, often in great numbers. Furthermore, most landscape features are static whereas wind turbines rotate. Smaller turbines may also present issues of scale and appearance in more localised contexts, as well as visual confusion when seen together with larger turbines.

This study on behalf of Angus Council requires the assessment of cumulative development and landscape capacity. However it is recognised in guidance that the determination of landscape capacity and cumulative impacts is not a straightforward exercise. The background and considerations involved in this process are detailed in this Appendix.

Definitions of the term 'capacity' applied to landscape generally refer to the ability to accept a development without a 'significant' or 'unacceptable' level of change to a landscape. This implies that criteria must be identified and thresholds must be determined to give meaning to the words 'significant' and 'unacceptable'.

Guidance on the assessment of cumulative impacts and landscape capacity is available from a number of sources, most particularly Scottish Natural Heritage *Assessing the cumulative impact of onshore wind energy developments (March 2012)* but also in UK guidance (e.g. *Landscape Character Assessment Guidance for England and Scotland Topic paper 6: Techniques and Criteria for Judging Capacity and Sensitivity. SNH and The Countryside Agency, 2002*) and will be referred to in the following sections.

The determination of 'cumulative impacts' and 'capacity' is subject to debate. No clear guidance is given in the published information beyond the need for the individual impact assessor or Development Plans to determine what the assessment criteria and significance thresholds are. Reasoned argument applicable to the specific circumstances applies, rather than the establishment of an absolute or universal definition. Inevitably this approach is subject to differences of opinion, with thresholds of significance and views on acceptability often differing depending on the background or vested interests of those involved in the debate.

In the absence of any clearly stated or agreed criteria or thresholds and to progress this study some form of threshold or thresholds need to be defined. In order to do this a number of terms and concepts need to be clarified, defining exactly what is being assessed and how. The purpose of the following section is to focus the subsequent assessment and to provide guidance and a basis for decisions to be made by the appropriate authorities.

2.0 Defining Terms: Sensitivity, Significance, Capacity and Acceptability of Change

Topic Paper 6 of *Landscape Character Assessment: Guidance for England and Scotland (2002)* refers to the fact that the terms 'sensitivity' and 'capacity' have often been used in an interchangeable manner in landscape character assessment, essentially referring to the ability of a landscape to absorb change without a significant effect on its character. A landscape of high sensitivity is often considered to have a low capacity for change, and vice-versa. Furthermore sensitivity is used as a key criterion in determining both significance of impact and landscape capacity. In fact there are subtle but important differences between sensitivity and capacity. This section discusses the differences and interrelationships between sensitivity, capacity and significance in landscape character assessment and how the acceptability of change may be determined.

2.1 Landscape Sensitivity

The sensitivity of a landscape is a measure of its inherent vulnerability to potential changes and their effects on fabric and character. Vulnerability to change can be considered in two ways:

1) As an inherent part of the landscape's characteristics, regardless of possible types or scales of change that may occur; or

2) In relation to a specific proposed type and scale of change.

In the former case the assessment of sensitivity would be applied in landscape character assessment where no particular change is being contemplated or assessed, and the landscape is being considered in a resource planning context. In the latter case the assessment of sensitivity would typically be applied in an environmental impact assessment where specific changes are envisaged. In the EIA case the sensitivity of the receiving landscape would be assessed against the magnitude of change in order to determine impact significance.

2.2 Landscape Capacity

Landscape capacity is variously described as the ability of a landscape to accommodate (or absorb) change without a significant (or unacceptable) change in fabric or character. This is usually taken to mean whether or not one or more of the key defining characteristics of the landscape is changed such that the overall fabric or character of the landscape is changed, i.e. a 'capacity threshold' is crossed. In the case of windfarms it is primarily landscape character that is being considered, particularly in cumulative assessments.

The determination of landscape capacity is closely related to landscape sensitivity and the determination of significance of impact. However assessment of capacity is a not necessarily based around the assessment of known development proposals, but rather the hypothetical ability to accommodate particular types of development, such as windfarms before a threshold or series of increasing thresholds are crossed.

According to *Topic Paper 6,* in determining capacity not only the sensitivity of the landscape to the particular type of development is considered but also the *landscape value* of the area concerned. Value may be determined in a number of ways, including by landscape designations (national, regional or local); cultural and historic associations and in terms of how it is valued by those who live in it or use it in some way.

The determination of capacity is primarily a planning tool rather than a reactive or assessment tool. Nevertheless the determination of capacity thresholds can also be used to assess existing levels of development or potential development scenarios such as is the case with windfarm developments in Angus.

2.3 Determination of Impact Significance

The principles involved in determining impact significance are the same whether a single or multiple developments are being considered. This involves assessing:

1) The sensitivity of the receptor to the type of change proposed; and

2) The magnitude of change that would result from the proposals.

Sensitivity and magnitude are considered in combination, leading to an overall assessment of impact. This informs a determination of whether the impact is significant in terms of the EIA regulations. In doing this the considerations about what exactly is being assessed should be taken into account and clearly delineated including baseline, types of impacts and specific developments.

The threshold at which significance is determined in relation to the EIA regulations should also be defined prior to assessment. However, this threshold is particularly open to debate and often subject to the perceptions of different groups of stakeholders.

2.4 The Nature of Impacts

The issue of whether impacts are positive, beneficial or neutral is also an important consideration when making decisions on the acceptability of impacts, regardless of their significance. If an impact were considered positive or neutral in nature it is likely that its level of significance would be considered less critical than were it considered negative. Most windfarm developers equivocate this issue by reference to public opinion polls indicating support for renewable energy and the division of public opinion that is apparent over most windfarm developments. This masks the underlying landscape issue that should be considered independently of a windfarm's primary function or other effects.

The purpose of a windfarm is to provide renewable energy involving low levels atmospheric carbon pollution. This accords with current policy and is considered positive and beneficial. Conversely, wind turbines are objects that are unprecedented in scale and appearance in most landscapes, especially the rural area s in which they are mainly located. Many published landscape character assessments of rural areas do not specifically mention wind turbines and windfarms, although increasingly there are guidelines relating to placing them within particular character types. Furthermore, whilst government policy and advice (e.g. SPP, web based guidance, SNH guidance) and local authority policy (Development Plans) support their development, it is always with a precautionary note relating to balancing benefits and impacts.

The tone of most guidance is that of achieving a balance of impacts against the positive returns of renewable energy. For example SPP states in paragraph 187:

> *'Planning authorities should support the development of wind farms in locations where the technology can operate efficiently and environmental and cumulative impacts can be satisfactorily addressed.'*

and;

> *'The design and location of any wind farm development should reflect the scale and character of the landscape. The location of turbines should be considered carefully to ensure that the landscape and visual impact is minimised.'*

Web based guidance for onshore wind states:

> *'Wind turbines can impact upon the landscape by virtue of their number, size or layout, how they impact on the skyline, their design and colour, any land form change, access tracks and ancillary components anemometers, substations and power lines. The ability of the landscape to absorb development often depends largely on features of landscape character such as landform, ridges, hills, valleys, and vegetation'.*

and:

'As more areas of search are taken up and as more sites are proposed within or near sensitive landscapes, landscape protection and designing appropriate mitigation through conditions and/or legal agreements, will become a more routine consideration alongside maximising the potential of wind energy. In relation to landscape impact, a cautious approach is necessary in relation to particular landscapes which are rare or valued, such as National Scenic Areas and National Parks'.

Wind turbines are placed in the landscape for a specific purpose other than landscape change. Given this fact and the nature of Government advice, a precautionary approach should be taken in the assessment of impacts by concluding that in most cases the impacts are to some degree negative. The degree of negative impact and level of significance will of course depend on the characteristics of the landscape in which the windfarm is located. It is conceivable that in some degraded or industrial landscapes the construction of a windfarm could be considered a neutral or positive change.

In terms of visual impacts the issue of public opinion is more relevant, but a precautionary note applies in this case as well. Particularly the issue of positive responses to the provision of clean energy needs to be separated from the consideration of visual impact of turbines in the landscape.

2.5 Acceptability of Change

As discussed above there is published guidance on methods of assessment of cumulative landscape and visual impacts of windfarms (e.g. SNH, 2012) and separate guidance on the factors that determine impact significance (e.g. LI & IEMA, 2002). However there is currently no generic guidance that defines how to determine the *acceptability* of impacts. Indeed generic guidance on acceptability may be inappropriate as any judgement on this is contextual and often a case of weighing perceived impacts against perceived benefits. The impacts and benefits will often be different in type and the balance of judgement is to an extent subjective. The acceptability of change in any particular landscape will depend on the nature of the landscape, the significance of the impacts and the purpose of the change. The final judgement is often informed by and weighed against specific development plan policies and material considerations.

The determination of significant change should theoretically be a clearly defined stage in this process, similar to an impact assessment. Nevertheless, as previously discussed, significance in landscape and visual impact assessment is not universally defined and is open to debate. If the significance of change is open to interpretation, then 'acceptability' of change is a still less definable term that is often based on opinion and is open to debate.

What is acceptable to one individual or organisation may not be acceptable to another. What may be seen as unacceptable change in a narrow context (e.g. landscape and visual impacts) may be seen as acceptable when considering the overall balance of positive and negative impacts (e.g. provision of carbon-neutral energy). In a study of windfarms in the Western Isles (SNH, 2004) the idea of a predetermined 'carrying capacity' is questioned and the concept of *Limits of Acceptable Change* (LAC) is discussed:

'LAC is first and foremost a process through which decisions are made on the conditions which are acceptable and then prescriptions are made for the actions needed to protect or achieve those conditions. So the objective of the LAC process is not to prevent change but rather to control it and to decide on the actions required to maintain or achieve the desired conditions. Other key features of LAC are the use of indicators and a monitoring programme. As a process, LAC is always participatory and multi-disciplinary, and may or may not involve a wide range of stakeholders. Whilst the term capacity may still be used in LAC, (recreational) carrying capacity is not a simple, single, absolute value. It is the amount, kind and distribution of use that can occur without causing unacceptable impacts on either natural resources or the perceptions and experiences of the users'.

This concept requires qualitative judgements about what is important in a landscape or to people using that landscape and what level of change is acceptable (i.e. what types and levels of change can take place before the landscape is considered to be critically or significantly changed). In the context of this study, acceptability of change will be related to cumulative landscape and visual impacts judged against landscape capacity as determined by structured a process of judgement; the provisions of criteria-based landscape policies; other material considerations and the wider Scottish picture of windfarm development. No account will be taken of the other potential impacts or benefits of windfarms. The resulting judgements of this study will need to be balanced against the other benefits or disadvantages of the proposals.

2.6 National and Local Policy

The acceptability of proposed windfarms and cumulative landscape and visual impacts of multiple windfarm development has to be considered in the light of national and development plan policy. National policies and Angus structure and local plan policies are described in Appendix 1 above.

2.7 Developing a Cumulative Impact Assessment Methodology

2.7.1 Cumulative Impacts

For the purposes of this study, cumulative impacts are taken to be those arising from more than one development of the same type, rather than the accumulation of changes making up one development. In the case of windfarms, cumulative studies concentrate on other windfarms. In practice, other features in the landscape or views (e.g. communications masts or electricity pylons) should also be taken into account. Nevertheless, given the singular appearance of windfarms and their generally isolated rural locations, the potential for overlap of cumulative impacts with other developments is more limited.

2.7.2 Baseline

The baseline for a cumulative, or indeed any, assessment is usually taken to include the existing landscape and visual receptors in the study area at the time of assessment. The baseline should include all operating windfarms and, arguably, all consented windfarms as this is effectively the 'permitted landscape'. The assessment of change and significance of

impact should be carried out relative to this baseline whether carrying out a standard or cumulative assessment.

Nevertheless, a landscape capacity study leading to the determination of an 'acceptable' level of windfarm development requires consideration of a full picture of all the windfarms in the landscape: operating, consented and proposed, in order to determine the extent and acceptability of change. The fact that there are operating or consented windfarms in an area is not necessarily an indication that the landscape is less sensitive to further development and that capacity is available. Indeed, depending on the landscape type, degree of development and objectives of policy in relation to landscape character, it may mean that most or all of the capacity is already occupied. Therefore, despite the existing baseline, the development must also in effect be considered relative to the underlying landscape.

2.7.3 Types of Cumulative Impact

Landscape

The assessment of cumulative landscape impacts involves an assessment of change in the fabric and character of the landscape as a result of the combined changes of more than one development. The changes are assessed in relation to defined areas of landscape such as a project study area, landscape character area or designated landscape. As previously discussed, it is effects on landscape character that are the primary focus in relation to windfarms from which all other assessments are derived.

Visual

The assessment of cumulative visual impacts involves an assessment of the change in views and visual amenity as a result of combined changes of more than one development, as experienced by people at their homes and during recreation, travel or work. There are three types of cumulative impact in relation to visual receptors:

1) Combined: more than one development is seen from a single static viewpoint in one arc of view (i.e. within the span of one view, without the receptor turning around). This would include particular directional viewpoints or the view from the principal aspect of a residential property.

2) Successive: more than one development is seen from a single static viewpoint by a receptor turning around to encompass more than one arc of view, up to 360^0. This includes high and open viewpoints, or views from all aspects of a residential property.

3) Sequential: more than one development is seen by a receptor visiting a series of viewpoints. This may involve travelling along a linear route or through an area in which views of the developments may be continuous or intermittent and different developments may be seen at different locations. This includes roads, railways, paths and other defined routes or could involve an area such as a designated landscape.

In practice most assessment will include all of these types of impact in order to gain a full picture of how cumulative impacts will be experienced by receptors.

2.7.4 Effect of Pattern of Development on Perception of Impact

Cumulative studies tend to focus on the number of windfarms, turbines or output capacities within a particular area as an indication of level of cumulative impact. Nevertheless, there is not necessarily a simple relationship between numbers, areas and cumulative impact. The pattern of windfarm and wind turbine development, in terms of size, layout and proximity may also affect the perception of cumulative impacts.

The effect of proximity of different windfarms and turbines to one another has a bearing on impacts. Whilst close proximity of two or more windfarms may reduce the total area visually affected, the level of perceived cumulative impact may be increased by juxtaposition of windfarms or turbines of significantly different appearance (due for example to differing turbine sizes or site layouts) leading to a jarring visual clash or an untidy, disorganised appearance.

Furthermore, studies and planning decisions have indicated that there is less resistance to expansion of existing windfarms than to creation of separate new windfarms. In particular, respondents to a survey on impacts of windfarms on tourism in Scotland (Glasgow Caledonian University and others, March 2008) showed little concern about views being affected by one windfarm compared with more than one windfarm being visible in the same view.

> *"A significant proportion of respondents (44%) agreed that they don't like to see several Wind farms in the same view. These results suggest that those respondents who have indicated having a neutral or even positive perspective on individual wind farm sites are less likely to have a similar opinion on a landscape that has several developments in view.*
>
> *This clear result compares with analysis in the previous section where there was a small increase in the negative response as the visual impact increased for an individual wind farm development. This suggests that people see one large scale development in an area as preferable to several smaller scale developments dotted on the landscape.*
>
> *On the other hand, both sets of results also confirm that a definite tipping point exists where wind farm development becomes untenable for a significant number of visitors".*

Current guidance and recent planning decisions are tending towards the concept of concentration of wind turbines into large clusters in certain areas. This is on the basis that this reduces the potential for a widespread dispersal of effects over a larger area and allows areas more sensitive to windfarm development to remain free of windfarm development. SNH guidance now highlights this issue and supports this type of approach where appropriate (*SNH, 2009*).

The policy may also offer advantages in terms of economies of scale for site servicing and electricity transmission. The disadvantages are likely to be that areas chosen for concentration of the turbines are likely to be significantly and adversely affected by development – this being effectively a 'sacrificial' landscape policy. Furthermore, this concept does not necessarily sit well with recent encouragement for smaller scale wind

energy development promoted by the Feed in Tariff where turbines are likely to relate to individual properties scattered across the landscape.

2.7.5 Setting Assessment Objectives

What exactly is being assessed depends on the purpose of the cumulative assessment. In the case of an EIA for a single development it is primarily the impacts of the proposal and its contribution to cumulative impacts that is being assessed. Such a study would therefore typically concentrate on areas in which the impact of the windfarm under consideration is significant and give only slight consideration to areas in which it is not, even if there were significant cumulative impacts from other windfarms.

In the case of a more broad-based cumulative study such as this, it is the overall impact of windfarm developments on a defined study area that is being assessed. Nevertheless this study requires a consideration of the both the full cumulative impact *and* the contribution that specific developments (proposed or operating) make to that impact, in order to inform decisions.

2.7.6 Defining Thresholds of Cumulative Development

The discussion above has defined the terminology and our approach to cumulative assessment. It has isolated the central issues that inform the assessment of acceptability of levels of change. The key requirement is to develop a methodology for defining thresholds of significance and acceptability that are clear and robust enough to be accepted by all sides of the debate. This study as a stage in the debate about acceptable levels of change in the landscape of Angus. Whilst we can describe and define what those levels of change might be it is difficult to enforce a universal view as to what levels of change are significant or acceptable.

Scottish Government Guidance underlines the landscape and visual issues associated with increasing levels of cumulative wind turbine development:

> *'In areas approaching their carrying capacity the assessment of cumulative effects is likely to become more pertinent in considering new wind turbines, either as stand alone groups or extensions to existing wind farms. In other cases, where proposals are being considered in more remote places, the thresholds of cumulative impact are likely to be lower, although there may be other planning considerations.*
>
> *In assessing cumulative landscape and visual impacts, the scale and pattern of the turbines plus the tracks, power lines and ancillary development will be relevant considerations. It will also be necessary to consider the significance of the landscape and the views, proximity and inter-visibility and the sensitivity of visual receptors.'*

SNH guidance Siting and Designing Windfarms in the Landscape (SNH, Dec 2009) lists the factors that affect the perception of cumulative impact of windfarm development:

> *'The cumulative impact of windfarm development on landscape and visual amenity is a product of:*
>
> *• the distance between individual windfarms (or turbines),*
> *• the distance over which they are visible,*
> *• the overall character of the landscape and its sensitivity to windfarms,*
> *• the siting and design of the windfarms themselves, and*
> *• the way in which the landscape is experienced.*
>
> *The combination of single turbines and small clusters of turbines can raise the same issues'.*

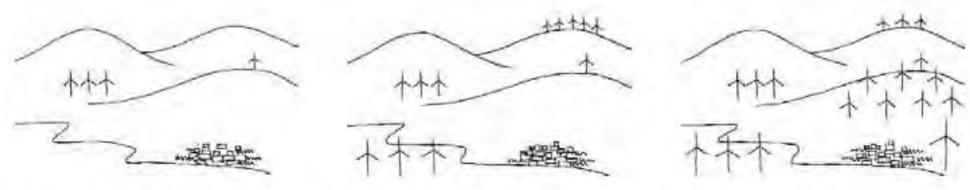
To this list might be added turbine height and windfarm size. In determining an acceptable level of development, it is necessary to clearly define what differing levels of development actually entail.

The SNH guidance identifies three broad levels of cumulative change in the landscape that may be set by local authorities depending on landscape sensitivity and value and local policy objectives:

- **Landscape Protection:** Maintain existing landscape character.
- **Landscape Accommodation:** Accept a degree of change providing this is not detrimental to key landscape characteristics and key visual resources.
- **Landscape Change:** Accept large amounts of change that may have detrimental effects on key landscape characteristics and visual resources.

In determining an acceptable level of development, it is necessary to clearly define what differing levels of development actually entail. The methodology therefore sets out defined levels of change to the landscape and visual environment that might occur or be experienced depending on the size, number and location of turbines to be built within an area.

The descriptions in Table 2.1 below set out a gradated landscape typology that defines the terms of reference for increasing levels of cumulative landscape and visual impact of turbines. It does this by describing their effect on landscape character and the experience of those living in or travelling through the landscape. Further generic illustration of this concept is provided in Part 1 section 5 of the SNH guidance:



Separate isolated features

Windfarms become key characteristic of the landscape

Windfarms become dominant characteristic of the area, creating a 'windfarm landscape'

The purpose of this approach is to address the gap between results of cumulative impact assessment and judgements on acceptability of change. It does not set thresholds of significance or acceptability but it does present a framework that describes levels of change in landscape character and the experience of visual receptors in the landscape. This can then be used to inform and shape the debate concerning the degree of change in a landscape and the acceptability of cumulative impacts and the *Limits of Acceptable Change*.

Table 1: Description of Levels of Cumulative Wind Turbine Development

Landscape Type	Landscape Character	Visual Experience
Landscape with no Wind Turbines	A landscape type or area in which no or very few wind turbines are present, and none are clearly visible from neighbouring areas.	There would be no discernible effects on visual receptors.
Landscape with Occasional Wind Turbines	A landscape type or area in which windfarms or wind turbines are located and/or are close to and visible. However they are not of such a size, number, extent or contrast in character that they become one of the defining characteristics of the landscape's character.	Visual receptors would experience occasional close-quarters views of a windfarm or turbine and more frequent background views of windfarms or turbines. Some of the turbines would not be perceived as being located in the landscape character type or area. No overall perception of wind turbines being a defining feature of the landscape.
Landscape with Wind Turbines	A landscape type or area in which a windfarm, windfarms or wind turbines are located and/or visible to such an extent that they become *one* of the defining characteristics of the landscape character. However, they are clearly separated and not the single most dominant characteristic of the landscape.	Visual receptors would experience frequent views of windfarms or wind turbines as foreground, mid-ground or background features, affecting their perception of the landscape character. However there would be sufficient separation between windfarms and turbines and sufficient areas from which wind turbines are not visible such that they would not be seen as dominating the landscape over all other landscape features.
Wind Turbine Landscape	A landscape type or area in which windfarms or wind turbines are extensive, frequent and nearly always visible. They become the dominant, defining characteristic of the landscape. Nevertheless there is a clearly defined separation between developed areas.	Visual receptors would experience views of windfarms as foreground, mid-ground and background features, to the extent that they are seen to dominate landscape character. Few areas would be free of views of wind turbines.
Windfarm	Landscape fully developed as a windfarm with no clear separation between groups of turbines. Few if any areas where turbines not visible.	Visual receptors would always be close to and nearly always in full view of wind turbines.

The above descriptions of levels of turbine development within a landscape are necessarily simple, factual and generic. They can be applied to any chosen scale of study area, from a region to a landscape type or a single landscape character area. They do not apply to any specific baseline landscape type or types: indeed the character of the landscape is likely to affect judgements on the assignation to a particular level of development. For instance, a large scale landscape may be less dominated and affected than a smaller scale landscape; or a more complex topography, or a densely wooded landscape may reduce the visibility of wind turbines within an area and hence affect the perception by visual receptors. A large landscape character area will require a greater extent and frequency of development than a smaller area to become affected by wind turbines. Furthermore, as discussed in Chapter 5 of this report, there are a number of design and siting factors that affect the perception of cumulative impacts. This includes not only size and number of turbines and windfarms in an area but also the juxtaposition of different layouts including turbine size, positioning and distribution.

The descriptions assume conditions of good visibility covering the 30-35km range that visibility studies and visual impact assessments of larger windfarms adopt as best practice. Clearly this exceeds the requirements for assessments of smaller turbines.

The descriptions are intended to be neutral in that they are purely descriptions of levels of development and the frequency or proximity at which wind turbines and windfarms may be seen. They do not attempt to define the levels of development as being good, bad, acceptable or unacceptable. This is a judgement that would be made when considering specific cases against the landscape type, its capacity for windfarm development, the development policy framework and other material considerations. In this case it is the determination of areas in which cumulative impact has reached the capacity of the landscape.

2.8 Capacity Assessment Method

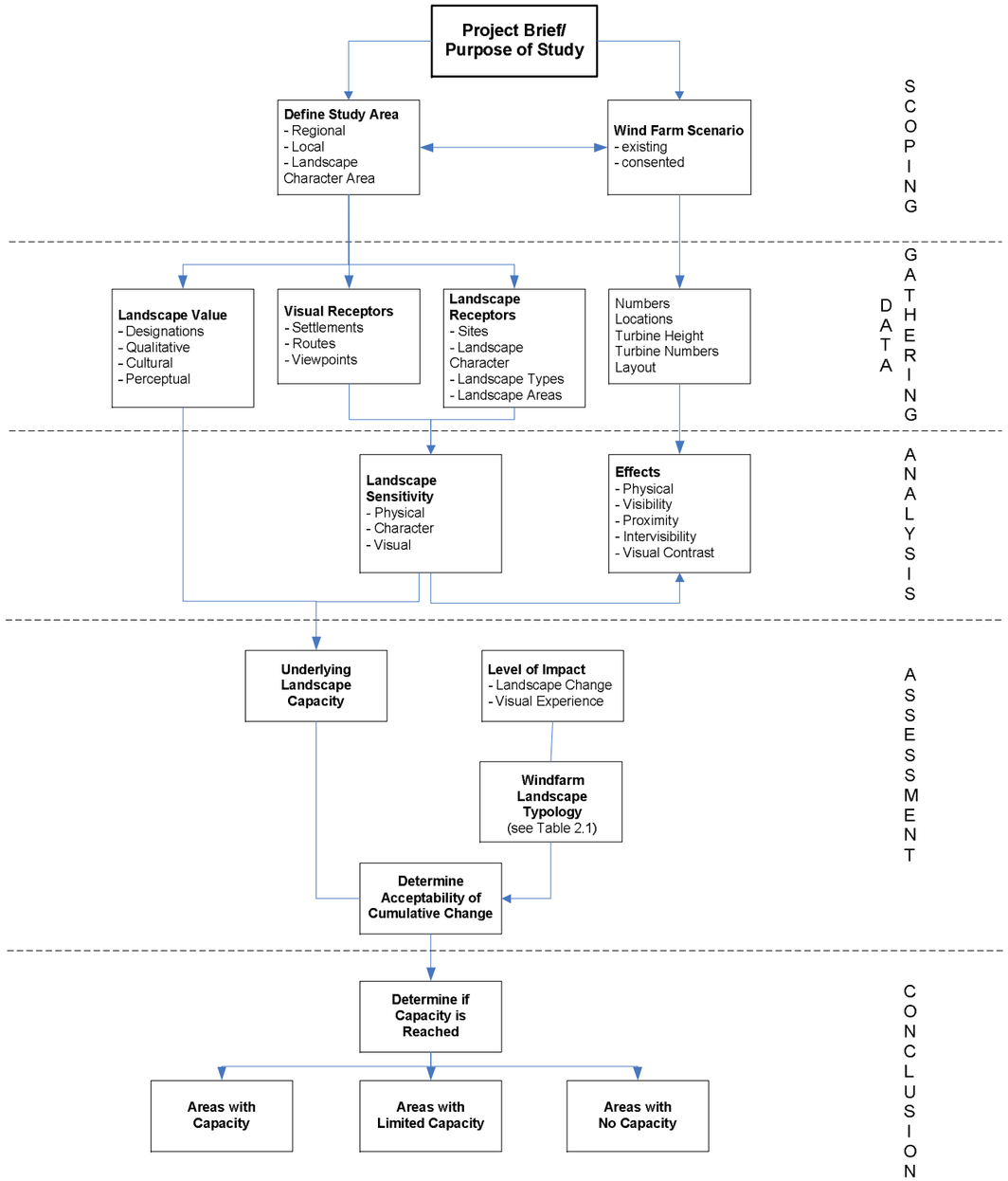
2.8.1 Assessment Process

The considerations discussed above have been taken into account in the staged methodology. This is illustrated by the flow diagram in Figure 1 overleaf. There are 5 stages in the process as shown in Table 2 below:

Table 2: Stages in Landscape Capacity Assessment

Scoping:	Define the purpose of the study, the study area and the wind energy development scenario that is to be assessed.
Data Gathering:	Gather information on receptors (visual and/or landscape); landscape designations and potential constraints; windfarms/ turbines (existing, proposed etc).
Analysis:	Determine landscape character sensitivity, visual sensitivity and landscape value. Determine visibility, direct and indirect landscape effects of the consented windfarms and turbines.
Assessment:	Determine landscape capacity from landscape sensitivity and value. Determine level of cumulative change caused by consented wind turbines, leading to a wind turbine landscape/ visual typology.
Conclusions:	Determine significance and/ or acceptability of existing and future potential cumulative change to the landscape and visual environment.

Figure 1: Cumulative Impact and Landscape Capacity Methodology Flowchart



This is a flexible framework which can be adapted to include the whole study area or focus on subdivisions of landscape, windfarm groupings or development scenarios as required. In this case local landscape character types have been considered, then building up to a picture of the whole of Angus.

The assessment for Angus includes:

1) Assessment of landscape capacity, cumulative change and acceptable limits of cumulative development in:

   - landscape character types and units in Angus;
   - broad regional landscape character areas of Angus;
   - Angus as a whole.

The cumulative development in each case is expressed via the wind turbine landscape/ visual typologies described in Table 2.1.

The cumulative and capacity assessment for onshore wind energy in Angus considers:

1) Current wind turbine landscape typology resulting from operating and consented wind turbines, where there is a high degree of certainty in the cumulative assessment scenario.

2) The limits of acceptable cumulative change expressed in terms of the wind turbine landscape typologies (e.g. acceptable level of development in an area might be judged as no more than a *Landscape with Occasional Windfarms*). This is based on a judgement considering landscape capacity but also including policy considerations, emerging guidance on wind turbine development and strategic landscape considerations in Angus.

3) The effects of consented wind turbines together with wind turbines currently under planning application – where there is a level of uncertainty regarding the potential cumulative scenario.

Further comment is made on the extent to which the current and proposed type and pattern of development (e.g. turbine size, windfarm size and separation between developments) affects the cumulative impacts and, if appropriate, how the area should be developed in order to keep within an acceptable cumulative change.

This information is used to determine where existing development has reached or come close to reaching landscape capacity and further development should be limited. On a more strategic level it identifies areas where development should be limited to provide separation between concentrations of wind turbine development. It also allows the identification of areas where further development may be possible and, in these cases, what level of development would be acceptable.

The assessment is carried out on the basis of the structured methodology in line with SPP and Scottish Government web based guidance in combination with professional judgement, on the basis of a desk analysis of available information on the landscape, on wind turbine developments and through site visits. Whilst a GIS application has been used, this is only as a tool for managing, mapping and illustrating spatial data.

The following sections detail the stages in determining landscape capacity.

2.8.2 Determining Landscape Character Sensitivity

The determination of landscape character sensitivity for a landscape character type involves a breakdown of the physical and perceptual characteristics that contribute to landscape character. Each criterion described below is evaluated in terms of **high, medium** or **low** for sensitivity to wind energy development. An overall assessment is derived from a composite of all the criteria. Whilst scale is often important, there is no consistent relative weighting for each criterion, as in each landscape type different criteria may to be critical to the ability to accommodate wind energy development.

Table 3. Determination of Landscape Character Sensitivity

Landscape Character Criteria	Factors affecting level of sensitivity
Scale (primarily in character but also in geographical size of area)	Consideration of horizontal and vertical scale. Larger scale landscapes are generally considered more able to accommodate commercial wind turbines, although a smaller size of turbine may reduce impacts. A larger physical area would be able to accommodate more development depending on other aspects determining capacity.
Landform	The relationship between wind turbines and landform is complex and also dependent on scale. Generally simple landforms: flat, undulating or gently rolling, are considered less sensitive and complex landforms more sensitive, especially if smaller scale. Landforms of sufficient scale may provide opportunities for screening or backgrounding turbines, reducing their visual sensitivity.
Pattern	The pattern of landcover (woodland, field boundaries, crops, roads, settlements etc). Degree of strength, regularity, fragmentation. Minimal or simple landscape patterns are considered less sensitive to wind turbine development. Again the relationship to scale is important.
Development	The degree of built or infrastructure development will affect suitability. In general a greater level of development is more suitable, particularly large scale industrial and extractive industries, or potentially large scale agriculture. Areas with small scale residential development would potentially be more sensitive. Undeveloped areas with remote or wilderness characteristics would also be more sensitive.
Quality	This is a measure of the condition and integrity of the landscape fabric and character. A landscape in good condition with a high degree of integrity is more likely to be sensitive to development. A landscape of poor quality may represent an opportunity to compensate for impacts.
Elements and Features	The elements that make up a landscape, such as woodlands, fields, hedges, buildings and landforms create its pattern but add to its distinctive composition and character. Prominent or distinctive focal features such as steep hills, towers, lochs add further distinctiveness. The relationship of wind turbines to these affects overall sensitivity.
Context	The characteristics of surrounding landscape areas provide a context that affects perception of a landscape and may affect how wind turbine developments are perceived. Landscapes acting as a backdrop or foreground to other areas are particularly sensitive.
OVERALL RATING	**High/ Medium/ Low**

The following definitions apply to the thresholds of low, medium and high landscape character sensitivity:

Low Sensitivity: A landscape type or area with key characteristics that would be capable of successfully accommodating or co-existing with wind energy development of all or most scales.

Medium Sensitivity: A landscape type or area with some key characteristics that would be capable of successfully accommodating or co-existing with wind energy development but also some characteristics that would be adversely affected and where scale of development may be a limiting factor.

High Sensitivity: A landscape type or area in which most or all key characteristics would be adversely affected by wind energy development and is not capable of successfully accommodating this type of change.

2.8.3 Determining Visual Sensitivity

The visual sensitivity of a landscape area is determined by who is likely to see it, (types and numbers of receptors) and how visible in general the area is. The assessment is made in relation to the visibility of tall structures.

2.8.4 Visibility Analysis

A systematic analysis of the relative visibility of areas of Angus has been undertaken. Three sets of visual receptors were determined as follows, and these are identified in Section 4:

- Settlements;
- Routes;
- Viewpoints

Each of the receptor types and locations is representative of locations frequented by people in Angus. The visibility analysis included each set of receptors, and generated visibility diagrams of different scenarios for different heights of objects in the landscape.

The analysis was carried out using a computer based technique in which the intervisibility between receptors and landforms, or objects of specific heights on the landforms, is determined. The more intervisibility, the greater the visual sensitivity is likely to be. In the case of area receptors (settlements) or linear receptors (routes) these are broken up into units of the same area or length such that this represents different population sizes or length exposed to view. No value judgement has been made as to relative sensitivity of receptors.

The extent of the visibility assessment was limited to a 15km radius from the receptors. In our experience, this is the distance within which the great majority of significant impacts from wind farms are likely to occur. Whilst it is recognised that impacts occur beyond this distance, up to 35km and beyond, as recognised by EIA best practice, this is not an EIA assessment and the results are considered to adequately distinguish between locations of potentially greater or lesser sensitivity.

Each receptor type was assessed at six different heights above ground level in order to distinguish between the potential visibility of windfarm infrastructure and turbines of differing height:

- 0m representing objects at or near existing ground levels such as tracks and small buildings;
- 15m representing maximum height of small domestic and farm scale turbines;
- 30m representing blade tip height of typical farm scale turbines;
- 50m representing blade tip height of many commercial windfarm turbines and some single Feed in Tariff turbines;
- 80m representing blade tip height of many commercial windfarm turbines and some single Feed in Tariff turbines;
- 125m representing blade tip height of typical commercial turbines currently in use

A receptor height of 2m was assumed.

Results of the visibility analysis are illustrated in Figures 4.2a-f to 4.4a-f. The colours show the differences in visual sensitivity across Angus. Red colours indicate areas that are most visible from the greatest numbers of receptors, grading through orange, yellow and green to blue areas that are seen by fewest receptors and uncoloured areas where objects of that height would not be seen at all from receptors.

The three key criteria which determine visual sensitivity are listed in Table 4 below. Each is rated in terms of high, medium or low and a composite rating derived based on professional judgement. The following definitions apply to the thresholds of low, medium and high visual sensitivity:

Low Visual Sensitivity: A landscape type or area which due to its location and characteristics has limited internal and/or external visibility and where wind energy developments would not be visible to many sensitive receptors.

Medium Visual Sensitivity: A landscape type or area which due to its location and characteristics has a moderate degree of internal and/or external visibility and where wind energy developments would be potentially visible to a wide range of receptors, some of which are sensitive.

High Visual Sensitivity: A landscape type or area which due to its location and characteristics has extensive internal and external visibility and where wind energy developments would be potentially visible to a wide range and number of sensitive receptors.

Table 4. Determination of Visual Sensitivity

Visual Sensitivity Criteria	Factors affecting level of sensitivity
Receptors	A greater number of potential receptors including higher population densities, visitor attractions or the presence of busy transport routes will lead to a higher visual sensitivity. The sensitivity and expectations of the receptors is also a contributory factor.
Internal Visibility	Views within a landscape area may be open or restricted by landform, vegetation or buildings. The greater the degree of openness and intervisibility the greater the sensitivity.
External Visibility	A landscape area that is visible from surrounding areas by virtue of its prominence or being overlooked is more visually sensitive than an area that is seldom seen.
OVERALL RATING	**High/ Medium/ Low**

The combination of landscape character and visual sensitivities leads to an overall assessment of landscape sensitivity for an area. Whilst landscape character is likely carry more weight in determining sensitivity, no consistent weighting is given to either factor as it is likely that different landscapes will express them to varying extents depending on their unique characteristics. Professional judgement is used in the case of each landscape type.

2.8.5 Determining Landscape Value

Landscape value reflects the value that society and individuals put on a landscape. This can be officially recognised by some form of local or national designation, or simply by its value to a 'community of interest' (this could be for example a local population, recreational users or conservation interest).

Other characteristics affecting value of a landscape include its historic and cultural associations, particularly if expressed by surviving features and patterns in the landscape. Finally there are more intangible characteristics generally valued by society, such as tranquillity remoteness and wilderness.

The key criteria which determine value are listed in Table 5 below. Each is rated in terms of high, medium or low and a composite rating derived based on professional judgement. The following definitions apply to the thresholds of low, medium and high landscape value:

Low Landscape Value: A landscape type or area which has no landscape designation; little apparent value to communities; no or few

cultural heritage designations or associations and has no distinctive or unusual perceptual values.

Medium Landscape Value: A landscape type or area which has at least in part local landscape or landscape related designations; value to local communities; some cultural heritage designations or associations and has some distinctive perceptual values.

High Landscape Value: A landscape type or area, all or much of which is covered by national landscape or landscape related designations; has value to local and wider communities; widely recognised cultural heritage designations or associations and has clearly distinctive and/or unusual perceptual values.

Table 5. Determination of Landscape Value

Landscape Value Criteria	Factors contributing to value
Designations	International, national, regional or local designations relating to landscape in particular, although ecological designations also contribute to the landscape value of an area.
Community value	An undesignated area may be particularly valued by a community of interest: local, or activity-based.
Cultural value	Valued landscapes will have historic associations, be rich in historic features and buildings and/or have literary or artistic associations.
Perceptual	Tranquillity, remoteness or wilderness are valued characteristics, whereas landscapes that are highly modified, developed and populated would have low value in this respect. Landscapes regarded as particularly scenic would also be more sensitive.
OVERALL RATING	**High/ Medium/ Low**

2.8.6 Determining Landscape Capacity

The final assessment of capacity combines sensitivity and value and is expressed as **High, Medium** or **Low**. The following definitions broadly define the relationship between landscape sensitivity/ value and capacity:

Low Capacity: A landscape that is both sensitive to wind turbine development and has a high value, and where only a slight level of change can be accommodated without significantly affecting any of the key defining criteria.

Medium Capacity: A landscape that has some sensitivity to wind turbine development and has some aspects of value, and where a moderate level of change can be accommodated which may significantly affect some of the defining criteria

High Capacity: A landscape that has low sensitivity to wind turbine development and has low value, and can accommodate substantial change that significantly affects many of the key defining criteria

Broadly speaking there is an inverse relationship between capacity and landscape sensitivity and value. Nevertheless it is not a simple relationship and we have not employed the use of a matrix in this study: a balance of judgement is made in each case as landscape value may be a more important factor than sensitivity in some cases; and vice versa in others.

It should be noted that in landscapes where there is existing wind turbine development the capacity for turbines may be reduced. This is because the landscape would be approaching the maximum level of change that it can acceptably accommodate.

2.9 Determining Acceptability of Change

The final stage involves bringing together the cumulative impact assessment and the landscape capacity assessment in a reasoned judgement of the effects of windfarm development on the Angus landscape. As explained above, the likely acceptability of a proposed level of development may be determined by considering against the underlying capacity of the landscape. This should also be considered against policy criteria and objectives.

2.10 Scope of Assessment

The scope of the assessment can be varied according to the extent of the study area and the purpose of the study. It can also vary according to the depth and detail required to assess impacts within the defined study area. In the case of a detailed study the method should build up to the wider study area from smaller units.

The current study focuses primarily on the local authority area of Angus, although areas beyond the boundary are being considered in terms of the visual influence of nearby windfarms and neighbouring contiguous landscape types. Nevertheless the results of the study will be discussed in terms of Angus and its landscapes.

Wind Energy Development Types

The study considers all sizes of turbines and developments operating, consented or proposed, as well as potential future scenarios where appropriate. However the capacity assessment and guidance for smaller turbines (under 15m to blade tip) is limited to localised generic siting and design considerations. The smallest turbines are not considered to have the same qualities of scale, prominence and widespread visibility that lead to the wider cumulative impacts that characterise larger turbines.

APPENDIX 3: CHANGES AND SUBDIVISIONS TO ANGUS LANDSCAPE CHARACTER AREAS

1.0 Background

A number of minor adjustments have been made to landscape character areas determined by the between the SNH 1999 assessment and the boundaries used in this study. There are also a number of landscape character areas in which sub-areas have been identified.

The changes to main LCA boundaries are principally derived from draft changes proposed by Angus Council. Most of these are minor. Ironside Farrar has also proposed two changes to LCA boundaries and defined the boundaries a number of settlements that were not previously distinguished.

2.0 Boundary Changes

The following proposed changes are intended to give a more accurate definition to LCA boundaries, relating more closely to well defined landscape features on the ground including (singly or in combination): breaks in slopes; clear changes in land use; roads, field boundaries, woodland/ plantation edges and built up areas.

Most of the changes have been derived from Angus Council (email from S. Roberts 16.01.13) and reviewed by Ironside Farrar, as detailed below, with a clear rationale for the change given. The numbered areas are illustrated in the attached figure A3.1.

Area Reference	Angus Council Change	IFL Change	Rationale
Area 1 Barry Links	Moves boundary between LCT 13 (Dipslope Farmland) and 14a (Coast with Sand) further south except for reclaimed flat land around Buddon Burn.	Accept change but adjust LCTs to Carnoustie urban area boundary.	Better reflection of changes in topography and/or land use between Dipslope Farmland, Coast with Sand and Urban area.
Area 2 Carnoustie	Moves boundary between LCT 13 and 14b (Coast with Cliffs) further north to minor road	Accept change but adjust LCTs to Carnoustie urban area boundary and around Hatton House.	Road and urban edge a more clearly defined boundary than mid-field.
Area 3 Arbroath West	Moves 13/14a boundary near Arbroath slightly further south.	Accept change and adjust edge of urban area to reflect current	Boundary aligned with urban area boundary and moved closer to change between cultivated and uncultivated open areas.
Area 4 Arbroath East	Very minor change between urban and LCT 14b	Accept change and adjust edge of urban area to reflect latest built up area.	Boundary aligned along new urban edge of Arbroath.
Area 5 Deil's Head	Move short section of 13/14b boundary inland	Accept change	Boundary aligned with change in slope facing towards sea.
Area 6 Ethie Castle	Move very short section of 13/14b boundary inland	Accept change	Boundary aligned with minor road.
Area 7 Ethie Mains	Move section of 13/14a boundary inland	Accept change	Boundary more clearly aligned with crest of landform.
Area 8 Dunninald House	13/14a boundary moved inland to minor road	Accept change	Boundary more clearly defined by alignment with road on crest of landform
Area 9 Montrose Basin south	Moves boundary between LCT 13 and 15 (Lowland Loch Basin) to north of A934	Move boundary to follow A934	Road is a better defined boundary: on the main break in slope and change in land use between pasture in 15 and arable in 13.
Area 10 Montrose Basin north	Moves boundary between LCT 10 (Broad Valley Lowland) and LCT 15 (Lowland Loch Basin) further downslope to the south, mainly aligned along the A935	Accept change	Boundary is better defined to edge of basin and road rather than part way down the side of the enclosing slope.
Area 11 Menmuir Hills - Noranside	Moves boundary between LCT 5 (Highland Foothills) and 10 (Broad Valley Lowland) south around a hill and along the minor road.	Accept change	Boundary between hill and valley is better defined around the hill and along minor roads.

Area Reference	Angus Council Change	IFL Change	Rationale
Areas 12 and 13 Menmuir Hills - Memus and Derachie	Moves boundary between LCT 5 (Highland Foothills) and 10 (North and South Esk) to align with field boundaries.	Accept change	Boundary more clearly defined by field and woodland boundary features on the ground.
Area 14 Glen Prosen and Glen Clova - Cortachy	Extends LCT 1b (Mid Highland Glen) further south into LCT10 (Strathmore) by including policies of Cortachy and Inverquaharity Castles	Accept Change	Boundary follows edge of river floodplain and treebelts before it narrows downstream into Strathmore. Includes most of estate policies in one landscape type.
Area 15 Kirkton of Airlie	Moves boundary between LCT 5 (Highland Foothills) and 10 (Broad Valley Lowland) further south to include small valley around Canty Burn and align with field/ woodland boundaries on hill crest above Strathmore.	Accept Change	Small valley is more characteristic of Highland Foothills and new boundary defines topographic edge of the larger valley of Strathmore
Area 16 Glen Isla - Mains of Airlie	Minor realignment of boundary between LCT 1b (Mid Highland Glen) and 10 (Broad Valley Lowland)	Accept Change	Better tie-in with realigned Area 15
IFL 1	n/a	Realignment of boundary between LCT 5 (Highland Foothills) and LCT 10 (North and South Esk) up valley side to align with minor road between Fern Den and Tigerton	Road is placed on main break of slope between steep slopes (predominantly pasture) to the north and less steep (predominantly arable land) to the south.
IFL 2	n/a	Realignment of boundary between LCT 5 (Highland Foothills) and LCT 10 (North and South Esk) down valley side to align with minor road east of Tigerton and then around base of hillslopes.	Road is placed on main break of slope with realignment further east grading back into existing defined boundary.
IFL	n/a	Larger built up areas defined as 'Urban'.	More consistent approach than existing data which defined Dundee and Arbroath but no other settlements.

In respect of the urban areas these have been identified separately for two reasons: (a) to be consistent across Angus and (b) for clarity, as the study concentrates on the rural landscape of Angus. The separate identification of these areas makes no significant difference to the assessment of the Landscape Character Areas in which they lie or indeed to commentary on potential effects on residential amenity or setting of settlements.

3.0 Proposed Landscape Sub-Areas

The following proposals are subdivisions of the main Angus LCAs. They reflect differences across the LCA that may be distinctive enough to influence landscape sensitivity and capacity in respect of wind energy. The differences include (singly or in combination): scale, elevation, landform, tree cover, development and influence of neighbouring character areas. The proposed sub-areas, their extents and the rationale for subdivision are detailed in the table below. The extents are illustrated in the attached figure.

In most cases the differences are not sufficient to define new landscape character types or areas, although some areas could well be sufficiently distinctive to be reclassified under a fully detailed review of landscape character in Angus.

Landscape Type/Location	Proposed Sub-Area	Rationale
LCT10: Broad Valley Lowland - Strathmore. (i) Area between Ruthven House and Leys of Cossans	Area of fluvioglacial landforms expressed as small hillocks and ridges in the farmland.	More complex small scale landforms contrast with flatter more open landscape in the rest of Strathmore. Field sizes smaller and boundaries more irregular than rectilinear shapes elsewhere. More small woodlands. This may affect size/ numbers of wind turbines.
LCT 10: Broad Valley Lowland - North and South Esk Valley (ii) River South Esk between Cortachy and Brechin	Character is defined by the river which meanders through the core of this area and the surrounding land which is more characterised by woodland policies, large houses and mills than the surrounding farmland.	A more complex and scenic landscape than the surrounding valley with smaller more irregular fields and woodlands.

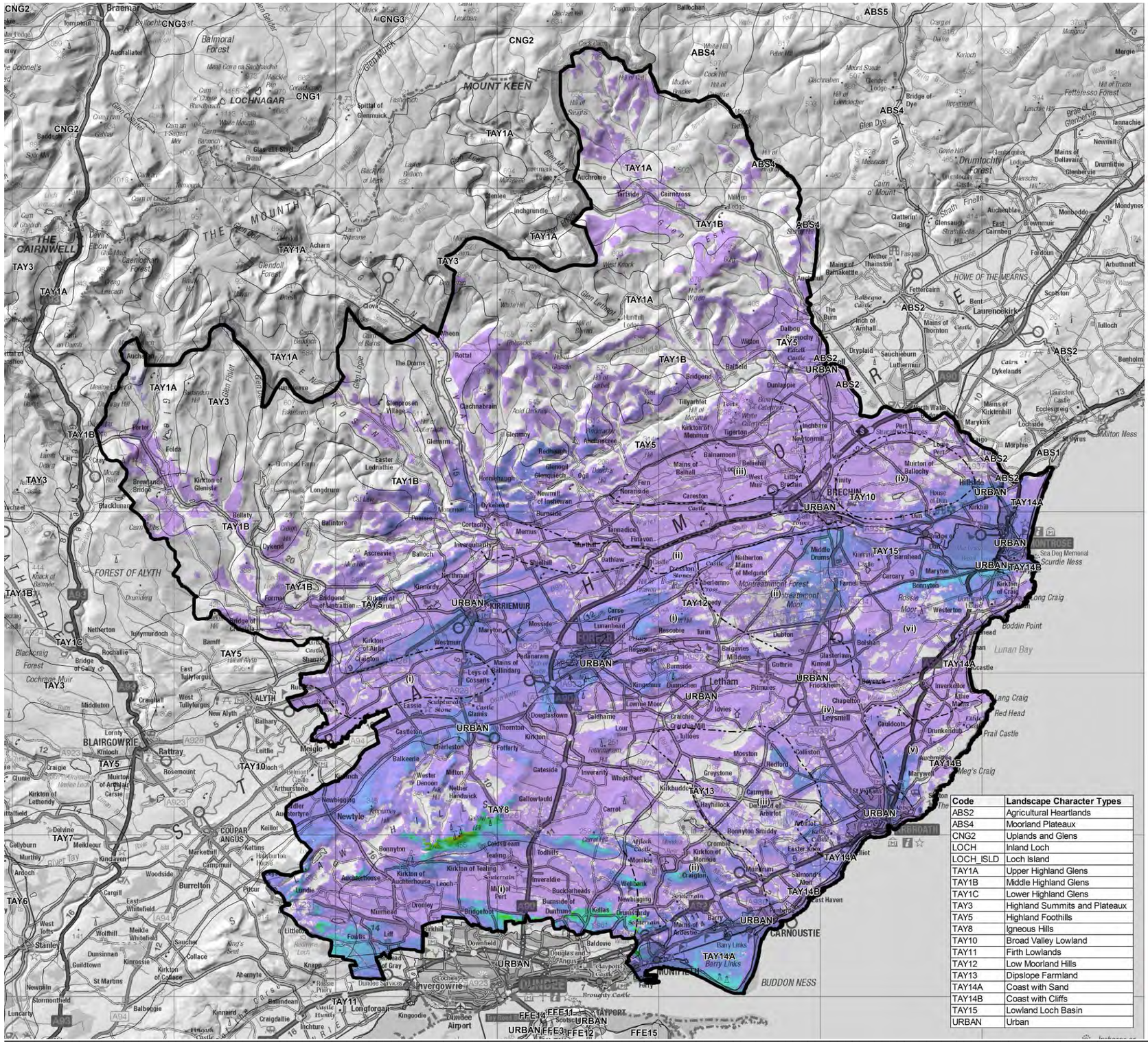
Landscape Type/Location	Proposed Sub-Area	Rationale
LCT 10: Broad Valley Lowland - North and South Esk Valley (iii) River North Esk catchment.	This area is topographically separated from the South Esk and its tributaries by glacial landforms, draining to the east/ northeast into the North Esk.	Separated from the main river corridor and transport routes. Characterised by a network of minor roads and subtle east-west undulations in the landform due to the drainage lines.
LCT 10: Broad Valley Lowland - North and South Esk Valley (iv) Higher ground around Muir of Pert separating the Rivers North and South Esk.	This area is elevated above the valley floors of Strathmore (North Esk) and Montrose Basin (South Esk).	Higher more exposed ground more similar to *Dipslope Farmland* than a valley. Forms containing slopes to Strathmore to the north and Montrose Basin to the south.
LCT 12: Low Moorland Hills (i) Forfar Hills (volcanic hills and farmland surrounding Forfar)	The area is characteristic of the landscape described in the SNH 1999 Landscape Character Assessment, with individual low but distinctive hills interspersed across an area of undulating farmland.	The modest scale and landform characteristics of the hills and spaces between make this area less suitable for larger scale wind energy projects.
LCT 12: Low Moorland Hills (ii) Montreathmont Moor (farmland and forestry between the Forfar Hills and Montrose Basin)	The area is not characterised by distinctive hills. Similar undulating farmland is centred around a large area of forestry on Montreathmont Moor.	The simple undulating landform and rectilinear landscape pattern would be more suitable for larger wind energy projects by comparison with the Forfar Hills.
LCT 13: Dipslope Farmland (i) Tealing Farmland	The sub-area furthest west located between the Dundee to the south and the Sidlaw Hills to the north. Narrower strip than most of the Dipslope Farmland to the east. Elevation 100-200m AOD, sloping to the south and east but partially contained by a ridge of land just north of Dundee.	Character is influenced by the location between the urban area and the hills. Generally more densely settled and affected by infrastructure including roads, electricity pylons and telecoms masts.
LCT 13: Dipslope Farmland (ii) Monikie/Crombie Farmland	Lying between the Sidlaw Hills and Forfar Hills to the north and the coastal area to the south. Elevation 200m AOD in N falling to 10m AOD near coast.	Character is influenced by greater tree cover than most of the Dipslope Farmland, in areas that include two country parks and estate policies of Panmure. More settlement in lower part to the south where the A92 lies and some open unimproved areas to the north
LCT 13: Dipslope Farmland (iii) Redford Farmland	Lying between the Forfar Hills to the north and the coastal area to the south. Max. elevation 197m AOD in N falling to ca. 20m AOD near coast.	This area has a higher, more open and larger scale character than most of the Dipslope Farmland due to elevation, lack of trees and field boundaries.
LCT 13: Dipslope Farmland (iv) Letham/ Lunan Water/ Arbroath Valleys	Lower and/or more sheltered ground lying between Letham, Friokheim, Arbroath and Lunan Bay. Max 165m AOD but generally below 100m AOD down to 10m AOD near Lunan Bay.	This lower area follows drainage lines including the Lunan Water, Brothock Water and Elliott Water and has a more settled, sheltered and contained character than the surrounding higher areas of Dipslope Farmland. Crossed by main roads including A92 and A933
LCT 13: Dipslope Farmland (v) Ethie Farmland	Higher/ exposed ground lying between Arbroath, Lunan Water and the coast. Ca. 30-95m AOD	This area has a predominantly open and exposed character, influenced by proximity of the coast and lower surrounding ground. Crossed at lowest point by main road A92 and railway. Limited in area.
LCT 13: Dipslope Farmland (vi) Rossie Moor	Higher ground lying between the Lunan Water, Montrose Basin and the coast. Ca. 30-150m AOD.	Characterised by an open character due to elevation, surrounding lower ground and coastal influence. Separated from other elevated Dipslope Farmland areas by the Lunan Water. Large fields and a small area of unimproved moorland on highest area. A92 passes across east near coast but most of area is sparsely populated and has few roads.

APPENDIX 4: VISIBILITY ANALYSIS FOR WIND TURBINES IN ANGUS

Figures 4.2 a-f: Visibility from Settlements

Figures 4.3 a-f: Visibility from Transport Routes

Figures 4.4 a-f: Visibility from Viewpoints



Code	Landscape Character Types
ABS2	Agricultural Heartlands
ABS4	Moorland Plateaux
CNG2	Uplands and Glens
LOCH	Inland Loch
LOCH_ISLD	Loch Island
TAY1A	Upper Highland Glens
TAY1B	Middle Highland Glens
TAY1C	Lower Highland Glens
TAY3	Highland Summits and Plateaux
TAY5	Highland Foothills
TAY8	Igneous Hills
TAY10	Broad Valley Lowland
TAY11	Firth Lowlands
TAY12	Low Moorland Hills
TAY13	Dipslope Farmland
TAY14A	Coast with Sand
TAY14B	Coast with Cliffs
TAY15	Lowland Loch Basin
URBAN	Urban

Angus Council

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March 2014 7933 ANC 112

Legend

- Study Area
- Scottish Local Authority Boundaries
- Landscape Character Areas
- (i) LCA Sub Areas (Ref. Table 6.1)

ZTV:

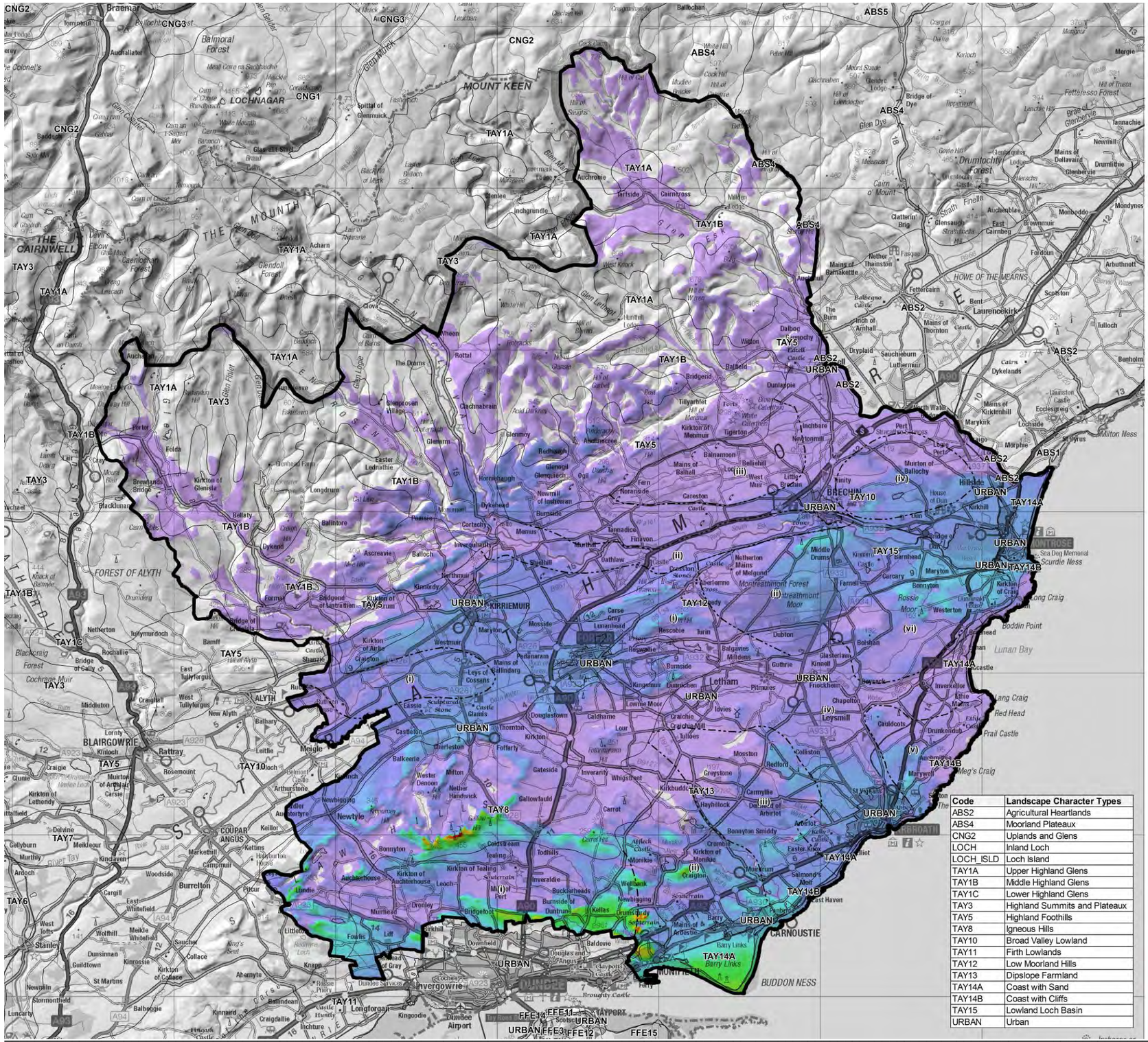
Highest Visibility

Lowest Visibility

Figure 4.2a

Visibility from Settlements (0m high object)

N 0 2.5 5 10 Km



Code	Landscape Character Types
ABS2	Agricultural Heartlands
ABS4	Moorland Plateaux
CNG2	Uplands and Glens
LOCH	Inland Loch
LOCH_ISLD	Loch Island
TAY1A	Upper Highland Glens
TAY1B	Middle Highland Glens
TAY1C	Lower Highland Glens
TAY3	Highland Summits and Plateaux
TAY5	Highland Foothills
TAY8	Igneous Hills
TAY10	Broad Valley Lowland
TAY11	Firth Lowlands
TAY12	Low Moorland Hills
TAY13	Dipslope Farmland
TAY14A	Coast with Sand
TAY14B	Coast with Cliffs
TAY15	Lowland Loch Basin
URBAN	Urban

Angus Council

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Legend

- Study Area
- Scottish Local Authority Boundaries
- Landscape Character Areas
- (i) LCA Sub Areas (Ref. Table 6.1)

ZTV:

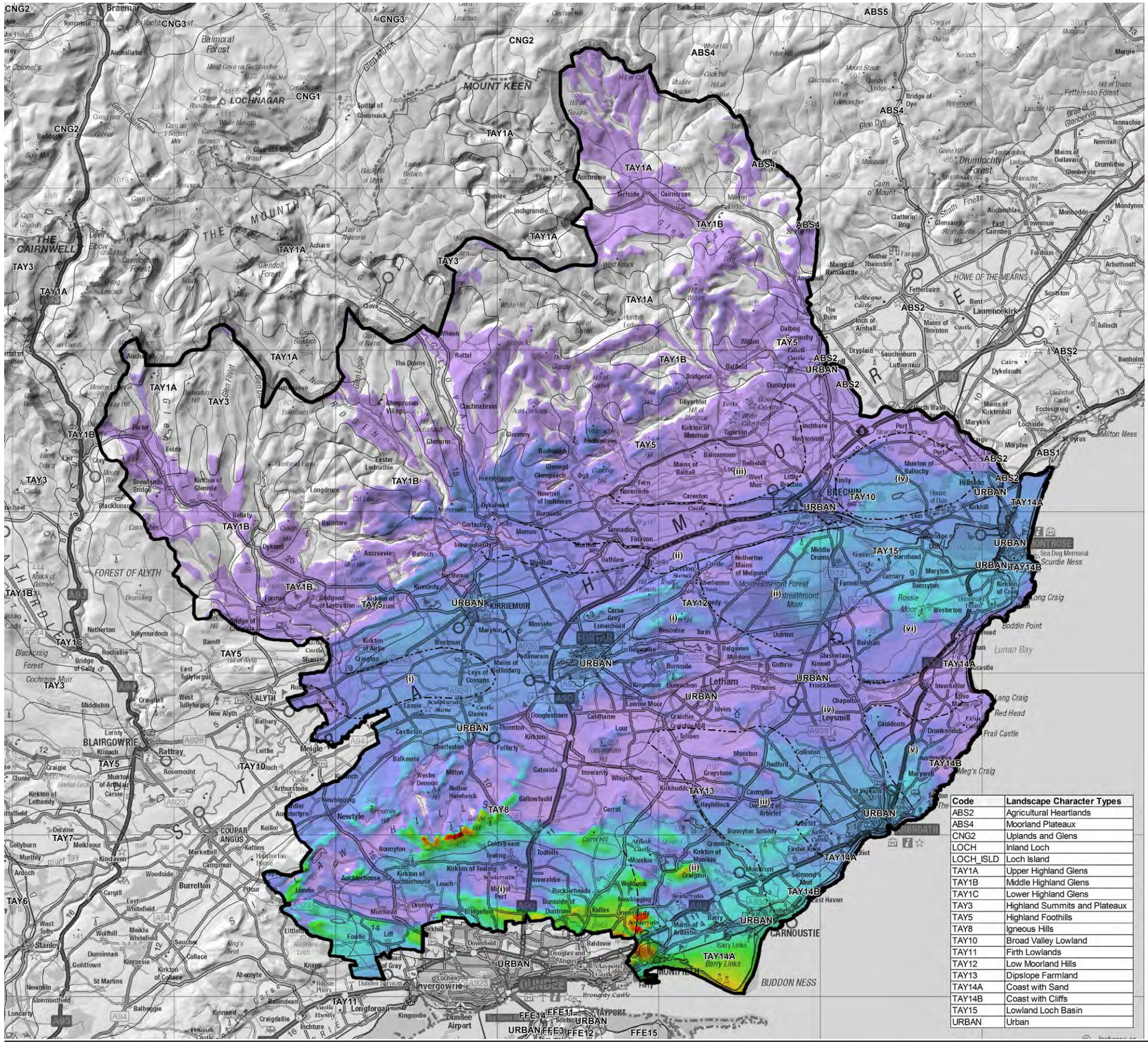
Highest Visibility

Lowest Visibility

Figure 4.2b

Visibility from Settlements (15m high object)

N 0 2.5 5 10 Km



Code	Landscape Character Types
ABS2	Agricultural Heartlands
ABS4	Moorland Plateaux
CNG2	Uplands and Glens
LOCH	Inland Loch
LOCH_ISLD	Loch Island
TAY1A	Upper Highland Glens
TAY1B	Middle Highland Glens
TAY1C	Lower Highland Glens
TAY3	Highland Summits and Plateaux
TAY5	Highland Foothills
TAY8	Igneous Hills
TAY10	Broad Valley Lowland
TAY11	Firth Lowlands
TAY12	Low Moorland Hills
TAY13	Dipslope Farmland
TAY14A	Coast with Sand
TAY14B	Coast with Cliffs
TAY15	Lowland Loch Basin
URBAN	Urban

Angus Council

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March 2014 | 7933 ANC 114

Legend

- Study Area
- Scottish Local Authority Boundaries
- Landscape Character Areas
- LCA Sub Areas (Ref. Table 6.1)

ZTV:

Highest Visibility

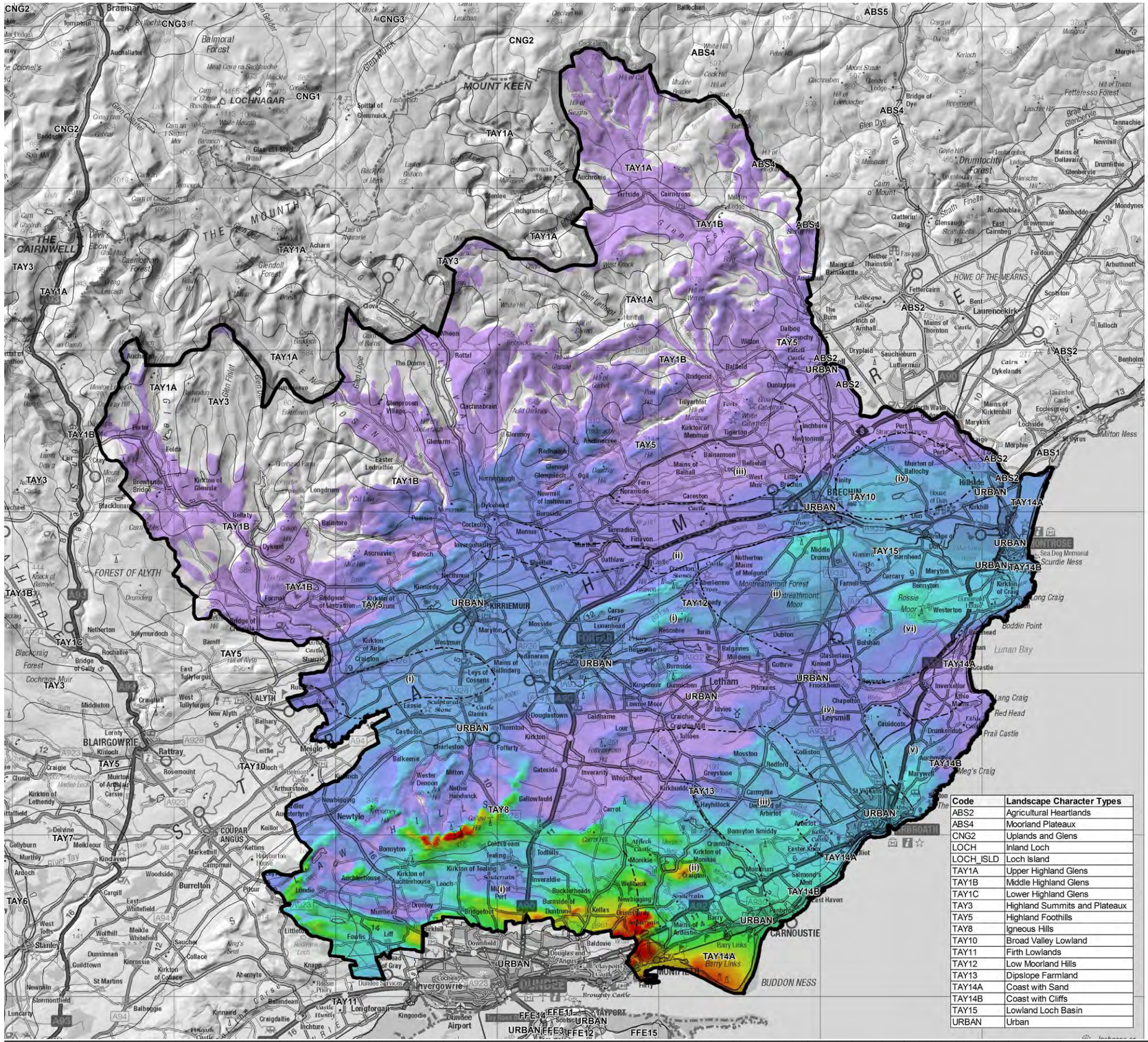
Lowest Visibility

Figure 4.2c

Visibility from Settlements (30m high object)

N

0 2.5 5 10 Km



Code	Landscape Character Types
ABS2	Agricultural Heartlands
ABS4	Moorland Plateaux
CNG2	Uplands and Glens
LOCH	Inland Loch
LOCH_ISLD	Loch Island
TAY1A	Upper Highland Glens
TAY1B	Middle Highland Glens
TAY1C	Lower Highland Glens
TAY3	Highland Summits and Plateaux
TAY5	Highland Foothills
TAY8	Igneous Hills
TAY10	Broad Valley Lowland
TAY11	Firth Lowlands
TAY12	Low Moorland Hills
TAY13	Dipslope Farmland
TAY14A	Coast with Sand
TAY14B	Coast with Cliffs
TAY15	Lowland Loch Basin
URBAN	Urban

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March 2014 7933 ANC 115

Legend

- Study Area
- Scottish Local Authority Boundaries
- Landscape Character Areas
- (i) LCA Sub Areas (Ref. Table 6.1)

ZTV:

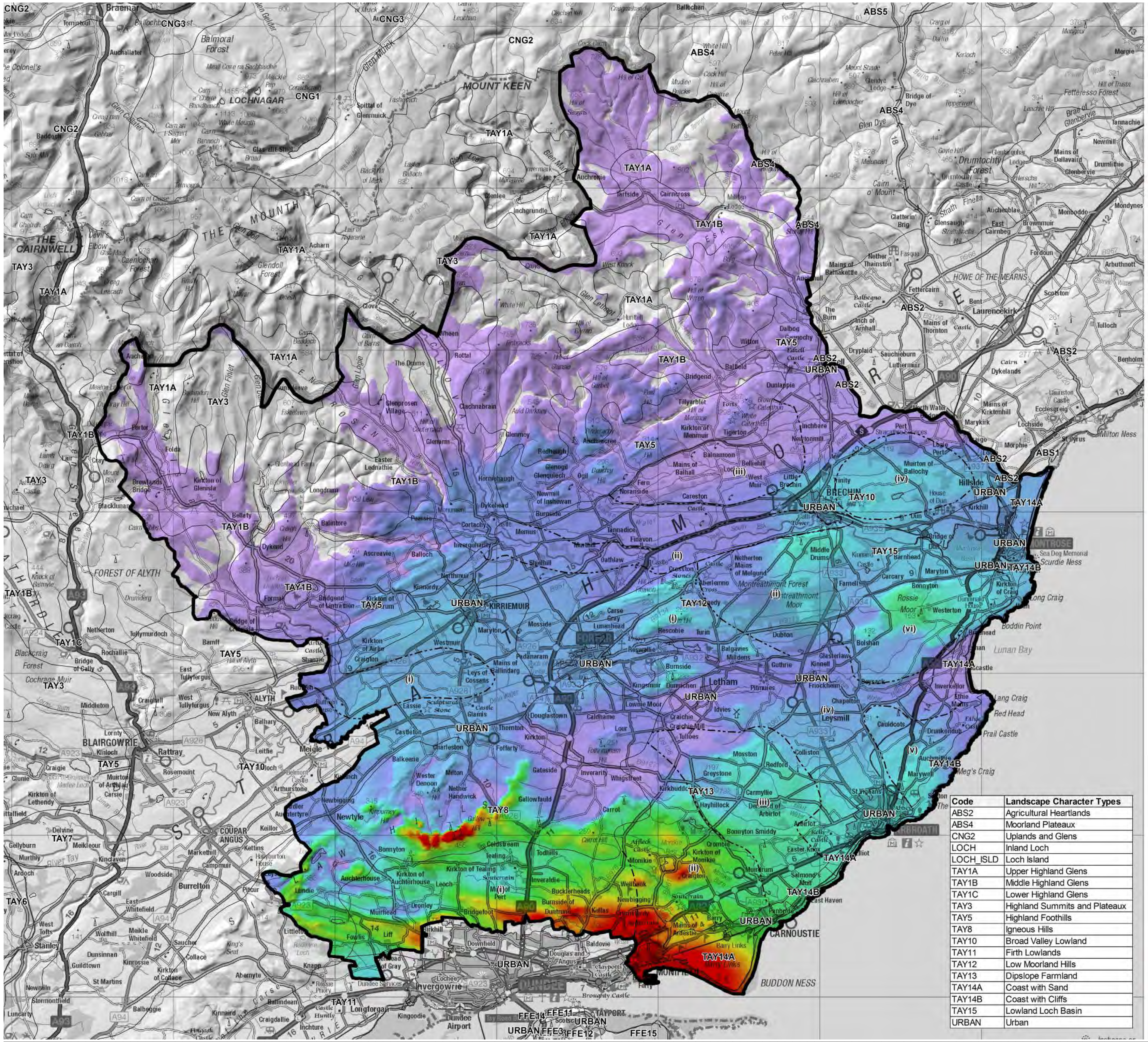
Highest Visibility

Lowest Visibility

Figure 4.2d

Visibility from Settlements (50m high object)

N 0 2.5 5 10 Km



Code	Landscape Character Types
ABS2	Agricultural Heartlands
ABS4	Moorland Plateaux
CNG2	Uplands and Glens
LOCH	Inland Loch
LOCH_ISLD	Loch Island
TAY1A	Upper Highland Glens
TAY1B	Middle Highland Glens
TAY1C	Lower Highland Glens
TAY3	Highland Summits and Plateaux
TAY5	Highland Foothills
TAY8	Igneous Hills
TAY10	Broad Valley Lowland
TAY11	Firth Lowlands
TAY12	Low Moorland Hills
TAY13	Dipslope Farmland
TAY14A	Coast with Sand
TAY14B	Coast with Cliffs
TAY15	Lowland Loch Basin
URBAN	Urban

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March 2014 7933 ANC 116

Legend

- Study Area
- Scottish Local Authority Boundaries
- Landscape Character Areas
- (i) LCA Sub Areas (Ref. Table 6.1)

ZTV:

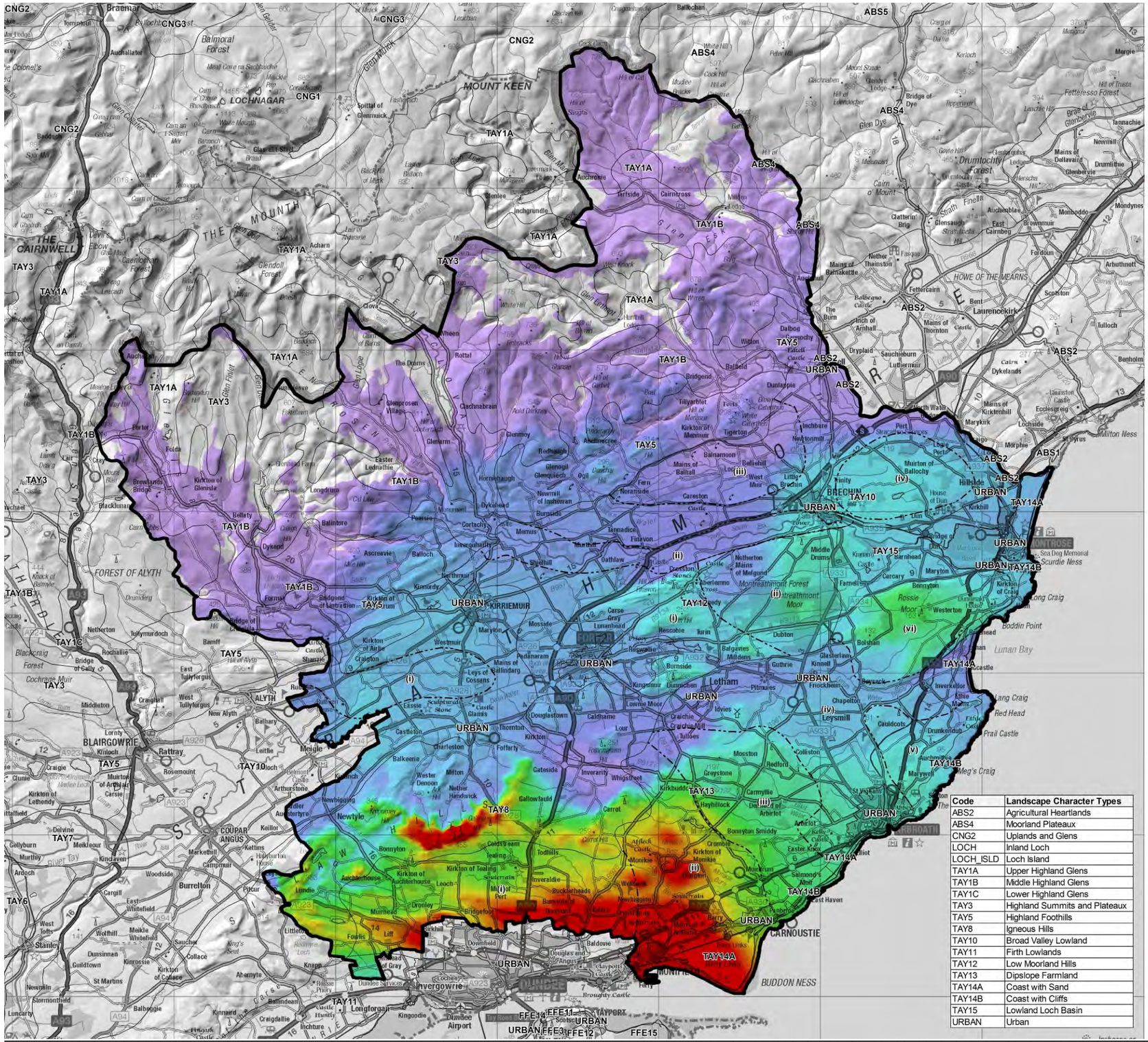
Highest Visibility

Lowest Visibility

Figure 4.2e

Visibility from Settlements (80m high object)

N 0 2.5 5 10 Km



Code	Landscape Character Types
ABS2	Agricultural Heartlands
ABS4	Moorland Plateaux
CNG2	Uplands and Glens
LOCH	Inland Loch
LOCH_ISLD	Loch Island
TAY1A	Upper Highland Glens
TAY1B	Middle Highland Glens
TAY1C	Lower Highland Glens
TAY3	Highland Summits and Plateaux
TAY5	Highland Foothills
TAY8	Igneous Hills
TAY10	Broad Valley Lowland
TAY11	Firth Lowlands
TAY12	Low Moorland Hills
TAY13	Dipslope Farmland
TAY14A	Coast with Sand
TAY14B	Coast with Cliffs
TAY15	Lowland Loch Basin
URBAN	Urban

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November 2013 7933 ANC 117

Legend

- Study Area
- Scottish Local Authority Boundaries
- Landscape Character Areas
- (i) LCA Sub Areas (Ref. Table 6.1)

ZTV:

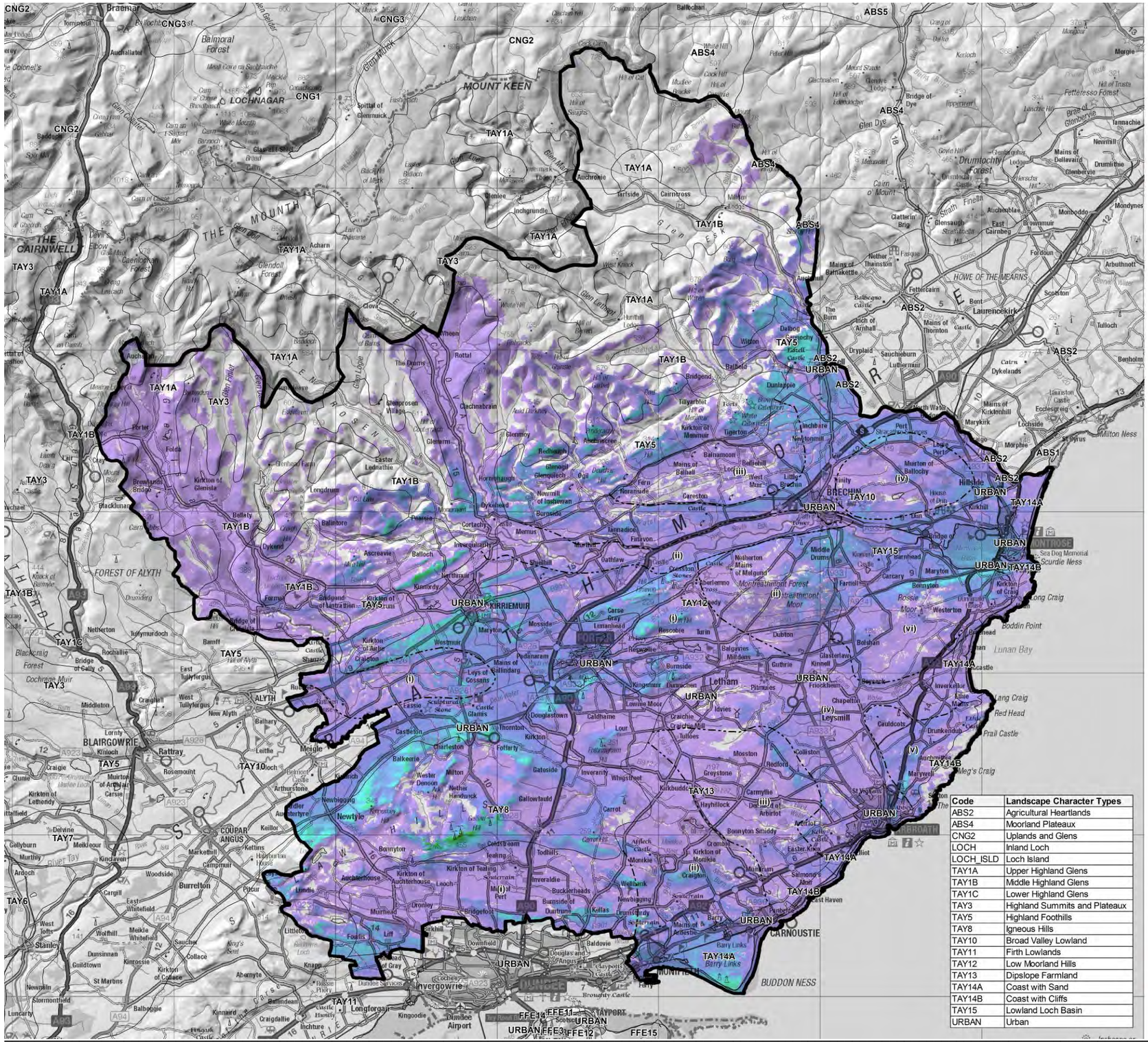
Highest Visibility

Lowest Visibility

Figure 4.2f

Visibility from Settlements (125m high object)

N 0 2.5 5 10 Km



Code	Landscape Character Types
ABS2	Agricultural Heartlands
ABS4	Moorland Plateaux
CNG2	Uplands and Glens
LOCH	Inland Loch
LOCH_ISLD	Loch Island
TAY1A	Upper Highland Glens
TAY1B	Middle Highland Glens
TAY1C	Lower Highland Glens
TAY3	Highland Summits and Plateaux
TAY5	Highland Foothills
TAY8	Igneous Hills
TAY10	Broad Valley Lowland
TAY11	Firth Lowlands
TAY12	Low Moorland Hills
TAY13	Dipslope Farmland
TAY14A	Coast with Sand
TAY14B	Coast with Cliffs
TAY15	Lowland Loch Basin
URBAN	Urban

Angus Council

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March 2014 7933 ANC 118

Legend

- Study Area
- Scottish Local Authority Boundaries
- Landscape Character Areas
- (i) LCA Sub Areas (Ref. Table 6.1)

ZTV:

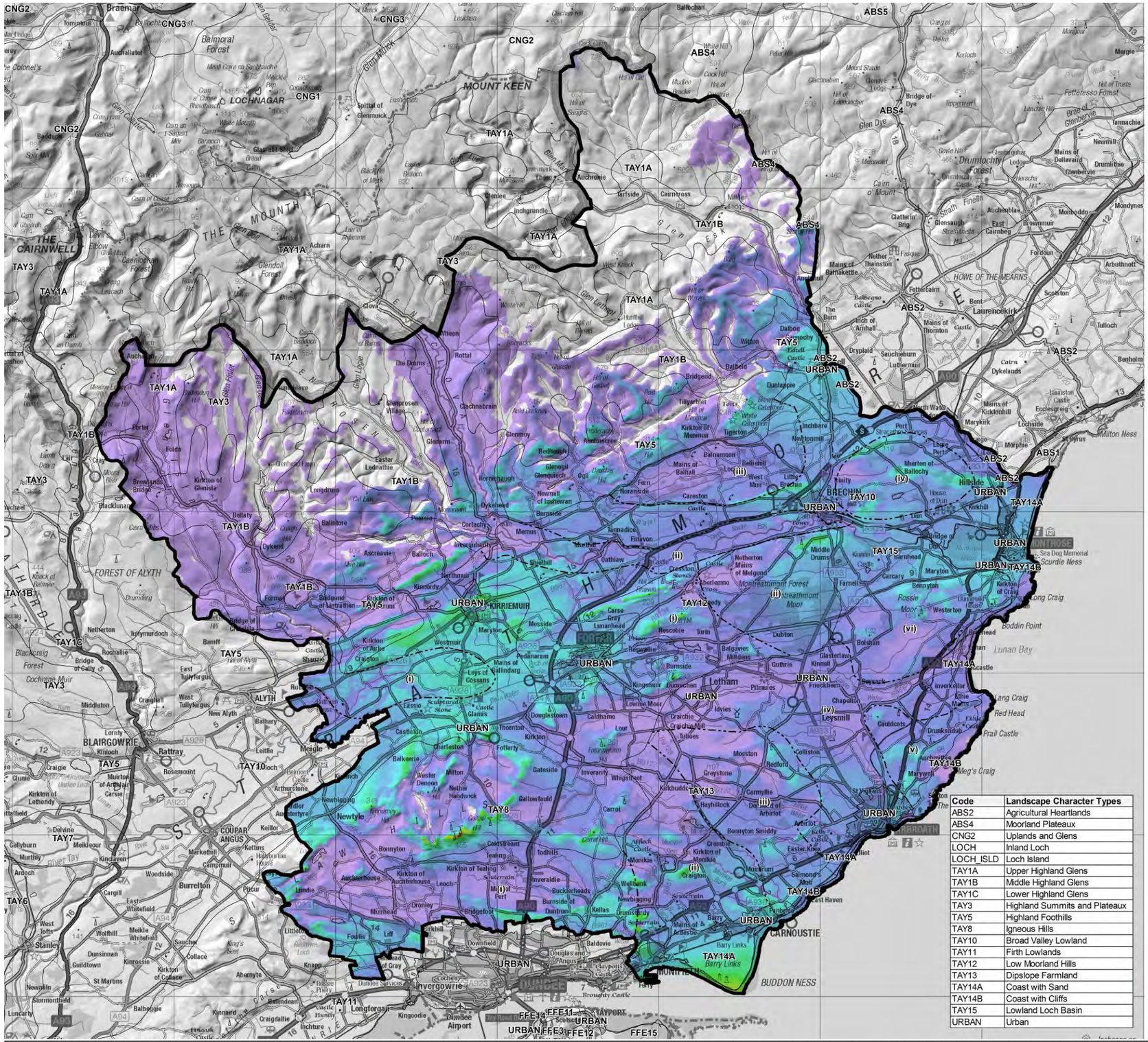
Highest Visibility

Lowest Visibility

Figure 4.3a

Visibility from Transport Routes (0m high object)

N 0 2.5 5 10 Km



Code	Landscape Character Types
ABS2	Agricultural Heartlands
ABS4	Moorland Plateaux
CNG2	Uplands and Glens
LOCH	Inland Loch
LOCH_ISLD	Loch Island
TAY1A	Upper Highland Glens
TAY1B	Middle Highland Glens
TAY1C	Lower Highland Glens
TAY3	Highland Summits and Plateaux
TAY5	Highland Foothills
TAY8	Igneous Hills
TAY10	Broad Valley Lowland
TAY11	Firth Lowlands
TAY12	Low Moorland Hills
TAY13	Dipslope Farmland
TAY14A	Coast with Sand
TAY14B	Coast with Cliffs
TAY15	Lowland Loch Basin
URBAN	Urban

Figure 4.3b

Visibility from Transport Routes (15m high object)

N 0 2.5 5 10 Km

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Legend

- Study Area
- Scottish Local Authority Boundaries
- Landscape Character Areas
- (i) LCA Sub Areas (Ref. Table 6.1)

ZTV:

Highest Visibility

Lowest Visibility

Code	Landscape Character Types
ABS2	Agricultural Heartlands
ABS4	Moorland Plateaux
CNG2	Uplands and Glens
LOCH	Inland Loch
LOCH_ISLD	Loch Island
TAY1A	Upper Highland Glens
TAY1B	Middle Highland Glens
TAY1C	Lower Highland Glens
TAY3	Highland Summits and Plateaux
TAY5	Highland Foothills
TAY8	Igneous Hills
TAY10	Broad Valley Lowland
TAY11	Firth Lowlands
TAY12	Low Moorland Hills
TAY13	Dipslope Farmland
TAY14A	Coast with Sand
TAY14B	Coast with Cliffs
TAY15	Lowland Loch Basin
URBAN	Urban

Figure 4.3c

Visibility from Transport Routes (30m high object)

N 0 2.5 5 10 Km

Angus Council
Wind Energy Consultancy

March 2014 7933 ANC 121

Legend

- Study Area
- Scottish Local Authority Boundaries
- Landscape Character Areas
- (i) LCA Sub Areas (Ref. Table 6.1)

ZTV:

Highest Visibility

Lowest Visibility

Code	Landscape Character Types
ABS2	Agricultural Heartlands
ABS4	Moorland Plateaux
CNG2	Uplands and Glens
LOCH	Inland Loch
LOCH_ISLD	Loch Island
TAY1A	Upper Highland Glens
TAY1B	Middle Highland Glens
TAY1C	Lower Highland Glens
TAY3	Highland Summits and Plateaux
TAY5	Highland Foothills
TAY8	Igneous Hills
TAY10	Broad Valley Lowland
TAY11	Firth Lowlands
TAY12	Low Moorland Hills
TAY13	Dipslope Farmland
TAY14A	Coast with Sand
TAY14B	Coast with Cliffs
TAY15	Lowland Loch Basin
URBAN	Urban

Figure 4.3d

Visibility from Transport Routes (50m high object)

N 0 2.5 5 10 Km

Angus Council
Wind Energy Consultancy

March 2014 7933 ANC 122

Legend

- Study Area
- Scottish Local Authority Boundaries
- Landscape Character Areas
- (i) LCA Sub Areas (Ref. Table 6.1)

ZTV:

Highest Visibility

Lowest Visibility

Code	Landscape Character Types
ABS2	Agricultural Heartlands
ABS4	Moorland Plateaux
CNG2	Uplands and Glens
LOCH	Inland Loch
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TAY1A	Upper Highland Glens
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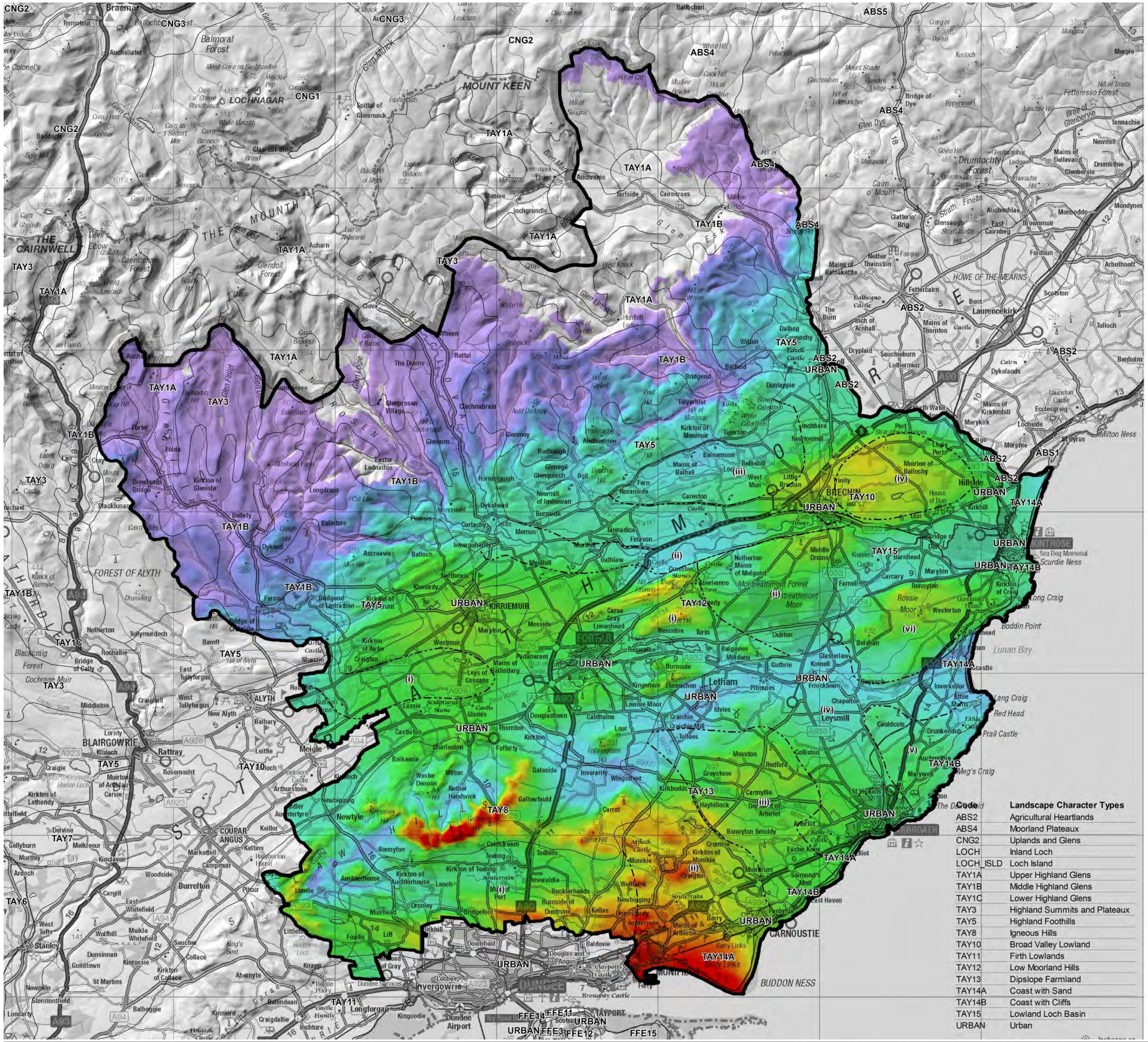
TAY5	Highland Foothills
TAY8	Igneous Hills
TAY10	Broad Valley Lowland
TAY11	Firth Lowlands
TAY12	Low Moorland Hills
TAY13	Dipslope Farmland
TAY14A	Coast with Sand
TAY14B	Coast with Cliffs
TAY15	Lowland Loch Basin
URBAN	Urban

Figure 4.3e

Visibility from Transport Routes (80m high object)

N 0 2.5 5 10 Km



Angus Council
Wind Energy Consultancy

March 2014 7933 ANC 123

Legend

- Study Area
- Scottish Local Authority Boundaries
- Landscape Character Areas
- LCA Sub Areas (Ref. Table 6.1)

ZTV:

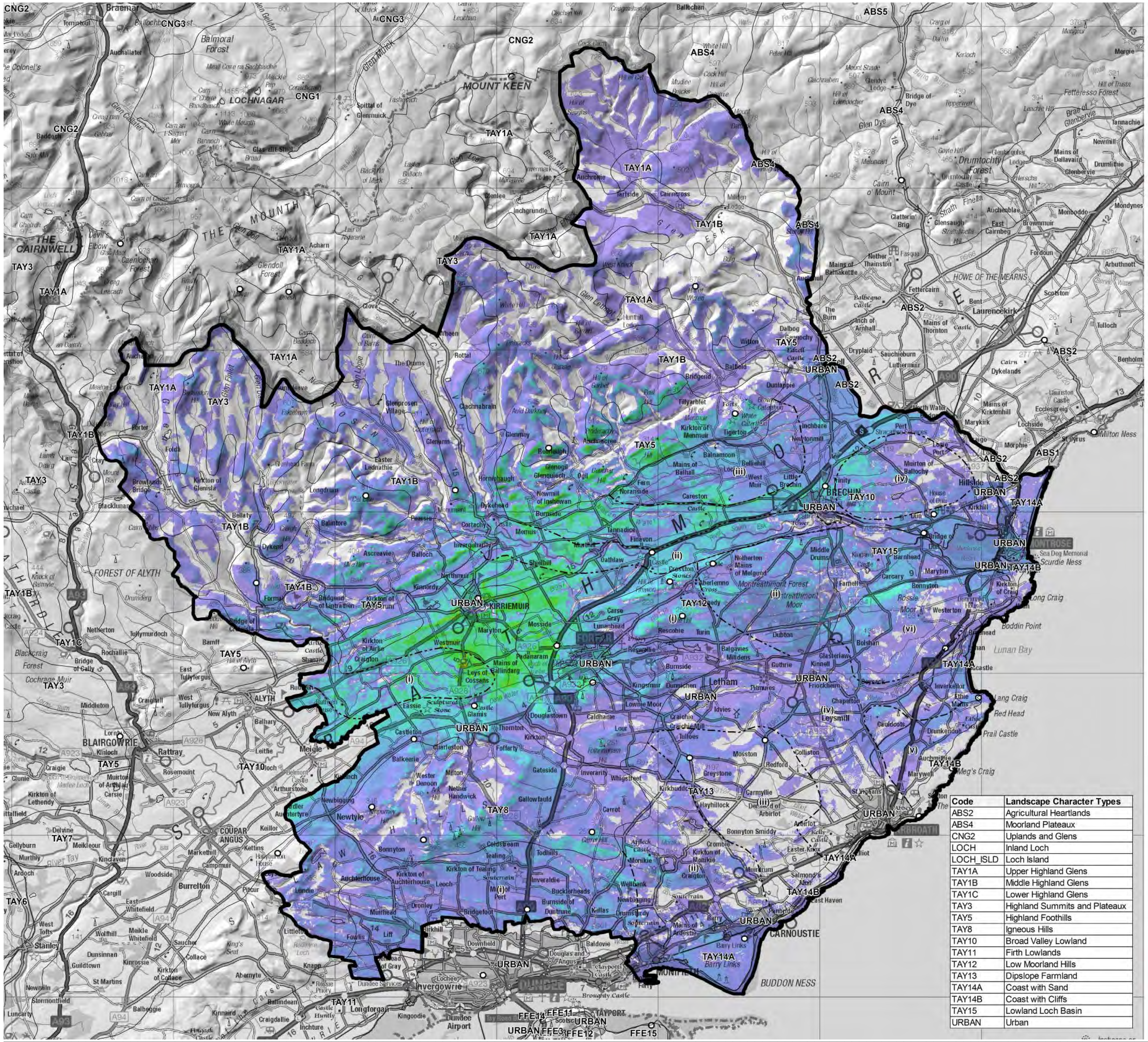
Highest Visibility

Lowest Visibility

Figure 4.3f

Visibility from Transport Routes (125m high object)

N 0 2.5 5 10 Km



Code	Landscape Character Types
ABS2	Agricultural Heartlands
ABS4	Moorland Plateaux
CNG2	Uplands and Glens
LOCH	Inland Loch
LOCH_ISLD	Loch Island
TAY1A	Upper Highland Glens
TAY1B	Middle Highland Glens
TAY1C	Lower Highland Glens
TAY3	Highland Summits and Plateaux
TAY5	Highland Foothills
TAY8	Igneous Hills
TAY10	Broad Valley Lowland
TAY11	Firth Lowlands
TAY12	Low Moorland Hills
TAY13	Dipslope Farmland
TAY14A	Coast with Sand
TAY14B	Coast with Cliffs
TAY15	Lowland Loch Basin
URBAN	Urban

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Wind Energy Consultancy

March 2014 7933 ANC 124

Legend

- Study Area
- Scottish Local Authority Boundaries
- Landscape Character Areas
- (i) LCA Sub Areas (Ref. Table 6.1)

ZTV:

Highest Visibility

Lowest Visibility

Figure 4.4a

Visibility from Viewpoints (0m high object)

N 0 2.5 5 10 Km

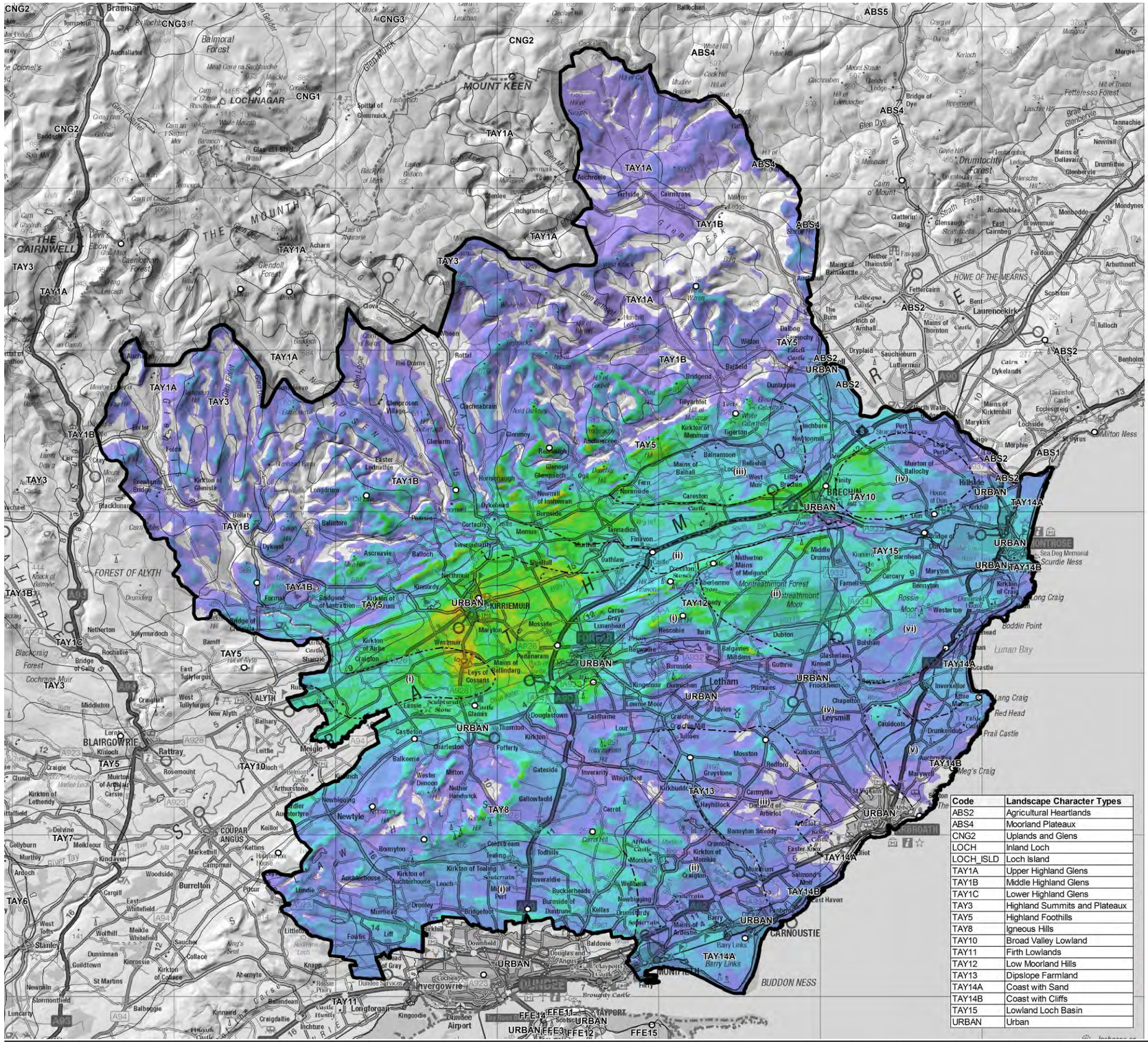


Figure 4.4b

Visibility from Viewpoints (15m high object)

Angus Council
Wind Energy Consultancy

March 2014 7933 ANC 126

Legend

- Study Area
- Scottish Local Authority Boundaries
- Landscape Character Areas
- (i) LCA Sub Areas (Ref. Table 6.1)

ZTV:

Highest Visibility

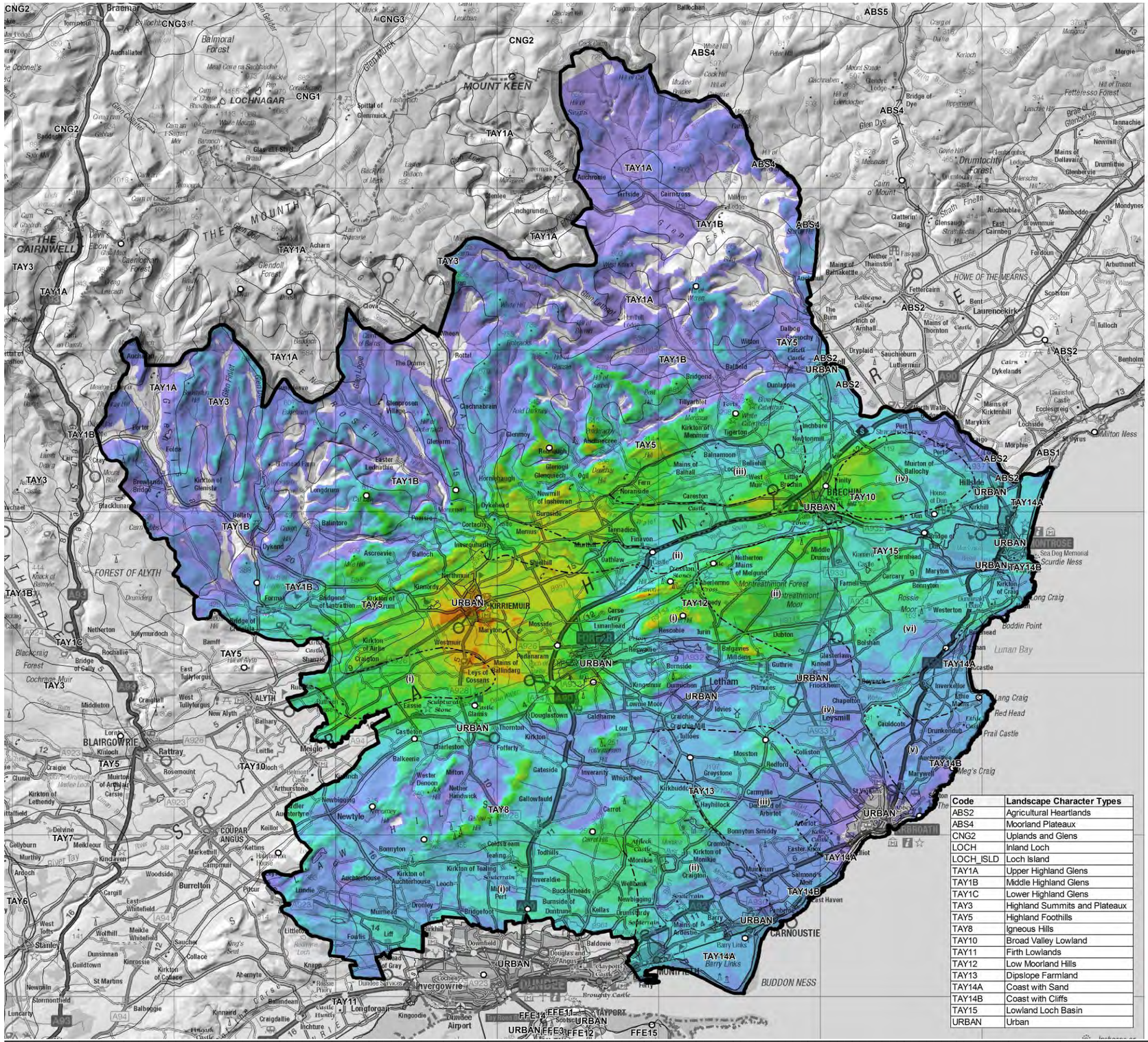
Lowest Visibility

Code	Landscape Character Types
ABS2	Agricultural Heartlands
ABS4	Moorland Plateaux
CNG2	Uplands and Glens
LOCH	Inland Loch
LOCH_ISLD	Loch Island
TAY1A	Upper Highland Glens
TAY1B	Middle Highland Glens
TAY1C	Lower Highland Glens
TAY3	Highland Summits and Plateaux
TAY5	Highland Foothills
TAY8	Igneous Hills
TAY10	Broad Valley Lowland
TAY11	Firth Lowlands
TAY12	Low Moorland Hills
TAY13	Dipslope Farmland
TAY14A	Coast with Sand
TAY14B	Coast with Cliffs
TAY15	Lowland Loch Basin
URBAN	Urban

Figure 4.4c

Visibility from Viewpoints
(30m high object)

N 0 2.5 5 10 Km



Angus Council
Wind Energy Consultancy

November 2014 7933 ANC 127

Legend

- Study Area
- Scottish Local Authority Boundaries
- Landscape Character Areas
- (i) LCA Sub Areas (Ref. Table 6.1)

ZTV:

Highest Visibility

Lowest Visibility

Code	Landscape Character Types
ABS2	Agricultural Heartlands
ABS4	Moorland Plateaux
CNG2	Uplands and Glens
LOCH	Inland Loch
LOCH_ISLD	Loch Island
TAY1A	Upper Highland Glens
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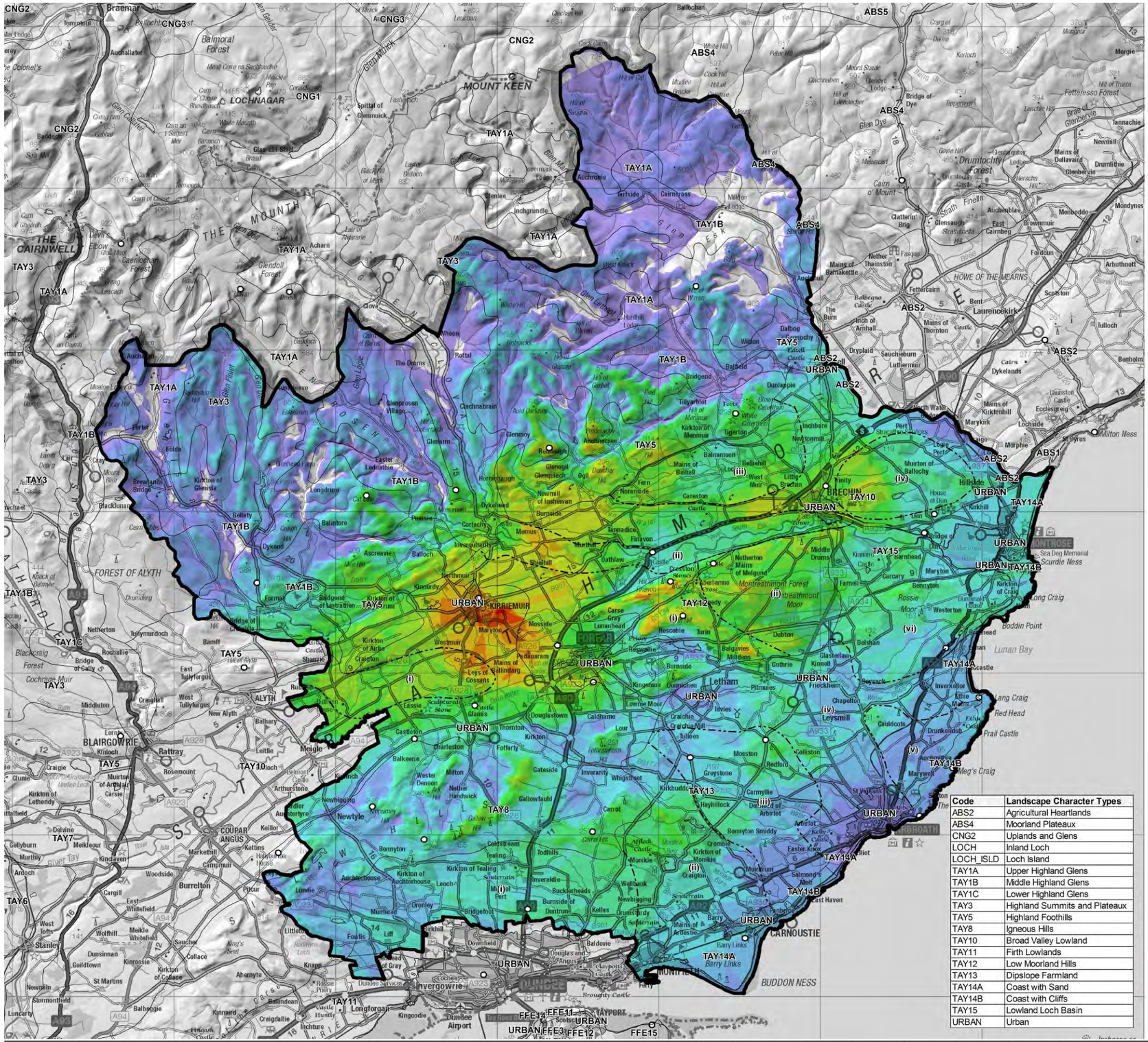
TAY5	Highland Foothills
TAY8	Igneous Hills
TAY10	Broad Valley Lowland
TAY11	Firth Lowlands
TAY12	Low Moorland Hills
TAY13	Dipslope Farmland
TAY14A	Coast with Sand
TAY14B	Coast with Cliffs
TAY15	Lowland Loch Basin
URBAN	Urban

Figure 4.4d

Visibility from Viewpoints (50m high object)

N 0 2.5 5 10 Km



Code	Landscape Character Types
ABS2	Agricultural Heartlands
ABS4	Moorland Plateaux
CNG2	Uplands and Glens
LOCH	Inland Loch
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TAY3	Highland Summits and Plateaux
TAY5	Highland Foothills
TAY8	Igneous Hills
TAY10	Broad Valley Lowland
TAY11	Firth Lowlands
TAY12	Low Moorland Hills
TAY13	Dipslope Farmland
TAY14A	Coast with Sand
TAY14B	Coast with Cliffs
TAY15	Lowland Loch Basin
URBAN	Urban

Angus Council
Wind Energy Consultancy

March 2014 7933 ANC 128

Legend

- Study Area
- Scottish Local Authority Boundaries
- Landscape Character Areas
- LCA Sub Areas (Ref. Table 6.1)

ZTV:

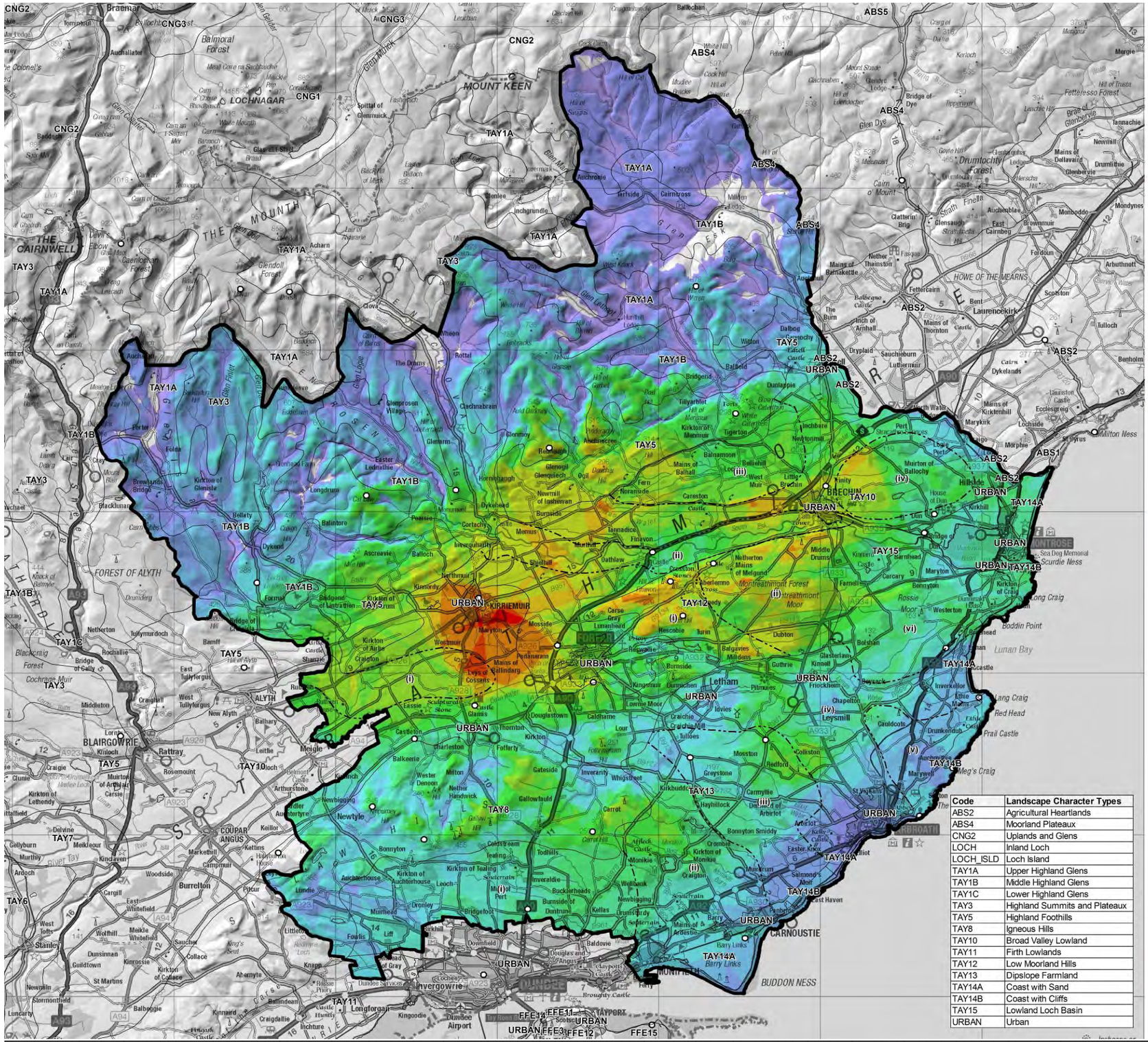
Highest Visibility

Lowest Visibility

Figure 4.4e

Visibility from Viewpoints (80m high object)

N 0 2.5 5 10 Km



Code	Landscape Character Types
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TAY12	Low Moorland Hills
TAY13	Dipslope Farmland
TAY14A	Coast with Sand
TAY14B	Coast with Cliffs
TAY15	Lowland Loch Basin
URBAN	Urban

Angus Council

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Wind Energy Consultancy

March 2014 7933 ANC 129

Legend

- Study Area
- Scottish Local Authority Boundaries
- Landscape Character Areas
- (i) LCA Sub Areas (Ref. Table 6.1)

ZTV:

Highest Visibility

Lowest Visibility

Figure 4.4f

Visibility from Viewpoints (125m high object)

N 0 2.5 5 10 Km

APPENDIX 5: FACTORS AFFECTING THE LANDSCAPE AND VISUAL IMPACTS OF WIND TURBINES

5.1 Introduction

There are a number of overlapping and interacting factors which affect the potential landscape and visual effects of wind turbines. The four main turbine factors are:

- Size of turbine
- Turbine design (shape/ blades/ tower /colour)
- Numbers of turbines (within groups and/ or single turbines spread across an area)
- Distribution of turbine groupings (spacing between groups and/or single turbines)

The effects of these factors will in turn differ depending on the character of the landscape in which the turbines are located.

5.1.1 Turbine Size

Turbine size is the first factor to consider in assessing the impacts of wind turbines. In particular, smaller turbines are considered to be more appropriate in lowland landscapes, which are usually more complex and varied than uplands, and where there are generally smaller scale features such as trees and buildings that provide a 'scale reference' against a turbine. Conversely, upland landscapes are generally simpler in character, larger in scale and there are fewer human scale reference features, meaning that larger turbines are more easily accommodated (see SNH guidance, 2009).

Turbine size for installed or consented commercial windfarms in Scotland varies from ca. 55m to blade tip at the original Hagshaw Hill to a current maximum of 147m. However, considerably smaller turbines are now commonly installed for the non-commercial scale proposals typical of Feed in Tariff (FiT) schemes. Current consents within Angus vary from many turbines of under 15m height on various domestic FiT schemes to 93.5m at the Former Tealing Airfield, with further turbines up to 125m height in the wider 30km buffer zone.

In this study we have classified six blade tip height categories from 'small' to 'very large' which would have differing relationships with the scale and character of the landscape and with one another. These are listed in Table 5.1 below.

There is a significant range of available commercial turbines sizes. However even the smaller commercial turbines are very much larger than any other common vertical object in the landscape, such as a house or trees, with only electricity pylons (typically 25-50m tall) coming close in size. Even the medium size of turbine falls within this height bracket and is therefore significantly taller than most trees and buildings. Furthermore, by being kinetic structures, the visual prominence of turbines is increased relative to existing static features. In this respect smaller turbines may be more noticeable as their blades rotate more rapidly than those of large turbines.

The small domestic scale turbines (<15m) are however closer to the heights of common visual references such as houses and trees and their landscape and visual impacts tend to be much more localised due to localised screening and backclothing by landforms and trees.

Table 5.1. Turbine Size Categories in This Study

Size Category	Blade Tip Height	Typical Use
Small	Turbines less than 15m in height	Typically used for domestic FiT schemes
Small-Medium	Turbines 15m to <30m in height	Typically used for domestic and farm FiT schemes
Medium	Turbines 30m to <50m in height	Typically used for farm and industrial FiT schemes
Medium/Large	Turbines 50m to <80m in height	Single turbine FiT schemes and smaller turbines used in commercial schemes
Large	Turbines 80m to <125m in height	Typical turbines used in commercial windfarms but also on some single turbine schemes
Very Large	Turbines 125m in height and greater.	Used in commercial onshore windfarms, as well as offshore (up to ca. 200m in the latter)

SNH considers that smaller turbines can be used to mitigate landscape impacts in a lowland situation with a smaller scale landscape pattern and scale indicators. As it has to be balanced against losses in output, size reduction should be used in specific cases where a clearly identified benefit can be achieved. The following are criteria by which this may be judged:

- mitigating significant landscape or visual impacts on a highly valued or sensitive receptor;
- avoiding an adverse scale relationship with a landform or other key landscape element or feature;
- allowing an intervening landform and/or forest to screen views of turbines from certain receptors; or
- achieving a significant reduction in overall visibility by virtue of relationship to surrounding landform and trees.

Where reduction in impact would be a matter of degree rather than a clear quantitative change the benefits are less clear cut.

SNH guidance also recommends that where two or more developments are in close proximity to one another, turbines of a similar size should be used. The use of significantly different turbine sizes within a single windfarm or between two windfarms or turbine developments in close proximity can otherwise lead to adverse visual and scale effects which increase the appearance of clutter, or create odd perspectives when seen from certain viewpoints.

5.1.2 Turbine Design

Variations in size aside, the design of wind turbines can vary considerably. This is particularly the case with smaller turbines under ca. 50m in height. The main variations affecting appearance of wind turbines are:

- two or three bladed
- solid or lattice tower
- shape/ size of nacelle
- proportion of blade length to tower height
- hub faces into or away from the wind direction
- colour

Other factors such as tower and blade shape tend to be more subtle but in combination can lead to a significant difference in appearance, as the difference between the two turbines below demonstrates:

Enercon and Siemens turbines have different nacelles, blades and towers leading to significant differences in appearance

Colour is an issue that is a more important variable in smaller turbines. Colour choice for larger commercial turbines has settled on a neutral light grey with slight variations in lighter or darker shade between developments. It is generally agreed that this colour range is most likely to reduce the prominence of turbines when seen under the most prevalent atmospheric conditions.

In the case of smaller turbines there is more variation in colour and more likelihood of being seen against land rather than sky. In particular many small turbines are white, which increases their prominence when seen from a distance, particularly seen against land.

A 47m high turbine seen from several kilometres distance reflects the evening light, contrasting with the dark backdrop of trees and grassland

Choices of turbine design, including colour, are of potential significance when considering the effects of individual turbines or wider cumulative effects on the landscape.

5.1.3 Windfarm Size

There is no current 'accepted' classification of commercial windfarm sizes in Scotland. Existing and proposed wind energy developments vary in turbine numbers and turbine sizes; from single small turbines to over 200 large turbines. Individual turbines vary in size from below 15m to more than 140m, with maximum outputs from a few kW to greater than 3MW.

To place Angus within context, it is worth considering the wider Scottish context of wind energy development. The table below refers to small, medium, large etc. size wind energy developments. For clarity we have adopted wind energy development size categories related wherever possible to published guidance or planning application procedures. The 20MW size above which SPG and SPP currently applies is shown in the Table 5.2 below, although it should be noted that emerging Government policy is recommending the abandonment of this scale threshold.

Table 5.2. Wind Energy Development Size Categories

Size Category	Size Criteria	Planning Criteria/ Illustrative Examples
Small	A development of 3 or fewer turbines.	As defined by SNH guidance on assessment of small scale wind energy development (*SNH 2012*)
Small/Medium	A windfarm of more than 3 turbines up to 20MW output	Current SPP recommends windfarms above 20MW are to be covered by SPG. *E.g. Between 4 turbines over 50m and 10x2MW turbines or 6x3MW turbines*
SPP 2010 'Cutoff' 20MW		
Medium	A windfarm between 20MW and 50MW output	Windfarms up to 50MW are dealt with as local planning authority applications. *E.g. Between 7x3MW and 16x3MW turbines*
Large	Windfarms greater than 50MW output	Windfarms over 50MW are section 36 Applications dealt with by Scottish Ministers. *A minimum size of 20x2.5MW or 17x3MW turbines*
Very Large	Windfarms greater than 100MW output	*A minimum size of 50 turbines over 125m tall*

5.1.4 Turbine Numbers and Landscape Impacts

Wind turbines considered out of their landscape context are usually simple, aerodynamic and functional structures that many consider to have a clear aesthetic of 'form following function' in their design. Landscape and visual impact issues relate primarily to their scale and potential incongruity in a landscape rather than to the aesthetics of the turbine design. In this case, the number of turbines in a wind energy development has a bearing on the visual image of the development that extends well beyond the landscape area that it physically covers:

- Small clusters of turbines still express the aesthetics of the individual turbines and the blade movement of each turbine is discernible. The cluster is seen as a discrete item within a landscape, becoming a significant feature but generally not dominating or changing the character of a large area.
- In large groupings of turbines there is area coverage of the landscape, rather than a discrete grouping. The individual turbines usually become lost in a mass, blade movements are perceived across the whole area and there is a more 'cluttered' appearance.
- As turbine numbers increase it is increasingly difficult to design a wind energy development such that overlap and clustered alignments are avoided when seen from surrounding viewpoints. Design mitigation becomes a matter of avoiding excessive clutter, skylining and proximity to sensitive receptors rather than creating aesthetically balanced groupings

It is recognised that these qualities grade into one another depending on the exact size of development (e.g. 3, 6, 12, 20, 50, 100+ turbines) and on how the turbines are grouped (e.g. in mass groupings or in lines along ridges). Nevertheless, to the extent that they are more easily contained and definable, single turbines and smaller windfarms would have a disproportionately lesser influence on the landscape than large windfarms and are less likely to dominate areas and blur boundaries between landscape types.

In small groupings, odd numbers of turbines (i.e. 1, 3 or 5) usually present a more balanced composition than even numbers, unless there is a strong regular pattern or line in the landscape to which the turbines can be related.

5.2 Turbine Layout

The layout of turbines within a windfarm is a critical consideration. Whilst the optimum layout, including turbine separation distances and position in relation to the prevailing wind will relate to maximising output, there will be other practicalities. Thus turbine layout may vary according to turbine numbers, the availability of land, topography, access and numerous environmental constraints. These factors are taken into consideration during the windfarm design development process in which the overall aesthetic of the windfarm is considered.

Layouts should relate to landforms and patterns in the landscape and present a coherent image from the surrounding viewpoints. Thus in lowland landscapes with a strong geometric pattern the turbines may be organised in lines of a grid, whereas in the case of a distinct landform such as a ridge or coastline they may be arranged in a curved line following the landform. In upland landscapes turbines may be arranged in a more organic pattern, following ridgelines or clustered around rounded hilltops. Attention should be paid to the relationship of outer turbines in large groups ensuring that there are no 'outliers' creating an untidy or disorganised appearance.

When two or more developments are in close proximity or a windfarm is being expanded there can be cumulative issues relating to site layout if these are clearly contrasting (e.g. a geometric layout adjacent to an organic layout). Such developments should be designed to achieve a harmonious layout and relationship.

5.3 Windfarm Distribution

5.3.1 Pattern of Windfarm Development

When considering cumulative impacts of turbines and windfarms it is not just the number of turbines in the landscape that affects impacts but also the development pattern. This has an effect on the ability of the landscape to absorb change and on visual receptors. The dispersal of the turbines in small groups has some advantages in that each grouping is less dominant within the landscape and presents a less cluttered visual image. There is also less likelihood of 'swamping' landscapes and blurring the boundaries between different landscape types and features if there are distinct gaps between clusters of wind turbines. However, the increased number of windfarms or turbine clusters also means that there is an increased likelihood of seeing a windfarm or turbine and at closer proximity than if the turbines were concentrated into fewer locations.

The trend in Scotland is for the concentration of wind turbines into fewer, larger, windfarms. This arises initially via large windfarm proposals and then through the later extension of many existing windfarms. The pattern may also play out on a wider regional scale or 'clusters and spaces' where groups of windfarms lie within large areas separated by significant areas without turbines.

The cluster and space pattern has become increasingly diluted by the recent proliferation of smaller FiT schemes and single turbines which relate more to the location of small scale consumers than to regional landscapes. In locations such as northeast Aberdeenshire spatial planning may be required to ensure an uncontrolled proliferation of turbines does not completely dominate the landscape.

5.3.2 Separation Distances between Turbines and Windfarms

Separation distance between turbines and windfarms has a bearing on how they are perceived together and within the landscape, particularly in relation to defining the limits of cumulative development. A clear visual separation between two or more windfarms can be achieved by a certain physical distance. This distance would depend on the size and number of the turbines or windfarms, the type of landscape(s) in which they are located and the degree to which they affect the character of the landscape.

Considering this in simple terms, turbines have both a direct effect on the landscape in which they lie and an indirect effect on the surrounding area. Therefore, although two turbines or windfarms may be separated by some distance and seen as clearly separate, the landscape in which they lie may be considered to be dominated by turbines. Only beyond a certain distance would the intervening landscape be considered to retain its original character, separating the two turbine dominated landscapes areas.

Table 2.1 develops this concept further by considering the effects of multiple wind energy developments and describes cumulative development thresholds. Further to a capacity assessment, an acceptable limit to development within a landscape area may be agreed (e.g. *Landscape with Occasional Wind Turbines* or *Wind Turbine Landscape*). The accepted level of development would then be achieved by consenting a combination of turbine sizes, windfarm sizes and separation distances between groupings, relating to the scale and character of the landscape (i.e. its capacity for that degree of development).

As an example a large scale upland plateau landscape accommodating a number of windfarms would be considered a *Wind Turbine Landscape* if the windfarms are large or very large, the topography is subordinate in scale to the turbines and the windfarms are separated by distances less than their typical extents. If the topography has a relief that is clearly greater than the turbine heights, and/or the windfarms are smaller and the separation between the windfarms is clearly greater than their extents, the landscape may be considered a *Landscape with Wind Turbines.* Finally a lowland landscape which is small in scale, with many small scale reference features, may easily be dominated by wind turbines. In this case the objective may be to limit development to a *Landscape with Occasional Windfarms* by allowing only small clusters of smaller turbines separated by substantial distances and with cumulative visibility reduced by localised tree or landform screening.

In each case different scales and patterns of landscape and development would require different turbine sizes, groupings and separation distances to lead to a particular windfarm landscape type. Such an approach has been adopted in this study and sizes and separation distances are recommended and explained in Chapter 6.

5.3.3 Distribution in Relation to Landscape Type

As discussed above, some landscape types have less capacity for development than others. In this case it would be appropriate to consider the relative merits of guiding development to the areas most capable of accommodating development, or to directing different types and scales of development to the areas most suited to each. Subject to the specific impacts of any particular proposal, this would reduce the potential for the most significant and adverse landscape impacts. It would also restrict the more developed wind turbine landscape types to a more clearly defined range of landscapes, thereby reducing the perception of unplanned proliferation of wind farms throughout a local authority area.

In strategic terms the established and evolving pattern of development should be taken into consideration as it reflects a clear rationale driven partly by landscape, visual and amenity issues (sensitive or valuable landscapes, proximity to settlements and recreational areas) and partly by technical issues (available land, available grid capacity, wind speed). This suggests that the number, size and distribution of further development should be considered very carefully in order to maintain differences in character between the uplands, the coast and the lowlands.

Also, in accordance with the guidance *Designing Windfarms in the Landscape* (SNH, 2009), consideration should be given to preserving areas in which no development is yet located or consented. These can provide significant gaps between clusters of wind turbines in which their visual influence is minimal. This again will reinforce distinctiveness between landscapes.

APPENDIX 6: WIND TURBINES IN ANGUS

Wind Turbine Database as at May 2013 (Permitted & Proposed) Showing Turbine Height Bands (grey = very large; pink = large; orange = medium/large; yellow = medium; green = medium/small) (see Figs. 5.1 and 5.2 for locations)

Turbine/Windfarm Name	No. of Turbines	Turbine Ht. (m)	Height Category	Landscape Type/ Other Comments
Angus – Consented Wind Turbines				
Neart Na Gaoithe Offshore Windfarm	125	197.0	125m+	Offshore
East Memus, by Forfar	1	86.6	80 to <125m	Highland Foothills
Land at Scotston Hill, Auchterhouse	1	80.0	80 to <125m	Igneous Hills
Former Tealing Airfield	1	93.5	80 to <125m	Dipslope Farmland
Ark Hill, Glamis by Forfar	8	81.0	80 to <125m	Igneous Hills
510m NE of West Mains Farmhouse, Auchterhouse	1	61.0	50 to <80m	Dipslope Farmland
350M SW Of Whitefield of Dun Farm, Montrose	1	67.0	50 to <80m	Broad Valley Lowland
350m SW of Whitefield of Dun Farm, Montrose	1	67.0	50 to <80m	Broad Valley Lowland
1200M W Of Dunswood, Menmuir, Brechin	1	77.0	50 to <80m	Broad Valley Lowland
630m SE of Pickerton, Guthrie	1	77.0	50 to <80m	Low Moorland Hills
Hill of Stracathro, Brechin	1	79.6	50 to <80m	Broad Valley Lowland
North Mains of Cononsyth, Arbroath	1	66.7	50 to <80m	Dipslope Farmland
350m SW of Old Montrose Farm, Montrose	1	39.0	30 to <50m	Lowland Loch Basin
Cottertown, Kilry	1	45.5	30 to <50m	Highland Foothills
400m N of Greenhillock, Kirkbuddo	1	46.0	30 to <50m	Dipslope Farmland
975M W of North Leoch Farm, Strathmartine	1	46.0	30 to <50m	Dipslope Farmland
1020m W of Auchenreoch Farm, Inchbare, Edzell	1	46.0	30 to <50m	Broad Valley Lowland
Balkemback Farm, by Tealing	1	46.5	30 to <50m	Dipslope Farmland
N of East Pitforthie Farm, Brechin	1	47.0	30 to <50m	Broad Valley Lowland
W of Lochlair Farm, Carmyllie	1	47.0	30 to <50m	Dipslope Farmland
350m NE Of Newton of Idvies Farm, Letham	1	47.0	30 to <50m	Dipslope Farmland
Balhall Lodge, Menmuir	1	47.1	30 to <50m	Highland Foothills
West Adamston Farm, Muirhead	1	47.5	30 to <50m	Dipslope Farmland
250M SW Of Genty, Airlie	1	34.5	30 to <50m	Highland Foothills
470m E of Crainathro Farm, Forfar	1	35.0	30 to <50m	Low Moorland Hills
300M N Of North Tarbrax Farm, Kincaldrum	1	45.7	30 to <50m	Igneous Hills
1100m NE of Arrat Farm, Brechin	2	46.5	30 to <50m	Broad Valley Lowland
760m SW of Balkemback Farm, Tealing	2	46.5	30 to <50m	Dipslope Farmland
Weater Meathie Farm, Inverarity	2	46.5	30 to <50m	Low Moorland Hills
700m E of Balrownie Farm, Menmuir	2	46.5	30 to <50m	Broad Valley Lowland
Glen Trusta Estate, Fern, By Brechin	2	46.9	30 to <50m	Highland Foothills
Afflochie Farm, by Brechin	2	46.9	30 to <50m	Highland Foothills
Reedie Farm Kirriemuir	2	46.9	30 to <50m	Broad Valley Lowland
Craignathro Farm, Forfar	2	33.0	30 to <50m	Low Moorland Hills
Bareyards House, Menmuir	1	17.75	15 to <30m	Highland Foothills
Sa'ty Dyke, Rossie Braes, Montrose	1	17.75	15 to <30m	Lowland Loch Basin
Dumbarrow House, Letham	1	17.75	15 to <30m	Dipslope Farmland
Woodfield House, Arbroath	1	17.75	15 to <30m	Igneous Hills
Netherbow, By Forfar	1	17.75	15 to <30m	Broad Valley Lowland
Tillyarblet Cottage, Glen Lethnot	1	17.75	15 to <30m	Highland Foothills
East Mains Of Dysart, Montrose	1	18.5	15 to <30m	Dipslope Farmland
75m SW of Leys of Dun Farm, Montrose	1	19.0	15 to <30m	Broad Valley Lowland
Sprottiesfauld, Eassie	1	19.25	15 to <30m	Broad Valley Lowland
West Ballochy, Montrose	1	19.25	15 to <30m	Broad Valley Lowland
Easter Craig Farm, Alyth	1	19.8	15 to <30m	Highland Foothills
Cairnleith Farm, Kirriemuir	1	19.8	15 to <30m	Highland Foothills
Blackden Farm, Aberlemno	1	19.8	15 to <30m	Low Moorland Hills
Middle Lundie Farm, Edzell	1	19.8	15 to <30m	Highland Foothills
Forthill Farm, Glen Lethnot	1	19.8	15 to <30m	Highland Foothills
Templeton Christmas Tree Farm, Strathmartine	1	19.82	15 to <30m	Dipslope Farmland
Grosefield Farm, Little Brechin	1	19.90	15 to <30m	Broad Valley Lowland
Appletree Cottage, Ballinshoe	1	20.0	15 to <30m	Broad Valley Lowland
Murton, Forfar	1	20.5	15 to <30m	Broad Valley Lowland
Heughhead Farm, Friockheim	1	21.0	15 to <30m	Dipslope Farmland
Montrose Railway Station	1	21.0	15 to <30m	Urban
E of Formal Farm, Kilry	1	21.0	15 to <30m	Highland Glens
280m S of Newbigging Farm, Pugeston, Montrose	1	24.5	15 to <30m	Lowland Loch Basin

Turbine/Windfarm Name	No. of Turbines	Turbine Ht. (m)	Height Category	Landscape Type/ Other Comments
Newton Of Inshewan, Memus	1	24.5	15 to <30m	Broad Valley Lowland
W Mains of Kinblethmont, Arbroath	1	24.5	15 to <30m	Dipslope Farmland
Balkelo Farm, Kirkton of Auchterhouse	1	24.5	15 to <30m	Dipslope Farmland
Grosefield Farm. Little Brechin	1	24.8	15 to <30m	Broad Valley Lowland
Balkemback Farm, Tealing	1	24.8	15 to <30m	Dipslope Farmland
Incheoch Farms, Alyth	1	24.8	15 to <30m	Highland Glens
The Cotter House, Strathmartine	1	24.8	15 to <30m	Dipslope Farmland
Gamekeepers Cottage, Tealing	1	24.8	15 to <30m	Dipslope Farmland
Myreton Garage, Duntrune	1	24.8	15 to <30m	Dipslope Farmland
Muirhouses Farm, Cortachy	1	24.8	15 to <30m	Broad Valley Lowland
Muirton Of Ballochy Farm, Montrose	1	24.8	15 to <30m	Broad Valley Lowland
Balkiellie Farm, Montrose	1	24.8	15 to <30m	Dipslope Farmland
Easter Craig Farm, Alyth	1	27.0	15 to <30m	Highland Foothills
Wester Coul Farm, Lintrathen, Kirriemuir	1	27.0	15 to <30m	Highland Foothills
Gagie Home Farm Holdings, Gagie, Tealing	1	27.0	15 to <30m	Dipslope Farmland
150m W Fordhouse Of Dun Farm, Montrose	1	27.0	15 to <30m	Broad Valley Lowland
NE of Charleton Farm, Montrose	1	27.0	15 to <30m	Lowland Loch Basin
WWTW Westerton of Rossie, Montrose	1	28.0	15 to <30m	Dipslope Farmland
Brae Of Pert Farm, Stracathro	2	19.8	15 to <30m	Brae Of Pert Farm, Stracathro
Mains of Logie, Montrose	2	19.9	15 to <30m	Broad Valley Lowland
195m NE of Stoneygroves Farm, Liff	2	24.5	15 to <30m	Dipslope Farmland
225m S of Muirhouses Farm, West Muirhouse, Arbroath	2	24.5	15 to <30m	Dipslope Farmland
Craigo Home Farm	2	24.8	15 to <30m	Broad Valley Lowland
230m NE of Windyedge Farm, Brechin	2	27.0	15 to <30m	Broad Valley Lowland
Ethie Mains Farm, Ethiehaven, By Inverkeilor	2	27.0	15 to <30m	Coast
500m NW of Meikle Tullo Farm, Edzell	2	27.0	15 to <30m	Highland Foothills
Nether Finlarg Kincaldrum	2	24.5	15 to <30m	Igneous Hills
460m S Of Castleton Of Eassie, By Glamis	3	24.8	15 to <30m	Broad Valley Lowland
350M W Of Ethiebeaton Farm, Monifieth	3	24.5	15 to <30m	Dipslope Farmland
Glen of Craigo, Montrose	3	24.8	15 to <30m	Broad Valley Lowland

Turbine Name	No. of Turbines	Turbine Ht. (m)	Height Category	Landscape Type/ Other Comments
Angus – Proposed Wind Turbines (Application/Scoping)				
Nathro Hill, by Edzell	17	135.0	125m+	Highland Summits and Plateaux
Firth of Forth and Tay	150	209.7	125m+	Offshore
720m N of East Memus Farm, Memus	1	86.5	80 to <125m	Highland Foothills
Frawney Windfarm, 1020m n of Over Finlarg Farm, Lumleyden	5	107.0	80 to <125m	Igneous Hills
NW of Govals Farm, Kincaldrum	6	87.0	80 to <125m	Igneous Hills
500m SW of New Downie Farm, Carnoustie	1	54.0	50 to <80m	Dipslope Farmland
800m SW of Gilchorn Farm, Inverkeilor	1	62.0	50 to <80m	Dipslope Farmland
400m N of Davidston Farm, Newtyle	1	62.0	50 to <80m	Igneous Hills
Henderston Quarry, Newtyle	1	66.0	50 to <80m	Igneous Hills
400M SW Of Newmill Of Balgavies Farm, Forfar	1	66.5	50 to <80m	Low Moorland Hills
500m NW of Renmure farm, Inverkeilor	1	77.0	50 to <80m	Dipslope Farmland
530m NE of Hatton Mill Farm	1	77.0	50 to <80m	Dipslope Farmland
600m W of Witton Farm, Lethnot, Edzell	2	74.0	50 to <80m	Highland Foothills
580M SE Of Carsegownie, Carsegownie, Forfar	1	34.6	30 to <50m	Low Moorland Hills
280M SW Of North Mains Of Turin, Forfar	1	40.5	30 to <50m	Low Moorland Hills
300m W of Parkconnon Farm, Colliston, Arbroath	1	41.5	30 to <50m	Dipslope Farmland
1057m SW of Chapelton of Menmuir farm, Brechin	1	46.0	30 to <50m	Broad Valley Lowland
150m NW of Balrennie Farm, Edzell	1	46.0	30 to <50m	Broad Valley Lowland
500m N of Boysack Farm, Friockheim	1	46.0	30 to <50m	Dipslope Farmland
Gallow Hill, Cortachy	1	46.5	30 to <50m	Highland Foothills
Land At Stracathro Service Area, Brechin	1	47.1	30 to <50m	Broad Valley Lowland
650m N of Broom Farm, Tannacice	1	49.5	30 to <50m	Broad Valley Lowland
Drowndubbs Farm, Kikbuddo	2	46.5	30 to <50m	Dipslope Farmland
189m NW of Kalulu House, East Murthill, Firfar	2	49.0	30 to <50m	Broad Valley Lowland

APPENDIX 7: ASSESSMENT OF LANDSCAPE SENSTIVITY AND VALUE FOR ANGUS LANDSCAPE CHARACTER TYPES

1A. Upper Highland Glens (outside National Park)

Landscape Character Sensitivity	Criteria /Sensitivity Levels
Scale	Medium, but with high sides. **Medium**
Landform	Steep sides enclosing flat or narrow valley floor. **Medium/High**
Pattern	Irregular. Relatively few boundaries or other pattern features. Dominated by landform. **Medium**
Development	Low to minimal development: tracks, occasional roads and houses. Small farmland areas**. Medium/High**
Quality	Most areas relatively natural and unaffected by development. A sense of wildness. **High**
Elements and Features	Dominated by landform features. Occasional farms and houses. Trackways. Occasional fields and forestry. **Medium/High**
Context	Glens form part of the highland backdrop to Angus and are the main access into the National Park. **High**
OVERALL RATING	**Medium/High**

Visual Sensitivity	Criteria/ Sensitivity Levels
Receptors	Minimal number of residential receptors. Main receptors are recreational visitors to highlands and National Park. **High**
Internal Visibility	Corridor views/ vistas and slightly wider visibility from upper valley sides. **Medium**
External Visibility	Only visible from Mid Highland Glens and Highland Summits and Plateaux. **Medium/Low**
OVERALL RATING	**Medium**

Landscape Value	Criteria/ Sensitivity Levels
Designations	No landscape designations although adjacent to National Park and NSA. Other designations include occasional listed buildings and SAMs. Cateran Trail in Glen Isla. **Medium/High**
Community value	Used by visitors and local population for outdoor recreation or access to highland summit areas. **High**
Cultural value	The Angus Glens are a key landscape feature of the local authority area. Former routes into/across Highlands. Occasional castles and hunting lodges. **High**
Perceptual	Tranquil, with a low level of development, elements of wildness and highly scenic views. **Medium/High**
OVERALL RATING	**High**

1B. Mid Highland Glens (outside National Park)

Landscape Character Sensitivity	Criteria /Sensitivity Levels
Scale	Medium to small, but with high sides. **Medium/High**
Landform	Steep sides enclosing flat or narrow valley floor. **Medium**
Pattern	Variable, dominated by landform but areas of flatter valley floors have field and woodland. **Medium**
Development	Some development. Scattered farms/ dwellings along valley floors, becoming less developed higher up towards the upper glens. **Medium**
Quality	Many areas relatively natural and unaffected by development. Settled areas generally in scale and harmony with rural glen setting. **Medium/High**
Elements and Features	Dominated by landform features. Clusters of dwellings, farms and isolated houses in valley floor areas. Fields on valley floor and lower sides. Extensive broadleafed woodland and conifer plantations. **Medium/High**
Context	Glens form part of the backdrop to Angus and are the main access into the highland area. **High**
OVERALL RATING	**Medium/High**

Visual Sensitivity	Criteria /Sensitivity Levels
Receptors	Low number residential receptors. Main receptors are recreational visitors to highlands and National Park. **High**
Internal Visibility	Corridor views/ vistas and slightly wider visibility from upper valley sides. **Medium**
External Visibility	Mainly visible from Upper Highland Glens and Highland Summits and Plateaux but lower sections extensively visible from lowland areas to the south. **Medium/High**
OVERALL RATING	**Medium/High**

Landscape Value	Criteria /Sensitivity Levels
Designations	No landscape designations although adjacent to National Park. Other designations include HGDL in Glens Isla and Clova, occasional SAMs, Many listed buildings. Cateran Trail in Glen Isla. **Medium/High**
Community value	Used by visitors and local population for outdoor recreation or access to highland summit areas. Visitor attractions. **Medium/High**
Cultural value	The Angus Glens are a key landscape feature of the local authority area. Former routes into/across Highlands. Castles, hunting lodges and estate policies. **High**
Perceptual	Tranquil, with a balanced rural character, transitional between settled and wilder areas with highly scenic views. **Medium/High**
OVERALL RATING	**Medium/High**

3. Highland Summits and Plateaux (Outside National Park)

Landscape Character Sensitivity	Criteria / Sensitivity Levels
Scale	Large. **Low**
Landform	Rolling but often steep sided hills of moderate elevation with occasional crags, steep corries, burns in gullies, folds or narrow upper glens. **Medium**
Pattern	Irregular patterns of heather, grassland and forestry, relating to landform. **Medium/Low**
Development	Little evidence of built development. Tracks, paths and occasional forestry. **Medium/High**
Quality	Generally well maintained/natural upland of heather with occasional planted forest. **Medium/High**
Elements and Features	Landform and vegetation cover is dominant. Few manmade features, boundaries etc. **Medium/Low**
Context	These uplands border the mountains of the National Park and contain the Angus Glens. **Medium/High**
OVERALL RATING	**Medium**

Visual Sensitivity	Criteria/ Sensitivity Levels
Receptors	Outdoor recreation receptors. Low population of residential receptors within or adjacent. Visible at distance from a wider area including a number of larger settlements and main transport routes. **Medium/High**
Internal Visibility	Extensive views across the type from the summits and ridges, but restricted in narrow valley and drainage landforms. **Medium/High**
External Visibility	Generally very conspicuous backdrop from lowland areas to the south within and beyond Angus. Any tall objects would also be highly visible from higher ground to the north. **High**
OVERALL RATING	**Medium/ High**

Landscape Value	Criteria/ Sensitivity Levels
Designations	No landscape designations and few other designations but adjacent to National Park. **Medium**
Community value	Important for outdoor recreation and access to higher summits to the north. A resource for sporting estates. **Medium/High**
Cultural value	A setting to the Angus Glens. Some well known viewpoints. **Medium**
Perceptual	An open landscape with panoramic views and a sense of remoteness and wildness. Forming backdrop to lowland areas and foreground to National Park mountains. Enclosing skyline to many Angus Glens **Medium/High**
OVERALL RATING	**Medium/High**

5. Highland Foothills

Landscape Character Sensitivity	Criteria / Sensitivity Levels
Scale	Medium with some small scale areas. **Medium**
Landform	Varied. Rolling and steep hills above undulating lower ground and narrow valleys. Burns often in gullies, folds or narrow glens. **Medium/High**
Pattern	Varied pattern from open hills to enclosed farmland and shelterbelts. **Medium**
Development	Lack of larger settlements. Development limited to farms, isolated houses, steadings, small villages, minor roads. All areas traversed by a high voltage electricity line. **Medium**
Quality	Generally well maintained farmland and estate land. **Medium/High**
Elements and Features	Attractive hamlets, large houses/castles, woodland copses, hillforts, electricity transmission line. Field and road boundaries often have walls and hedges. **Medium/High**
Context	A transitional landscape marking the Highland boundary fault, separating the uplands of the Mounth from Strathmore. 'Gateway' to Angus Glens. **Medium/High**
OVERALL RATING	**Medium/High**

Visual Sensitivity	Criteria/ Sensitivity Levels
Receptors	Local population of residential receptors and travellers. More distant residential and travelling population in adjacent lowlands, Walkers, visitors to locations of interest. **Medium/High**
Internal Visibility	Varied visibility; between panoramic views from hilltops to narrow vistas from small glens. **Medium**
External Visibility	Generally quite visible from areas of population and transport corridors although set against a higher backdrop. Visible to receptors travelling to/from the Angus Glens. **Medium/High**
OVERALL RATING	**Medium/High**

Landscape Value	Criteria/ Sensitivity Levels
Designations	No landscape designations. Many ancient woodlands and several SAMs (mainly settlements and hillforts) **Medium/High**
Community value	Areas used by local residential population and visitors for informal recreation. Sites of historic/ archaeological/ natural history interest. **Medium/High**
Cultural value	Significant number of locations of archaeological/ historic interest including Caterthuns, Edzell Castle, Balintore Castle. **Medium/High**
Perceptual	Deeply rural landscape of highly varied interest and many attractive settings and views. Forms a 'gateway' to the Angus Glens. **Medium/High**
OVERALL RATING	**Medium/High**

8. Igneous Hills

Landscape Character Sensitivity	Criteria/ Sensitivity Levels
Scale	Medium with some larger scale. **Medium**
Landform	Rolling or conical hills and valleys of variable form. Occasional outcrops. **Medium**
Pattern	Diverse but typically higher ground is open and the lower areas with rectilinear patterns of medium-large scale fields and shelterbelts. **Medium**
Development	Varies between areas of low development in some of the hills to lower farmland areas with settlements main roads, pylons and other infrastructure. Wind turbines and transmitter masts on some hills. **Medium**
Quality	Well managed open and enclosed farmland. Heather Moor variably managed with some areas reverting to scrub. **Medium**
Elements and Features	Plantations, tree belts in lower areas. Transmitter towers, wind turbines (Ark Hill and Scotston). Electricity transmission lines. **Medium**
Context	The Sidlaws form a backdrop to Dundee and the Firth of Tay and divide the lowland farming areas of Angus and Perthshire. **Medium**
OVERALL RATING	**Medium**

Visual Sensitivity	Criteria/ Sensitivity Levels
Receptors	Residential and travelling receptors within the LCA and surrounding areas. Outdoor recreational receptors on the hills. **Medium/High**
Internal Visibility	Extensive views from ridges and summits. More restricted views from valleys. **Medium**
External Visibility	Visible as a skyline landform from surrounding lower areas. Southern and eastern slopes particularly sensitive to views from large population but lower landforms well screened from surroundings. **Medium/High**
OVERALL RATING	**Medium/High**

Landscape Value	Criteria/ Sensitivity Levels
Designations	No landscape designations. Some SSSIs. Kinpurney/ Auchterhouse Hill Forts. **Medium**
Community value	Areas used by local residential population for informal recreation. Viewpoints and footpaths. **Medium**
Cultural value	Some archaeological/ historic interest including hillforts and cairns on summits and small castles on the periphery. **Medium**
Perceptual	Varied hill and farmland landscape forming backdrop to Dundee and the Tay, with some development of transmission towers windfarm. Open, but with little feeling of remoteness or naturalness. **Medium/Low**
OVERALL RATING	**Medium**

10. Broad Valley Lowland

Landscape Character Sensitivity	Criteria/ Sensitivity Levels
Scale	Medium, although overall scale of valley is very large. **Medium**
Landform	Generally a simple, gently sloping or flat valley form but with areas of more complex fluvioglacial landform. **Medium/Low**
Pattern	Open, simple, regular large arable fields with variable field boundaries, predominantly post and wire fences. A network of shelterbelts and plantations although more open to the west. **Medium**
Development	Well settled landscape with small towns, villages and a significant density of farms and houses. Areas crossed by major roads and a network of minor roads **Medium/Low**
Quality	Farmland intensively managed. Generally a well managed landscape although hedgerows/ trees are declining with expanded field sizes/ lack of management. Some sand and gravel quarrying and peri-urban landscapes detract. **Medium/High**
Elements and Features	Typical lowland farmland features together with roads and settlements. Tree/hedgerow boundaries to many fields but also low wall and post and wire. A number of large houses/ castles and designed landscapes including Glamis Castle. Electricity lines. Some small-medium wind turbines singly or in small groups. **Medium**
Context	Mid section of a vast lowland valley stretching from the River Tay in the southwest to Howe of the Mearns in the northeast, set between the Highland Boundary and volcanic hills to the south. **Medium**
OVERALL RATING	**Medium**

Visual Sensitivity	Criteria/ Sensitivity Levels
Receptors	Significant population of residential and transport receptors throughout. Visitors to attractions such as Glamis/ Kirriemuir. **Medium/High**
Internal Visibility	Wide open views across the valley and long distance views along it in which larger structures are prominent. Screening by shelterbelts and landforms from lower parts of the valley. **Medium/High**
External Visibility	Views over valley from all higher surrounding areas. Taller structures would be clearly visible. **Medium/High**
OVERALL RATING	**Medium/High**

Landscape Value	Criteria/ Sensitivity Levels
Designations	Some significant designed landscapes. Many SAMs and listed buildings. Ancient Woodlands and SSSIs. **Medium/High**
Community value	Setting and recreational amenity for a number of settlements and residents as well as visitor locations. Many core paths. **Medium/High**
Cultural value	Designations reflect a rich past history of settlement and activity. Literary associations include JM Barrie. **Medium/High**
Perceptual	A settled, developed, active landscape with roads, buildings and large agricultural enterprises, although there are also many tranquil spots. **Medium/Low**
OVERALL RATING	**Medium**

12(i). Low Moorland Hills (Forfar Hills)

Landscape Character Sensitivity	Criteria/ Sensitivity Levels
Scale	Medium, with some smaller scale areas on hills. **Medium/High**
Landform	A series of east-west ridges rising above more gently undulating farmland, with steep slopes and outcrops in places. **Medium/High**
Pattern	Variable, with lower angled areas having rectangular medium/large field patterns and hills and steeper slopes with smaller, broken patterns rising to open pasture. **Medium**
Development	Small settlements, scattered houses and farms. A network of mainly small roads. **Medium**
Quality	Managed farmland and open hilltops. Scenic areas within the hills. **Medium**
Elements and Features	Varied. Dense network of small roads, tracks, farms, houses and cottages. Hillforts and standing stones. Stone wall and hedge field boundaries. Small lochs between some hills. Electricity lines and telecommunications towers on some hills are detractors. **Medium/High**
Context	Several distinctive hilltops provide views across surrounding farmland area which merges into the Dipslope Farmland and Strathmore. Hills provide a backdrop to Strathmore and Forfar. **Medium/High**
OVERALL RATING	**Medium/High**

Visual Sensitivity	Criteria/ Sensitivity Levels
Receptors	Moderate to high population of residential and travelling receptors within area and close by. Hills visible from wider areas. Some visitors to hilltops, lochs etc. **Medium/High**
Internal Visibility	Fairly open landscape in which hills and tall objects are widely visible. **Medium/High**
External Visibility	Hills widely visible from surrounding areas but lower ground between hills less so. **Medium/High**
OVERALL RATING	**Medium/High**

Landscape Value	Criteria/ Sensitivity Levels
Designations	Hillfort and standing stone SAMs. SSSI Lochs. Small areas of inventory ancient woodland. **Medium**
Community value	Informal recreation for local people and visitors. Network of footpaths and several viewpoints. **Medium**
Cultural value	Hillforts, crosses (Aberlemno) and standing stones of historic interest. Viewpoint on Balmashanner Hill. Some estates with listed buildings. **Medium**
Perceptual	A varied rural landscape with distinctive hilltop views and relatively little development. **Medium/High**
OVERALL RATING	**Medium**

12(ii). Low Moorland Hills (Montreathmont Moor)

Landscape Character Sensitivity	Criteria/ Sensitivity Levels
Scale	Medium to large, with smaller scale domestic reference features in farmland areas. **Medium/Low**
Landform	Undulating and gently rising to the north and west before sloping steeply down to Strathmore. **Medium/Low**
Pattern	Predominantly medium/large rectilinear patterns of fields and forestry. **Medium/Low**
Development	Small settlements, scattered houses and farms. A network of mainly small roads. Forestry area largely undeveloped. **Medium**
Quality	Managed farmland and forest. Deterioration in field boundaries. **Medium**
Elements and Features	Mainly arable farmland and mature forestry with intermittent stone wall and hedge field boundaries. Network of small roads, tracks, farms, houses and cottages in farmland area. Montreathmont forest is distinctive. **Medium**
Context	Elevated lowland farming area between Forfar Hills and Montrose Basin set between other lowland areas. **Medium**
OVERALL RATING	**Medium/Low**

Visual Sensitivity	Criteria/ Sensitivity Levels
Receptors	Moderate population of residential receptors. Some visitors to forest area. Network of mainly minor roads. **Medium**
Internal Visibility	Fairly open landscape in which tall objects are widely visible, although Montreathmont forest provides significant screening across the centre. **Medium**
External Visibility	Edges visible from surrounding lower areas but central forest area mainly visible from higher ground including nearby hills and Rossie Moor. **Medium**
OVERALL RATING	**Medium**

Landscape Value	Criteria/ Sensitivity Levels
Designations	Montreathmont forest is in ancient woodland inventory. **Medium**
Community value	Network of forest paths provides informal recreation for local people and visitors. **Medium**
Cultural value	Little of note. Melgund Castle. Some listed buildings. **Medium/Low**
Perceptual	A typical rural arable landscape with a distinctive large lowland forest that offers a sense of tranquillity and naturalness. **Medium**
OVERALL RATING	**Medium**

13. Dipslope Farmland (Overall Assessment)

Landscape Character Sensitivity	Criteria/ Sensitivity Levels
Scale	Medium, with some larger scale areas on highest ground but also with smaller domestic scale features. **Medium**
Landform	Gently rolling or undulating, with a north-south dip towards the sea and steeper northern slopes above Montrose Basin. **Medium**
Pattern	Large or medium rectilinear arable fields, woodland blocks, broken by watercourses on lower ground. Occasional open uncultivated areas on higher ground (e.g. Rossie Moor) or where field boundaries have been removed. **Medium**
Development	Bordering urban areas (Dundee, Carnoustie, Arbroath). Occasional villages and scattered hamlets, farms and houses. Main roads, railway line and a network of smaller roads. Disused quarries and airfields. **Medium**
Quality	Intensively managed agricultural landscape with some areas of unimproved land and woodland and some areas of former mineral extraction. Areas of well maintained designed landscape. **Medium**
Elements and Features	Arable farmland predominates. Scattered settlement dispersed throughout. Occasional large houses and policies. Large farm buildings. Electricity pylons. **Medium**
Context	A large slightly elevated lowland farmland area set between igneous hills, Dundee and the North Sea. **Medium**
OVERALL RATING	**Medium**

Visual Sensitivity	Criteria/ Sensitivity Levels
Receptors	Moderate number of both travelling and residential receptors. **Medium**
Internal Visibility	Generally open views from higher areas, with some lower valley areas more restricted. Tree cover in the west restricts views. Any larger structures are prominent at a distance. **Medium/High**
External Visibility	Varied. Few areas are prominent when seen from surroundings although the areas north and east of Dundee are potentially visible from a large population and Rossie Moor is visible from surrounding lower ground. **Medium**
OVERALL RATING	**Medium**

Landscape Value	Criteria/ Sensitivity Levels
Designations	Designed landscapes at Pitmuies, Guthrie and Guynd. Large areas of SAMs along Lunan Water and Bay area. SSSIs. Scattered ancient woodland. Two country parks at Crombie and Monikie. **Medium**
Community value	Setting to a number of settlements. Country parks, Golf Course, **Medium**
Cultural value	Policy woodlands, SAMs. Castles. **Medium**
Perceptual	A vast area of open, intensively managed agricultural land with areas of more sheltered and intimate landscape in shallow valleys, settlements, designed landscapes and country parks. **Medium**
OVERALL RATING	**Medium**

13(i) Dipslope Farmland (Dundee/Tealing)

Landscape Character Sensitivity	Criteria/ Sensitivity Levels
Scale	Medium, but also with smaller domestic scale features. **Medium**
Landform	Gently rolling or undulating, falling south and east from the Sidlaw Hills towards Dundee and the Firth of Tay. **Medium**
Pattern	Large or medium rectilinear arable fields, woodland blocks, broken by occasional watercourses on lower ground. **Medium**
Development	Bordering urban area of Dundee although city screened. Villages and scattered hamlets, farms and houses. Main roads and a network of smaller roads. Disused airfield. Large electricity substation. **Medium**
Quality	Intensively managed agricultural landscape with woodland areas. **Medium**
Elements and Features	Arable farmland predominates. Scattered settlement dispersed throughout. Large farm buildings. Golf courses. Quarry. Several electricity transmission lines. Occasional wind turbines. **Medium**
Context	A settled area of elevated lowland arable farmland area set between the Sidlaw hills and Dundee. **Medium**
OVERALL RATING	**Medium**

Visual Sensitivity	Criteria/ Sensitivity Levels
Receptors	Moderate number of both travelling and residential receptors. Close to Dundee (although southern edge is a screening ridge). Overlooked by walkers/ viewpoints on Sidlaw Hills **Medium**
Internal Visibility	Mainly open with small woodlands partially screening views. Any larger structures are prominent at a distance. **Medium/High**
External Visibility	Limited. Although overlooked by Sidlaws they screen views from further north and west. Although close to Dundee views from the city are limited by containing landform. **Medium**
OVERALL RATING	**Medium**

Landscape Value	Criteria/ Sensitivity Levels
Designations	Small areas of inventory ancient woodland. Occasional SAMs. Listed buildings **Medium**
Community value	Setting to a number of small settlements and backdrop to Dundee. Adjacent country parks in Dundee. Forest access land. Golf Course. **Medium/High**
Cultural value	No notable features. Some SAMs and listed buildings. **Medium/Low**
Perceptual	An area of open, intensively managed agricultural land with a number of settlements forming a hinterland to Dundee and rising into the Sidlaw Hills. **Medium**
OVERALL RATING	**Medium**

13(ii) Dipslope Farmland (Monikie/Crombie)

Landscape Character Sensitivity	Criteria/ Sensitivity Levels
Scale	Medium, with some smaller scale areas and features associated with villages and country parks and larger open areas to the north. **Medium**
Landform	Gently rolling or undulating, with a north-south dip towards the sea. **Medium/Low**
Pattern	Medium rectilinear arable fields broken up by woodlands. Occasional open uncultivated areas on higher ground. **Medium**
Development	Bordering urban areas in south (Monifieth, Carnoustie). Occasional villages and scattered hamlets, farms and houses. Less populated in the north. Main road in south and a network of smaller roads. **Medium/High**
Quality	Intensively managed agricultural landscape with some areas of unimproved land and significant areas of well maintained recreational and designed landscape. **Medium/High**
Elements and Features	Arable farmland predominates but also significant areas of country parks and estate policies (Panmure house demolished in 1950s). Settlement dispersed throughout. Large farm buildings. Electricity pylons. **Medium/High**
Context	A slightly elevated arable farmland area close to Dundee with significant areas of enclosure and recreational landscapes. **Medium**
OVERALL RATING	**Medium**

Visual Sensitivity	Criteria/ Sensitivity Levels
Receptors	High number of both travelling and residential receptors within or nearby. **Medium/High**
Internal Visibility	Generally open views from higher and treeless areas to N and S. Tree cover restricts views elsewhere. Any larger structures prominent at a distance. **Medium**
External Visibility	Varied. Few areas are prominent when seen from surroundings although overlooked by higher ground to N and E and from edge of Dundee. Visible as backdrop from coast. **Medium/High**
OVERALL RATING	**Medium/High**

Landscape Value	Criteria/ Sensitivity Levels
Designations	Two country parks at Crombie and Monikie. Inventory ancient woodland at Panmure estate. Some SAMs and listed buildings associated with estates. National Trust site at Barry Mill. Peat bog SSSI. **Medium/High**
Community value	Setting to a number of settlements. Two country parks. **Medium/High**
Cultural value	Panmure estate and a number of SAMs. **Medium**
Perceptual	A varied area of farmland close to Dundee with a number of settlements significant enclosed areas of mature woodland including two country parks and a relict estate landscape. **Medium/High**
OVERALL RATING	**Medium/High**

13(iii) Dipslope Farmland (Redford Farmland)

Landscape Character Sensitivity	Criteria/ Sensitivity Levels
Scale	Medium, with some larger scale areas on highest ground where field boundaries are removed and trees are few. Also smaller domestic scale features. **Medium/Low**
Landform	Gently rolling or undulating, with a NW-SE dip towards the sea and lower farmland. **Medium/Low**
Pattern	Large or medium rectilinear arable fields, many where field boundaries have been removed. Occasional woodland blocks. **Medium**
Development	Scattered hamlets, farms and houses. Main roads and a network of smaller roads. Disused quarries. **Medium**
Quality	Intensively managed agricultural landscape with declining field boundaries, some areas of woodland and some former mineral extraction. Area of well maintained designed landscape. **Medium**
Elements and Features	Arable farmland with intermittent boundaries predominates. Scattered minor settlement dispersed throughout. Large house and policies at Guynd. Large farm buildings. Electricity pylons. **Medium**
Context	A large, intensively managed elevated arable farmland area set above the North Sea and surrounded by similar farmland. **Medium**
OVERALL RATING	**Medium**

Visual Sensitivity	Criteria/ Sensitivity Levels
Receptors	Moderate number of travelling and low number of residential receptors. **Medium/Low**
Internal Visibility	Generally open views, although tree cover around Guynd restricts views. Any larger structures are prominent at a distance. **Medium/High**
External Visibility	Varied. Few areas are prominent when seen from surroundings, but often forming a low horizon on which tall structures would be widely visible. **Medium/High**
OVERALL RATING	**Medium**

Landscape Value	Criteria/ Sensitivity Levels
Designations	Designed landscape at Guynd. Some SAMs and listed buildings. Little inventory ancient woodland. **Medium**
Community value	Setting to small settlements and houses. **Medium/ Low**
Cultural value	House and designed landscape at Guynd. A few SAMs and listed buildings. **Medium**
Perceptual	An area of open, intensively managed arable land with few features and limited areas of more sheltered and intimate landscape. **Medium/Low**
OVERALL RATING	**Medium/Low**

13(iv) Dipslope Farmland (Letham/ Lunan Water/ Arbroath)

Landscape Character Sensitivity	Criteria/ Sensitivity Levels
Scale	Medium, with many smaller scale areas/ features associated with settlements and watercourses. **Medium/High**
Landform	Gently rolling or undulating, shallow and sometimes indistinct valley sides, and often flat valley floors gradually descending to the North Sea coast. **Medium**
Pattern	Medium rectilinear arable fields, woodland blocks, broken by watercourses on lower ground. **Medium**
Development	Bordering or containing urban areas/ villages (Arbroath, Letham, Friockheim). Hamlets, farms and houses. Main roads, railway line and a network of smaller roads. Golf course. Disused quarries and airfields. **Medium/High**
Quality	Intensively managed agricultural landscape with some areas of woodland and some areas of former mineral extraction. Areas of well maintained designed landscape and golf course. **Medium**
Elements and Features	Arable farmland predominates. Mixture of stone walls, post and wire fences and open field edges. Areas of polytunnels. Watercourses. Settlement dispersed throughout. Main roads often following valley and linking settlements. Network of minor roads. Large farm buildings. Occasional wind turbines. **Medium**
Context	A settled, lowland, arable farmland area situated mainly in shallow valleys and often sheltered by areas of higher farmland. **Medium/High**
OVERALL RATING	**Medium**

Visual Sensitivity	Criteria/ Sensitivity Levels
Receptors	Moderate to high number of both travelling and residential receptors. **Medium/High**
Internal Visibility	Generally open mid distance views, although tree cover restricts views in many locations. Any larger structures are prominent at a distance. **Medium**
External Visibility	Varied but some parts are less visible than surrounding *Dipslope Farmland* areas. Tall objects would be fairly widely visible. **Medium**
OVERALL RATING	**Medium**

Landscape Value	Criteria/ Sensitivity Levels
Designations	Designed landscapes at Pitmuies and Guthrie. Large areas of SAMs along Lunan Water and Bay area. Significant numbers of listed buildings. Scattered inventory ancient woodland. **Medium/High**
Community value	Setting and travel routes to a number of settlements. Golf Course. **Medium/High**
Cultural value	Designed landscapes, SAMs and listed buildings. **Medium/High**
Perceptual	An area of intensively managed agricultural land with areas of more sheltered and intimate landscape in shallow valleys, settlements and designed landscapes. **Medium**
OVERALL RATING	**Medium/High**

13(v) Dipslope Farmland (Ethie)

Landscape Character Sensitivity	Criteria/ Sensitivity Levels
Scale	Medium but also with smaller domestic scale features in more sheltered and woodland/ plantation areas. Fairly limited extent. **Medium/High**
Landform	Gently rolling or undulating, falling inland to shallow valleys and towards the sea. **Medium**
Pattern	Large or medium rectilinear arable fields and woodland blocks, broken by watercourses on lower ground. **Medium**
Development	Occasional farms and houses. Main road and railway line and a network of smaller roads. **Medium**
Quality	Intensively managed agricultural landscape with small areas of estate policies/ plantation woodland. **Medium/High**
Elements and Features	Arable farmland predominates. Low stone walls towards the sea but more mixed boundaries including hedges inland. Scattered houses dispersed throughout including large listed houses/ castles which are now hotels. Large farm buildings. Communications masts. **Medium/High**
Context	A slightly elevated lowland farmland area set above Arbroath and surrounding shallow valleys and exposed to the North Sea, but with more intimate and sheltered inland areas. **Medium**
OVERALL RATING	**Medium**

Visual Sensitivity	Criteria/ Sensitivity Levels
Receptors	Moderate number of both travelling and residential receptors within or nearby. Coastal walkers and cycleway. Guests at hotels. **Medium/High**
Internal Visibility	Generally open exposed views from higher areas, with some lower areas more restricted. Tree cover further inland restricts views. Any larger structures prominent at a distance. **Medium/High**
External Visibility	Mainly visible at close or middle distance from surrounding farmland and coastal areas. Tall objects would be fairly widely visible. **Medium**
OVERALL RATING	**Medium/High**

Landscape Value	Criteria/ Sensitivity Levels
Designations	Scattered inventory ancient woodland. Occasional SAMs and a number of listed buildings. **Medium**
Community value	Background setting to Arbroath. Cycle route. **Medium/Low**
Cultural value	Large houses/ castle and policy woodlands, SAMs. **Medium**
Perceptual	A small area of open, intensively managed agricultural land elevated above its surroundings and exposed to the North Sea coast, with areas of more sheltered and intimate landscape in small estate landscapes. **Medium/High**
OVERALL RATING	**Medium**

13(vi) Dipslope Farmland (Rossie Moor)

Landscape Character Sensitivity	Criteria/ Sensitivity Levels
Scale	Medium, with some larger scale areas on highest ground but also with smaller domestic scale features. **Medium**
Landform	Rolling or undulating. A broad hill with a south and east dip towards the sea and the Lunan Water and steeper northern slopes above Montrose Basin. **Medium**
Pattern	Large or medium rectilinear arable fields often with boundaries removed, woodland blocks, broken by watercourses on lower ground. Open uncultivated area on higher ground at Rossie Moor. **Medium**
Development	No villages. Scattered hamlets, farms and houses. Main road, railway line in east. Sparse network of smaller roads in west. **Medium**
Quality	Intensively managed agricultural landscape with varied field boundaries, some areas of natural moorland and woodland and a quarry. **Medium**
Elements and Features	Arable farmland predominates. Scattered small settlement throughout. Occasional castle/ large houses and policies. Rossie school. Large farm buildings. Communications mast. **Medium**
Context	A large elevated lowland farmland area set between Montrose Basin, Lunan Water and the North Sea. **Medium/High**
OVERALL RATING	**Medium**

Visual Sensitivity	Criteria/ Sensitivity Levels
Receptors	Moderate number of travelling and residential receptors. Coastal walkers and cycle route nearby. **Medium**
Internal Visibility	Generally open views. Tree cover and landform restricts views in places. Any larger structures are prominent at a distance. **Medium/High**
External Visibility	Generally visible and sometimes prominent from surrounding lower ground and further afield. **Medium/High**
OVERALL RATING	**Medium/High**

Landscape Value	Criteria/ Sensitivity Levels
Designations	Designed landscape at Dunninald Castle. SSSI at Rossie Moor. Grade A listed buildings at Braikie and Dunninald. Scattered inventory ancient woodland. **Medium**
Community value	Walks across Rossie Moor and adjacent woodlands. Cycle route. **Medium**
Cultural value	Two castles. Designed landscape. **Medium**
Perceptual	A large area of open, intensively managed agricultural land and scattered houses, with a small area of more natural moorland landscape. Forms a backdrop to Montrose Basin and town. Unfrequented in the west but transport corridors pass through the east. **Medium/High**
OVERALL RATING	**Medium**

14a. Coast with Sand

Landscape Character Sensitivity	Criteria/ Sensitivity Levels
Scale	Medium, with smaller scale features. Generally limited in area. **Medium/High**
Landform	Flat, open, low lying, with mature dunes and small escarpments. **Medium**
Pattern	Predominantly simple but varied between regular pattern in cultivated farmland areas, linear pattern in beach areas, organic pattern in golf courses and irregular pattern in dunes. **Medium**
Development	Varies between influence of adjacent urban margins to occasional isolated hamlets and houses. Roads (mainly minor) and railway. One small fishing village. Golf courses. **Medium**
Quality	Varied. Generally scenic due to open sea views. Often intensively managed (golf courses and arable farming). In places character is compromised by adjacent urban development. **Medium**
Elements and Features	Sandy beaches and mature dunes. Flatness and open sea views. Golf courses. Former WW2 airstrips and defences (current military range at Barry Budden) **Medium/High**
Context	Mainly a narrow strip between farmland, settlements and the sea. Sometimes indistinct transition into inland farmland areas. **Medium**
OVERALL RATING	**Medium**

Visual Sensitivity	Criteria/ Sensitivity Levels
Receptors	Low population of residential receptors with greater numbers immediately adjacent. Travelling population on road and rail. Cyclists. Beachwalkers and golfers. Sailors and Kayakers. **Medium/High**
Internal Visibility	Wide open views with some local restrictions due to dunes/ landforms and occasional blocks of trees at Barry Budden and Montrose. Tall structures would be prominent in this landscape type. **High**
External Visibility	Visible from adjacent higher ground and urban areas. Tall objects would be seen silhouetted against the sea. **Medium/High**
OVERALL RATING	**Medium/High**

Landscape Value	Criteria/ Sensitivity Levels
Designations	SSSI and SAC at Barry Budden and SSSI north of Montrose. SAMs at Lunan Bay. **Medium**
Community value	Setting for local residents in houses/ villages. Most areas easily accessible from neighbouring settlements and holiday caravan parks for formal and informal recreation. Golf courses. Cycle routes. Beach walks. **High**
Cultural value	Historic/ attractive villages. Some locations of archaeological/ historic interest. **Medium**
Perceptual	Windswept coastal strips with accessible sandy beaches and hinterland which whilst undramatic in landform provide tranquillity, recreational access and open views. **Medium/High**
OVERALL RATING	**Medium/High**

14b. Coast with Cliffs

Landscape Character Sensitivity	Criteria/ Sensitivity Levels
Scale	Medium, with smaller scale features (cliffs generally up to 30m but escarpments up to 80m). Generally limited in area. **Medium/High**
Landform	Gently sloping with small rocky cliffs, rocky reefs, bays, inlets and rocky escarpments. **Medium/High**
Pattern	Varied between regular pattern in cultivated farmland areas to complex and irregular pattern in rocky cliff areas. **Medium**
Development	Varies between influence of adjacent urban margins to occasional isolated hamlets and houses and stretches with no settlement/ roads. A number of small fishing villages/ havens and harbours. Roads (mainly minor) and railway. Golf courses. **Medium/High**
Quality	Varied. Generally scenic due to open sea views and cliff landforms. Hinterland often intensively managed (arable farming). In places character is compromised by adjacent urban development. **Medium/High**
Elements and Features	Rocky outcrops and cliffs characterised by very varied eroded form with many caves, arches and small stacks/ outcrops. Small coves, havens and harbours. Lighthouse at Scurdie Ness. Open and distant sea views. **Medium/High**
Context	A narrow strip between farmland, settlements and the sea but with dramatic elevated views and considerable detail and interest. **Medium/High**
OVERALL RATING	**Medium/High**

Visual Sensitivity	Criteria/ Sensitivity Levels
Receptors	Low population of residential receptors with greater numbers immediately adjacent. Travelling population on road and rail. Cyclists and walkers. Sailors and Kayakers. **Medium/High**
Internal Visibility	Wide open views. Tall structures would be prominent in this landscape type. **High**
External Visibility	Visible from adjacent urban areas, hinterland, sandy coastline and other headlands. Tall objects would be seen silhouetted against the sea form inland. **Medium/High**
OVERALL RATING	**Medium/High**

Landscape Value	Criteria/ Sensitivity Levels
Designations	SSSI along most lengths of rocky coast. **Medium/High**
Community value	Setting for local residents in houses/ villages. Most areas easily accessible from neighbouring settlements and holiday caravan parks for formal and informal recreation. Cycle routes. Clifftop walks. **High**
Cultural value	Historic/ attractive fishing villages. Some locations of archaeological/ historic interest including clifftop forts and castles. **Medium**
Perceptual	Windswept coastal strips with accessible clifftop walks and secluded beaches/ havens providing tranquillity, dramatic interest, recreational access and open views. **Medium/High**
OVERALL RATING	**Medium/High**

15. Lowland Loch Basin

Landscape Character Sensitivity	Criteria/ Sensitivity Levels
Scale	Medium to large. **Medium/Low**
Landform	Flat, open, low lying tidal basin and farmland contained by surrounding higher areas of farmland. Small scale steep slopes on raised beaches and river embankments **Medium**
Pattern	Varied. Open, large-scale basin to E. Rectilinear farmed fields to W and more organic patterns within Kinnaird deer park. **Medium**
Development	Montrose to E of basin, otherwise small hamlets and scattered farms/ houses. Fringed by main roads, crossed by minor roads, railways **Medium**
Quality	Well managed farmland. Estate policies. Basin managed for wildlife. Attractive rural settlements. **Medium/High**
Elements and Features	Tidal basin is unique in Scotland. Shorelines, mudflats and tidal watercourses. Rich natural heritage. Arable farmland with mature deciduous/mixed woodlands, avenue trees, hedges. Town of Montrose. Attractive hamlets. Kinnaird House and deer park. **Medium/ High**
Context	Generally lowland surroundings. Unique basin provides a setting for Montrose. **Medium/High**
OVERALL RATING	**Medium/High**

Visual Sensitivity	Criteria/ Sensitivity Levels
Receptors	Moderate/ high number of residential receptors as overlooked by Montrose in addition to small settlements. Significant travelling population along peripheral main roads. Visitors to attractions including wildlife centre, House of Dun, Montrose. **Medium/High**
Internal Visibility	Clear inter-visibility within basin area but some screening by trees in western part and any tall structure would be highly visible. **Medium/High**
External Visibility	Overlooked from higher surrounding areas but screened from a distance. Tall structures would be prominent in this type. **Medium/High**
OVERALL RATING	**Medium/High**

Landscape Value	Criteria/ Sensitivity Levels
Designations	Basin is a SSSI. HGDLs and listed buildings at Kinnaird castle and House of Dun (adjacent). **Medium/High**
Community value	Areas used by local residential population and visitors for formal/informal recreation. Visitor attractions including SWT visitor centre, Caledonian railway. **Medium/High**
Cultural value	HGDLs. Some SAMs. Caledonian Railway. Historic town of Montrose **Medium/High**
Perceptual	A unique tidal basin feature with water and sky reflections, set in a wider lowland farmland landscape. Provides a setting for the town of Montrose. Hinterland of well managed farmland, mature trees and attractive hamlets and houses. **Medium/High**
OVERALL RATING	**Medium/High**

Appeal Decision

Inquiry opened on 3 November 2009

Site visits made on 17 & 19 November 2009

by R P E Mellor **BSc DipTRP DipDesBEnv DMS CEnv MRICS MRTPI**

an Inspector appointed by the Secretary of State for Communities and Local Government

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Decision date:
25 January 2010

Appeal Ref: APP/X1545/A/06/2023805
Hockley Farm, Hockley Lane, Bradwell-on-Sea, Essex CM0 7PZ

- The appeal is made under section 78 of the Town and Country Planning Act 1990 against a refusal to grant planning permission.
- The appeal is made by NPower Renewables Ltd (NRL) against the decision of Maldon District Council (MDC).
- The application Ref FUL/MAL/06/00291, dated 27 February 2006, was refused by notice dated 7 July 2006.
- The development proposed is the construction of a wind farm comprising 10 turbines with a maximum height of 121m to blade tip, substation building, anemometer mast and ancillary infrastructure.
- This decision supersedes that issued on 10 September 2007. That decision on the appeal was quashed by order of the High Court.

Decision

1. I allow the appeal, and grant planning permission for the construction of a wind farm comprising 10 turbines with a maximum height of 121m to blade tip, substation building, anemometer mast and ancillary infrastructure at Hockley Farm, Hockley Lane, Bradwell-on-Sea, Essex CM0 7PZ in accordance with the terms of the application, Ref FUL/MAL/06/00291, dated 27 February 2006, and the plans submitted with it subject to the conditions set out on the attached schedule.

Procedural Matters

2. The Inquiry sat between 3 November and 20 November. I made accompanied site visits to the control tower of London Southend Airport on 17 November and to the appeal site and the surrounding area on the morning of 19 November. I also made unaccompanied site visits to the surrounding area on the afternoon of that day and on other days.

3. The appeal was accompanied by: an Environmental Statement (ES) produced in accord with the Town and Country Planning (Environmental Impact Assessment) (England and Wales) Regulations 1999, as amended; and comments from statutory consultation bodies and representations duly made about the ES and the likely environmental effects of the proposed development. Further information was requested by the Planning Inspectorate under regulation 19 and was submitted in February 2007. Further wind data was subsequently supplied by the Appellant in response to a request from the Rule 6 party that was endorsed by the Inspectorate. In coming to my decision I have taken into account that and all other environmental information

submitted in connection with the appeal including that arising from written and oral evidence and questioning at the Inquiry.

4. The ES describes the rated capacity of each turbine as between 1.5MW and 2.5MW. This would depend on the final selection of equipment. The approximate rotor diameter would be 82m. Highways access has been assessed on individual turbine blade lengths of between 33.3m and 42.0m. The application description limits the height of the turbines to 121m. The submitted drawing REN/BRA/0040/A shows a 'typical' turbine. It is thus only illustrative and, within the height limit, a different detailed design may be employed, the approval of which can be reserved by planning conditions, as can the precise micro-siting of each turbine within the application site.

Main issues

5. I consider the main issues to be the effects of the proposed development on:

   a) the landscape and seascape;

   b) the setting of ancient monuments, listed buildings and conservation areas;

   c) the living conditions of residents in respect of noise and outlook;

   d) aviation interests with particular reference to the radar at London Southend Airport;

   e) ecology with particular reference to birds and bats;

   f) traffic and transport; and

   g) whether any identified harm in these respects is outweighed by benefits of the wind farm development.

Background

6. Following the first public inquiry in 2007, planning permission was granted by Inspector Major. That decision was subsequently challenged on several grounds. The Secretary of State accepted some but not all of the grounds of challenge. With the consent of the parties, the decision was quashed by the High Court in 2008 because drafting errors in two planning conditions relating to the control of noise may have led to the conditions being unenforceable. The other grounds of challenge were not considered by the Court. The appeal has been redetermined by a different Inspector and on the basis of new evidence in relation to all issues.

Planning Policy and Changes since the 2007 Inquiry

7. Three key principles of the Government's Planning Policy Statement 22 'Renewable Energy' (PPS22) remain of particular relevance. Key principle (i) is that: 'Renewable energy developments should be capable of being accommodated throughout England in locations where the technology is viable and environmental, economic, and social impacts can be addressed satisfactorily'. Key principle (viii) provides that: 'Development proposals should demonstrate any environmental, economic and social benefits as well as how any environmental and social impacts have been minimised through careful consideration of location, scale, design and other measures'.

Importantly key principle (iv) also provides that: 'The wider environmental and economic benefits of all proposals for renewable energy projects … are material considerations that should be given significant weight in determining whether proposals should be granted planning permission.'

8. There have been significant changes in other local, regional and national planning policy since the 2007 Inquiry. In particular, whilst Policy PU6 of the Maldon District Replacement Local Plan (2005) (the LP) remains in place, some other development plan policies have expired, notably Policy EG2 of the Essex and Southend-on-Sea Replacement Structure Plan (2001) (the SP). Also the East of England Plan (2008) (the EEP) has now been adopted as the Regional Spatial Strategy. Whilst some of its policies have been challenged in the courts, they are not relevant to this development. I thus consider that this does not prevent my giving those policies which are relevant full weight as part of the development plan. In particular Policy ENG2 sets specific targets for installed renewable energy capacity for 2010 and 2020. These targets cover all forms of onshore renewable energy explicitly exclude offshore wind. It is not disputed that the 2010 target will be missed. Sub-regional targets have yet to be developed.

9. Whilst not itself adopted policy or directed at development control decisions, the ARUP Report 'Placing Renewables in the East of England' commissioned by the Regional Assembly is a material consideration insofar as it will inform other measures to meet the renewable energy targets for the region up to 2020. It indicates an overall need for about 500 wind turbines in the region if that target is to be achieved. The Report describes the Greater Thames Estuary (including the Dengie Peninsula) as having 'Medium Landscape Sensitivity' with a potential maximum wind farm typology of 4-12 turbines. Whilst the mapped constraints do not include all potentially relevant matters such as aviation and cultural heritage, they do indicate that parts of the peninsula are notably free of other strategic constraints such as: low wind speeds; national landscape or conservation designations; or the presence of residential dwellings within 500m. However the Report contains caveats and further local assessments are advised.

10. At national level 'Planning Policy Statement; Planning and Climate Change' (PPSPPC) was published by the Government in December 2007 as a Supplement to Planning Policy Statement 1. It expands on previous policy in PPS22 and it explicitly takes precedence over other Planning Policy Statements where there is any difference in emphasis on climate change. It may also supersede relevant development plan policies that have yet to be updated. The Department of Energy and Climate Change has also published the UK Renewable Energy Strategy (2009) which provides for interim renewable energy targets between 2010 and 2020. The Government has recently issued draft National Policy Statements on Energy, Nuclear Power and Renewable Energy. Amongst other things these now make it more likely that a new Nuclear Power Station (NPS) will be developed near the closed Bradwell NPS.

11. Since the 2007 Inquiry, several guidance documents of relevance to wind turbine development have also been published by bodies including Natural England, English Heritage, and the Civil Aviation Authority.

12. The main physical change to the vicinity of the appeal site since 2007 has been the installation of a large offshore wind farm at Gunfleet Sands to the east. Elsewhere, London Southend Airport has changed hands and the new owners are taking forward expansion plans with the construction of a railway station underway and the recent submission of a planning application to extend the runway. EEP Policy E7 and other development plan policies for that area include in-principle support for the development of the airport to meet local demand and to contribute to local economic development.

Reasons

a) Landscape (including Seascape)

13. The 10 turbines have been significantly reduced in number when compared to pre-application proposals which were for as many as 34 turbines over a much larger site.

Landscape Impact

14. PPSPPC at paragraph 20 enjoins local planning authorities to ensure that any local approach to protecting landscape does not preclude the supply of any type of renewable energy other than in the most exceptional circumstances.

15. The LP at paragraph 10.31 makes particular reference to Maldon, as a coastal district, having a greater potential to exploit wind than any other source of renewable energy. The Environmental Statement and the Arup Study both confirm that the appeal site is located within an area of adequate wind resource. The appeal site is in the countryside where LP Policy CC6 will only permit development that (in summary) will not harm landscape character, is of appropriate design for the landscape, and is itself landscaped to protect and enhance landscape distinctiveness. Saved SP Policy CC1 also seeks the particular protection of undeveloped coastal areas with any development not to adversely affect its open and rural character, historic features or wildlife. In this 'Coastal Zone' LP Policy CC11 adds further criteria that (in summary) development will only be permitted that: requires a coastal location; has minimal impact on views; meets an essential overriding local need which cannot be met within settlement development boundaries; and that every reasonable effort is made to use previously-developed land. These LP and SP policies set exacting requirements which might be readily applied to many forms of conventional built development but it would be a best very difficult, and more usually impossible, for any commercial scale wind turbine development to satisfy all of the requirements. That is relevant to the above provisions of PPSPPC as, to the extent that these policies might be interpreted as precluding wind farm development, I do not consider that 'the most exceptional circumstances' have been demonstrated to exist. The more recent EEP Policy SS9 includes different conservation criteria for the coastal environment with an emphasis on internationally-designated sites of importance to wildlife.

16. There are in any event different landscape criteria in LP Policy PU6 that are more specific to facilities for renewable energy, which would include wind turbines. It is therefore more appropriate to concentrate on this policy. It provides (amongst other things) that: 'Proposals for the development of renewable energy facilities will be permitted provided they would not: (a) have

a significant visual impact on the appearance of the surrounding area, the countryside or local landscape; …'. In that regard, whilst the policy applies to all forms of renewable energy, the Council accepted at the Inquiry that any commercial wind farm would have a 'significant' visual impact and that the correct test should include a consideration of 'harm'. Otherwise, an ostensibly permissive policy would effectively embargo any wind farm developments anywhere in the District, contrary to PPSPPC paragraph 20.

17. Policy PU6 includes the additional requirement that renewable energy facilities would not: (b) (ii) have an adverse impact upon areas of … landscape … importance.' No national landscape designations apply to the appeal site. LP Policy CC7 included the appeal site within a Special Landscape Area (SLA) where permission was not to be given for development unless it conserves or restores the character of the area (which character is not defined in the policy or text). That policy has been saved. However the LP supporting text refers at paragraph 3.44 to the SLA being superseded by Landscape Character Assessments (LCA). The national Planning Policy Statement 7 'Sustainable Development in Rural Areas' (PPS7) also prefers the use of criteria-based policies utilising tools such as LCA, rather than rigid local designations (such as an SLA).

18. Several LCAs have been prepared Since the LP was adopted. However the development plan policies have yet to be updated in response to their recommendations. The Council's landscape witness agrees that the most relevant (and recent) LCA is that by Blandford Associates for Maldon and neighbouring districts in 2006. That LCA places the appeal site within the defined 'D7 Bradwell Drained Estuarine Marsh'. It is also adjacent to the 'D8 Dengie Drained Estuarine Marsh' which includes a narrow strip to the east but which also extends over a much larger area in the south of the peninsula. In contrast to the Arup Report, both areas are described as having 'high' sensitivity to change.

19. For the D7 and D8 areas the LCA defines identical key characteristics that include 'mostly arable farmland on reclaimed marsh', 'a sense of huge sky', 'sound of birds', 'tranquillity', 'panoramic views', 'the absence of trees except around isolated farms', and 'the absence of settlements'. The more detailed assessments of visual character for each area also identify some other common characteristics such as a 'strong sense of being windswept and desolate'. The CPRE tranquillity mapping exercise reinforces the assessment that this is a tranquil area. I agree with these assessments of landscape character. The LCA remarks that both areas provide long views across the flat lands of the Chapel of St Peter's-on-the-Wall, and of Bradwell Nuclear Power Station (NPS) and its associated pylons. I consider that these built elements contribute to the area's present landscape character and that they have introduced more vertical elements into an essentially flat and low lying area. The proposed turbines would be still taller vertical structures that would be seen against the sky from all angles, as the wireframe images in the Environmental Statement clearly demonstrate. As the sky is so extensive it is better able to absorb structures as large as those proposed, particularly as the turbine towers and blades would have a slender form. The impact at ground level would be limited because the ground is so low-lying and because the turbine towers would occupy only small individual footprints, particularly by comparison with the

NPS. The concrete foundations would be below ground level and the flat character of the reclaimed marsh would thus remain largely intact at their base.

20. In the LCA, some differences between D7 and D8 are identified in their visual characteristics and in the key planning and land management issues. Whereas the proposed Landscape Strategy Objectives for both areas include the common objective to 'restore' historic landscape patterns and features, the companion objectives differ in that they are to 'conserve' the D7 landscape but to 'enhance' the D8 landscape. The D8 enhancement objective allows for the introduction of 'new and/or enhanced elements where distinctive features or characteristics are absent'. It is not clear that this would extend to a development as large and as different as a wind farm notwithstanding the potential for wind farm development that was identified by the LCA as a key issue in Area D8. Neither do the accompanying guidelines otherwise clearly indicate how to respond to that potential. The subject wind farm proposed in this appeal for Area D7 is similarly highlighted as a key issue for that area but without further specific reference. Nevertheless the suggested landscape planning and land management guidelines highlight conservation measures for both areas D7 and D8. In any event the 'conserve and restore' objectives for D7 and the suggested guidelines have not been translated into adopted development plan policy or a Supplementary Planning Document following appropriate consultation processes. This limits the weight to be accorded to them.

21. The wind turbines would be large structures visible over a wide area extending several kilometres across land and sea. They would result in a significant change in landscape character. Whilst modest nature conservation enhancements can be incorporated in the development, their positive landscape impact would be at ground level and they would be dwarfed by the scale of the turbines. However the large skies would provide a neutral background for the tall but slender structures. The degree of change would also diminish with distance. The turbines would dominate their immediate surroundings where they would create a 'wind farm landscape character'. However in more distant views the turbines would become but one element in a wider landscape and skyscape that might be termed a 'drained estuarine marsh with wind farm'.

Visual Impact

22. Whilst the visual impact would be greatest in the central part of the D7 landscape character area, such as in views from the public footpath through the site, and from the adjacent areas to the east and west, it would diminish in the northern part of D7 towards the airfield and the Nuclear Power Station, and also towards the southern part of area D8. From the west and within the settlements of Bradwell-on-Sea and Tillingham, some views would be restricted by buildings and foliage. Where they could be seen the turbine's slender form would only marginally obstruct panoramic views of the wide skies and the reclaimed marshland, particularly by comparison with the NPS or other more conventional buildings. However the size and movement of the turbines would be a distraction that would affect the viewer's perceptions of the area.

23. I accept the Appellant's point that individual responses to the sight of wind turbines do vary. Some people see them positively for their aesthetic qualities or because of their function in providing clean energy and addressing climate change. Others see them negatively, particularly where there is a perceived contrast with valued characteristics of their surroundings or where there is other perceived harm such as a noise impact. Occasional sight of the turbines on a visit to the area may also have less of an impact than daily visibility from a person's home. These differing views may be strongly held, although perceptions may also change over time. Several of those at the Inquiry who objected strongly to the proposed development also made it clear that they considered the more distant Gunfleet Sands offshore wind farm visually acceptable. However I can attach little weight to the Appellant's 'Allegra' evidence which suggests that most people consider wind turbines acceptable in their local area. The extent of that local area is not defined and it is capable of wide interpretation. It is also not clear what proportion of those questioned have direct experience of such development as 78% were unaware of any local initiatives in their area related to renewable energy. In any event it appears that a majority of adults in Bradwell and Tillingham support BATTLE in opposing the appeal scheme. However some support for the wind farm has been expressed locally by the Othona Community (which has a base adjacent to St Peter's Chapel and which makes use of that building) and by others from beyond the immediate area including from witnesses living north of the Blackwater.

24. Apart from local residents, the turbines would be seen by visitors to the area and especially: those travelling to and from St Peter's Chapel; walkers using the local footpaths (which are widely promoted); birdwatchers; and those passing at sea and in the Blackwater estuary. However the reactions of those viewers can also be expected to vary.

25. I consider the effects on St Peter's Chapel below in relation to its setting. For residents, walkers and other visitors I accept that the area is widely valued as unusually remote and tranquil and that this general conclusion is supported both by the LCAs and by the CPRE tranquillity mapping exercise. However that mapping exercise does not also demonstrate that the wind farm would have a seriously adverse effect on tranquillity. Wind turbines rank relatively low on the scale of those factors which the attitudes survey found to harm tranquillity and below such factors as the presence of electricity pylons or people. Where tranquillity mapping was undertaken after the development of 7 wind turbines at Coldham it does not appear to have prevented the achievement there of a good score for tranquillity.

26. For those who perceive the turbines negatively, there would be a marked and major adverse visual impact in the immediate environs of the turbines, but this would lessen with distance. In particular I do not consider that there would be a significantly adverse impact on views from the sea or across the Blackwater from where the present landscape appears as little more than a thin line on the horizon, punctuated by a few trees, pylons and the looming presence of the nuclear power station. However even within the Dengie Peninsula, many of the key landscape characteristics would survive including the windswept and desolate feel, the huge skies, the panoramic views and much of the present tranquillity. It is entirely to be expected that windfarms will be located in

windswept locations to capture the wind resource. The turbines will introduce additional movement beyond that associated with the action of wind on trees and the sea. However, as the CPRE mapping indicates the usual absence of a human presence and the daily traffic movements associated with most other forms of built development would help to retain the feel of tranquillity.

27. Whilst many visitors to the area would also see the Gunfleet Sands turbines, they would usually need to face away from the subject onshore wind farm to do so. Even when seen in the same views, because of the separation distance the Gunfleet turbines would usually appear so much smaller than the on-shore turbines that I do not consider that there would be a significant cumulative impact.

Conclusion

28. I conclude on this issue that the wind farm would introduce significant change to the landscape. Many viewers, but not all, would consider the visual impact as harmful to varying degrees and more especially at near distances. That harm would conflict with the first landscape criterion in LP Policy PU6. The wind farm would also conflict with some conservation and restoration objectives for area D7 of the Landscape Character Assessment and therefore with related objectives of LP Policy CC7 and the second landscape criterion of LP Policy PU6. Nevertheless many of the key landscape characteristics of the area would be conserved including the windswept and desolate feel, the huge skies, the panoramic views and much of the present tranquillity. Some people would view the turbines more positively and there would be no significant adverse impact on the seascape. I consider that these factors substantially mitigate the identified harm to the landscape. There nevertheless remains harm which needs to be weighed against any benefits of the development. These may include the benefits of renewable energy in combating the threats of climate change to the wider landscape of this low-lying coastal area.

b) The Setting of Ancient Monuments, Listed Buildings and Conservation Areas

29. Amongst the criteria of LP Policy PU6 is one that renewable energy facilities will be permitted provided they would not (amongst other things): '(b) (ii) have an adverse impact upon areas of … architectural, …, historical or conservation importance'. No harm has been alleged by the Council or English Heritage to the views to and from the Bradwell or Tillingham Conservation Areas. I agree that their character and appearance would not be harmed. Neither has the Council or English Heritage alleged harm to the setting of any listed building or scheduled ancient monument (SAM), with the exceptions only of the Grade 1 listed St Peter's Chapel and the associated Othona Roman Fort SAM.

30. The English Heritage document: 'Wind Energy and the Historic Environment' acknowledges that climate change is itself likely to be detrimental to the historic environment for reasons which include the effects of rising sea levels and increased 'storminess'. The document also points to the reversibility of wind energy developments which can further mitigate their impact. In this case the expected 25 year life of the windfarm would be short relative to the longevity of St Peter's and the SAM.

St Peter's

31. St Peter's can be seen at considerable distances across the reclaimed marshland, particularly from the south and west and also from the sea. Whilst resembling an agricultural barn, and used as such for much of its life, it is noticeably taller than most barns and has a strong vertical emphasis. It is a simple structure that has been altered and partially reconstructed and now contains few notable architectural features. However the building is of great historic interest as one of the oldest surviving churches in England and as a rare surviving example in this region of an early stone building.

32. The definition of setting in English Heritage's 'Conservation Principles' is: 'The surroundings in which a place is experienced, its local context, embracing past and present relationships to the adjacent landscape'. I do not accept the Appellant's argument that the setting is limited to a small and somewhat arbitrarily circumscribed area close to the building. Instead I consider that the setting does extend to a much wider area within which the building can be seen and identified. However the impact of the development on that setting will vary according to the juxtaposition of St Peter's and the development in the same views and will also diminish with distance.

33. There is advice in Paragraph 2.26 of PPG15 to take account of the historic landscape which is here also relevant to the setting of St Peters. The historic landscape from the time of the development of St Peter's and through the middle ages, when the salt marshes were grazed, has since changed as the result mainly of: the reclamation and draining of the marsh; the construction of sea defences; the conversion of the marshland from grazing to arable production; and the more recent intensification as modern large-scale arable farming with larger fields and fewer trees and hedges. The nuclear power station also has a wide influence in views across the area. Its associated power lines pass across the marsh on pylons close to the appeal site. Whilst currently out of use it appears likely that this or another higher voltage power line will be retained on a similar route in association with a new nuclear power station.

34. The development would not achieve the conservation and restoration of historic landscape patterns sought by the LCA. Commercial wind turbine development is very much associated with the 21st century and would contribute further change. Nevertheless, the surviving elements of the historic landscape would remain visible below and between the turbines and the visible development would be reversible.

35. Notwithstanding the past changes to the historic landscape, the remote coastal situation of St Peter's, in a tranquil location well away from any settlement, enhances the appreciation of the building for those visiting it whether for its historical interest or for spiritual reasons. In distant views, those who were previously aware of the building and its historical and spiritual significance will have an enhanced appreciation of it from other visitors. If approaching the building on the principal footpaths from the south or west, it can be seen from a long distance within a wide and open landscape. The proposed wind farm would also appear in some of these views and would, during its lifetime, contribute a further change in landscape character away from that existing at the time that the chapel was built. However open views would remain available across the reclaimed marsh and it should still be possible for visitors

to imagine the original setting of the chapel adjacent to the undrained marshland without the on-shore and off-shore turbines, the power station and pylons, the sea wall and the modern agricultural landscape.

36. Only at a long distance from the south west would the wind farm appear directly in front of St Peter's. However from here the chapel would appear as only a tiny and relatively insignificant feature in the landscape, particularly as seen from the small number of residential properties in this direction. For those walking towards the building, that partial obstruction to direct views would soon clear. In particular pilgrims and others using the St Peter's Way approach route would then have a long time to appreciate the distant views of St Peter's in its isolation as they continue north along the sea wall. The wind farm would then only be one element in long and wide 360 degree views. For a significant time during the latter part of their journey, the wind farm would be behind their left shoulder where it would not impinge at all on views of the chapel. For the larger number of visitors approaching from Bradwell village and the car park along the former Roman road, the wind farm would appear initially at the side of their intermittent long views of the chapel and then back over their right shoulder, again allowing an appreciation of the building's still-isolated location.

37. Views of St Peter's from the north are already more curtailed by topography and vegetation. Those on the final approach to the building along the coastal footpath from this direction might see the turbines behind or to the side of the chapel. However the operation of perspective means that the turbines would appear relatively small and they are unlikely to be visible in a dominant position above the roof of the building. A photo-montage published in the Daily Telegraph is misleading in this regard.

38. In more distant views from the sea, the turbines could appear behind and above the chapel from some angles. However this impression would be fleeting as most such viewers would be on moving craft. Moreover the historical and spiritual dimension of the building is likely to be less significant for those at sea who would not be visiting the chapel itself.

39. Views from a listed building are also relevant to its setting. However from inside the building the turbines could not be seen from any window and could only be seen at an oblique angle when leaving through the door. The turbines would be visible (in one direction only) to those looking out from the area around the building, including the overspill congregation from the occasionally large religious services held at the Chapel. Whilst tall buildings can affect the setting of a listed building from some distance (PPG15 paragraph 2.17), in this case I consider that the separation distance to the nearest turbine would be sufficient to mitigate their impact in such views. There would remain longs views between and to either side of the turbines and the overall outlook from the vicinity of the chapel would be of a 'drained estuarine marsh with wind farm' rather than of a 'wind farm landscape'.

Othona Roman Fort SAM

40. Part of the original 3rd century Roman fort was lost to the sea many years ago as the result of coastal erosion. At the Inquiry, the English Heritage witness accepted that the setting of the (largely buried) SAM is less sensitive than that

of St Peter's (which was built in about 654AD on top of the fort using reclaimed materials) whilst maintaining that the fort adds to the historical significance of the Chapel. In practice I do not consider that the wind farm would have any significant effect on the setting of the SAM when considered in its own right.

Bradwell Lodge

41. BATTLE claims additional unacceptable harm to the setting of the Grade II* Bradwell Lodge. That house is of both architectural and historic interest. It was previously associated with the ownership of much of the former marshland including the site of the wind farm. Indeed a substantial drainage programme was carried out by an 18th century owner and it appears that the increased farming revenue may have helped to fund the improvement and enlargement of the house itself. However in the 20th century the ownership of the farmland (and thus control of the views across it) was divided from that of the house.

42. Unlike St Peter's, public views towards the house are limited with only glimpsed views available from beyond its own garden and modest park. The main concern is with views out. In this regard I saw that many of the principal ground floor rooms face south where their outlook is already affected to a degree by the electricity pylons. A number of the turbines would be visible from those rooms and from the garden and some first floor rooms. However these views would be mitigated by distance and perspective such that the apparent height of the turbines relative to the pylons and a number of large trees would be reduced. The trees would also contribute partial screening.

43. A more open view above the trees would be available from the top floor 18th century belvedere. That was clearly designed to provide all-round views both above the village buildings inland and towards the Blackwater and also over the marshland towards the sea and as far as the Kent coast. Two off-shore wind farms can already just be seen in the far distance. A clearer view of the on-shore turbines would be available from this level. However it would still be possible to see equally long distances between and past the turbines. The original function of the room to provide extensive views would thus be substantially unimpaired. I therefore agree with the Council and English Heritage that the setting of this building would not be unacceptably harmed.

Conclusions

44. I conclude on this issue that the wind farm would have an adverse impact on some aspects of the wider setting of St Peter's Chapel such that it would not be preserved. Neither would the setting be enhanced. In particular the wind farm would intrude into some long views to and from the Chapel in which the scale and movement of the turbines would distract some attention from the building and further alter its landscape setting. However that landscape setting has already changed since the chapel was erected. Moreover these effects would be mitigated by the separation of the turbines from the chapel and by the long and wide views that would remain available to and from the building. The separation distance would diminish the relative scale of the turbines. The wide vistas available around the building would still allow the remote and isolated context of the chapel to be appreciated. The adverse impact and associated conflict with LP Policy PU6 would thus be diminished. There would nevertheless be harm that would need to be weighed against any benefits of the

development, including benefits of renewable energy in combating the threats of climate change to the wider historic environment.

45. The vulnerability of the location to rising sea levels or increased 'storminess' due to climate change is illustrated in that Othona Fort is itself much reduced in size due to past coastal erosion. The development would thus be more likely to assist rather than harm the physical preservation of that monument (and of St Peter's). Neither do I consider that there would be significant harm to the setting of the Othona Fort SAM or Bradwell Lodge or of other historic buildings, structures or conservation areas.

c) Living Conditions

46. LP Policy PU6 includes the provision that renewable facilities will be permitted provided they would not (amongst other things): '(b) (i) generate an unacceptable level of noise …; or (iii) have a detrimental impact upon adjoining properties and landholdings.'

47. The greater the separation between turbines and dwellings the less likely is it that there will be unacceptable effects in relation to noise and outlook. However the practicality of achieving wide separation is dependent on the density of residential development which is inevitably higher in the East of England than, for example, in rural parts of North America and Scotland where greater separation can be achieved. The Arup study applied a 500m separation distance from properties with postcodes as a proxy strategic constraint to model noise considerations around dwellings. The mapped results (which also include other strategic constraints such as low wind conditions, nationally protected landscapes and nature conservation areas) indicate the relative scarcity of land in this region without such constraints. The Dengie Peninsula contains one of the few such large areas in Essex.

48. Table 14.1 of the Environmental Statement indicates the distances of dwellings from the nearest turbine. The landowner's house is, at 600m, the nearest. The nearest independent dwelling is Munkins Farm (to the North) at 630m. The separation distances then rise significantly with examples such as Eastlands (N) (710m), Fairview (N) (750m), Sandbeach (S) (880m), Packards (SW) (1230m) and Delameres (NW) (1440m). There are other dwellings between these distances.

Noise

49. An adequately accurate survey of background noise levels at representative locations is important to the subsequent imposition of noise controls. The Council was given the opportunity to agree the method and locations for the background noise survey before it was undertaken by the Appellant's acoustics consultants but declined to take up that offer. The Council does not now dispute the way that the survey was conducted or its results. Whilst BATTLE has raised a number of detailed criticisms, such as the locations chosen for the monitoring equipment, these are not supported by any alternative survey results to support BATTLE's view that the results may have been inaccurate. Neither was it obvious from the locations which I inspected that they would have significantly distorted the survey results.

50. At times background noise levels are notably low on the Dengie Peninsula owing to the sparse development and the present absence of traffic and industry from most of the area. Such low noise levels are typical of remote rural areas. They would be at their lowest in still weather conditions. However background noise levels do rise in windier conditions for reasons which include the sound of wind in trees and other vegetation. There is therefore scope for rising background noise to mask rising turbine noise emissions, which also vary with the wind speed, although the Environmental Statement predicts that turbine noise may also exceed background noise by varying amounts at particular wind speeds.

51. Paragraph 10 of PPG24 'Planning and Noise' acknowledges amongst other things that much development of essential infrastructure will generate noise and provides that the planning system should not place unjustifiable obstacles in the way of such development although it must not cause an unacceptable degree of disturbance. Planning Policy Statement 22 'Renewable Energy' (PPS22) - at paragraph 22 - and its Companion Guide provide that renewable energy developments should be located and designed in such a way as to minimise increases in ambient noise levels and states that ETSU-R-97 'The Assessment and Rating of Noise from Wind Farms' (ETSU) should be used for the rating and assessment of noise from wind farms. This is also agreed in the Statement of Common Ground between the Appellant and the Council.

52. Where there is higher background noise, ETSU relates noise immission limits to actual background noise levels. However when there is low background noise, such as may occur in this area, set noise limits are recommended within the $L_{A90,10min}$ 35dB-40dB range. The Appellant argues that it is only necessary to establish the probability that these maximum noise limits will not be exceeded and then to consider how to address the situation if that proves not to be the case in practice. It is clear in ETSU that this approach was adopted because lower noise limits would be unduly restrictive on developments which are recognised as having wider national and global benefits and because lower limits are not necessary in order to offer a reasonable degree of protection. At the Inquiry the Council contested the ETSU approach in this regard notwithstanding its previous agreement to the use of ETSU in the Statement of Common Ground. However, having regard to the advice in PPS22, I consider it inappropriate to depart from ETSU.

53. The other main point at contention between the Council and the Appellant is the level within the 35dB-40dB range at which the maximum daytime noise limit for immissions should be set at those residential properties with no financial involvement in the wind farm. The Council contended at the previous Inquiry, and initially at this second Inquiry, that the limit should be 35dB whereas the Appellant contends that it should be 40dB. The Council subsequently modified its position to propose a planning condition with a 38dB maximum.

54. ETSU cites 3 factors for determining the appropriate noise level within the 35-40dB range: the number of dwellings in the neighbourhood of the wind farm; the effect of noise limits on the number of kWh generated; and the duration and level of exposure. On the first count the number of dwellings near to the wind farm is relatively small. Provided that the set maximum noise levels are not exceeded at these nearest dwellings, noise levels within the main villages

of Bradwell and Tillingham should be lower because of the greater separation, albeit they may remain above 35dB at some locations.

55. On the second count, the Council points to relatively narrow margins between the predicted noise immissions and the 40dB maximum noise limits used by the Appellant. That suggests that to comply with a lower maximum noise limit of 35dB or 38dB it would be necessary to modify the design of the development from that proposed. The likely means of achieving this would be to operate some or all turbines in a reduced noise mode and/or to increase the separation distances from residential property.

56. Although there are no figures before me, operating the turbines in reduced noise mode to meet even a 38dB limit would inevitably reduce power output to some extent. Moreover the scope for such noise reduction is likely to be limited. Also it is difficult to accurately predict noise immissions to within 1 or 2db. Thus if these measures are applied at the outset it would then be more difficult to reduce the noise levels further should the noise immissions at affected dwellings exceed those predicted and breach the set limits. If the operating noise could not be reduced sufficiently by such measures then the only option would be to stop the turbine, whether temporarily or permanently. As well as being inefficient in energy production, that poses an additional risk to the economic viability of the operation and creates uncertainty for the potential investor.

57. In terms of location, as there are dwellings to the north, south and west of the wind farm and a marshland nature conservation area of international importance to the east, moving a turbine away from one dwelling is likely to bring it closer either to another dwelling or to the protected marshland. To move the turbines outside the appeal site would require the consent of the relevant landowner. One reason given for the previous reduction in size of the proposed wind farm has been the unwillingness of some landowners to accommodate the turbines. Another was the need to maintain adequate separation from the marshland nature conservation areas along the coast which are important bird habitats. It is also necessary to maintain adequate separation distances between the turbines themselves because turbulence from one turbine can affect the efficient operation of others and may affect noise emissions. The only other means of increasing separation distances from dwellings would therefore be to reduce the number of turbines and site the remainder further from the edges of the appeal site with a proportionate loss of power output for each turbine removed.

58. The circumstances are different from those at the recently-dismissed Shipdham appeal (APP/F2605/A/08/2089810) where the turbines would have been as little as 432m from a dwelling. The Inspector there concluded that the separation distances had not been chosen to minimise increases in ambient noise levels (as required by PPS22 paragraph 22) as the turbines could have been sited further away on the same farm. All the turbines at the dismissed North Dover Appeal (APP/X2220/A/08/2071880) were within 570m of the nearest dwelling and thus appreciably closer than in the present case.

59. Moreover ETSU cites the example of a single turbine causing 40dB of noise at nearby dwellings as justifying a more restrictive approach to noise than a larger development of 30 wind turbines creating similar noise but with

commensurately greater power output. The appeal proposal is for only 10 large turbines. However their combined maximum power output of 15-25MW equates to the typical output of 30-50 x 0.5MW turbines at the time that ETSU was prepared in 1997, when turbines were smaller and less powerful. By contrast only 2 turbines were proposed at Shipdham, where a 35dB limit was proposed (and was predicted to be exceeded).

60. On the third count, ETSU suggests that: 'a property which experienced background noise levels below 30dB(A) for a substantial proportion of time in which the turbines would be operating could be expected to receive tighter noise limits than one at which background noise levels soon increased to levels above 35db(A)'. There are some residential properties here at which background noise levels would often be below 30dB(A) at lower wind speeds, However this includes at times when the turbines would be immobile and not generating noise. The number of dwellings at which these low background levels would be significantly exceeded by operational turbine noise for a substantial proportion of the time is much lower.

61. It is necessary to consider all three factors together. The 40dB limit is within the range recommended by ETSU for conditions of low background noise. Only a relatively small number of dwellings would be affected by the application of a 40dB rather than a 38dB limit and for only limited periods when the relevant background noise levels apply and the turbines are operating. For that and all the other above reasons I conclude on balance that a 40dB limit is justified in this case.

62. Late in the Inquiry BATTLE submitted newly obtained evidence that a draft 2006 report by the Hayes Mackenzie Partnership to the Department of Trade and Industry had recommended revisions in the ETSU night-time noise limits having regard to World Health Organisation advice on sleep disturbance. Whatever the case may be in that respect the Government in any event continues to endorse the ETSU limits.

Wind Shear

63. Wind shear denotes increasing wind speed with height above ground and is known to be more common in flat landscapes such as the appeal site. The accuracy of prediction of this effect has been improved since the previous Inquiry owing to the gathering of on-site wind data rather than relying on data from another site at Foulness. If wind shear were to occur the actual turbine noise would be higher than that predicted at lower heights closer to ground level. However, any consequential noise increases would still be subject to overall noise limits set in a planning condition or Section 106 Planning Obligation, even if they exceeded the amounts predicted by Mr Jiggins on the basis of only 1 standard deviation. Consequently these effects would be a commercial risk for the operator, rather than a risk of harm to living conditions, and would be no reason for dismissal of the appeal.

Amplitude Modulation

64. Amplitude Modulation (AM), sometimes referred to as blade swish or thump, is a recognised phenomenon and ETSU makes some allowance for it. However ETSU was unable to formulate an accurate measurement methodology or to establish the causes or the frequency and magnitude of its occurrence and left

the matter for further investigation. There is some evidence of subsequent complaints about 'excess' AM including different tonal characteristics. The Salford Report commissioned by the Government considered complaints that had been made about wind farm noise and concluded that the incidence of (excess) AM was low and affected few people. The Government concluded that there was not a compelling case for further research. Whilst BATTLE claims that the problem of excess AM was underestimated by the researchers, it remains the case that excess AM appears only to occur at a minority of wind farm sites. The lack of an agreed definition of what constitutes excess AM or an agreed basis for its accurate measurement makes it particularly difficult to construct a planning condition or other objective means of control. I note that when this issue was recently considered at the recent Wadlow Farm appeal, the Secretary of State agreed with the Inspector that no condition was necessary (Doc 5.33B - Appeal Ref APP/W0530/A/07/2059471).

65. The wording of an AM condition put forward by Mr Stigwood for BATTLE includes a number of apparently arbitrary measures that have not been adequately justified and which would be uncertain in their impact. I also consider the wording to be vague and imprecise with regard to when and by whom measurements would be carried out and how the results would be assessed and acted upon.

66. BATTLE point out that another of the recommendations apparently deleted from the draft Hayes Mackenzie 2006 report was that a 5dB reduction should be applied to the noise limits for the presence of high levels of AM to minimise the risk of sleep disturbance. The final report contained the modified text: 'However during the night time periods when high levels of modulation have been measured, it may be appropriate to apply a penalty to the incident noise from the wind farms'. It would not be appropriate here to apply any such penalty to the conditions imposed on the planning permission firstly because excess AM has yet to be adequately defined, secondly because there is no agreed objective measurement of excess AM, and thirdly because it may never arise at all.

67. The Appellant suggests that excess AM can only be addressed by the local authority using statutory nuisance powers. That would not depend on precise technical measurement as more subjective means of assessment could be applied by environmental health officers. In the absence of an agreed alternative means of applying an effective condition, and because the balance of probability suggests that the risk of excess AM occurring is small and would affect few people, it would not warrant the dismissal of the appeal. I conclude that statutory nuisance procedures are the best means currently available of addressing this issue, should it arise.

Enforceability

68. The Council accepts that 'technically' a condition could be drawn up to control operational noise and that would be its preferred approach. Indeed substantial agreement had been reached between the acoustics witnesses for the Appellant and the Council on the form that such conditions would take, apart from some remaining differences including the appropriate maximum day-time noise levels. However the Council then concluded that practically the steps to deal with any potential breach of the conditions would be so complex and difficult as

to bring the effectiveness of the condition into question. On that basis the Council questions the lawfulness of the conditions in relation to enforceability or reasonableness under the tests for conditions set out in Circular 11/95.

69. The Appellant's response has been to submit a S106 unilateral undertaking which is no less complex but which would have different means of enforcement and which is not subject to the same 11/95 tests. BATTLE would prefer the use of conditions (albeit with different wording) and has criticised many legal and technical aspects of the submitted S106 undertaking. The Appellant has made modifications to the draft undertaking but BATTLE maintains a number of objections to its provisions. The Appellant has also submitted revised draft planning conditions which more closely resemble the noise management scheme proposed in the undertaking but would be alternative to that undertaking. BATTLE would prefer the use of conditions but has proposed different wording for the main condition. The Appellant's noise consultant has raised a number of technical objections to that wording and I do not consider that a departure from the ETSU approach has been adequately justified.

70. Whilst ETSU refers to the possibility of using S106 obligations to control noise, ETSU-style planning conditions are in widespread use and have been endorsed by the Secretary of State in many previous decisions. There is a lack of evidence that they are in practice ineffective. Paragraph B51 of Circular 05/05 'Planning Obligations' also advises that, where possible, planning conditions are preferable to obligations for reasons which include their more ready enforceability.

71. I acknowledge that the Inspector for the Shipdham Appeal concluded that the planning conditions before her failed the test of enforceability and were too complex and unwieldy for frequent use. However, those conditions were worded differently and were considered to lack precision. Moreover it was anticipated there that the set noise levels would be frequently exceeded, which I do not consider to be likely here.

72. I accept that the procedure for confirming and enforcing against breaches of the noise limits is complex and potentially lengthy. However one potential reason for delay would be the need to wait for weather conditions to reflect those persisting at the time of the original complaint before undertaking the necessary noise measurements. I do not regard that as causing unreasonable harm for residents since, if the harmful noise is only experienced in particular weather conditions, it would not be suffered when those conditions are absent. The more frequently the harmful noise occurs, the easier it would be to measure its effects. Moreover it would be quicker to serve a breach of condition notice (against which there is no appeal) rather than to follow the enforcement provisions for a S106 obligation. I conclude that conditions can be adequately enforceable. Neither do I consider that they are unreasonable, particularly as I consider that the Circular 11/95 test of reasonableness is directed primarily at the effect on the developer rather than at the interests of third parties.

73. With reference to other BATTLE comments, I do not consider that it is necessary to add a requirement that the list of consultants be updated during the life of permission since any such need could be addressed as and when it arose. Neither is it reasonable to exclude the use of the professional noise

consultants who made the original assessment. I consider that it would be impractical to define in the guidance notes which atypical 'noise outliers' such as the dawn chorus or helicopters should be excluded. It would be for the acoustician to show that the results were robust having regard to such considerations. The reference in Note 1(b) to the specification by the Local Planning Authority of the conditions under which the survey shall be carried can have regard to wind shear amongst other factors. I have amended the wording of Condition 24(vi) to provide for the measuring of wind speed and data at 2 heights to be approved by the local planning authority.

74. For these reasons I conclude that it is necessary and reasonable to attach a planning condition to control noise and that this would be effective and preferable to the submitted S106 unilateral undertaking. The terms of that undertaking provide that it would not come into effect if such a planning condition is applied. No condition is necessary in respect of amplitude modulation.

Outlook

75. It is a well-established planning principle that there is no right to retain unchanged a view from private property. However it can be in the public interest to safeguard the outlook from such property in respect of unacceptably overbearing or dominating development. I saw that some private residences such as Munkins currently enjoy very open outlooks towards the proposed site of the turbines although at others such as Cricketers Cottage the outlook is at least partially restricted by buildings or planting within their private gardens or at neighbouring property. The visual impact on individual properties will vary for that reason and also according to the varying separation distances and orientations of the dwellings and their main rooms and gardens.

76. I acknowledge that the Inspector for the dismissed Market Drayton appeals (APP/L3245/A/08/2088742) concluded that there would be unacceptable harm to outlook at distances of about 700m from 100m high turbines whereas the Inspector for the allowed Den Brook appeal (APP/Q1153/A/08/2107162) (decided 22 March 2007) concluded that 120m high turbines would not result in unacceptable living conditions for occupiers at a similar 700m distance. The latter Inspector subsequently concluded at the North Dover Appeal that turbines there would have been unacceptably dominant at distances of 360-570m. I am not aware of all the circumstances of these cases. However whilst I appreciate that the view for occupiers of the nearest dwellings here such as Munkins Farm (630m) and Eastlands (710m) would be negatively affected, I do not consider that the turbines would be unacceptably overbearing or dominating of their outlook. At other more distant dwellings such as Packards the wind farm would be seen as a smaller element in a wide view across the marsh. Whilst the environment of these dwellings would certainly change, the wind farm should not make them unattractive places to live.

Conclusions

77. Whilst noise levels would noticeably exceed low background noise levels at some dwellings at some times, the proposed noise limits would be reasonable for this scale of development and it is likely that the limits defined by ETSU can be achieved. The opportunity to operate the turbines in reduced noise mode at

reduced output provides a safety margin if the limits are found to be exceeded in practice. Whilst it might necessarily take time to assess and rectify any infringements owing to the need to await suitable weather conditions, if such conditions are scarce, then the associated excess noise would be endured for shorter periods. The risk of excess amplitude modulation is small, is unlikely to affect more than a few people if it occurs at all, and should be capable of rectification using statutory nuisance powers. Whilst I do not conclude that there would be no risk of harm to living conditions in respect of noise, the risk of significant or prolonged harm would be acceptably small. Whilst there would be a negative effect on outlook for some residents, the wind farm would not be unacceptably dominating or overbearing so as to contravene the public interest in that regard. I nevertheless conclude that the risk of some harm in these respects means that there would be literal conflict with some relevant criteria of LP Policy PU6.'

d) Aviation

Safety

78. Saved LP Policy CON7 provides that planning permission will not be granted for wind farms if (amongst other things) the proposed development would have a detrimental effect on the safe operation of the relevant airport. Paragraph 96 of the Technical Annex to the Companion Guide to PPS22 places the onus on the applicant to prove that the proposal will have no adverse effect on aviation interests.

79. The wind farm would be in line of sight of the primary radar at London Southend Airport (LSA). When turning, one or more of the turbines would often paint on the radar. These images might resemble moving aircraft and thus would not be filtered out of the radar display. The airport is not equipped with secondary surveillance radar that would identify and give height information for aircraft and in any event many of the aircraft operating in the area are not suitably equipped to transmit that information. There has been no agreement between the Appellant and LSA that any form of technical mitigation is both necessary and possible. In particular, whilst in-fill technology has been applied at Glasgow Airport, LSA's present analogue radar is not readily compatible with digital infill radar. It would need to be replaced by a plot extracted system. However there is no current plan for such provision.

80. Since the previous Inquiry, the Civil Aviation Authority has revised its CAP 764 Policy and Guidelines on Wind Turbines. The main safety concerns of LSA relate to paragraph 1.8 of that document in that the resulting clutter may conceal an aircraft within the clutter. If, in those circumstances, pilots were relying on a radar service from LSA rather than visual flight rules to maintain separation and if the LSA Air Traffic Control Officer (ATCO) misinterpreted the radar display, then LSA considers there could be a risk of collision between aircraft. However that risk is disputed by the Appellant's witness who considers that the radar impacts are well within the normal capabilities of the ATCOs to handle them.

81. LSA does not at present control the airspace around the airport. However there is controlled airspace at higher altitudes above 5,500ft which is busy with aircraft over-flying on their way to and from the principal London Airports.

Most air traffic currently using LSA comprises smaller aircraft for business, leisure or training purposes. There are also movements in the area of other small aircraft including helicopters and microlights. Many aircraft have no contact with LSA and rely on visual flight rules to maintain separation from other aircraft. Others only seek a low order of radar service. LSA only rarely provides a full Radar Deconfliction Service that seeks to maintain horizontal separation between aircraft of 5nm or more (about 1-5% of all flights or 185 times a year). However this could increase as the airport also has ambitions to extend its runway to attract larger aircraft on scheduled or charter services (see below). In that event, with the anticipated growth of passenger numbers, the airport is likely to upgrade its radar equipment and to apply for control of its airspace. In the meantime, proposals to create a holding area close to Bradwell for aircraft waiting to land at London City Airport have been deferred and that facility might be provided elsewhere.

82. The wind farm would be within a zone of restricted airspace around Bradwell Nuclear Power Station that extends up to 2000ft. Most air traffic is excluded and would need to either fly around the restricted area or to over-fly it at a greater height. This would include recreational aircraft flying along the coast, air-show traffic, and those practising aerobatics over the sparsely populated peninsula. Most of these aircraft would be operating under visual flight rules. Some aircraft are allowed to enter the restricted area below 2000ft, including emergency services helicopters or those associated with use of the power station. These aircraft would operate regularly in the area. However this exception apparently does not apply to low flying military aircraft which remain excluded.

83. Lighting mounted on the towers would have the potential to draw additional attention to the wind farm in an otherwise dark area when seen from the ground, especially if the lights appear to flash when interrupted by the passage of the turbine blades. This could be mitigated to some degree by the use of low power lighting directed at those (typically military aircraft) with night vision equipment. However there is a lack of evidence before me to assess the visual impact of such lights. The submitted proposals do not include lighting and I do not propose to require them as a condition. However in the event that the Ministry of Defence or others were to provide a more compelling safety case to fit lighting in the future, in circumstances where planning permission might not be needed, I propose a condition which would require the consent of the Local Planning Authority who could then weigh the relevant safety and environmental considerations.

84. The Appellant does not now dispute that the turbines could interfere with the radar display within a number of clutter cells. However it is disputed whether aircraft would necessarily be concealed. Since the previous Inquiry, the Gunfleet Sands wind farm has been installed and that also paints on the LSA radar. LSA does not object to that development which is further from the airport and is in an area with reduced local air traffic. However there is evidence before me of an exercise to establish whether a Cessna 152 light plane was concealed when it flew over those turbines. The submitted images suggest that the plane was intermittently missed in some sweeps of the radar but that it remained visible at other times. Nevertheless, as previous sweeps

remained visible, the loss of one or more sweeps did not remove all evidence of the presence of an aircraft from the display.

85. There also appear to be characteristic differences between the images of the wind turbines and those of moving aircraft, not least the size of the images and the longer tracks made by aircraft across the screen. The positions of the turbines are easily marked permanently on the display and I conclude that ATCOs would rapidly become familiar with these differences. It seems highly improbable that aircraft might enter the area undetected and then circle (or hover) entirely within the clutter cells (and above the restricted airspace) and thereby be concealed for longer periods. Moreover light aircraft are more likely to be travelling approximately N-S along the coast rather than E-W out to sea. They would thus be more likely to cross the narrow axis of the wind farm rather than its long axis. They would then only enter the clutter cells for brief periods. Evidence before the Inquiry that other UK airports operate safely with wind farms in their vicinity was not significantly challenged.

86. ATCOs already normally avoid the area proposed for the wind farm when vectoring aircraft on approach to LSA but may direct aircraft through that area on occasion. However they would not do so now if there was another aircraft already there and would not in the future had they seen an aircraft enter the area. I consider it likely that they would be able to continue to detect such aircraft over the wind farm even if the image is degraded. Should there be doubt as to the presence of such aircraft, avoiding the wind farm would reduce but not remove the options for diverting aircraft. However I consider that this would be a rare occurrence and it has not been suggested by LSA that they would establish an exclusion zone around the wind farm whenever a deconfliction service was to be provided.

Economic Effects

87. The previous Inspector was aware that LSA had ambitious expansion plans but concluded that there was a lack of evidence of real progress towards such expansion. Whilst there has since been a fall in passenger numbers, mainly due to the loss of a Ford Motor Company contract, the airport's prospects have otherwise improved in that the railway station is under construction, the airport has new owners with funds for expansion, and a planning application has been submitted to extend the runway. In the context of generally supportive development plan policies, there appears to be a real prospect of the expansion plans coming to fruition.

88. LSA remains concerned that the wind farm could hamper its expansion. However paragraph 10.1 of CAPS 764 emphasises that, whilst it is appropriate for an airport to include an assessment of economic impact, any comments made in this respect need to be unambiguous. The LSA case falls seriously short in this regard and relies heavily on vague assertion. The suggestion that some airlines might be deterred from using the airport is not supported by substantive evidence and is contradicted by the on-going expansion of comparable airports with windfarms in their vicinity, such as Newquay and Leeds-Bradford. Moreover the likelihood that the expansion of the airport would be accompanied by control of the airspace and radar improvements such as secondary radar should diminish rather than increase any risks associated with the wind farm. There is a lack of evidence to quantify assertions that any

diversion of aircraft to avoid the wind farm would materially increase fuel usage or CO2 emissions.

Conclusions

89. I conclude on this issue that the development would not have a detrimental impact on aviation interests including the safe operation of London Southend Airport and would not contravene relevant provisions of the development plan in those regards. On the information before me neither would it have a detrimental effect on the airport's proposed expansion or the associated economic benefits.

e) Ecology

90. Amongst the criteria of LP Policy PU6 are that renewable energy facilities will be permitted provided they would not (amongst other things) : '(b) (ii) have an adverse impact upon areas of ecological, …, importance'. Natural England (NE) and the RSPB had withdrawn their objections before the previous Inquiry. NE expressly stated in a letter dated 27 April 2007 that the development would not have an adverse effect on the integrity of the adjacent sites of European importance for nature conservation (Dengie SSSI/SPA/Ramsar site and the Blackwater Estuary SSSI/SPA/Ramsar site). The primary concern at the previous Inquiry related to the impact on birds. At neither Inquiry did Maldon District submit any evidence in relation to the original reason for refusal. However BATTLE submitted evidence in relation to birds and also to bats.

Birds

91. BATTLE's main concern is a risk of collision between birds and the moving turbines, particularly if a roosting flock is startled by a raptor. It appears that the circumstances have not materially changed since the previous appeal. There is also some dispute as to how far inland of the sea wall and towards the appeal site birds may roost when high spring tides cover the saltmarsh. Nevertheless whilst the loss of birds to turbine strike cannot be ruled out, there is no substantive evidence that this would occur here to an extent that would justify resisting the development.

Bats

92. Bats are protected species and the Appellant accepts that there is some generic risk of collision between bats and turbines. However the proposed turbines would be located to comply with NE guidance that there be a minimum 50m buffer between known bat foraging/commuter routes and rotor blades. BATTLE makes some criticisms of the bat surveys made in 2004-05 which did identify some bat roosts over 500m from the turbines and objects that bat habitat features and movements may have changed since then. In that regard NE has requested in a letter of 30 October 2009 that, should the appeal be successful, further comprehensive pre-construction bat surveys be provided. The letter specifies matters that the surveys should cover.

93. BATTLE refers to the cases of *R v Cornwall County Council ex parte Hardy* and *R (on the application of Simon Woolley) v Cheshire East BC*. In the Hardy case there was a recognised need for bat surveys but the Council had determined there would be no significant nature conservation effects before such surveys

were carried out. In this case surveys have been carried out and there have been no obvious changes in the physical circumstances since then. In the Woolley case it was inevitable that a licence would be needed to disturb bats and therefore the Council needed to have regard to the Habitats Directive and the three tests for granting a licence. In the present case there would be no direct or deliberate harm to bats or their habitat and no licence is likely to be needed.

Conclusions

94. I conclude based on the previous survey evidence that there is unlikely to be a significant effect on bats as a protected species. The turbines can also be sited to avoid harm to other protected species in the area including water voles and badgers. Neither do I consider that there would be any significant effect on birds or their habitats or on the integrity of the adjacent European sites. The proposals would therefore not contravene the above criterion of LP Policy PU6. Regard should also be had to the potential adverse implications of climate change for natural habitats more generally. The provision of renewable energy can reduce such risks.

f) Traffic and Transport

95. LP Policy PU6 includes the provision that renewable facilities will be permitted provided they would not (amongst other things): '(b) (i) generate an unacceptable level of … traffic; … .' Neither the Highway Authority nor the District Council have raised objections in this regard. However BATTLE and others object in relation principally to the construction traffic which would include a substantial number of heavy goods vehicles movements including a proportion of abnormally large loads.

96. Whilst much of the proposed construction access route would be on a rural Class C road, I saw that the road is generally of reasonable width and that it has previously been the subject of numerous improvements that have eased the sharper bends. These were probably prompted by the original development of the nuclear power station. I saw that this road is signposted as the main route to and from Bradwell in preference to the parallel B road through Southminster and Tillingham. That B road and connecting side roads nevertheless provide an alternative route into and out of the area should the proposed access route be obstructed by construction traffic. There is only a short stretch of road west of Bradwell garage where no such alternative route is available. I consider that the risk of significant or prolonged obstruction there is slight.

97. Studies carried out by the Appellant indicate that some street furniture would require temporary removal to facilitate the passage of abnormal loads and that other temporary upgrading works would be required at the Latchingdon Road and Maldon Road junctions. These mainly involve verge strengthening within the boundaries of the public highway. However third party land at the latter junction (adjacent to Bradwell garage) might be needed by agreement in order to allow the passage of the largest 42m turbine blades if these were selected in preference to a smaller 33.3m blade. It appeared from my site inspection that the passage of a 42m blade would also require works to lop the lower boughs of a tree at this junction which is the subject of a Tree Preservation Order.

That would not warrant the dismissal of the appeal and I consider that these studies adequately demonstrate the feasibility of providing access to the appeal site.

98. I acknowledge that heavy goods vehicles travelling to and from the power station are unlikely to use a short stretch of the access route road east of Bradwell garage at present and that some large agricultural vehicles also avoid this section of road. Consequently the proportionate increase in heavy goods vehicle movements during construction of the wind farm will be greater than elsewhere on the route. However that does not demonstrate that this section of road is inherently unsuitable. Whilst there is a group of houses close to this section of road this is not the only part of the route or the only rural road where that occurs. A condition agreed by the Appellant and the Council provides for a Traffic Management Plan to manage traffic movements associated with the construction of the development and any replacement of the equipment.

99. The Appellant and the landowners have submitted a unilateral undertaking under Section 106 of the Act which provides for before and after surveys of the highway and for the developer to meet any reinstatement costs.

Conclusions

100. I agree with the Highway Authority that the road network is capable of accommodating the extra traffic without undue risk to the safety of other drivers or pedestrians along the access route. There would be no conflict with LP Policy PU6 in that regard.

g) Benefits

101. As to the benefits, the development would facilitate the delivery of the Government's commitments on both climate change and renewable energy as set out in PPS22 and elsewhere. The benefits in reducing carbon emissions as a result of this and similar developments elsewhere would include a reduced potential harm from climate change to the landscape, cultural heritage and ecology. Notwithstanding the discontinuous nature of energy generation from wind, the energy produced by this and other wind farms would also contribute individually and cumulatively to the nation's energy needs and would reduce reliance on diminishing supplies of fossil fuel. The development would reduce the likely shortfall in provision towards EEP regional energy targets for renewable energy production. It would contribute to the large number of wind turbines likely to be needed to meet those targets in the longer term. It is immaterial in these regards that a new nuclear power station is likely to be developed nearby or that the wind farm would generate much less energy than that power station. Both would contribute to non-carbon energy production and both forms of power generation are likely to be needed to meet national targets for energy production and to replace lost production capacity elsewhere, as indicated by the draft National Policy Statement for Energy (EN-1).

Other Matters

102. I have had regard to all other matters raised at the Inquiry and in written representations but they do not outweigh my conclusions on the main issues.

In particular I acknowledge that those living along the access route would experience noise and disturbance from additional traffic and large vehicles during the construction and decommissioning phases. However these would be temporary phenomena associated with many forms of development and are not determinative in the public interest which requires that development be able to proceed. A condition can require the management of construction noise from within the construction site.

Conditions and Obligations

103. The attached schedule of conditions is based upon draft planning conditions that were submitted to the Inquiry by the parties and which were subject to discussion or written comment. The reason for each condition is included on the schedule. I have made minor wording amendments to improve the clarity of conditions.

104. I refer above to my conclusions in respect of the enforceability of noise conditions and to the reason why I have not included a condition suggested by BATTLE in respect of amplitude modulation.

105. Unilateral planning obligations have also been submitted by the Appellant under Section 106 of the Act in relation to a noise management scheme, highways reinstatement and any interference with TV reception. Apart from the noise scheme which I address above, these were agreed by the Council to suitably address the relevant concerns. I agree.

106. Where I have not included other requested conditions this is because I do not consider that they satisfy one or more of the tests for conditions set out in Circular 11/95 which require that they be necessary, relevant to planning, relevant to the development to be permitted, enforceable, precise and reasonable in all other respects.

Overall Conclusions

107. EEP Policy ENG2 supports renewable energy and sets targets for renewable energy provision, towards which this proposal would contribute. The supporting text to LP Policy PU6 also seeks to encourage renewable energy development. However I have identified conflict with some criteria of LP Policy PU6 and with the objectives of other development plan policies for the protection of the coast and countryside. Neither PU6 nor the other policies include explicit provision for balancing any of the identified harmful effects of renewable energy facilities with the environmental and other benefits of renewable energy production. However these conflicting development plan objectives themselves require a balancing exercise. National policy also requires a balancing exercise between harm and benefits and is another important material consideration that can outweigh the development plan where there is conflict.

108. The wind farm has been designed and would be located to minimise its adverse environmental impact. These include its location: where there are no nationally designated landscapes; at a sufficient distance from residential property; and by modifying the original proposal to provide an adequate buffer between the turbines and the designated nature conservation areas to the east. It would not be likely on the evidence before me to have a significant

adverse effect on ecology or aviation interests. Many of the other impacts are capable of mitigation by the application of planning conditions or the operation of planning obligations.

109. However I have concluded above that there would be some harm to the public interest locally, particularly in respect of a change in landscape character, an associated adverse visual impact for many, but not all, viewers in their appreciation of the landscape, and an adverse impact on some aspects of the setting of St Peter's Chapel which, in consequence would not be fully preserved, and would not be enhanced. These effects would diminish with distance. Also in respect of noise, immissions would at times noticeably exceed the low background noise levels currently experienced by some residents. However it remains probable that noise immissions there and generally would not exceed the limits that ETSU defines as allowing reasonable living conditions. If they did exceed such limits, operational noise reduction measures would remain available. It might take time to identify and control such noise, particularly if it occurs only in rare weather conditions and that could risk temporary harm to living conditions. There is also a slight risk that excess amplitude modulation might occur and affect a few people but that could be addressed using environmental legislation if it constitutes a statutory nuisance.

110. The identified harm would be mainly local in its impact and I do not doubt that it would be keenly felt by those affected. However the benefits would be of much wider application. If renewable energy is to achieve the goal of substantially reducing carbon emissions whilst maintaining energy supplies it will need to be supplied from many sources including on-shore and off-shore wind turbines. The Arup study illustrates the likely scale of provision needed in eastern England alone over the coming years whilst also highlighting the main constraints to provision. In that context a wind farm of this scale and output would be of significant benefit for its contribution to the provision of renewable energy in order to address regional and national targets for its provision. I conclude that the identified harm and associated conflict with the development plan is limited and would be here outweighed in the wider public interest by the benefits. These would also include the benefits that reducing climate change could have for the conservation of landscape, cultural heritage and natural habitats. For these reasons I conclude that the appeal should be allowed.

R P E Mellor

INSPECTOR

Schedule of Conditions

Scope and Duration

1. The development hereby permitted shall be begun before the expiration of three years from the date of this permission.

   Reason: To comply with section 91 of the Town and Country Planning Act 1990 (as amended).

2. The date when electricity from the development is first exported to the local electricity grid network, hereafter known as the "operational date", shall be notified in writing to the Local Planning Authority within 28 days after its occurrence.

   Reason: To establish the commencement date for the 25 year operational life of the wind farm.

3. This permission shall expire no later than 25 years from the operational date. Within 12 months of the expiration of the permission, all elements of the development at and above ground level shall be removed and the land restored, in accordance with the Decommissioning Method Statement required by Condition 19.

   Reason: For the avoidance of doubt and to establish the duration of the planning permission and in the interests of safety and amenity once the plant is redundant.

4. If any wind turbine hereby permitted fails for a continuous period of 12 months to produce electricity for supply to the local electricity grid network, then, unless otherwise agreed in writing with the Local Planning Authority, that wind turbine and the ancillary equipment solely relating to that wind turbine shall be removed from the site and the land shall be reinstated within a period of 6 months from the end of the 12 month period in accordance with a scheme that shall have been submitted to and approved in writing by the Local Planning Authority prior to the commencement of the works. The scheme shall include management and timing of the works and a traffic management plan, and shall be implemented as approved.

   Reason: To ensure removal of redundant equipment in the interests of amenity and protection of the local environment.

Design, Layout and Grid Connection

5. Notwithstanding the submitted illustrative Drawing REN/BRA/0040/A, no turbine foundations or turbines shall be erected until the technical specification, size, design, external appearance, surface finish and colour of the turbines and foundations, in addition to details of the design measures to withstand flooding (in relation to turbines and foundations), as set out in the planning application and assessed in the Environmental Statement have been submitted to and approved in writing by the Local Planning Authority. No name, sign, symbol or logo shall be displayed on any external surfaces of the turbines other than those to meet statutory health and safety requirements. Development shall be carried out only in accordance with the approved details

   Reason: In the interests of visual amenity.

6. All wind turbine blades shall rotate in the same direction.

   Reason: In the interests of visual amenity.

7. The turbines and access tracks shall be sited within 30 metres of the locations indicated on Drawing REN/BRA/0043/A submitted with the planning application in positions which shall first have been submitted to and approved in writing by the Local Planning Authority and which shall have regard to the results of the further archaeological investigation and ecological surveys required by other conditions of this permission. The distance between the centre lines of turbine towers shall at no time be less than three times the diameter of the rotors. No part of any turbine shall encroach beyond the red line site boundary as shown on Drawing REN/BRA/0039A.

   Reason: To safeguard archaeological and ecological interests whilst maintaining the minimum space between turbines in accordance with the guidance in the Companion Guide to Planning Policy Statement 22.

8. No development other than the access works defined in Condition 18 shall take place until details of the materials to be used for the construction of the turbine and anemometry mast foundations, hardstandings and access tracks and the design, external appearance, materials, colours and surface finishes of all buildings and means of enclosure have been submitted to and approved in writing by the Local Planning Authority. The development shall be carried out only in accordance with the approved details.

   Reason: In the interest of visual amenity.

9. No development shall take place until details of the site compound, including its surfacing and drainage and any temporary structures to be erected, have been submitted to and approved in writing by the Local Planning Authority. The development shall be carried out in accordance with the approved details. The compound shall be removed and the land restored within a period of twelve months from the operational date in accordance with a scheme previously agreed in writing by the Local Planning Authority.

   Reason: In the interest of visual amenity and to ensure the compound is removed once redundant.

10. No development shall take place until the method of connecting the installation to the local electricity grid network has been notified to the Local Planning Authority in writing. Details of the on-site substation and new tower, if required, as indicated on submitted Drawing REN/BRA/0042A and including the control building to be erected in the position shown on submitted Drawing REN/BRA/0043/A shall be submitted to and approved in writing by the Local Planning Authority and the development shall be carried out in accordance with the approved details. With the exception of the connections within the substation and between the substation and the 132kV line all cabling shall be laid underground.

    Reason: In order to ensure a satisfactory appearance in the landscape.

11. The anemometry mast shown on submitted Drawing REN/BRA/0041/B shall not be installed before details of its colour and finish and the means of obtaining readings at 2 different heights have been submitted to and approved in writing by the Local Planning Authority. The development shall be carried out only accordance with the approved details.

    Reason: In the interest of visual amenity.

12. The turbines, anemometry mast and substation shall not carry any form of external illumination except as may first be approved in writing by the Local Planning Authority.

Reason: In the interest of visual amenity.

Construction

13. No development shall take place until a Construction Method Statement has been submitted to and approved in writing by the Local Planning Authority. The statement shall include details of:

i) a Site Environmental Management Plan to include details of measures to be taken during the construction period to protect wildlife, habitats and hydrology; an ecological survey; an investigation and monitoring scheme to oversee and direct construction works; and details of soil handling, storage and restoration;

ii) access to the site from the adjacent highway and parking arrangements for site personnel, contractors and visitors and arrangements for the delivery and removal of materials;

iii) arrangements for the loading, unloading and storage of plant and materials;

iv) measures to be taken to give advanced notification of road closures on the road network to the site;

v) the provision and use of wheel-washing facilities for construction traffic;

vi) measures to be taken to protect the users of Public Footpath 19 Bradwell-on-Sea during the construction of the development to include segregation, warning signs, waymarking and/or temporary diversion details; and

vii) a construction noise management plan;

viii) a programme to inform the Ministry of Defence, London Southend Airport and the Civil Aviation Authority of: the dates that construction starts and ends; the maximum height of construction equipment; and the latitude and longitude of every turbine as constructed.

The approved provisions of the Construction Method Statement shall be implemented and maintained for the duration of the construction works.

Reason: In the interests of highway and aviation safety, residential and visual amenity and protection of the environment.

14. Construction work shall only take place between the hours of 08:00 – 18:00 on Monday to Friday inclusive and 08:00 – 13:00 hours on Saturdays with no such construction work on a Sunday or a national or Bank Holiday. Outwith these hours, works at the site shall be limited to emergency works and dust suppression, unless otherwise approved in writing by the Local Planning Authority. The Local Planning Authority shall be informed in writing of emergency works within three working days of their occurrence.

Reason: To minimise disturbance to residents in the vicinity of the wind farm.

15. The delivery of any construction materials or equipment for the construction of the site, other than turbine blades, nacelles and towers, shall be restricted to the hours of 08:00 – 18:00 on Monday to Friday inclusive, 08:00 – 13:00 hours on Saturdays with no such deliveries on a Sunday or a national or Bank Holiday unless otherwise approved in writing by the Local Planning Authority having been given a minimum of two working days notice of the proposed delivery.

Reason: To minimise disturbance to residents in the vicinity of and on the route to the wind farm.

Flood Risk

16. The sub-station shall be constructed with a minimum finished floor level of 3.49m AOD in accordance with section 4.3 of the Flood Risk Assessment in Volume 2 of the Environmental Statement.

Reason: To reduce the risk of damage by flooding.

Archaeology

17. No development shall take place within the application site until the applicant, or their agents or successors in title, has secured the implementation of a programme of archaeological work, comprising a staged programme of archaeological mitigation which shall include, as necessary, provision for exploratory trenching, preservation in situ of archaeological remains and/or appropriate excavation and recording. This work shall be undertaken in accordance with a written scheme of investigation which has been submitted to and approved in writing by the local planning authority.

Reason: The site is of archaeological interest.

Access

18. (a) No works, other than any archaeological work required by Condition 17 and those in connection with the construction of the vehicular access from the public highway to the site, shall commence until that access has been provided in accordance with a scheme that has first been submitted to and approved in writing by the Local Planning Authority. The scheme shall include details of: its width; surfacing; the positioning of gates and visibility splays and their subsequent treatment post-construction; and a programme for implementation. The scheme shall be implemented and maintained in accordance with the approved details.

(b) Within 6 months of the operational date a scheme for landscaping at the Maldon Road entrance and the area around the control building/sub station site, including a programme for its implementation, shall be submitted to and approved in writing by the Local Planning Authority. The approved landscaping scheme shall be implemented in accordance with the approved programme. If within a period of 5 years from the date of planting, any tree or plant is removed, uprooted, destroyed or dies, another of the same species and size shall be planted at the same place, unless the Local Planning Authority gives its written consent to any variation.

Reason: In the interests of highway safety and to protect the character and appearance of the area.

Decommissioning

19. At least 12 months preceding the date of expiry of this permission, a Decommissioning Method Statement shall be submitted to the Local Planning Authority, to include: a noise management plan; a traffic management plan for decommissioning; details of the restoration of the site, including measures to be taken to safeguard wildlife habitats; and a timetable for its implementation. The decommissioning of the development shall be implemented and maintained in accordance with the approved details.

Reason: To ensure the development is decommissioned in an acceptable manner in the interests of highway safety, nature conservation interests and visual amenity.

Shadow Flicker

20. No electricity shall be exported to the local grid until a written scheme has been submitted to and approved in writing by the Local Planning Authority setting out the protocol for the assessment of shadow flicker in the event of any complaint from the owner or occupier of any lawfully occupied dwelling which existed or had permission at the time of planning permission, including remedial measures. Operation of the turbines shall take place in accordance with the agreed protocol unless the Local Planning Authority gives its prior written consent to any variations.

Reason: In the interests of nearby residential amenity to restrict the impact of shadow flicker.

Traffic Management

21. No development shall take place until a Traffic Management Plan relating to the management of traffic movements associated with the construction of the development and any replacement of blades, nacelles or towers to and from the trunk road network (A12) (including off-site measures to accommodate very large vehicles) has been submitted to and approved in writing by the Local Planning Authority. The Traffic Management Plan shall include:-

i) A comprehensive study of the proposed access route from the A12 Trunk Road to the application site to identify locations where highway works will be required or where highway infrastructure/street furniture will require temporary removal or replacement with removable street furniture to facilitate passage by abnormal loads.

ii) Provision for a trial run of the design vehicle to the application site using the access route, which shall be notified to the Local Planning Authority 14 days prior to the trial run. If, as a result of the trial run, further highway works are identified these must be reported to the Local Planning Authority and agreed measures must be carried out prior to the first delivery of any component by the design vehicle.

iii) Details of the measures to be taken to manage and control construction traffic on the proposed construction route and site access to include construction traffic routes and signage, abnormal load traffic management, warning signage, diversion routes and signage and proposals for temporary speed limits/ traffic regulation orders. The details shall also include measures to reinstate signs, verges and lamp standards and any other items displaced from the highway and a programme for their reinstatement.

iv) Following completion of the development and the requirement for the highway works referred to above the reinstatement of the highway in a manner and in accordance with a timetable to be agreed by the Local Planning Authority.

The development shall be carried out in accordance with the approved Traffic Management Plan.

Reason: In order to ensure adequate traffic management in the interests of other road users and pedestrians.

Ecology

22. The development hereby permitted shall not commence until a specification for protected species surveys for badgers, bats and water voles to be carried out has been submitted to and approved in writing by the Local Planning Authority. The survey results and a programme of mitigation work to address significant issues identified by the surveys shall be submitted to and approved in writing by the Local Planning Authority. The surveys will be undertaken by a suitably qualified ecologist in the last suitable season prior to site preparation and construction work commencing, and the approved programme of mitigation work shall be implemented in full.

Reason: For the protection of nature conservation interests.

23. No development shall take place until a written Habitat Management Scheme to include a programme of works providing for the enhancement of existing hedgerows and the establishment of grassland strips along field margins and between site tracks and field margins to be seeded with a species-rich plant mix has been submitted to and approved in writing by the Local Planning Authority. Development shall be carried out in accordance with the approved details and programme.

Reason: For the protection of nature conservation interests.

Noise

24. The rating level (as defined in the Glossary of PPG24: 'Planning and Noise') of noise immissions resulting from the combined effects of the wind turbines (including the application of any tonal penalty) when determined in accordance with the attached Guidance Notes shall not exceed the values set out in Tables 1 and 2 below and:

i) No electricity shall be exported to the local grid network until the wind farm operator has submitted to the Local Planning Authority for written approval a list of proposed independent consultants who may undertake compliance measurements in accordance with this condition. Amendments to the list of approved consultants shall be made only with the prior written approval of the Local Planning Authority.

ii) Within 21 days from receipt of a written request of the Local Planning Authority following a complaint to it alleging noise disturbance at a dwelling which lawfully exists or has planning permission at the date of this consent, the wind farm operator shall at its expense employ an independent consultant approved by the Local Planning Authority to assess the rating level of noise immissions from the wind farm in accordance with the procedures described in the attached Guidance Notes. The written request from the Local Planning Authority shall include a statement as to whether, in the opinion of the Local Planning Authority, the noise giving rise to the complaint contains or is likely to contain a tonal component.

iii) Where a dwelling to which a complaint is related is not listed in the Tables attached to these conditions, the wind farm operator shall submit to the Local Planning Authority for written approval proposed noise limits from those listed in the Tables to be adopted at the complainant's dwelling for compliance checking purposes. The proposed noise limits are to be those limits selected from the Tables specified for a listed location which the independent consultant considers as being likely to experience the most similar background noise environment to that experienced at the complainant's dwelling. The submission of the proposed noise limits to the Local Planning Authority shall include a written justification of the choice of the representative background noise environment provided by the Independent Consultant. The representative background noise environment and proposed noise limits shall be approved in writing by the Local Planning Authority. The rating level of noise immissions resulting from the combined effects of the wind turbines when determined in accordance with the attached Guidance Notes shall not exceed the noise limits approved in writing by the Local Planning Authority for the complainant's dwelling.

iv) Prior to the commencement of any measurements to be undertaken in accordance with these conditions, the wind farm operator shall submit to the Local Planning Authority for written approval the proposed measurement location identified in accordance with the Guidance Notes where measurements for compliance checking purposes shall be undertaken. Measurements to assess compliance with the noise limits set out in Tables 1 and 2 attached to these conditions or approved by the Local Planning Authority pursuant to paragraph (iii) of this condition shall be undertaken at the measurement location approved in writing by the Local Planning Authority.

v) The wind farm operator shall provide to the Local Planning Authority the independent consultant's assessment of the rating level of noise immissions undertaken in accordance with the Guidance Notes and paragraph (ii) above within 3 months of the date of the written request of the Local Planning Authority unless otherwise extended in writing by the Local Planning Authority. The assessment shall include all data collected for the purposes of undertaking the compliance measurements and certificates of verification and calibration of the instrumentation used to undertake the compliance measurements as required by paragraph 1(b) of the attached Guidance Notes.

vi) The wind farm operator shall continuously log wind speed, wind direction and rainfall at the permanent meteorological monitoring mast erected in accordance with this consent and shall continuously log power production, nacelle windspeed, nacelle wind direction and nacelle orientation at each wind turbine all in accordance with paragraph 1(e) of the attached Guidance Notes. These data shall be retained for the life of the planning permission. The wind farm operator shall provide this information in the format set out in paragraph 1(f) of the attached Guidance Notes to the Local Planning Authority on its request within 14 days of receipt in writing of a request. The recording of wind speed and direction at the meteorological monitoring mast shall be at 2 heights which shall first have been approved by the local planning authority in writing such that wind shear data can be accurately calculated.

vii) Where a further assessment of the rating level of noise immissions from the wind farm is required pursuant to paragraph 4(c) of the attached Guidance Notes, the wind farm operator shall submit a copy of the further assessment within 42 days unless otherwise extended in writing by the LPA.

Reason: To protect the living conditions of local residents.

Table 1 - Between 23:00 and 07:00 hours (Noise Level in dB $L_{A90, 10min}$)

	Wind Speed (m/s) at 10m height within the site averaged over 10 minute periods											
Location (easting, northing grid coordinates)	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**
	L_{A90} Decibel Levels											
Eastlands (602355, 207572)	43	43	43	43	43	43	45	49	51	52	52	52
Hockflete (601394, 206683)	45	45	45	45	45	45	45	45	48	49	49	49
Delameres Farm (600038, 206327)	43	43	43	43	43	43	45	46	46	46	46	46
Packards (600250, 204950)	43	43	43	43	43	43	43	43	46	50	50	50
Dots and Melons (600657, 204448)	43	43	43	43	43	43	43	46	48	48	48	48
Marsh House (601485, 203597)	43	43	43	43	43	43	43	45	49	52	52	52
Howe Farm (601574, 202603)	43	43	43	43	43	43	43	43	46	49	49	49
Sandbeach (602369, 205341)	43	43	43	43	43	43	45	48	51	52	52	52
Linnet's Cottage (603151, 208057)	43	43	43	43	43	43	45	49	51	52	52	52
Munkins Farm (602046, 207339)	43	43	43	43	43	43	45	49	51	52	52	52
Bacons Chase (600866, 206664)	43	43	43	43	43	43	43	45	48	49	49	49
Fairview (601304, 206807)	43	43	43	43	43	43	43	45	48	49	49	49

Table 2 - At all other times (Noise Level in dB $L_{A90, 10min}$)

	Wind Speed (m/s) at 10m height within the site averaged over 10 minute periods											
Location (easting, northing grid coordinates)	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**
	L_{A90} Decibel Levels											
Eastlands (602355, 207572)	40	40	40	40	40	41	45	48	51	53	54	54
Hockflete (601394, 206683)	45	45	45	45	45	45	45	45	47	49	51	52
Delameres Farm (600038, 206327)	40	40	40	40	42	45	47	50	53	55	56	57
Packards (600250, 204950)	40	40	40	40	40	40	40	42	44	46	48	49
Dots and Melons (600657, 204448)	40	40	40	40	40	41	44	47	50	52	54	55
Marsh House (601485, 203597)	40	40	40	40	40	40	41	44	47	49	50	50
Howe Farm (601574, 202603)	40	40	40	40	40	40	40	42	45	47	48	48
Sandbeach (602369, 205341)	40	40	40	40	40	41	44	48	51	54	56	57
Linnet's Cottage (603151, 208057)	40	40	40	40	40	41	45	48	51	53	54	54
Munkins Farm (602046, 207339)	40	40	40	40	40	41	45	48	51	53	54	54
Bacons Chase (600866, 206664)	40	40	40	40	40	40	41	44	47	49	51	52
Fairview (601304, 206807)	40	40	40	40	40	40	41	44	47	49	51	52

Note to Tables 1 and 2: The geographical co-ordinates references are provided for the purpose of identifying the general location of dwellings to which a given set of noise limits applies. The wind speed at 10 metre height within

the site refers to the wind speed measured at 10 metre height at the permanent meteorological monitoring mast erected in accordance with the planning permission on the wind farm site.

SCHEDULE OF GUIDANCE NOTES RELATING TO CONDITION 24

These notes are to be read with Condition 24. They further explain these conditions and specify the methods to be deployed in the assessment of complaints about noise immissions from the wind farm.

NOTE 1

(a) Values of the $L_{A90,10min}$ noise statistic shall be measured at the approved measurement location using a sound level meter of BS EN 60651/BS EN 60804 Type 1, or BS EN 61672 Class 1 standard (or the equivalent UK adopted standard in force at the time of the measurements) set to measure using a fast time weighted response as specified in BS EN 60651/BS EN 60804 or BS EN 61672-1 (or the equivalent UK adopted standard in force at the time of the measurements). The sound level meter shall be calibrated in accordance with the procedure set out in Note 1(b).

(b) The entire sensitivity of the acoustical and electrical systems which make up the sound level meter shall be checked during a compliance measurement survey which shall be accomplished by applying an acoustic calibrator conforming to BS EN 60942 (or the equivalent UK adopted standard in force at the time of the measurements) to the microphone to check the sensitivity of the sound level meter system before and after the period of measurements. The difference in the noted sensitivities of the measurement system shall be recorded and the difference shall not exceed 1 dB during the compliance measurement survey period. The performance of the sound level meter shall have been verified to ensure it is operating in accordance with BS EN 60651/BS EN 60804 Type 1, or BS EN 61672-1 Class 1 standard (or the equivalent UK adopted standard in force at the time of the measurements) within the preceding 24 months prior to any periods during which data is obtained. The performance of the acoustic calibrator used to check the sensitivity of the acoustical and electrical systems which make up the sound level meter shall have been verified to ensure it is operating in accordance with BS EN 60942 (or the equivalent UK adopted standard in force at the time of the measurements) within the preceding 12 months prior to any periods during which data is obtained. Verification of the sound level meter and the acoustic calibrator shall be undertaken by a calibration laboratory which is accredited by the United Kingdom Accreditation Service to undertake such testing to ensure the verification results are traceable to national standards for sound in air defined by the National Physical Laboratory

(c) The microphone shall be ½" in diameter and shall be mounted at 1.2 - 1.5 metres above ground level, fitted with a two layer windshield or suitable equivalent. The two layer windshield or suitable equivalent shall be approved in writing by the Local Planning Authority prior to the commencement of measurements. The microphone shall be fitted with the approved windshield and shall be placed outside the complainant's dwelling and be not more than 35 metres from it. The microphone shall be placed at least 3.5 metres away from the building facade or any reflecting surface except the ground. In the event that the consent of the complainant for access to his or her property to undertake compliance measurements is withheld, the wind farm operator shall submit for the written approval of the Local Planning Authority details of the proposed alternative representative measurement location prior to the commencement of measurements. The measurements shall be undertaken at the approved alternative representative measurement location.

(d) The $L_{A90,10min}$ measurements shall be synchronised with measurements of the 10-minute wind speed, wind direction, rainfall and power generation data from the turbine control systems of the wind farm.

(e) To enable compliance with the noise condition to be evaluated, the wind farm operator shall continuously log arithmetic mean wind speed in metres per second (ms^{-1}), arithmetic mean wind direction in degrees from north and rainfall data in each successive 10-minute periods by direct

measurement of 10 metre height wind speeds and direct measurement of hub height wind direction and direct measurement of rainfall at the permanent meteorological monitoring mast erected in accordance with the planning permission on the wind farm site. The wind farm operator shall continuously log arithmetic mean nacelle anemometer wind speed, arithmetic mean nacelle orientation, arithmetic mean wind direction as measured at the nacelle and arithmetic mean power generated during each successive 10-minute periods for each wind turbine on the wind farm. The rainfall detection system to be installed at the permanent meteorological mast erected in accordance with the planning permission on the wind farm site shall be approved by the Local Planning Authority prior to the first export of electricity from the development to the local electricity distribution network. All 10-minute periods shall commence on the hour and in 10 minute increments thereafter synchronised with Greenwich Mean Time.

(f) Data provided to the Local Planning Authority in accordance with paragraph (v), (vi) and (vii) of the noise condition shall be provided in comma separated values in electronic format.

NOTE 2

(a) The noise measurements shall be made so as to provide not less than 20 valid data points as defined in Note 2 paragraph (b).

(b) Valid data points are those measured during the conditions specified by the Local Planning Authority in its written request but excluding any periods of rainfall measured at the permanent meteorological mast erected in accordance with the planning permission on the wind farm site. These specified conditions shall include the range of wind speeds, wind directions, times of day and power generation. In specifying such conditions the Local Planning Authority shall have regard to those conditions which prevailed during times when the complainant alleges there was disturbance due to noise.

(c) A least squares “best fit” polynomial curve of an order deemed appropriate by the independent consultant shall be fitted to the data points and used to define the wind farm noise level at each integer wind speed.

NOTE 3

(a) Where, in the opinion of the Local Planning Authority as advised to the wind farm operator in its written request under paragraph (B) of the noise condition, wind farm noise immissions at the location or locations where compliance measurements are being undertaken contain or are likely to contain a tonal component a tonal penalty shall be calculated and applied using the following rating procedure.

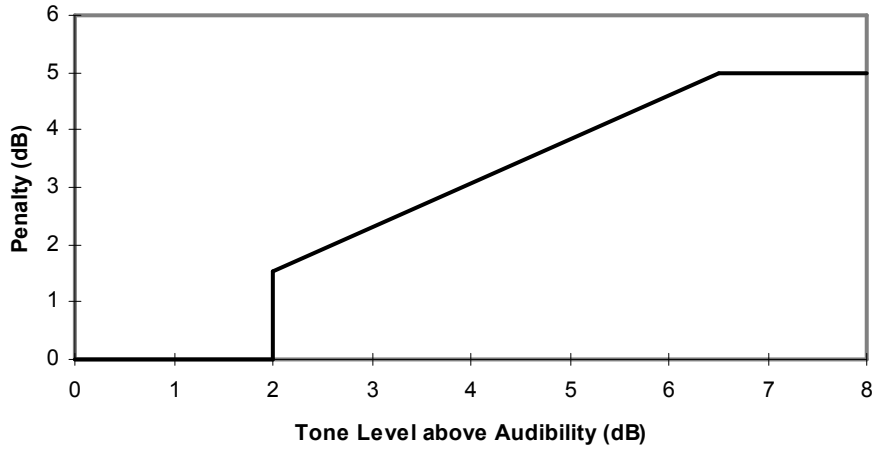
(b) For each 10-minute interval for which $L_{A90,10min}$ data have been obtained as provided for in Note 1 a tonal assessment shall be performed on noise immissions during 2-minutes of each 10-minute period. The 2-minute periods shall be regularly spaced at 10-minute intervals provided that uninterrupted clean data are available (“the standard procedure”). Where clean data are not available, the first available uninterrupted clean 2-minute period out of the affected overall 10-minute period shall be selected. Any such deviations from the standard procedure shall be reported.

(c) For each of the 2-minute samples the tone level above audibility (L_{ta}) shall be calculated in accordance with Note 5..

(d) The tone level above audibility (L_{ta}) shall be plotted against 10 metre height wind speed for each of the 2-minute samples. For samples for which the tone level was below the audibility criterion or no tone was identified, a value of zero audibility shall be substituted.

(e) A least squares “best fit” linear regression shall then be performed to establish the average tone level above audibility for each integer wind speed derived from the value of the “best fit” line. If there is no apparent trend with wind speed then a simple arithmetic mean shall be used.

(f) The tonal penalty shall be derived from the average tone level above audibility of the tone according to the figure below.



NOTE 4

(a) If a tonal penalty is to be applied in accordance with Note 3(a) the rating level of the turbine noise at each wind speed is the arithmetic sum of the measured noise level as determined from the best fit curve described in Note 2 and the penalty for tonal noise as derived in accordance with Note 3(f) above.

(b) If no tonal penalty is to be applied then the rating level of the turbine noise at each wind speed is equal to the measured noise level as determined from the best fit curve described in Note 2.

(c) In the event that the rating level of noise at the dwelling to which a complaint relates is higher at any wind speed than the limit(s) set out in the Tables attached to the conditions or the noise limits for a complainant's dwelling approved in accordance with paragraph (iii) of the noise condition, the independent consultant shall undertake a further assessment of the rating level to correct for background noise. The wind farm operator shall ensure that all the wind turbines in the development are turned off for such period as the independent consultant requires to undertake the further assessment. The further assessment shall be undertaken in accordance with the following steps:

(i) Repeating the steps in Note 2, with the wind farm switched off, and determining the background noise (L_3) at the assessed wind speed.

(ii) The wind farm noise (L_1)at this speed shall then be calculated as follows where L_2 is the measured level with turbines running but without the addition of any tonal penalty:

$$L_1 = 10\log\left[10^{L_2/10} - 10^{L_3/10}\right]$$

(iii) The rating level shall be re-calculated by adding the tonal penalty (if any is applied in accordance with Note 3) to the derived wind farm noise L_1 at that wind speed.

(iv) If the rating level lies at or below the values set out in the Tables attached to the conditions or at or below the noise limits approved by the Local Planning Authority for a complainant's dwelling in accordance with paragraph (iii) of the noise condition then no further action is necessary. If the rating level exceeds the values set out in the Tables attached to the conditions or the noise limits approved by the Local Planning Authority for a complainant's dwelling in accordance with paragraph (iii) of the noise condition then the development fails to comply with the conditions.

NOTE 5

Tonal Assessment Method

This method is based on that defined in pages 104 to 109 inclusive of ETSU-R-97. The method is to be used to assess the audibility of a tone as perceived by the average listener and to derive the tone level above audibility. There are three main steps in the procedure:

A) Frequency analysis of the noise at receiver locations.

B) Determination of the sound pressure level of the tone(s) and the sound pressure level of the masking noise within the critical band.

C) Evaluation of the difference between the tone and the masking noise sound pressure levels by comparison with a criterion curve to determine the audibility of a tone and give a value for the tone level above audibility.

The analysis shall be performed on an 'A' weighted audio recording of two minutes' duration. A two minute, RMS-averaged FFT is calculated from the sampled data using a Hanning time-window with a frequency resolution of 3.0±0.5 Hz and an analysis bandwidth of 2 kHz. Multiple short-term RMS-averaged FFT spectra within the sampled data are also calculated using the same parameters as described for the two minute, RMS averaged spectrum. This should result in an averaging time of 0.29 to 0.4 seconds for each individual short-term spectra.

The single averaged FFT spectrum and the multiple short-term FFT spectra shall then be used to assess the audibility of any tones present within the audio recording. The two minute averaged FFT shall be inspected for peaks within the spectrum to identify possible tones. The maximum value of the peaks shall be compared to the logarithmic average of the sound pressure levels of the rest of the lines within a band of frequencies centred on the peak, termed the 'critical band'. The width of the critical band is 100 Hz for tone frequencies from 20 Hz to 500 Hz and 20% of the tone frequency for frequencies above 500 Hz.

If a single tone is present the critical band is centred upon the tone. If two or more closely spaced tones are present the critical band is placed so that it contains the maximum possible amount of tonal energy. In order to do this it is first necessary to identify the tones within the spectrum. Each FFT spectral line in the two minute spectra must be classified according to the following criteria: a peak is classed as a tone if its level is more than 6 dB above the logarithmic mean average of the sound pressure levels of the rest of the lines in the critical band centred on the peak, but excluding the one line each side of the peak. If the peak qualifies as tone the adjacent lines are also classified as a tone if their level is within 10 dB of the peak and greater than 6 dB above the average level previously calculated. If a spectral line is more than 6 dB above the average masking level and more than 10 dB below the peak level it is classified as neither tone nor masking. Having identified the tones the critical band can be placed to maximise the sound pressure level of the tones within the critical band.

Because classifying a line as a tone means it can no longer be counted as masking, an iterative procedure is required for the proper identification of tones and masking:-

- **Find peaks in the spectrum** - calculate the average energy in the critical band centred on each peak, not including the two lines adjacent to the peak. If the peak is more than 6 dB above the average masking level then it is a tone. Then classify adjacent spectral lines.
- **Classify adjacent spectral lines** - compare spectral lines at frequencies above and below the peak to the average level. If a line is more than 6 dB above the average and less than 10 dB below the peak then it is a tone. If a spectral line is more than 6 dB above the average masking level and more than 10 dB below the peak level then it is classified as neither tone nor masking, and not included in the calculation for either level. Calculate the new average masking level centred around the peak, discounting adjacent spectral lines and all other lines classed as tones. Repeat this step as necessary until no more lines are reclassified.

The process described above is repeated for every critical band centred around tonal peaks in the spectrum. The result is that within each critical band every spectral line is classified as tone energy, masking energy or neither. Having identified the lines in each spectrum contributing to tonal levels, masking levels or neither, the tonal analysis can continue as follows:

The masking energy within the critical band is calculated from the two minute RMS spectrum. Calculate the masking level in the critical band (L_{pm}) correcting for a reduction in the number of lines due to the exclusion of tones and correcting for the Hanning window:

$$L_{pm} = 10\log_{10}\sum 10^{\frac{L_m}{10}} + 10\log_{10}\left[\frac{(critical\ band\ width)}{(N_m \times \Delta f)}\right] + 10\log_{10}\left(\frac{1}{1.5}\right)$$

Where: L_m = sound pressure level of each line containing masking noise
N_m = number of lines within the critical band containing masking noise
Δf = the frequency resolution of the FFT spectrum.

For each of the short term spectra of 0.29 to 0.4 seconds duration, calculate the tone energy within each critical band (L_{pt}') using the lines identified as tones from the 2-minute spectrum.

$$L_{pt}' = 10\log_{10}\sum 10^{\frac{L_t}{10}}$$

Where: L_t = sound pressure level of each line containing tonal noise.

The tone level used in the assessment (L_{pt}) is the arithmetic mean of the top 10% of tone levels (L_{pt}') from all the short-term spectra constituting the 2 minutes of data. The audibility of a tone is dependent upon the tone level difference (ΔL_{tm}) and the frequency of the tone:

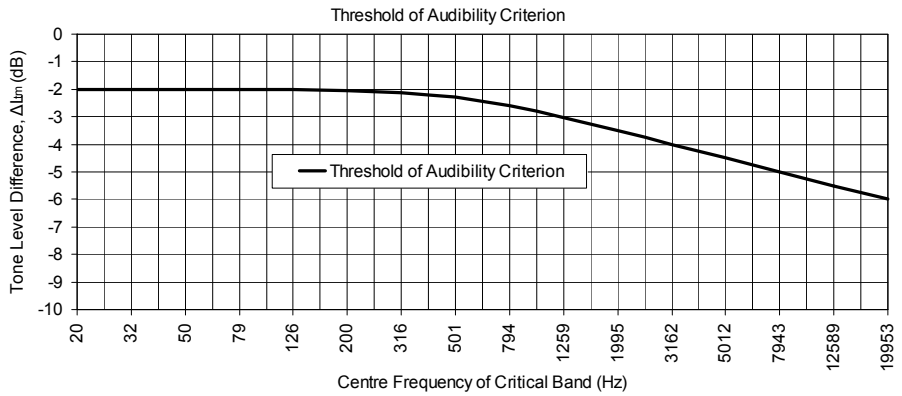
$$\Delta L_{tm} = L_{pt} - L_{pm}$$

The audibility criterion is defined as follows:

$$\Delta L_{tm,crit} = -2 - Log_{10}\left(1 + (f/502)^{2.5}\right)$$

Where: f = frequency at the centre of the critical band.

This is the level at which the average listener will be just able to hear the tone. The figure below details the audibility criterion based upon the above equation. It can be seen from the figure that the audibility criterion is related to the frequency of the tone.



The tone level above audibility (L_{ta}) can then be calculated by:

$$L_{ta} = \Delta L_{tm} - \Delta L_{tm,crit}$$

Values of the tone level above audibility (L_{ta}) shall be calculated for each of the valid data periods and for each of the tones present within the spectrum. The highest value for the tone level above audibility for the most audible tone shall be used to calculate the penalty to be applied as set out in Note 3 above.

APPEARANCES

FOR THE LOCAL PLANNING AUTHORITY:

Mr S Randle	of Counsel
He called	
Mr C Tokley DipEP MRTPI	Planning Consultant
Ms Bolger	Landscape Architect
Mr J Neale MA IHBC	English Heritage
Mr R Davis BSc(Eng) MIOA	Acoustics Consultant of Robert Davis Associates
Mr Taylor	Technical Services Manager, London Southend Airport
Mr T Clark	Air Traffic Services Manager, London Southend Airport
Mr Welch	Managing Director - London Southend Airport
Mr Kirkland	Aviation Consultant of NATS

FOR THE APPELLANT:

Mr D Hardy LL.B(Hons) Oxon	Solicitor of Cobbetts LLP
He called	
Mr D Stewart MA (Cantab) DipTP MRTPI	Planning Consultant of David Stewart Associates
Mr J Stevenson MA MPhil DipEconDev MLI MRTPI MInstEnvSci FRGS	Landscape Architect of Jeffrey Stevenson Associates Ltd
Dr J Edis BA(Hons) MA PhD	Heritage Consultant of CgMS Ltd
Mr M Spaven MA(Hons) MSc	Aviation Consultant of Spaven Consulting Ltd
Mr M Jiggins MSc MIOA	Acoustics Consultant of Hoare Lea Acoustics
Dr S Percival BSc PhD MIEEM	Principal, Ecology Consulting

FOR BATTLE :

Miss Tina Douglass	of Counsel instructed by Ms Susan Ring of Richard Buxton, Solicitors
She called	
Dr J Constable	Director of Policy and Research - Renewable Energy Foundation
Mr N Yates	Tillingham resident and representative of BATTLE
Mr d'Arcy Serrell-Watts	Bradwell resident
Mr T Oliver MA DipLA	Formerly Head of Rural Policy CPRE
Mr J Lee	Bradwell resident and former caravan park proprietor
Mrs J Davis RN RM RHV MA	Resident of Deeping St Nicholas, Lincolnshire
Mr M Stigwood	Acoustics consultant
Dr L Hoare PhD	Director of Planning - Renewable Energy Foundation
Mr G Billington MIEEM	Ecology consultant specialising in bats
Ms J Payton	Bradwell Resident
Mr D Kent	Bradwell Resident

INTERESTED PERSONS:

Mrs Witney	Mersea Resident and Coordinator of Colchester and NE Essex Friends of the Earth
Ms Mainwood	Wivenhoe resident and spokeswoman for BRARE (Bradwell for Renewable Energy)

Mrs Mullins	Mersea resident
Mr J Harrison CEng CMAREng, BTech, MIMarEST, MIDGTE	Essex resident with interest in energy generation
Mr Bailey	Tillingham resident and farmer
Mrs Cole	Tillingham resident and sheepdog trainer
Mr Mee	Tillingham resident and Parish Councillor

DOCUMENTS SUBMITTED DURING THE INQUIRY

MALDON DISTRICT COUNCIL

MDC9	Written Opening Statement
MDC10	Written Closing Statement
MDC11	Davis Draft Noise Conditions and Commentary 16 November
MDC12	Davis Noise Procedure
MDC13	Tokley View on Enforceability of Noise Conditions
MDC14	Copy of email from MDC to BATTLE dated 30 November 2009 with reference to planning conditions and BAT/19 document.
MDC15	Email of 21 December 2009 confirming that noise conditions are not agreed

NPOWER RENEWABLES LTD

NRL1	Extract from Bolger Proof for South Norfolk Inquiry
NRL2	OS 1:50,000 Colchester
NRL3	OS 1:25,000 Blackwater Estuary (+ site visit notations added by BATTLE)
NRL4	Extract from LizLake Landscape Proof to 2007 Inquiry
NRL5	Email chain between NRL and London Southend Airport
NRL6	Draft National Policy Statement for Nuclear Power Generation (EN-6)
NRL7	Draft National Policy Statement for Energy (EN-1)
NRL8	Draft National Policy Statement for Renewable Energy Infrastructure (EN-3)
NRL9	Consolidated revised draft conditions
NRL10	Comments on Stigwood Draft Conditions
NRL11	Written note of changes Stigwood 11/1 and Davis 11/2
NRL12	Tracked changes incorporating Stigwood comments and Davis comments
NRL13	Revised Noise S106 Unilateral Undertaking submitted on Day 12
NRL14	Written Opening Statement
NRL15	Natural England Letter of 30 October 2009
NRL16	Written Closing Statement
NRL17	S106 Obligations 17/1 Television; 17/2 Highways; 17/3 Noise Unilateral; 17/4 Noise Agreement
NRL18	Email correspondence dated 26 November 2009 with attached draft Version 3 planning conditions
NRL19	Email correspondence dated 27 November 2009 with attached planning conditions reference 3598770_1.DOC

BATTLE

BAT/1/1	The UK Renewable Energy Strategy 2009 p72
BAT/3/8	Bradwell Lodge, Print and Script by W Angus Sculp
BAT/4/7	CPRE email confirming up to date map used in evidence (Oliver)
BAT/6/5a	Draft Noise Condition for Amplitude Modulation (Stigwood)
BAT/6/5b	Rationale to AM condition (Stigwood)
BAT/6/6a	Draft general noise condition (Stigwood)
BAT/6/6b	Rationale for general noise condition (Stigwood)
BAT/6/7	Comparison of predicted LAeq wind turbine noise measurements undertaken by MAS Environmental Document date 12 November 2009 (Stigwood)
BAT/6/8	Proposed conditions following MDC advice 11 November (Stigwood)
BAT/6/9	Document on MDC conditions received on 17 November (Stigwood)
BAT/11/4	Little Blakenham Pit

BAT/11/5	Bat Migration Document
BAT/12/11	Number10.gov.uk – Wind farm health petition response (Hoare)
BAT/12/12	Euronoise 2009 Van den Berg Conference Paper 'Why is wind turbine noise noisier than other noise?' (Hoare)
BAT/13	Report on Tranquillity Mapping Methodology (Oliver)
BAT/14	Written Opening Statement
BAT/15	Written Closing Statement
BAT/16	Copies of emails to show when Stigwood comments sent to NRL
BAT/17	Regina v Cornwall CC ex parte Hardy (2000)
BAT/18	The Queen (Woolley) v Cheshire East BC and Millenium Estates (2009)
BAT/19	BATTLE Comments on Version 3 Planning Conditions
BAT/20	Letter from Richard Buxton of 30 November 2009 commenting on draft S106 Noise Undertaking
BAT/21	Email from Richard Buxton dated 14 December 2009 (21/1) and attached summary of implications of omissions of recommendations from Hayes Mackenzie Partnership report to Department of Trade and Industry in 2006 (21/2)
BAT/22	Email from Richard Buxton dated 21 December 2009 with comments on revised draft noise conditions and revised S106 undertakings.

CORE DOCUMENTS

5.3A	Derbyshire Dales/Peak District NPA v SoSCLG and Carsington Wind Energy (2009)
5.31a	Coronation Power SoS Decision (4 Appeals) (APP/P4225/A/08/2065277 &c)
5.31b	Coronation Power Decision Inspector's Report Extracts
5.32	Enertrag (UK) Ltd v SoS for Communities and Local Government CO/1160/2008
5.33a	Wadlow Farm Inspector's Report (APP/W0530/A/07/2059471)
5.33b	Wadlow Farm Secretary of State's Decision (APP/W0530/A/07/2059471)
5.34	Nantglyn Decision Issued on 18 November 2009 (APP/R6830/A/08/2074921)
8.36	World Health Organisation Night Noise Guidelines

OTHER DOCUMENTS SUBMITTED DURING THE INQUIRY

DOC1	Statement of Common Ground (MDC/NRL)
DOC2	Statement of Common Ground (MDC/NRL) (Noise)
DOC3	Draft noise conditions 11 November (MDC/NRL)
DOC4	Draft Non-Noise Conditions 11 November (MDC/NRL)
DOC5	Revised Version of Conditions (MDC/NRL)
DOC6	Tree Preservation Order at Bradwell Garage
DOC7	Harrison Statement
DOC8	Witney Statement (6/1)and FoE pamphlet 'Renewable energy – Your questions Answered' (6/2)
DOC9	Bailey Statement
DOC10	Mee Letter, Statement and 4 Appendices (10/1-10/5)
DOC11	Mainwood Statement
DOC12	Cole Statement and Internet Extracts

Appeal Decision

Inquiry opened on 20 October 2009

Accompanied site visits made on 29 October 2009

by Philip Major **BA(Hons) DipTP MRTPI**

an Inspector appointed by the Secretary of State for Communities and Local Government

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Decision date:
8 December 2009

Appeal Ref: APP/E2001/A/09/2101851
Land south of West Linton Farm, Brow Lane, Balkholme, East Riding of Yorkshire DN14 7XH.

- The appeal is made under section 78 of the Town and Country Planning Act 1990 against a refusal to grant planning permission.
- The appeal is made by Sixpenny Wood Windfarm against the decision of East Riding of Yorkshire Council.
- The application Ref: DC/07/04680/STPLFE/STRAT, dated 19 July 2007, was refused by notice dated 6 November 2008.
- The development proposed is a wind farm comprising ten turbines up to 125m high, control building, anemometry mast, access tracks including access off the public highway, underground electrical cabling (all for a period of 25 years) and a temporary construction compound.

Decision

1. I allow the appeal, and grant planning permission for a wind farm comprising ten turbines up to 125m high, control building, anemometry mast, access tracks including access off the public highway, underground electrical cabling (all for a period of 25 years) and a temporary construction compound at land south of West Linton Farm, Brow Lane, Balkholme, East Riding of Yorkshire DN14 7XH in accordance with the terms of the application, Ref: 06/07/04680/STPLFE/STRAT, dated 30 July 2007, and the plans submitted with it, subject to the conditions set out in the attached schedule.

Preliminary Matters

2. I carried out visits of the area and particular viewpoints in company with the parties on 29 October. In addition I undertook unaccompanied visits to other locations as requested by the parties. This includes visiting the recently constructed wind farm at Lissett, East Yorkshire.

3. It was agreed at the inquiry that the East Yorkshire has performed well against the targets set for renewable energy capacity to 2010, and looks to be in a strong position in relation to Regional Spatial Strategy (RSS) targets for 2021. However, it is also agreed that the targets are minima, and will be reviewed in the light of evolving national policy.

4. The application is for 10 turbines and the current intention is to install turbines of 2MW rated power. Although turbines up to 3MW had been considered during the preparation of the proposal it is common practice for the choice of turbines to be made at the time planning permission is granted. Any contribution to the production of renewable energy is to be welcomed and I therefore see no

difficulty with the actual turbines being determined in accordance with operational criteria set by the appellant. The size and configuration of the turbines has not been changed and the nature of the development in land use terms has therefore remained consistent. Grid access can be achieved through a connection to the line a short distance to the north of the site, and no issue has been taken on this point.

5. There has been little comment in relation to the proposed control building, anemometry mast, access tracks and temporary construction compound. These are relatively minor items when seen alongside the proposed turbines and have not led to the Council's reasons for refusing planning permission. Hence this decision concentrates on the turbines themselves.

Planning Policy

National Policy

6. Relevant national policy can be found principally in Planning Policy Statement 1 – *Delivering Sustainable Development* (PPS1) and its supplement – *Planning and Climate Change*; Planning Policy Statement 22 – *Renewable Energy* (PPS22) and its companion guide – *Planning for Renewable Energy;* and Planning Policy Statement 7 – *Sustainable Development in Rural Areas* (PPS7).

7. The overriding message from PPS1 is that development plans should promote sustainable development, and this includes setting regional targets for renewable energy generation in Regional Spatial Strategies (RSS).

8. PPS22 indicates that renewable energy development should be capable of being accommodated throughout England in areas where the technology is viable, and environmental, economic and social impacts can be addressed satisfactorily. It encourages the promotion of renewable energy developments through the relevant development plan.

9. PPS7, although seeking to protect the countryside from unacceptable development, also advocates the sensitive exploitation of renewable energy sources in accordance with the policies of PPS22.

10. The recently published Renewable Energy Strategy sets out what the government sees as being needed to meet the legally binding targets set for renewable energy consumption. This indicates that about 30% of electricity generation will be required from renewables by 2020, compared with about 6% today. It is clearly a challenging objective. Onshore wind power is expected to make a major contribution.

11. The thrust of energy policy at a national level is therefore to promote the development of renewable technology to combat the effects of climate change. These policies carry very significant weight.

Development Plan

12. The development plan comprises the Regional Spatial Strategy for Yorkshire and the Humber 2008 (RSS12), saved policies of the Joint Structure Plan for Kingston upon Hull and the East Riding of Yorkshire 2005 (JSP) and the saved policies of the Boothferry Local Plan 1999.

13. The following polices are relevant to this appeal and can be summarised thus:

RSS 12

YH2 sets out a general objective of reducing greenhouse gas emissions in the region, and to continue to do so into the future.

ENV5 sets out regional targets for installed grid connected renewable energy capacity for 2010 and 2021. This is further broken down into indicative local targets, those for the East Riding being 41MW and 148MW by 2010 and 2021 respectively.

ENV9 seeks to ensure that the historic environment is safeguarded and enhanced.

ENV 10 seeks to safeguard and enhance landscapes that contribute to the distinctive character of Yorkshire and the Humber.

JSP

SP1 has the objective of protecting and enhancing the character and distinctiveness of settlements, including important skylines and views.

ENV6 seeks to protect the setting, character or appearance of strategically important buildings, including listed buildings.

SP4 seeks to protect the distinctive character of, amongst other areas, the Ouse and Trent Levels, within which the appeal site falls.

Local Plan

EN2 sets out criteria against which development will be assessed. These include the likely effects on, amongst other things, the character of the locality and amenity of local residents, ancient monuments and listed buildings, and the character of landscape. The policy indicates that significant adverse effects which cannot be mitigated or dealt with by condition or agreements will not be approved.

EN6 and EN7 are policies which seek to restrict development in open countryside, and ensure that any development permitted is appropriately sited, designed and constructed.

EN51 states that applications which adversely affect the setting of a listed building will be refused except where the proposal would secure the retention of and beneficial use of the listed building.

14. It is pertinent to note that the Local Plan predates both PPS1 and PPS22. It was conceded at the inquiry that Local Plan policy EN73 (which deals specifically with wind turbines) does not accord with national guidance. It can therefore be given little weight. Similarly, Policy EN49, though cited in the refusal notice, relates to developments which directly affect listed buildings and require listed building consent. That policy therefore has no relevance in the current case.

General Background

15. It was agreed between the appellant and Council that an inquiry into a particular proposal is not the forum for debating national policy on renewable energy. Government policy is strongly supportive of both onshore and offshore wind power in order to assist in the reduction of CO_2 emissions. It is widely

accepted that this technology results in savings of CO_2 emissions, and that wind turbines quickly move into 'credit' even allowing for construction and transport emissions. I am therefore able to give little weight to arguments advanced which question such savings.

16. For similar reasons I am unable to afford weight, in the context of this proposal, to the suggestion that there are better alternatives, such as wave and tidal power. These are undoubted possibilities for the future, but the fact remains that national policy seeks to take advantage of a raft of renewable technologies over time, and is strongly supportive of wind power at present.

17. It is common ground between the parties that within the East Riding there are 4 wind turbine developments of varying sizes which are installed, and which have a capacity of 43.5MW. Some 4.5MW of that is not grid connected, and this means that the target of 41MW grid connected by 2010 is not quite met. But it is close, and other renewable sources have not been counted. Whilst this is a creditable position in relation to the East Riding, the position in the region is less clear, and certainly less good. The agreed installed capacity falls well short, with a total of 97.3MW (again 4.5MW not grid connected) of onshore wind capacity against a renewables target to 2010 of 708MW. The regional target for 2021 is 1850 MW and for East Yorkshire it is 148MW.

18. As a result, although the East Riding might be said to be doing its bit, there is a long way to go, even taking into account the permitted but not built schemes in the region. National advice makes it clear that targets, when met, should be raised, and I see no reason why the target for the East Riding should not follow that course. There is no justification for restricting development because current targets are close to being met, or because new targets have not yet been worked out. In any event previous studies of potential capacity for the East Riding suggest that there is spare capacity. The target of 41MW to 2010 was only set after a process designed to allocate targets 'equitably' within the region, and not in relation to overall capacity. There is also no sequential test to be followed in site selection, and no extra weight can be attributed to any adverse effects just because targets are close to being met. This proposal must be considered on its merits taking into account the main issues and other considerations set out below.

Main issues

19. The main issues raised in the appeal are:

(a) The effect of the proposed development on the surrounding landscape;

(b) The effect of the proposal on the living conditions of nearby residents, with particular reference to visual intrusion and noise;

(c) The effect of the proposal on the setting of Howden Minster.

Reasons

Landscape

20. The appeal site is within a flat landscape in the flood plain of the River Ouse as it widens towards the Humber estuary. There is no special designation of the landscape in this area. It falls within national landscape character area 39 – Humberhead Levels, as defined by Natural England in their Countryside

Character Area assessment. Within this a more local assessment has been carried out in the East Riding of Yorkshire Landscape Character Assessment of 2005 by Golder Associates. The development would be within the Drained Open Farmland landscape type (9) and the main part of the site, including the turbines would be within or on the northern edge of the sub-character type described as Blacktoft and Laxton Drained Farmland (type 9d). The northern part of the site lies within the type designated as M62 Corridor Farmland (type 8a) though to all intents and purposes it has the same character as type 9d.

21. The local assessment of the Drained Open Farmland describes the character of the area, and includes such descriptions as 'low lying flat intensively farmed', 'scattered farmsteads and villages', 'open large scale landscape with few trees and woodland', 'extensive views across the flat open landscape'. Within the more local type of Blacktoft and Laxton Farmland the description accurately identifies that the open views elsewhere in this character type are sometimes interrupted by small areas of woodland. These descriptions apply equally well to the M62 corridor type. I do not find the landscape to be particularly tranquil as suggested by reference to the Campaign to Protect Rural England tranquillity map; the M62 corridor is too close, and at times too prominent in the immediate background, for that to be a reasonable position to hold. There is additional intrusion from the nearby railways and B1230.

22. The stark openness of areas such as Goole Fields to the south of the Ouse is absent from the locality surrounding the appeal site, though the flat arable landscape still offers extensive views. The emphasis is horizontal, and the dispersed areas of minor woodland do little to combat that character trait. Although described by some as being akin to a parkland setting, I do not agree; to my mind the landscape is clearly large scale and flat, and predominantly open. Settlements and farmsteads are dispersed throughout the area, some being visually contained within distinct boundaries formed by lanes, roads, dykes and hedgerows. Nonetheless there are extensive vistas beneath 'large skies' which emphasise the flat, horizontal and simple nature of the landscape. But the landscape is clearly valued highly by the local population, and I saw evidence that it is well used for recreation during my site visits. There are both local and long distance footpaths close by, and the wind farm would be seen from both.

23. The landscape has clearly changed dramatically over the years, including the draining of land, hedgerow removal and establishment of large fields used for arable purposes. In short the landscape has been sculpted to reflect the needs of successive generations. This has been described as bland, and to the extent that it is simple and lacking complexity I agree. It is also not a particularly striking landscape. This lack of complexity, open character and lack of distinctiveness lead me to the judgement that it would have a moderate sensitivity to change.

24. I do not intend to provide a narrative on what would be seen from each viewpoint. Suffice to say that within this landscape, as with most others, the presence of wind turbines could not be hidden. The sparse woodland and tree cover would offer interruption of views from some locations, but in the main the wind farm would be wholly apparent as a collection of substantial features. The turning of the blades would add to the prominence. I agree with the

principal parties that the effect would be at its greatest within about 2km to 3km of the turbines, but reducing with distance.

25. In my judgement the development would have a significant effect on the character of the landscape of the area – turbines of this size could hardly do otherwise. I cannot see that in an area such as this there is any room for doubt about the effect of such a development on landscape character. In objective terms it could not realistically be argued that the character of the landscape would be enhanced by such large and uncharacteristic structures. Indeed I have no doubt that the effect on landscape character could only be described as adverse and long term irrespective of whether they are seen as a positive feature in the struggle against climate change. In effect it would change the landscape from its current state into a landscape which includes wind turbines as a major component of its character.

26. However, in my opinion the large scale, horizontal and simple character of the landscape lends itself as well as any rural landscape could to the introduction of large scale but vertical structures which in themselves are relatively simple and sculptural. There would be a distinct and noticeable contrast between the horizontal and vertical elements (landform and turbines) but both are large and neither would dominate the other. The turbines would be seen in the sweep of the wide horizons and the extensive skyscape in a manner which would tend to complement the landscape in scale.

27. Mitigation of the effects of the turbines can only be expected to be minimal given their size. However, I am satisfied that their siting has been designed so that the pattern of development would sit as comfortably as possible in the landscape. There would be no abrupt gaps or outlying turbines to disturb the composition of the layout. The wind farm would be seen as a coherent whole (much as that at Lissett is perceived) rather than a series of individual components. Consequently, though unavoidably prominent, the development would be in a form which would make sense to the viewer.

28. That said, it must be the case that some viewers will not like the look of the turbines, and will perceive substantial harm being caused to both the character and appearance of the countryside. On the other hand, it is shown both by general surveys, and by responses to this proposal, that not all are opposed to such development. Many people find the relatively simple aerodynamic design of turbines to be attractive.

29. In visiting the many viewpoints identified, and in travelling around the area generally, I noted that with distance the effect of the turbines would reduce significantly. But even within the 2 – 3km zone the development would, in my opinion, be acceptable. Large and unmissable I agree, and involving an adverse effect on the character of the landscape, but not so harmful that this should be the deciding factor when set against the pressing need for the development of renewable energy capacity.

30. In terms of the development plan it is clear that the proposal would accord with the terms of RSS policies YH2 and ENV5, which themselves reflect the strong support for renewable technology set out in national guidance. This must be balanced against the fact that the proposal would conflict with the objectives of

part of RSS Policy ENV10, JSP Policy SP4 and Local Plan policies EN2 and EN6. I turn to the overall balance later.

31. Before moving on to deal with the living conditions of nearby residents I will deal briefly with the potential cumulative impact of wind farms in the area. I am aware of other permitted schemes not yet built, and note that the Council takes no issue with cumulative effect. The Environmental Statement deals with this matter and I agree that although there is the potential to be able to see many turbines from some viewpoints the cumulative effect is not likely to be sufficiently harmful to justify refusing this proposal.

Living Conditions

32. Dealing firstly with visual intrusion, I note that the principle parties agree to a large extent on the number of properties from which significant views of the turbines would be possible. The 'worst case' advanced by the Council is that some 93 properties would be so affected. However, there is no right to a view per se, and any assessment of visual intrusion leading to a finding of material harm must therefore involve extra factors such as undue obtrusiveness, or an overbearing impact, leading to a diminution of conditions at the relevant property to an unacceptable degree.

33. During my accompanied site visit I was taken to a number of the dwellings closest to, and with the clearest views of, the appeal site. The occupants of these dwellings would be the most seriously affected by the development. It was clear to me that the turbines would be very prominent in views from those properties, as well as from others in similar locations, and to a lesser extent at properties and villages further afield.

34. But that prominence does not necessarily equate to harm. There would, of course, be a significant change in the view from those properties. The outlook would change from an aspect generally across open fields to an outlook in which turbine or turbines would be the major feature within the landscape. I can well appreciate that many would find that a serious diminution of their outlook, though accept that others would find them acceptable and attractive.

35. The distance to one or more turbines from any dwelling not associated with the development is agreed to be around 600m as a minimum. That is over 4 times the height to tip of the turbines themselves. The turbines are slim and would not fill the field of view, though there are locations where more than a single turbine would be prominent. Nonetheless, the landscape between the turbines would remain, and would be the major horizontal component of any view. Whatever personal feelings are held it is my judgement that given their spacing and configuration the turbines would not be so dominant that they would introduce unacceptable obtrusiveness, be overbearing to the point of oppressiveness, or otherwise lead to visual intrusion which would amount to significant harm to living conditions.

36. Turning to the objections made in relation to noise, I note that the Council is satisfied that the proposed development would be acceptable in this respect. Objections have been addressed by the appellant. This indicates that assessments were undertaken in accordance with the guidance of ETSU-R-97, as specified in PPS22, and show that the development is capable of complying with the noise limits set in that document.

37. The objectors views that noise evidence has been presented inaccurately and by reference to unreliable data has largely been brought forward late in the day, and have not been subject to testing by cross examination. Because of the late production of detailed objections on these grounds it was also not possible for the appellant to introduce an expert witness during the inquiry.

38. That said, post inquiry correspondence has clarified the situation. What is clear is that the noise monitoring locations were agreed, and I have no reason to doubt that the Council's expert and the appellant's noise expert carrying out the assessment chose appropriate locations. Similarly I have no substantive evidence to show that the time of year during the monitoring has led to materially higher results. Although harvesting was taking place during the period I am satisfied that data was recorded at appropriate times, and that anomalous recordings have been excluded from the results.

39. It is clear that wind direction during the monitoring period did not accord with the submitted wind rose for Humberside. Though there is no proven correlation between that wind rose and the site I accept that it is likely to be a closer match than the wind directions recorded during the monitoring period. Even so I am satisfied that there was a suitable range of wind directions and speeds recorded during the noise survey in order that the technical experts could draw meaningful conclusions, in accordance with ETSU guidance. In any event I have no alternative noise monitoring information.

40. Since the assessments were carried out a section of the M62 to the north has been resurfaced with low noise 'tarmac', and it has been acknowledged that this will have an effect on background noise assessments. Accordingly the predictions have been reworked by the appellant's experts, and this shows that the proposal continues to comply with ETSU-R-97 guidance. I have noted the comments by the objectors that greater allowance for the low noise surfacing should be made, but I am not persuaded by the evidence. It is the case that technical information suggests that the low noise surface is, in its early life, about 5dB quieter than standard asphalt. But I am told that low noise surfacing will become noisier with age, so a judgement must be made as to what allowance should be made 'in the round'. It therefore seems to me that the allowance of 5dB to account for the difference between the previous concrete surface and the new surface is reasonable. Similarly I am satisfied that the new central barriers on the M62 are likely to make no material difference.

41. Information and evidence on the noise implications of the proposal is based on survey data and predictions. It is therefore not precise, nor could it be, but it errs on the side of caution. I am well aware of the experience which has been gained by the appellant's advisers in this respect, and as a result can afford their conclusions significant weight. I am therefore satisfied that the objectors concerns have been satisfactorily addressed in correspondence. The amended figures for the proposed noise conditions (changed as a result of the road surface information) would, in my view, provide suitable protection. I also give significant weight to the fact that the Council's own technical officers have not raised objections to the appellant's evidence produced in the Environmental Statement and subsequently.

42. Dealing with other matters of noise nuisance raised by a number of objectors, it remains the position that there is no substantive and verified evidence of adverse health effects from wind farms from either low frequency noise or sleep loss. I recognise that this is a real concern for people living closest to the site, but I have no reliable evidence before me that such effects would ensue. Studies cited have not been peer reviewed and have not been carried out by specialists in acoustics. Although the studies suggest that wind farms can generate adverse effects there is currently insufficient evidence to support that conclusion.

43. It has been suggested that there should be a minimum separation distance between turbines and dwellings, and that some power companies require a set separation. However, ETSU-R-97 is predicated on the fact that noise imission at properties will be within acceptable set limits. As such there is no need to set separation distances. This remains the principle upon which government advice applies.

44. In conclusion on this issue I find that, subject to the imposition of appropriate conditions, the living conditions of nearby residents would not be likely to be unacceptably harmed. There would therefore be no conflict with the relevant objectives of Local Plan policy EN2. The proposal would be in accordance with the guidance of PPS22.

Setting of Howden Minster

45. The Minster Church of St Peter and St Paul is the most striking building in Howden. It is Grade I listed, and its attached and ruined choir is a Scheduled Ancient Monument (SAM). S66(1) of the Planning (Listed Buildings and Conservation Areas) Act of 1990 imposes a duty that, when considering whether to grant planning permission, special regard must be given to preserving the setting of a listed building.

46. The tower of the Minster stands out above the compact centre of the town and is seen from vantage points on the approach to the town and when passing by. Notable viewpoints are those from the north along the B1228, from where the tower and Minster roof are evident; from the M62 bridge over the River Ouse; and from the roads approaching generally from the east. It is clear that the Minster was erected with the intention of being a landmark, and it still serves that purpose, though the outwards expansion of the town, particularly by large industrial buildings in the eastern sector, has diluted its effect.

47. The Minster tower is also seen in views from the A63 Selby road when approaching from the west, and it is the effect of the proposed wind farm on this view which is the principal concern of the Council, and on which I focus.

48. There is no accepted definition of a building's setting. Certainly in this case the setting of the Minster would include the majority of the compact town in its immediate locality. It is here that the tower, nave, chapter house and choir are most in view, either wholly or in glimpses. But from these locations the wind farm would not generally be seen, and so could have little or no impact on the setting of the Minster.

49. From further afield the Minster is noticeable, but the fact that it can be seen does not equate with the viewer being in the setting. In short, I do not accept

that setting in this context means that land from which the Minster is a prominent landmark is automatically within the setting of the Minster. Nonetheless Planning Policy Guidance Note 15 (PPG15) – *Planning and the Historic Environment*, indicates that a proposed high or bulky building might affect the setting of a listed building some distance away, or alter views of a historic skyline. To the extent that the Minster tower forms part of a historic skyline, albeit much altered by newer development, any intrusion into that skyline could be deemed to affect the setting of the Minster.

50. In this case there is no disagreement that from the west the Minster tower would be seen in part with a backdrop of distant turbines. But the blades would be at a lower level than the top of the tower, and would primarily be seen to its left (north). These views would be restricted to relatively short stretches of the A63. In reality it is most unlikely that the views would be anything other than short glimpses from a moving vehicle since there is no footpath at this point and walking along the carriageway is a hazardous activity. The backdrop of turbines also varies according to the presence or otherwise of vegetation and the curvature and alignment of the road. In fact for much of the time on this approach (though the approach time itself is short) the turbines would be seen as set apart from the Minster tower, if they are seen at all. This contrasts with views from the B1228 where those walking along the footpath from Howden Station have an impressive vista of the Minster.

51. Hence, whilst I can well understand the Council's wish to ensure that the setting of the Minster is preserved, it is my judgement that the objections to the proposal on this basis are overstated. I consider that the Minster tower would retain its dominance. Any impact would be minor at worst and non existent at best. I do not consider that the setting of the Minster would be harmed. As a result I am satisfied that the setting of the Minster would be preserved, and that there would be no conflict with the objectives of RSS policy ENV9, JSP policies SP1 and ENV6, or Local Plan policies EN2 and EN51.

Other Considerations

52. A number of other considerations have been raised in writing and at the inquiry. Although I deal with them here together I can confirm that I have given the fullest attention to each of the matters introduced.

53. Shadow Flicker. The incidence of shadow flicker is recognised by the appellant and can be dealt with by a suitable condition. This would control the operation of particular turbines if shadow flicker was predicted and weather conditions were clear. As a result this matter carries little weight.

54. No objection has been raised by the Council in relation to ecological matters. Though I acknowledge that birds and bats have been killed by wind turbines I am reassured by the studies carried out for the Environmental Statement in this case. There is no evidence that the scheme would be likely to result in material loss of life to any wildlife. Similarly I recognise that habitat would be preserved or in part enhanced.

55. Highway safety has been raised as an issue in relation to deliveries to the site during the construction phase of development, and in relation to driver distraction. There is no objection from the Highway Authority. Having seen

the location of the site access, which has good visibility along the B1230, I see no reason to suppose that the scheme would have a material effect on highway safety. Driver distraction seems to me to be unlikely given the range of development features to which drivers are commonly exposed without harm.

56. There is concern that construction activities could be disruptive to local residents. Given the fact that large scale plant would be required on site during construction I agree that this would be possible. However, suitable conditions would deal with this matter.

57. Television interference is possible with large structures such as turbines. However there are methods by which interference can be mitigated should it occur. This is a matter which is capable of being dealt with by appropriate condition.

58. Concern has been expressed that the wind farm could cause difficulties and accidents for horse riders. I have no doubt that turbines which come suddenly into view could indeed startle horses, but that is not the case here. The landscape is open, and the nearest turbines would be some distance from the nearby bridleway known as Skelton Broad Lane. As such I do not consider that danger to horse riders would be significant. Because of the separation distances from footpaths and property I also consider that other safety concerns such as ice throw are not sufficient to attract weight in this decision.

59. In addition to Howden Minster there are listed buildings closer to the site. The Council has not alleged any harm to their settings. These are modest buildings with a quite different relationship to their surroundings than Howden Minster, and I agree that none would be adversely affected by the proposal.

60. It has been argued that the development would bring some economic benefit to the area. However, I do not agree that this can be realistically seen as rural diversification, which seems to me to relate to small scale developments on individual holdings brought about by individual landowners. But I agree that economic benefit is inevitable to an extent, both in short to medium term job opportunities, and in provision of ongoing financial reward to landowners.

61. I am aware that several people have criticised the manner in which representatives of the appellant have dealt with nearby residents. That is not a matter for me as I must assess the proposal on its planning merits. I am also unable to give weight to concerns relating to property value as this is not a material planning consideration.

Overall Conclusion and Balancing Exercise

62. On the main issues I find that there would be harm to the landscape character of the area, and conflict with some parts of the development plan. However, the degree of harm is limited and in my judgement is outweighed by the urgent need to provide renewable energy and the support of policy at national, regional and sub regional level. Subject to suitable conditions I do not find that there would be unacceptable harm to the living conditions of nearby residents, nor to the setting of Howden Minster. No other considerations are determinative, and consequently I have decided that the appeal will succeed.

Conditions and S106 Obligation

Conditions

63. A raft of conditions was discussed at the inquiry, some of which I have noted above, with much of the content agreed between the Council and appellant. I have considered them in the light of the observations made, and the advice of Circular 11/95 – *The Use of Conditions in Planning Permissions*. In general I have removed wording such as 'unless otherwise agreed with the local planning authority' so as not to lead to a situation where changes could be made without following the procedures pursuant to S73 of the 1990 Act.

64. A condition allowing a five year commencement period is appropriate in this case given the long lead in times of some such schemes. The proposal is for a development which is intended to remain on site for 25 years. It is necessary to impose a condition restricting the development in line with that. In the event of any turbine not producing electricity for a period of 12 continuous months then it would be reasonable to require its removal, and land reinstatement, by condition, in order to reduce visual impact. It seems to me that a period of 12 months should enable any repairs required to malfunctioning turbines, or alternatively an application to be made to vary the condition, as necessary. Conditions are necessary which control the maximum height, appearance, and rotation of blades, in order to minimise intrusion. For the same reason a condition requiring final details of the control building and anemometry mast to be submitted and approved is necessary.

65. I accept that micrositing of turbines and tracks might be needed, depending on ground conditions. However, the suggestion that 30m should be allowed for this seems to me to be generous. That effectively gives a diameter of 60m in which to site a turbine. In my view that strays into the area where the whole layout might become compromised. I therefore agree that a condition restricting micrositing to 20m from the positions shown on the application drawings is reasonable and necessary in order to avoid unacceptable visual effects.

66. Conditions dealing with the traffic generation of the development, site access, the construction of the wind farm, and pollution control, are necessary to ensure that development takes place in an acceptable manner. These can be addressed by the requirement to submit appropriate schemes for approval prior to works commencing. It is also reasonable to require hours of working on site to be controlled by condition to protect the amenities of local residents. I will vary the suggested hours slightly to afford greater protection for residents on weekday evenings. For the same reason I agree that burning of materials on site, and the direction of any lighting rigs during construction, should be controlled by condition.

67. It is also necessary to control shadow flicker effects by condition, to avoid harming living conditions of residents who might otherwise be adversely affected. In addition, the possibility of television interference should be investigated, which can be controlled by condition, in order to ensure that a satisfactory service is available to local residents.

68. I agree that it is necessary to impose a condition requiring archaeological investigations in order to record any archaeology on site. In relation to wildlife on site, and to minimise intrusion or enhance habitat, it is reasonable to require a conservation strategy by condition.

69. As suggested by the Council it is reasonable to require a condition to ensure that the developer and/or operator of the wind farm informs the Ministry of Defence and/or Civil Aviation Authority of the details of the scheme, in order to ensure air safety. However, as there is no suggestion that any lighting would be required on site I do not intend to refer to that matter. Any subsequent lighting found to be necessary would be subject to a separate proposal.

70. The proposed noise conditions have been agreed between the Appellant and Council in principle, and are in a format commonly used in cases such as this. I have amended the wording slightly to take account of the views of all parties and believe that this will offer protection to local residents from an unacceptable noise environment.

S106 Obligation

71. A Unilateral Undertaking pursuant to S106 of the Town and Country Planning Act 1990 has been submitted. This deals with 3 principle matters.

72. First, a community fund would be established, with the aims of promoting charitable, educational, community, environmental, energy efficiency and general community amenity schemes or projects for the benefit of the community within the East Riding, preferably within 5km of the site.

73. Secondly a donation would be made towards tree planting through the HEYwoods initiative. Thirdly there is an obligation to submit a Nature Conservation Strategy, which is attached as Schedule 2 to the Undertaking.

74. This Undertaking needs little comment from me. However, the advice of Circular 05/2005 – *Planning Obligations* - is relevant. It indicates that planning obligations are intended to make acceptable development which would otherwise be unacceptable in planning terms. I cannot say that without the obligation in its entirety the development proposed would be unacceptable. It seems to me that the community fund and tree planting contribution, though no doubt welcome and of benefit, bear only a tenuous direct relationship with the proposed development. I fail to see how they are fairly and reasonably related in scale and kind to the proposed development and they do not directly mitigate any adverse impact. That said, the obligation exists, and I am aware of the contents of '*Delivering Community Benefits from Wind Energy Development*' (a report for the Renewables Advisory Board) which deals with such matters. The obligation will bite and provide the benefits noted above as specified in the executed undertaking.

Conclusion

75. For the reasons given above I conclude that the appeal should be allowed.

Philip Major

INSPECTOR

SCHEDULE

Conditions and Guidance Notes

1) The development hereby permitted shall begin not later than five years from the date of this decision.

2) This permission shall be for a period of 25 years from the date of first generation of electricity to the grid from all the development. Within 12 months after the end of that period all surface elements shall be removed from the site and the land restored in accordance with a decommissioning method statement submitted to and approved in writing by the local planning authority not later than 12 months before the expiry of the 25 years.

3) The turbines and tracks shall be sited within 20 metres of the positions shown on the submitted plan at Figure 4.1 of the Environmental Statement dated July 2007.

4) In the event that any turbine hereby permitted fails to produce electricity for supply to the electricity grid for a continuous period of 12 months, then:

   (i) The operator of the development shall notify the local planning authority in writing within one month of the end of that 12 month period;

   (ii) The wind turbine and its associated ancillary equipment shall be removed from the site within 9 months from the end of that 12 month period;

   (iii) If any wind turbine is removed in accordance with (ii) above, the land associated with each removed turbine shall be restored in accordance with a scheme to be submitted to the local planning authority within 2 months of the end of the 12 month period. Such scheme to be approved in writing by the local planning authority and to include management and timing of the works and a traffic management plan. The restoration shall take place in accordance with the approved scheme.

5) No development shall take place until details of the wind turbine specification, including colour and finish, have been submitted to and approved in writing by the local planning authority. Only the approved wind turbine shall be installed at the development site.

6) The maximum height to the tip of any turbine blade shall be 125 metres above the adjacent ground level and all blades shall rotate in the same direction.

7) The wind turbines shall not display any sign, symbol or logo on any external surface, and no turbine shall be illuminated, unless express consent or permission has previously been obtained from the local planning authority.

8) No development shall take place until final details of the control building, including layout, elevations, materials, surface finishes and boundary treatment, have been submitted to and approved in writing by the local planning authority. Development shall be carried out in accordance with the approved details.

9) No development shall take place until details of the anemometry mast, including dimensions and materials, have been submitted to and approved in writing by the local planning authority. Development shall be carried out in accordance with the approved details.

10) No development shall take place until details of the proposed access to the site from the B1230, including temporary or permanent improvements to the public highway and any replacement tree planting, have been submitted to and approved in writing by the local planning authority. Development shall be carried out in accordance with the approved details.

11) No development shall take place until a traffic management plan has been submitted to and approved in writing by the local planning authority. The traffic management plan shall include details of construction vehicle routing, management of junctions to and crossings of the public highway and other public rights of way, schedule of timing of movements, details of escorts for abnormal loads, temporary warning signing, and banksman/escort details. Development shall be carried out in accordance with the approved traffic management plan.

12) No development shall take place until a construction method statement has been submitted to and approved in writing by the local planning authority. The construction method statement shall address the following matters:

(i) Siting and details of the areas on site designated for the storage of heavy duty plant and equipment, including vehicles and car parking facilities for construction site operatives and visitors;

(ii) Details of all on site activities including earth moving, on site aggregate mixing, crushing, screening, piling, and on site storage and transportation of raw material;

(iii) Working practices to control fugitive emissions of dust arising from on site activities;

(iv) Working practices for protecting the living conditions of nearby residents, including measures to control noise and vibration arising from on site activities, as set out in British Standard 5228 Part 1: 1997 – *Noise and Vibration Control on Construction and Open Sites*;

(v) Details of any water crossings, including any proposed bridges and culverts where tracks cross drains;

(vi) Mitigation to avoid badgers becoming trapped overnight in open trenches.

Development shall be carried out in accordance with the approved construction method statement.

13) No development shall take place until an environmental management plan has been submitted to and approved in writing by the local planning authority. The environmental management plan shall address the following matters:

(i) Construction vehicle maintenance and management;

(ii) Minimisation of surface runoff and erosion;

(iii) Construction of water crossings and culverts;

(iv) Construction of a new bridge adjacent to Roseclose Bridge;

(v) Construction of the control building and installation of electrical equipment;

(vi) Construction of turbine foundations, including provision for any necessary dewatering;

(vii) Adherence to relevant environmental legislation, relevant pollution prevention guidance and waste management procedures.

Development shall be carried out in accordance with the approved environmental management plan.

14) No development shall be carried out until a written scheme of investigation for archaeological resource has been submitted to and approved in writing by the local planning authority. The scheme shall be implemented as approved.

15) No development shall take place until a nature conservation strategy has been submitted to and approved in writing by the local planning authority. The strategy shall include those measures identified in the draft heads of terms format included at Appendix 2 of the Supplementary Environmental Information. The strategy shall be implemented as approved.

16) No development shall take place until a scheme for the mitigation of unacceptable shadow flicker effect for any dwelling within 10 rotor diameters of any turbine has been submitted to and approved in writing by the local planning authority. The scheme shall be implemented as approved.

17) No turbine shall be erected on site until a scheme to secure the investigation and mitigation of any electro-magnetic interference to terrestrial television caused by the operation of the turbines has been submitted to and approved in writing by the local planning authority. The scheme shall be implemented as approved.

18) The hours of work during the construction phase of the development shall be limited to 0700 to 1800 hours Monday to Friday, and to 0800 to 1300 hours on Saturdays. No work shall take place on Sundays or Bank Holidays.

19) Traffic movements to or from the site associated with the construction of the development shall be limited to 0700 to 1800 Monday to Friday, and 0800 to 1300 on Saturdays. No traffic movements shall take place on Sundays or Bank Holidays.

20) Notwithstanding the provisions of condition 19, delivery of turbine and crane components may take place outside the hours specified subject to not less than 24 hours prior notice of such traffic movements being given to the local planning authority and to the Humberside Police.

21) No open burning of any waste material shall be permitted within the site.

22) Any lighting rigs during construction on site shall be installed in such a way that the light is directed away from residential property.

23) Within 6 months of the date of this permission the developer and/or operator of the wind farm shall provide written confirmation to the Ministry of Defence/Civil Aviation Authority of the proposed date of commencement of the development and the maximum extension height of any construction equipment.

24) Within 28 days of the commissioning of the final turbine the developer and/or operator of the wind farm shall provide written confirmation to the Ministry of Defence/Civil Aviation Authority of the date of completion of construction; the height above ground level of the highest potential obstacle; the position of that structure in latitude and longitude.

25) The rating level of noise immissions from the combined effects of the wind turbines on the development site (including the application of any tonal penalty) when calculated in accordance with the attached Guidance Notes, shall not exceed the values set out in the tables below. Where there is more than one property at a given location these noise limits apply to all properties at that location. Noise limits at properties lawfully existing at the date of this permission not listed in the tables shall be taken from the nearest listed location.

Between 23:00 and 07:00 hours (Noise Level in dB $L_{A90, 10min}$):

	Standardised Wind Speed at 10 m height (m/s)											
Location	1	2	3	4	5	6	7	8	9	10	11	12
Balkholme, Nearest Location	43	43	43	43	43	43	43	43	44	45	47	49
West Linton Farm	43	43	43	43	43	43	43	43	44	45	47	49
East Lynton Farm	43	43	43	43	43	43	44	45	47	49	51	53
Manor Farm, Greenoak	43	43	43	43	43	43	44	45	47	49	52	54
Property at Greenoak Crossing	43	43	43	43	43	43	44	45	47	49	52	54
Carr House Farm	43	43	43	43	43	43	44	46	49	51	54	57
Low Metham Grange	43	43	43	43	43	43	44	46	49	51	54	57
Northside Farm	45	45	45	45	45	45	45	46	49	51	54	57
Property at Railway Crossing at Shortbutts Lane	43	43	43	43	43	43	44	46	49	51	54	57
Laxton, Nearest Property	43	43	43	43	43	43	43	44	47	50	53	57
Property at Nine Acre Plantation	43	43	43	43	43	43	43	44	47	50	53	57
Kilpin, Nearest Property	43	43	43	43	43	43	45	47	49	51	53	56

At all other times (Noise Level in dB $L_{A90, 10min}$):

	Standardised Wind Speed at 10 m height (m/s)											
Location	1	2	3	4	5	6	7	8	9	10	11	12
Balkholme, Nearest Location	42	42	42	43	43	44	45	46	47	49	51	52
West Linton Farm	42	42	42	43	43	44	45	46	47	49	51	52
East Lynton Farm	46	46	47	48	49	50	51	53	54	55	57	58
Manor Farm, Greenoak	38	39	40	41	43	44	46	48	50	52	53	55
Property at Greenoak Crossing	38	39	40	41	43	44	46	48	50	52	53	55
Carr House Farm	36	37	38	40	42	43	46	48	50	52	54	56
Low Metham Grange	36	37	38	40	42	43	46	48	50	52	54	56
Northside Farm	45	45	45	45	45	45	45	48	50	52	54	56
Property at Railway Crossing at Shortbutts Lane	36	37	38	40	42	43	46	48	50	52	54	56
Laxton, Nearest Property	37	38	39	40	42	43	45	47	48	50	51	52
Property at Nine Acre Plantation	37	38	39	40	42	43	45	47	48	50	51	52
Kilpin, Nearest Property	39	40	42	43	45	46	48	49	50	51	52	53

26) At the request of the local planning authority following a complaint to it, or following the reasonable request of the local planning authority, the wind farm operator shall within 2 months, at its expense, employ a consultant approved by the local planning authority to assess and report on the level of noise immissions from the wind farm following the procedures described in the attached Guidance Notes.

27) Wind speed, wind direction and power generation data for each wind turbine shall be continuously logged and provided to the local planning authority at its request and in accordance with the attached Guidance Notes within 28 days of such request.

THE GUIDANCE NOTES FOR PLANNING CONDITIONS COVERING NOISE

These notes are to be read with conditions 25 – 27. They further explain these conditions and specify the methods to be deployed in the assessment of noise immissions from the wind turbines.

NOTE 1

(a) Values of the $L_{A90,10min}$ noise statistic should be measured at the complainant's property using a sound level meter of IEC 651 Type 1, or BS EN 61672 Class 1, standard (or the equivalent relevant UK adopted standard in force at the time of the measurements) set to measure using a fast time weighted response. This shall be calibrated in accordance with the procedure specified in BS4142: 1997 (or the equivalent relevant UK adopted standard in force at the time of the measurements).

(b) The microphone shall be mounted at 1.2 - 1.5 m above ground level, fitted with a two layer windshield or suitable alternative approved by the local planning authority, and placed at the complainant's property. Measurements shall be made in "free-field" conditions, so that the microphone shall be placed at least 3.5m away from the building facade or any reflecting surface except the ground.

(c) The $L_{A90,10min}$ measurements shall be synchronised with measurements of the 10-minute arithmetic average wind speed and with operational data from the wind turbine control systems.

(d) The wind farm operator shall continuously log arithmetic mean wind speed and arithmetic mean wind direction and power generation data in 10 minute periods from the nacelle anemometers of each wind turbine, duly corrected for the presence of the rotating blades, to enable compliance with the conditions to be evaluated. Wind speed and wind direction shall be averaged from the data from all wind turbines and 'standardised' to a reference height of 10 metres as described in ETSU-R-97 at page 120 using a reference roughness length of 0.05 metres.

NOTE 2

(a) The noise measurements shall be made so as to provide not less than 20 valid data points as defined in Note 2 paragraph (b). Such measurements shall provide valid data points for the range of wind speeds, wind directions, times of day and power generation requested by the local planning authority. In specifying such conditions the local planning authority shall have regard to those conditions which were most likely to have prevailed when the complainant alleges that there was disturbance due to noise. At its request the wind farm operator shall provide all of the data collected under condition 26 to the local planning authority.

(b) Valid data points are those that remain after all data collected during rainfall have been excluded.

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(c) A least squares, 'best fit' curve shall be fitted to the valid data points to define the wind farm noise level at each integer speed.

NOTE 3

Where, in the opinion of the local planning authority the noise immissions at the complainant's property contains a tonal component, the following rating procedure shall be used.

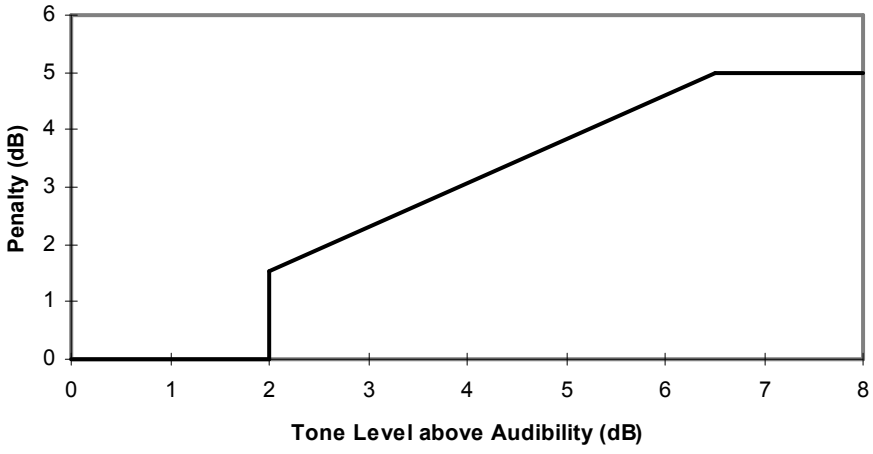
(a) For each 10-minute interval for which $L_{A90,10min}$ data have been obtained as provided for in Note 1 a tonal assessment shall be performed on noise immissions during 2-minutes of each 10-minute period. The 2-minute periods shall be regularly spaced at 10-minute intervals provided that uninterrupted clean data are available.

(b) For each of the 2-minute samples the margin above or below the audibility criterion of the tone level difference, DeltaL_{tm}, shall be calculated by comparison with the audibility criterion given in Section 2.1 on pages 104 -109 of ETSU-R-97.

(c) The margin above audibility shall be plotted against wind speed for each of the 2-minute samples. For samples where the tones were below the audibility criterion or no tone was identified, a value of zero audibility shall be assumed.

(d) A linear regression shall be performed to establish the margin above audibility at the assessed wind speed for each integer wind speed. If there is no apparent trend with wind speed then a simple arithmetic average shall be used.

(e) The tonal penalty is derived from the margin above audibility of the tone according to the figure below. The rating level at each wind speed is the arithmetic sum of the wind farm noise level, as determined from the best fit curve described in Note 2, and the penalty for tonal noise.



NOTE 4

If the rating level is above any of the limits set out in condition 25, measurements of the influence of background noise shall be made to determine whether or not there is a breach of condition. This may be achieved by repeating the steps in Note 2, when all the wind turbines are not operating, and determining the background noise at the assessed wind speed, L_3. The wind farm noise at this speed, L_1, is then calculated as follows where L_2 is the measured level with wind turbines operating normally but without the addition of any tonal penalty:

$$L_1 = 10 \log\left[10^{L_2/10} - 10^{L_3/10}\right]$$

The rating level is re-calculated by adding the tonal penalty (if any) to the wind farm noise L_1. If the rating level exceeds the limits set out in condition 25 then the development fails to comply with that condition.

APPEARANCES

FOR THE LOCAL PLANNING AUTHORITY:

Miss M Thomas	Of Counsel.
She called	
Mr A Smith DipTP MRTPI	Associate, Scott Wilson.
Miss R Condillac BA(Hons) DipLA CMLI	Principal Landscape Architect, Scott Wilson.
Mr S Devey DipTP MRTPI	Team Leader for Conservation, Landscape and Archaeology, East Riding of Yorkshire Council.

FOR THE APPELLANT:

Mr D Goodman	Partner, Hammonds LLP.
He called	
Mr D Stewart MA DipTP MRTPI	Principal, David Stewart Associates.
Miss A Priscott BA(Hons) CMLI	Principal, Anne Priscott Associates Ltd.
Dr R Wools BArch PhD DipCons RIBA IHBC	Principal, Roger Wools & Associates.

INTERESTED PERSONS:

IN OPPOSITION

Mr D Hatton	Chairman, Sixpenny Wood-Not.
Mr D Davis MP	Member of Parliament for the area.
Mrs R Holland	Local Resident.
Mr M Barnard	Adviser to Sixpenny Wood-Not on noise.
Dr N Wilkinson	Eastrington Parish Council.
Mr I Scotter	Local Resident.
Mr G Bloom MEP	Member of the European Parliament.
Mrs M Cockbill	Chair, East Riding CPRE.
Mr F Holland	Local resident.
Mrs J Sowden	Local Resident.
Mr J Stephenson	Local Resident.
Mr T Harford	Former resident of Laxton.
Mr S Evison	Local landowner.
Ms J Evison	Former local resident.
Cllr P Robinson	Councillor for Howdenshire Ward.

IN SUPPORT

Mr R Claxton	East Riding Resident.
Miss J Gregory	Local Resident.
Cllr C Vassie	Energy Champion, York City Council.
Mr M Cooper	Local Resident.

DOCUMENTS HANDED IN AT THE INQUIRY (OR SUBSEQUENTLY BY AGREEMENT)

From the Council and Objectors

1 Opening submissions of Miss Thomas.
2 Extract of the Environmental Impact Assessment Regulations 1999.
3 Consultation response from Natural England, dated 6/11/2007.
4 Extract of LVIA methodology.
5 Consultation response from the Civil Aviation Authority dated 22/8/2007.
6 Extract from the Listed Buildings Act 1990.
7 Visual Impact of Windfarms: Best Practice. SNH 2002.
8 Covering letter and copy of updated noise assessment.
9 Bundle of letters opposing the proposal.
10 Closing Submissions (and associated documents) of Miss Thomas.
11 Post Inquiry response (11/11/09) to the submissions of Hayes McKenzie (4/11/09).

From the Appellant and Supporters

12 Opening submissions of Mr Goodman.
13 UK Renewable Energy Strategy Executive Summary.
14 Extract from Tedder Hill Landscape Proof.
15 Extract LVIA Field Survey Sheet.
16 Communication from Yorkshire Electricity Distribution Plc.
17 Bundle of letters supporting the proposal.
18 Closing submissions of Mr Goodman.
19 Post inquiry Hayes McKenzie comments of 4/11/09.
20 Post inquiry Hayes McKenzie comments of 16/11/09.

General Inquiry Documents

21 Council's letter of notification of the inquiry.
22 Statement of Common Ground.
23 Digest of Development Plan policies.
24 File of documents and correspondence from the submission of the application to the Council's decision.
25 Suggested conditions, Council's comments, and corrected draft noise condition.

26 Certified copy of executed s106 Unilateral Undertaking.
27 File of statements from those speaking against the development.
28 File of statements from those speaking in favour of the development.

PLANS HANDED IN AT THE INQUIRY

A Plan of wind farm development operational, permitted, pending, refused and at appeal in E Yorkshire and the surrounding areas.
B Swept path analysis of the proposed site access.

Appeal Decision

Inquiry opened on 23 July 2009

Site visits made on 3 August and 27 October 2009

by Andrew Pykett **BSc(Hons) PhD MRTPI**

an Inspector appointed by the Secretary of State for Communities and Local Government

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Decision date:
11 December 2009

Appeal Ref: APP/Q1153/A/06/2017162
Land to the south east of North Tawton and the south west of Bow

- The appeal is made under section 78 of the Town and Country Planning Act 1990 against a refusal to grant planning permission.
- The appeal is made by RES Developments Ltd against the decision of West Devon Borough Council.
- The application Ref: 8250/2005/OKE, dated 10 November 2005, was refused by notice dated 31 January 2006.
- The development proposed is nine 3-bladed horizontal axis wind turbines, electricity transformers, access tracks, crane hardstandings, control building, sub-station, met mast, temporary construction compound and met masts.
- The inquiry sat for 13 days on 23, 24, 27-31 July, 3 August, 20-23 and 26 October 2009.
- This decision supersedes that issued on 22 March 2007. That decision on the appeal was quashed by order of the Court of Appeal.

Preliminaries

1. At the Inquiry an application for costs was made by RES Developments Ltd against the West Devon Borough Council. This is the subject of a separate Decision.

2. The original public inquiry into the above appeal was held in November 2006. The appeal was successful but the decision was challenged in the High Court. Although the challenge was unsuccessful, the appeal decision was subsequently quashed by the Court of Appeal in July 2008. The decision was therefore returned for re-determination taking account of all matters raised. I held a pre-inquiry meeting in Spreyton to consider the arrangements for the inquiry on 1 June 2009. Two third parties were granted Rule 6 status for the purposes of the inquiry. These are: the Den Brook Judicial Review Group Ltd (DRJRG), and the Campaign to Protect Rural England (CPRE).

3. An Environmental Statement (ES) was prepared in 2005 under the provisions of the Town and Country Planning (Environmental Impact Assessment) (England and Wales) Regulations 1999 to accompany the application. Volume II of the ES is accompanied by Volume I, which comprises a non-technical summary, and Volume III is a series of plans, drawings, maps, photographs and photomontages. Supplementary Environmental Information (SEI) was prepared and issued in 2006 in three equivalent volumes on behalf of the appellant and before the first inquiry. It pays attention to the landscape and visual assessment of the scheme, together with assessments of its archaeological impact, and its effect on scheduled ancient monuments and the

historic landscape. Before the second inquiry further Supplementary Environmental Information was prepared. It comprises a revised noise assessment and a capability statement. I have taken account of all the submitted material. Evidence submitted on behalf of the appellant indicates that, although not recorded on the application form, the turbines would be removed after 25 years. I have taken this into account also.

4. I carried out a formal visit to the site and its surroundings with the parties on 3 August. I visited the 6 locations at which background noise recordings were made on 27 October. I made unaccompanied visits to various locations including Cosdon Hill, Ramsey Hill, and Belstone Tor; relevant locations on the Tarka Trail, and the Two Moors Way; and the bridleways between Staddon Farm and Higher Nichols Nymett, and that to the north-east of Burrow.

Decision

5. I allow the appeal, and grant planning permission for nine 3-bladed horizontal axis wind turbines, electricity transformers, access tracks, crane hardstandings, control building, sub-station, met mast, temporary construction compound and met masts on land to the south east of North Tawton and the south west of Bow in accordance with the terms of the application, Ref: 8250/2005/OKE, dated 10 November 2005, and the plans submitted with it, subject to the conditions included in the schedule at the end of this decision.

Main issues

6. In additional to the matters to which I have referred above, I have also taken account of material submitted at the application stage; at the time of the first inquiry; the first appeal decision and the subsequent court proceedings; and, of course, the evidence and submissions made at the second inquiry. Taking account of all these matters and of my own assessments resulting from my visits to the site and its surroundings, I have concluded there are two main issues in this case.

7. These are:

   (i) the effect of the proposed development on:

   - the character and appearance of the surrounding area, including the historic environment;
   - local ecology, especially bats;
   - the living conditions of local residents, especially in relation to possible noise disturbance; and

   (ii) whether any harm resulting from the first main issue could be sufficiently regulated by conditions, or would be outweighed by the benefits of renewable energy generation, to justify the development.

8. There is inevitably a good deal of overlap between the matters considered at and identified as main issues in the first inquiry. However, that decision was referred to and quashed by the courts largely on the basis of the manner in which possible noise disturbance had been considered. Although the consequences of the scheme in relation to noise were raised at the first inquiry,

it is evident that it was not the subject of specialist evidence by the principal parties to the inquiry. As I have recorded above, that inquiry also pre-dated the SEI prepared in 2009. The council's position in relation to this matter remained the same for both inquiries – it raises no objection to the scheme on noise grounds, but notwithstanding this I have identified it as a component of the first main issue as far as this re-determination is concerned.

Reasons

9. The nine turbines would be sited on land within the valley of the upper reaches of the Den Brook – a tributary of the River Yeo which itself flows to the north into the River Taw. The appeal site covers an area of approximately 2km² (200ha), although the land actually occupied by turbine bases and ancillary development would amount to just over 3½ha. The ES records that the actual make of turbine has not yet been selected, but at its maximum extent it would not exceed a height of 120m above ground level. The blades would be about 45m in length, and the tower would be approximately 75m in height. The turbines would be generally arranged on a south-west/north-east axis over a distance of about 1500m. The scheme includes the erection of two temporary 80m high monitoring masts, together with a network of 4.5m wide access tracks and a centrally located temporary construction compound. The control building and sub-station would also be centrally located. The necessary grid connection does not form part of the appeal proposal, but I understand the current proposal would follow a route to the west and north-west to North Tawton.

10. The ES is based on turbines with a nominal capacity of 1.65 – 2.3 MW, and, subject to the weather and ground conditions, the development operations would take up to about 12 months. The scheme envisages the delivery of most plant and materials from the A30 at Whiddon Down, along the A382 and the A3124 towards North Tawton, and thence to a new site entrance off the A3072. Some minor road improvement and traffic management works would be necessary at Whiddon Down, at the railway bridge on the A3124, and at the A3124/A3072 junction.

Character and appearance

11. The appeal site lies in the gently rolling agricultural landscape which characterises that part of mid Devon between Dartmoor to the south and Exmoor to the north. The site and its surroundings fall within two of the character areas included in the Countryside Agency's character map of England – area 148: Devon Redlands, and area 149: The Culm. The former area extends from the east and includes most of the appeal site itself. Amongst other key characteristics, reference is made to the hilly landscape of villages, hamlets, farmsteads, hedgebanks and winding lanes. The village of Bow lies within this area. However, this character area forms a relatively narrow extension into The Culm. This includes extensive areas to the north, south and west, and it comprises the vast majority of the land between Dartmoor and Exmoor.

12. Reference is made, amongst other key characteristics, to rolling open pasture separated by many small valleys; to the wide views across a remote landscape, and the scattered hamlets and farms connected by winding sunken lanes.

Similar areas are identified in Map 5 of the *Devon Structure Plan 2001 to 2016* (2004). Policy CO1 of the structure plan refers to the more finely defined Landscape Character Zones. On the basis of this assessment both the appeal site and most of the surrounding land to the north and west fall within area 8 – the Mid Devon Farming Belt. Much of the surrounding land to the south falls within area 16 – the Tedburn St Mary Area. Policy CO1 (Landscape Character and Local Distinctiveness) requires that the distinctive qualities and features of Devon's Landscape Character Zones should be sustained and enhanced.

13. A still more detailed study was carried out on behalf of the West Devon Borough Council to identify the Landscape Character Types (LCTs) within the council's area. The assessment was issued in June 2008. On the basis of this analysis the appeal site falls within LCT 1F – farmed lowland moorland. The description refers to the open, gently rolling or flat landscape where the pastoral farmland and rough ground has an elemental, empty character, dominated by wet unenclosed moorland. Most specifically in relation to the appeal proposal, the management guidelines advise that the introduction of wind farms would have the potential to impact on and dilute the local landscape character. The surrounding area to the north, west and south falls within LCT 1D – inland undulating uplands. This type consists of open rolling and sloping uplands mainly in pastoral cultivation with little arable land. It has an open downland character locally. It is subject to the same guidance in relation to wind farms as area LCT 1F.

14. The appeal site lies close to the boundary between West Devon Borough Council to the west, and Mid Devon District Council to the east. The land to the east of the appeal site, including the settlements of Bow and Zeal Monachorum, falls within the mid Devon farming belt (gently rolling farmland) landscape type. Key characteristics include the rolling, rounded medium-scale hilltops with convex valley sides falling gently towards major river valley floors. The area has a strong agrarian flavour, and the historic village centres are considered to be features of higher quality than much of the landscape.

15. Policy NE10 (Protection of the countryside and open spaces) of the *West Devon Borough Local Plan Review* (2005) records that development within the countryside outside settlement limits or not otherwise in accordance with the policies of the plan will not be permitted unless it provides an overriding economic or community benefit which avoids unacceptable harm to the distinctive landscape character of the area. Natural features which contribute to the character are protected, including views. However, in relation to wind energy proposals this policy is essentially subject to Policy PS10 (Energy production in West Devon). For this supports wind energy proposals provided they have no significant adverse impact on: the qualities and special features of the natural landscape or townscape; nature conservation; or the conditions of those living and working nearby. In this respect the local plan accords with the contents of structure plan Policy CO12 (Renewable Energy Development). While it too seeks to promote renewable energy development in the context of the sub-regional target of 151MW by 2010, such development is rendered subject to its impact on the qualities and special features of the landscape and on the conditions of those living or working nearby.

16. The northern edge of the Dartmoor National Park lies about 5½kms to the south of the appeal site. Between the two – and at its closest about 2kms to

the south and south-west of the site – the land is designated as an Area of Great Landscape Value. Structure plan Policy CO4 records that such areas are particularly sensitive to new development, and local plan Policy NE9 is similarly protective. However, in the determination of renewable energy schemes both paragraph 24 of Planning Policy Statement (PPS) 7: *Sustainable Development in Rural Areas* and paragraph 15 of PPS22: *Renewable Energy* promote the use of criteria-based policies in preference to such local designations.

17. The highest parts of the Dartmoor National Park lie along its northern edge, and there is a distinct boundary between the surrounding agricultural landscape and the moorland itself. Other than in the vicinity of Whiddon Down, the designated area is essentially defined by the A30 dual-carriageway, but the proximity of the high and open moorland to the surrounding agricultural landscape facilitates an appreciation of the qualities and characteristics of both areas in both directions.

18. Amongst other matters, structure plan Policy CO2 (National Parks) records that the application of particular care is necessary to ensure that no development outside the Park is permitted which would damage its natural beauty, character or special qualities. Similarly, local plan Policy NE7 (Dartmoor National Park) seeks to avoid development which would have an unacceptable adverse effect on the setting of the Park's landscape, or on viewpoints within the Park. The significance of national designations is also recognised and acknowledged in PPS22. Although paragraph 14 records that buffer zones should not be created around designated areas, it also specifies that the potential impact of renewable energy projects close to their boundaries will be a material consideration to be taken into account in the determination of planning applications. At the inquiry my attention was drawn to the contents of the *Dartmoor National Park Management Plan 2007.* It includes a comprehensive list of Dartmoor's special qualities. Amongst these, reference is made to the extensive views across Devon which the moor is able to provide.

19. Policy EN 1 of the *Regional Planning Guidance for the South West* (RPG10) (2001) also provides for both the strong protection of the region's nationally important landscape areas and the conservation and enhancement of local character. The *Regional Spatial Strategy for the South West* (RSS) is in the course of preparation. The draft revised version incorporating the Secretary of State's proposed changes was issued in July 2008, and I am therefore able to lend it significant weight in this appeal. Policies ENV1 and ENV2 also seek to protect and enhance the region's natural and historic environment, and Policy ENV3 records that particular care will need to be taken to ensure that no development is permitted outside the National Parks which would damage their natural beauty, character and special qualities.

20. During my visits to the appeal site and the surrounding area I was able to consider all the views expressed on behalf of the both the principal parties and those who have made representations. I visited the four closest settlements – North Tawton, Bow, Spreyton and Zeal Monachorum – together with most of the viewpoints discussed, including those on Dartmoor. I have considered the impact of the scheme in terms of its effect on both landscape character and visual amenity.

Landscape Character

21. At the ES stage it was concluded that the wind farm would result in a re-definition of the local landscape character zones. The new zone would cover the wind farm site itself and its immediate environs, covering an area of about 8km². Within the new zone the turbines would be dominant. Beyond this zone it was assessed that there would be a buffer zone up to approximately 2kms in width where the turbines would be co-dominant with the character of the existing zones.

22. At the inquiry the council's landscape witness indicated his agreement with the principle that the proposed development would be sufficient to result in the changes to zones described in the ES. However, in his view a significantly larger area would be affected. He considered the turbines would be prominent in an area defined by North Tawton, Bow and Spreyton – an area of approximately 30km². In contrast, the appellant's landscape witness noted that the site is a localised area of larger scale more open landscape, including open views where the scale of the landscape can be readily appreciated. He makes a distinction between the area of the site itself and the smaller scale, undulating and more vegetated landscapes beyond, in which the turbines would have more limited visibility with increasing distance. In his view the development would be dominant in an area defined by the A3072 to the north, Broadnymett to the east, Ham Farm and Itton to the south, and Cocktree Moor and Halse Farm to the west. In the surrounding area, defined by North Tawton, Zeal Monachorum, Bow and Spreyton the turbines would be significant but not dominant. He considered the change would be insufficient to result in the creation of a localised wind farm landscape.

23. I have referred above to the narrowness of the Devon Redlands character area and to The Culm to the north, south and west. In my opinion the distinction is readily visible in the landscape, and its lack of width renders it more sensitive to change. I believe the development proposed would be sufficient to result in a localised zone in which the turbines would effectively dominate and define the landscape within and around them. However, I also agree with the appellant's view that within The Culm and beyond, the landscape character, combined with distance, would help to attenuate this dominance quite rapidly. In landscape character terms I do not believe the development would give rise to a co-dominant surrounding zone.

Visual Effects

24. As I have recorded above, the appeal site lies in the upper reaches of the valley of the Den Brook. More accurately, seven of the proposed turbines would lie on land which drains into the Den Brook. The two most southerly turbines would be sited on land which drains into the unnamed stream which crosses Itton Moor. It too flows into the River Yeo, just to the south-west of the Den Brook/Yeo confluence. Neither of the valleys is deeply incised, and from some vantage points the topography of the site takes the form of a relatively extensive shallow basin which is overlooked from higher ground in all the surrounding directions. It is evident from the site itself however that the land is not flat. The two streams are separated by a low ridge and the land rises gently from the north-east to the south-west. The turbines would occupy sites between about 122m AOD (T5) and 160m AOD (T1). With increasing

distance, in my view the topography of the site itself becomes less significant – a perception which to my mind would be reinforced by the number, distribution and height of the turbines.

25. The ES includes a total of 13 photographs of the site and its surroundings, with a photomontage for each viewpoint indicating the appearance of the proposed turbines. Photographs were also taken from an additional 11 locations and wireframes prepared. These were supplemented with the submission of the initial SEI by revisions to the photomontages for viewpoints 1, 3, 4 and 9, and by the addition of 4 further viewpoints – A, B, C and D. At the inquiry I also had the benefit of photographs from 25 viewpoints supplied by the landscape witness for the DBJRG. I have considered the photographic material and the wireframes within the terms in which they were supplied – as an aid to my experience of visiting the site and many of the viewpoints.

26. The site is crossed by a railway line which I gather is subject to modest seasonal use by passenger trains, but I saw on my visit that visibility from the line would be severely curtailed by trees. The closest publicly accessible vantage points to the turbines would be to the south where a minor road from the A3124 at Itton Cross passes through the hamlet of Itton, before crossing Itton Moor and turning south towards Spreyton. The closest turbine (T3) would be about 150m from the lane. I agree with my predecessor however that the more attractive prospects of the appeal site and its background are to be obtained from the north. From this general direction, and especially from the north-east, the bulk of Dartmoor is invariably present. Quite apart from the difference in height, the distinction between the agricultural landscape of the foreground and middle-distance, and the moorland leading to the horizon, enables the viewer to appreciate and value the interdependence of its components.

27. ES Viewpoint 1 from close to Nichols Nymett Moor Cross is an example of the views available from the minor road which connects North Tawton with Zeal Monachorum and Bow. The appellant draws attention to the low proportion (14%) of the 30km radius zone of theoretical visibility study area from which the turbines would be theoretically visible. Although this proportion would be further reduced by characteristic high hedgebanks and hedges, I noted on my visits that prospects were available in the direction of the appeal site and beyond through field gates, lanes and tracks. Such apparently fortuitous glimpses are always gratifying in the countryside. From this and similar vantage points the viewer would be at about 150-200m AOD at a distance of just over 2kms to the nearest turbine. The complete height of most of the turbines would be visible, but the panorama is extensive and the essential components of the scene are on a large scale. I recognise the turbines would exceed the scale of trees and farmsteads by many times, but on the contrary, their size would complement the scale of the scene as a whole. In this sense I do not depart from my predecessor's view that the turbines would be framed by the landscape. It follows that in my opinion the proximity of the site to Dartmoor would not detract from the appreciation, experience or prospect of the national park. Although the turbines themselves would be very large, I consider that in number and extent the project would not be excessive in relation to its landscape setting.

28. From the viewpoint of ramblers or riders one of the most significant routes from which the turbines would be visible is the bridleway between Higher Nichols Nymett and Staddon Gate – passing through Westacott Barton and Staddon Farm. Although most of the route lies to the north of thick or high hedges, the turbines would be readily visible through field gates. To the east of Staddon Farm the right of way lies on the south side of the field boundary. In any event, riders would be able to see over most of the hedges. At its western end the bridleway would be about level with the hub height of the lowest of the turbines, but the route gently declines to about 160m AOD. The impact of the turbines would thus be rendered greater by their height in relation to the potential vantage points from the north. From the viewpoints of the observer however, the turbines would be offset from the highest parts of Dartmoor. The northern slopes and tops of Cosdon Hill, Belstone Tor and Yes Tor would all appear to the south-west of the observer. Notwithstanding the proximity of the observer to the turbines, in my view they would not seriously diminish the impact or presence of this part of the moor. At a maximum blade tip height of 280m AOD (T1) this would still be well below the three high points of 550m (Cosdon Hill), 479m (Belstone Tor) and 619m AOD (Yes Tor). The prospect to the south-west from the bridleway to the north-east of Burrow is at about the same height, but in this case the turbines would be directly in line with Dartmoor. I conclude that from this particular location the scheme would have a harmful effect on visual amenity.

29. SEI Viewpoint A is to the north-east of Sanford Barton and is representative of views from the A3072. It is from a lower elevation than Viewpoint 1 and the distance to T5 is only 1.2kms. The northern tors and hills of Dartmoor form the south-eastern horizon, but one effect of the lower level would be to increase the perceived height of the planned turbines. From this location the balance between the turbines and their landscape setting would not be as evident, and the height of the turbines would be emphasised by their breaching of the skyline. From this location also I consider the turbines would have a harmful effect.

30. ES Viewpoint 2 provides an indication of the impact of the proposed development on North Tawton. In this regard I agree with the council's landscape witness who considered at the inquiry there is a distinction to be made between the visual impact of wind energy schemes on individual dwellings on one hand and whole settlements on the other. Although the *Guidelines on the Environmental Impacts of Windfarms and Small Scale Hydroelectric Schemes*[1] suggests a buffer zone is desirable in relation to both forms of human occupation of the land, a rural village or small town has a social and community function which cannot similarly apply to an individual dwelling. To my mind the impact of a wind energy scheme on the landscape setting of such a settlement must be a matter of greater significance than the effect of the same scheme on isolated dwellings. In the case of North Tawton however the theoretical zone of visual influence included in the ES indicates that most of the town would be out of sight of the proposed turbines. Visibility of the development would be confined essential to an area at the southern entrance to the settlement. The upper parts of the turbines would be visible

[1] CD49, paragraph 2.4.4

over the horizon to the south-east, but in my view they would be sufficiently distant not to have an adverse effect on visual amenity.

31. A gateway at Itton Cross (ES Viewpoint 3) is a good vantage point for the assessment of the visual effect of the proposed turbines from the west. At this location the viewer would be above the level of the turbine bases, and the topographical context – the shallow basin – of the development would be evident. The fields in the foreground are quite large, and the ridge to the east of North Tawton provides a degree of enclosure. In contrast to the prospects from the north however, there is no complementary upland area and the turbine blades would be seen against the background of the sky. Although in clear weather Exmoor is visible to the north-east, in my view it is too distant to make the same contribution as Dartmoor does in views from the north.

32. The proposed wind farm would be theoretically visible from Spreyton looking north-west. However, the principal street through the village follows an east-west route blocking visibility to the north. ES Viewpoint 8 is from a footpath at the northern end of the village. I saw on my visit that there are variations in the prospect along the footpath, but in my view the resultant differences in the visibility of the wind farm would have only a minor effect. From this viewpoint the landscape has a different character with smaller fields, more hedgerow trees and steeper slopes. The trees would partially obscure some of the turbines, the closest of which would be some 2.9kms away. I do not dispute that the turbines would change the prospect from this part of Spreyton, but in my view the overall effect would be limited.

33. Bow would be a little closer to the nearest turbine than Spreyton, but more significantly, the valley of the River Yeo effectively connects the village with the appeal site. The village is sited on rising land on the east side of the valley and the turbines will therefore be clearly visible – especially from houses with south-west facing windows in, for example, Hobbs Way, Nymet Avenue, Collatons Walk and Gregory Close. ES Viewpoint 7 indicates the visual impact of the turbines from the village hall and playing fields. The photograph shows some of the houses on streets in the south-western quadrant of the village. From the viewpoint selected three of the turbines would be almost in line – an arrangement which in my view is bound to increase the impact of the rotation of the blades by continually creating and recreating a series of angles. On the other hand, the proximity of the turbines to each other would result in the wind farm occupying a lower proportion of the total scene than equivalent views from the more southern or northern viewpoints. As the viewpoint illustrates, the scene includes the northern hills of Dartmoor – principally Cosdon Hill. A wind farm would be an uncompromisingly new and man-made addition to the landscape, but in the light of its design, form and purpose I would not regard it as a challenger to Dartmoor. Nor do I consider the view of Dartmoor would be blighted. In my view a wind turbine has a readily comprehensible design simplicity, and although the proposed turbines would undoubtedly be large, I do not consider the number and distribution of turbines would be inconsistent with its landscape setting as seen from the village.

34. The churchyard at Zeal Monachorum would be nearly 4.3kms from the nearest turbine. The surrounding village occupies a low hill-top and the Zone of Visual Influence plans included in the ES indicate that the turbines would be visible at both blade tip and hub heights. Many potential views from village streets

would be interrupted by buildings however. I do not believe the appeal proposal would have as substantial a visual impact on the village as the parish council fears. Nevertheless, I do not dispute the parish council's observation that, from the churchyard, the most easterly turbine (T5) would be directly in line with the summit of Cosdon Hill. Indeed, this is confirmed by the appellant's wireframe view. However, the photomontage which is derived from the wireframe also indicates both that the blades would remain below the horizon, and the majority of the turbines would be hidden by foreground or middle-distance trees. In my opinion the effect of the visible turbines from the churchyard would be limited. I consider the impact on the setting of St Peter's Church as a listed building later in this decision.

35. The height, proximity and status of the Dartmoor National Park justify an assessment of the visual effects of the proposal from greater distances to the south and south-west. The ES Viewpoints include: 4 Whiddon Down; 5 Ramsley Hill; 9 Yes Tor; and 10 Cosdon Hill. All the locations are at significantly higher altitudes and distances than the other viewpoints. Whiddon Down is at 261m AOD and 7.0kms to the nearest turbine; Ramsley Hill is at 260m AOD and 7.4kms; Yes Tor is the highest and most distant at 614m AOD and 14.1kms; and Cosdon Hill is at 550m AOD and 9.5kms.

36. I have taken account of the designation of Dartmoor as a national park. In the context of a wind energy scheme this necessity is perhaps most notably acknowledged in paragraph 14 of PPS22. This records that the potential impact on designated areas of renewable energy projects close to their boundaries will be a material consideration to be taken into account in determining planning applications. In addition, paragraph 21 of PPS7 notes that the national parks have been confirmed by the Government as having the highest status of protection in relation to landscape and scenic beauty. However, in my view it does not follow that significant change is therefore to be avoided, and in any event, over-reliance on the designated status of Dartmoor would be inconsistent with the requirement of paragraph 19 of PPS22 that the landscape and visual effects of renewable energy schemes will vary on a case by case basis.

37. I have already referred to the special qualities of Dartmoor and in particular to the extensive views across Devon which it affords. In the context of the northern edge of the moor, I have taken account of the intervisibility between Dartmoor and Exmoor. The latter is also a national park. At their closest the northern edge of Dartmoor is about 38kms from the southern edge of Exmoor, and on clear days the two moors are readily visible from each other. From Exmoor however the turbines would be about 32kms away at their closest. They would be indistinct, and motion of the blades would be lost. I recognise that the intervisibility of the moors helps to define their setting, the appreciation of both, and the intervening area of Devon; but the impact on the prospect from Exmoor would be very limited. In my view the distance is too great to fall within the terms of paragraph 14 of PPS22.

38. On the contrary, and although I understand from evidence submitted on behalf of CPRE the appeal site does not fall within the area of a parish adjoining the moor, the proximity of the appeal site to Dartmoor renders the potential impact of the turbines on this national park an important material consideration. I have already recorded my views in relation to the effect of the scheme where

Dartmoor forms part of the background. From the opposite direction I believe there is a distinction to be made between viewpoints where no part of the moor is visible and those where the prospect includes part of the designated area. Although ES Viewpoint 4 at Whiddon Down would provide an elevated view of the turbines, no part of the designated area would be included, and it is difficult to contend that from this location there would be any effect on the moor. I acknowledge however that such circumstances would apply in only a limited number of cases.

39. To my mind, the other ES Viewpoints which include part of the designated area in the foreground are of much greater significance. There is no dispute as to the visibility of the proposed turbines from both the tops of hills and tors and from the slopes below them. Another of the special qualities referred to in the national park's management plan is the absolute peace which can still be experienced, contributing to the strong sense of wildness on the open moorland. This aspect of the experience of the moor is emphasised in visual terms by its openness and the almost complete lack of trees. Some of these qualities are evident in ES Viewpoints 9 (Yes Tor) and 10 (Cosdon Hill) and from Belstone Tor. The openness of the moor also results in far fewer interruptions to visibility than those which occur in the agricultural and settled landscape closer to the appeal site.

40. I have considered whether the openness and wildness of the moor, as aspects of its natural scenic beauty, would be compromised or diminished by the visibility of the turbines. One of the principal benefits of the extensive views across Devon from the edges of the open moorland area is to be found in the contrast it affords and appreciation of the differences it makes possible. The lower ground is settled by small towns, villages, roads, railways and farms. It is an agricultural and occupied landscape where human activity is continually present. Notwithstanding is size and impact, in my opinion a self-evidently man-made structure such as a wind farm is more appropriately and compatibly sited in such an area. From the highest vantage points the tops of the turbines would be well below the level of the observer, and although the same would not apply to ES Viewpoint 5 (Ramsley Hill), this lies within a different landscape character zone under the Devon County Council appraisal. It falls within the enclosed moor (Zone 30), which virtually surrounds the high moor (Zone 31).

41. I have taken account of the status afforded to Ramsley Hill through its identification by the Ordnance Survey as a recognised viewpoint. It is also located on the Dartmoor Way long distance recreational route. I understand the chimney to the north-west of the viewpoint is a remnant of former mining activity, and this too sets it apart from the prospects provided by the high moor. Although the turbines would appear above the horizon from this vantage point, I believe their number and distribution would ensure that the development as a whole would be but one component of the scene. I do not think the turbines would detract from the prospect as a whole.

42. I have considered the impact of the appeal proposal from vantage points on two other long distance footpaths – the Tarka Trail and the Two Moors Way. The Tarka Trail passes the site to the west along the valley of the River Taw. At its closest it is just over 2kms away and it follows a north/south direction. Along this length it is either close to the river or on minor roads between hedgebanks. The ZVI plans indicate that the turbines would be only partially

visible from this part of the footpath, and I do not consider they would have a serious adverse effect. The footpath also crosses an area of open moor below Belstone Tor from which the turbines would be visible at a distance of approximately 10kms to the north-east. At this distance and altitude the turbines would constitute but one component of an extensive prospect. In my view the wind farm would be sufficiently distant from and below the general level of Dartmoor to neither diminish nor harm the essential qualities of either the moor or the trail. The Two Moors Way also follows a north/south route and at its closest passes just under 5kms to the east of the appeal site. Although I believe the turbines would be visible through a gateway at Whelmstone Cross they would constitute no more than a glimpse – much of the path in the vicinity is between thick hedges which circumscribe the outlook to the west.

Historic Environment

43. Both the council and the DBJRG are concerned about the effect of the scheme on aspects of the historic environment. At the inquiry I received evidence from the Devon County Archaeologist on behalf of the council. There are a number of archaeological sites in the vicinity of the appeal site, including most notably, scheduled ancient monuments to the west and north-east.

44. That to the west includes a complex of large Roman military enclosures together with series of smaller enclosures and ring-ditches in fields around The Barton on the east bank of the River Taw. One of the camps survives as low earthworks just to the south of the railway which crosses the appeal site. It would be about 2kms from the nearest turbine (T10). The course of the Roman road leading to the site also crosses the appeal site, and, as I saw on my visit, it is also visible in part. The Tarka Trail long distance footpath passes to the west, but the camp earthworks themselves are obscured by hedgerow trees. In any event, the council considers that the impact on the setting of the camp is not unacceptable[2]. I agree.

45. In contrast, the council is concerned about the effect of the proposed development on the setting of the scheduled monuments near Bow. Amongst others, these include the site of a henge close to the south-west corner of the field to the south-west of Hampson Cross. I gather it is now considered the group of prehistoric monuments centred on the henge site were developed over a long period, perhaps from before 3000BC. The henge itself was probably constructed just before the end of the third millennium BC, and it would have been surrounded by a concentration of barrows and ring ditches. There is reason to believe the location had a ceremonial, rather than a strictly utilitarian, function.

46. My attention was drawn at the inquiry to the manner in which archaeologists now rationalise the relationship between such sites and their landscape setting. I understand this has grown in recent years, so that it can be said of many such monuments that they have a landscape role. More locally, there is no reason to distinguish between the archaeological importance of prehistoric monuments on Dartmoor – which happen to have been constructed from granite, from those in lowland Devon – which would have been construed of

[2] It is noted in passing that the latest proposed grid connection route passes through the Scheduled Monument. Scheduled Monument Consent is necessary for a number of works affecting such ancient monuments.

earth or timber. Most specifically, it is considered the principal means of access to the henge would have followed an east-west axis, but that the earth mound on its south side could have constituted a representation of Cosdon Hill visible on the horizon. Thus the setting of the henge would have a direct relationship with the horizon of the principal landform to the south-west.

47. The appeal site lies almost directly between the henge site and Cosdon Hill, as illustrated in SEI Viewpoint C. There would be no impact on the monument from the works themselves, but its setting would be affected, and I agree with the council that the intrusion of development into the setting of a monument – albeit one which is not upstanding – can impair our appreciation of its function, location and context. As is recorded in paragraph 6 of PPG16: *Archaeology and Planning,* archaeological remains are part of our sense of national identity and they are valuable both for their own sake and for their role in education, leisure and tourism.

48. However, paragraph 27 of PPG16 refers amongst other matters to a presumption against proposals which would have a significant impact on the setting of visible remains. It thus effectively makes a distinction between the settings of upstanding monuments and those which are now only or largely below ground level. There must remain a substantial element of debate and speculation about the design and form of the henge, and about the extent to which it would have sought to derive its inspiration from the surrounding landscape. In any event, the proposed development would not obscure Colson Hill – its presence would remain clear and obvious, and I cannot see that the proposed development would hinder the archaeological interpretation of the monument site. I conclude that notwithstanding its archaeological importance, the effect of the turbines on the setting of the monument is of limited significance. In my view the appeal scheme would breach neither the terms nor the purpose of structure plan Policy CO8 (Archaeology) or local plan Policy BE7 (Archaeology and Sites of Local Importance).

49. St Martin's Chapel at Broadnymett is both a scheduled ancient monument and a Grade II* listed building. It forms part of a small complex of buildings at Broadnymett, and would be just under 800m from the nearest turbine (T5). The chapel dates from the late thirteenth century and it is no longer in use, other than as an agricultural store. It originally served the ancient parish of Broad Nymett – an area of only about 17ha (42 acres) – before it was absorbed into the parish of North Tawton. SEI Viewpoint B shows both the chapel and its proximity to the proposed wind farm.

50. I saw on my visit to the chapel that its setting is already severely affected by agricultural buildings and activities, although the effect of these is ameliorated by an extensive growth of trees and bushes close to the chapel itself. In contrast to the henge, the chapel is both a visible and tangible expression of historic interest. The photomontage reveals that it would be possible for the chapel and the turbines to be simultaneously visible, but in my view the chapel can now have only a very limited setting. It is a small building in a very secluded location, and to my mind its impact is confined to a very limited surrounding area. I do not consider the setting or the experience of visiting the chapel would be diminished by the existence of the proposed turbines. In this respect I depart from the view expressed by my predecessor as the chapel becomes visible only from close locations.

51. My attention has been drawn to a number of other listed buildings in the vicinity. Broadnymett Farmhouse and Crooke Burnell Farmhouse are both Grade II buildings within about 800m of the nearest proposed turbines. Although in my view the setting of a farmhouse usually includes a larger area than a dwelling which has no such functional relationship with the surrounding land, in neither case do I consider this extends as far as the proposed turbines. The topography surrounding the farmhouses would remain undisturbed, and I do not believe the turbines would compromise or diminish their appearance or quality as listed buildings.

52. There are four listed houses (two with barns) on the sloping land to the north of and overlooking the appeal site. They are: Staddon Farmhouse; Westacott Barton and barn; Nichols Nymett House; and Upcott Farmhouse and barn. The buildings are between 1800m and 2160m from the nearest turbines, and Westacott Barton and Upcott Farmhouse are both Grade II* buildings.

53. Each of the dwellings occupies a similar setting in the sense that they lie in the open countryside below the crest of the hill slope. In my view, and in each case, their settings are limited to the surrounding fields and enclosures, and although the turbines would be visible when Westacott Barton is approached from the north, I do not believe its setting would be impaired. Indeed, although the barn is sited close to the bridleway, the house occupies a much more secluded location which curtails an appreciation of its interest. I consider furthermore that the turbines would be too distant to have a harmful effect on the setting of the buildings. Similar points arise in relation to Staddon Farmhouse. Although this is more visible from the bridleway, the proximity of the house to the right of way would prevent the turbines from interfering with an appreciation of the building. I saw on my visit to Nichols Nymet House that although the prospect to the south across the valley to Dartmoor must be a benefit for those living in or visiting the house, its status as a listed building and its setting are understood and appreciated from much closer and in the opposite direction. I conclude that the settings of the listed buildings identified would not be seriously adversely affected, and that the scheme would not conflict with structure plan Policy CO7 (Historic Settlements and Buildings) or local plan Policy BE3 (Listed Buildings).

54. I have also considered the impact of the scheme on St Peter's Church at Zeal Monachorum. It too is a Grade II* listed building, and a particular concern of the Zeal Monachorum Parish Council. In its later submission the council reproduces a photograph taken from the north-east corner of the churchyard but including the east end of the church itself. The scene includes trees within the church yard and adjoining properties as well as the more distant landscape leading to Cosdon Hill. It is an attractive, concentrated and varied prospect to which the component parts all make their own valued contribution. I visited the location during my site visit. Although the trees would obscure some of the turbines, others would be visible in the middle distance with Cosdon Hill forming the background.

55. In my view the setting of a parish church can extend to far larger distances than those which apply to dwellings. Paragraph 2.17 of PPG15: *Planning and the Historic Environment* describes how the identification of the setting of a listed building can vary with the circumstances. I see no reason why in some cases this should not include the background landscape, especially when the

two elements of the scene (the building and the landscape) contribute so much to each other. However, the nearest turbine would be 4.3kms, and the top of Cosdon Hill is 15kms away. There is disagreement as to whether the blades would or would not just break the skyline, but in my view it is unlikely that, in most conditions, they would be as distinct as suggested by the parish council. Furthermore, the turbines would be below the ridge level of the church roof, and well below the top of the tower. In addition, the corner of the church yard from which the photograph is taken cannot be a frequently used route. I thus conclude that, notwithstanding their visibility, the turbines would not detract excessively from the setting of the building.

56. I have also given consideration to the effect of the proposed development on the setting of the relevant local conservation areas and on views out of them. It is suggested on behalf of the DBJRG that, particularly in relation to the Bow, North Tawton and Zeal Monachorum Conservation Areas, the turbines would intrude into the views of the valleys and the approaches towards the settlements. However, although at some locations it would be possible to simultaneously observe both the turbines and buildings falling within the conservation areas, the distances would be such that I do not believe they would seriously harm their character or appearance. Nor do I consider harm would result to views out of the areas sufficient to compromise the preservation of their character or appearance.

Conclusion on character and appearance

57. Except perhaps in a limited number of industrialised or urbanised locations, it will invariably be the case that modern commercial wind turbines will be out of scale with both the natural vegetation and other man-made structures in the vicinity. Similarly, it might have been expected within the context of the Devon landscape that the proposed wind farm would be too large for its landscape setting. The wind farm would be most closely observed from the minor road which passes through Itton, but this is only a lightly trafficked route. In contrast, the next closest route is the A3072, and this is relatively heavily trafficked. In my view the greatest visual harm resulting from the scheme would be experienced both on this route, and, to a lesser extent, from the bridleway to the north-east of Burrow. In this sense the scheme would therefore conflict with the landscape protection policies, or parts of policies, of the development plan to which I have referred – principally structure plan Policy CO1, local plan Policy NE10, Policy EN 1 of RPG 10, and Policy ENV1 of the emerging RSS.

58. There would certainly be an impact on the prospects towards, through and beyond the turbines at many other locations, but the development would be seen from greater distances and in the context of larger panoramas. From the north, and perhaps ironically, the presence and scale of Dartmoor would allow the comparatively smaller mass of the wind farm to provide a landscape context for the development. Similarly, from Dartmoor the distance from the site and the difference in height would ensure that the visual effect of the scheme would be manageable[3]. From these locations I believe the development would not be incompatible with the landscape protection policies

[3] In this respect I believe the case is distinguishable from that at Yelland (CD27v) where, although the turbines would have been smaller and fewer, the site was on higher land significantly closer to the national park boundary.

of the development plan cited above. In relation to Dartmoor I see no overriding conflict with structure plan Policy CO2, local plan Policy NE7 or Policy ENV 3 of the RSS. Nor, in relation to the historical environment, do I see any overriding conflict with structure plan Policies CO7 or CO8, local plan Policies BE3 or BE7, or Policy ENV2 of the emerging RSS.

Local Ecology

59. An ecological assessment of the site taking particular account of protected species was carried out on behalf of the developer at the ES stage of the project in 2004. Amongst other matters the assessment noted a moderate to locally high level of bat activity, mainly associated with the hedgerows, woodland edges and wetlands. A total of seven species of bat was identified; the distribution suggesting that individuals were entering the site from roosts around the periphery. However, most of the bats were observed flying at between 2 and 10m above ground level and in this case the blades would not be closer than 30m above ground level. It was recognised that the noctule bat would be more vulnerable as it often flies between 10 and 20m above ground level.

60. The ES refers to the then level of knowledge concerning the interaction between bats and wind farms as inadequate to formulate a definitive impact assessment of the operational phase of the scheme. Since that time (and since the 2006 Inquiry) more guidance has been issued. Most notably, Natural England has published Technical Information Note TIN051: *Bats and Onshore Wind Turbines: Interim Guidance.* This in turn derives from Eurobats Publication Series No 3: *Guidelines for consideration of bats in wind farm projects* (2008). To minimise the risk to bat populations the Technical Information Note advises a 50m buffer around any feature (trees, hedges) into which no part of the turbine should intrude. On the basis of the proposed turbines in this case the DBJRG calculates that the base of each machine should be approximately 62.25m from trees and hedges. The DBJRG is also critical of the equipment used; of the length and time of day of the surveys; and the omission of surveys in April and October. Attention is drawn to the manner in which bats may be attracted to the moving parts of turbines, possibly in pursuit of insects which in turn are drawn by heat.

61. In response it was observed on behalf of the appellant that there are some notable differences between the bat populations of the United Kingdom and those in the rest of Europe. There is no large scale migration of bats in the UK for example, and the danger of building a wind farm on a migration route does not therefore arise. The survey conducted at the ES stage was undertaken on three evenings spread throughout the active season using the guidelines available at the time. In any event, the survey effort is a matter for the professional consultant, and the surveys conducted were adequate and sufficient. Further surveys would be unlikely to result in different or conflicting results. Most recently, barotrauma has been identified as a possible cause of death when bats come into close contact with wind turbines. This involves tissue damage where there is a rapid or excessive pressure change associated with the rotation of the blades.

62. The majority of bats at the site are common pipistrelles. Although it is considered these bats are at a medium level risk of collision, their population is

not thought to be threatened. The parties agreed that the most vulnerable species found at the site is the noctule bat. It both flies at a higher level and does not adhere to linear features such as hedges. However, only low numbers were recorded, and it is not considered by the appellant that the proposed wind farm would significantly impact on the conservation status of the local populations.

63. The appellant acknowledges that, although no turbine would be located closer than 50m to woodland habitat, some would be located closer to hedgerows. I understand that this would only happen at locations near to relatively defunct hedgerows and/or areas of relatively low bat activity. It is considered this would minimize the overall impact on the conservation status of the local bat populations. Hedgerow enhancement would not take place at such locations, and the maternity roost (previously proposed for the centre of the site) has been dropped[4].

64. I have considered the possible effect of the scheme on bats and on the local bat population in the light of the advice included in PPS9: *Biodiversity and Geological Conservation.* It records that the aim of planning decisions should be to prevent harm to biodiversity interests. If significant harm cannot be prevented, adequately mitigated, or compensated for, then planning permission should be refused. As far as protected species are concerned, planning permission should be refused where harm to the species or their habitats would result, unless the need for, and benefits of, the development clearly outweigh that harm.

65. Figure 6.6 of the ES reproduces the data from the bat surveys onto an OS base with the areas of high and moderate activity identified. The plan clearly illustrates the importance of both hedgerows and watercourses for foraging purposes. The principal routes are: the course of the Den Brook itself across Broadnymett Moor; the access track south of Sandford Barton towards the railway; the course of the Roman road; and the route of the minor road north-east of Itton leading to Itton Moor. Along these routes there appears to be only one turbine site (T1)[5] which would be close to the existing hedgerow. The submitted layout plan indicates the centre of the turbine site would be about 60m from the hedgerow to the north.

66. I recognise that understanding the relationship between bats and wind turbines is a developing area, and the potential for surveys to become out-of-date exists. An additional survey using the latest equipment would doubtless have improved the extent and detail of our knowledge of the site. However, in my view the work carried out in 2004 constituted a thorough survey of the land, and I agree with the appellant that new surveys would be unlikely to reveal significantly changed circumstances. I do not dispute the danger that turbines present to bats, including the noctule bat. The scheme thus entails the threat of some harm to individuals, but not to roosts, and there is no suggestion that the turbines would constitute a threat to local bat populations.

67. The possibility of birds colliding with the turbines was also raised by the DBJRG. The ES noted the abundance of starlings at the appeal site, with a

[4] See Figure 6.21 Rev 0.1 attached to Dr Holloway's Proof.
[5] The site of T3 appears to have been incorrectly plotted on this plan. The site layout plan (Figure 3.1) shows the site some distance further north.

flock of approximately 21,000 recorded in December 2004. I understand there is a roost of many hundreds of thousands at Okehampton Camp about 9kms south-west of the appeal site, and the area is used for foraging. The DBJRG is particularly concerned that the assessment for the potential for collision may have been made on the basis of incorrect turbine heights. However, paragraph 6.2.5 of the ES correctly records the form of the proposed development and the maximum height of the turbines. In any event, I agree with the appellant that taking account of the abundance of the species, fatalities would be likely to be insignificant and not a threat to the breeding population.

Conclusion on Ecology

68. I therefore conclude in relation to this matter that the potential effect of the proposed development on local ecology has been the subject of detailed investigation and assessment, including special consideration for protected species. In my view the project is in conformity with the relevant parts of Policy EN 1 (Landscape and Biodiversity) of RPG 10; with structure plan Policy CO10 (Protection of Nature Conservation Sites and Species); and with local plan Policy NE6 (Protected Species).

Possible Noise Disturbance

69. Although structure plan Policy CO12 (Renewable Energy Development) is favourable to the provision of renewable energy developments, it is subject to the consideration of their impact on the conditions of those living or working nearby. Policy CO16 (Noise Pollution) provides greater definition. It records that development should not be located where it would result in a significant increase in the level of noise affecting existing land uses in the vicinity. The local plan specifies similar safeguards. The support for renewable energy in local plan Policy PS10 is subject to there being no significant adverse impact on the conditions of those living and working nearby, and Policy BE18 (Potentially Polluting Activity) states that noise generating development will not be permitted if it would be liable to increase unreasonably the noise experienced by the users of noise-sensitive development nearby.

70. Paragraph 22 of PPS22 also recognises that the renewable technologies may generate increases in noise levels. In addition to its suggestion that development plans might include minimum separation distances, it recommends the use of a report by the Energy Technology Support Unit (ETSU) of the former Department of Trade and Industry – *The Assessment and Rating of Noise from Wind Farms* (ETSU-R-97) – published in 1996. In this case the development plan does not set out any minimum separation distances, and the status of ETSU-R-97 is thereby enhanced. The Companion Guide to PPS22: *Planning for Renewable Energy* provides further advice. Amongst other matters, it records that well-specified and well-designed wind farms should be located so that increases in ambient noise levels around noise-sensitive developments are kept to acceptable levels with relation to existing background noise[6]. It too refers to ETSU-R-97 as relevant guidance on good practice which should be used when assessing and rating noise from wind energy developments.

[6] Page 167, paragraph 41

ETSU-R-97

71. The purpose of ETSU-R-97 is recorded as being the description of a framework for the measurement of wind farm noise with indicative noise levels thought to offer a reasonable degree of protection to wind farm neighbours, without placing unreasonable restrictions on wind farm development or adding unduly to the costs and administrative burdens on wind farm developers or local authorities. It thus attempts to strike a balance between the environmental benefits of wind energy development on one hand (which are often expressed on a global scale), and the potential for environmental damage by noise pollution (which are assessed at a local scale). The guidance constitutes an exhaustive – even elaborate – examination of the issues relating to the assessment of wind turbine noise and its regulation, but it was recognised by the authors that it and its recommendations should be reviewed 2 years after publication[7]. However, there has been no review, and evidence submitted by the appellant indicates that there are no current plans to revise ETSU-R-97[8].

72. It is recognised by the parties nevertheless that the commercial wind turbines currently favoured (and proposed in the current case) are materially larger than those considered by the authors of the report. At the inquiry it was clear there was agreement that ETSU-R-97 fails to pay adequate attention to the impact of wind shear resulting from atmospheric changes, and the manner in which wind turbine noise is propagated is not considered. Amongst many other matters, the report promotes a correlation between background noise levels at receptor locations with simultaneous measurements of the mean wind speed at 10m above ground level measured at the proposed site. Some of the acousticians who practice in this field fear that the failure to pay sufficient regard to variations in wind shear could result in significant errors when comparisons are made between background noise levels and wind turbine noise immission[9] levels. A methodology has been identified which seeks to overcome this problem[10].

73. The report (ETSU-R-97) refers to a number of source documents including PPG24: *Planning and Noise,* and BS 4142: 1990: *Method for rating industrial noise affecting mixed residential and industrial areas.* The latter records that, in relation to background levels, a difference of +10 dB or more indicates that complaints are likely, while a difference of +5 dB is of marginal significance[11]. ETSU-R-97 favours the setting of noise limits relative to the background in a manner similar to that adopted in BS 4142, but it adopts a number of limits derived from different times of the day and different locations.

74. For small schemes or in remote locations away from noise-sensitive receptors the report recommends a simplified limit of 35 dB(A) $L_{A90,10min}$ for 10m high wind speeds up to 10m/s. This obviates the need for a background noise survey. In locations where a background survey is necessary – as in the current case – a night-time (23:00 – 07:00) limit of 43 dB or 5 dB above background, whichever is the greater, is specified outside the relevant building (usually a dwelling). This is derived from the 35 dB(A) sleep disturbance

[7] CD61, pages 2 and 111
[8] Document 32
[9] As in 'to send in' or 'inject'; the correlative of emission
[10] CD100, *Prediction and assessment of wind turbine noise,* Acoustics Bulletin March/April 2009
[11] CD62, paragraph 9

criteria cited in PPG24, with an allowance of 10 dB(A) made for attenuation through an open window, and 2 dB subtracted to account for the use of L_{A90}s rather than L_{Aeq}s.

75. During the day-time the equivalent limit is 35-40 dB(A) or 5 dB(A) above background, whichever is the greater. The actual value for the day-time lower limit depends on an assessment of 3 factors – the number of dwellings in the neighbourhood of the wind farm; the effect of the limits on the number of kWh generated; and the duration and level of exposure. The day-time limits are also perhaps rather curiously based on the sleep disturbance criterion from which the night-time limit is derived. Strangely, the day-time lower limit thus appears to be lower than the night-time lower limit; but the night-time limit is derived from an internal standard. Finally, the report recommends a higher limit fixed limit of 45 dB(A) at dwellings occupied by those who are financially involved with the scheme. In such circumstances consideration should also be given to increasing the permissible margin above background, although the margin is not specified.

76. As is evident from the above paragraph, most of the various noise limits are precisely and numerically expressed. Theoretically, they are capable of being translated into minimum distances between the turbines and receptor locations. Given the precision in ETSU-R-97 it is not surprising that much of the debate at the inquiry was concerned with the accuracy of the background noise data at receptor sites; the correlation between this and the noise generated at critical wind speeds; the propagation of turbine noise; the variations between different turbine models; the effects of differences in wind shear and wind direction; and the inherent uncertainties in all such measures and assessments.

77. In order to consider these matters in the context identified in the report, I have considered the purposes of the different limits. Various reasons are identified. The 35 dB(A) simplified limit is described as being sufficient for the 'protection of amenity'. The increased fixed limit with financial involvement is described as being derived from 'the level of disturbance and annoyance caused by a noise source'. The origin of the day-time and night-time lower limits are however more precise. Both refer to sleep disturbance criteria, and the latter cites the 35 dB(A) limit included in paragraph 5 of Annex 2 of PPG24. This in turn is derived from the World Health Organisation (WHO) guideline designed to 'preserve the restorative process of sleep'[12]. To my mind the different criteria imply different thresholds. The need to avoid sleep disturbance is a significantly more demanding and compelling criterion than the mere evasion of disturbance or the protection of amenity, and the use of a limit derived from the WHO inevitably suggests that a breach might legitimately be regarded as a threat to health. My attention has been drawn to more recent WHO publications. The *Guidelines for Community Noise* was published in 1999[13]. It recommends a limit of 30 dB(A) $L_{eq,\ 8h}$ for continuous noise in bedrooms – which equates to about 28 dB(A) $L_{A90.}$

[12] Environmental Health Criteria 12 – Noise. World Health Organisation, 1980.
[13] CD64

78. Uncertainty over the variously expressed purposes of the limits is aggravated by the WHO's most recent advice – *Night Noise Guidelines for Europe*[14]. This recognises the variations which exist in relation to the health effects observed in the population to different levels of night noise, and refers to the needs of vulnerable groups such as children, the chronically ill and the elderly. It concludes that the population should not be exposed to night noise levels of greater than 40 dB $L_{night, outside}$ during the part of the night when most people are in bed. This, of course, is less than the 43 dB(A) night-time lower limit referred to in ETSU-R-97, and it serves to emphasise the critical importance of the limits. As the appellant observes, this limit would equate to 38 dB(A) L_{A90} and I acknowledge that it is based on a whole year of nights. Although I accept the wind would not be blowing in the same direction for a whole year, it is evident nevertheless that the wind can blow in the same direction for long periods.

79. I mention in passing that the noise levels to which I have referred in PPG24 are identified in relation to the boundary between noise exposure categories (NEC) A and B. The NECs are designed to assess proposals for residential development close to noise sources. Paragraph 8 of PPG24 records that the NEC procedure cannot be used in the reverse context for proposals which would introduce new noise sources into areas of existing residential development. According to Annex 1 this is because in general, developers are under no statutory obligation to offer noise protection measures to existing dwellings which will be affected by a proposed new noise source.

80. I have referred to these matters to both provide a context for the ensuing considerations, and to record my sympathy with the view that a review of ETSU-R-97 is overdue. Nevertheless, I recognise and acknowledge its significance in the context of the current case.

81. Other than participating in the discussion of draft conditions the council did not offer any evidence in relation to possible noise disturbance at the inquiry. Evidence was submitted primarily by the appellant and DBJRG. The parties did seek to produce a Statement of Common Ground in respect of noise matters[15], but I fear much of this document records the extent of their disagreement. In this decision I have sought to consider and take account of what I regard as being the most critical differences.

Background surveys

82. The Companion Guide to PPS22 records[16] that noise levels from turbines are generally low and, under most operating conditions, it is likely that turbine noise would be completely masked by wind-generated background noise. A link is thereby established between the noise generated by the turbines at varying wind speeds and the noise experienced by nearby receptors who, it is assumed, will be experiencing corresponding meteorological circumstances – at least as far as wind is concerned. The existing (pre-development) noise environment at potential receptor sites therefore needs to be established. Chapter 7 of ETSU-R-97 provides detailed guidance about the practices to be adopted. The ES and SEI record the 6 locations where background surveys

[14] Document 44
[15] Document 40
[16] Page 167

were conducted. These were at: Broadnymett, Coxmoor and Ham Farm – to the north-east, east, and south-east of the appeal site respectively; and at Itton Manor, Halse Farm and Crooke Burnell – to the south-west, west and north-west.

83. Five of the 6 survey locations are the closest dwellings to the appeal site in the relevant directions recorded. To the south-west Lower Itton is marginally closer than Itton Manor, but I make no issue of that. In my view the dwellings are sufficiently close for the survey results to be representative. The survey locations are selected on the basis that if the predicted turbine noise falls below the limits included in ETSU-R-97, all other dwellings in the relevant direction in the area will also be below the limits. The DBJRG is critical not so much of the locations but of the precise sites, and of the manner in which the surveys were conducted. I visited all 6 sites on a moderately windy day.

84. ETSU-R-97 indicates that background noise measurements should be made in the garden or other area used for rest and relaxation, but, in order to avoid reflected noise, the site should not be closer than 3.5m from the façade of a building. I saw on my visit to Crooke Burnell that the site favoured by DBJRG would have been closer to the house, but at both sites the dominant noise was of the wind blowing through trees and pampas grass.

85. At Halse Farm the site lay within the front garden of the house. DBJRG is concerned that leaves left on the ground may have artificially increased the recorded background noise level. On the day of my visit there was significant noise from the wind blowing through the trees surrounding the garden, but the leaves at ground level were not moving. They were effectively held in place by the grass and I could detect no noise derived from that potential source. In contrast, fallen leaves at the side of the house on a tarmac surface were both moving and generating noise. However, to my mind this did not constitute a potential external amenity space, and I agree with the appellant that the site was appropriately selected.

86. At Itton Manor the recordings were taken in the garden of the house where an external table and chairs indicated an area used for rest and relaxation. I have no reason to doubt the appellant's assurance that the pond pump located in the garden was not working at the time of the survey, and I saw that the adjacent road was very lightly trafficked. Most of the noise was being generated by the wind blowing through trees and hedges, and I noted that the garden of Lower Itton was similarly sized and had a similar relationship with the adjoining house.

87. I agree with the appellant that there is no readily apparent external amenity area at Ham Farm. Potential sites close to the farmhouse were either too close to buildings or self-evidently not amenity spaces – including the site suggested by DBJRG. The site used in the survey is indeed close to a small generator building, but its noise was removed from the record. Again, the dominant noise during my visit was that generated by the wind blowing through trees and hedges close to the buildings.

88. There are a number of potential external amenity locations at Broadnymett. I considered the alternative site suggested by DBJRG. It was indeed closer to the house, but I could detect no apparent difference between that and the site

of the recordings. I acknowledge that a site closer to the building may experience lower wind speeds, but it may also be subject to greater reflections. The dominant noise source during my visit was again that generated by the wind in the many surrounding trees.

89. I am more sympathetic to the views expressed by DBJRG in relation to the selection of a site at Coxmoor. Although I do not describe the site as being in the middle of a field, it was certainly some distance from the house and its adjoining neighbouring property, and it did not have the appearance or character of a domestic curtilage. There are more appropriate areas for external rest and relaxation in the extensive but domesticated garden to the south and south-west of the house. Although these locations were more sheltered than the site actually chosen, I am far from convinced that background noise levels would be lower as suggested by DBJRG. The sites closer to the houses were surrounded by trees, and, on the contrary, I would anticipate that wind generated noise would be rather greater. During my visit however I noted that at all the locations the dominant noise was the wind in the trees.

Rain distortion

90. Under the heading of the 'analysis and derivation of background noise levels', ETSU-R-97 discusses[17] the effects on the noise environment of receptor dwellings of both weather conditions not associated with wind speed and other sources of noise. It is considered in particular that rain results in a distortion of the background environment, and it is suggested that recordings made during periods of rain should be removed from the data. The DBJRG contends that this can only be reliably achieved when a rain gauge is located at the same site as the microphone. I acknowledge that this would increase the reliability of the circumstances when there is a need to remove rain-induced noise recordings. I also agree with DBJRG that some rain events can be very localised. However, in my experience such events are more likely to be associated with significant increases in wind speed. The appellant has used rainfall records from the met station at North Wyke to remove data which may be affected by rainfall, and it is less likely that rain falling over more extensive areas would be associated with localised high winds. I conclude that an appropriate correlation exercise has been executed in accordance with the purpose of the guidance included in ETSU-R-97.

91. At the inquiry DBJRG also referred to other typical background noises mentioned in ETSU-R-97. In my view it is not entirely clear whether it was the intention of the authors that such noises – work in fields, milking equipment and milk chillers, traffic and aircraft noise – should or should not be included. The position is clearer for the night-time; the noise of traffic and owls should be included as part of the noise environment of the dwelling concerned. In general I favour the appellant's view that, even in countryside locations like the appeal site, the artificial circumscription of background surveys would result in a misleading record of the rural environment.

[17] Page 86

Equipment

92. I have considered the criticisms made by DBJRG in relation to the design of the microphone and its wind shied; together with the exclusion of under-range and over-range data. While I recognise that the design and capacity of the recording equipment could obviously have an effect on the background levels recorded, and that this results in part from the approach adopted by ETSU-R-97, in my view it is neither desirable nor necessary to pursue the scientific levels of accuracy which the criticism implies. I have no reason to doubt the appellant's observation that equipment capable of measuring below the levels within the capacity of the more robust external equipment is essentially confined to laboratory conditions. It was suggested in the inquiry on behalf of DBJRG that acoustics is not an exact science, and I do not believe it is desirable to exaggerate the degree of precision necessary.

Wind shear

93. Having heard and considered the evidence submitted by the parties I am generally confident about the adequacy of the background noise survey in relation to the approach included in ETSU-R-97. Notwithstanding their differences, the parties did agree that ETSU-R-97 does not adequately confront the issue of wind shear. This is considered to be at least in part a result of the significantly increased height of modern commercial turbines compared with those which were used at the time of publication. Wind shear is defined in ETSU-R-97[18] as a description of the increase in wind speed with height above ground level, and it is self-evident that there will be a potentially greater difference between ground level and a hub height of 30m and ground level and a hub height of 75m.

94. ETSU-R-97 indicates that wind shear can be calculated from a formula where the only variables are height, wind speed and ground roughness. As the appellant records, it is now acknowledged that the formula fails to take account of the effect of atmospheric stability. During the day-time the heating of the surface by the sun causes the air to be buoyant. This modifies the frictional force on the airflow. At night, as the surface cools the air become negatively buoyant, and the frictional force is modified in the opposite way. During the day the atmosphere is generally unstable, but at night it becomes stable. When buoyancy is not acting in either direction, the atmosphere is neutral. The shear is larger in stable conditions and smaller in unstable conditions.

95. When atmospheric conditions become extremely stable – for example, on a clear night with low wind speeds – the maximum wind speed can occur at a certain height with lower speeds at both greater and lesser altitudes. This is known as a nocturnal jet. The frequency of nocturnal jets below 100m above ground level in the UK is not known, but I understand they are not considered to be a regular feature of the boundary layers where clouds are present. Evidence submitted on behalf of the appellant indicates that there is a complex relationship between atmospheric stability, roughness and wind direction. In this case for example, it is thought that isolated patches of woodland to the north-west and south-east of the appeal site could constitute sufficient roughness to lead to increased shear in the downstream wind profile.

[18] Page 120

96. ETSU-R-97 discusses[19] the effects of variations in topography on wind speed and noise experienced at receptor locations. It appears the increasing height of modern turbines renders the effect of variations in atmospheric stability on wind shear of equal importance. Wind direction can also have an important effect in relation to both the wind profile and the more readily apparent effect on downwind propagation. To my mind all these factors serve to illustrate the complexity of the subject – especially taking account of the continual and substantial variations in wind speed and direction which are such a notable feature of the weather in the UK. The characteristics of two such capricious phenomena as wind and noise, and the effect of the former on the latter, must make predictions at receptor locations inherently uncertain. Indeed, paragraph 5.4 of the Statement of Common Ground (Noise)[20] records that the parties agree there is no single mathematical expression which will hold true at all times to describe the vertical wind profile. I think the circumstances serve to emphasise the necessity, at the least, for the imposition of robust and adequate noise conditions. By referring to conditions I do not mean to undermine the attempt to forecast turbine noise as it would be experienced at receptor locations, but I do believe it must be an exercise fraught with difficulty and uncertainty.

97. Partly in response to the realisation that stability induced wind shear was not taken into account by ETSU-R-97, the appellant's acoustic advisors have altered the manner in which they seek to predict the noise generated and propagated by turbines. They have departed from the guidance included in ETSU-R-97. My attention was drawn by DBJRG at the inquiry to many locations within ETSU-R-97 which refer to the correlation of measured background noise levels with wind speeds up to 12m/s measured on the site of the proposed development at a height of 10m above ground level. As I understand it the justification for the correlation to the 10m high site wind speed was adopted because this was the height of readily available portable anemometer masts[21], and because this is the reference height used by turbine manufacturers.

98. Although I agree with DBJRG that 10m above ground level is the height frequently cited in ETSU-R-97, I see no overriding reason why the necessary correlation should not be made with the wind speed at the actual proposed hub height of the turbines. I recognise that omitting the correlation with the 10m reference height amounts to a departure from the methodology adopted by ETSU-R-97, but in many other respects DBJRG is critical of the document. In any event, although ETSU-R-97 enjoys the status afforded it by PPS22 and subsequent Government endorsements, I see no reason why alternative improved or otherwise adequate methodologies should not be utilised. There is no useful purpose to be served by slavishly following guidance if more robust processes are available and reliable. In my view the 10m reference height is simply a means to an end – the end in this case being to relate the background noise measurements to the wind speed and hence the noise generated by the turbines. I cannot see that the method adopted by the appellant undermines this principle.

[19] Pages 47-49
[20] Document 40
[21] ETSU-R-97 page 85

Propagation

99. There is agreement between the parties that an example of a relevant area not covered by ETSU-R-97 is that concerned with the propagation of sound outdoors. In this case the appellant has used one of the International Standards series – ISO 9613-2 (Part 2: General method of calculation)[22]. Its purpose is to enable noise levels in the community to be predicted from sources of known sound emission.

100. The DBJRG have drawn my attention to its limitations. In particular it is claimed the use of the ISO is inappropriate where there is both wind *and* a temperature inversion; it is limited to conditions where the wind is between 1 and 5m/s measured between a height of 3 and 11m; and the method of calculating the ground effect is applicable only where the ground is approximately flat – either horizontally or with a constant slope. The document also identifies an uncertainty of +/- 3 dB over distances between 100 and 1000m. I acknowledge the existence of these limitations in relation to the use of the ISO, but it on the basis of this propagation model that the appellant predicts the turbine generated noise at the 6 receptor sites would, with one exception, be within the criteria derived from ETSU-R-97.

101. The predicted margins are as follows:

- at Halse Farm the downwind turbine noise would be below the night-time limit by at least 8.5 dB, and below the day-time limit by at least 7 dB;
- at Lower Itton the equivalent margins are 5 dB and 1 dB;
- at Ham Farm the equivalent margins are 5.5 dB and 0.5 dB;
- at Broadnymett the equivalent margins are 8 dB and 4 dB;
- at Coxmoor the equivalent margins are 9.5 dB and 6.5 dB;
- the exception is Crooke Burnell. Here the equivalent night-time margin is 6.5 dB, but the downwind predicted noise *exceeds* the day-time limit by a maximum of 1 dB. However, the predicted noise would fall below the 40 dB L_{A90} limit referred to in ETSU-R-97[23]. The house is also occupied by a financially involved participant where ETSU-R-97 indicates an even higher lower limit of 45 dB(A)[24].

102. In response to the DBJRGs criticisms, the appellant has cited a paper given at the Third International Meeting on Wind Turbine Noise in Denmark in June 2009 – Wind Farm Noise Predictions and Comparisons with Measurements[25]. This is said to confirm the predictions derived from the propagation model. Be that as it may, much rests on the comparisons between the sites considered in the paper and the current appeal site.

[22] CD68
[23] Page 63
[24] Page 66
[25] CD155

103. Three sites were considered, but I agree with the DBJRG that they all appear to be at odds with the current appeal site. Site A is described as being located on a relatively high plateau characterised by moderately undulating terrain and minimal vegetation – a mixture of grassland and peat bog. The land was effectively frozen during the survey. Site B is located on flat terrain with minimal vegetation. It too is surrounded by peat bog and was water logged during the survey. Site C is lightly undulating but effectively flat in acoustic terms. There is minimal vegetation but with large areas of forestry further away. At Site A, a 110º arc of downwind propagation was used, but ISO 9613-2 specifies a maximum angle of +/-45º. At Sites B and C, two datasets were produced using 30º and 90º arcs, but at all sites the study focussed on the periods in which all the two speed turbines were generating in the high speed mode[26]. It is only at Site C that a ground factor of G=0.5 was used – as with the current appeal case – and the graphs indicate that the measured noise levels are generally higher than the predicted levels. Finally, I note in the conclusions to the paper that further study is considered to be desirable, including in more complex terrain profiles and using variable speed machines. In my view the three sites studied certainly appear to be radically different from the land in the immediate vicinity of and surrounding the current appeal site. For the reasons expressed by the DBJRG I have attributed little weight to the paper, and I am concerned that the propagation model appears to have been used outside the terms of its limitations.

104. The utility and accuracy of the propagation model is further complicated by doubts over the identity of the actual machine which would be used. For understandable commercial reasons the prospective developer is reluctant to specify a particular manufacturer or model other than as a candidate. There are a number of turbine manufacturers producing machines of similar dimensions and appearance, but exhibiting differing sound power characteristics.

105. Both the appellant and DBJRG have provided evidence of the different sound power levels emitted by the candidate machine – a 2MW Vestas V90 – and others. There are evident differences between the machines. The information provided by the parties indicates a difference at cut-in speed (4m/s) of about 4 dB. With a wind speed of between 8 and 12m/s DBJRG's figures show a difference of 1.5 dB (on the basis of 4 machines), while the appellant shows a difference of about 1 dB at 12 m/s (on the basis of 3 machines). It is in this context that the DBJRG has referred to the significance of the compatibility of the application for planning permission and the ES in *R v. Rochdale MDC* [2000][27]. I acknowledge that the differences between machines constitutes an additional element of uncertainty, but I do not believe it would be sufficient to undermine any permission granted. Similarly, I understand wear and tear, particularly of the blades, would also have an effect, together with variations implicit in the warranty of machines. It would however endow any conditions designed to regulate noise at receptor sites all the more important.

106. As is recorded in paragraph 2 of DoE Circular 11/95 : *The Use of Conditions in Planning Permissions,* the power to impose conditions when granting planning permission is very wide. Amongst other matters however, conditions

[26] The candidate turbine in the current appeal is a variable speed machine.
[27] Document 36

should only be imposed where they are necessary. The appellant observes that the candidate turbine is capable of meeting the noise limits specified in ETSU-R-97, but simultaneously records that it is prepared to accept planning conditions to the same effect. Largely as a result of the complexities involved, the draft conditions are painstakingly elaborate, but in my view their acknowledged necessity by the appellant does not inspire confidence. I recognise however that conditions to regulate noise at receptor locations derive, at least in part, from the uncertainties to which I have referred and the need to secure compatibility between the planning application, any planning permission and the ES for the scheme. I consider the draft conditions later in this decision.

Day-time lower limit

107. I have already referred to the threshold as advised in ETSU-R-97 for the day-time lower limit – it lies within the range of 35-40 dB(A). Although in comparison with day-time the desirability of more stringent limits at night-time is generally acknowledged – in PPG24 for example, ETSU-R-97 adopts the rather surprising approach that external day-time noise limits should lie somewhere between that required to forestall sleep disturbance *outside* the adjacent noise-sensitive building (ie 35 dB(A)), and the higher level that would still avoid sleep disturbance *inside* (ie 43 dB(A)).

108. The actual value chosen should depend on three considerations: the number of dwellings in the neighbourhood of the wind farm; the effect of noise limits on the kWh generated; and the duration and level of exposure. Both night-time and day-time lower limits are therefore both sleep-related, and closer to each other than the limits included in PPG24. One effect of the structure of the limits is that, subject to the upper limit (of 5 dB above background) and notwithstanding the ability to regulate noise emissions by reducing the rotational speed of the blades, compliance with the day-time lower limit should ensure that the night-time lower limit would be comfortably met. In this case a value of 37.5 dB(A) was agreed with the council[28].

109. The purpose of the variable day-time lower limit is to allow some flexibility to take account of the numbers of dwellings in the vicinity; the proportion of time background noise levels were very low; and the effect of limitations on the power generated. In accordance with the implications of these considerations, it appears the design of the proposed wind farm has been driven by the ETSU-R-97 noise limits on one hand and the maximisation of power generation on the other. I agree with DBJRG that the adoption of 37.5 dB as the day-time lower limit appears not to have been the subject of detailed assessment. The level was agreed between the appellant and the council early in the process, and the rationale for the adoption of this level is unclear to me.

110. What is evident however is that the effect of the three factors is to render rural locations with low population densities but higher background noise levels the most attractive destinations for wind energy schemes. Based on the appellant's data, DBJRG has assessed that Ham Farm and Crooke Burnell have background noise levels below 30 dB for 44% of time. The comparable

[28] Although she uses a different day-time lower limit and ground hardness assumption, the principle is usefully (and clearly) illustrated in Dr Hoare's Figures 5, 6 and 7. However, I see no reason to dispute the ground hardness assumption adopted by the appellant.

proportions for Lower Itton, Broadnymett and Coxmoor are 25%, 21% and 16% respectively.

111. On the basis of their duration and the level of exposure, DBJRG suggests the day-time lower limit should be set at 35 dB. I agree that these are relatively long periods, but I note the comment in ETSU-R-97 that the approach is difficult to formulate precisely and a degree of judgement should be exercised. I saw on my visits that that there are only a limited number of dwellings in the vicinity of the appeal site. On the basis of these considerations, and notwithstanding the low background noise levels, I raise no objection to the adoption of 37.5 dB as the day-time lower limit.

Amplitude modulation

112. Evidence was submitted at the inquiry by the residents of dwellings close to existing wind farms. Particular reference was made to the adverse effect of amplitude modulation (AM) – the modulation of aerodynamic noise at blade passing frequency. Under the heading of 'penalties for the character of the noise' in ETSU-R-97[29] the phenomenon is described as blade swish, and it records that it has been considered by some to have a characteristic that is irregular enough to attract attention. The noise levels recommended in the report take account of the phenomenon, but it is acknowledged that further research may be required to enable proper measurements and assessments to be made.

113. According to the appellant, the precise causes of high levels of modulation are not clearly understood, but five possible contributory factors are identified. They are: close separation distances between turbines in a line where such a line points towards noise-sensitive buildings; unusual topography; the ratio of blade length to tower height; high levels of wind shear; and specific turbine types.

114. DBJRG also refers to very stable atmospheric conditions as a possible contributory factor. ETSU-R-97 records that the modulation in blade noise can result in a variation in the overall noise level by up to 3 dB(A) close to the turbine. Receptor locations close to reflective surfaces may result in an increase in the modulation depth by as much as +/- 6 dB(A). It is reported on behalf of DBJRG that such greater modulations can occur at distances in excess of 900m from the closest relevant turbine. In some cases the noise experienced can possess intrusive impulse characteristics.

115. One of the potential contributory factors referred to by both parties is the proximity of turbines. The same matter was referred to in evidence submitted on behalf of CPRE. In its section on the technology of wind turbines the Companion Guide to PPS22 provides an example of turbine spacing of around 6 times the rotor diameter (540m) where the machines are in line with the prevailing wind direction, and the General Specification of the Vestas V90[30] itself specifies a distance of 5 rotor diameters (450m). In contrast, the appellant observes that a typical minimum is 3 rotor diameters. In this case the layout of the proposed wind farm is such that the majority of the turbines would be aligned in two lines on a south-west/north-east orientation, with T2,

[29] Page 68
[30] CD150, paragraph 1.4

T7, T4 and T5 forming a northern group and T1, T8 and T6 forming a southern group. The average separation distance of turbines within each group would be 377m and 452m respectively. The possibility of energy loss through wind shadowing by upstream machines referred to in the Companion Guide is essentially a matter of the prospective developer, but the layout would appear to lend itself to the possibility of high levels of downstream turbulence.

116. Because of concern about the presence and impact of AM the Government commissioned research into the matter from the University of Salford[31]. The research essentially takes the form of a survey of local authorities with wind farms in their areas. The survey indicated that 27 out of the 133 wind farms operational at the time had received formal complaints about noise at some point in their history. Only in 4 cases however was AM considered to be a factor, although it was a possibility in another 8 cases. DBJRG has expressed misgivings about the survey and the interpretation of its results, but the study also includes a discussion of the possible causes of greater than expected AM. Amongst other matters the report records that sound generation by turbulence is still not completely understood, and there are no existing models by which it can be predicted. In some situations AM noise seems to travel a considerable distance from the turbines, but further studies are needed to explain and predict the observed noise levels. Topographical effects may also result in turbines being 'unsure' about the direction of the wind, or the wind may be blowing in different directions at different heights. The report concludes that the incidence of AM and the numbers of people affected are too small to make a compelling case for further research. On the other hand such research would be prudent to improve understanding.

117. In its consideration of the report the Government concluded[32] there was not a compelling case for more work into AM at the time (2007), however the matter would be kept under review. In its observations on AM the appellant records that recent examples of high levels have been at sites incorporating Repower MM82 turbines. Although it is said that this make of turbine is not proposed for the current site, as I understand the position, no commitments have been made either for or against any specific make or model. On the basis of the evidence I have received I conclude that the possibility of a greater than expected impact from AM would be possible. In circumstances where the result of unforeseen consequences is sleep disturbance, I am in no doubt that, in the event of the appeal succeeding, a condition to regulate the phenomenon is both necessary and reasonable. I discuss this matter later in this decision.

Conclusion on Noise

118. The parties are effectively in agreement that the utility of ETSU-R-97 is questionable in some respects, and I have also been quite critical in a number of respects. This is perhaps inevitable when the processing of the application and the appeal has taken such a long time. Both the manner in which the advice is applied and the basis of the methodology have changed since the application was submitted, and I agree with DBJRG that there are some notable uncertainties inherent in the process. Notwithstanding the endorsement which the report enjoys through its citation in paragraph 22 of PPS22, I believe it

[31] CD103
[32] CD109

would be misguided not to amend and refine the procedure it adopts when this will improve the value of the exercise. In my view, this is what the appellant has sought to do without loosing sight of the essential purposes of the document.

119. It is important in this context to record that its purpose is two-fold. It seeks to protect the living conditions of residents who would be near wind turbines, but it also aims to avoid placing unreasonable restrictions on wind energy development. It does not set out, for example, to render wind turbines inaudible at nearby dwellings. I have considered the matters raised by DBJRG and others in the light of the contents, purposes and general principles of ETSU-R-97, as improved in current practice.

120. In my view the appellant has carried out a detailed and comprehensive assessment of the noise environment in the vicinity of the appeal site. An assessment has also been made of the impact the proposed wind farm would have on the locality. No doubt more exhaustive surveys and assessments could have been undertaken over more extended time periods and meteorological conditions, and a number of the uncertainties identified by DBJRG could be reduced. I fear however that the application of the practice of acoustics to the noise generated by wind turbines is such that they could never be entirely extinguished, and in this case some of the day-time margins – especially at Ham Farm and Lower Itton – are very small.

121. It is in the light of these inherent uncertainties that I conclude the living conditions of local residents would not be unreasonably affected provided the necessary and appropriately worded conditions were imposed. If the appellant's predictions are correct there would be no need for the conditions to be enforced, but it is important that the council is able to take the necessary action if it became expedient to do so. In my view the uncertainties which have been identified serve to accentuate the necessity for the imposition of conditions on any permission granted. I conclude on this basis the proposed development would not conflict with the provisos included in both structure plan Policies CO12 and CO16 and local plan Policies PS10 and BE18.

122. The possibility was raised at the inquiry that I should consider whether the scheme gave rise to a likely violation under Articles 3 and 8 of the European Convention on Human Rights. Article 3 is the prohibition of torture, and Article 8 is the right to respect for private and family life. The matter is raised in the context the possibility of sleep deprivation. I recognise that allowing the appeal would inevitably result in some interference at the homes of residents in the surrounding area. I do not believe the turbines would be inaudible. However, this consideration must be balanced against the rights and freedoms of others, and I am satisfied that if the development, subject to conditions, goes ahead, its effect would not be disproportionate.

Other Matters

123. A number of additional matters have been raised during the processing of this case which in my view do not constitute main issues. These include the potential impact of the proposal on tourism, health, safety and agriculture.

Tourism

124. Although the effect of the proposed development on the potential of the locality as a tourist destination was considered at the previous inquiry, Visit Devon – a non-profit making, public-private partnership – was not formed until 2008. It fully supports the need for renewable energy projects in the South West, but it is particularly concerned about the number, size and scale of the turbines in an otherwise undeveloped area so close to the Dartmoor National Park. My attention has been drawn in particular to two tourism based businesses at Staddon Farm and Nichols Nymet House.

125. Both properties lie on the south facing slope of the ridge between North Tawton and Bow. The appeal site lies to the south of both at a distance of about 2kms. Staddon Farm is the base for the organisation and sale of horse-riding holidays – usually at destinations abroad. I understand there was a prospect that similar holidays could have been instigated locally, taking advantage of the proximity of the land to Dartmoor. However, the prospect of the proposed development has resulted in a decision being postponed.

126. Nichols Nymet House includes a bed and breakfast business with three holiday cottages in a converted stable block. One of the most important aspects of the destination is its peace and tranquillity – characteristics which it is feared it would be impossible to identify in the event of the development proceeding.

127. There can be no dispute that the operation of the proposed wind farm would be evident from both properties, from their immediate surroundings, and from the surrounding roads, bridleways and footpaths – making an allowance for the additional height of those on horse-back. I recognise the development would significantly affect the way in which the area is seen and perceived by those on holiday, but I am unconvinced that it would result in serious harm to actual or potential businesses. Notwithstanding their visibility, I believe it would be to exaggerate their influence to suggest that they could also undermine or compromise the viability of otherwise successful business enterprises. Although the visual effects would be felt in a relatively wide area, the change to the character of the landscape would be comparatively localised. On this basis I do not believe the proposed development would be a threat to local tourism.

Health

128. A number of local residents and others have expressed concern about the possible health impacts of the proposed turbines. However, many of these concerns are based on the possible consequences of sleep deprivation and/or the purported emission of low frequency noise from the turbines. I have referred to the first of these matters in a preceding section of this decision. I again acknowledge that the possibility of sleep disturbance – given especial prominence by the criteria adopted in ETSU-R-97 – would indeed be a serious consequence, albeit one confined to a limited number of noise-sensitive properties. As far as low frequency noise is concerned however, the Companion Guide to PPS22 records that there is no evidence that ground transmitted low frequency noise from wind turbines is at a sufficient level to be harmful to human health.

129. A number of representations have been made in relation to the possible effects of shadow flicker and reflected light. It is recognised that in some circumstances the former can trigger an epileptic reaction, and both can be irritating. However, the Companion Guide to PPS22 records that the phenomenon should not apply to the slower moving new generation of turbines, and in any event the Statement of Common Ground includes a draft condition designed to overcome the problem. It is not possible to entirely eliminate reflected light, but there is no indication that it might be the cause of a similar reaction.

Safety

130. Evidence submitted on behalf of CPRE refers to the potential for wind turbines to present a source of high risk to the public. Possible causes refer to blade failure, fire, structural failure, ice and lightning strikes. Others have referred to the possibility of driver distraction and the inadequacy of the local roads to accommodate large delivery vehicles. The latter matters are also addressed by the Companion Guide to PPS22. I acknowledge that the implementation of the scheme would necessitate some minor road alterations. These are essentially matters between the appellant and the local highway authority. As far as the possible distraction of drivers is concerned, I saw on my visits that the local network does not carry substantial volumes of traffic and the turbines would be set well back from roads and junctions. I see no objection to the project on these grounds.

131. I acknowledge that the EIA Regulations refer to the risk of accidents in the selection criteria for the screening of Schedule 2 development, but in my view the ES is not deficient in its consideration of the safety implications of the development or the associated risk assessment. Modern wind turbines are undeniably large structures, and, as with any man-made machine, they can be subject to failure from time to time.

132. However, both the ES and the Companion Guide to PPS22 record that properly designed and maintained wind turbines are a safe technology. I have no reason to doubt that the turbines would be certified to withstand extreme conditions. The technology itself is fairly simple, and this in itself must reduce the risk of accidents. I understand the turbines will include lightning conductors, and the possibility of the icing of the blades would result in the turbine being shut-down.

133. The Companion Guide to PPS22 records that maximum safety can be achieved by ensuring the turbines are set-back from roads and railways by at least fall over distance. I understand however that two of the proposed turbines (T6 and T8) would be within 100m and 90m respectively of the railway line which crosses the appeal site. However, in my view the likelihood of a collapse is extremely remote.

Agriculture

134. Representations were made at the inquiry to the effect that the proposal had had a divisive effect on the agricultural community. The earthmoving operations necessary to construct the wind farm would also adversely affect the hydrology of the land and possibly sterilise large areas. The scheme would not be as reversible as the appellant suggests.

135. I do not dispute that wind energy schemes can have a divisive effect on communities where substantial or rapid change has not been characteristic of the recent past. However, in this respect such proposals do not differ from other schemes where one area of land is favoured over another. It is a matter which in my view falls outside the remit of the planning mechanism.

136. In relation to the second matter, the ES includes a hydrological assessment of the scheme. Attention is drawn to the different hydrological regimes in the areas of the site which drain into the Den Brook and into the unnamed stream to the south. I understand that in part this is due to different soil types. Amongst other matters the turbines positions have been identified in order to avoid watercourses, but the ES recognises the likely need for drainage and treatment. I have no reason to suppose that best practice would not be applied to the excavation of foundations or the other operations involved, and I agree with the view expressed in the ES that the hydrological effect of the scheme would be minimal.

Conclusion on the first main issue

137. I therefore conclude in relation to the first main issue that the project would be a cause of some harm in terms of its visual effect on the landscape – especially from some vantage points to the north and north-east of the site. The scheme would also result in a significant change to the landscape character of the surrounding area. I found there would be no harm however in relation to the historic environment or with respect to local ecology. In relation to possible noise interference, I am concerned that this is a matter where there are significant uncertainties surrounding the generation and propagation of wind turbine noise. In contrast, I am reasonably confident about the background noise surveys. In my view these conclusions can only accentuate the importance and necessity of appropriately worded conditions to any permission granted in order to secure compliance with the limits included in ETSU-R-97. I have found no harm resulting from the other matters raised.

Renewable Energy Policy

138. I turn now to the second main issue, under the terms of which it is necessary to consider the position of the scheme in relation to the range of policies which specifically refer to the generation and supply of energy from renewable resources. A number of the key principles included in paragraph 1 of PPS22 are relevant. Sub-paragraph (ii) records that regional spatial strategies and local development documents should contain policies designed to promote and encourage, rather than restrict, the development of renewable energy resources. Sub-paragraph (iv) indicates that the wider environmental benefits of proposals for renewable energy projects, whatever their scale, should be given significant weight in the determination of planning applications. Similarly, sub-paragraph (vi) recognises that small-scale projects can provide a valuable contribution to the overall outputs of renewable energy, and applications should not therefore be refused simply because the level of output would be small.

139. The thrust in favour of the adoption and growth of renewable energy is reiterated in numerous international and national statements and policies – largely in response to concerns about climate change and its effects. Most

latterly, paragraph 11 of the Supplement to PPS1: *Planning and Climate Change* (2007) records that authorities should have regard to the contents of the Supplement as a material consideration which may supersede the policies of the development plan. *The UK Renewable Energy Strategy*[33] (2009) refers to the legally-binding target to ensure that 15% of our energy comes from renewable sources by 2020. The strategy's lead scenario is that more than 30% of our electricity should be generated from renewables by 2020 – up from about 5.5% today. I acknowledge nevertheless that notwithstanding the new imperative, the need for a balance to be struck between the requirement for sites and their local impact remains central to decision making. I note also the council's point that the strategy does not seek to establish sectoral or technology targets. On the contrary, the Government has sought to introduce a raft of measures including a reduction in demand and use, and the securing of diverse and secure energy supplies. The development of onshore wind energy remains but one part of a wide range of measures.

140. The most directly relevant policy included in RPG 10 (2001) is Policy RE 6 (Energy Generation and Use). Amongst other matters, it encourages a minimum of 11-15% of electricity production to be from renewable energy sources by 2010; it has full regard for the recommendations and background information included in the *Renewable Energy Assessments and Targets for the South West* (2001)[34]; and it also records that development plans should specify the criteria against which renewable energy projects will be assessed, balancing the benefits of developing more sustainable forms of energy against the environmental impacts, in particular on national and international designated sites.

141. The draft revised RSS including the Secretary of State's proposed changes was issued in 2008. Policy RE1 includes renewable energy targets for 2010 and 2020. The 2010 minimum target is 509-611 MW installed onshore capacity, of which about 151 MW would be in Devon. The equivalent regional cumulative target for 2020 is 850 MW. Policy RE4 (Meeting the targets through development of new resources) records that in considering individual applications, local planning authorities will take account of the wider environmental, community and economic benefits of proposals, whatever their scale. They should also be mindful that schemes should not have cumulative negative impacts, and proposals in protected areas should be of an appropriate scale and not compromise the objectives of designation. The draft strategy has now reached an advanced stage and its contents therefore enjoy significant weight.

142. Policy CO12 is the most directly relevant policy of the *Devon Structure Plan 2001 to 2016* (2004). It repeats the sub-regional target of 151 MW by 2010, but, as I have already reported, it renders schemes subject to consideration of their impact on the qualities and special features of the landscape and upon the conditions of those living and working nearby. It also identifies priority search areas in the Key Diagram. Although the appeal site does not fall within such an area this does not in my view seriously undermine the consideration which should be given to other sites.

[33] Document 35
[34] CD 11

143. Policy PS10 of the *West Devon Borough Local Plan Review* (2005) is similar to the equivalent policy in the structure plan. It offers support to renewable energy projects provided they have no significant adverse effects on the qualities and special features of the natural landscape or townscape, on nature conservation, or on the conditions of those living and working nearby.

144. It is therefore evident that the stance adopted in both the development plan and emerging policy is essentially supportive of the renewable energy schemes, subject to a number of provisos which I have considered in the preceding sections of this decision. At the inquiry the appellant and the council came to an agreement listing the capacity of the operational, consented and pending renewable energy schemes in Devon. This records a total installed capacity of 32.8 MW, and consented schemes of 82.75 MW. Three appeals are pending (including the current case) providing 44 MW; applications are pending providing 31.1 MW; and pre-planning discussions are underway for an additional four schemes providing 64 MW. The parties agreed that the deficit for the 2010 Devon target is therefore 118.2 MW. As far as the RSS targets are concerned, the installed capacity is now 154.84 MW and the deficit for the 2010 target is therefore 354-456 MW. The deficit in terms of the 2020 target is 695.16 MW.

145. Paragraphs 2-5 of PPS22 indicate the importance which is attached to the targets for increasing renewable energy capacity. Paragraph 3 states that they should be recorded as a minimum amount of installed capacity, although they may also be expressed as a percentage of electricity consumed or supplied. Progress should be monitored and targets should be revised upwards if they are met. The latter provision is however subject to the region's renewable energy resource potential, and the capacity of the environment for such development. Achievement of the target should not be used in itself as a reason for refusing planning permission for further projects, and the prospect of offshore generation should not be used as a justification for lower targets for onshore projects.

146. My attention was drawn by the council to paragraphs 14-16 of the Supplement to PPS1. These are concerned with the performance of the RSS in mitigating climate change. It is noted that strategic targets form part of the framework for planning decisions. However, they should be used as a strategic tool for shaping policy, and not applied directly to individual planning applications. It is on this basis that the council argues the strategic targets are peripheral to the consideration of the merits of the appeal proposal.

147. I have considered the applicability to this case of the performance management measures and strategic targets referred to in the Supplement to PPS1. The Supplement is concerned with the broader issue of climate change and the reduction of carbon emissions, whereas PPS22 has a significantly more focused purpose. It is concerned only with the contribution which renewable energy schemes can make to the wider environmental objective. Nevertheless, as an addition to PPS1 the Supplement has an overarching status in relation to the delivery of sustainable development. It is specifically noted that, where there is any difference in emphasis on climate change between the Supplement and the other PPS/Gs in the series, this is intentional and the Supplement takes precedence. In addition, paragraph 11 of the Supplement records that it may

supersede the policies of the development plan. The Supplement (2007) also post-dates PPS22 (2004) and its Companion Guide (2004).

148. I therefore agree with the council that the content of the Supplement appears to diminish the extent to which the deficit in relation to the renewable energy targets can have a significant bearing on this case. However, my view is tempered by the wider remit of the Supplement, and by the evident weight with which they – the renewable energy targets – are promoted in PPS22. Indeed, paragraph 3.13 of Chapter 3 of the Companion Guide specifically states that targets are important because they have to be followed through into local development frameworks and the development control process. Even within the context of the appeal, there are few who doubt or question the legitimacy of the targets in terms of either climate change or the attractions of renewable energy, and in my view, a poor performance must add some weight to the benefit of a project which would serve to decrease the size of the deficit. In this case it appears the 2010 renewable energy target for Devon will be only be about 22% achieved, and the equivalent proportion for the region will be between 25 and 30%. I recognise that with the addition of the consented schemes the Devon proportion would rise to about 77%, but evidence submitted on behalf of the appellant notes that lead-in times can be long. Even though the appeal scheme could not now make a contribution to the 2010 target, if the project was implemented with the other consented schemes, the proportion would rise to just over 88%. However, it seems inevitable therefore that the targets will not be achieved, and, though by no means determinative, I conclude this state of affairs must make its own contribution to the benefit of the project.

149. I have taken account of the council's concern that both the output of the proposed wind farm and the predicted emissions saved have been exaggerated. The council has referred to the predicted long-term mean annual capacity factor for the proposed wind farm of 25.2% - equivalent to 39.77 GWh/annum. These figures are indeed less than those included in the ES in 2005. Similarly, I accept that the savings in terms of reduced CO_2 emissions are now much reduced – from 860g/kWh to 430g/kWh. However, as the council observes, although these benefits would be notably less than those originally predicted in the ES, the targets are expressed in terms of installed capacity. Even on the basis of their recalculated levels, the scheme would still make a significant and valuable contribution. I note in this context that the Companion Guide to PPS22 reports that capacity factors in the UK generally fall anywhere between 20 and 50%, with 30% being typical.

150. The council has also drawn my attention to a challenge in 1999 to the decision in respect of an unsuccessful appeal for a wind farm in County Durham - *National Wind Power Ltd v. SSETR* [1999][35]. In that case the judge held that the decision-maker could take account of both the absolute and relative contributions of the scheme then under consideration – that is, the installed capacity and the anticipated actual output. It appears in the current case that a similar argument formed part of the challenge in respect of the first appeal decision. However, the point was essentially overtaken by other events before the decision was quashed. I do not dispute the point made by the council, but

[35] Document 56

I note that the capacity of the proposed development would fall within the national average.

151. I have considered the council's point that the appellant has failed to demonstrate the necessary regard for the location of the scheme as required in paragraph 1(viii) of PPS22. However, I have no reason to doubt that the process described in paragraphs 2.1.1 to 2.5.2 of the ES were carried out as recorded. This reports how sites were sought in the areas of West Devon, North Devon and Mid Devon west of the M5 motorway. A total of 47 potential sites were reduced to 16 for a variety of reasons. These were subject to more detailed scrutiny and subsequently reduced to 11. Of these, 6 appeared to be large enough to permit the siting of at least 5 turbines, and the site at Den Brook was the largest. In my view this process described a comprehensive procedure by which the site was identified, and I agree with the appellant that there is no requirement to pursue a sequential process.

152. I conclude in relation to the range of national and development plan policies against which renewable energy schemes fall to be considered, that the scheme would make a limited but valuable contribution to the reduction of CO_2 emissions. It thus complies with the purpose of Policy RE 6 of RPG 10 and the subsequent emerging equivalent policies of the RSS. Subject to the matters I have considered under the heading of the first main issue, it accords with the purposes of structure plan Policy CO12 and local plan Policy PS10.

Conditions

153. I turn now to consider the draft conditions which were submitted to and discussed at the inquiry. The draft conditions cited are those attached at Document 65. I have considered the conditions in the light of both the preceding parts of this decision and the contents of DoE Circular 11/95: *The Use of Conditions in Planning Permissions.* I have considered the draft noise conditions separately.

154. The standard period in which development is to be commenced is 3 years. I acknowledge however that in relation to a commercial wind energy scheme a longer time would be necessary because of the long lead-in times involved. A period of 4 years would be appropriate.

155. Draft condition 2 limits the life of the wind farm to 25 years and makes provisions for the after-care of the site. Both the council and DBJRG consider the limited removal of the concrete turbine bases would be insufficient. However, in my view the removal of concrete to a depth of 1m below ground level would be sufficient for the re-establishment of agriculture. The costs of restoration would fall to the then owner or operator of the site.

156. There was no objection to draft condition 3 concerning the removal of the temporary construction compound and two temporary meteorological masts.

157. The purpose of draft condition 4 is to secure the removal of turbines which, for any reason, stop working for a continuous period of 12 months. This is indeed a rather long period, but I have no reason to doubt the appellant's contention that lead-in times for spare parts can be significant. I have nevertheless clarified the meaning of 'operational', and, in the interests of precision, I have removed the flexibility included in the original draft.

158. There was no objection to draft condition 5 concerning the preparation of a construction method statement.

159. Draft condition 6 regulates the external finish and colour of the proposed turbines and buildings. The CPRE favoured a white finish, but both the council and the appellant would prefer a more subdued finish. Paragraph 3.2.15 of the ES specifies a pale grey colour with a semi-matt finish. In my view this would appear less stark than white, and I have specified it accordingly.

160. There was no objection to draft condition 7 concerning the direction of rotation of the proposed turbines.

161. The purpose of draft condition 8 is to allow some flexibility in the siting of turbines to take account of, for example, ground conditions. Both the council and DBJRG drew attention in this context to the effect of *R v. Rochdale MBC,* and the danger that an assessment made on the basis of submitted drawings may be undermined by an excess of flexibility. The appellant also expressed some sympathy for this view, but felt the matter could be left to the council. In my view the condition fails the test of precision included in Circular 11/95. The proposed siting of the turbines is capable of being clearly and precisely defined on the ground on the basis of the submitted drawings, and in the event of adverse ground conditions a revised application may be necessary. It follows that I consider draft condition 8 should be omitted. Departing from the 50m micrositing flexibility included in Figure 3.1A of the ES also largely resolves the concern expressed in English Nature's Technical Information Note about the proximity of turbines to hedgerows.

162. There was no objection in principle to draft condition 9 concerning ecological mitigation and compensation measures, nor draft condition 10 concerning archeaology.

163. Draft condition 11 seeks to establish a means of regulating the possible incidence of shadow flicker. In my view a clause requiring the implementation of the scheme is both necessary and reasonable.

164. The purpose of draft condition 13 is to secure a scheme to investigate and alleviate any electro-magnetic interference with radio or television reception. There was no objection.

165. Neither the council nor the appellant were enthusiastic about a lighting scheme for the proposed turbines. However, the area is one which is subject to low altitude training and in my view a condition is both necessary and reasonable. I have constructed a condition based on draft condition 18 which in my view would have only a limited adverse effect on local amenity.

166. There was no fundamental objection to draft condition 15 concerning off-site highway works, nor draft condition 16 concerning working times and practices during the construction phase.

167. Draft condition 17 specifies the type of turbine and their maximum height.

168. The council has suggested an additional condition preventing the commencement of the proposed development unless and until a connection to the national grid is approved by the council. In the appellant's view such a condition would fail the test of relevance included in Circular 11/95. The local

electricity distribution company would in any event have to obtain approval for the route. This matter if referred to in the Companion Guide to PPS22[36]. From the appellant's viewpoint it is self-evidently a prerequisite of the scheme for which a separate mechanism applies. I therefore see no need to add a condition which would duplicate the requirement.

Noise conditions

169. The draft conditions cited are those included in Document 66. Draft noise conditions were discussed at the inquiry, including the submissions made by DBJRG. I have considered in the first instance the draft conditions agreed between the appellant and the council.

170. In ETSU-R-97 it is suggested[37] that the need to regulate noise emissions from wind turbines is too complicated to be the subject of conditions imposed on a planning permission. In view of this the contents of a section 106 Agreement under the above Act are drafted together with supplementary guidance notes. However, more recently the contents of the draft Agreement have effectively been translated into a number of conditions, but including the necessary guidance notes. Notwithstanding the endorsement of ETSU-R-97 conferred by PPS22, the advice of ODPM Circular 05/05: *Planning Obligations* is that, where possible, conditions are preferable to obligations[38].

171. The draft conditions essentially seek to: (a) establish rating levels for noise immissions at 7 noise-sensitive dwellings; (b) specify a procedure for considering complaints about turbine noise; (c) provide for the disclosure of information; and (d) devise a scheme for the measurement of immissions in a range of different wind speeds and directions with the purpose of demonstrating compliance with the rating levels. In the event that noise immission levels are exceeded, the development will have failed to comply with (a). The council would then have the option of pursuing the matter by means of either a Breach of Condition Notice or an Enforcement Notice.

172. In relation to draft noise condition 1, DBJRG observes: that 'rating level' is not defined; that 'properties' should read 'dwellings'; that 'lawfully exist[ing]' is not defined; and that 'nearest' is not defined. 'Rating level' is defined in the Glossary to PPG24, and I raise no objection to 'dwellings' being substituted for 'properties'. I consider the meanings of 'nearest' and 'lawfully exist[ing]' are clear in both their geographical and planning senses, but I have omitted the final phrase in the interests of precision.

173. Draft noise condition 1 refers to Tables 1 and 2. These tables record the various levels at the receptor sites at different wind speeds. Table 1 refers to the night-time hours, and Table 2 to the remainder. DBJRG observes that it is neither practical nor useful to refer to fractions of decibels, but, in contrast, the wind speeds should refer to fractions. I accept the appellant's view however that the limits are specified in relation to wind speed integer levels having been derived from a polynomial curve. I raise no issue with the detail inherent in the noise limits as these too would be mathematically derived.

[36] Page 183, paragraph 99
[37] Page 91
[38] Paragraph B51

174. In relation to draft noise condition 2, DBJRG observes: that the council should be able to investigate noise immissions in the absence of a complaint; that the consultant's report should include all relevant data in an electronic format; and that the 28 day period is excessively rapid. I see no practical benefit in the council being able to instigate an investigation without a complaint. The data sought by DBJRG would be available under the provisions of draft noise condition 3, but I agree that 28 days could be too short a period to take account of different meteorological conditions. I have therefore increased the period to 56 days.

175. In relation to draft noise condition 3, DBJRG observes that locations for the data cited are not defined. However, the data is from each turbine so the locations would be known. In the interests of consistency I have increased the period specified to 56 days.

176. In relation to draft noise condition 4, DBJRG observes: that there is a need for a consultant to be appointed at the expense of the developer to advise the council; and that the council's satisfaction should be agreed in writing. I agree with both suggestions. I have also altered 'developer' to 'wind farm operator' in the interests of consistency with draft noise condition 2.

177. The council has suggested, with the support of DBJRG, that a fifth noise condition would be necessary seeking details of the actual wind turbine design and technical specification which it is intended to install. Notwithstanding the case of *R v. Rochdale MBC* to which I have previously referred, the appellant considers such a requirement is unnecessary. One of the purposes of the planning system is to seek to anticipate and forestall adverse impacts on the living conditions of neighbours. To this end details of design and technical specifications are a useful source of information, but absolute predictability is neither possible nor necessary. It is in order to minimise the effect of uncertainty that conditions would be necessary and reasonable. What would matter in the current case would be that the noise immissions at the receptor locations would not exceed the specified limits. The design and technical specification of the turbine would be irrelevant.

178. The DBJRG also made some observations on the schedule of Notes which supplement the draft noise conditions. In relation to Note 2(a) it is suggested that other meteorological criteria should be added – wind shear level, frozen ground and cloud cover. I agree that these are important variables. At Note 2(b) the need to specify adjacent rain gauges and to avoid atypical data points should be specified. I have included references to both these matters. At Note 2(c) a 3rd order polynomial is recommended. The appellant's preference is for a 2nd order polynomial. In my view either would be sufficient for its purpose, and I have therefore retained the Note as drafted.

179. It is in Note 4 that the conditions reach their conclusion. The DBJRG holds that the Note should require that any offending turbine is switched off. I acknowledge that this would be a logical conclusion of the process, but it would clearly constitute a serious step which should only be taken after due consideration of all the circumstances. It would be a matter for the council in the first instance. In this respect I agree with the appellant that such action falls to be specified in either a Breach of Condition Notice or an Enforcement Notice. I anticipate that the scheme required by draft noise condition 4 would

inevitably involve switching off selected turbines for temporary periods in order to permit the necessary evaluation.

180. The DBJRG has provided an alternative noise condition[39] and a reasoned justification[40] to those agreed between the appellant and the council. I have considered the alternative but I can see no obvious advantage over the draft conditions and their supplementary notes discussed above.

181. However, as is evident from my consideration of the possible noise impact of the proposed wind farm, I am concerned about the effect of greater than anticipated AM[41] arising at the site. At my instigation DBJRG has drafted a condition designed to regulate this possibility[42] and prepared a reasoned justification[43], and this has been the subject of a response by the appellant[44].

182. The appellant objects in principle to the inclusion of a condition designed to regulate AM on the grounds that excessive AM is rare; stable atmospheric conditions are rare at the appeal site; it is not recommended in ETSU-R-97; and there is insufficient knowledge to achieve the necessary balance between the preservation of amenity without causing profound damage to the UK wind industry.

183. In my opinion these misgivings are either overstated or misleading. I do not see that the rarity of the circumstance constitutes a valid reason to object to such a condition. If it is unlikely, then it is equally unlikely that it would be necessary to enforce the condition. On the basis of the evidence I have heard I am satisfied that the phenomenon is not fully taken into account in ETSU-R-97, and the condition proposed is of a precautionary nature. I would have more sympathy with the appellant's view had the purpose of ETSU-R-97 been merely the preservation of amenity, but it is not. From the viewpoint of wind farm neighbours the most important purpose of ETSU-R-97 would be more accurately described as the preservation of sleep. Taking account of both this and the uncertainties to which I have already referred, it is for these reasons that in my opinion the imposition of conditions is both necessary and reasonable.

184. The appellant complains that the condition drafted by DBJRG contains subjective elements, but I cannot see this. I fear the psycho-acoustic approach suggested by the appellant would be likely to be significantly more subjective. The possibility of a penalty approach is suggested similar to that included in ETSU-R-97 for a tonal component and as cited in Note 3. However, I have received no details of an appropriate sliding scale. I do accept nevertheless that the proposed condition would benefit from redrafting in order to clarify its content and purpose. I have amended it to this effect.

Overall conclusion

185. Paragraph 1(i) of PPS22 states that renewable energy developments should be capable of being accommodated throughout England in locations where the

[39] Document 46
[40] Document 49
[41] That is, greater than anticipated in ETSU-R-97.
[42] Document 45
[43] Document 50
[44] Documents 54 and 53

technology is viable and environmental, economic, and social impacts can be addressed satisfactorily. Similarly, and notwithstanding the extensive landscape protection policies which are integral to the planning system, paragraph 19 effectively requires that proposals are considered on a case by case basis. In the identification of the main issues in this case I have sought to balance the requirement that any adverse effects on the locality should be weighed against the widely accepted benefits of renewable energy generation. As is so often the case with planning decisions, the effects of both the development proposed and the policies of the development plan pull in different directions.

186. As far as the effect of the scheme on the character and appearance of the surrounding area is concerned, I have concluded that although the development would result in the creation of a localised zone in which the turbines would dominate the landscape character, this would diminish quite rapidly. I see no significant objection to the proposed development in relation to its effect on the historic environment. In visual terms however, I believe there would be locations to the north of the appeal site which would be harmed by the development. In contrast, I have concluded there would be no equivalent effect in relation to the local ecology. The effect of the scheme on the noise environment was the subject of much evidence and occupied a significant proportion of the inquiry. The issue is the subject of specific guidance, but I am concerned that with the growth of knowledge and the advent of larger commercial machines, ETSU-R-97 is not now as applicable as previously. However, subject to some important conditions, I have concluded that the effect of the scheme is likely to fall within the limits which were designed, in part, for the protection of wind farm neighbours. I have also taken account of other matters which I did not consider constituted main issues but which were raised by contributors to the inquiry.

187. In conclusion, the harm I have identified is fairly limited. In respect of the landscape protection provisions of the development plan there is conflict with structure plan Policy CO1, local plan Policy NE10, and Policy EN 1 of RPG 10. The protection of the landscape is also a component of Policy RE 6 of RPG 10, of structure plan Policy CO12, and of local plan Policy PS10. The purpose of these policies is to support the exploitation of renewable energy, but they require in each case that a balance is struck. The latter policies also require that account is taken of the living conditions of nearby residents. The purpose of structure plan Policy CO16 and local plan Policy BE18 is more specific – to protect existing residents from noise pollution. This is also one of the purposes of ETSU-R-97. I have concluded that, subject to conditions to regulate its impact, the scheme would conflict with neither Policy CO16 nor Policy BE18, and that the conflict with the landscape policies to which I have referred is sufficiently limited to be outweighed by the purposes of structure plan Policy CO12, local plan Policy PS10, and Policy RE 6 of RPG 10. It is for the reasons given above that I have concluded the appeal should be allowed.

Andrew Pykett

INSPECTOR

APPEARANCES

FOR THE LOCAL PLANNING AUTHORITY:

Mr Peter Wadsley	of Counsel, instructed by the Solicitor to West Devon Borough Council
He called:	
Ms Frances Griffith BA FSA MIFA	Devon County Archaeologist
Mr Mark Holland BA(Hons) DipLA CMLI	Chris Blandford Associates
Mrs Jane Hart BA MSc MRTPI	Chief Planning Officer, West Devon Borough Council

FOR THE APPELLANT:

Mr Marcus Trinick	Partner, Eversheds LLP
He called:	
Mr Colin Goodrum BSc(Hons) DipLA MLI	LDA Design
Mr David Stewart MA(Cantab) DipTP MRTPI	David Stewart Associates
Dr Stephen Holloway BSc(Hons) PhD MIEEM CEnv	Andrew McCarthy Associates
Dr Janet Barlow BSc(Hons) MSc PhD	Department of Meteorology, University of Reading
Dr Andrew McKenzie BSc(Hons) PhD MIOA	Hayes McKenzie Partnership

FOR THE DEN BROOK JUDICIAL REVIEW GROUP Ltd:

Mr Reuben Taylor	of Counsel, instructed by Ms Susan Ring of Richard Buxton Solicitors
He called:	
Ms Sarah Reynolds BSc(Hons) DipLD MA MLI	The Landscape Partnership
Mrs Pamela Coles	Local resident
Mr Ivan Buxton	Wildlife warden
Mrs Jane Davis RN RM RHV MA	Resident of Deeping St Nicholas, Lincolnshire
Mrs Clair Hodgson BA	Local resident
Dr Lee Hoare PhD	Data analyst
Mr Michael Stigwood FRSPA MIOA	MAS Environmental

FOR THE CAMPAIGN TO PROTECT RURAL ENGLAND:

Mr T J W Hale	Chairman, Devon CPRE
He called himself and:	
Mr James Paxman BA	Chief Executive, Dartmoor Preservation Association
Dr P A W Bratby BSc PhD ARCS	Energy consultant

WRITTEN STATEMENTS AND LETTERS BY INTERESTED PERSONS

OBJECTORS

Mr Justin Whittaker
Cllr James McInnes
Dr & Mrs K E Whitaker
Mr Nick Jewell
Ms Lesley Jewell
Mr David Gribble
Mr Luke de Haan
Mr George Livingstone-Learmouth
Ms Ruth Harvey
Cllr Paul Rogers
Ms Christine Lovelock
Ms Brenda Ware, for Bow Parish Council
Mr J K Welsbey, for Zeal Monachorum Parish Council
Ms Nicola Poultney, for Visit Devon
Mr Martin Quick
Mr Q Morgan Edwards
Mr Tony Wood
Ms Muriel Goodman
Ms Alix Quested
Ms Maggie Greaves
Mr P F Coles
Mr Peter Green, for Bow and District Historical Society
Mr Michael Addison
Ms Alison Thornton
Mr Colin Stabler
Ms Christine Stabler
Ms Anne Ramsey
Ms Carol Hughes
Cllr Jenny Rosser
Ms Maureen Thomson
Mr Peter Hadden

SUPPORTERS

Mr C D Bell
Ms Nan Pratt
Mr John Vincent
Mr Francis George Macnaughton
Ms Eva Ritchie
Dr Steve Ritchie
Ms Deborah Marshall, with Dan Marshall and Kira Moore
Mrs M B Williams

DOCUMENTS SUBMITTED DURING THE INQUIRY

1 Statement of Common Ground, including draft conditions
2 Bundle of supporting statements and letters, submitted by the appellant
3 Opening Statement by Mr Trinick for the appellant
4 Opening Statement by Mr Wadsley for the council
5 Opening Statement by Mr Hale for the CPRE
6 Opening Statement by Mr Taylor for DBJRG
7 Letter of support dated 15 July 2009 from the Mortenhampstead Action Group for Sustainability
8 Answer to RES Development's rebuttal of Zeal Monachorum Parish Council's paper on the impact of the proposed wind farm at Den Brook
9 Viewpoint Assessment and Effects, submitted for DBJRG
10 Wireframe Views, Viewpoints J K N Q U V and Y, submitted for the appellant
11 Landscape & Visual Impact significance tables, submitted for DBJRG
12 Photograph N, submitted for DBJRG
13 Agreed note on photograph viewpoints, including wireframes for Viewpoints G W and X, submitted for DBJRG and the appellant
14 Map showing photograph locations wider setting, submitted for DBJRG
15 Installed Renewable Energy Capacity Targets and Operational, Consented, Appeal Pending, Applications Pending and Pre-Planning Proposals in Devon, submitted for the council and the appellant
16 Note – height of cheese factory at North Tawton, submitted for the council
17 Note – Area of Great Landscape Value and the wind farm character zone, submitted for the council
18 Plan showing areas of impact, submitted for the appellant
19 Letter of support dated 25 July 2009 from Exeter Friends of the Earth
20 Note – CPRE Tranquility mapping, submitted for CPRE

21 Two large biomass proposals in the South West Region, submitted by the council
22 Pages 1-4 Climate Change Act 2008, submitted by CPRE
23 BWEA Statistics 2008, submitted by the council
24 Letter and enclosures dated 30 July 2003, Scheduled Ancient Monuments: West Devon, submitted by the council
25 Note – Wind shear model used to calculate wind speed at turbine hub height, Submitted by the appellant
26 Draft non-noise conditions: Comments of DGJRB
27 Additional draft condition, submitted by the council
28 Note – grid connection wayleaving, submitted by the appellant
29 Extract from Option Agreement, submitted by CPRE
30 Chapter 7, Draft Revised RSS for the South West incorporating the Secretary of State's Proposed Changes, July 2008, submitted by the council
31 *The UK Low Carbon Transition Plan,* submitted by the council
32 Exchange of letters dated 21 August and 1 October 2009 between Mr Philip Mulligan and Lord Hunt of Kings Heath, submitted by the appellant
33 Plan showing proximity of North Wyke and Halse Farm, submitted by the appellant
34 *Derbyshire Dales District Council and Peak District National Park Authority v. Secretary of State for Communities and Local Government and Carsington Wind Energy Limited* [2009], submitted by the appellant
35 *The UK Renewable Energy Strategy,* submitted by the appellant
36 *R v. Rochdale MBC* [2000], submitted by DBJRG
37 CPRE Policy Position Statement *Onshore Wind Turbines,* submitted by the appellant
39 Den Brook Wind Farm – Planning Conditions 2009, submitted by the appellant
40 Draft Statement of Common Ground (Noise)
41 Email dated 6 October 2009 and Draft Noise Conditions
42 Diagram, submitted by the appellant
43 Number 10 official website extract, submitted by DBJRG
44 *Night Noise Guidelines for Europe,* World Health Organization, submitted by DBJRG
45 Draft noise condition for Amplitude Modulation, submitted by the DBJRG
46 Draft noise condition for Wind Farm noise, submitted by the DBJRG
47 Den Brook Wind Farm – Planning Conditions 2009
48 Third International Meeting on Wind Turbine Noise, Aalborg, Denmark, submitted by the DBJRG
49 Rationale for general noise level condition for Wind Farm noise, Den Brook, submitted by the DBJRG
50 Rational to the Den Brook excess Amplitude Modulation condition, submitted by the DBJRG
51 MAS Errata, submitted by the DBJRG
52 Den Brook Wind Turbines – Human Rights Issues, submitted by Mr Hadden

53 Comments on DBJRG's draft noise condition for Amplitude Modulation, submitted by the appellant
54 Comments on DBJRG's draft noise condition for Wind Farm noise, submitted by the appellant
55 *North Wiltshire District Council v. Secretary of State for the Environment and Clover* [1992], submitted by the council
56 *National Wind Power v. The Secretary of State for the Environment, Transport and the Regions and others* [1999], submitted by the council
57 Closing Submission by Mr Hale
58 Closing Submissions by Mr Taylor
59 Closing Statement by Mr Wadsley
60 Closing Submissions by Mr Trinick (read by Mr Paul Maile)
61 Appeal Decision dated 1 December 2006, submitted by the appellant
62 Appeal Decision dated 15 January 2008 APP/V3310/A/2031158, submitted by the appellant
63 *The impact of wind farms on the tourist industry in the UK,* submitted by the appellant
64 Letter dated 15 November 2006 from English Heritage, submitted by the appellant
65 Draft conditions, final version, submitted by the appellant
66 Draft noise conditions, final version, submitted by the appellant
67 Email dated 11 November 2009 concerning lighting specification, submitted by the council

Schedule of Conditions

1. The development hereby permitted shall begin not later than 4 years from the date of this decision.

2. Other than in respect of the temporary construction compound and the 2 temporary meteorological masts shown in figures 3.1, 3.9 and 3.10 of the Environmental Statement (Volume III), the permission hereby granted is for the proposed development to be retained for a period of not more than 25 years from the date that electricity from the development is first supplied to the grid, this date to be notified in writing to the local planning authority. By no later than the end of the 25 year period the turbines shall be decommissioned and all related above ground structures shall be removed from the site. Six months before the due date for the decommissioning of the turbines, a scheme for the restoration of the site shall be submitted and approved in writing by the local planning authority. The scheme shall make provision for the removal of all the above-ground elements, plus 1m of the concrete turbine base below ground level, and all associated equipment before its return to agricultural use. The scheme shall include details of the phasing of the works. Upon approval, the restoration scheme shall be implemented in accordance with the phasing details, the turbines having been removed not later than the due date.

3. The temporary construction compound and the 2 temporary masts referred to in condition 2 above shall be removed within 2 years of the date that electricity is first supplied to the grid, and the ground shall be restored to its previous condition within 6 months thereafter.

4. If any turbine hereby permitted ceases to generate electricity for a continuous period of 12 months all its above-ground elements plus 1m of the concrete turbine base below ground level, save for the access tracks, shall be removed within the ensuing period of not more than 6 months.

5. No work shall commence on site until a Construction Method Statement including details of all on site construction, drainage, mitigation, restoration and reinstatement works, together with details of their timetabling has been submitted to and approved in writing by the local planning authority. This shall detail the following:

    - The construction of the access into the site from A3072 and the creation and maintenance of associated visibility splays, as illustrated in figures 3.1 and 10.5 of the Environmental Statement (Volume III);
    - The nature and use of access by rail, including any improvement works (eg signals, passing loop) for the purposes of transporting construction materials and turbine components to or from the site;
    - The formation of the construction compound;
    - The construction of the crane pads;
    - The carrying out of foundation works;
    - The construction of the sub-station and control building;

- The erection of the meteorological masts;
- The arrangements to be made for the cleaning of the site entrances and the adjacent public highway;
- The formation of the access tracks and any areas of hardstanding;
- The post-construction restoration/reinstatement of the working areas;
- The measures to be taken to avoid any damage to on-site archaeological remains that are to remain in-situ.

Construction shall only take place in accordance with the methods as approved.

6. No development shall take place until details of the following have been submitted to, and approved in writing by, the local planning authority:

(a) The external finish and colour of the proposed turbines, which shall be pale grey with a semi-matt finish; and
(b) The materials to be used in the construction of the external surfaces of the proposed buildings.

The development shall be carried out in accordance with the approved details, and there shall be no subsequent change to the finish or coloration of the turbines.

7. All the turbine blades shall rotate in the same direction.

8. Before the commencement of the development hereby permitted a scheme of illumination of the most northerly (T5), southerly (T3), and westerly (T10) turbines shall be submitted to and approved in writing by the local planning authority. The scheme shall provide for 25 candela omni-directional lighting in the horizontal plane (360º). In the vertical plane the lighting shall be limited to the sector between 15º below and 30º above the horizon. The lighting shall be night vision goggle compatible or infra-red lighting on the hubs of the turbines. The scheme shall be implemented as approved by the date that electricity is first supplied to the grid.

9. Before development commences a scheme shall be submitted to and approved in writing by the local planning authority for the ecological mitigation and compensation measures proposed within the site incorporating the principles set out in Tables 6.15 and 6.16 of the Environmental Statement (Volume II) and the amended habitat mitigation plan set out in Figure 6.21 Rev 0.1. The scheme, as approved, shall be implemented throughout the construction and operational phases of the development.

10. The development hereby permitted shall not commence until a programme of archaeological work has been implemented in accordance with a written scheme of investigation submitted to and approved in writing by the Local Planning Authority.

11. The development hereby permitted shall not commence until a scheme to avoid the incidence of shadow flicker at any dwelling or other sensitive property has been submitted to and approved in writing by the local planning authority. The scheme shall be implemented as approved and as necessary.

12. The development hereby permitted shall not commence until a scheme to secure the investigation and alleviation of any electro-magnetic interference to television and radio reception, caused by the operation of the wind turbines, has been submitted to and approved in writing by the local planning authority. The procedure set out in the approved scheme shall be followed at all times.

13. The development hereby permitted shall not commence until a detailed Construction Management Scheme for off-site highways works has been submitted to and approved in writing by the local planning authority. This shall include a Traffic Management Plan for the routing of construction traffic to and from the site, addressing in particular the movement of abnormal loads, the arrangements to be made for any Highways Act Agreement that may be required, and the re-instatement of off-site works not needed to be retained after the construction phase. The development shall be carried out in accordance with the approved scheme.

14. Notwithstanding the statement prepared in accordance with condition 5 above, construction work shall take place only between the hours of 07:00 and 19:00 on Monday to Friday inclusive, 07:00 and 13:00 on Saturdays with no such working on a Sunday or local or national public holiday. Outside these hours, development at the site shall be limited to turbine erection, maintenance, dust suppression and the testing of plant and equipment or construction work that is not audible from any noise-sensitive property outside the site. The receipt of any materials or equipment for the construction of the site, other than turbine blades, nacelles and towers, is not permitted outside the said hours.

15. The development hereby permitted is confined to 3-bladed horizontal axis wind turbines with a maximum height to the blade tip of 120m above ground level.

16. The rating level (as defined in the Glossary of PPG24: *Planning and Noise*) of noise immissions from the combined effects of the wind turbines (including the application of any tonal penalty), when assessed in accordance with the attached Guidance Notes, shall not exceed the values set out in the attached Tables 1 and 2 below. Noise limits for dwellings which lawfully existed at the date of this permission but not listed in the Tables attached shall be those at the nearest location listed in the Tables.

17. At the request of the local planning authority following a complaint the wind farm operator shall, at its expense, employ a consultant approved

by the local planning authority, to assess the level of noise emissions from the wind farm at the complainant's property following the procedures described in the attached Guidance Notes. A report of the assessment shall be provided in writing to the local planning authority within 56 days of a request under this condition unless this period is extended by the local planning authority in writing.

18. Wind speed, wind direction and power generation data for each wind turbine shall be continuously logged and provided to the local planning authority at its request and in accordance with the attached Guidance Notes within 56 days of such a request.

19. No wind turbine shall generate electricity to the grid until the local planning authority, as advised by a consultant approved by the local planning authority at the expense of the operator, has approved in writing a scheme submitted by the wind farm operator providing for the measurement of noise immissions from the wind turbines. The objective of the scheme (which shall be implemented as approved) shall be to evaluate compliance with condition 16 in a range of wind speeds and directions and it shall terminate when compliance with condition 16 has been demonstrated to the satisfaction of and agreed in writing by the local planning authority.

20. At the request of the local planning authority following the receipt of a complaint the wind farm operator shall, at its expense, employ a consultant approved by the local planning authority, to assess whether noise immissions at the complainant's dwelling are characterised by greater than expected amplitude modulation. Amplitude modulation is the modulation of the level of broadband noise emitted by a turbine at blade passing frequency. These will be deemed greater than expected if the following characteristics apply:

    a) A change in the measured $L_{Aeq,\ 125\ milliseconds}$ turbine noise level of more than 3 dB (represented as a rise and fall in sound energy levels each of more than 3 dB) occuring within a 2 second period.

    b) The change identified in (a) above shall not occur less than 5 times in any one minute period provided the $L_{Aeq,\ 1\ minute}$ turbine sound energy level for that minute is not below 28 dB.

    c) The changes identified in (a) and (b) above shall not occur for fewer than 6 minutes in any hour.

    Noise immissions at the complainant's dwelling shall be measured not further than 35m from the relevant building, and not closer than within 3.5m of any reflective building or surface, or within 1.2m of the ground.

21. No wind turbine shall generate electricity to the grid until the local planning authority, as advised by a consultant approved by the local planning authority at the expense of the operator, has approved in writing a scheme submitted by the wind farm operator providing for the measurement of greater than expected amplitude modulation immissions generated by the wind turbines. The objective of the scheme (which shall be implemented as approved) shall be to evaluate compliance with condition 20 in a range of wind speeds and directions and it shall

terminate when compliance with condition 20 has been demonstrated to the satisfaction of and agreed in writing by the local planning authority.

SCHEDULE OF GUIDANCE NOTES RELATING TO CONDITIONS 16 - 18

These notes (or any superseding equivalent UK adopted procedure) are to be read with conditions 16 - 18. They further explain these conditions and specify the methods to be deployed in the assessment of complaints about noise immissions from the wind farm.

NOTE 1

(a) Values of the $L_{A90,10min}$ noise statistic should be measured at the complainant's property, using a sound level meter of IEC 651 Type 1, or BS EN 61672 Class 1, standard (or the equivalent relevant UK adopted standard in force at the time of the measurements) set to measure using a fast time weighted response. This should be calibrated in accordance with the procedure specified in BS 4142: 1997 (or the equivalent relevant UK adopted standard in force at the time of the measurements).

(b) The microphone should be mounted at 1.2 - 1.5m above ground level, fitted with a two layer windshield or suitable equivalent approved by the local authority, and placed outside the complainant's dwelling. Measurements should be made in "free-field" conditions, so that the microphone should be placed at least 3.5m away from the building facade or any reflecting surface except the ground.

(c) The $L_{A90,10min}$ measurements should be synchronised with measurements of the 10-minute arithmetic average wind speed and with operational data from the turbine control systems of the wind farm.

(d) The wind farm operator shall continuously log arithmetic mean wind speed and arithmetic mean wind direction data in 10 minute periods from the hub height anemometer on the site to enable compliance with the conditions to be evaluated. Such data shall be 'standardised' to a reference height of 10m as described in ETSU-R-97 at page 120 using a reference roughness length of 0.05m.

NOTE 2

(a) The noise measurements should be made so as to provide not less than 20 valid data points as defined in Note 2 paragraph (b). Such measurements should provide valid data points for the range of wind speeds, wind directions, wind shear levels, frozen ground, cloud cover, times of day and power generation requested by the local planning authority. In specifying such conditions the local planning authority shall have regard to those conditions which were most likely to have prevailed during times when the complainant alleges there was disturbance due to noise. At its request the wind farm operator shall provide all of the data collected under condition 17 to the local planning authority.

(b) Valid data points are those that remain after all periods during rainfall have been excluded as informed by a rain gauge sited adjacent to the measurement location. Additional atypical data as agreed by the local planning authority shall also be removed.

(c) A least squares, "best fit" curve of a maximum 2nd order should be fitted to the data points and define the rating level at each integer speed.

NOTE 3

Where, in the opinion of the local planning authority noise immissions at the location or locations where assessment measurements are being undertaken contain a tonal component, the following rating procedure should be used.

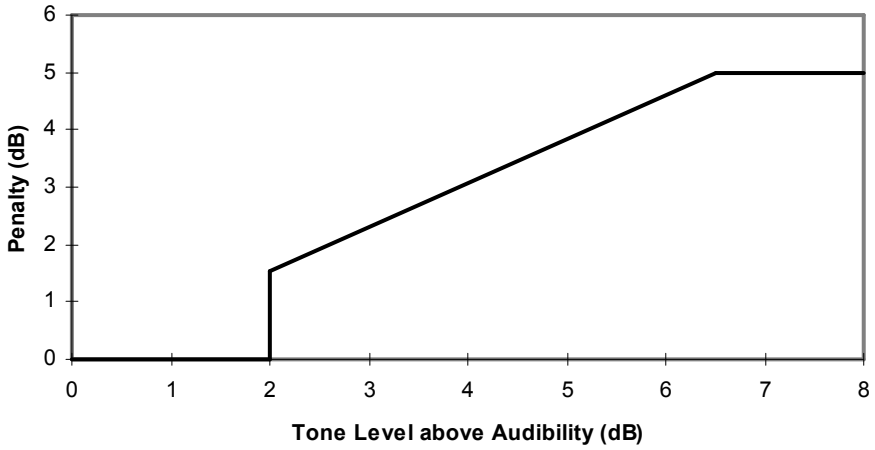
(a) For each 10-minute interval for which $L_{A90,10min}$ data have been obtained as provided for in Note 1 a tonal assessment is performed on noise immissions during 2 minutes of each 10 minute period. The 2 minute periods should be regularly spaced at 10 minute intervals provided that uninterrupted clean data are available. Where clean data are not available, the first available uninterrupted clean 2 minute period out of the affected overall 10 minute period shall be selected. Any such deviations from standard procedure shall be reported.

(b) For each of the 2-minute samples the margin above or below the audibility criterion of the tone level difference, Delta L_{tm}, should be calculated by comparison with the audibility criterion given in paragraph 2.1 on pages 104-9 of ETSU-R-97.

(c) The margin above audibility is plotted against wind speed for each of the 2-minute samples. For samples for which the tones were below the audibility criterion or no tone was identified, substitute a value of zero audibility.

(d) A linear regression should then be performed to establish the margin above audibility at the assessed wind speed for each integer wind speed. If there is no apparent trend with wind speed then a simple arithmetic average shall be used.

(e) The tonal penalty is derived from the margin above audibility of the tone according to the figure below. The rating level at each wind speed is the arithmetic sum of the wind farm noise level, as determined from the best fit curve described in Note 2, and the penalty for tonal noise.



NOTE 4

If the rating level is above the limit set out in the conditions, measurements of the influence of background noise should be made to determine whether or not there is a breach of condition. This may be achieved by repeating the steps in Note 2, with the wind farm switched off, and determining the background noise at the assessed wind speed, L_3. The wind farm noise at this speed, L_1, is then calculated as follows where L_2 is the measured level with turbines running but without the addition of any tonal penalty:

$$L_1 = 10\log\left[10^{L_2/10} - 10^{L_3/10}\right]$$

The rating level is re-calculated by adding the tonal penalty (if any) to the derived wind farm noise L_1. If the rating level lies at or below the values set out in the conditions then no further action is necessary. If the rating level exceeds the values set out in the conditions then the development fails to comply with the conditions.

TABLES OF NOISE LIMITS RELATING TO CONDITION 16

Table 1: Between 23:00 and 07:00 hours (Noise Level in dB $L_{A90,\ 10min}$)

	Standardised Wind Speed at 10 m height (m/s)											
Location	1	2	3	4	5	6	7	8	9	10	11	12
Halse Farm	43.0	43.0	43.0	43.0	43.0	43.0	43.0	45.4	48.9	52.0	54.4	55.8
Itton Manor	43.0	43.0	43.0	43.0	43.0	43.0	43.0	43.0	45.4	48.7	51.7	54.2
Ham Farm	43.0	43.0	43.0	43.0	43.0	43.0	43.0	43.0	43.0	43.0	47.2	52.7
Crooke Cottage	43.0	43.0	43.0	43.0	43.0	43.0	43.0	43.0	43.0	43.0	45.9	49.7
Crooke Burnell	43.0	43.0	43.0	43.0	43.0	43.0	43.0	43.0	43.0	43.0	45.9	49.7
Broadnymett	43.0	43.0	43.0	43.0	43.0	43.0	43.0	43.1	46.8	50.6	54.4	58.0
Coxmoor	43.0	43.0	43.0	43.0	43.0	43.0	43.0	45.6	49.5	53.3	56.9	59.9

Table 2: At all other times (Noise Level in dB $L_{A90,\ 10min}$)

	Standardised Wind Speed at 10 m height (m/s)											
Location	1	2	3	4	5	6	7	8	9	10	11	12
Halse Farm	37.5	37.5	37.5	37.5	38.0	40.5	43.6	46.9	50.1	53.0	55.4	56.9
Itton Manor	37.5	37.5	37.5	37.5	37.5	37.5	40.1	43.1	46.0	48.7	50.7	52.0
Ham Farm	37.5	37.5	37.5	37.5	37.5	37.5	37.5	37.9	40.2	42.8	45.3	47.6
Crooke Cottage	37.5	37.5	37.5	37.5	37.5	37.5	37.5	37.9	40.6	43.5	46.6	49.7
Crooke Burnell	40.0	40.0	40.0	40.0	40.0	40.0	40.0	40.0	40.6	43.5	46.6	49.7
Broadnymett	37.5	37.5	37.5	37.5	37.5	37.6	40.4	43.5	46.6	49.7	52.4	54.7
Coxmoor	37.5	37.5	37.5	37.5	37.5	38.8	42.2	45.9	49.7	53.3	56.4	58.7

Appeal Decision

Inquiry held on 7-9 January, 13-16 January, 19-23 January and 9 and 10 February 2009

Site visits made on 11 and 12 February 2009

by Mr D Lavender MRTPI

an Inspector appointed by the Secretary of State for Communities and Local Government

The Planning Inspectorate
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Decision date: 16 March 2009

Appeal Ref: APP/X2220/A/08/2071880
Land west of Enifer Downs Farm and east of Archers Court Road and Little Pineham Farm, Langdon.

- The appeal is made under section 78 of the Town and Country Planning Act 1990 against a failure to give notice within the prescribed period of a decision on an application for planning permission.
- The appeal is by Ecotricity Group Ltd against Dover District Council.
- The application, Ref DOV/07/01148, is dated 15 August 2007.
- The proposal is for wind energy development comprising: erection of up to 5 wind turbines (maximum height 120m), together with access tracks, hardstanding areas, electricity sub-station and temporary construction compound.

Application for costs

At the Inquiry an application for costs was made by Dover District Council against the Appellant. This application is the subject of a separate Decision.

Decision:

I dismiss the appeal and refuse planning permission for the development applied for.

Procedural and administrative matters

1. As originally submitted, the application was accompanied by an Environmental Statement (ES) prepared under the Town and Country Planning (Environmental Impact Assessment)(England and Wales) Regulations 1999.

2. After the appeal was lodged, the Council resolved, at the meeting of its Planning Committee on 5 June 2008, that it would have refused planning permission for the following reasons:

   (i) In the absence of the provision of further information required by the Local Planning Authority under Regulation 19 of The Town and Country Planning (Environmental Impact Assessment) (England and Wales) Regulations 1999, as set out in the draft report dated 18 April 2008 by Ramboll Whitbybird, in respect of site selection, highways and transport, ecology, grid connections, landscape and visual impact, cultural heritage and tourism and socioeconomics, the Local Planning Authority, does not have sufficient environmental information to fully assess the impact of the proposed development.

(ii) In the absence of information requested by the Local Planning Authority as set out in the letters dated 20 December 2007 and 19 February 2008, the Local Planning Authority are unable to fully and properly consider the merits and the impact of the proposed development.

3. It had first been held that this appeal would fall jointly to the Secretaries of State for Communities and Local Government (DCLG) and for Business, Enterprise and Regulatory Reform (BERR) to determine. A Pre-Inquiry Meeting (PIM) was held on Monday 3 November 2008 at which reference was made by the parties to the submission of Supplementary Environmental Information (SEI) provided by the Appellant and dated Thursday 30 October 2008. This incorporated some of the details which the Council's June 2008 Committee resolution had identified as being absent, and also included an appraisal of a scheme for 4 turbines. Following objections from the Council and other Rule 6 parties about the timing and content of this SEI, I ruled that I would invite the Secretaries of State to consider the option of permitting four turbines, rather than five, as a potential amendment to the application proffered by the Appellant, adding that I would also consider, and invite the Secretaries of State to consider, the additional environmental information that accompanied the 4 turbine option in determining the planning application. Following clarification of the Appellant Company's status, the appeal was subsequently transferred to me for my own determination. Further Environmental Information, relating specifically to wind shear, was submitted in December 2008.

4. The statement of Common Ground accordingly asserts (among other things) that the planning application before me consists of the following:

- Planning application forms dated 15 August 2007;
- Environmental Statement (September 2007), including particularly the "application drawings", namely figures 4.1 (existing site plan), 4.2 (proposed site plan), 4.3 (elevational drawing of turbine), 4.4 (turbine foundations), 4.5 (substation), 4.6 (turbine colour scheme), and 4.6 (daylight/night marking).
- Environmental Statement Technical Appendices (September 2007);
- Environmental Statement Non Technical Summary (September 2007);
- Environmental Statement Supplementary Information (October 2007);
- Design and access statement (September 2007);
- Planning statement (September 2007);
- Statement of Community Involvement (September 2007);
- Flood risk assessment (October 2007);
- Supplementary Environmental Information (30 October 2008);
- Supplementary Environmental Information (December 2008);

5. In answer to my questions, the Appellant advised that the turbine drawings and details are of a potential candidate turbine, and that the drawings of the sub-station are of a typical building. Within the parameters set by the

application description and the Environmental Statement (ES) and Supplementary Environmental Information (SEI), I have therefore regarded those details as being for illustrative purposes only. The Statement of Common Ground further affirms that only temporary permission is sought for the construction compound, which would not remain in situ once the turbines have been commissioned and begun generating electricity. The turbines themselves, together with their foundations and associated crane pads, internal access tracks, substation and grid connection are proposed to endure for 25 years.

6. At my request, a site plan was submitted incorporating all of the land within the Appellant's ownership or control outlined in blue (Inquiry Document 50). I have taken this as an additional application plan rather than as a replacement of figure 4.1 as the red line area on it does not identify the site of the proposed substation.

7. The Council's resolved reasons for refusal allege only an insufficiency of Environmental Information and thus raise potential rather than actual objections to the scheme itself. Those alleged deficiencies are numerous and wide ranging, the 20 December 2007 letter referred to in reason 2 extending to seven pages and the letter of 18 February 2008 to nineteen pages. It is implicit from section 10 of the PIM minutes and my subsequent ruling (on the 4 turbine scheme), that I saw no compelling reason to require anything more than the 30 October 2008 SEI to be submitted. That approach did not, however, preclude a finding, on the basis of the evidence and submissions to the Inquiry, that further information could, in the event, be necessary. Indeed, my ruling refers to paragraph 112 of Circular 2/99, which affirms that if a developer fails to provide sufficient information to complete an ES, the application can be determined only by refusal.

8. Nonetheless, Circular 2/99 cautions against the use of regulation 19 powers to obtain other than the minimum information about environmental effects consistent with compliance with the Regulations, adding that such powers should not be used simply to obtain clarification or non-substantial information. Paragraph 11 of the Planning and Climate Change Supplement to PPS1 similarly militates against requiring excessively detailed information. Both the October 2008 and December 2008 SEI were subjected to publicity procedures in accordance with the Regulations and, in my judgement, they satisfy (together with the original ES) the definition of an Environmental Statement in Regulation 2. Nonetheless, throughout the Inquiry, the Council and Parish Councils maintained the stance that the Environmental Information was inadequate to satisfy the Regulations, despite the Council's planning witness conceding in cross-examination that the evidence to the Inquiry had provided sufficient detail for me to satisfactorily determine the application. Closing submissions covered the subject in some detail, that from LAG referring in particular to the judgement of Sullivan J in *Blewett-v-Derbyshire County Council* [2003] EWHC 2775. In the light of that judgment, I find nothing that might have caused me to be other than satisfied with the Environmental Statement or the scope and content of the Environmental Information now before me, and I have taken it all (ES, SEI and evidence) into account in determining this appeal.

9. It is also necessary to make clear at the outset my approach to the 4 turbine scheme introduced in the October 2008 SEI. In essence, I do not regard this as a separate proposal from the five turbine scheme (effectively with two

applications running in parallel on which two separate decisions are required). Nor do I regard it as a revision to the 5 turbine scheme in the sense that only the four turbine scheme now stands to be considered. Instead, as indicated in the notes to my post PIM ruling, and as requested by the Appellant, I consider the proposal before me as a five turbine scheme and, should that be unacceptable, consider whether a condition limiting the scheme to four turbines (by excluding turbine T1) would overcome the objections to 5 turbines. With the agreement of the parties, and in order to avoid any risk of confusion between the number of turbines proposed and the number that might be permitted, I have above included the words "*up to*" five turbines in the banner heading description of the proposal.

The main issues

10. Largely in consequence of the additional detail provided in the October 2008 SEI, dispute at the Inquiry centred on a more limited range of matters than had been raised at the PIM. Partly for that reason, the timetabling of the Inquiry was arranged to include a small number of topic-based sessions covering landscape, aviation, noise and policy interests. Other evidence was heard more traditionally on a sequential basis, and included cultural heritage, highways and a range of amenity considerations relevant to "places of habitation" (homes, workplaces, schools and places of worship). A great many representations were also made in writing, including two letters of support passed to me at the Inquiry. I have taken all of these into account but, in the interests of brevity, my reasoning focuses only on what I consider to be the principal important and controversial issues[1]. These broadly concern strategic principles and questions of development control detail, and I categorise them accordingly. Having heard all of the evidence, read all of the third party representations and inspected the site and its surroundings, it seems to me that that the main issues in this case are:

Strategic principles:

1. Quantitative considerations
2. The approach to alternatives
3. The suitability of the local landscape to accommodate wind turbine development
4. The impact on aviation interests

Detailed development control matters:

5. The extent to which the proposed turbines would bear directly upon the environment and amenities enjoyed by local people who would experience the effects of their presence most closely, with particular regard to noise, flicker and visual impact; and
6. The effect of the proposal on cultural heritage interests, including locations of acknowledged scenic attraction.

[1] South Bucks DC-v-Porter (No2)[2004]UKHL33

11. During the course of processing the application, the site has become known as the "North Dover" wind farm site and I refer to it in shorthand accordingly.

Strategic principles:

Issue 1: Quantitative considerations

12. Paragraph 2 of PPS22 "Renewable Energy" requires Regional Spatial Strategies to include targets for renewable energy *capacity*. These are to be derived from assessments of the region's renewable energy resource potential, taking into account the regional environmental, economic and social impacts (either positive or negative) that may result from exploitation of that resource potential.

13. Such targets are different from *generation* targets, which are more widely referred to in National and International obligations as a measure for promoting increases in the proportion of energy derived from renewable resources. Those targets are reflected, for example, in the Government's aim of producing 20% of UK electricity requirements from renewable sources by 2020. The achievement of such targets is dependent upon a wide range of variables. These include intervening rates of population and household growth, changes in the rate of replacement of energy inefficient appliances with energy efficient ones (such as low energy lighting, washing machines and refrigerators), increases in usage of powered appliances in general (such as computers) and the effect of improved standards of home and workplace heating and insulation.

14. Both types of target share the common purpose of tackling climate change. However, *capacity* targets are the more relevant of the two to the spatial planning process because they involve direct comparison of factors (regional capacity and capacity of the technology to generate) that can be firmly established at the outset and accurately monitored as the target date approaches. Importantly, it would plainly be wrong to seek to derogate renewables technologies by introducing input data for generation into a target for capacity, or vice-versa, because the two are entirely different measures.

15. As paragraph 3 of PPS22 advises, spatial planning targets should be expressed as the minimum amount of installed *capacity* (used in this sense to refer to the manufacturer's warranted or "rated" energy output), reviewed on a regular basis, and revised upwards if they are met, subject to further *capacity* (used in this sense to refer to environmental, economic and social capacity) being identifiable. The Planning and Climate Change Supplement to Planning Policy Statement 1 (PPS1) elaborates upon this advice and, at paragraph 20, further makes clear that applicants should not be required to demonstrate either the overall need for renewable energy or why a proposal for such development must be sited in a particular location.

16. In essence, it is thus for each region to determine its own minimum capacity for renewables, and there is no compelling requirement in PPS22 for any one region to meet a pre-set proportion of UK generation needs. It would be both surprising and inexpedient for a Region to promote a minimum capacity figure in statutory development plan policy without having first established that such capacity exists, normally through a "bottom-up" rather than a "top-down" analysis involving at least a measure of consultation with the constituent

Counties and/or Districts. Only on-shore capacity is to be counted, not just in recognition of the extent of Local Authority administrative boundaries but also because, no matter how close the turbines are to a particular coastline, it may be the case that the energy will be brought ashore in a different administrative area or Principality. Off-shore generation is thus counted as a contribution to National generation targets, but not to regional capacity (or planning) targets. For the purposes of North Dover, however, a key point is that capacity assessment by planning authorities, rather than case-by–case assessment of individual planning applications, is intended to underpin quantitative and broad distributional considerations at regional (and, it follows, sub–regional) level.

17. In this particular case, approved Regional Spatial Strategy (RPG9 2004 Alterations) policy INF7 establishes indicative capacity targets in Kent (for all on-shore renewables, not solely wind) of 111MW by 2010 and 154MW by 2016. These figures are proposed to be retained in policy NRM14 emerging RSS (the South East Plan). The adopted Kent and Medway Structure Plan (SP) will shortly be superseded by the South East Plan, but it does affirm that the majority of Kent's contribution to renewables is likely to come from wind (paragraph 9.25) and further refines this by suggesting (in paragraph 9.26) that 100MW of its 2016 target could come from one large wind farm (more than 50MW), five small clusters of 4-10 turbines (6MW), six large turbines and 30 small single wind turbines.

18. From the evidence to the Inquiry, I am far from certain that either Regional or sub-Regional capacity has yet been assessed with the assiduity such precise figures suggest. As matters currently stand, however, installed capacity (all Kent on-shore renewables) amounts to 129.11MW including the recently completed Little Cheney Court "large" wind farm (60MW). While some additional "clusters" are in the pipeline (including North Dover), none can yet be regarded as "commitments". As far as resource capacity is concerned, the presence of a gliding club at nearby Waldershare Park, an airstrip at Inglenook Farm and the remains of several windmills (including Swingate Mill and the mill at South Foreland) attest to the relative windiness of this part of Kent, which is undisputed. Even if permitted now, it is unlikely that North Dover would be completed in time to be counted within the 2010 target period. I find no reason to doubt that its quantitative contribution towards the 2016 target would be both beneficial and welcome and that this part of Kent has a wind resource that could usefully be exploited in meeting or exceeding statutory development plan indicative capacity targets.

Issue 2: The approach to alternatives

19. Clause 4 of Part II of Schedule 4 to the Town and Country Planning (Environmental Impact Assessment)(England and Wales) Regulations 1999 effectively requires an applicant for EIA development to include in the Environmental Statement an outline of the main alternatives studied and an indication of the main reasons for the choice, taking into account the environmental effects. Paragraph 83 of Circular 02/99, however, affirms that this does not amount to a requirement for a developer to actively look for alternatives (alternative sites, choice of process and phasing of construction), but only to record the environmental merits of practicable alternatives where such alternatives have been considered.

20. The approach to site selection is the subject matter of Chapter 3 of the ES. Among other things, this indicates the range of criteria employed in the initial search for sites and the reasons for focusing on the North Dover site. While various of those reasons are open to dispute (such as the criterion that turbines should not, typically, be closer than 400 m to dwellings), it seems to me that the relevant guidance in Circular 02/99 has been followed and I do not find it necessary, or desirable, to delve further into the subject of alternative sites.

21. Moreover, as PPS22 advises, renewable energy developments should be capable of being accommodated throughout England in locations where the technology is viable and environmental, economic and social impacts can be addressed satisfactorily. There is thus no need to rank sites in any particular order of preference or to fear that the "best" site might be sacrificed to development of a lesser site or sites. Rather, it is the nature of wind energy development that, subject to there being no harmful cumulative impact (which is not the case here) an assemblage of suitable sites (whether "best" or "satisfactory") should be utilised. This is because the contribution of wind to energy supplies derives from a large number of relatively small installations (compared to traditional power stations on which the country has traditionally relied for the bulk of its electricity supplies) spread across a wide range of locations (which can compensate for day-to-day localised variations in wind speed) and embedded close to sources of demand (so that losses through transmission are minimised). Any contribution from North Dover (even if the site was found not to be the *best* in the district or County but nonetheless *satisfactory*), would thus be beneficial not only for quantitative reasons and reasons of sustainability, but also in terms of continuity, diversity and security of supply, and distributional efficiency.

Issue 3: The suitability of the local landscape to accommodate wind turbine development.

22. There is a wealth of evidence before me disputing the capacity of the landscape to satisfactorily accommodate proposed turbines in the number and size proposed. This includes the oral, documentary and photographic submissions from the Council's, Appellant's and LAG's own professional landscape witnesses, a landscape impact assessment of the proposal made on behalf of the County Council in January 2008 and the 17 photomontages, 25 additional montages and further "wirelines" included in the Environmental Statement and Supplementary Environmental Information. I deal here only general principles of landscape strategy and reserve more detailed consideration of the evidence for the specific points raised by issues 4 and 5.

23. In effect, the site lies a little less than 4 km inland from the Channel coast, on the gentle northern "back slope" of the Kent Downs and towards the higher end of one of the several dry valleys that incise this chalky land form on an approximate north-east/south west alignment. These shallow valleys lend the landscape hereabouts a gently rolling character and it is the dramatically exposed flanks of some of them where they border the coast that create the part of the famous White Cliffs that progressively decline in height from Dover north-eastwards towards Kingsdown. When viewed from the coast to the south east, the rolling landscape separating the solidly urban areas of Dover and St Margaret's is seen across the tops of the valleys and thus appears

mainly flat, expansive and very open, with large scale arable fields interspersed increasingly to the west of A258 with blocks of woodland and stretches of hedgerows. The valleys themselves, however, are of markedly different character. Much of the network of rural lanes passing through them is sunken and tree lined and they hide a number of small settlements often of historic character and all of profoundly rural quality.

24. In landscape policy terms, the coastal margin, traced by the Saxon Shore Way long distance footpath and extending inland to Upper Road, is part of the White Cliffs area of designated Heritage Coast. The South Foreland section of the Kent Downs Area of Outstanding Natural Beauty also extends further inland to the alignment of the A258 Dover to Walmer Road, typically a little less than 2 km from the appeal site. The main part of the Kent Downs AONB, however, lies some way off to the south west of Dover and both parts exclude the appeal site, which falls within an area carrying the SP policy EN5 local landscape designation of Special Landscape Area. Whereas Planning Policy Guidance Note 7 "*Sustainable Development in Rural Areas*" (PPS7) makes clear that AONBs have been confirmed by the Government as having the highest status of protection in relation to landscape and natural beauty, it cautions that local landscape designations should be maintained or extended only where necessary to ensure that particular characteristics of the landscape are respected. It is not intended that this SP designation excludes development altogether, or that the designation be retained in the South East Plan, and I therefore attach only limited significance to it. Policies CO1 and CO5 in the Dover District Local Plan 2002 (LP) both recognise that certain types of development inherently require rural locations, the latter policy applying only to development on the Heritage Coast, not close to it. In these circumstances, I find no landscape policy in the statutory or emerging development plan of sufficient weight to militate against the principle of wind farm development taking place at the North Dover site.

25. The Council also acknowledges that "*the most suitable types of landscape for wind turbine development are typically expansive and open, with few receptors, no archaeological influences and some visual detractors*". There is some resonance between that and the Appellant's assessment that "*between the broad horizons and the rolling contours, the turbines would be a relatively small feature at 2 km distance or more*". It is also not far removed from the County Council's 2008 assessment which remarks, for example, that "*when viewed from within the South Foreland part of the AONB, the turbines would be a relatively small element in a much wider view. The clean and simple design of the turbines also mitigates their intrusive effects. There are also other visual detractors such as masts, pylons and overhead power lines either within the AONB or near to the wind farm so that views from the AONB towards the turbines cannot be regarded as completely unspoilt*." The County's assessment concludes, among other things, that the overall character of the AONB would not be significantly affected, and that the scale of the landscape is more able to accommodate these features than a small scale intimate landscape. Natural England has not objected on landscape grounds.

26. From my own inspection of the area, I have come to much the same verdict on the widest compass of views from inside and outside the AONB including,

for example, VP13[2], VP14, A9[3], A21, A22 and A24. The proposed turbines would be more significant features in a range of views towards the horizon taken from closer to the site, such as VP10, VP12 and A12. I saw that these montages generally have the turbines as the central focus of a single angle of view, whereas in reality the eye would rove over a much greater number of features both nearer to and further off and in a much wider range of directions. In this broad context the turbines would still not in my judgement represent such a dominant feature that appreciation of the local countryside in general for its intrinsic character and beauty or the greater diversity of its landscape character, would be seriously compromised. I further observed that within the small intimate landscape of the valleys themselves, the contours and the vegetation lining large parts of the local network of rural lanes, and within the settlements, would in many places mask the turbines completely, or almost completely, from sight. I accept therefore that the landscape has capacity to absorb a cluster of turbines, but in doing so I make two qualifications. The first is that, in some localised areas, there are particular properties or parts of settlements in which the turbines would be fully exposed or only partly masked from view. In these places, the relationship between the height and spread of the proposed turbines and their proximity to places of habitation of much smaller scale, as well as to sites and buildings of historical significance, requires particularly careful scrutiny. The second is that in certain of the long distance views, where the turbines would be seen above the skyline, the sensitivity of both the viewpoint and viewer warrant particular attention. I refer to the latter as "locations of acknowledged scenic attraction". Both are subjects that I return to in my consideration of issues 5 and 6.

Issue 4: Impact on aviation interests.

27. Paragraph 25 of PPS22 says of wind farms that "It is the responsibility of developers to address any potential impacts, taking account of Civil Aviation Authority, Ministry of Defence and Department for Transport guidance in relation to radar and aviation, and the legislative requirements on separation distances, before planning applications are submitted". There was discussion at the Inquiry over whether "addressed" in the context of paragraph 25 of PPS22 means "resolved". I remark only that "addressed" is the word used in PPS22, but both words can accommodate situations in which safety concerns are either met, or are recognised as not capable of being met. This is why I regard aviation interests as a factor bearing on the principle of what is being proposed rather than simply, for later, as a development control detail. "Addressing" through early consultation also gives CAA an opportunity to offer technical advice to the parties, if requested, in the event of dispute and before positions become entrenched in a planning application.

28. Two objectors appeared at the Inquiry to raise aviation matters, the first concerning Kent International Airport (KIA) and the second concerning the Inglenook Farm airfield. The nature of concerns raised by each is different (the first being concerned with technical effects and the second with physical effects), so I deal with them in sequence. At the outset I record that the planning process is concerned with regulating the use and development of

[2] VP = Photomontage Viewpoints, taken from October 2008, replacing those in ES.
[3] A= Additional Viewpoints, taken from SEI October 2008.

land in the public interest and not with the protection of the commercial interests of one organisation or individual against the legitimate business activities of another.

29. I am aware, for example, that the 2003 Airport White Paper *"The Future of Air Transport"* signalled the valuable role that KIA could play in contributing to regional economic development and urged that this be recognised in regional and local planning frameworks. SP policy TP24 and policy T9 in the emerging South East Plan accordingly acknowledge the potential of KIA to develop into a regional airport and become one of the largest single generators of economic activity within the County.

30. However, having ambitions for substantial growth (as expressed in KIA's 2008 draft master plan) is not the same as having certainty that such growth will, in practice, occur. Much will inevitably depend on choices made by others, for example with regard to the future development of London, Gatwick and Stanstead airports, the degree of competition from Lydd airport and actual rates of growth in overall demand for air travel and transport. Indeed, although KIA has undisputed spare capacity, it starts from a relatively low base with passenger numbers amounting to just 16,000 last year (mainly seasonal charters and weekly services) and 625 freight aircraft movements (or roughly two per day). There is no suggestion that KIA's growth could not materialise if 5 wind turbines were constructed at North Dover, the economic argument before me being that their presence would make additional aircraft operators more difficult, but not impossible, to attract. Against the importance attached by the Government to tackling climate change, and the relative certainty that turbines would be installed at North Dover if planning permission is granted, I do not therefore regard KIA's own development aspirations to be, in spatial planning terms, an overriding public interest.

31. Likewise, while there may be a case for requiring a wind farm operator to pay for, or contribute towards, radar or other airport improvements the need for which is directly attributable to proposed turbines, it would be wrong for airport operators to resist turbine development solely in the expectation of securing a contribution towards improvements that cannot be so attributed. In the event, no such contribution was explicitly sought or offered at the Inquiry. Given all of these circumstances, my reasoning is focussed solely on the question of air safety, which is governed by a range of statutory guidance, including the "Rules of the Air" (SI 1996 No. 1393) and other CAA published guidance, rather than by spatial policies in the statutory development plan.

KIA

32. Air traffic control (ATC) at KIA extends over a radius of 25 nautical miles (nm). Above 6,500 feet the airspace hereabouts is largely available only to commercial and military aircraft (including, for example, passenger aircraft inward and outward bound from the main London airports). It is "controlled" airspace (class A), meaning that all aircraft entering it must have ATC clearance, fly by instruments and comply with ATC instructions. The relevant ATC in this upper air space is London, not KIA. Below 6,500 feet the airspace is "uncontrolled" (class G), effectively meaning that it is open to all air traffic with or without radar contact or instrumentation. However, ATC at KIA is equipped to provide a "lower airspace radar service" (LARS) within the 25 nm

radius, and is thus able not only to guide the landing and departure of commercial flights below 6,500 feet to and from the airport but also, in the general interests of air safety, to offer a range of radar and other services and advice to any other airspace users with whom it is in contact. This includes advice about the presence of air traffic which displays on radar but is not in contact with ATC.

33. Of significance to both "upper" and "lower" airspace is a navigation beacon (Dover VOR) located 2.3 km east of the application site. The beacon provides important navigational data to support air traffic services in transit as well as instrument controlled departures and arrivals at airports as far away as Heathrow, Bournemouth and Luton. There is no dispute that wind turbines can adversely affect the operation of such beacons and a scheme has already been agreed with NATS to mitigate this. Its implementation can be secured by planning conditions.

34. However, KIA's concerns extend further than interference with the beacon's navigation systems alone. This is because the beacon also represents the main transfer point between upper and lower airspace for commercial aircraft departing from and arriving at KIA, as well as serving effectively as a signpost and control point for private aircraft crossing the channel to and from the continent by the normally preferred shortest sea route. Also operating within this sector of KIA's lower airspace are occasional coastguard and rescue helicopters in transit along the coast, "sight seeing" traffic along the White Cliffs themselves, aircraft using the Inglenook airstrip, and gliders from Waldershare Park. Even though the KIA runway is aligned roughly east-west, a very high proportion of ATC activity thus arises from movement in close proximity to the beacon which, like the North Dover site, lies about 20 km south of the airport. It is for this reason that KIA contends that the location of the proposed turbines, relative to the airport ATC systems and main areas of flight activity, "could not be worse".

35. The effects of the presence of the proposed turbines on KIA radar surveillance would be to present a similar "paint" on the screen to moving aircraft, and to de-sensitize the screen image in the area around the turbines. It is speed of movement that distinguishes turbines from other fixed or slower moving "paints", such as the Church Hougham television mast or ships in the English Channel. Because radar does not, by itself, distinguish between the height of objects above ground level, this speed of movement of the turbines even over only a couple of degrees of the radar sweep could, for example, become confused with a light aircraft (such as those using Inglenook airfield, which might enter the de-sensitized area from one direction and, as they curve away or towards the airstrip, leave in another), or obscure gliders rising in thermals above North Dover. For safety reasons, aircraft adopting flight information (in any form) from KIA would thus either have to be directed (or "vectored") away from North Dover to avoid the turbines by at least the requisite 5 nautical miles separation distance, or cautioned and left to fly by sight across the turbine site. KIA say that it would be impossible to adopt the first of these measures for commercial flights, not least because such flights are deposited almost unannounced from upper airspace, with the normal approach path to the KIA runway being via the Dover VOR beacon, and that commercial pilots would not be content with the alternative of operating under

reduced radar service close to the beacon. The additional "clutter" of the turbines on the radar screen would, it is argued, also be likely to unduly absorb the ATC operator's attention and thus risk diminishing the quantity and quality of flight information that ATC is currently able to give to all aircraft in contact (commercial and private) elsewhere.

36. In disputing these points, the Appellant refers, among other things, to the ability of experienced ATC operators to differentiate between radar paints of turbines and aircraft, proposals for the future use of transponders, the short periods of time during which aircraft crossing North Dover would be out of radar "sight" (particularly if only four turbines are permitted), and the presence of other air traffic in the uncontrolled lower air space area which currently flies without instrument control or ATC advice yet does so safely. In this latter respect, I observe that the overall amount of air traffic seeking information from KIA is low (but I was also told that there is considerable "bunching" during popular flying times) and I understand that KIA is not currently operating LARS due to a shortage of controllers. I further note that aircraft are already vectored around areas of bad weather, and may be vectored around or advised to fly by sight through existing glider and light aircraft traffic over North Dover whether the turbines are there or not. Circumstances here are also not directly comparable with the Elsham wind farm appeal, to which KIA refers.

37. Equally, however, circumstances are not directly comparable with other airports to which my attention was drawn, where wind farms in some number have been absorbed into flight operations and ATC has been satisfactorily maintained. At those airports mitigation has either been put in place or the turbines are not in such critical airspace. Both of these points would variously seem to apply at KIA itself, to the Kentish Flats, Thanet and Little Cheyne Court Wind Farms. For North Dover, however, although it would be open to KIA to seek designation of protected airspace once flights exceed a particular number, there is no certainty when that will be. Nor do I regard the presence of existing hazards to air safety in the area to be a sound justification for permitting more. A suggestion that KIA could be notified by telephone when gliders are airborne has not been manifested in the form of any agreement with Waldershare Park or others and, according to KIA, adherence to it could not be relied upon in any event.

38. Significantly, in originally commenting on the application, CAA affirmed that responsibility for aerodrome safeguarding rests in this case fundamentally with the aerodrome operator (KIA). Similar advice was re-iterated in its letter of 18 December 2008 referring to 4 turbines, which concludes by saying "*the LARS service received from KIA is an important aspect of overall safety in this area and any degradation in the existing service or constraint on the future expansion of the service may need mitigating.*" That does not amount to an objection, but it is certainly not a ringing endorsement of the Appellant's approach either. Nor can it be interpreted as giving planning clearance. Conversely, CAP764 stresses the importance of early and continuing dialogue between airport operators and wind energy developers, while paragraph 96 of the PPS22 Companion Guide makes clear that the onus of proof to show that a wind farm will not unacceptably affect aviation interests (including safety) lies with the developer. On the balance of air safety evidence before me, I

prefer that of the KIA ATC operator who, unlike the Appellant's witness, has specific expertise in the control of air traffic and "hands on" experience of its operation in this particular part of Kent. The key points of his evidence are that, contrary to CAP764 advice, there has been no meaningful engagement by or with the developer to address KIA safety fears, and that "avoidance" is not a practicable mitigation option in this particular case because of the significance of the nearby navigation Dover VOR beacon and the focus of aviation activity attracted around it. The unambiguous view of ATC is that the safety of commercial flights into and out of KIA would be compromised and that there would be a degradation of the LARS service that KIA has been commissioned to provide, the maintenance or enhancement of which the CAA regards as important for air safety reasons.

Inglenook

39. This airstrip lies to the north of the proposed turbines and, according to the ES, at a distance of about 2,020 m from the nearest turbine (measured from the runway midpoint). The ES also indicates that the approach to and from the airstrip from the west/southwest currently passes across the turbine field between proposed turbines T2, T3 and T4. Two alternative flight paths have been suggested by the Appellant, but these would involve flying above developed areas at less than 1,500 feet, which is not permitted by the Rules of the Air. The airfield operator has suggested instead a route slightly to the south of East Langdon, which omission of turbine T1 would facilitate.

40. CAA advice on the subject of turbulence is also relevant here. Its CAP764 publication indicates that, given normal requirements for minimum separation and avoidance of obstacles, turbulence does not normally require additional consideration, but acknowledges that there may be some local variations. While the ES points to Rule 5 of the Rules of the Air (which effectively specifies minimum separation of aircraft from buildings of 1,500 feet vertically and 600 m horizontally), I am also conscious of the advice in CAP428 which cautions against obstacles greater than 150 feet within 2000 m of the runway mid point. In this case, not only does the airfield operator suggest that the nearest turbine (T2) to the runway would (contrary to the ES figure) be slightly closer than 2000m, but the turbine blade tips would also be some 460 feet higher than the runway. Even with T1 omitted and with take-off and landing on an alignment south of East Langdon I am not therefore convinced that the Rules of the Air separation distances could be maintained relative to T2. While (for obvious reasons) those separation distances are not intended to apply during take off and landing, it seems to me that they remain especially pertinent during approach and departure manoeuvres in terms of potential turbulence effects on the types of light aircraft that might use Inglenook. I find some support for this stance in the CAA letter of 18 December 2008. It says that the effects of wind turbulence on aircraft are not yet known, so it is impossible to draw any firm conclusions, but points out that disturbed air is likely to return to free flow within 10 rotor diameters (820 m) or 20 rotor diameters in the worst case (1.64km). CAA accordingly cautions that, when the wind is from the south or southwest, aircraft landing or taking off from the airstrip would therefore be very likely to pass through the disturbed air down wind of the turbines. Notwithstanding the contents of the brief 2007 exchange of e-mails between the airfield operator and the

Appellant's aviation consultant, in order to remove any possible risk of danger it thus seems to me that measures might also need to be introduced to enable aircraft to avoid turbulence effects from turbine 2, even if not 3, 4 and 5.

41. I acknowledge that the airstrip is "not a major operation" and that there would be a strong case for holding that development needed in the public interest should not be thwarted by it. Nonetheless, while the airstrip exists, the safety of its users is paramount. Again, CAA urge caution rather than unconditional support and recommended dialogue with the airfield operator does not appear to have been pursued in earnest (inasmuch as the Appellant's own flight path suggestions would contravene statutory clearances above developed areas, precise runway length remains open to dispute and turbulence effects have been only superficially considered). In consequence, safety concerns relating to turbulence, in particular, remain unresolved to the extent that I am not fully convinced that they can be satisfactorily overcome.

Detailed development control matters:

Issue 5: Effects on the environment and amenities enjoyed by local people

42. The appeal site lies in an area of open countryside around which stand the settlements of West Langdon (about 1.2 km to the north of the nearest turbine), East Langdon (about 700 m to the east of the nearest turbine), Guston, about 1km from the nearest turbine) and Pineham (typically about 600m from the nearest turbine). The nearest individual properties to turbines include Enifer Downs farmhouse (360 m from turbine 5), Little Pineham Farm (430 m from turbine 4), and Langdon Court (479 m from turbine 1). None of the turbines would be more than 570 m from a dwelling. In all, the Parish Councils estimate there to be 100 dwellings within 820 m of any one turbine, reducing to 23 if turbine T1 is excluded. SP policy NR5 has a particular focus on avoiding or mitigating pollution impacts from development arising from, for example, noise, diminished levels of tranquillity and light intrusion. SP policy QL1 and LP policy DD1 extend general development control considerations safeguarding against un-neighbourly development to visual impact in its widest sense.

43. Separation distance is not, in itself, a decisive factor in judging policy compliance or the associated standards of environmental quality, but it provides a broad context for consideration of amenity impacts in this particular case which I find notable for proposing turbines of the size proposed as close neighbours to places of habitation. As I indicated both orally and in writing to the parties at the Inquiry, noise, light flicker and visual intrusion are in my estimation the three factors with greatest potential to affect local amenity. Each warrants careful examination, and I accordingly consider them in turn. In doing so, I am aware that Enifer Downs farmhouse exists with the benefit of only temporary permission, on expiry of which it will be expunged unless the viability of the farmholding to which it is attached has been demonstrated to the Council's satisfaction. At the time of my inspection, the enterprise seemed to be physically well established and while having no knowledge of its functional or financial viability I saw no reason to attach less importance to the living conditions of its occupiers than at any other dwelling in the vicinity.

Noise

44. Paragraph 22 of PPS22 affirms that ETSU-R-97 should be used to assess and rate noise from wind energy development. In practice this establishes a four stage process.

45. The first stage is to measure prevailing background noise levels during day and night time periods. ETSU-R-97 recognises that, in many cases, it would be impracticable to undertake background noise levels at every property that might be exposed to turbine noise and recommends that measurements are therefore taken at a sample of representative properties. These are not always the closest properties to the turbines but are expected to be the ones where the noise environment, once the turbines are operational, is likely to be most affected.

46. The second stage is to use those measurements to generate maximum permissible day-and night-time noise levels. These are set at a prescribed margin above background level – normally 5 dB(A) (or, in low noise environments, at recommended fixed levels). This margin recognises that a balance needs to be struck between the impact of turbine noise and the need to ensure satisfactory living conditions for those who might be exposed to it. Since the margin is prescribed in ETSU-R-97, the required levels that emerge from this stage of the process are thus entirely dependent upon the results of the background noise measurements.

47. The third stage is to predict the likely noise emissions from the turbines at each of the representative properties. This is normally achieved by validating turbine manufacturers' warranted outputs against local anemometric data (such as wind speed) and other site specific environmental conditions (such as topography). The purpose of this stage is to provide the turbine operators and local people with assurance, before the turbines are purchased or installed, that they will actually be capable of operating within the pre-established noise limits. They do not affect the noise limits themselves, or limit turbine noise in operation, but are produced solely for comparison with the background noise measurements. The outcome of that comparison does, however, influence turbine choice and contribute to ensuring, at site planning stage, that there will be adequate separation distances from places of habitation.

48. The fourth and final stage is to draft planning conditions requiring that the pre-established noise levels are not breached. Provided the third stage noise predictions prove robust (and that turbine choice and separation distances have been suitably fixed), there is no reason to believe that these noise levels would be breached. Indeed, experience throughout England is that they very rarely are.

49. Significantly, however, in the event of a wind farm neighbour complaining that a noise condition has been breached, the generally accepted form of condition requires the validity of that complaint to be assessed by comparing the actual level of noise exposure at the property concerned with background noise level measured at stage 1 at the nearest representative property. Not only is the original background measurement therefore important in itself, but so is the selection of representative properties. This is because inadequacy in either respect can result in the specified noise levels being set too high, expose

significantly more than the representative properties alone to excess turbine noise, and frustrate the enforcement of noise limits that are intended to safeguard against greater than 5dB(A) above actual background levels at any neighbouring property. It is in that context that I view the submission that in over 250 wind farm proposals, neither predictions of turbine noise nor noise limits established by the Appellant's noise consultant have been exceeded, because all are predicated on the validity of the initial measurements of background noise.

50. Given these factors, it is clearly important that stage one of the process is carried out fastidiously. Background measurement is not straightforward - ETSU-R-97 devotes 39 pages to the subject in Section 6 and gives further advice in 10 pages of Section 8 (in the form of supplementary guidance notes to a suggested model form of planning Obligation). Among its salient recommendations are that agreement should be reached with the planning authority/EHO on the identification and number of properties at which background noise levels are to be measured and the precise location at those properties where the measurements should actually be taken. It also includes advice on the type of equipment to be used and on methodology.

51. In the event, the representative properties, the precise locations for standing the monitoring equipment and the selection of the measurement apparatus for the ES were all chosen unilaterally by the Appellant's noise expert. However, such choices inevitably rely upon some degree of compromise to take account of the layout and usage of the property involved, the significance of any sounds that may affect noise meter readings, and aural privacy considerations during the actual process of mensuration. Although the measurements were taken with the agreement of the building occupiers concerned, the evidence suggests that this was not secured in the light of their having any understanding of ETSU-R-97 processes or, at the time, any access to independent informed explanation of the significance of the outcomes for safeguarding their own noise environment or that of their neighbours.

52. In order to correct acknowledged errors, three suites of amendments have been made to the baseline data since the September 2007 ES (in the October 2008 SEI, the December 2008 SEI and the Appellant's rebuttal evidence) and although one of the measurement positions was changed, again LPA agreement neither to that nor any of the others was sought or obtained. I note the Appellant's noise expert's assertion that the various corrections do not indicate that the original ES outcomes were in any way corrupted, and I accept that the Appellant's noise expert is well acquainted with ETSU-R-97 guidance and has considerable experience in the selection of suitable measurement points. However, both the Council's and LAG's own noise experts have identified factors that, at least, open the results to question. These include, for example, the appropriateness of the selected "representative" locations (such as that at Hart Cottage as being representative of the noise environment at West Langdon) and the suitability of the precise microphone positions (such as at Langdon Court). Added to these are further disagreements over the validity of causative assumptions made about increases in measured noise levels that coincide with morning and evening peak travel hours, the effect of wind direction and the degree of accuracy that can be attached to the "best fit" curves for the various data sets taken at each measurement location.

53. The point here is not solely one of whether criticisms of the actual data that has been recorded are justly made. Indeed, my own visual and aural assessment of the Appellant's selected measurement points did not disclose any undue preference for locations that were, for example, over-exposed to traffic noise from A2. The Council's noise expert also wryly observed at the Inquiry that the results of any two sets of background measurements taken, for example, by the same person using the same equipment at the same location and over the same time span, but on different dates, would in all likelihood vary from each other. It is clear that this is not a precise science.

54. Rather, my first concern is that the process of background noise measurement in this case cannot be said to have been undertaken in either an open or fair manner. When carried out on the basis of the Appellant's own unilateral choices there will always be a lingering doubt, whether unfounded or not, that the outcomes have been manipulated in such a way as to maximise rather than minimise the scope for turbine noise to be judged acceptable. There can be no question that if steps had been taken to secure necessary consensus at the outset on where and how data was to be collected and analysed (as ETSU-R-97 suggests), the measurements would have yielded demonstrably more robust results, even if those results had thereby been found to be no different. Given the importance of background noise levels to the overall process, it seems to me that the only way in which robust levels can now be established to allow the subsequent stages of setting noise limits, predicting turbine noise and formulating suitable safeguarding conditions to be undertaken with confidence (actual and perceived) would be through revalidation on a consensual basis, with further measurements taken fully in line with ETSU-R-97 advice. This is a subject that I return to later, in my overall conclusions.

55. My second (and related) concern is that, given the imprecision inherent in the process of background noise limits in general, some of the third stage noise predictions fail to demonstrate sufficient cushion to fill me with confidence that the margin above background noise determined during the first two stages would not, in practice (or if re-worked on a consensual basis), be exceeded. Indeed, the Appellant's own predictions show that the noise environment at Little Pineham Farm (night-time), Langdon Court (daytime) and Enifer Downs Farm (night-time) would exceed ETSU-R-97 guidance with 5 turbines and that Little Pineham Farm (night-time) would be exposed to excess noise even with only 4 turbines. The predictions also show that the noise environment would variously be either at or only just below the required levels at all three properties during other times, or even with one or more turbines temporarily shut down or operating at reduced power ("mitigation"). Notably, these three properties are, among the five representative background monitoring points, all the closest to turbines, and turbines T3 and T4 are closest to Little Pineham Farm, not T1 (which is the only one proffered for omission in the 4 turbine option). Conversely, the risk of levels being exceeded is shown to fall rapidly away at the other two (St Margaret's Farm and Hart Cottage), which are just over 1 km away from the nearest turbines to them.

56. This amply demonstrates the veracity of PPG24 "*Noise*" advice that the best form of noise mitigation is separation between noise generating and noise sensitive development. "Mitigation" (other than by separation distance) should not, in my judgement, be deployed in this case as a device to provide scope for

the Appellant to site turbines closer to places of habitation than would otherwise be acceptable, because the safety margins at the three "representative" properties concerned are of such small order, even after allowing for the manufacturer's recommended "safety factors" for various uncertainties. Those "safety factors" cannot be relied on with confidence when the predictions are based on a "candidate turbine", which may not be the model employed in practice. Moreover, although commenting in the context of day-time limits within the range of 35-40dB(A), ETSU-R-97 says that "*the more dwellings there are in the vicinity of a wind farm, the tighter the limits should be as the total environmental impact will be greater*". Clearly in this case, if the present noise predictions proved to be inaccurate by only a relatively tiny amount, a greater number of properties within, say, the 500 m – 1 km range could also be at risk of exposure to excess noise with fewer, if any, further post-installation remedial mitigation options remaining available.

57. Nor is it, in my estimation, sufficient in this particular case (where the margins are as tight as currently predicted) to rely solely upon planning conditions to deal with excess noise exposure should it occur. Such conditions have become increasingly refined with the passage of time since ETSU-R-97 guidance (which promoted their expression in planning Obligations) was published. However, if breaches are alleged, investigation and remediation can still be a lengthy and complex process, not least because of the need to wait for climatic conditions (notably wind speed and direction) at the time of complaint to be replicated and with sufficient forewarning to ensure that the requisite measurement equipment is at hand. The time taken to then investigate and agree potential causes and to assess the effectiveness of practicable solutions must also be added. Clearly, the greater the number of properties close by, the greater will be the potential number both of complaints fed through the Council and needing to be investigated, and of occupiers exposed to excess noise while those investigations are in train. All this in the face of a natural reluctance by the Appellant to forego electricity generation or incur the cost of turbine modification or replacement without clearly demonstrable reason.

58. I am also aware of criticisms that ETSU-R-97 does not adequately deal with the full range of noise emissions from wind turbines of similar size to those involved in this case, the blades of which penetrate the atmosphere at higher levels than smaller "first generation" turbines. This applies particularly to excess amplitude modulation and low frequency noise. Amplitude modulation (widely known as "blade swish") occurs during the downward sweep of the blades. Its regular pulsing is generally unexceptional, not least because its audibility diminishes rapidly with rising wind speed. However, there can be occasions when the turbines rotate at a greater velocity than measured wind speed would suggest, with the consequence that swish is not masked to the degree expected and can, allegedly, also be accompanied by other noises such as an unusually loud "thump". Low frequency noise was described to me at the Inquiry as similar to the deep throbbing noise heard from the sound system of a passing car, but at the very threshold of audibility. Some people are, I understand, more sensitive to this kind of noise than others and, once woken by it, find return to sleep difficult. Both have been the subject of Government sponsored research and post-PPS22 statements concerning them have been issued. These indicate that complaints have been wrongly attributed to low frequency noise, that excess amplitude modulation is still being investigated at

only one property and that no further work on either amplitude modulation or low frequency noise is proposed or justified at this time. There nevertheless remains on-going dispute between objectors to, and promoters of, wind farm development over the significance of both types of noise and how excess amplitude modulation might be caused, with agreement only that any likelihood of its occurrence cannot be predicted.

59. Any alleged or actual shortcomings of ETSU-R-97 in these or other respects are matters for wider review than is appropriate in the consideration of an individual planning application. Reference was, however, made to one case in which allegedly "unpredicted" noise is claimed by a wind farm neighbour to have been so disturbing as to have caused the dwelling concerned to be vacated. The parties were also aware of a small number of other cases where allegations of excess amplitude modulation continue to be investigated. In debating planning conditions, I expressed the view that even a small risk of similar disturbance occurring should be safeguarded against in this particular case because there are so many more properties in much closer proximity at North Dover. To the extent necessary to allay local fears, I see nothing in Circular 11/95 to prevent the imposition of planning conditions in such circumstances and this is an approach from which the Appellant did not demur (albeit on the basis that the risk of such noise being encountered was so small that it could be discounted). I also do not see the imposition of such a condition as being at odds with either of the Government's two post-PPS22 statements, and it is entirely consistent with the advice in paragraphs 10 and 11 of PPS24. Having accordingly invited the parties to consider whether appropriately worded conditions could be formulated, however, I am left in no doubt from the intricacies of noise measurement involved that, as with any other noise source, separation distance is the best insurance against unacceptable noise impact, whatever its cause. Paragraph 22 of PPS22 and paragraph 41 of the PPS22 Companion Guide both endorse that approach. Although ETSU-R-97 adopts the opposite stance of rejecting the stipulation of a minimum separation distance, it pre-dates both documents and I find its commentary on the subject of separation to be of relevance. In particular, this records that "*the difference in noise emissions between different types of machine, the increase in scale of turbines and wind farms seen today and topographical effects described below all dictate that separation distances of 350-400 m cannot be relied upon to give adequate protection to neighbours of wind farms*". The technology has, of course, moved on since that comment was made, but probably at greater rate than experience of the environmental effects of 120 m high turbines at about the 400 m distance. I record here only that a separation distance from houses of between 350-400 m would exclude turbine 5, of between 400-500 m would also exclude turbines 1 and 4, and of greater than 570 m would exclude them all.

Flicker

60. As the Companion Guide to PPS22 explains, shadow flicker only occurs inside buildings. For the purpose of my analysis, however, I do not regard shadow flicker as ambiguously as the Companion Guide might be taken to imply, simply as the casting of shadows over neighbouring properties ("shadow throw"). Rather, I regard it as the rhythmic pulsing of contrasting light and relative darkness that occurs when the size of a room window (domestic or otherwise)

excludes a significant proportion of sunlight other than that which is filtered through the orbit of the moving turbine blades. This contrast is greatest when the sun is brightest, so it is more apparent during some seasons of the year than others. It will also occur only when the sun is sufficiently low in the sky - normally at or about sunrise or sunset - to be seen through (rather than above or to either side of) the turbine blades so that the passage of sunlight is effectively blocked completely or substantially by each blade in turn. It does not occur when direct sunlight is not visible (such as when it is cloudy) or when the turbines are aligned away from the window (because of wind direction). Also, the flicker does not alternate at speeds likely to give rise to health effects – it is most likely to be experienced as a brief and relatively infrequent annoyance, for example by those waking up in a first floor bedroom without curtains or taking enjoyment in the last of the day's sunshine in an otherwise unlit downstairs living room or workplace. As with noise, its impact diminishes greatly with distance, the PPS22 Companion Guide advising that flicker effects have been proven to occur only within ten rotor diameters of a turbine, in this case equating to 820 m.

61. Coverage of the subject in Chapter 14 and Appendix 13 of the ES deals with "shadow throw" rather than shadow flicker. Relevant sections say, among other things, that the maximum distance for "shadow flickering" influence for the Enercon E-82 turbine with the hub height proposed is 1,552 m. Using WindPRO computer software and assuming an eye height of 1.5 m, the ES identifies a maximum of 105 buildings or "receptors" potentially exposed to the various "shadow flicker" effects of all of the turbines (adopting "worst case" parameters and "bare landscape"). The specific "receptors" in East Langdon and Pineham are identified in the Supplementary Environmental Information dated October 2007 on plan and by building reference number, but not by property address or description, so it does not follow that all are places of habitation. The 2008 SEI for the four turbine option remarks that the removal of turbine 1 would reduce the number of "receptors" affected by more than 50 shadow hours per year from 12 to 6, and that "flicker" effects at East Langdon School would be reduced from 30 shadow hours per year to 10 shadow hours per year.

62. The Council commissioned its own assessment of these results which, apart from observing that the turbines had been moved about 100 m south in the 4 turbine scheme (which the appellant later affirmed to be a result of typographical error and had not influenced the outcome), focussed on seven "representative" dwellings. There are no set thresholds of acceptability for shadow flicker in the UK, but guidelines adopted by the Irish Government apparently recommend that shadow flicker at neighbouring offices and dwellings within 500 m of a wind turbine should not exceed 30 hours per year or 30 minutes per day. On that basis, the study found that five of the properties would require mitigation for the 5 turbine scheme and four for the 4 turbine alternative. Since those are "representative" dwellings, this does not mean that only a maximum of five properties would be affected.

63. At the Inquiry, I drew attention to my difficulties in identifying, from the information before me, the actual numbers of places of habitation that might be affected by shadow flicker rather than "shadow throw". The approach taken in the ES and in the Appellant's suggested safeguarding condition is that a

scheme would be submitted to the Council for approval specifying the measures that would be taken if "shadow flicker" from any particular turbine was alleged by any particular building user to be occurring. The scheme would, according to the ES, include the supply of window blinds to those who agree, failing which photo-electric apparatus would be fitted to shut one or more of the turbines down at times when shadow flicker is a risk. However, before either of these measures would be implemented, the user of any property concerned would be required to keep a log of dates and times over a period of two weeks to demonstrate the pattern of occurrence. The log (or logs) would then be cross-checked for veracity by requesting the turbine manufacturer to produce their own calculations for the specific property concerned. It seems to me that with normal climatic and seasonal vagaries, the time span between original complaint and final remedy could thus be considerable, during which time up to 105 potential "receptors" (although probably far fewer on the basis of the Council's "representative" properties) could remain exposed to the "annoyance" of shadow flicker. I also question whether the fitting of window blinds would be regarded by any complainant as an acceptable (even if effective) response. In response to these concerns, the Council suggested an alternative condition that would be "pro-active" rather than "reactive" inasmuch as it would require detailed survey and calculations to more precisely identify affected properties before development commenced. With all of the ES "receptors" involved, that would, however, be a potentially arduous task and one that the Appellant could have difficulty in undertaking in the absence of any statutory right of entry to the properties concerned. Without any further information on how many properties, and which, might be affected by actual shadow flicker in time to be examined at the Inquiry, I therefore undertook a brief visual appraisal of a sample of properties during my site inspection.

64. From that, I am for the most part content that shadow flicker effects would be avoided by a combination of distance, contours and building orientation. This applies particularly in East Langdon. There, I saw that the school had a classroom facing towards the turbines but its two windows are, in my estimation, sufficiently large to dilute any shadow effect that might occur during normal school hours. St Augustine's church has a tall, narrow window facing towards the turbine field but this is of coloured glass and at the opposite end to the altar. Any internal contrast between light and shade would thus be much diminished and unlikely to impinge significantly on devotions. Flicker effects elsewhere within the centre of the village would be largely masked by trees, especially if turbine T1 is omitted. There would, however, in my judgement be potentially adverse shadow flicker effects with either five or four turbines at Seven Seas (facing kitchen window), Grove End (lounge and bedroom windows), Enifer Downs farmhouse (facing kitchen and living room windows), Little Pineham Farm and Dane Cottages (bedroom and living room windows). All of these are within 820 m of a proposed turbine and have wholly or mainly open views across the turbine field embracing easterly or westerly segments of the sun's transit. There might also be some small risk at more distant properties in Napchester, such as St Margaret's Farm (bedroom and living room windows) which are shown, in the Council's analysis, to be within the 0-50 hour exposure category.

65. The actual numbers likely to be affected are, therefore, relatively small and, for that reason, a "pro-active" planning condition broadly along the lines suggested

by the Council but specific to the properties I have identified would, I consider, meet Circular 11/95 tests and should be capable of establishing effective mitigation. Nonetheless, as with noise, adequate separation distance is the most robust "pro-active" protection against harmful impact, enabling the "re-active" fitting of control mechanisms to be held in reserve should unpredicted flicker occur (for example through seasonal or physical loss of existing screening vegetation, or the effect of raised eyeline at upper floor levels when compared with the ES measurement level of 1.5 m). I find it significant in this respect that dimensions of as little as between 360 m and 570 m represented by some of the properties in this case fall not just below, but well below, the ten rotor diameters criterion cited in the PPS22 Companion Guide. Use of that criterion as a minimum separation distance is (and not just at site selection stage) the only form of flicker mitigation that the PPS22 Companion Guide explicitly recognises.

Visual impact

66. Paragraph 39 of the PPS22 Companion Guide affirms that the planning system exists to regulate the development and use of land in the public interest. In most cases, the outlook from a private property is a private interest, not a public one, and the public at large may attach very different value judgements to the visual and other qualities of wind turbines than those who face living close to them. Equally, people pass through a diverse variety of environments when going about their daily lives, whether by car or when using the local rights of way network, and I find nothing generally objectionable in turbines being part of that wider experience. However, when turbines are present in such number, size and proximity that they represent an unpleasantly overwhelming and unavoidable presence in main views from a house or garden, there is every likelihood that the property concerned would come to be widely regarded as an unattractive and thus unsatisfactory (but not necessarily uninhabitable) place in which to live. It is not in the public interest to create such living conditions where they did not exist before.

67. From the east, I saw that the wind farm would be fully exposed to view from Enifer Downs farmhouse and Seven Seas. The former is a single storey dwelling standing only about 200 m from the edge of the turbine field and the latter is a modestly proportioned two storey house set only about 500 m from the edge of the turbine field. The nearest representative photomontage to these is A19, which is taken at 190 m from turbine T1. However, that is the montage that I asked to be extended because it does not pan as far northwards as T1 which, it was agreed, would require an upward tilt of the head, at that distance, to see the blade tips. From the properties themselves, the turbines would spread fully across the outlook (more than one turn of the head) from main rooms and gardens of both properties, the distance between the two outermost turbine towers (T1 and T5) in this vista being approximately 700 m (or 782 m to outer blade tips). Dimensions of about 400-700 m are representative of turbine spacing throughout the proposed cluster, and all five would be visible with no significant screening by vegetation or contours. Significantly, with Enifer Downs farmhouse itself only 360 m from T5, my impression is that the visual experience of the occupiers from the main living rooms and garden of their property would be comparable to living actually within the turbine cluster. Although more distant, that impression would not be

much different from the kitchen and back garden of Seven Seas. The view of the turbines from living room windows and loggia of a third property, at Grove End, would be slightly more angled, and some of the turbines could be more easily screened by vegetation. Nonetheless, I consider that the looming presence of rotating turbines of the height proposed would be unpleasantly overwhelming and unavoidable from all three of these properties, and especially so at Enifer Downs farmhouse even if turbine T1 was excluded.

68. From the south west, the turbines would be plainly visible from Little Pineham Farm and Dane Cottages (as well as from a range of other properties hereabouts, but which are more distant and generally angled away from the turbines or have a measure of screening from farm buildings). Little Pineham Farmhouse is a small, two storey detached cottage about 100 years old, with its bay-windowed front facing towards the turbine field. Dane Cottages are currently undergoing refurbishment but present a three storey gable end towards the turbine field. I understand that there are to be main windows on each floor in this gable end (including a first floor living room and balcony) to maximise views that, on a clear day, apparently extend as far as Pegwell Bay. The nearest photomontage to both of these properties is A20, taken at a distance of 510 m from turbine T4, which is some distance further back than Little Pineham Farmhouse. The spread of the turbines from this direction would again be 700 m between the outermost turbine towers (T3 and T5) and although there would be some masking of the lower part of the tower of T5 by contours and vegetation, the upper part of the tower and the rotor would be wholly visible. That turbine would be less than 600 m from Dane Cottages while T3, T4 and T5 would all be within 800 m of both Little Pineham Farm and Dane Cottages. The occupiers of these properties too would be faced with the unavoidable and, in my estimation, unpleasantly overwhelming presence of rotating turbines spreading both horizontally and vertically across a substantial proportion of their main outward field of view. By comparing the turbine spacing to the distance from these properties, I again liken that to conveying the impression of living in or at a wind farm, rather than simply having a turbine cluster close by. The omission of turbine T1 would not significantly reduce this visual impact because it is the most distant from these properties and thus least prominent in this panorama.

69. At West Langdon, to the north of the site, the separation distance is greater, typically just in excess of 1 km. The relevant photomontages are A7 (amended) and A8. There is localised screening by a combination of contours and vegetation, but I saw that the settlement stands on a downward slope and is largely oriented to face towards the turbine field. This is particularly noticeable from Forstal Farm and the Millennium Green but also from the lane along the ridge to the Church and Church Farm (although these latter views are filtered between roadside trees). The spread of turbines in this instance (between T1 and T3) would be 800 m and, moving about the settlement at my site inspection, I gained the impression that the outlook from the whole of this small community would be dominated by their unavoidable presence, whether seen as a complete cluster, individually or just in glimpses of moving blades. In this case it is the spread of the turbines rather than their height that would, in my judgment, be so visually invasive as to make the settlement a less satisfactory place in which to live than it is now. That applies whether there

would be five turbines or four because turbine T1 is one of the more distant from this perspective.

70. There are some individual properties closer or equally close to turbines that I judge would be less affected. These include New Cottages at Guston, where turbine T5 would be only about 650 m distant but the greatest spread of turbines (in that case between T1 and T3) would be about 450 m further back. They would also appear much more tightly grouped, and thus less intrusive in the view, if turbine T1 is deleted. Although much the same applies at St Margaret's Farm in Napchester, the nearest turbine would be about 1.2 km away and all would be seen only as part of a much broader rural panorama. The turbines would barely be seen from Langdon Abbey, Langdon Court and Hart Cottage.

71. However, in those cases that I have identified where the full height and maximum spread of turbines in the numbers proposed would be seen at their greatest from closest to (typically at up to about 800 m), and with little or nothing by way of intervening screening, it is my conclusion that living conditions would be demonstrably harmed by significant and over-dominant visual impact. There would be conflict with the relevant SP and LP policies safeguarding against un-neighbourly development whether from noise, flicker or visual impact.

Issue 6: Effect on cultural heritage interests, including locations of acknowledged scenic attraction.

72. There was criticism of the ES coverage of cultural heritage (Chapter 10) at the Inquiry, but I am content that the evidence now before me deals with the subject in adequate detail. This includes descriptive material, commentary on the appropriate approach to consideration, and both analysis and critique of sensitivity, magnitude of change and significance of effects. I do not review all of this documentation here, but my findings are informed by it. I identify only the key points arising from the submissions and from my site inspection that have led me to those findings, focussing on the main cultural heritage interests over which there was dispute at the Inquiry. My assessment works progressively outwards from the site itself.

On-site archaeology

73. Table 10.1 of the ES identifies known or expected archaeological remains "within the site". This is misleading, because although some (such as the Roman Road) are on land over which the Appellant has control, not all are within the turbine field and few if any can be said to lie directly under the red line application site defining the turbine bases, tracks and sub-station. Nonetheless, they do indicate some likelihood of buried remains of at least local or regional significance being found during ground disturbance caused by construction of the turbine cluster. The Council points out that, to date, investigation has been limited to desk study without any consultation with the County Archaeologist or others and that, if further investigation is not undertaken until after permission has been granted, any prospect of preservation in situ might be inopportunely eliminated.

74. Part B of PPG16 makes clear at paragraph 19 that consultation between developers and planning authorities should take place at the earliest stage and

paragraph 21 says that where there are indications that important archaeological remains may exist, it is reasonable for the planning authority to request the intending developer to arrange for field evaluation (distinct from full-scale archaeological excavation) before any decision on the application is taken. This advice is also manifested as a main thrust of SP policy QL7. Nonetheless, the presumption in favour of preservation in situ in paragraphs 8 and 27 of the PPG16 Annex applies only to nationally important remains and, as paragraph 27 further avers, involves a considered balance between a range of factors including the need for the development.

75. With that advice in mind, I acknowledge that the routing of construction traffic across the site is open to variation and the permanent access track network might well be capable of being constructed on a load-spreading platform laid on top of the ground rather than dug into it. If necessary, it might also be possible to site the substation apparatus within the existing former colliery-related building in the centre of the site. The excavation of turbine bases is nonetheless a very invasive process in both depth and spread, and the bases below 1 m in depth are not intended to be "reversible" development. The tightly drawn application boundary leaves little scope for micro-siting of the turbine bases should remains be found during the excavation process. Aerial photographs suggest, however, that the greatest likelihood of remains being found is in the vicinity of T1, so omission of that turbine would contribute to minimising archaeological risk.

76. On balance, therefore, the potential for harm to archaeological interests is, I consider, small and in this case insufficient by itself to warrant refusal of permission for, at least, a four turbine scheme. A condition requiring, before development commenced, more detailed survey, recording and, if necessary, preservation elsewhere, would be likely to provide sufficient protection. Nonetheless, it is regrettable that PPG16 advice has not been more diligently followed, particularly when a relatively small amount of agreed pre-application field work could have lent greater certainty to the subject of preservation than reliance solely on post-decision investigation required by planning condition.

Langdon Abbey

77. Langdon Abbey is both a Scheduled Ancient Monument and a Grade II* Listed Building. Only limited visual evidence of the Abbey itself now survives, but "Langdon Abbey" also refers to the farm complex constructed around the remains and includes the farmhouse, built in the late 16th Century. The ensemble stands in a secluded woodland dell about 500m to the north of the turbine field. To my mind it is the dell that provides the visual envelope of the historic setting here, not any part of the turbine field itself. The Council accepts that the significance of potential effect would be slight to none, and I find no reason to depart from that assessment.

East Langdon Conservation Area and related cultural interests.

78. East Langdon is one of the small villages of historic character and profoundly rural quality that populate the dry valleys dissecting the local landscape. The Conservation Area extends to within about 550 m of turbine 1 and covers the nearest end of the village to the turbine field, amounting to just over half of its built-up area, thus excluding more modern ribbon and estate-type

development at the north eastern end. At the centre of the Conservation Area is a small triangular green, apparently created following the demolition of a former farmstead during the last century. The loose assemblage of buildings around this include St Augustine's Church (a Scheduled Ancient Monument and a Grade II* Listed Building), Jossenblock (a large house and barn, (Listed, Grade II*), The Rectory (a Grade II Listed Building) and Langdon Court (a Grade II Listed Building). There is also a group of newly constructed barn-like dwellings off one side of the green. Pervading the whole are an emphatically sylvan setting, architecture of traditional scale and appearance, and a notable lack of visually intrusive features.

79. From within the Conservation Area, there would be relatively few places from which the turbines would be seen because of the masking effect of trees and the valley sides. From parts of the gardens of Jossenblock, The Rectory and Langdon Court, for example, any turbine would only be seen when facing away from the Listed Buildings. From those and from the Green glimpses mainly of turbine T1 would be at or above hub height with the bulk of the towers behind trees and thus low on the skyline. If turbine T1 is excluded, historically significant views and settings would, I consider, be adequately preserved.

80. The Rector of St Augustine's put to me that the presence of rotating turbines within sight and earshot of the Church would be disturbing to acts of worship, remembrance and celebration. A similar point was made by the Rector of St Peter's Church in Church Whitfield. Churches are the main spiritual and pastoral focus of community activity and local people identify strongly with them to establish, individually and collectively, their own distinctive sense of place, purpose and history. The quality of the buildings themselves and of their surroundings also often represent the pinnacle of a settlement's architectural achievement and they are widely recognised and appreciated as a showcase of the environmental quality of a settlement and the social well-being of its people. For all of these reasons, it seems to me that a unique and particularly compelling importance attaches to maintaining the peace and tranquillity of their surrounds and the quality of views to, from and of them that are religiously, socially, architecturally, historically or visually important to the community. In an economic sense, these functions in turn contribute to ongoing preservation and enhancement of the buildings themselves. I accordingly include all of these factors in my consideration of the desirability of preserving or enhancing Listed Buildings and their settings for the purposes of Section 66(1) of the Planning (Listed Buildings and Conservation Areas) Act 1990. I also see no reason to exclude from that consideration recently extended areas of burial ground, where these have a direct visual or physical relationship to a church. However, it would plainly be untenable to reject development simply on the basis that it would be seen from an historic church or associated graveyard – to do so would effectively exclude turbines from most of rural (and urban) England.

81. Turning specifically to St Augustine's Church, therefore, I am content that turbine T5 would not be seen in the view along the approach path between the Lych Gate and the porch and that none would intrude into areas around the porch that might be important to the setting of the church when, for example, wedding photographs are being taken. It was suggested that any future loss of a nearby screen of tall conifer trees might expose the main churchyard to view

of the turbines, but there is only hearsay evidence that their removal might be threatened even if the existing alignment of the Conservation Area boundary does not lend protection. There is no dispute, however, that turbines would be plainly visible further to the rear of the Church, above a more distant line of foreground trees, and most notably across part of the outward view at and towards the end of the extended graveyard area. Turbine T1 would be just 0.58 km from this location. The Appellant has suggested that some additional boundary planting could create suitably solid screening. There is, however, only limited space for this within the churchyard and I saw that there might be adverse implications for a section of retaining wall here. It would also be likely to take some time to establish full effect. In the absence of suitable screening, the presence and movement of turbines this near could, I consider, be found so pervasive as to disrupt those seeking solace in quiet contemplation, particularly directly after bereavement, and I would come to a similar view whether exercising my Section 66(1) duty or not.

82. Nevertheless, the most secure safeguard for ensuring preservation of the "contemplative" setting of the Church would, I consider, be greater separation distance. Exclusion of nearest turbine (T1) would be beneficial in that context, but it seems to me that the spread of turbines across this view is also a factor. I say that particularly in the context of views into and out of the Conservation Area and the wider setting of the Church itself. From the elevated parts of Pond Lane and Hollands Hill (and from some points on the footpath between) I saw that the low but clearly identifiable tower of the Church is a significant landmark in itself, enabling the eye to alight easily on other visible parts of the settlement and providing a clear reference for the scale of buildings within it. The turbine cluster would effectively become a broad and eye-catching backdrop to this charmingly arcadian scene. The contrast in height, modernity and character between these very different structures in such close juxtaposition would, I consider, be jarring, an effect that would be amplified by the spread of turbines to T5, which would be somewhat detached from the others when seen from these general directions. It is thus my conclusion that neither four nor five turbines would suitably preserve or enhance the setting of the Church, or what I regard as important views into the Conservation Area.

Church of St Peter, Church Whitfield

83. This Church is both a Scheduled Ancient Monument and a Grade II* Listed Building. Despite its rural location, it serves a sizeable and mainly urban parish and stands a little under 1 km to the south west of the nearest turbine, in this case T3. The front of the Church and churchyard face away from the turbines, which would only be visible from the graveyard behind it, mainly from two conjoined areas of land that have become a graveyard extension. The relatively few burials that have so far taken place here are in a line along the western boundary, in the shelter of a boundary hedge. There is also a small garden of memory sited more towards the centre of the westernmost section of land, and a memorial bench stands close to the north east boundary but faces inwards towards the Church rather than outwards across the surrounding landscape. I saw that the A256 between Dover and Sandwich passes in a cutting just beyond this boundary and I found the traffic noise here very audible. Turbine noise would not, in my estimation, be heard above this at the distance concerned. However, all five turbines would be seen rotating well

above the woodland canopy on the horizon. As at St Augustine's, turbine T5 would appear in relative isolation to one side of the cluster, which would thus be strung out for a considerable distance squarely across the main outward field of view, making it difficult to ignore their presence. I acknowledge that the visual relationship to the Church itself is, at best, tenuous in this case but the physical and functional relationship between the Church and this section of graveyard is likely to become more consolidated over time. The sensitivity of viewpoint and viewer are also factors to which I attach weight in coming to the conclusion that, while the historic setting of the Church would not be directly harmed, the proposal for either four or five turbines would have some adverse impact on the general ambience that those attending or visiting the extended graveyard might reasonably expect to experience.

Swingate Mill

84. This tall brick windmill tower is a Grade II Listed Building. The sweeps are no longer attached and the tower has been adapted for residential occupation. It stands in relative isolation about 2 km to the south east of the turbine field. It is a landmark of some prominence in the local landscape and its historic setting might reasonably be taken to extend as far as is necessary to demonstrate the importance of topography to wind exposure. I do not therefore question that the proposed turbines can be held to fall within its setting. Nonetheless, there is clear synergy between both the mill and the turbines inasmuch as they would be inter-visible examples of mans' past and present approaches to harnessing the power of the wind in this area and the variety of uses to which that power can be put. The turbines would also provide a contrasting image of the progression of the technology and the physics of wind capture relative to height, scale and appearance. The separation distance between the mill and the turbines would be sufficient for each to be seen as an individual entity and I take the view that the setting of the Listed Building would in this case be enhanced rather than diminished by their distant presence.

Maydensole House

85. This Grade II* Listed Building stands about 1.5 km from the site and is part of a small enclave of farm development (including a Grade II Listed barn) situated at the bottom of a valley to the north west of West Langdon. The Council acknowledges that the fold in the landscape here coupled with woodland shaws to the south and west prevent any unacceptable juxtaposition of turbines and buildings. I share that view. The setting would be preserved.

Church of St Martin of Tours, Guston

86. I agree with the Council's assessment that the setting of this Grade II* Listed Church would also be preserved.

The White Cliffs and South Foreland Lighthouse

87. The length of the Saxon Shore Way from Kingsdown via Hope Point and then atop the cliffs to Bockell Hill where stands the Dover Patrol memorial (VP 15), a tea room and a swathe of land owned by the National Trust to my mind ranks, in terms of visual quality, among the finest sections of coastal paths in England. In any landward view from this well trodden section of footpath the turbines would represent a distant but significant landmark. Many who come

here specifically to absorb and admire the qualities of rurality, natural beauty and stillness might find the presence of such a broad array of turbines incongruous, even at a distance of 4.6 km, when seen as part of the experience of a landscape of such high intrinsic aesthetic quality. Much the same applies to the view from South Foreland Lighthouse (Grade II Listed). This is perhaps not the most easily accessible among the National Trust's portfolio of buildings, and is set adjacent to an area of scrubland concealing some large World War II bunkers. Nonetheless, the view from the platform around the light encompasses probably the most panoramic and uncluttered stretch of landward skyline available from the cliff tops (A23). From here I noted, in particular, that the skyline silhouette of the turbine cluster would be much less compact and symmetrical than the three WWII radar masts (maximum 110 m high) at Swingate, while the rotation of their blades would draw the eye more compulsively. The setting of this building would not, in my estimation, be impaired but the attractive and uncluttered panorama, that people come to enjoy from it, would be.

Dover Castle and the Western Heights.

88. I was unable to climb the keep of Dover Castle (Grade I Listed and Scheduled Ancient Monument) during my inspection as building work was in progress and I can therefore only rely on the verbal and photographic evidence before me. While it was argued that the seaward view alone was historically significant, I heard that the rear of the Castle was most vulnerable to attack, formed the processional entrance route and provided a first or last sight of England for royal guests arriving from or departing to the continent. The present day visual relationship to Fort Burgoyne and the Duke of York's Royal Military School further consolidate the view northwards (to the horizon above the ridge beyond) as part of the setting of castle. Within this setting, it is apparent from the relevant photomontage (A17, at 3.72 km) that even though the Swingate masts appear taller than the proposed turbines because of their greater proximity, the spread and rotation of the turbines on the horizon would represent a more demanding and less harmonious focus for the eye. I also find turbine 1 in particular in this view to be uncomfortably close to the otherwise suitably isolated tower of the Duke of York's Royal Military School. In these specific respects, I consider that the setting of the Castle would not be preserved or enhanced.

89. Conversely, from the Western Heights, I saw that the angle of view is away from the Castle and passes across the built up area of Dover itself (which portrays a scene of movement rather than stillness) to a part of the skyline already populated with a number of pylons and masts. Views of the blade tips from here (VP16) would not, I consider, be either significant or incongruous.

Other matters

90. Paragraph 21 of the PPS22 Companion Guide advises that amendments to existing roads required to gain access to a site should be detailed in any wind farm application. At the time the ES was compiled, it had been intended to deliver turbine components via the port of Dover but, in the light of concerns expressed by the Highway Authorities (in this case both the Department for Transport and the County Council) it was proposed at the Inquiry to use the port of Chatham instead. The Companion Guide does not stipulate the length

of the access between the point of manufacture/importation of the turbines and delivery to site over which road alternations need to be considered by the ES. However Chatham was, I understand, used for turbines of similar size for Little Cheyne Farm and, on the basis that no further alterations would be needed in the Medway Towns, I indicated that I would consider only the section between the point of departure from the Trunk Road network and the North Dover site entrance. In effect, that section is adequately covered by the existing ES and I could see no reason to require any further Environmental Information on the subject. While the route is narrow in places, and its use would inevitably cause some inconvenience to local people, I am content that turbine delivery would not represent an insurmountable obstacle to turbine development. Any residual concerns could, I consider, be suitably dealt with by planning conditions.

91. The Companion Guide further says that, with regard to driver distraction, the presence of turbines within sight of roads should not be considered particularly hazardous. In this case, objector concern focuses on the A258 between Dover and Walmer. This is a two way road, for the most part with no footways. It is subject to the national 60mph speed limit. I was told that this road has a poor accident record, there having been a number of fatalities along it. In places, forward visibility is limited by undulations and it was also pointed out that the road serves as an access to a caravan site at Martin Mill, apparently much frequented by drivers from the continent who might be unfamiliar with driving on the left. Nonetheless, even at its closest, the turbine field would be some 2 km to the west of the road and, at this distance, turbines would only appear directly in front of drivers approaching from junctions on its eastern side, or departing from junctions on its western side. There is no reason to believe that continental motorists would regard wind turbines as such a novelty as to distract their attention when undertaking these manoeuvres. The main risks would seem to be from poorly sighted overtaking of one vehicle by another, and from drivers coming unexpectedly upon slow moving or stationary traffic. Drivers are required by law to take reasonable care to ensure their own and others' safety at all times. I do not therefore consider that the turbines would add to accident risks on A258.

92. Moreover, although I am aware of a great deal of research on the subject, I have found no evidence that actually demonstrates a causative relationship between the presence of turbines and any attributable pattern of the incidence of ill-health, despite the presence of a great number of wind farms in the UK and elsewhere. While understanding parental concerns, I do not therefore attach any weight to a suggestion that, on the basis of "attachment theory", the turbines might give rise to depression and declining levels of academic achievement among local school children.

93. Concern about the effect on business interests was drawn to my intention in the context of two local enterprises – one being the "White Doves of Dover" at Dane Cottages in Pineham and the other being a studio used for fine art restoration attached to a house on the edge of Guston. I understand that doves might be reluctant to fly across the turbine field, but not all outward or return flights will necessitate this. From the ornithological evidence before me, I also have little reason to doubt that the birds would soon grow accustomed to the presence of the turbines and find suitably safe routes between or around them.

The art studio at Guston falls within an arc of the sun's traverse where shadow would not be cast by the turbines.

94. Following correspondence with MOD during the Inquiry, it would also seem that provision of turbine lighting would not be a significant obstacle to development of the wind farm, any request for low intensity or infra-red illumination of the nacelles being a matter that can be suitably dealt with by planning condition. Risk of public danger from ice-throw could be similarly avoided by planning condition requiring the turbines to be fitted with vibration sensors. The turbines would, I consider, be sufficiently exposed to view to avoid startling horses and riders using the local road and bridleway network. However, I do take note of objector criticism that turbine T1 would lie within "fall-over" distance of Waldershare Lane and that turbine T5 would lie within "fall-over" distance of the 33kV power lines traversing the site itself. While there are no mandatory separation distances in either respect, both indicate that the siting of turbines has not been undertaken with a view to achieving maximum safety.

Overall conclusions:

95. In dividing the main issues in this case into two categories, I have sought to distinguish between broad matters of policy principle and detailed matters of development control.

96. In the first of these categories, it is clear that there is a need in Kent to increase capacity for the generation of electricity from renewable sources, including wind, in order to ensure that the target expressed in extant and emerging RSS for the period to 2016 can be met. There is no statutory or other need to explore alternatives because this site has the wind resource to make due contribution and is in a part of Kent where there is, I consider, landscape capacity to absorb a "small cluster" of 120 m high turbines as defined in SP paragraph 9.26.

97. However, beyond those points there are two repeating criticisms of the application scheme that variously permeate through each of my remaining conclusions. The first is inadequate attention to prescribed processes in the formulation of the application, and the second is failure to demonstrate the sensitive approach to exploitation of renewable energy resources expected by paragraph 16(i) of PPS7.

98. In the case of aviation interests, I consider that paragraph 25 of PPS22 requires a more attentive response than a unilateral suggestion by a wind farm developer, in an ES or at Inquiry stage, that pilots of aircraft be advised to fly through or around potential hazards placed in their present main flight paths. With KIA, it is also not in my view sufficient for the Appellant to argue that the prospect of ATC being unable to provide a satisfactory service is so small that it should be ignored. Air accidents are rare but generally arise from unlikely and unforeseen combinations of events. When they do occur, they also often end in fatality, as the light aircraft crash above East Langdon in 1996 demonstrates. I therefore look upon the maintenance of air safety as an important public interest and a material planning consideration of great weight. It is the purpose of ATC to minimise the unforeseen, and this can only be achieved by being able to offer the best level of service that is practicable. There may or may not be a way in which radar effects of concern KIA can be economically

mitigated (at least until such time as the airport's growth ambitions materialise). Mr James's evidence to the Steadings Wind Farm Inquiry, for example, suggests that there might be. However, despite a collaborative assessment having apparently being offered by the developer, and co-operation and engagement having apparently been offered by KIA, for whatever reason the parties have not consorted in discussion or investigation of the subject. I am left only to either agree or disagree with the Appellant's assertion that the turbines, by themselves, would not, in the CAA's words, "diminish the existing ATC service or constrain the future expansion of that service".

99. In that respect, the unique features that make the North Dover Area a hub of flying activity and thus problematic for ATC at KIA include the position of the Dover VOR beacon and the presence of the White Cliffs, the short sea crossing and the thermals above the Downs. Those features cannot be moved and nor can the flight patterns associated with them to achieve the requisite 5 km avoidance distance, whereas the siting of wind turbines is comparatively footloose. It follows that, if the ATC service would be diminished or constrained and suitable technical mitigation cannot be agreed, it is the turbines that would have to be moved and not the flight paths.

100. The problem at Inglenook airfield is different in both character and scale and may, with further discussion, prove more readily capable of being overcome for example by adopting the four turbine option and, if necessary, agreement not to fly in certain weather conditions. Again, discussion with the operator was recommended by CAA but this was not followed through with any vigour, a criticism that can be applied also in some measure to at least the first round of correspondence with MOD on the subject of turbine lighting, which was not resolved until the end of the Inquiry.

101. On the balance of the evidence placed before me, I have found demonstrable risks that ATC and air safety would be unacceptably compromised by the presence of the proposed turbines. More particularly in PPS22 terms, however, it is my conclusion that those risks, no matter how small they might be, have not been either properly or satisfactorily addressed or resolved. In either case, I am unable to conclude that this is an acceptable location, in principle, for a turbine cluster to be developed, and it would be wrong to grant conditional permission in the absence of any certainty that workable mitigation could be agreed later.

102. Turning then to the development control details, I again find inadequate attention to process, not only in relation to the ETSU-R-97 recommendations for measurement of background noise levels but also in the way in which the ES deals with "shadow throw", leaving the more important subject of "shadow flicker" open largely to conjecture. In cases where there is substantial separation between turbines and neighbouring places of habitation, these matters of process may not be significant. However, although the Appellant's planning witness was able to refer to cases where turbines had been sited at about 600 m from one or two dwellings, he accepted that he had not before come across a case in which turbines of the size and number involved in this case have been proposed so close to so many properties. Indeed, having examined all of the many wind farm decisions in the Inquiry documents (not all of which include dimensions), and on the basis of my own experience, I come

to much the same conclusion. That may or may not be because schemes with lesser separation distances have been "weeded out" at the pre-application stage of impact analysis but it does, in my opinion, at least signal a need for particular caution.

103. Different opinions were expressed to me on how long it would take, and what would be needed, to check the validity of background noise levels with fresh measurements taken on a consensual basis. However, I find that this is not a matter that can be left to planning condition, because the margins here are so tight that there can, at the present point in the decision-making process, be no guarantee that achievable noise limits would then derive from them. To impose a condition in such circumstances would (as with radar mitigation at KIA) be contrary to the judgment in *Maureen Smith and S of S for the Environment, Transport and the Regions and others [2003] EWCACiv262*, to which LAG was at pains to direct me. The risk of unacceptable shadow flicker is, I acknowledge, slight and more readily susceptible to control by planning condition. However, public perception of the least satisfactory living conditions will inevitably attach to those properties considered to be most exposed to the combined effects of noise, flicker and visual impact. It cannot pass without notice that my adverse findings on the last of these coincidentally alight also on the same properties as the first two. I have not been convinced that physical separation between turbines and places of habitation would be sufficient in this case to ensure that satisfactory living conditions would be maintained.

104. I return again to questions of process in relation to my findings on cultural heritage interests, where I note that the approach recommended in PPS16 to investigation of on-site archaeology has not been followed. That aside, the impact of the turbines on other cultural interests would be visual rather than physical, and both more widely and thinly scattered. English Heritage has not objected, but in the case of the two churches to which I have referred (St Augustine's and St Peter's), I nevertheless consider the turbines to be uncomfortably close and conspicuous. In comparison, the effect of the turbines on the setting and views into and out of East Langdon Conservation Area, and on more distant views from Bockell Hill, South Foreland Lighthouse and Dover Castle are, I consider, more a matter of broad landscape composition (or "landscape architecture" in its grandest sense). I attach importance to that subject in this case because of the acknowledged quality of the respective viewpoints (including the quintessentially undisturbed rural setting of East Langdon) and the numbers and likely qualitative expectations of visitors to them. In all of these, it is the number and spread of the turbines, together with their silhouette above the skyline, that I find unacceptably inelegant.

105. Omission of turbine T1 would go some way to addressing spread but the remaining even number of turbines would serve only to make the silhouette still less attractive, by creating what might, by some, be recognised as a restless architectural form (because, like a house without a front door, there would be no central point for the eye to naturally alight upon). Conversely, omission of two turbines, for example T1 and T5, would leave the outline of a simple trinity of more closely spaced turbines which, I consider, the eye could more easily assimilate. Such an outline would blend more comfortably into long distance views and settings, provide greater separation from East Langdon (including St Augustine's Church, and other places of habitation to the east),

and be less likely to dominate the outlook from West Langdon. It would also impinge less intrusively into the view from the extended graveyard area of St Peter's Church. Notably too, safety concerns about "fall over" distance would be overcome, while at Enifer Downs farmhouse (which is the closest of any dwelling to a proposed turbine), omission of both T1 and T5 would almost halve the spread of turbines and nearly double the distance between the house and those that would then remain. There would thus be less impact on neighbour living conditions here and nearby, even though the absence of T5 would only peripherally reduce the visual effect on residents in Pineham. Investigation of the implications of excising these two turbines would, furthermore, allow for consideration of a greater range of alternatives for the preservation of any archaeological finds that might be identified by timely field "evaluation".

106. Nevertheless, notwithstanding the context provided by my ruling following the pre-Inquiry meeting, both the Appellant and the Council cautioned against reducing the number of proposed turbines, not least because of the implications for the amount of energy the site would then be able to generate. Even with three turbines, important matters of principle (air safety) and process (noise) that I have identified would remain to be properly addressed. Separation distance from properties at Pineham might, as paragraphs 55, 65, 68 and 103 above imply, also prove insufficient (if the combined effects of noise, flicker and visual intrusion are still found to require mitigation) to ensure satisfactory living conditions. Planning conditions alone cannot resolve those points, whether for five turbines or any lesser number.

107. In sum, notwithstanding the significant weight attached by paragraph 1(iv) of PPS22 to the wider environmental and economic benefits of proposals for renewable energy projects, and my finding that there is both need and landscape capacity for renewable energy generation in this part of Kent, important safeguards in National planning guidance and the statutory development plan have not, in this case, been satisfactorily met. I have considered all other matters raised at the Inquiry, including ecological, arboricultural and agricultural concerns but I find nothing to alter my conclusion that the scheme as put before me is unacceptable in policy, safety and environmental terms. It does not represent a sensitive approach to exploitation of renewable energy resources in this particular area of countryside and I therefore refuse planning permission for it.

D Lavender

APPEARANCES

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Interested Persons:

Opposing:

Mr A Sencicle	Dover Society
Mr G Thomas	CPRE Kent
Mr G Smith	Inglenook Farm, Roman Road, Maydensole, near Dover, Kent

DOCUMENTS

General

Document	1	Attendance lists for each day of the Inquiry.
Document	2	Minutes of Pre-Inquiry Meeting.
Document	3	Inspector's Pre-Inquiry Ruling on Admissibility of 4 Turbine Scheme.
Document	4	Inquiry timetable (final)
Document	5	Core documents, as follows:

A. Application Documents - Wind Turbine

A1 Planning Application dated 21 September 2007
A2 Environmental Statement (September 2007)
(a) Non-Technical Summary
(b) Text
(c) Appendices
A3 Planning Statement (September 2007)
A4 Design and Access Statement (September 2007)
A5 Statement of Community Involvement (September 2007)
A6 Supplementary Environmental Information (December 2007)
A7 Flood Risk Assessment (December 2007)
A8 Development Control Manager Report to Planning Committee (5 June 2008)
A9 Minutes of Planning Committee (5 June 2008)
A1O Consultee Responses
A11 Third party responses to Application
A12 Ramboll Whitbybird: Initial review of Environmental Statement (February 2008)
A13 Ramboll Whitbybird: Review of Supplementary Environmental information (November 2008)
A14 Scoping Opinion Request by Ecotricity (November 2006)
A15 Local Planning Authority Scoping Opinion (January 2007)
A16 Supplementary Environmental Information (October 2008)
A17 Supplementary Environmental Information (December 2008)

B. Post-Appeal **Documents**

B1 None

C. Planning Policy Documents

Development Plan

C 1 Regional Planning Guidance 9 for the South East (which includes replacement Chapter 10 (Energy Efficiency and Renewable Energy)
C2 Kent and Medway Structure Plan (adopted July 2006)
C3 Dover District Local Plan (adopted 2002) - As amended by SoS – with Proposal Maps
C4 Secretary of State's letter and direction concerning the saved polices of the Dover District Local Plan
C5 Kent and Medway structure Plan SPG1: Landscape Character (2006) and Maps
C6 Kent and Medway Structure Plan SPG2: Biodiversity Conservation (2006)

Emerging Development Plan

D1(a) Emerging draft Regional Spatial Strategy for the South East – the South East Plan
D1(b) "Panel Report on the Regional Spatial Strategy for South East England" August 2007
D1(c) Proposed Changes from the Secretary of State in relation to the Draft South East Plan
D2(a) Emerging LDF documents as relevant:
-(c) Dover District Local Development Framework
(a) Core strategy
(b) Site allocations
(c) Development contributions SPD

F. Planning Policy Statements (PPS) and Companion Guides

F1(a) PPS1: Delivering Sustainable Development (2005)
F1(b) PPS1: Supplement on Climate change
F2 PPS 7: Sustainable Development in Rural Areas (2004)
F3 PPS 9: Biodiversity and Geological Conservation
F4(a) PPS 22: Renewable Energy (2004)
F4(b) PPS22 Companion Guide (2004)
F5 Consultation: Planning Policy Statement: Planning and Climate Change – Supplement to Planning Policy Statement 1 (December 2006)

G. Planning Policy Guidance (PPG)

G1 PPG 15: Planning and the Historic Environment (1994)
G2 PPG 16: Archaeology and Planning (1990)
G3 PPG24: Noise (1994)
G4 PPG13: Transport (2001)

H. Other Planning Documents

H1 Planning White Paper (Planning for a Sustainable Future)
H2 Department for Communities and Local Government "Environment Impact Assessment: a Guide to Good Practice & Procedures – a consultation paper" (June 2006)
H3 Town and Country Planning (Environmental Impact Assessment (Amendment) (England) Regulations 2008
Town and Country Planning (Environmental Impact Assessment) (England & Wales) Regulations 1999

I. Local Authority and Statutory Body Reports

I 1 Landscape Assessment of Kent(Kent County Council)
I2 The Kent Downs AONB Management Plan (2004) Kent Downs AONB Joint Advisory Committee
I3 Kent Downs AONB Landscape Design Handbook' (2005) Kent Downs AONB Joint Advisory Committee

J. Government Circulars

J1 ODPM Circular 11/95: "The use of Conditions in Planning Permissions"
J2 ODPM Circular 02/99: "Environmental Impact Assessment"
J3 Circular 1/2003: Safeguarding Aerodromes, Technical Sites and Military Explosives Storage Areas

K. Various Wind Farm Appeal Decisions

a. Lamerton (APP/Q1153/A/04/1170234)
b. Werfa (APP/F6915/A/02/1097582)
c. Guestwick A (APP/K2610/A/05/1180685)
d. Guestwick B (APP/K2610/a/05/1180685)
e. Llethercynon (APP/T6850/A/03/1122720)
f. Penpell (APP/Q0830/A/05/1189328)
g. Ceredigion (APP/D6820/A/07/1200875)
h. Whinash (DTI decision letter and Inspector's conclusions and recommendations)
i Knabs Ridge (APP/E2734/A/04/1161332)
j. Yelland (APP/Q1153/A/05/1180685)
k. Den Brook (APP/Q1153/A/08/2017162)

l. Fullabrook (DTI GDBC/003/00024C) (decision letter, consent and Inspector's conclusions)
m. Crimp
n. Crow Holt(APP/A3010/A/06/2017850)
o. Shooters Bottom (APP/Q3305/A/05/1181087)
p. Wern Ddu (APP/R6830/A/05/1185359)
q. Middlemoor (DTI/GDBC/001/00245C)
r. Kessingland
s. Ellands
t. Darracott (APP/W1145/A/03/1119641)
u. Knabs Ridge (APP/E2734/A/04/1161332)
v. Carsington
w. Bradwell (APP/X1545/A/06/2023805)
x. Scout Moor
y. Roskrow (APP/Y0815/A/03/1129335)
z. Corlic, Greenock (Inverclyde)
aa. Bradworthy (Torridge)
bb. Elsham
cc. Shipdham 2003
dd. Shipdham 2006
ee. Boxworth and Conington (APP/W0530/A/05/1190473
ff. Inner Farm (APP/V3310/A/06/2031158)
gg. Thackson's Well (APP/E2530A/08/2073384)
hh. Jordanstone, Fishguard (APP/A/98/512221)
ii. Mynydd Y Gwrhyd (APP/Y6930/A/05/1189610)
jj. Rossie, Auchtermuchty (P/PPA/250/675)

L. Renewable Energy Documents

L 1 Directive on Renewables 2001/77/EC
L2 Scottish Natural Heritage, "Guidelines on the Environmental Ecotricity Impacts of Wind farms and Small Scale Hydro Electric Schemes"(2001)
L3 DTI Energy White Paper "Our Energy Future: Creating a Low Carbon Economy" (2003)
L4 Enterprise and Culture Committee of the Scottish Parliament, 6th Report "Renewable Energy in Scotland" (2004)
L5 EC Communication "The share of renewable energy in the EU", COM(2004)366 final (2004)
L6 House of Lords Science and Technology Committee, 4th Report of Session 2003-4 "Renewable Energy: Practicalities" (2004)
L7 National Audit Office Report " Department of Trade and Industry: Renewable Energy" (February 2005)
L8 Wind Power and the UK Wind Resource, Environmental Change Institute at Oxford University (2005)
L9 Sustainable Development Commission Report, "Wind Power in the UK" (2005)
L10 UK ERC "The costs and impacts of intermittency: an assessment of the evidence on the costs and impacts of intermittent generation on the British electricity network" (2006)
L11 DTI Energy Review "The Energy Challenge" (July 2006)
L12 The Stern Review, "Economics of Climate Change": Executive Summary only (October 2006)
L13 DTI Energy White Paper "Meeting the Energy Challenge" (2007)
L14 Speech made by John Hutton, SoS for Business, to the Fabian Society – 17 September 2007
L15 Draft proposal from the EU Commission (January 2008)

L16 Draft Renewable Energy Strategy: Executive Summary only (June2008)
L17 Written Statement from the Energy Minister (Low Carbon Economy Summit - June 2008)
L18 Speech by the Prime Minister (Low Carbon Economy Summit - June2008)
L19 2020 Vision Report by the Renewables Advisory Board
L20 Best Practice Guidelines for Wind Energy Development, BWEA (2004)
L21 PAN 45 (2002) Renewable Energy Technologies

M. Climate Change Documents

M1 H M G o v e r n m e n t "Climate Change: the UK Programme 2006" (March2006)
M2 Intergovernmental Panel on Climate Change Fourth Assessment Report Climate Change 2007: Synthesis Report
M3 Natural England's draft policy on climate change

N. Landscape and Visual Documents

N1 The Countryside Agency "Landscape Character Assessment: Guidance for England and Scotland" (2002)
N2 The Landscape Institute, Institute of Environmental Management and Assessment, 2002, "Guidelines for Landscape and Visual Impact Assessment", Second Edition
N3 English Heritage "Wind Energy and the Historic Environment" (2005)
N4 Produced for Scottish Natural Heritage by the University of Newcastle, "Visual Assessment of Wind farms: Best Practice"
N5 Scottish Natural Heritage and The Countryside Agency "Topic Paper 5: Understanding Historic Landscape Character" (2004)
N6 Scottish Natural Heritage and The Countryside Agency Landscape Character Assessment Series "Topic Paper 6: Techniques and Criteria for Judging Capacity and Sensitivity" (2004)
N7 Scottish Natural Heritage and The Countryside Agency Landscape Character Assessment Series "Topic Paper 9: Climate change and natural forces - the consequences for landscape character" (2003)
N8 INTENTIONALLY BLANK
N9 Visual representation of wind farms. Good Practice Guidance(2006)
N10 Designing Wind farms in the Landscape, Draft for Consultation, Scottish Natural Heritage, 2008
N11 The Visual Issue, An Investigation technique into the technologies a n d M e t h o d o l o g y used in wind farm computer visualizations, April2007

O. Noise

O1 ETSU-R-1997 The Assessment andRating of Noise from Wind Farms, DTI Working Group on Noise from Wind Turbines (1996)
O2 British Standard BS4142 "Method for Rating Industrial Noise Affecting Mixed Residential and Industrial Areas", British Standards Institute, HMSO 1997
03 ISO 9613-1 Acoustics – Attenuation of sound during propogation outdoors, Part 1
04 ISO 9613-2 Acoustics – Attenuation of sound during propogation outdoors, Part 2

R. Cultural Heritage

R1 COLLCUTT, S.N. 1999. The setting of cultural heritage features. Journal of Planning& Environment Law. June 1999:498-513
R2 Setting Standards: A review (IFA Working Group of the setting of

cultural heritage features, April 2008)
R3 Conservation principles - Policies and guidance for the sustainable management of the historic environment (English Heritage, April 2008)
R4 Descriptions and scheduling of Listed Buildings and Ancient Monuments within 5Km of appeal site

S. Aviation

S1 ''Wind Energy and Aviation interests, Interim Guidelines' Wind Energy,Defence & Civil Aviation Interests Working Group, ETSU W/14/00626/REP, DTI, 2002
S2 Civil Aviation Authority, CAP 764 'CAA Policy and Guidelines on Wind Turbines'
S3 Civil Aviation Authority, CAP 738 - Safeguarding of Aerodromes (excerpts only)
S4 Wind Turbines And Aviation Interests - European Experience And Practice, STASYS Ltd, ETSU W/14/00624/REP, DTI PUB URN No. 03/515, DTI, 2002
S5 Civil Aviation Authority, Safety Regulation Group, CAP 493: Manual of Air Traffic Services Part 1 (excerpts only)
S6 Civil Aviation Authority, Safety Regulation Group, CAP 670: Air Traffic Services Safety Requirements, Part B, Section 4, GEN 01, 12 June 2003 (excerpts only)
S7 Civil Aviation Publication, CAP 168: Licensing of Aerodromes (excerpts only)
S8 Civil Aviation Authority, Safety Regulation Group, CAP 428: Safety
S9 Standards at Unlicensed Aerodromes, October 2004 (excerpts only) UK Aeronautical Information Publication entry for Manston
S10 AA Safety Regulation Group, CAP 774: UK Flight Information Services,Civil Aviation Authority, Safety Regulation Group 12 June 2008

T. Other

T1. The BWEA handout/press release dated 29 November 2007 re the Advertising Standards Agency report on CO2 savings
T2 SPP6
T3 British Horse Society Guidance on Wind farms
T4 A short history of Guston (M.E. Bodiam)
T5 Saint Martin of Tours - Guston Parish Church History
T6 East Langdon and Martin (Major G.S. Johnson)
T7 A history of St Augustine's church, East Langdon
T8 Langdon Primary School, consultation report 8th June 2006 (Dr Alan F Snoad)
T9 St Mary's Church, West Langdon
T10 A history of Whitfield (Rev. 3 Howard Brown)

Document 6 Statement of Common Ground between Ecotricity Group Ltd and Dover District Council
Document 7 Statement of Common Ground between Ecotricity Group Ltd (5 January 2009 version) and NATS and covering letter dated 12 December 2008
Document 8 Statement of Common Ground between Ecotricity Group Ltd and Infratil on Aviation Matters - Radar
Document 9 Working drafts of planning conditions, dated 21 January 2009, 5 February 2009 and 9 February 2009.
Document 10 Inspector's notes on documentation, dated 26 January 2009.

Document 11 Inspector's initial comments on working drafts of conditions, dated 27 January 2009
Document 12 Suggested site visit itineraries

Council Documents

Document 13 Council's opening statement
Document 14 Letter from Terence O'Rourke to PINs dated 11 November 2008 (referred to in Council's opening statement).
Document 15 Ms Kaner's Proof of evidence and Summary
Document 16 Ms Kaner's Appendices
Document 17 Appeal Decision A2066130 – residential development at Franconia, The Droveway, St Margaret's Bay.
Document 18 "Renewable Energy Technologies in the English Countryside", February 1994 (whole document).
Document 19 Mr Trehy's Proof of evidence and Summary
Document 20 Mr Trehy's Appendices
Document 21 Visitor figures for Dover Castle (including The Keep).
Document 22 Extract from Institute for Archaeologists' Standard and Guidance for desk-based assessment, revised October 2008.
Document 23 Extract from Institute for Archaeologists' Standard and Guidance for Stewardship of the Historic Environment, September 2007.
Document 24 Good Practice Guide to managing risk and maximising benefit when dealing with archaeology and development.
Document 25 Bundle of plans indicating numbers of properties within 1, 2 and 5 km of each turbine and calculation sheets.
Document 26 Plans and bundle of lists of properties within 820 m of each turbine (submitted at Inspector's request).
Document 27 List showing distances of Little Pineham Farm, Enifer Downs Farm and Langdon Court from the nearest turbines to them.
Document 28 Dr A Farahmand-Razavi's proof
Document 29 Bundle of plans, letters and e-mails dated 12-13 January 2009 seeking to establish division of trunk road and County highway networks at Whitfield roundabout and width of highway in Archers Court Road (submitted at Inspector's request)
Document 30 Bundle of e-mails relating to turbine lighting, up to 10 December 2008.
Document 31 Mr Jensen's Proof of evidence and Summary
Document 32 Mr Jensen's assessment of background noise levels using regression line formulas based on figures in 2007 ES - tables.
Document 33 Mr Jensen's assessment of background noise levels using regression line formulas based on figures in 2007 ES - graphs.
Document 34 Combined graphs for the 5 representative receptors daytime/night time (Pineham Farm daytime adjusted).
Document 35 Mr Miller's Proof of evidence and Summary.
Document 36 Mr Miller's Appendices.
Document 37 GOSE correspondence on saved policies in SP (relevant to SLA).
Document 38 SP Panel report on Local Landscape designations.
Document 39 Extract from Stilton Wind Park ES, dealing with site selection
Document 40 Renewable energy Schemes in the Pipeline in Kent 22 January 2009.

Document 41 BBC news report on Eurotunnel bid for Dover Strait to become World Heritage site.
Document 42 Assessment of ES Shadow Flicker Report, November 2008.
Document 43 Swale Council report on Port of Sheerness wind turbine proposal.
Document 44 Responses to Inspector requests for further information
Document 45 Ecotricity Good Neighbour policy and press release on North Dover
Document 46 Plan showing wind speed relative to designated areas in Dover District.
Document 47 Memo from Ramboll to Council detailing Mr Jensen's comments on proposed noise conditions.
Document 48 Council's closing statement.

Appellant Documents

Document 49 Mr Houghton's Opening Statement
Document 50 Plan showing application site outlined in red and land under control of Appellant outlined in blue (submitted at the Inspector's request).
Document 51 Mr David's Proof of evidence
Document 52 Mr David's Summary
Document 53 Mr David's Appendices
Document 54 Mr David's Figures
Document 55 Mr David's Rebuttal evidence
Document 56 Six plans showing shadow flicker receptors by sector
Document 57 Amended Viewpoints A7 for 5 and 4 turbine schemes.
Document 58 Extract from "Renewable Energy Technologies in the English Countryside", February 1994.
Document 59 Extended photomontage A19 and explanatory note
Document 60 Bundle of e-mail correspondence with Energy Defence Estates concerning turbine lighting.
Document 61 Mr Collett's Proof of evidence
Document 62 Drawing numbered 67.90.001-0 showing generator transport by turnable trailer.
Document 63 Mr McKenzie's Proof of evidence
Document 64 Mr McKenzie's Summary
Document 65 Mr McKenzie's Appendices
Document 66 Mr McKenzie's Rebuttal proof of evidence
Document 67 Mr McKenzie's noise and wind time histories Appendices
Document 68 Evidence to Mountboy wind farm by Mr Bowdler
Document 69 Sound Power levels for E-82 turbine and noise safety factor.
Document 70 Mr Spaven's Proof of evidence
Document 71 Mr Spaven's Summary
Document 72 Mr Spaven's Appendices
Document 73 Radar plots across East Kent and Channel.
Document 74 CAA consultation document on proposal for incremental expansion of transponder use in UK airspace.
Document 75 Stakeholder Consultation by NATS on proposal for controlled air space at Stansted.
Document 76 Mr James's evidence to the Steadings Wind Farm Inquiry 18 January 2008.

Document 77 E-mail exchange between Mr Smith and Mr Spaven , June 2007.
Document 78 Mr Stewart's Proof of evidence
Document 79 Mr Stewart's Appendices
Document 80 Written rebuttal submission on White Doves of Dover
Document 81 Responses to Inspector requests for further information
Document 82 Plan of swept path for turbine vehicle.
Document 83 Note on draft conditions by Ecotricity – 5 February 2009
Document 84 Mr Houghton's Closing Statement.

Parish Councils' Documents

Document 85 Parish Councils' opening statement.
Document 86 Three bound volumes of witness proofs and, statements and appendices.
Document 87 Ring binder containing Parish Councils' Core Documents
Document 88 Summary of Mr Leach's evidence.
Document 89 Summary of Mr Walters's evidence.
Document 90 Mr Moor's supplementary photographs
Document 91 Four photographs of the Dublin spire accompanying Mr Clayson's evidence
Document 92 *Script of Mr Sencicle's evidence.*
Document 93 Mr Sencicle's letter of appointment.
Document 94 Extract from Definitive Rights of Way Map for Langdon area.
Document 95 Letter from Mr G Sencicle, dated 3 January 2009.
Document 96 Request from Mr Walters for Inspector to visit Bowerfield Farm Kennels, dated 8 January 2009.
Document 97 List prepared by Mr Walters to show numbers of properties within 820 m of turbines, categorised by village.
Document 98 Comments on proposed conditions.
Document 99 Parish Councils' closing statement.

LAG's Documents

Document 100 LAG's opening statement.
Document 101 Two bound volumes of wind farm appeal decisions.
Document 102 Ms Bolger's Proof of evidence.
Document 103 Ms Bolger's Appendices.
Document 104 Appeal decision A2047477 - Aston Grange Farm Wind Turbines, Cheshire.
Document 105 Kent Downs AONB Management Plan "Final Text approved for Adoption", dated October 2008.
Document 106 *Mr Hyde's Proof of evidence and Appendices.*
Document 107 Plan showing locations of LAG's photographs.
Document 108 Reports of blade fracture of Conisholme turbine and ice-shedding at Whittlesey turbine.
Document 109 *Mr Stigwood's Proof of evidence and Summary.*
Document 110 Mr Stigwood's response to Dr McKenzie's evidence and rebuttal.
Document 111 Mr Pound's written submission.
Document 112 Mrs Pound's written submission.
Document 113 Ms Baker's written submission.
Document 114 Conditions note for Inspector

Document 115 Comments on proposed conditions.
Document 116 Extract from Guardian Newspaper 7 November 2008.
Document 117 MAS Environmental – alternative approach to conditions as suggested by the Inspector.
Document 118 MAS Environmental -the enforceability and reasonableness of wind farm conditions
Document 119 LAG's closing statement.

Infratil Documents

Document 120 Mr James's Rebuttal Proof of evidence.
Document 121 Extract from Mr James's evidence to the Shipdam wind turbine Inquiry.
Document 122 Lower Airspace Radar Statistics.
Document 123 Mr Thompson's Proof of evidence of evidence.
Document 124 Mr Thompson's Appendices.
Document 125 Mr Leitch's Proof of evidence of evidence.
Document 126 Infratil's Core Documents, as follows:

KIA1 Civil Aviation Authority, CAP 168: Licensing of Aerodromes - Cover Page and Chapter 1
KIA2 Civil Aviation Authority, CAP 393: Air Navigation: the Orders and Regulations -Cover Page, Parts 9-10 & 12-14 of Section 1 and Sections 1-6 of Schedule 1 of Section 2.
KIA3 Civil Aviation Authority, Safety Regulation Group, CAP 493: Manual of Air Traffic Services - Cover Page, Sections 1, 3 & 5 and Chapter 2 of Section 8.
KIA4 Civil Aviation Authority, CAP 670: Air Traffic Safety Requirements - Cover Page, Part A and Part B.
KIA5 Civil Aviation Authority, CAP 738: Safeguarding of Aerodromes.
KIA6 Annex 11 to the Convention on International Civil Aviation; International Civil Aviation Organisation (ICAO) - Cover Pages, Paragraph 2.2 of Chapter 2, Paragraph 2.6 of Chapter 2.
KIA7 Manual of Air Traffic Services (MATS) Part 2 - Section 2 and Chapters 1, 2 and 3 of Section 4.
KIA8 The Future of Air Transport (Aviation White Paper) dated December 2003 - Cover Page, Paragraphs 11.93, 11.95 & 11.99.
KIA9 The Future of Air Transport Progress Report dated December 2006 - Cover Page, Paragraphs 1.12, 4.11 & 5.5.
KIA10 The Town and Country Planning (Safeguarded Aerodromes, Technical Sites and Military Explosive Storage Areas) Direction 2002.
KIA11 Royal Air Force Air Warfare Centre: The. Effects of Wind Turbine Farms on ATC Radar, 10 May 2005.
KIA12 United States Department of Defense Report to the Congressional Defense Committees: The Effect of Windmill Farms on Military Readiness, 2006.
KIA13 Appeal Decision IEC/3/73 on application for 85 turbine development at Kyle Forest, east Ayrshire.
KIA14 Kent International Airport - Manton Draft Master Plan dated October 2008.
KIA15 Civil Aviation Authority , CAP 764 'CAA Policy and Guidelines on Wind Turbines' [updated version from July 2006 document included with Core Documents, as yet unpublished although proof read and in final form, produced with permission of the CAA; publication expected in early February 2009]
KIA16 Annotated aviation map of the South East of England (including Kent International Airport and the appeal site)
KIA17 Letter from the Civil Aviation Authority to the Dover District

	Council dated 5 December 2008
KIA18	Letter from the Civil Aviation Authority to the Dover District Council dated 18 December 2008

Document 127 Letter dated 9 February 2009 containing comments on proposed conditions.

Document 128 Infratil's closing statement.

Third Party Documents

Document 129 Bundles of third party representations received at application and appeal stage, prior to the opening of the Inquiry.

Document 130 Bundle of third party representations received in response to SEI (circulated to the parties by the Inspector at the Inquiry).

Document 131 Letter dated 9 January 2009 from Highways Agency to PINs proposing its representations be dealt with through planning conditions rather than Inquiry appearance.

Document 132 Two e-mails supporting the proposal (from Ms Bateman and Mr Kinrade)

Document 133 Letter dated 24 November 2008 setting out National Trust objection to the proposal in light of SEI.

Document 134 E-mail dated 12 January 2009 from Mr A Sencicle

Document 135 Script of Mr Thomas's evidence to the Inquiry (appearance)

Document 136 Script (e-mail 14 January 2009) of Mr Sencicle's evidence to the Inquiry (appearance)

Document 137 Letter dated 16 January 2009 from English Heritage, indicating no comments on this occasion.

Document 138 Script of Mr Smith's evidence to the Inquiry (appearance)

APP15

HISTORIC SCOTLAND
ALBA AOSMHOR

Sent by e-mail: PLNProcessing@angus.gov.uk

Planning & Transport Division
Angus Council
County Buildings
Market Street
FORFAR
DD8 3LG

Longmore House
Salisbury Place
Edinburgh
EH9 1SH

Direct Line: 0131 668 8773
Switchboard: 0131 668 8600
Rory.McDonald@scotland.gsi.gov.uk

Our ref: AMH/90069/10
Our Case ID: 201403204
Your ref: 14/00669/FULL

02 September 2014

Dear Sirs

Town And Country Planning (Development Management Procedure) (Scotland) Regulations 2013
Erection of 2 wind turbines of 50m to hub height and 74m to blade tip, temporary anemometer and ancillary development, Land 600m west of Witton Farm, Lethnot, Edzell
The Caterthuns, hillforts

Thank you for your consultation which we received on 21 August.

Historic Scotland does not object to this proposed development.

Notwithstanding our comments above and in the annex below, we confirm that your Council should proceed to determine the application without further reference to us.

If you require any further information, please contact me.

Yours faithfully

RORY MCDONALD
Senior Heritage Management Officer East

Annex

The development proposal

The proposals are for the creation of a wind turbine development comprising two turbines, temporary anemometer mast and associated site infrastructure. The turbines will have a maximum height of 74m.

Historic Environment Assets affected

The Caterthuns hillforts are a complex pair of monuments located on adjacent hill summits rising to between 260m and 300m OD from where they command extensive views across the fertile farmland of Strathmore. The Brown Caterthun is a multi-period fort, remodelled throughout the 1st millennium BC, and defined by multiple lines of earth and stone ramparts and ditches. The White Caterthun is similar in form, but capped by a massive stone-walled fort, which encloses an area of the summit measuring some 140m by 60m. The forts are amongst the most impressive and best preserved in Scotland and represent an important archaeological resource.

Impact of the development on the setting of the scheduled monument

To understand and appreciate *The Caterthuns hillforts* as a monument it is necessary to understand its relation to topography and landscape. Historic Scotland has long recognised the desirability of preventing development close to such sites or which might adversely affect their wider setting since the purpose of these sites can only be properly understood by appreciating their location within their wider landscape setting. This wider landscape setting should contribute to the interpretation and appreciation of a field monument, and also to the understanding of the mindset which led the builders of such sites to decide on these particular locations. Development proposals should recognise the significance, character and value of these monuments; and should seek to conserve the archaeological interest of the site based on a thorough understanding of the historic environment and due consideration to the principles of national planning policy.

The setting of *The Caterthuns* is characterised by the paired dominant hilltop location of the forts, their close proximity and their liminal position between the bulk of the Grampians rising to the north and west and the low-lying fertile farmland of Strathmore reaching down towards the sea to the south and east. *The Caterthuns* occupy a specifically selected location within their landscape; not the highest and most dominant, but one which emphasises the change in terrain from hill land to lowland, allows extensive views both to and from the site and allows for the construction of a paired set of monuments. The characteristic double-summit form of The Caterthuns can be seen over a considerable distance and was clearly located and constructed to be a prominent and easily identifiable feature.

The current setting of the monument is one of managed moorland, within a wider landscape of mixed moorland, gazing land and conifer plantations to the north and west, and mixed grazing, arable and woodland to the south and east. The landscape is identifiably man-made but rural with a small and limited presence of larger structural elements in the form of electricity pylons, agricultural silos and small to medium height

wind turbines. There are currently no windfarms within approximately 20km, but one distant windfarm can be seen to the north west.

We have considered the impact of the proposed development on the setting of the scheduled monument and reached the following conclusions: –

- The turbines will appear in views when entering the summit fort of the Brown Caterthun. However, this effect is quickly dissipated by movement through the entrance; the turbines will be visible but identifiable as a wind farm behind neighbouring hill summits.
- The development is unlikely to be visible in views towards *The Caterthuns* from the surrounding area and will not appear directly behind the monument, disrupting the relationship between the forts or challenging them for dominance, in any obvious key viewpoints.
- The wind turbine development will not disrupt any perceived or possible relationships between *The Caterthuns* and other monuments.

Historic Scotland's comments
We do not object to this development proposal.

The wind farm will have an impact on the setting of the scheduled monument known as *The Caterthuns, hillforts*. However, due to their proposed location and design, the turbines will not challenge the monument for dominance within its setting, will not interrupt any obvious key views of the monument from the surrounding area, and will not disrupt any perceived relationships between *The Caterthuns* and other monuments or landscape features in the vicinity. The turbines will be visually obvious from The Caterthuns but will not fundamentally disrupt the relationship between the forts themselves, or the relationship between the forts on their hill summits and the low-lying fertile land which they dominate.

As a result, while we acknowledge an impact on the setting of the monument, we consider that impact to be limited and localised. Consequently, we do not consider the proposed development will adversely affect the way in which this monument is understood, appreciated and experienced to such an extent that issues of national significance are involved.

APP16

LeslieIA

From: Claire Herbert [Claire.Herbert@aberdeenshire.gov.uk]
Sent: 01 September 2014 14:39
To: PLNProcessing
Cc: Damian Brennan (BrennanD@angus.gov.uk)
Subject: Planning consultation 14/00669/FULL - archaeology response

Plan App No: 14/00669/FULL
Planning Officer: Damian Brennan
Proposal: Erection of 2 wind turbines of 50 metres to hub height and 74 metres to blade tip, temporary anemometer mast and ancillary development
Address: Land 600M West Of Witton Farm Lethnot Edzell
Postcode:
Grid Reference: NO 5547 6995

Thank you for consulting us on the above application. I can advise that in this particular instance, no archaeological mitigation is required.

Kind regards,
Claire

Claire Herbert MA(Hons) MA AIFA

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Infrastructure Services
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http://www.aberdeenshire.gov.uk/archaeology

http://www.aberdeenshire.gov.uk

Scottish Natural Heritage

APP17

Siting and Designing windfarms in the landscape

Version 1

December 2009

Contents

Part 1

Introduction

1.1 Good design principles for windfarms are becoming established following more than a decade of windfarm development in Scotland and with more than fifty windfarms constructed and operating. Design is a material consideration in the planning process and SNH believes that good siting and design of windfarms is important for all parties involved, helping to produce development which is appropriate to a landscape whilst delivering Scottish renewables targets.

1.2 In 2001, SNH published '*Guidelines on the Environmental Impacts of Windfarms and Small Scale Hydroelectric Schemes*', which included guidance on the siting and design of windfarms. Since this time, however, our understanding of the effects of windfarm siting and design has developed further and some new issues have come to the forefront, such as the cumulative impacts of multiple developments. This guidance, which supersedes the landscape sections of the original guidelines, reflects this advance in our understanding of the key landscape and visual issues relevant to windfarm development. Nevertheless knowledge and understanding in this area is evolving quickly and it is expected that this guidance will need to be regularly reviewed and updated to reflect this.

1.3 This is guidance on landscape issues, building upon areas of SNH renewables policy. It does not refer to wider technical design considerations (such as wind speed, access to grid) or to other natural heritage issues (such as impacts on birds, other wildlife and habitats) which are also of importance in relation to both siting and design. A range of other considerations such as noise, archaeology, access and transport are also relevant to the design of windfarms and guidance on these topics is available elsewhere. It should be used alongside other SNH guidance, including our *Strategic Locational Guidance for Onshore Windfarms* (2002, updated March 2009), *Cumulative Effects of Windfarms* (2005), and *Visual Representation of Windfarms Good Practice Guidance* (2006), available on the SNH website.

1.4 Developers and those involved in windfarm design should also refer to the Spatial Frameworks for Windfarms being developed by Local Authorities in response to Scottish Planning Policy (SPP) 6[1]. This guidance has been written during the period that Local Authorities are developing their Spatial Frameworks, with a view to providing guiding principles at a strategic level. However, when considering an individual application, the adopted development plan and supplementary planning guidance as well as SPP6 provide the framework within which the application should be considered.

1.5 The guidance is structured in two parts. Part 1 provides siting and design guidance for windfarms. Part 2 provides guidance on strategic siting and design considerations for windfarms in relation to the requirements of SPP6.

1.6 This guidance is being written at a time of change, not least the proposed revision of currently separate SPPs into a single document. It is intended to review the guidance periodically so this document, Version 1, will gradually benefit from subsequent updates and amendments. Comments will be sought via the SNH website.

1 Scottish Planning Policy 6: Renewable Energy, Scottish Executive 2007 – to be superseded in 2010 by a new consolidated SPP.

1.7 The views expressed in this document are drawn from the experience of SNH staff who have advised on windfarm applications across Scotland in many different landscape settings and at many different scales of development. They have also been informed by a public consultation exercise and a workshop held at Battleby in March 2009.

Background

1.8 SNH supports the adoption of renewable energy technologies, including windfarms, to address the effects of climate change and supports the Scottish Government's adopted policy in SPP6[2]. Windfarms have an important role to play, taking advantage of the good wind resource in Scotland. However, our support for renewables has to be balanced with the Scottish Government's commitments and aspirations to conserve and enhance the natural heritage, including the quality and diversity of Scotland's landscapes. The purpose of this guidance is to help guide windfarms towards those landscapes best able to accommodate them and to advise on how windfarms can be designed to best relate to their setting and minimise landscape and visual impacts.

1.9 Scotland is renowned, at home and internationally, for its diversity and quality of landscape and scenery, particularly its distinctive coast, mountains and lochs. This contributes to the overall quality of life for all who live in or visit Scotland, and provides a setting for our economic activity, including tourism. It also means that landscape is the basis for many of our social, community and cultural values. The European Landscape Convention applies to all landscapes, and recognises landscape character assessment as a way of informing decisions. The Convention promotes integrated policies for landscape protection, management and planning, and encourages the involvement of the public in developing these. SNH's Landscape Policy Framework (2005) recognises both the importance of landscape to Scotland's natural heritage and people's lives, while acknowledging that this relationship will change as landscapes evolve.

1.10 Wind turbines are generally large structures with the potential to have significant landscape and visual impacts. The development of windfarms, including associated infrastructure such as tracks, power-lines and ancillary buildings, has already had a major impact on many of Scotland's landscapes – arguably the biggest change since that resulting in some parts of Scotland from commercial afforestation in the 1970s and 80s. Thus far most of this change has occurred in landscapes considered more suitable for windfarm development. This guidance aims to learn from current experience to inform the future siting and design of windfarms.

1.11 It is therefore important that care continues to be taken to ensure that further windfarms are sited and designed so that adverse effects on landscape and visual amenity are minimised, and that areas which are highly valued for their landscapes and scenery are given due protection. If windfarms are sited and designed well, the capacity of our landscape to incorporate this type of development will be maximised. Conversely, if they are poorly located and designed the scope for further development in the future will be greatly reduced.

2 SNH Policy Statement 01/02 SNH's Policy on Renewable Energy.

2

Landscape and Visual Assessment of Windfarms

What is Landscape and Visual Impact Assessment?

2.1 Landscape and Visual Impact Assessment (LVIA) is a standard process for examining the landscape and visual impacts of a development. The methodology for this is set out in the 'Guidelines for Landscape and Visual Assessment' (GLVIA), produced by the Landscape Institute and the Institute of Environmental Management and Assessment[1].

2.2 LVIA follows an iterative process by which alternative sites and designs for a development are proposed, assessed, and amended (a process often referred to as mitigation). Through this process, LVIA identifies the preferred siting and design option for a development, balancing different environmental issues as well as functional, technical and economic requirements. Ultimately, the final scheme is assessed for predicted residual impacts on the landscape and visual resource. LVIA is usually carried out by Chartered Landscape Architects who apply professional judgements in a structured and consistent way based on landscape design principles. The LVIA should assist decision makers, members of the public and other interested parties by providing a clear and common understanding of the predicted effects of windfarm proposals in an impartial and professional way.

Context for Landscape and Visual Impact Assessment

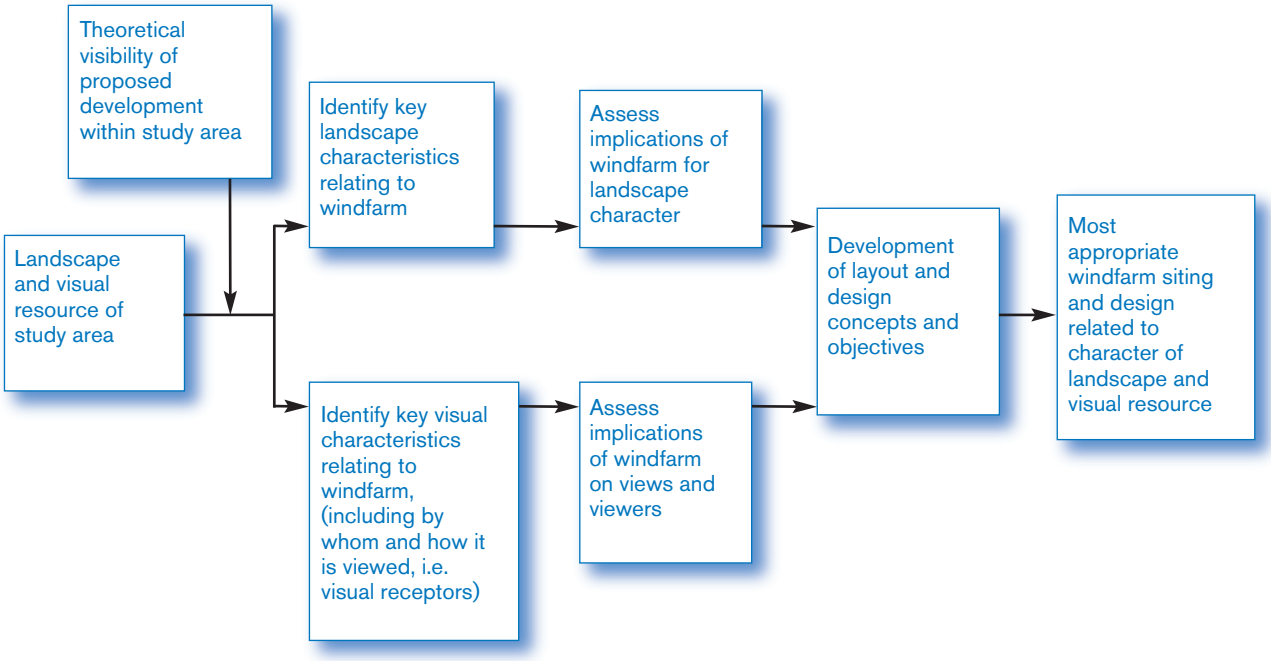
2.3 LVIA is a standard process of assessment that may be presented as a separate report or form one part of an Environmental Impact Assessment (EIA) within an Environmental Statement (ES). While a LVIA will usually be required for every windfarm proposal, an EIA is only a statutory requirement for wind energy proposals where the proposal is likely to have significant effects on the environment. Circular 8/2007[2] sets out when EIA may be required for windfarms.

Landscape and visual impacts of Windfarms

2.4 LVIA comprises two separate parts, Landscape Impact Assessment (LIA) and Visual Impact Assessment (VIA), although these are related processes as described within the GLVIA. LIA considers the effects of the proposal on the physical landscape, which may give rise to changes in its character, and how this is experienced. VIA considers potential changes that arise to available views in a landscape from a development proposal, the resultant effects on visual amenity and people's responses to the changes.

2.5 The flow diagram below indicates the process of LVIA, which commences with determining the key characteristics of the landscape and visual resource.

1 Guidelines for Landscape and Visual Impact Assessment, 2nd Edition, (Spon Press), Landscape Institute and Institute of Environmental Management and Assessment.
2 Scottish Planning Series Planning Circular 8-2007: The Environmental Impact Assessment (Scotland) Regulations 1999. Scottish Government.



2.6 Early in the LVIA process it can be determined which landscape and visual characteristics are particularly relevant or sensitive to the development proposal. Focussing on these, the designer can explore what the potential impact of a windfarm will be if it is sited and designed in different ways, and determine what the main design aims should be to create a windfarm that relates well to the landscape.

2.7 Clearly other technical and economic factors will also be important in the decision-making process, as will other environmental impacts such as effects on wildlife and habitats. Cumulative effects with other windfarms will also be a consideration[3].

Design Statements

2.8 Design Statements help communicate the issues, constraints and decision making processes behind development of a design. They document the design process of a development, whether it requires a LVIA and/or EIA or not, so they are not a wholly additional piece of work. Their relevance to windfarm or wind turbine applications is notable. A design statement need not be a lengthy or complex document and diagrams can be used to summarise the design process. They are a useful way for designers to explain why an application has a particular layout or appearance to consultation bodies, Local Authorities and the public. Further guidance on producing design statements is provided in PAN 68[4], and an example of a windfarm design statement for Clyde windfarm is included in Appendix 1.

2.9 Design Statements are also helpful in establishing design objectives. These may need to be referred to in the future if the scope of a scheme changes: for example for a windfarm extension, amendment of the type of wind turbines, or even for another windfarm nearby. Design objectives can help to

- maintain the integrity of a scheme in changing circumstances;
- explain the design background of windfarm extensions; and
- indicate how existing nearby windfarms or cumulative impacts have influenced the design and layout of a new proposal.

3 For further discussion on cumulative effects see 'Cumulative effect of windfarms', version 2, SNH 2005, available on the SNH website.

Presentation of information within landscape and visual impact assessment

2.10 A number of methods are used to illustrate the potential landscape and visual impacts of a proposal. In LVIA, illustrations are used by landscape and planning professionals in four main ways.

- To record site assessment, in the form of photographs and sketches, as an aide-memoire:
- To provide computer generated Zone of Theoretical Visibility maps (ZTVs) to show the area from which a proposal may be visible;
- To provide visualisations that show potential visibility from a specific viewpoint and aid an assessment of the magnitude of impact, typically in the form of computer-generated wireline diagrams and photomontages, and;
- To illustrate key concepts and design principles using line drawings and diagrams.

2.11 When used on site, these illustrative tools are typically sufficient to make judgements of predicted landscape and visual impact for the LVIA. However, in addition, other illustrative techniques may be useful, such as computer generated simulations, fly-throughs and video-montage. Further guidance on the selection, production methods and use of illustrative techniques is available in the 'Visual Representation of Windfarms: Good Practice Guidance' (2006)[5].

Small windfarms and the need for assessment

2.12 In addition to large windfarm developments, there continues to be interest in developing single turbines and small windfarms in Scotland, particularly in lowland settings, typically including between one and three turbines. If there are more than two turbines, or the turbines are more than 15m in height, they are Schedule 2 developments under the Environmental Assessment Regulations. It is then a matter for the Planning Authority to decide whether they are likely to have significant environmental effects and therefore require EIA.

2.13 Even if an EIA is not required, there is usually a need for submission of a LVIA in support of a planning application. This assessment should be carefully scoped so that it is appropriate to the size and scale of the development and the likelihood of significant landscape and visual impacts, including cumulative effects. SNH's guidance note on 'Natural Heritage assessment of small scale wind energy projects which do not require formal Environmental Impact Assessment'[6] provides advice on the level of landscape and visual assessment likely to be appropriate for different scales of turbines (although it is important to highlight that the landscape and visual impacts of turbines are not directly proportional to their size). SNH will be producing more detailed guidance on the installation of micro wind turbines (<50kw) later in 2009.

Duration of impacts and decommissioning

2.14 The expected lifetime of wind turbine generators is typically around 25 years, and planning permission is usually granted for this period. Decommissioning of the turbines at the end of this operational phase is often a specific condition of planning permission and is an important consideration when designing and assessing a windfarm.

2.15 Decommissioning commonly proposes that turbines and ancillary buildings are removed, leaving their foundations and access tracks in situ, but covered over and

4 Planning Advice Note 68: Design Statements (2003) The Scottish Government.
5 SNH, Scottish Society of Directors of Planning and Scottish Renewables Forum (2006) Visual Representation of Windfarms: Good Practice Guidance. Table 2, pp.36.
6 available at www.snh.org.uk

re-vegetated, thus reducing the need for further ground disturbance. There is therefore potential for some residual visible change to the landscape, even when restored, although this can be minimised through thoughtful design and consideration of how decommissioning will proceed at the project outset. The use of carefully worded legal agreements or planning conditions to ensure delivery of appropriate removals and restoration of site conditions at the end of a project's lifespan will also be of benefit. In some locations, however, it may be assessed that it is possible to remove foundations and access tracks without unacceptable environmental disturbance and this approach should be an aspiration in the design of any windfarm site.

Partial restoration of access tracks to grass

2.16 There is likely to be continued demand for renewable energy generation in Scotland for many decades ahead. Thus it is possible that existing well-designed windfarms may remain in use well beyond 25 years, with turbines either refurbished or replaced and a planning consent renewed. However, a time limited consent does provide the opportunity for decommissioning to be required should it be judged, for whatever reason, that the windfarm development was inappropriate.

3

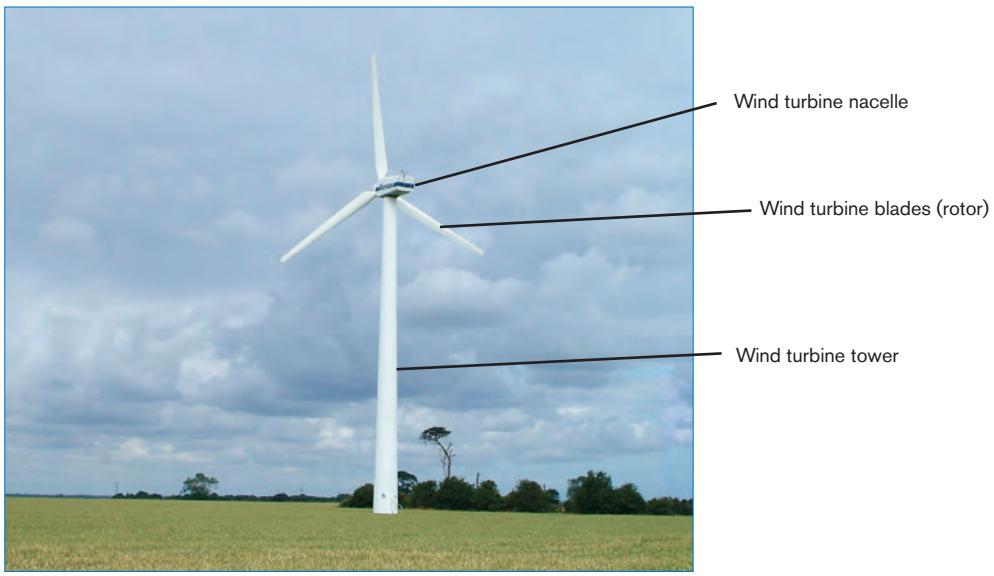
Wind Turbine Design and Layout

3.1 The landscape and visual impacts of a windfarm are strongly influenced by the design and layout of wind turbines. This section focuses upon the different types of wind turbine and their layout or array, while the following section considers how these principles relate to landscape and visual characteristics.

3.2 Impacts also result from infrastructure serving the development, such as access tracks and borrow pits, anemometers, control building, and substation (where necessary). Design and siting of this ancillary infrastructure are also referred to in this section.

Turbine form and design

3.3 A wind turbine comprises a tower that supports a nacelle, that is the main shell containing the electric generator and to which the turbine blades attach via a hub. The nacelle has an anemometer attached so that the direction in which the blades face can be altered to maximise wind capture. Further guidance on wind turbines is available in Planning Advice Note 45[1].



3.4 The landscape and visual impacts of a wind turbine vary not only with its size, but also with the make and model of the turbine proposed. Turbines of the same height may have varying visual appearances due to their different design and technical characteristics.

3.5 Windfarm developers are often reluctant to be specific as to the actual model of turbine to be used because market availability, costs, and turbine technology may

1 Planning Advice Note 45, Renewable Energy Technologies, Scottish Executive, 2002, www.scotland.gov.uk

change during the period between submitting an application and actual construction. However, they will usually have a shortlist of preferred models for consideration and applications should include details of these. The LVIA and EIA should assess, as far as is possible, impacts of the model within the shortlist that represents the 'worst case scenario'.

3.6 Turbine properties, in addition to height, colour and individual design, which may be important when choosing the most appropriate model for a particular site, are:

- the proportion of blade length to tower height; and
- the dynamic impact resulting from rotation of the turbine blades (larger, slow moving blades will have a very different impact from shorter, faster moving blades which may give the impression of increased clutter).

Alternative wind turbine proportion – these images show the contrast between blade length and tower height, which affects the overall visual range.

Turbine colour

3.7 Selecting the most appropriate colour for a turbine(s) is an important part of detailed windfarm design and mitigation. It has previously been assumed that wind turbines could be painted a colour that would camouflage them against their background. However, experience has shown that no single colour of wind turbine will consistently blend with its background and it is more important to choose a colour that will relate positively to a range of backdrops seen within different views and in different weather conditions.

3.8 When determining the most appropriate colour for wind turbines, key considerations are:

- the immediate landscape context and anticipated backcloth against which the turbines will be viewed predominantly (for example sky, heather moorland, woodland);
- the direction the turbines will most frequently be viewed from (including the angle of the sun and how it is likely to reflect on the wind turbines);
- the predominant weather conditions (which will dictate typical sky colour and will vary for different parts of the country);
- seasonal variation in landscape colours;

– the proposed design and layout of the windfarm; and other windfarms within the area.

Variable colouring of turbine bases typically does not correspond with the skyline from most viewpoints and increases contrast when seen against the sky. From some viewpoints, this effect can also make the turbines seem to 'float' above the land.

Different colour of wind turbine components creates a more complex image and means the visibility of different sections varies

White turbines will look bright in certain light conditions, but will tend to convey a positive image. This may be associated with cleanliness and existing white foci in our landscape such as white-washed cottages.

Grey wind turbines will appear less prominent when seen against a grey sky, although they will rarely match the shade. When visible, a grey colour may appear 'dirty' and be associated with an industrial, urban or military character

3.9 As a general rule for most rural areas of Scotland:

– A single colour of turbine is generally preferable;

– The use of graded colours at the turbine base should be avoided;

– A light grey colour generally achieves the best balance between minimising visibility and visual impacts when seen against the sky;

– The use of coloured turbines (such as greens, browns or ochres) in an attempt to disguise wind turbines against a landscape backcloth is usually unsuccessful;

– Paint reflection should be minimised;

– For multiple windfarm groups or windfarm extensions, the colour of turbines should generally be consistent; and

– Precise colour tone and the degree of paint reflectivity should be specified at the application stage.

Turbine transformer colour

3.10 It is preferable for wind turbine transformers to be housed within the turbine towers, to minimise the number of elements and visual complexity of a windfarm scheme. However, where transformers are housed separately near the base of turbines, the colour of their housing requires careful consideration. This should be site specific, relating to the surrounding land cover, not the wind turbines, as transformers are rarely viewed against the skyline. Such an approach ensures that their visibility is reduced, and they are seen as a separate element to the wind turbine so that they are less likely to detract from the simplicity of its form. Browns, khakis and 'earth' colours are generally the most successful colour choices for transformers, with greens often appearing too bright.

In variable light conditions and against different backgrounds, wind turbines of the same colour can appear to have contrasting visual effect

Turbine lighting

3.11 In some locations it may be necessary to light wind turbines for reasons of civil or military aviation safety. Such lighting, typically at the top of the tower of the wind turbine, may appear prominent in night views and may be incongruous in predominantly un-lit rural areas. Where lighting is necessary, this should be designed to minimise landscape and visual impacts whilst satisfying health and safety or navigation requirements. This may, for example, be achieved by incorporating shields so that the lights can only be seen from above.

3.12 As yet there has been little experience of lighting turbines in Scotland. However, it is likely to become more of an issue as more sites are being explored within flight paths. SNH is collating information to develop our understanding of these impacts with a view to developing further guidance in due course.

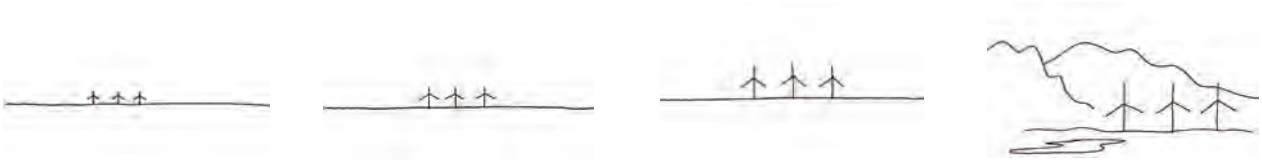
Turbine size

3.13 As wind energy technology has developed, larger wind turbines have become available. Currently machines typically consist of 60 – 100 metre high towers with blades of 40 metres or more, so their overall height to blade tip is typically 100 – 140 metres, although some higher turbines are now available. Longer blades result in a greater rotor area and, combined with the fact that they will likely extend upwards into higher wind velocities, their wind capture and energy production tends to be proportionally larger than smaller turbines.

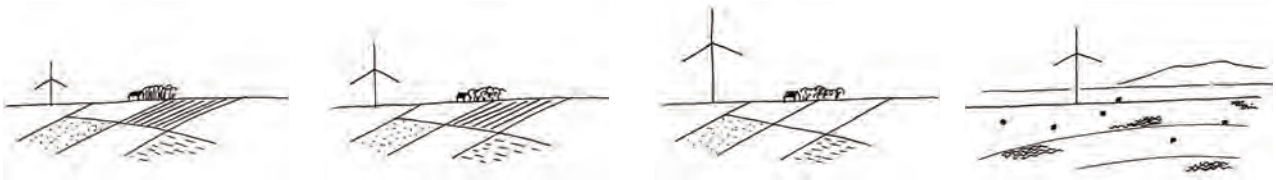
The size of these wind turbines is difficult to perceive, located in open moorland with no definite scale indicators

The buildings adjacent to this windfarm act as scale indicators, and emphasise the large scale of the wind turbines

3.14 Choice of turbine size is an integral part of the design process of a windfarm in relation to key landscape and visual characteristics. Identification of the key landscape characteristics, their sensitivity and capacity to accommodate change will inform this. Generally speaking, large wind turbines may appear out of scale and visually dominant in lowland, settled, or smaller-scale landscapes, often characterised by the relatively 'human scale' of buildings and features. On the other hand, the longer blades of larger turbines often have slower rotation speeds and this can be less visually distracting than the faster speeds of smaller blades.



Increase of wind turbine height is not very noticeable within moorland landscape, due to lack of size indicators; nevertheless, there may be a threshold at which larger wind turbines no longer seem to directly relate to the local area of moorland but, rather, relate more closely to the neighbouring high mountains



The size of wind turbines is clearer within a distinct landscape pattern that includes definite scale indicators. Although older/domestic wind turbines may relate to the scale of buildings, most commercial wind turbines commonly used now, over 60m in height, will seem to dominate elements of landscape pattern. There may be, however, a threshold in some landscapes at which a larger wind turbine would no longer seem associated with the underlying landscape pattern and seem 'elevated' above it, by appearing to relate to larger components.

3.15 Wind turbine size is also a key issue in upland landscapes that are viewed against or from landscapes which are more intricate in scale and pattern, or where it is otherwise difficult to discern scale and distance. By illustrating the scale of an upland landscape, wind turbines may seem to compromise the perceived expansive nature of some of these areas.

3.16 As the experience of different landscapes varies greatly, it is not appropriate to provide strict guidelines on turbine sizes that should be used for particular landscapes. Site-specific assessment and design is essential for each development proposal.

3.17 It is understood that procurement of 'smaller' turbines is becoming increasingly difficult as turbine manufacturers move towards larger models. However, some smaller models remain available and may be particularly appropriate near or adjacent to an existing development comprising of small turbines as well as in smaller scale landscapes. It is important to highlight that a 'one size fits all' approach will not respond to the great variation of landscape scale and windfarm requirements; thus it is important that a market for different sizes of wind turbines, including medium and small sizes, is maintained.

Turbine scale

3.18 Size comparisons between wind turbines and other tall structures may help people to be able to visualise how tall a proposed development would appear in the landscape. Table 1 shows the heights of some tall elements in the Scottish landscape that may provide useful scale comparisons. It is important to appreciate, when making comparisons of this sort, that wind turbines are typically not viewed in the same way as monuments or landmarks, which generally have much greater 'solidity'. In addition, although the visibility extent of turbines will obviously increase with their greater height, the relationship between visual impact and turbine size is not directly proportional. Principally, this is because a windfarm is viewed within a surrounding context, which varies; and also because the actual size of a wind turbine is usually difficult to perceive.

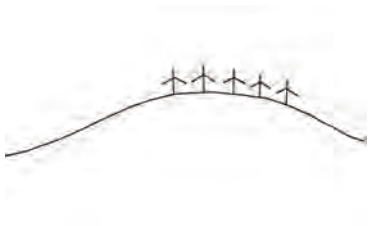
Electricity pylon acts as scale reference in relation to wind turbines

Table 1 Landscape elements which may be used as scale comparisons

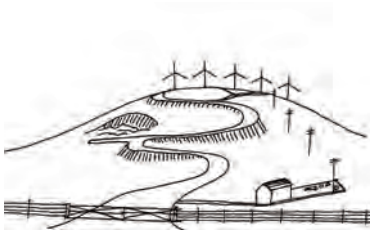
Landscape Element	Typical Height (in metres)
Metal Pylons	25 to 50
Telecommunications Masts	15 to 20
Television Transmission Masts	300
MoD Masts	70 to 80
Cockenzie Power Station Chimney	149
Inverkip Power Station Chimney	212
Forth Road Bridge Towers	150
Domestic Buildings (1.5–2 storey)	6–10
Mature Deciduous Trees (depending on species)	10–20

Ancillary infrastructure

3.19 Ancillary elements for a windfarm development should also be designed to relate to the key characteristics of a landscape. It is essential that these elements do not confuse the simplicity of the windfarm design, or act as a scale indicator for the turbines themselves. Undergrounding power lines within the windfarm, using transformers contained within tower bases (where possible), and careful siting of substations, connecting transmission lines, access tracks, control buildings and anemometer masts will all help to enhance a windfarm design. Simplicity of appearance and use of local, high quality materials will further enhance this.



Windfarm creates simple image in the landscape



Insensitive siting and design of windfarm infrastructure creates complex image and conflicts with underlying landscape character

3.20 There may also be practical constraints in delivering large turbine components to site, because of, for example, the limitations of rural bridges, road junctions or corners. Additional landscape and visual impacts, associated with widening of roads, access tracks and corners in order to enable transport of long turbine blades, should be taken into account.

Small windfarm substation

Windfarm access track across slopes

Junction of windfarm access track and public road

3.21 Detailed advice on the siting and design of tracks can be found in the SNH publication 'Constructed tracks in the Scottish Uplands' (SNH Natural Heritage Management Series, 2006).

Turbine layout / array

3.22 Turbines can be arranged in many different layouts within a windfarm. The layout of a windfarm should relate to the specific characteristics of the landscape. This means that the most suitable layout for every development will be different. The development process for a windfarm typically begins with a layout that responds mainly to wind speed and wind turbine specification, sited within defined land ownership / tenure boundaries. For a small windfarm, this might comprise a single row of wind turbines along a ridge; while, for a larger development, a grid of wind turbines is often taken as the starting point, with the turbines spaced at minimum separation distances to avoid turbulence (often equating to 4–5 rotor diameters).

3.23 From this starting point, turbines will typically be moved or removed due to physical constraints, such as watercourses, areas of deep peat and steep slopes, and in response to sensitive habitat or wildlife species. During this process of modification, landscape and visual issues will also inform the layout. Although landscape and visual concerns – such as the need to avoid visibility from a particularly sensitive viewpoint - may present an absolute constraint, many

landscape and visual sensitivities can be addressed through good design in windfarm layout. This commonly involves a number of changes to create the most appropriate windfarm to fit the design objectives of the project.

3.24 There are a number of common types of layout, chiefly divided into regular or irregular formats. Generally, the fewer the number of wind turbines and the simplest of layout upon the most even of landform, the easier it is to create a positive feature - visually balanced, simple and consistent in image as it is viewed from various directions. This is most easy to achieve with a simple line upon level ground. As soon as there is deviation from this, the visual image becomes more complicated.

Single wind turbine forms point feature with simple and direct relationship to surrounding landscape

Single line of wind turbines. These posses a visual relationship to each other as well as to the landscape.

Double row of wind turbines. Wind turbines within each group have visual relationship to each other and landscape. The two groups also have a separate and collective visual relationship to each other and the landscape.

Grid layout reveals simple visual relationship when looking down rows, but appears more complex when looking across rows.

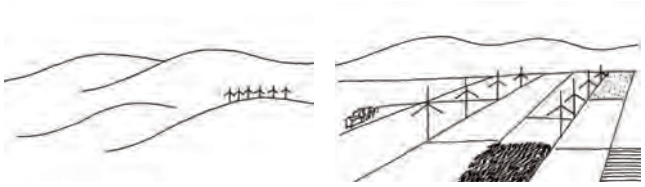
3.25 A regular shape, such as a double line, a triangle, or a grid can appear appropriate within a wide open and level space where there is a regular landscape pattern, such as within agricultural fields. However, as soon as you move through the landscape and see it from different directions and elevations, views of the grid change and reveal a variable effect, seeming ordered along some rows, but in others overlapping. In addition, the rationale of the position of turbines is confused if they appear at variable elevation.

Informal layout. However regular spacing between wind turbines and direct link to landscape pattern gives layout visible rationale and sense of order.

Informal layout with no obvious rationale. Creates chaotic image that contrasts with the underlying simplicity of the hills.

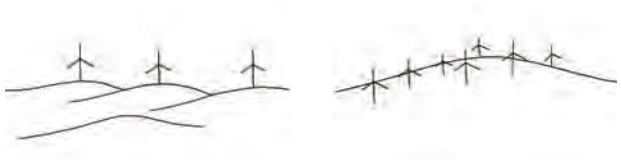
3.26 Irregular layouts can be more appropriate in landscapes of variable elevation and pattern, as is most common in Scotland. However, irregular forms pose an even greater challenge in terms of creating a simple image as the turbines will interact in varying ways with each other as well as with the underlying landscape. This can result in effects that do not correspond to good design principles, such as varying visual density of wind turbines, overlapping turbine rotors (often termed 'stacking up'), partial screening behind a skyline and turbine outliers separate from the main group.

Two different views of the same windfarm. The layout appears simple from one direction, but complex from another



A windfarm layout appears simplest where it relates directly to the underlying landscape characteristics

Where a landscape does not include any obvious elements or features to which a windfarm could relate directly, it may be most appropriate for a windfarm to form a distinct feature in its own right. However, for this approach to appear clear, it will usually require the windfarm to be surrounded by an area of open space.



Wind turbines relate to small scale undulations at a local level. However, if the key views are distant, these undulations would not be obvious and the wind turbines would alternatively appear in closest association with the broad scale landform

Alternatively, the windfarm can be designed to relate to the broad scale landform

3.27 Windfarms should directly relate to underlying landscape characteristics of a similar scale and/or prominence. This design principle also means that wind turbines may be able to be accommodated within areas of complex pattern. Odd numbers of turbines often present a more balanced composition than even numbers.

Micrositing

3.28 Micrositing is the movement of wind turbines by small distances within the overall windfarm layout, typically involving distances of up to 100m. The process is used at two main stages of windfarm development:

- Firstly, during the design stage to ensure that turbine layout is satisfactory from key viewpoints and achieves the design objectives. It can also be used to maximise the screening benefits of landform or landcover from key viewpoints.
- Secondly, during the construction phase of a project where previously unexpected conditions are encountered on site. This may happen, for example, where a turbine needs to be located away from an area of peat that is deeper than predicted on the initial survey.

3.29 Developers should seek to minimise the need for micrositing by conducting thorough site investigation during the design process.

3.30 Micrositing during construction can obviously have an effect on the nature and extent of the appearance of a windfarm as previously assessed and illustrated within an ES, especially those set out in regular patterns such as grids or evenly spaced lines. Any significant changes in layout should be assessed to ensure that the overall design objectives for the site are not compromised. Decision makers should also consider the extent of micrositing that it is appropriate to allow when consenting development. Where, for reasons of design coherence, there is a clear need to maintain turbine layout in accordance with submitted plans, then the permissible micrositing distances may need to be strictly limited. This is particularly important for sites of limited numbers of turbines, where there is a strongly formal layout or where micrositing may result in changing the altitude of turbines and therefore affect the windfarm's design relationship with surrounding topography.

A line of wind turbines, where slight alterations of position and elevation have disrupted the image of consistency and rhythm.

3.31 Planning permissions should therefore contain a condition limiting the distance that turbines can be microsited without requirement for further permission. It is important that such micrositing conditions are tailored to be specific to the nature and scale of the proposed developments, and have particular regard to the possible effects on design layout and the overall visual coherence of the scheme.

4

Windfarm Siting and Design

4.1 This section deals with siting and designing windfarms within the landscape. It applies similar design principles to those outlined in Section 3 and develops them further in relation to landscape and visual effects. Experience has shown that the application of these principles will have an important influence on reducing the overall landscape and visual impacts of a windfarm.

4.2 The chapter begins with generic issues in relation to windfarm LVIA, and then highlights specific aspects of siting and design. It offers general guidance only and for any windfarm would need to be supplemented by more detailed design objectives, established through the LVIA process. Cumulative landscape and visual impacts, which also form part of LVIA, are addressed by section 5 of this Guidance.

4.3 Reference is made to generalised categories of windfarm size as listed below. This grouping is for the sake of simplification, and it should be noted that landscape and visual impacts are not directly proportional to wind turbine numbers.

Windfarm size	Number of Turbines
Small	1–3
Medium	3–20
Large	20–50
Very Large	50+

Landscape character

4.4 The first step to carrying out the Landscape Impact Assessment (LIA) section of a windfarm LVIA is typically to assess the landscape character of the study area to identify the key characteristics relevant to windfarm development. Different places have different 'landscape character', comprised of distinct and recognisable patterns of elements. These relate to underlying geology, landform, soils, vegetation, land use and settlement. Taken together these qualities contribute to regional distinctiveness and a local 'sense of place'. Understanding a landscape's key characteristics and features is vital in considering how new development will affect it or, with appropriate design, contribute to it.

4.5 Landscape Character Assessment (LCA) can assist in designing development which best respects a location's distinctive character. It is a tool to help understand what the landscape is like today, how it came to be like this and how it may change in the future. LCA helps to ensure that change and development does not undermine whatever is characteristic or valued about a particular landscape, and that ways of improving the character of a place can be considered.

4.6 At a regional scale, SNH Landscape Character Assessments may inform this assessment. SNH's National Programme of LCA comprises 27 studies and an

overview report[1]. These LCAs highlight key landscape characteristics across the country, and also identify the main forces for change in these landscapes and relevant guidance. It should be noted that many of the LCAs were produced during the 1990s and, although they remain relevant as descriptors of landscape character, do not necessarily address the sensitivity of particular landscape character types to windfarm development.

4.7 In addition to the broad-scale information offered by LCAs, LIA should include an assessment of local landscape characteristics, and how they are experienced, in relation to the specific proposal. There should also be an assessment of the extent and distribution of predicted visibility within relevant character areas.

Landscape and scenic value

4.8 A landscape may be valued for many reasons, such as for its specific landscape quality, scenic beauty, tranquillity or wildness, recreation opportunities, nature conservation or historic and cultural associations. A windfarm will not necessarily be incompatible with valued qualities of a landscape; this will depend on the nature of the development and the nature of the landscape qualities that are valued.

4.9 LCAs do not place value on one landscape type over another, but they may point to the reasons why a landscape might be valued, because of special characteristics or the experience the landscape offers. In contrast, landscape and scenic value is recognised at national and local levels through development plan policies and designations such as National Parks, National Scenic Area (NSA) or local landscape designations including Areas of Great Landscape Value (AGLV). Designations are usually supported by legislation and associated with specific planning policies at a national and regional level. The lack of any designation does not imply that a landscape has no value[2]. Some landscapes are strongly linked to cultural heritage, for example, while others may be valued for their perceived lack of human influences. In line with the European Landscape Convention[3] SNH promotes an 'all-landscapes approach', founded on the recognition of value in all landscapes.

4.10 In addition to recognition of landscape and scenic value through an accolade, value may be placed on a landscape due to its rarity or novelty within a particular area. Although landscape assessments do not place value on the distribution or frequency of landscape character types, national or regional maps showing the occurrence of different types clearly indicate where this may be an important issue.

4.11 For the LVIA of windfarms, the key challenge with respect to landscape value is to ascertain for what a landscape is valued and by whom, and then to assess the predicted impacts of the proposed development on this valued landscape. Establishing the quality of a valued landscape is best informed by a clear description or citation, for example as provided for NSAs in 'Scotland's Scenic Heritage'[4], and for local landscape designations within many Local Authority Development Plans. However, for some valued areas, this information may not be available, and thus the LVIA needs to first establish the quality of the valued landscape through landscape and visual assessment of the baseline conditions and how it is used, for example through consultation, visitor information and user websites. For areas of wildness and wild land (see section below), SNH has established a method for this assessment as detailed within SNH interim guidance 'Assessing the impacts on wild land' (2007). The key test applied in relation to NSAs, but often employed for other valued landscapes too, is not whether impacts would be significant, but whether these would affect the *integrity* of a valued landscape.

1 These Landscape Character Assessments are available to download from SNH's website under the 'Landscape Character of Scotland' series on the publications page at http://www.snh.org.uk/pubs/results.asp?Q=landscape
2 SNH and Historic Scotland Guidance, SNH 2005, para.2.2, p.8
3 The European Landscape Convention and information about its implications can be viewed at http://www.coe.int/t/dg4/cultureheritage/conventions/Landscape/florence_en.asp
4 Scotland's Scenic Heritage, Countryside Commission for Scotland (1978)

Wild land and places with a strong sense of remoteness

4.12 Areas of Scotland which are very remote, inaccessible, rugged and with little evidence of human influence are widely referred to as 'wild land'; however, even those areas that possess only some of these characteristics or in a slightly degraded way may have qualities of wildness. These characteristics and the value they receive are discussed in SNH policy statement 'Wildness in Scotland's Countryside' (2002). A recent study by SNH has revealed that the majority of Scottish residents think it important for Scotland to have wild places[5]. Some of the areas possessing qualities of wildness lie outside designated areas and are therefore not protected by statute, although NPPG14 recognises their sensitivity and asks Planning Authorities to take great care to safeguard their character through specific policies in Development Plans[6]. No detailed mapping of Scottish wild land has yet been undertaken, although SNH has identified 'Areas of Search' which represent the broad areas where wild land is likely to be present[7]. SNH's Strategic Locational Guidance for Onshore Windfarms, states that the mapped Areas of Search for Wild Land have high sensitivity to windfarms and proposals in such areas are unlikely to be compatible with their wild land qualities[8].

4.13 Wild land areas, due to their remoteness and poor grid connections, tend not to attract windfarm proposals.

4.14 However, because perception of wild land relies on there being no or minimal visibility of human features, windfarms, like any built structure, will be out of character in these areas – and scope for mitigating impacts will be very limited. In addition, the potential visibility of windfarms, individually and cumulatively, from within wild land areas can be a concern. This is a particular issue in relation to windfarms because of the long distances over which they can be seen. Therefore, proposals likely to affect an area of wild land merit careful consideration. SNH interim guidance[9] sets out a method for this assessment.

4.15 There may be rare situations where there are isolated built elements already within a landscape perceived to be wild land, such as bothies, shepherds' cottages, or shooting lodges, where small-scale wind turbines may be sited in a way that relates to these structures.

Experiencing windfarms in the landscape

4.16 Compared to pylons or roads, a windfarm is still a relatively unusual feature in the landscape. People's responses vary – to some a windfarm may seem to threaten its surroundings, while others may view it as an exciting, modern, or even futuristic addition with symbolic associations with clean energy and sustainability. Our understanding of people's responses to windfarm development over recent years has also been informed by a number of public attitude studies that have been undertaken[10]. These suggest that the majority of people are in favour of wind power, although visual impact issues are often highlighted as a concern to those surveyed.

4.17 The impact of a windfarm will depend on how and where it is experienced; for example, from inside a residence, while moving along a road, or from a remote mountaintop. These factors are taken into account through LVIA when determining

5 Public Perceptions of Wild Places and Landscapes in Scotland. SNH Commissioned Report No. 291. (2008)
6 NPPG14 – Natural Heritage, paragraphs 16, 47, 69 and 71.
7 SNH map of Search areas for Wild Land, available at http://www.snh.org.uk/pdfs/polstat/wsc-m3.pdf
8 SNH Strategic Locational Guidance for Onshore Windfarms with respect to the Natural Heritage. SNH 2002, updated March 2009
9 Assessing the impacts on wild land, interim guidance note SNH 2007
10 Renewable Energy Awareness and Attitudes Research Management Summary URN08/657, BERR (June 2008).
Public Attitudes to Windfarms: A survey of Local Residents in Scotland, The Scottish Government (2003).
Tourist Attitudes to Wind Farms. Mori Scotland (September 2002)
Economic Impacts of Wind Farms on Scottish Tourism, The Scottish Government (March 2008)

the sensitivity of the landscape and visual resource, and those people that will be affected by the development (receptors). Typically, LVIA includes assessment of impacts upon the key users of the landscape, including residents, motorists, workers, those partaking in recreation and tourists. Impacts of a windfarm on local residents require particular attention as, unlike visitors, residents will experience a windfarm from different locations, at different times of the day, usually for longer periods of time, and in different seasons. Conversely, impacts on tourists and those taking part in recreation may be relatively brief, but their sensitivity to landscape change is regarded as high because their purpose is specifically to enjoy their surroundings.

4.18 Through LVIA, it is important to take account of how a windfarm will be experienced from surrounding roads, transport, and recreational routes. Views will vary depending on proximity to the road, the angle of view, and intervening landscape features. The first glimpse of a windfarm is important, and careful consideration should be given to the design of the windfarm layout in relation to such views.

Perception of a windfarm depends on how it is viewed and the duration of a view

4.19 As larger numbers of windfarms are built in Scotland, it has been increasingly necessary to consider their cumulative effects, as seen sequentially, from main transport and recreational routes. Of particular importance are: how these developments relate to each other in design and relationship to their settings; their frequency as one moves through the landscape; and their visual separation to allow experience of the character of the landscape in-between. Further detail on this aspect of LVIA can be found in SNHs 'Cumulative Effect of Windfarms' guidance[11].

4.20 The visibility and visual impacts of a windfarm are affected by the distance from which it is viewed, as well as other aspects such as weather conditions and siting. In the past, guidance notes such as Planning Advice Note 45 have offered generic categories of visibility and visual impact in relation to distance, suggesting the following: that in an open landscape at distances of up to 2 km, a windfarm is likely to be a prominent feature; between 2–5 km it will be relatively prominent; between 5–15 km only prominent in clear visibility when it is seen as part of the wider landscape; and over 15 km it will only be seen in very clear visibility and as a minor element in the landscape[12]. However, in practice these guidelines are limited in their application:

- firstly, because it is unclear what height of turbine these distances were based upon[13]; and,
- secondly, because visual impacts are not directly proportional to distance, as the nature of a view (e.g. a framed / open view or backclothed/skyline view) and its context are as important as the size of a development within that view.

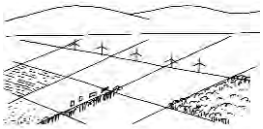
11 Cumulative Effect of Windfarms, SNH (2005).
12 PAN 45 figure 8
13 A study in 2002 for SNH by the University of Newcastle suggests that for the current 3rd generation turbines of 100m+ the distances used by PAN45 should be increased by 20%

Windfarm siting and design in relation to landscape and visual characteristics

4.21 Like any built structure, the impacts of a windfarm depend on both the characteristics of the development and how these relate to the characteristics of its surroundigs. The most distinctive characteristics of a windfarm are typically its collection of tall, often uniformly spaced turbines, each with moving blades that change orientation according to wind direction. Windfarms are most appropriate in a landscape where their presence and design appear rational. They are usually sited in exposed places that are open, high and relatively prominent, in order to take advantage of maximum wind capture. However, other factors influencing their siting include land ownership, access, grid connection, site topography, location in relation to other natural or cultural heritage interests and/or statutory designations, aviation constraints, proximity to settlement and the need to avoid excessive turbulence.

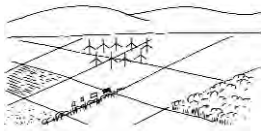
4.22 It is important to site and design a windfarm so that it relates directly to the qualities of a specific site. As discussed previously within this section, this involves being able to determine the key characteristics of the landscape and visual resource, and then considering the relationship of all aspects of the windfarm in direct relation to these. This will range from the overall siting of the windfarm as a whole, to turbine size, location, pattern, and associated elements such as access tracks, powerlines or buildings.

Cluster of wind turbines relates to open hill



Line of wind turbines relates to landscape pattern

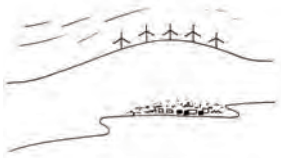
Line of wind turbines appears irrational across open hill



Cluster of wind turbines appears irrational in relation to linear elements of landscape pattern

Siting of house appears to relate to conditions favourable for inhabitation, principally shelter, water, access and well-drained ground

Woodland appears to relate to conditions favourable for growth, principally shelter and well-drained ground



Windfarm appears to relate to conditions favourable for wind energy generation, principally exposure

4.23 With regards to windfarm design in relation to key characteristics, the main variables addressed through LVIA are likely to include the following:

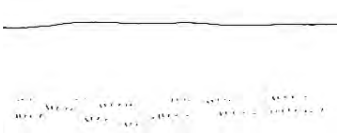
- Layout and number of wind turbines;
- Size, design, and proportion of wind turbines;
- Route and design of access tracks, including the junctions with public roads;
- Location, design and restoration of temporary borrow pits;
- Location, design and restoration of temporary construction compounds;
- Location and size of wind monitoring masts;
- Positioning and mitigation of turbine lighting (if required);
- Visitor facilities, including paths, signs, parking and visitor centre (if proposed); and
- Land management changes, such as muirburn, woodland management, fences, and stock grazing.

4.24 Through the process of design and assessment of various scenarios, regard should be given to the general principles summarised within the following section.

Landform

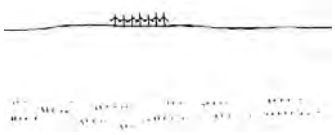
4.25 Landform is a key characteristic of many landscape character types, affecting whether it is rugged, flat, undulating or rolling, and upland or lowland. In flat landscapes, physical relief tends to become accentuated so that even low hills appear substantial.

4.26 It is very difficult to site and design a windfarm upon a variable landform, such as undulating moorland or hills, without presenting a confusing image. This is because the wind turbines will be seen from different directions at varying elevations and spacing, and against varying backdrops. To avoid this effect, it is generally preferable for wind turbines to be grouped upon the most level part of a site so the development appears more cohesive, rather than as a collection of disparate individuals.



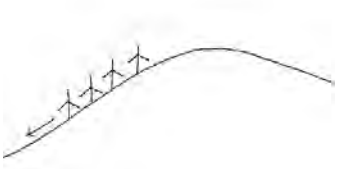
At a broad scale, moorland appears fairly simple in landform and pattern

Relative positions of wind turbines illustrates landform undulations that actually exist and, consequently, create complex image



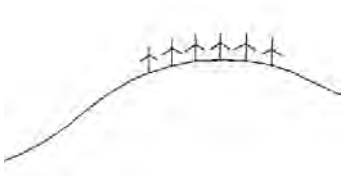
One option is to cluster wind turbines close together upon a local area of flatter ground, so that the variation is less obvious than the image of a single collective feature

4.27 It is important to site and design a windfarm so that it appears visually balanced in relation to the underlying and surrounding landform. Turbines seen upon steep slopes often appear to be 'unstable'. It is also important that the scale and extent of a windfarm does not seem to overwhelm the distinctive character and scale of the landform.



Wind turbines upon slope create a visually dynamic image, seeming unstable

Windfarm appears visually unbalanced upon hill



Windfarm relates to underlying landform, creating a balanced image

4.28 Skylines are of critical importance. This is illustrated by the contrast between the simple horizontal skylines of wide flat landscapes and the more complex vertical and diagonal skylines where there are mountains and hills. The viewer's eye is naturally drawn to skylines, although the extent to which this happens depends on the nature of the skyline and the distribution and type of other elements and foci within the landscape. The character of a skyline may be particularly valued if it conveys a sense of wildness, if it forms the backdrop to a settlement, if it comprises a particularly distinctive landform, or where distinctive landmarks and/or cultural features appear on it.

4.29 Given the prominence of skylines, it is particularly important that a windfarm is sited and designed to relate to this feature. A key challenge of this is, however, that the skyline will vary in relation to the position and elevation of a viewer and visibility conditions, such as weather. Nevertheless, design of a windfarm from key viewpoints and sequential routes should ensure a windfarm does not detract from the character of a distinctive skyline. Care should be taken to ensure that the windfarm does not overwhelm a skyline. If the skyline is 'simple' in nature, for

example over moorland and hills, it is important that wind turbines possess a simple visual relationship to this feature, avoiding variable height, spacing and overlapping of turbines and, also, visibility of blade tips intermittently 'breaking' the skyline.

Windfarm relates simply to skyline

Windfarm contrasts in character to skyline

Windfarm seems to overwhelm visible extent of skyline

Windfarm appears as isolated and minor feature on skyline

4.30 During the design of a windfarm, there may be opportunities to take advantage of the landform to limit visibility of wind turbines and site infrastructure. For example, when sited on hill ridges, turbines may be set back from the edge and placed such that the slopes preclude visibility from below, even if they may be clearly visible from adjacent hills.

When only part of a turbine is visible on the skyline, it can create a confusing image.

Landscape scale

4.31 The scale of a landscape affects the sense of openness and enclosure. The term 'scale' does not refer to a definite dimension, but describes the perception of relative size between elements, for example a large scale open moorland or mountainous landscape and a small scale sheltered glen. To perceive scale, we rely on elements whose size and extent are recognisable to us – common features such as trees and houses. We use these as scale indicators to gauge the size and distance of other elements and make spatial judgements.

4.32 Landscape scale and openness are particularly important characteristics in relation to wind turbines because large wind turbines can easily seem to dominate some landscapes. For this reason, landscape scale can dictate the ability of an area to accommodate windfarm development, both horizontally in terms of its extent, and vertically with regard to wind turbine height.

Windfarm relates well to the scale of the landform and the skyline

4.33 A key design objective for a windfarm will be finding an appropriate scale for the windfarm that is in keeping with that of the landscape. To achieve this, the siting and design of the development will need to ensure that the windfarm in relation to the following aspects, is:

- Of minor vertical scale in relation to the key features of the landscape (typically less than one third);
- Of minor horizontal scale in relation to the key features of the landscape – the windfarm surrounded by a much larger proportion of open space than occupied by the development;
- Of minor size compared to other key features and foci within the landscape; or separated from these by a sufficiently large area of open space (either horizontally or vertically) so that direct scale comparison does not occur.

Windfarm appears as minor feature, both horizontally and vertically in relation to the surrounding landscape

Windfarm appears as minor feature horizontally, but overwhelming vertically in relation to the surrounding landscape

Windfarm appears as minor feature vertically, but overwhelming horizontally in relation to the surrounding landscape

Perspective

4.34 Size indicators within a landscape affect our judgement of visual perspective and thus our recognition of whether a feature is small or far away, large or near. The introduction of turbines into a landscape can confuse this sense of perspective, however, as they are typically of undefined size, yet much larger than any other man-made structures that would help us judge how large and how near they are. Careful consideration is therefore needed in the siting and design of windfarms, and between windfarms, to avoid confusing our sense of perspective. This is particularly the case where different turbine sizes are used and / or where there are gaps between groups of wind turbines at varying distances to viewers.

Windfarm relates to key characteristic of the landscape, yet it is difficult to perceive scale and distance within moorland

Visual link between windfarm and elements of known size, aid perception of scale and distance, emphasising the height of the wind turbines

Perception of scale and distance seems distorted due to variable sizes of wind turbines combined with an absence of reference points and size indicators

Land use

4.35 Land use is also an aspect of landscape character, reflecting the past and current activity of an area. In turn, land use influences landscape pattern, texture, colour, foci and the framework of these elements within an area, which may be simple or complex and affect how people move and view a landscape. Land management can also affect the condition of a landscape and the perception of its value, e.g. whether it seems neglected or well-maintained.

4.36 Wind energy generation may form one part of many different land uses. Existing developments vary in their setting from urban areas, industrial and harbour areas, agricultural ground, woodland, and moorland. Wind energy is typically able to relate to other land uses, apart from within areas such as wild land areas and sensitive residential locations. A key design objective should be to either relate directly to the specific characteristics of the land use or, alternatively, to appear separate and removed from these, avoiding the incongruity of something in-between that conflicts in nature and function.

Windfarm related to harbour land use

Windfarm related to agricultural land use

Windfarm relates to scale of landscape and land use

Relationship between windfarm and land use not clear

4.37 Where appropriate, the development of a windfarm can act as the stimulus for restoration and/or improvement of land use within or around a windfarm site, which are typically assured through the planning process by legal agreements.

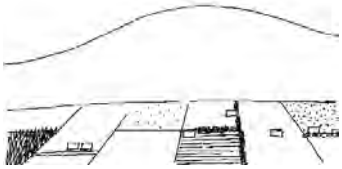
Landscape and visual pattern

4.38 Strongly influenced by land use and physical features, landscape and visual pattern relates to the configuration of key elements. It is a product of the arrangement of repeated or corresponding features, be they a network of drystane dykes, hedgerows, shelter-belts, drainage channels, the distribution of drumlins along a valley, or repeated rock formations.

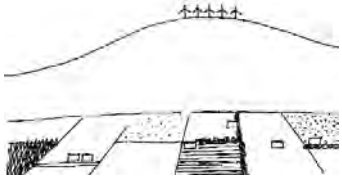
4.39 Developments should typically be designed to relate to landscape pattern where this contributes to landscape character and visual composition. However, the elements of landscape pattern to which a windfarm should relate will be strongly affected by their scale and prominence. The location of tall wind turbines, for example around 100 m high, in relation to small elements of pattern, such as 1.5 m high fences or 25 m high knolls, would represent a disparate relationship that would not appear rational from most viewpoints. Wind turbines that do not relate to

elements or features of similar prominence and/or scale within the underlying or adjacent landscape pattern, such as a forest plantation, will seem equally discordant.

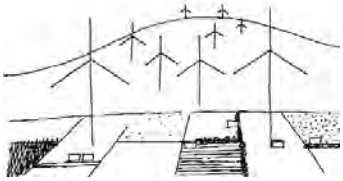
4.40 The distinctive character of some landscapes relies on strong contrasts of pattern, for example an intricate arrangement of fields and regular spacing of croft houses seen against a simple moorland hill backcloth. In these locations, it is important that the addition of a windfarm neither compromises the simplicity of the backcloth hills, or the hierarchy or pattern of the lowland landscape below.



Distinction of lowland landscape pattern relies partly on simple backcloth that highlights this in contrast



Windfarm detached from landscape pattern. Creates a focal feature that will distract slightly from lowland landscape, but distance maintains most of simple hill backcloth.



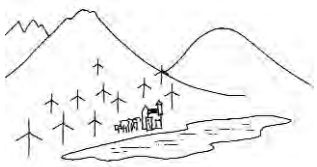
Windfarm not only contrasts to lowland landscape pattern, but reduces distinction by crossing over into neighbouring area of simple hill.

Focal features

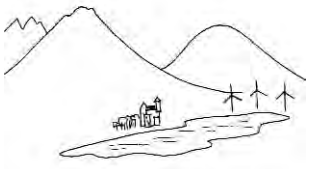
4.41 Focal features can be natural features, such as mountain peaks, ridges, rock outcrops or clumps of trees; or they may be man-made structures like hill-forts, masts and towers; they can also be formed by existing wind turbines / windfarms. They may form part of landscape pattern or be seen as isolated features within a landscape. Often, where the landscape panorama is complex, there will be a hierarchy of foci that will be influenced by the relative size, distribution, position, prominence and cultural value placed upon them.

4.42 Windfarms, because of their very nature and typical location within open landscapes often become major focal points. Thus their interaction with the existing hierarchy of foci needs to be considered in their siting and design, in order to minimise potential visual conflicts or compromise the value of existing foci. In some instances, however, the introduction of a windfarm as a focal feature may have beneficial effect, helping to distract from negative prominent features.

Existing focal points within landscape



Windfarm reduces focal prominence and distinction of original foci



Windfarm creates prominent focal feature, but does not seem to intrude upon or reduce distinction of existing foci due to separation

Settlements and urban / industrial landscapes

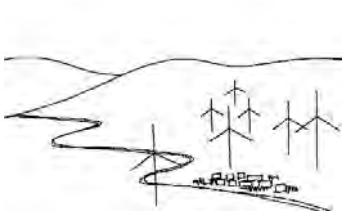
4.43 Settlements and buildings within a landscape tend to be sensitive to the development of a windfarm for three main reasons:

- by being places from which people will view a windfarm and within which a key quality may be the provision of shelter and a sense of refuge that may seem impinged upon by the movement and proximity of a wind turbine;
- because buildings act as a size indicator in views that may emphasise the much greater scale of wind turbines in comparison; and
- because the settlement itself often forms a focal feature / landscape pattern to which a development would need to relate.

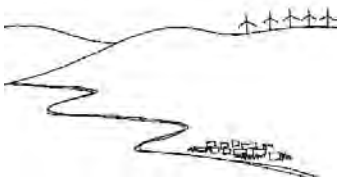
Turbines seen against other features

4.44 It is important that windfarms should not dominate or negatively affect settlements. The threshold for this effect will vary in different landscapes, for different settlements and with different windfarm and wind turbine designs.

4.45 Individual domestic-scale turbines can be located nearer to buildings for small-scale industry, agriculture or for residential use. These may be relatively noticeable due to the faster blade rotation of smaller machines. SPP6 and PAN45 recommend that any proposals within 2 km of a settlement should be considered individually to asses their suitability.



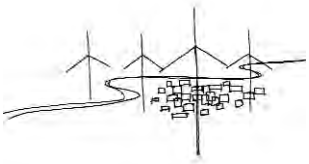
Windfarm appears to impinge upon neighbouring settlement



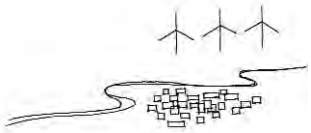
Windfarm separated from settlement by open space

4.46 There may be some locations where larger wind turbines can be accommodated near to or within urban and industrial locations. Additional key issues to address in these situations will be residential amenity, noise and shadow flicker. In these settings, large wind turbines typically appear most appropriate where they are separated slightly from buildings; are seen set back against an area of open space and visual simplicity; or are marginal to the urban/industrial area, for example, along a river edge, road corridor, the coast or large open space. The aim should be to minimise the sense of imposition upon buildings and more intimate spaces. This might be achieved by the turbines mainly being seen against an open background, and avoiding the creation of a visually complex image. In these circumstances, careful consideration of the nature of views in and out of these areas is needed, along with appreciation of the nature of impacts from recreational areas and residences.

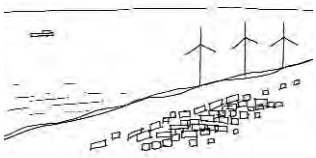
Wind turbines can relate well to urban features such as a harbour wall



Windfarm impinges upon space and views of adjacent settlement



Windfarm prominent in views from settlement but does not seem impinging because of separation space



Windfarm near to settlement, but seems less impinging due to adjacent open space offered by sea

4.47 In some places, larger turbines with slower rotation of blades may be preferable to smaller turbines with faster speeds. However, there will always be a need to relate the size of the turbines to the local context, taking account of the existing buildings and foci.

4.48 Landscape value, which may be reflected by designations such as World Heritage Sites, Conservation Areas or areas with Tall Building Policies, will also need to be considered.

4.49 Other factors to consider within urban situations, and which should be addressed through LVIA are;

- intervisibility and setting of turbines;
- lines of sight between well known viewpoints;
- views of existing focal points; and
- the relationship between wind turbines in urban areas and those in the surrounding landscape and seascape.

Wind turbines in an urban setting

Coast

4.50 Scotland has a great diversity of coastal landscapes, ranging from low-lying beaches with dunes, to craggy intricate cliffs and headlands. An assessment has been undertaken for SNH that characterises the coastline of Scotland into 33 seascape units[14].

4.51 Windfarms should relate to the sense of openness and exposure within coastal areas. However, as views are typically drawn to the coast, these areas will be sensitive to the location and design of a windfarm. This occurs both in relation to the inland and offshore land/seascape character and views, and includes views from boats and ferries. Simple, open, flat coastal areas can probably better accommodate windfarms than complex coastal landscapes, such as those with inlets and islands.

14 An assessment of the sensitivity and capacity of the Scottish seascape in relation to offshore windfarms, SNH Commissioned Report No. 103. (2005)

Wind turbines can relate well to some coastal landscapes

4.52 Due to the focus of views along coastlines and the typical concentration of settlements within these areas, a windfarm will often create a new focal feature or landmark near to the coast. For this reason, it will be important that they do not detract from existing landmarks, such as historical or navigational features, or coastal settlements and areas valued for recreation.

4.53 Cumulative impacts may occur between onshore and offshore wind energy developments, and this is likely to become an increasingly important design consideration in the future as leases are granted to develop windfarms in Scottish inshore and offshore waters. From inland areas, offshore developments may not even be perceived as being offshore if their immediate setting within the sea is screened by inland features. Views of offshore windfarms may also be affected by onshore developments. It may, for example, be undesirable to view off-shore development with onshore development in the foreground.

An offshore windfarm, 1km off the coast

4.54 Further guidance on this aspect of windfarm LVIA can be found in 'Guidance on the Assessment of the Impact of Offshore Windfarms – Seascape and Visual Impact Report'[15] and 'Guide to Best Practice in Seascape Assessment'[16].

15 DTI in association with SNH, CCW and The Countryside Agency (2005)
16 Maritime Ireland/Wales INTERREG 1994–1999. Countryside Commission for Wales, Brady Shipman Martin and University College Dublin (March 2001)

Woodland

4.55 Where turbines are seen from a distance in combination with woodland, their large scale can be difficult to discern. However, where windfarms are sited immediately adjacent to, or within woodland areas, trees may act as a scale indicator accentuating turbine size in comparison.

4.56 Trees are only likely to have a screening effect if they occur within the fore or midground of views looking towards turbines in the distance. If this occurs, the screening effect may change or be lost as one moves through the landscape.

4.57 Large-scale conifer plantations, particularly when seen from a distance and upon slopes, can create distinctive lines, colour, texture and shape. Ordinarily, the design objective would be to relate to this distinctive landscape pattern. However, in contrast to native woodland, forest plantations tend to be more temporary features of the landscape. For this reason, through LVIA, the designer needs to consider future plans for a forest and consider whether this, or the underlying and surrounding landscape, is of greater relevance in defining the character of the landscape to which the windfarm should relate.

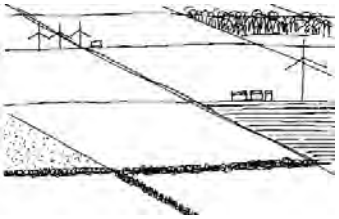
4.58 If a windfarm is located within a forest, the clearance of trees to create open spaces for the turbine bases and access tracks can create a pattern of spaces, lines and shapes that may increase the complexity of the windfarm from distant views.

The relationship between windfarms and forestry requires careful consideration

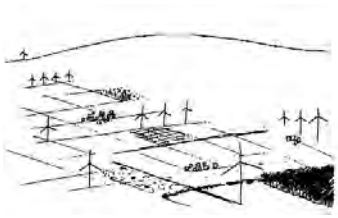
Small / Community Windfarms

4.59 Small scale community owned windfarms can make a positive contribution to rural economic development. However, it should be noted that single turbines or small windfarms do not necessarily result in less landscape and visual impact than a larger development. As the efficiency of wind turbines increases this may lead to proposals with fewer yet relatively large turbines in landscapes which have limited capacity to accommodate them. Whilst a community development may be preferred within an area due to its contribution to a local economy, the ownership of a development does not mitigate landscape and visual impacts, it affects the judgement of acceptability of impacts in line with planning policy. All windfarm development should be carefully assessed through LVIA (albeit scoped to fit the scale and nature of the development), including cumulative effects.

4.60 Cumulative impacts of multiple individual wind turbines and / or small windfarms are a particular concern, especially where these are randomly located or of different designs. This issue may become more widespread as opportunities and incentives to generate electricity for on-site or community use, or to generate community income, become more widespread. There is a need for developments to be sited and designed in relation to each other in order to avoid negative impacts on landscape character and visual amenity. It is therefore recommended that Local Authorities have suitably robust spatial and design policies to minimise landscape and visual impacts where small windfarm development is likely to occur outside their Broad Areas of Search.



Single and small windfarms fitted to agricultural landscape pattern



Although individual developments are all small scale and fitted to local characteristics, developments cumulatively become defining element of character type – a 'windfarm landscape'

5

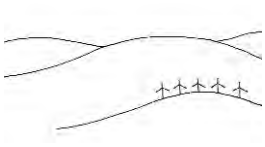
Designing in landscapes with multiple windfarms

5.1 The previous section highlighted the factors to be considered when designing individual windfarms. In many parts of Scotland, however, the issue is how best to plan for and accommodate multiple windfarms. This is complicated by the fact that, at any one time, many developments may be consented but not built, or submitted but not determined. This means that planning, siting and designing windfarms tends to be based on constantly changing baseline conditions.

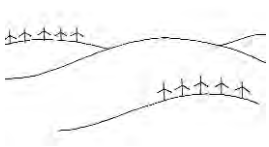
5.2 Cumulative impacts occur when one windfarm is proposed in the vicinity of another existing or already proposed windfarm. SNH has published guidance on assessing the Cumulative Effects of Windfarms[1] which sets out when and how cumulative effects should be considered. This section contains design guidance in circumstances where such cumulative effects are expected to arise. It also touches on aspects which Local Authorities may need to consider when drawing up spatial frameworks and Supplementary Planning Guidance for windfarm development to fulfil the requirements of SPP6 and PAN45 Annex 2. This is dealt with in more detail in Part 2.

5.3 As part of the design process where other windfarms exist or are proposed, it will be important to undertake an assessment at a strategic level of the potential cumulative landscape and visual impacts. The impact of smaller windfarms, and in some cases individual turbines, will also require consideration. The methodologies contained with the Cumulative Effects of Windfarms guidance should be helpful, as may Topic Paper 6 'Techniques and criteria for judging capacity and sensitivity'[2].

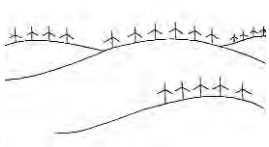
5.4 When designing an individual windfarm, key design objectives should be developed as stated previously in section 4. Where cumulative impacts are likely to occur within an area, design objectives should also be established that can be consistently applied to all proposed developments. This should result in a similarity of design and windfarm image within an area that limits visual confusion, and also reinforce the perceived appropriateness of each development for its location. Cumulative design objectives should relate to ancillary infrastructure as well as wind turbines.



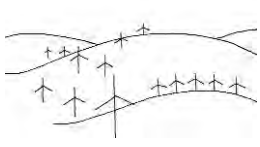
Individual windfarm relates directly to landform characteristic as single line upon horizon



Numerous developments relate consistently to key characteristic of the landscape, but not prevalent and thus remain as isolated features.

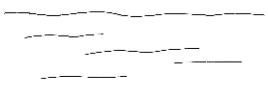


Multiple windfarms relate to same characteristic, to create consistent image and reinforce perceived appropriateness of each windfarm. However, by occupying every incidence of specific characteristic, will become key characteristic that changes overriding character



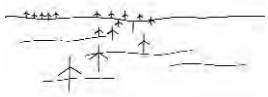
Additional windfarms contrast in pattern, scale and relationship to key characteristics, creating a confusing image and questioning relationship of original development to its surroundings.

1 'Cumulative effect of Windfarms'. SNH 2005 (currently under review)
2 Landscape Character Assessment Guidance for England and Scotland – Topic Paper 6:Techniques and Criteria for Judging Capacity and Sensitivity. SNH and The Countryside Agency (2005)



The key characteristics of the landform are often illustrated most clearly by the skyline. In this open landscape, the skyline has a horizontal emphasis and uninterrupted character.

Windfarm acts as a prominent focus. Although it does not occupy a major proportion of the skyline, it contrasts to the horizontal emphasis at a local level as a single collective feature.

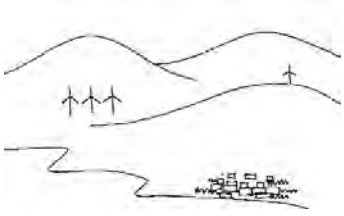


Additional development results cumulatively in major proportion of skyline being occupied by windfarms. In addition, its siting and shape does not relate to the skyline feature, nor horizontal emphasis.

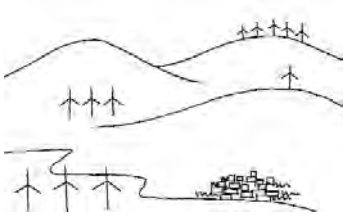
Windfarms cumulatively dominate the skyline feature, although they relate to its horizontal emphasis and simplicity of line.

5.5 The development of multiple windfarms within a particular area may create different types of cumulative effect, such as where:

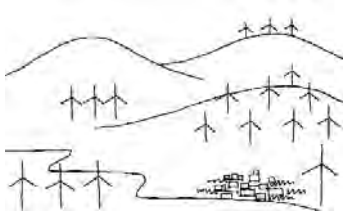
- The windfarms are seen as separate isolated features within the landscape character type, too infrequent and of insufficient significance to be perceived as a characteristic of the area;
- The windfarms are seen as a key characteristic of the landscape, but not of sufficient dominance to be a defining characteristic of the area;
- The windfarms appear as a dominant characteristic of the area, seeming to define the character type as a 'windfarm landscape character type'.



Separate isolated features

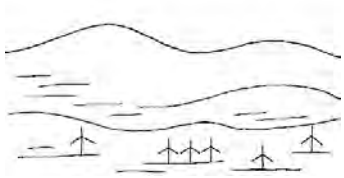


Windfarms become key characteristic of the landscape

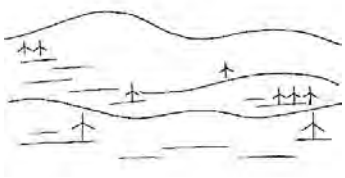


Windfarms become dominant characteristic of the area, creating a 'windfarm landscape'

5.6 These effects can occur at varying scales, for example affecting just a local character type, or prevailing over much of a character type at a regional level. The appropriateness of these different effects will depend on the character and value of a landscape and defined objectives for change. There will be differing circumstances where windfarm development would be welcomed – as landscape enhancement or accepted as part of the usual trend for landscape diversification and evolution – or else be considered undesirable, being contrary conservation aims.



Dominance of landscape character by windfarms occurs at local level only. Other areas of similar character not affected.



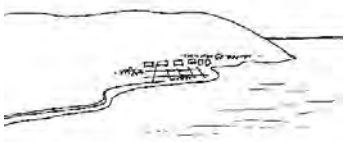
Dominance of landscape character at wider scale, but local pockets perceived as unaffected

5.7 An opportunity may be taken in some instances to use windfarm landscapes to improve areas which have been considered lacking in defining character. It is important to stress that this approach is only appropriate in certain locations where study has revealed that capacity exists for further turbines – elsewhere it will be important to retain areas free from development to maintain landscape diversity.

Relating to landscape character

5.8 If windfarm development extends over several different landscape character types within an area, this can lead to a reduction in the distinction between these

different types. If windfarms already exist within a particular landscape character type, further windfarm development should be limited to the same or similar types within the neighbouring area. An exception could be where these developments are of distinctly different character themselves, for example if they strongly contrast in scale.

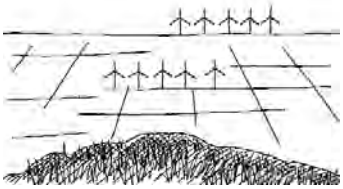


Distinct combination of contrasting character types – open hill, settlement and firth

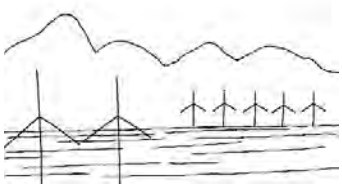
Windfarm creates new feature. This distracts from existing focus of view; however, distinction between character types is maintained.

Windfarms cross different character types, reducing the distinction between these.

5.9 The relationship of multiple developments to neighbouring landscape character types is very important, especially where developments are located near the boundary of these or will be highly visible from neighbouring landscape character types.



Windfarm siting and design relates to simple landform and appears distant enough not to impose on nearby hills



From alternative viewpoint, looking over agricultural ground, visibility of wind turbines is highlighted by backcloth. The turbines also compete with the visual prominence of the hill range.

Complementing landform

5.10 Multiple windfarms should not obscure distinctive landforms, either by 'flattening' out the varying relief (due to their relative magnitude) or by 'filling' up or crowding an enclosed or flat area.

Establishing new patterns

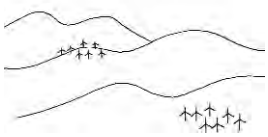
5.11 The opportunity to introduce a new, characteristic landscape pattern through consistent design of turbine arrays will be important where a 'windfarm landscape' has to be established. Existing landscape scale and pattern should be respected, as they may assist in designing a new landscape. Where a new spatial pattern is proposed it will be important to identify key design prompts or cues within the landscape (which may be existing windfarms) and work with these. Consideration needs to be given to how the new pattern relates to any existing neighbouring windfarms, and adjacent landscape character.

Relationship between windfarms

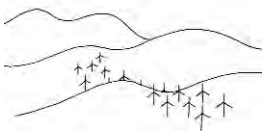
5.12 Where two or more windfarm proposals which would be inter-visible enter the planning system in parallel, or alongside existing or consented windfarms, this should be a material consideration in the planning process.

5.13 A key factor determining the cumulative impact of windfarms is the distinct identity of each group of windfarms, typically related most closely to their degree of separation and similarity of design. This applies whether they are part of a single development, a windfarm extension, or a separate windfarm in a wider group. A windfarm, if located close to another and of similar design, may appear as an extension; however, if it appears at least slightly separate and of different design, it may conflict with the other development. In these cases, and if a landscape is not able to accommodate the scale of a combined development, windfarm groups

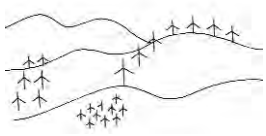
should appear clearly separate. It is critical to achieve a balance between windfarms and the undeveloped open landscape retained between them. Adequate separation will help to maintain windfarms as distinct entities. However, the separation distance required will vary according to the landscape characteristics.



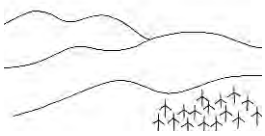
Distinct windfarm groups. Similarity of design and relationship to the landscape. With large areas of open space in between, character of underlying landscape prevails.



No clear distinction between group(s). Extending beyond skyline, it is not possible to confirm whether the groups link.

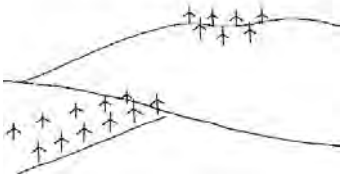


Although no clear area of space between windfarm groups, distinction highlighted due to contrasts of turbine scale and layout (variety of development type creates visual complexity).

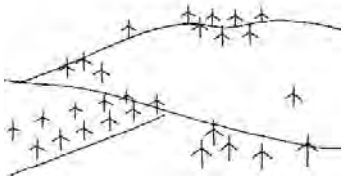


Extension to original development creates larger single windfarm. This has increased impacts in the local area, but limits the extent of impacts through the wider landscape.

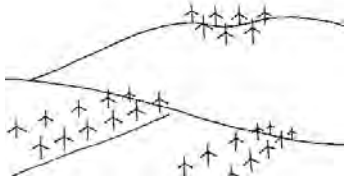
5.14 In some locations the existing pattern of windfarm development may be complex. Relating further development to a complex pattern will be challenging, but the same key principles should apply, focusing on improving the overall pattern and character of development rather than exacerbating existing conflicts between designs.



Existing windfarm developments of contrasting design and relationship to the landscape.



Additional windfarm designs amplifies adverse cumulative impacts



Additional windfarm reinforces character of one original windfarm, although increases the sense of incongruity of the other.

5.15 In some circumstances, intervening topography may limit visibility and reduce the need for visual compatibility between neighbouring proposals, although site design should always be compatible with landscape character.

Focal point pattern and scale

5.16 As multiple windfarms are built, they are more likely to 'compete' with the landscape's original foci and it may lack a sole dominating focal point as a result. The design aspiration should be to avoid visual confusion and to maintain focal point pattern and hierarchy.

Settlements

5.17 Care should be taken to avoid multiple windfarms dominating the landscape setting of a settlement. Windfarms may do this if they are close to it at high elevation, surround or enclose the access and main approaches, dominate approaches through sequential cumulative effects (through the presence of several windfarms in succession), or are physically too close. How a 'windfarm landscape' relates to a settlement will depend on the design of the windfarms and their spatial relationships with each other, and how the settlement relates to its hinterland.

Windfarm extensions

5.18 Recent windfarm development has included numerous extensions to existing windfarms. These give rise to similar issues of consistency as those arising from adjacent windfarm developments, and similar design principles should apply. Layout and site design objectives and principles should echo those of the original windfarm. Extensions should use turbines which are compatible with those in the existing windfarm, including aspects of scale, form, colour, and rotation speed. Such compatibility issues will be more important the closer the windfarms are.

Extensions should not compromise the landscape setting of neighbouring windfarms and should respect existing focal points in the landscape. The potential for a windfarm extension to 'outlive' the existing windfarm (if this is decommissioned), and therefore stand on its own, should also be considered in the design process.

Windfarm as two distinct groups. This creates a complex image due to interactions between each wind turbine with the landscape and all the other wind turbines within its group as well as between the two groups of turbines. This is complicated further by the fact that most people view the development while travelling through it. In addition the windfarm has an irregular layout over a variable landform and there are a number of other prominent landscape features within the area, including forest blocks and powerlines.

Designing in landscapes with multiple windfarms – summary of key principles

- Multiple windfarms will result in different types of cumulative effect. For each windfarm or strategy concerning potential windfarms, the most appropriate cumulative design objectives should be established, while also taking into account existing developments
- Some landscape character types will be able to accommodate multiple windfarms, while this may be inappropriate within others. Generally, it will be preferable for windfarm development to be limited in its range of landscape character type within a particular area, to avoid reduction in the distinction between types
- Individual windfarms should generally appear visually separated from one another in a landscape, unless specifically designed to create the appearance of a single combined windfarm
- Different forms of windfarm development should respond to different landscape character types, to ensure windfarm landscapes complement the landform in their positioning, extent and density
- Windfarms should not unacceptably dominate settlements
- Windfarms should take account of existing focal points in the landscape, which may be neighbouring windfarms
- Multiple windfarm development should not change distinctive skylines or occupy the major proportion of a skyline from key viewpoints or receptors
- Extensions should consolidate the scale, size and mass of the existing development; if the new turbines are compatible with the existing ones the resulting windfarm should relate to the area's landscape character in extent and scale

Part 2

Strategic planning for windfarms

Introduction

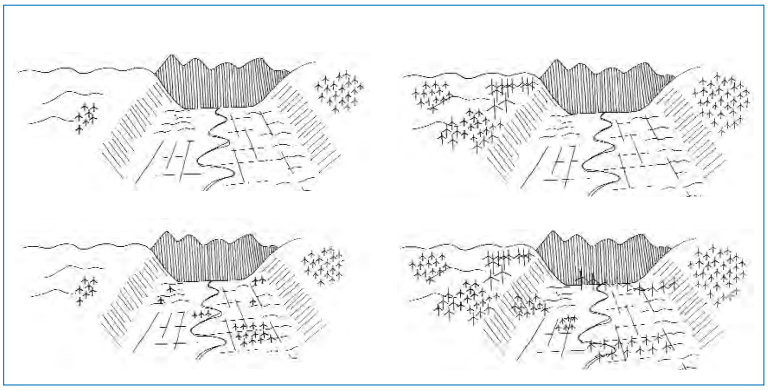
1. This section provides guidance to Planning Authorities. It does not replace or override the policy principles stated in SPP6, but seeks to compliment and expand upon the landscape and visual considerations as identified in Planning Advice Note (PAN) 45 Annex 2[1], published in November 2008. This guidance is being issued at a time of change within the planning system. The existing SPP / NPPG series is being replaced by a single, consolidated Scottish Planning Policy statement, to be published later in 2009. This section may require revision once the new SPP is published.

2. SPP6 requires planning authorities to set out a spatial framework for the consideration of windfarm proposals over 20MW, with broad areas of search identifying areas where proposals are likely to be supported, areas to be afforded significant protection from windfarm development, and the criteria to be followed in the remainder of the area. In most areas the pattern of existing windfarm development will strongly affect the scope of a framework.

3. Planning for multiple windfarms is a complex and sensitive issue. SNH seeks only to express key principles in relation to landscape within this guidance to help Planning Authorities produce a clear and robust spatial policy. At this strategic scale Planning Authorities will benefit from working together to consider the broader impacts of windfarms on neighbouring areas

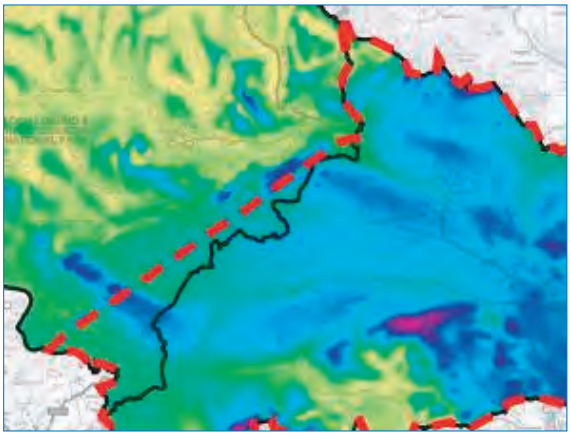
4. Landscape considerations are just one aspect of the process of identifying a spatial framework. Other constraints and natural heritage issues will also have to be taken into account to develop a robust and coherent framework. This guidance works on the assumption that other areas of natural heritage sensitivity will either have been sieved out earlier in the process of developing a spatial framework, or that these sensitivities are carried forward for consideration alongside landscape and visual and other issues. In an area with multiple windfarms there is potential for the overall landscape character to be significantly changed. The presence of a number of windfarms may make them a key characteristic of the landscape, or even a dominant characteristic such that it becomes a 'windfarm landscape'. There may be some loss of tranquillity and some aspects of naturalness may be lost. In any of these circumstances good design remains an important objective, even if the landscape has changed from its original character. The design principles outlined earlier in this guidance remain relevant.

1 Planning Advice Note (PAN) 45: Annex 2: Spatial Frameworks and Supplementary Planning Guidance for Wind Farms, Scottish Government, November 2008



Example of exploration of design concepts for multiple windfarms within a distinct region. The first diagram represents the existing cumulative situation with two windfarms upon upland hill areas. A key issue to address was whether all further windfarms should be restricted to the same character type to avoid reducing the distinction between this type and the flat bottomed valley below.

5. Potential cumulative visual impacts are difficult to address through strategic planning. The process can be assisted by viewshed mapping and analysis of representative viewpoints, key views and important tourist routes across the area, informed by 'dead ground' ZTVs[2] and viewpoint visualisations.



Example of visual exposure analysis. Pink represents places within which a wind turbine would be seen from the most extensive area within the study area, Yellow represents the where it would be seen from the least extensive area.

Plan showing sample viewpoint locations that informed the development of a windfarm capacity study. For each viewpoint, site assessment was carried out in addition to the production of visualisations that showed sample wind turbines of different height in various hypothetical locations in relation to the viewpoints across the region.

Identifying landscapes suitable for multiple windfarms

6. One of the potential consequences of considerable windfarm development across Scotland could be that few landscapes might be left unaffected by windfarms. This would diminish the diversity which is one of the key characteristics of the Scottish landscape. Good strategic planning can help to avoid this by ensuring that windfarms are sited within those areas best able to accommodate them. It should also mean that areas less suitable for such development, or more valued for the present character or qualities of the landscape, can be kept free of windfarm impacts. Views of windfarms from within these areas may also be affected, and will therefore require careful consideration. This has been shown by some planning exercises[3].

7. Landscape capacity studies can help to inform and identify where development would be preferable in landscape terms. They can be particularly helpful when spatial frameworks are being developed.

8. As the landscape and visual impacts of windfarm development can extend over a wide area and across Planning Authority boundaries, it is important to consider the

2 ZTV maps that show the area within which an element of defined height and extent would be visible from a specific viewpoint.
3 Such as those undertaken in Ayrshire and the Clyde Valley

current pattern of development in a regional and national context. SNH has developed a windfarm footprint map[4] which identifies the location and size of most of the windfarms which are already installed, approved or being considered. The map demonstrates that windfarm development is currently clustered in those areas which are generally of lower constraint (in natural heritage terms) and with access to the national grid. Further development activity is likely to continue to focus on those areas with good access to the grid and close to areas of existing development or land use change. This has led to a pattern of 'clustering' of windfarms which crosses Planning Authority boundaries and which reflects the range of constraints on windfarm development. In considering which areas are suitable for further windfarm development this existing pattern of development must form a key consideration.

A large windfarm in a large scale, open landscape.

9. The intrinsic characteristics of a landscape also render some landscape types more suitable for multiple windfarms than others. Analysis of landscape character information at a strategic level can help in identifying those landscape types best suited to large scale and multiple windfarm development.

10. Impacts on recreational interests also need to be considered at a strategic level. This will include the effects on users of Long Distance Routes where relevant, impacts on popular destinations for recreation such as National or Regional Parks, and also on important recreational resources such as rivers and mountains. Summits and other elevated viewpoints are often popular destinations that are likely to be particularly affected by views of multiple windfarms.

Different landscapes – different approaches

11. In judging whether or not an area should be kept free of windfarm impacts it is helpful to develop a clear view about which of three possible landscape objectives should apply[5]: landscape protection, accommodation, or change. These should not be seen as rigidly distinct objectives. They seek only to illustrate the different approaches that are relevant to different landscapes.

A large windfarm in a rolling managed upland landscape.

4 Available at http://www.snh.org.uk/strategy/renewable/sr-rt01.asp
5 For further discussion on landscape objectives see SNH's Landscape Policy Framework. Policy Statement No. 05/01

12. **Landscape Protection:** where the aim is to maintain the existing landscape and visual resource, retaining or reinforcing its present character and protecting its quality and integrity. It is likely to be difficult to accommodate windfarms in such areas. Small-scale development may nonetheless be possible where it relates well to the existing landscape in terms of both scale and design. Micro generation may be acceptable where this relates well to the existing built environment. Where a landscape designation is in place, it is important to understand the special qualities for which the area is designated and to consider how the proposal could affect these. In National Scenic Areas, for example, landscape protection will be the most appropriate objective, reflecting the high degree of protection afforded to these areas by SPP6 and NPPG14[6].

> Nationally and internationally designated areas where landscape protection is an appropriate approach are likely to be afforded 'significant protection' in Planning Authority Spatial Frameworks.

13. **Landscape Accommodation:** where the aim is to retain the overall character of the landscape, yet accepting that development may be allowed which will have an impact on the landscape locally; development fits within the landscape and does not change its character on a large scale. Landscape accommodation implies that there may be important landscape-related constraints in terms of the siting and scale of windfarms, but that suitably designed windfarms can be compatible with this objective. Within local landscape designations the degree of landscape protection will be less than for National Scenic Areas. In some local landscape designations an appropriate objective may be to accommodate windfarms, rather than seek landscape protection. Where this approach is chosen the justification will need to be clearly articulated in relevant planning policy.

> Landscape accommodation may be an appropriate approach within the 'other' areas in Planning Authority Spatial Frameworks, where other constraints and policy criteria will apply. A landscape accommodation approach could also be relevant to 'Broad Areas of Search' if the associated criteria make it clear that overall landscape change is to be avoided.

14. **Landscape Change:** where it is accepted that the area is one whose landscape character may be allowed to change, which could result in a perception of a windfarm landscape. Landscape change does not imply that 'anything goes': good landscape design principles still need to be followed to ensure that the development is appropriate for the scale and character of the landscape.

> Areas where landscape change is an appropriate approach are likely to be consistent with 'Broad Areas of Search' in Planning Authority Spatial Frameworks.

SNH Strategic Locational Guidance

15. SNH has published Strategic Locational Guidance for Onshore Windfarms[7] to guide planners, practitioners and others in respect of natural heritage constraints at the strategic level. It identifies three zones of natural heritage sensitivities and aims to promote a consistent approach to windfarm development. It is important to note that the zones identified within the Strategic Locational Guidance are mainly designations-based and do not take account of landscape character or potential visual effects.

6 National Planning Policy Guideline 14 Natural Heritage, Scottish Government 1999
7 Strategic Locational Guidance for Onshore Windfarms with respect to the Natural Heritage. SNH 2002, updated March 2009, www.snh.org.uk.

16. To date, the majority of windfarm development has been in Zone 1 – the zone of least natural heritage sensitivity. Areas where landscape change is an appropriate objective, and where multiple windfarm development might be encouraged, are most likely to be found within Zone 1. However, it should not be assumed that all of this zone should be open to landscape change. The scale and detail of some landscapes will always make it difficult for them to accommodate windfarms satisfactorily, and there are many areas within Zone 1 which are valued locally for the character, quality and amenity value, for example on account of the recreation opportunities they provide close to towns. In some locations, the concentration of proposed developments in Zone 1 is leading to the potential for undesirable cumulative impacts.

Identifying capacity and the limits to development

17. Within areas identified as being suitable for multiple windfarms there will still be a limit on the number or extent of windfarms which can reasonably be accommodated. SPP6 states that '*Development plans should identify those areas where there are existing windfarm developments and set out, in relation to the scale and proximity of further development, the critical factors which are likely to present an eventual limit to development*'[8]. Within Broad Areas of Search, Planning Authorities are encouraged to complete a landscape capacity study to determine how much development can be accommodated and what the critical factors might be that will define an eventual limit to development. The critical factors will be specific to the landscape involved, but could include the factors summarised below.

8 SPP6, Annex A, paragraph 3

Critical factors relating to capacity for windfarms

This box lists key factors that ought to be taken into account when considering capacity for windfarms. It was developed in response to a need identified in SPP6 (paragraph 3 Annex A, cumulative impacts).

– Effects on landscape designations – or landscape value
Effects of additional development on the qualities, integrity and objectives of any relevant landscape designation should be analysed and described.

– Effects on landscape character
The effect of development on existing landscape character should be described. It is likely that as more windfarms are developed, and / or at closer distances to each other, they will begin to be perceived as a key landscape characteristic and will therefore change landscape character.

– Effects on sense of scale
Tall structures are likely to dominate and alter the perception of vertical scale in the landscape. This will be the case particularly when larger turbines are seen in comparison with developments using smaller turbines or when proposed turbines are viewed in comparison with other landscape features.

– Effects on sense of distance
Effects on distance may be distorted with additional windfarm development. For example, if larger turbines are located in the foreground of smaller turbines or vice versa.

– Effects on existing focal points in the landscape
An existing windfarm development may act as a focal point in the landscape and the effects of other windfarm development on this should be considered.

– Effects of skylining
A viewer's eye tends to be drawn towards the skyline. Where an existing windfarm is already prominent on a skyline the introduction of additional structures along the horizon may result in development that is disproportionally dominant. The ratio of developed to non-developed skyline is therefore an important landscape consideration.

– Effects on sense of remoteness or wildness
The existing experience of remoteness and wildness should be assessed, and the effects of development on it analysed.

– Effects on other landscape interests
Effects of additional development on other interests in the landscape should be considered. For example, this may include consideration of the effects on the landscape setting of settlement or other cultural interests and associations with the landscape.

Surrounding areas

18. Where an area is identified for multiple windfarm developments, it will be important to establish a clear boundary to that area. This is in order to achieve visual separation, such that those travelling through the landscape will perceive a clear distinction between the windfarm landscape and the landscape outwith. Otherwise, the perception of being within a windfarm landscape may become extended, or may only peter out gradually, thus losing diversity in the landscape experience. There may be some benefit in maintaining the current development pattern – of clustering and gaps – that has evolved in some areas due to a range of opportunities and constraints. This approach should also help to address cumulative impacts[9].

19. The scale required of such landscape planning is necessarily large, given the extent of a typical large windfarm which may extend across Local Authority boundaries. Surrounding areas to be kept free of windfarms may have to be substantial to be effective, considering intervisibility and sequential impacts. They

9 SPP6, Annex A, paragraph 3

also need to take account of the distance necessary to provide an area of undeveloped ground in between. Perception of this will typically depend on factors such as the concealment offered by landform and windfarm size. In very open landscapes larger separation distances may be required than in hilly areas where the landform may provide more effective visual separation. It may not be necessary to preclude small windfarm developments within such separation areas, e.g. farm-scale developments or single turbines, where these are clearly of a smaller size or scale than the large-scale windfarm developments within the windfarm landscape itself. However, there will be a limit to the number of smaller developments that can be accommodated in this way.

In developing Spatial Frameworks for windfarms Planning Authorities should consider identifying areas that should be afforded significant protection in order to reduce the potential for further cumulative impacts[10]. These areas may be required between very large individual windfarms, clusters of windfarms, and Broad Areas of Search.

10 Para 33, Planning Advice Note 45, Annex 2, 2008

Appendix 1

Design Statement for Clyde Windfarm

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Please note that the references to other chapters/tables are not included within this guidance.

Design Strategy

1 Requirements for a 'design strategy' stem from national policy[1], and were reinforced in the scoping responses from the Royal Fine Arts Commission for Scotland and Scottish Natural Heritage. In addition, it has now become accepted best practice in the design of windfarms, to consider how the windfarm will relate to the landscape, its landform, scale and other landscape features.

2 The overall aim of the design strategy was to create a windfarm with a cohesive design that relates to the surrounding landscape. The inherent nature of turbines as bold, modern structures means that the form of the windfarm as a whole is important, and a strong, clear cut design strategy is necessary. The strategy therefore considered the appearance of the windfarm as an object or composition in the landscape as the primary factor in generating the layout.

3 The objectives of the design strategy were as follows:

- to produce a cohesive layout which would be legible in views from the surrounding landscape and be easy to understand;
- to develop a layout that reflects the landform and topography of the landscape;
- to develop a layout that seeks to match the scale of the turbines, and the scale of the overall development, with the scale of the landscape.

4 The background to the design strategy also included an examination of alternative patterns for the layout in relation to the topography.

Scope of the Strategy

5 The design strategy sets out the overall approach to the design development of the windfarm. Subsequent alterations to the layout were made in response to, for example, ecological, hydrological, archaeological and energy yield considerations, as well as to reduce visual impacts arising from these alterations. With the design strategy in place, however, these latter changes could be reviewed with an understanding of the appearance of the windfarm within the landscape.

6 The design strategy did not consider site selection, with the site already having been selected by Airtricity using their site selection methodology. The design strategy therefore focussed on considering layout options for the Clyde site in response to the site conditions. The design strategy did, however, influence the site boundaries of the development. Both extensions and reductions to the original site boundary were consequences of the implementation of the design strategy.

7 In the development of the designed layout, computer modelling was used as a tool to aid design. In particular, wireframes were generated for views from key locations around the site and photomontages produced for viewpoints used in the assessment of landscape and visual impacts (see **Chapter 6**).

8 The major development components considered in the design were turbines and deforestation/replanting. Forestry design issues have been progressed alongside this design strategy and are set out below.

9 Cumulative issues with other windfarms have not been considered as part of the design strategy, as the closest other, existing or known potential, windfarms are unlikely to be seen as part of the same windfarm, although some views from the surrounding area will include more than one development (see **Chapter 6**).

1 Scottish Executive (2001) *Designing Places: A Policy Statement for Scotland*.

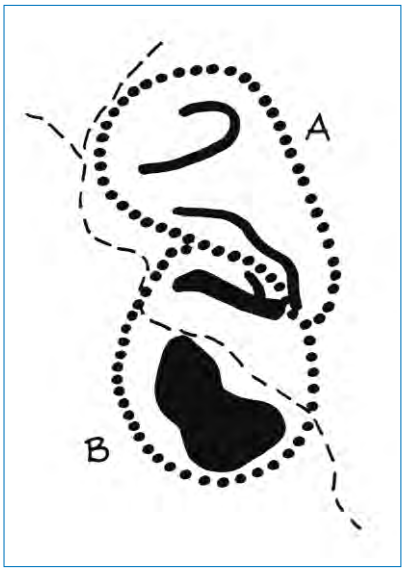
Topography

10 The general topography of the windfarm area is one of undulating hills of the Southern Uplands. Valleys divide the hills such that the site is not seen as a whole from valley locations. This has the effect that in views from much of the surrounding landscape, only part of the site is visible, and turbines will often not be seen in full, and are likely to be seen against the sky. The experience is very different in views from hill tops, where the full extent of the windfarm may be appreciable.

11 These different viewing conditions exclude options for layouts that are dependant on full visibility of most turbines. Instead, there are opportunities for different strategies for different parts of the windfarm that are not seen together in the same view.

12 The site can be divided into two parts that have different landform types. The design strategy that has been developed for each of these is described below.

Sketch 1: Topography of the site. The northern part of the site is made up of ridges, whilst more plateau-like areas lie to the south.



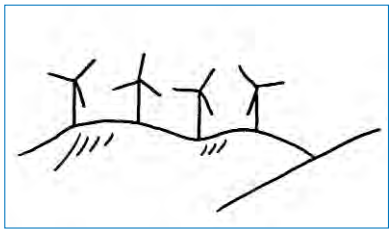
Sketch 2: Design approach A is used for the northern part of the site, and design approach B is used for the southern part of the site.

Design Approach A

13 The northern part of the site has many strong hill and ridge features to which the layout responds. In particular, the ridges of Ewe Hill to Hardrig Head, Tewsgill Hill to Rome Hill to Duncangill Head and Normangill Rig to Yearnhill Head and Hare Cleuch Head form strong topographic features. Lady Cairn, Rodger Law, Harleburn Head, Pin Stane and Clyde Law form a broader area with spurs to the north (for example Mid Hill), and therefore form an area of transition to plateau.

14 This overwhelming characteristic of the landform has been used as the basis for the design in this part of the site. At the scoping stage, a layout with many more turbines along the ridges and down the slopes was used as an initial layout, but this was found to be unsuitable given the lack of clarity of the relationship with the local topography. Visual analysis of the scoping layout further confirmed that the layout should be designed as lines of turbines that related more closely to the ridges.

15 Another design option placed double rows of turbines on the ridges, but this was found not to result in a clear reflection of the ridges in views from the surrounding area. The strategy adopted was therefore *to place single lines of turbines along the ridges, with closer spacing and centred upon the ridges*. The visual effect of this is that the hubs of the turbines reflect the profile and topography of the landform when viewed from the surrounding area. In view of the transition from single ridges to broader plateau, design approach B was used for Lady Cairn to Clyde Law.



Sketches 3 and 4: A double line of turbines hides the profile of a ridge, while a single line relates to it.

Design Approach B

16 Across the southern part of the site, immediately north of the M74, and the whole area to the south of the M74, the topography is less distinct than the northern part, and there is broad undulating moorland without distinct ridges.

17 The design principles applied for the northern part of the site were found to be unsuitable for this part of the site, given that they are developed for more distinct landform types. An alternative layout, based on a grid was also found to be unsuitable, given the smooth contours and irregular plateau form when seen from viewpoints around the area. For this part of the site, therefore, the strategy was *to develop groupings, using the subtle ridges to orientate them*.

Sketch 5: A group of turbines on an undulating plateau.

Infrastructure

18 Alternative designs for the substation buildings were considered in the design of the windfarm. Should the Scottish Executive be minded to grant consent for the windfarm, a detailed architectural design brief for the substations will be drawn up. This will consider the relative design merits of both traditional buildings (for example, with a slate pitched roof and painted roughcast walls, in the style of existing local farmhouses) versus a more modern design, which more closely reflects the function of the buildings.

19 The access tracks that serve the turbines have been routed so as to follow the ridge tops wherever possible. This is to minimise their visibility in the surrounding landscape. Where tracks cannot follow ridges, they follow other features such as existing farm tracks, valleys, or field boundaries wherever possible.

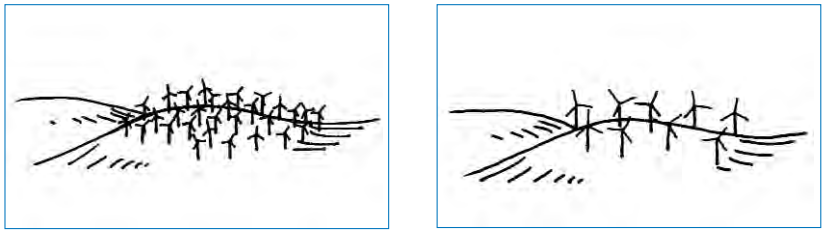
20 The grid connection for the windfarm does not form part of this application for consent. However, the design strategy for the windfarm aims to avoid the potentially confusing design impacts of additional pylons in the site area, by supporting the underground routing of the grid connection.

21 The colour of turbines and transformers has been considered, and it is judged that a non-reflective pale grey should be used for all elements. This is because it would not be possible to use other colours for the lower parts of towers (where they are seen against the land rather than against the sky), or turbines in forested areas, for any one viewing angle, without increasing the impact on other views. In addition, the introduction of more than one colour would reduce the overall visual coherence of the windfarm.

Sketches 6 and 7: Bicoloured turbines are difficult to match up with the horizon..

Scale

22 Larger numbers of smaller turbines compared with smaller number of larger turbines would generate similar yield but have different grouping and visual impacts. A comparative analysis confirmed that greater numbers of smaller turbines have broadly similar ZVIs to fewer larger turbines. However, the greater number of smaller turbines would result in more frequent 'bunching' or 'overlapping' of turbines in views from the surroundings. This 'bunching' or 'overlapping' adversely affected the design objective of reinforcing ridgelines. As a consequence, it was concluded that larger turbines (and fewer) was preferred.



Sketches 8 and 9: Comparison of small and large turbines.

Outcome

23 The application layout is based on the design strategy described above. In particular, the strategy seeks to create a design that reads coherently with the landscape, and is not reliant on arbitrary boundaries that are not present in the landscape (i.e. the site or administrative boundaries).

24 The layout also considers issues of energy yield and incorporates further changes resulting from mitigation of other impacts (see **Table 3.1** below). As a consequence of these other factors, consistent spacing of the turbines has not always been possible along the full length of some ridges. Whilst this may be noticed in some views from the surrounding landscape, on the whole, it is judged that the development will appear to relate to the topography, and that the design objectives have not been compromised.

Modifications to Scheme Design

25 As a consequence of the EIA process, there have been a number of modifications to the design to avoid and minimise environmental impacts without compromising the overall design strategy. These are set out fully in **Table 3.1** below and have included the relocation or removal of turbines, access tracks, borrow pits and associated infrastructure to:

- comply with the overall design strategy;
- reduce visual impacts from key viewpoints;
- increase distances between development components and watercourses;
- avoid key habitats of nature conservation interest;
- increase distances from bird breeding locations;
- reduce noise impacts on residential properties;
- avoid Scheduled Ancient Monuments (SAMs) and other areas of archaeological interest;
- minimise transport impacts;
- remove turbines from the MOD's low fly zone;
- avoid the lines of sight for telecommunications installations.

To illustrate the extent of change, the scoping, baseline and assessment layouts are included as **Appendix 3.2**.

Appendix 2

GLOSSARY

Ancillary infrastructure	The built elements and structures of a windfarm, apart from the turbines, which serve the development, such as access tracks, borrow pits, the control building and substation.
Anemometer mast	A mast erected on a windfarm site, usually the same height as the turbine hubs, to monitor wind speed.
Broad Area of Search	Area(s) to be specified by a Planning Authority within their Spatial Framework for Windfarms where proposals are likely to be supported, subject to specific proposals satisfactorily addressing all other material considerations.
Borrow pit	A quarry within a windfarm site excavated to provide stone for site infrastructure.
Capacity Study	Research which attempts to identify the acceptable limits to development in a given area.
Decommissioning	The process by which a windfarm is dismantled and the site restored.
Design Statement	A document which records the design process that is undertaken for a development.
EIA	Environmental Impact Assessment, the process by which the identification, prediction and evaluation of the key environmental effects of a development are undertaken, and by which the information gathered is used to reduce likely negative effects during the design of the project and then to inform the decision-making process.
European Landscape Convention	Also known as the Florence Convention, the ELC promotes the protection, management and planning of European landscapes and organises European co-operation on landscape issues. It is the first international treaty to be exclusively concerned with all dimensions of European landscape.
LCA	Landscape Character Assessment, a documented process which describes and categorises the landscape, highlighting key landscape characteristics and the main forces for change.
LIA	Landscape Impact Assessment, part of the LVIA process which explores the potential effects on the landscape of a proposed development (see below).
LVIA	Landscape and Visual Impact Assessment – a standard process for examining the landscape and visual effects of a development.
Micrositing	The movement of wind turbines by small distances within the overall windfarm layout, either at the design or construction stages of development.
NSA	National Scenic Area – area designated for its outstanding scenic value and beauty in a national context.

PAN	Planning Advice Notes provide advice on good practice and other relevant information, e.g. PAN45 on Renewable Energy Technologies.
Planning Authority Spatial Frameworks	Frameworks set out in Development Plans by the Local Authority, supported by broad criteria, for the consideration of windfarm proposals over 20 megawatts.
Strategic Locational Guidance (SLG)	SNH Policy Statement which sets out a number of principles that should guide the location of onshore wind farm projects so as to minimise effects on the natural heritage. Provides broad overview at a Scottish level of where, in natural heritage terms, there is likely to be greatest scope for windfarm development, and where there are the most significant constraints.
SPP	Scottish Planning Policy. A statement of Scottish Government planning policy on nationally important land use and other planning matters, supported by a locational framework, e.g. SPP6 focusses on 'Renewable Energy'.
VIA	Visual Impact Assessment, part of the LVIA process, which considers potential changes that arise to available views in a landscape from a development proposal, the resultant effects on visual amenity and people's responses to the changes.
ZTV	Zone of Theoretical Visibility – a mapped visualisation of the areas over which a development can theoretically be seen.

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Angus Local Plan Review (2009)

Implementation Guide for Renewable Energy Proposals

Policies ER34 Renewable Energy Developments
&
ER35 Wind Energy Development

Angus Council
June 2012

PREFACE

There is increasing interest through both informal enquiries and planning applications for the establishment of renewable energy projects in Angus. While the majority are in connection with a range of wind turbine projects, proposals for a number of hydro schemes have also come forward.

The Angus Local Plan Review, formally adopted in February 2009, establishes the Council's land use planning policies in relation to dealing with renewable energy proposals. This Implementation Guide therefore clarifies and expands on Local Plan Review Policies ER34 Renewable Energy Development and ER35 Wind Energy Development and those factors that will be taken into account in considering and advising on proposals for renewable energy projects in Angus. It also directs developers and other interested parties to other relevant documents, policies, regulations and guidance.

The Implementation Guide has been developed through consultation with a wide range of stake holders.

A Strategic Environmental Assessment of the Implementation Guide has also been undertaken and the Environmental Report is published alongside the Implementation Guide and submitted to the Scottish Gateway.

Angus Council
June 2012

Glossary

Watt (W)	a unit of power defined as one joule per second measures the rate of energy conversion
Kilowatt (kW)	equal to one thousand (10^3) watts. One kilowatt of power is approximately equal to 1.34 horsepower. The average annual electrical energy consumption of the average UK household is approx 4,700 kilowatt-hours
Megawatt (MW)	equal to one million (10^6) watts. A large residential or commercial building may consume several megawatts in electric power and heat. Nuclear power plants have net summer capacities between about 500 and 1300 MW
Gigawatt (GW)	equal to one billion (10^9) watts or 1 gigawatt = 1000 megawatts. This unit is sometimes used for large power plants or power grids
Wind croft	development of group of 3 small (less than 15m) wind turbines
Wind cluster	development of group of three or four turbines 15-50m
Wind farm	development of three or more turbines over 50m
Run of river	A hydro electric scheme that abstracts water depending on the flow available within the watercourse at any given time. No storage reservoir.
ZTV	Zone of Theoretical Visibility – a mapped visualisation of the areas over which a development can theoretically be seen.
VIA	Visual Impact Assessment - part of the LVIA process, which considers potential changes that arise to available views in a landscape from a development proposal, the resultant effects on visual amenity and people's responses to the changes
LVIA	Landscape and Visual Impact Assessment - a standard process for examining the landscape and visual effects of a development.
SAS	Scottish Government on-line planning Specific Advice Sheet
Sensitive Properties	Residential properties including care homes; educational buildings, hospitals, cemeteries; some visitor facilities and accommodation; and proposed development areas
EIA	Environmental Impact Assessment - the process by which the identification, prediction and evaluation of the key environmental effects of a development are undertaken, and by which the information gathered is used to reduce likely negative effects during the design of the project and then to inform the decision-making process.
ALPR	Angus Local Plan Review 2009
DASP	Dundee and Angus Structure Plan 2002
HSE	Health and Safety Executive

Contents

Appendices

*The print maps are illustrative of detailed information that can be accessed via the web-based version of the Implementation Guide, They are intended to indicate the location and range of International, National and Local designation within the ALPR area.

1. Purpose and Scope of this Implementation Guide

1.1 Context

Tackling climate change is, potentially, one of the biggest challenges we face. In 1992 the United Nations Framework Convention on Climate Change (http://unfccc.int/2860.php) was adopted as the basis of a global response to the problem. Signatory governments have since agreed to reduce emissions which contribute to climate change and global warming. To help achieve this, the Scottish Government set initial targets to generate 80% of Scotland's electricity (8GW) from renewable sources by 2020, with an interim target 31% by 2011 (5GW). In May 2011 the Scottish Government announced that the 2011 interim target had been exceeded and raised the renewable energy target for 2020 to 100% and 16GW of installed capacity. The planning system will contribute to achieving these targets by ensuring that projects are well located and designed.

The Angus Local Plan Review establishes the development plan policies to be taken into account when assessing proposals for renewable energy projects – policies ER34 Renewable Energy Development and ER35 Wind Energy Development.

In support of the development plan position the Implementation Guide provides:-

- more detailed information and clarification of the main factors that will be taken into account in considering and determining renewable energy proposals in Angus;
- an application checklist (Section 3.3);
- specific guidance for landscape and visual assessment issues in relation to wind turbines (Section 4); and
- specific guidance for guidance on noise assessment in relation to wind turbines (Section 5).

Commentary on technical constraints such as landform, access to the transmission network, accessibility, etc is included as these may have implications for effective development. The Implementation Guide also directs developers and other interested parties to relevant documents, policies and regulations.

Angus Council has reservations about mapping specific areas of search and constraint for wind energy proposals. The identified constraints will naturally restrict development opportunity, but need not prevent it. Applying cumulative impact as a significant constraint is problematic - as each planning application approved alters the potential cumulative impact. Also, there is not a direct correlation between the number of wind energy proposals and the degree of impact. It is appropriate to consider each proposal within the development context of each application rather than apply a theoretical limit. (The Council expressed concerns during the consultation on SPP 6 Renewable Energy Development in 2006, relating to the 20MW threshold in the Location Framework given that the area, turbine size and siting are the cause of impact, not output. Committee Report 1196/06 can be viewed at www.angus.gov.uk/ccmeetings/reports-committee2006/infrastructure/1196.pdf)

1.2 Supporting Documents

This Implementation Guide has been prepared under the provisions of the Town and Country Planning (Scotland) Act 1997 and is subject to the following supporting assessments:-

- Strategic Environmental Assessment
  This Implementation Guide qualifies for the requirements of a Strategic Environmental Assessment (SEA) under the Environmental Assessment (Scotland) Act 2005. An Environmental Report (ER) has been prepared which illustrates the SEA process and all potentially significant environmental effects associated with the Implementation Guide.

- Habitats Regulation Assessment
  Consideration has been given to the requirements of the EC Habitats Directive (92/43EEC) as applied in Scotland through the Conservation (Natural Habitats, &c.) Regulations 1994 (as amended). The Angus Local Plan Review 2009 and the policies that are the subject of this Implementation Guide (ER 34 and ER35) have been subject to an Appropriate Assessment.

  There is no requirement to apply the Regulations to the Implementation Guide. The existing local plan policies aim to protect all sites designated for their natural heritage value from adverse impacts. In addition, any subsequent proposals for renewable energy development will be subject to specific environmental regulation.

- Equalities Impact Assessment screening determined full Equality Impact Assessment in not required.

2. Renewable Energy Overview

Planning permission will be required for most renewable energy developments from either the local planning authority or the Scottish Government. Some small scale renewable energy proposals on both domestic and non domestic buildings are allowed under Permitted Development Rights as defined in Planning Circular 2/2010 http://www.scotland.gov.uk/Publications/2010/03/05114236/0 and as amended in 2010 http://www.oqps.gov.uk/legislation/ssi/ssi2010/ssi_20100027_en_1 and Circular 2/2011 http://www.scotland.gov.uk/Publications/2011/03/17092643/0

There are a wide range of renewable energy technologies which may be considered, and in many cases the scale of the proposal correlates with the scale of potential planning matters that may arise. It should be noted that some developments will also require to be considered under other legislation including, noise, emissions, pollution control which are not part of the planning process and may therefore require additional consents or licences.

2.1 Hydro

The primary source of hydroelectric power in Angus is anticipated to be run of river schemes where water is abstracted from a water course, diverted through pipes to a turbine and returned to the water course. The main elements for the panning system include:-

- Water abstraction – usually by a low, ground or underwater intake weir;
- Pipeline route;
- Turbine house and ancillary structures;
- Water return – usually in the form of a tailrace;
- Access routes; and
- Effect on the water course and its ecology.

Where dams are constructed these are likely to be small scale and planning matters will include:-

- Location and scale of the dam itself;
- Turbine house and other associated structures;
- Outflow/spillway; and
- Hydrogeology.

In all cases the transmission of power, construction works/compound and access routes, and environmental impact should be considered by the applicant.

Landscaping and planting proposals may reduce landscape and/or visual impact and improve biodiversity.

2.2 Bio-energy

Bio-energy or biomass ranges from small scale domestic boilers up to major commercial generators. The main issues will relate to commercial electricity generation, but proposals for domestic bio-energy facilities will still require to demonstrate there are no unacceptable adverse effects, particularly emissions. For commercial generators, not only are there the effects of the plant itself to consider, but the Scottish Government has indicated that fuel source over the life of the plant will be a valid planning consideration to ensure sustainable bio-energy can be sourced. While woody biomass is the major source, there are projects based on straw, distillery waste etc. These later sources are likely to be utilised in smaller facilities, often based around an existing business and reducing their energy costs. The primary planning issues relating to large biomass plants will include:-

- Scale, design and location;
- Emissions;
- Fuel Source;
- Access; and
- Storage facilities.

2.3 Landfill Gas

There will be limited opportunity for this method of generation in Angus, given limited landfill sites and the current waste to heat plant in operation at Lochhead Landfill site. The main planning issues will relate to:-

- Suitability of the location in terms of design and compatibility with surrounding land uses etc. Obviously the choice of location will be restricted by where landfill sites are located;
- Emissions; and
- Design.

2.4 Solar/photovoltaics

There has been no large scale commercial proposal in Angus to date. The primary interest is for roof mounted or free standing arrays associated with existing or proposed properties. In many cases small scale proposals are permitted development, but localised planning concerns can arise and include:-

- Visual impact and surrounding amenity;
- Visual impact where the property is a Listed Building or within a Conservation Area and compatibility with these designations;

2.5 Anaerobic Digestion

This generation method is likely to be of interest to the agriculture and food processing sectors in Angus, where biodegradable waste and farm slurry can be used to generate methane to produce heat and/or electricity. It is a constant and manageable process with a product that can produce energy for onsite or offsite use. The primary planning considerations relate to:-

- Siting and location;
- Fuel source and the implications of importing material to the proposed site;
- Landscape and visual impact; and
- Proposed management and mitigation measures.

There are three types of digester which relate to the temperature of the process:

1. Psychrophylic (15-25^{0}C) – stable and easy to manage but slow.
2. Mesophylic (35-40^{0}C) – process takes 15 to 20 days, but process robust, simple and relatively cheap.
3. Thermophylic (50-60^{0}C) – 12 to 15 days with higher conversion but more complex and costly.

Mesophylic or thermophylic digesters provide higher yields, and can require less space. The process and plant are flexible enough to meet the needs of farm units, through food processing to municipal organic waste disposal.

Proposals may also require to meet regulations relating to emissions, odour and noise.

2.6 Onshore Wind

Development proposals range from small single turbines to major windfarms subject to S36 of the Electricity Act, which are the responsibility of the Energy Consents and Deployment Unit of the Scottish Government. This is the primary area of renewable

energy proposals in Angus and the planning considerations are strongly influenced by the scale and location of the proposal including:-

- Landscape and visual impact;
- Potential adverse effects on designated natural and built heritage sites, protected species;
- Impact on residential amenity, soils and water bodies; and
- Access

2.7 Offshore Wind

Applications for offshore wind farms are submitted to and processed by Marine Scotland. Angus Council has the opportunity to feed into this process through consultation at all stages and to date input has been made on the proposals at Inchcape, Seagreen Phase 1, 2 and 3, and Neart na Gaoithe. The Council is also actively involved in the development for the landfall and transmission of the energy from Seagreen and Inchcape in Angus.

3. Guidance for Applicants

3.1 The land use planning context

The context for renewable development proposals is summarised below.

Table 1: Land Use Planning Context

The **National Planning Framework 2** (NPF2) • aims to 'realise the potential of Scotland's renewable energy resources and facilitate the generation of power and heat from clean, low carbon sources, including … producing heat and power from renewable sources …' • requires 'landscape and visual impacts … to be important considerations in decision-making on developments' • identifies major infrastructure projects needed to deliver the national strategy, including the electricity grid through Angus. http://www.scotland.gov.uk/Resource/Doc/278232/0083591.pdf;
Scottish Planning Policy (SPP 2010) - planning is about:- • where development should happen; • where it should not; and • how it interacts with its surroundings. This involves promoting and facilitating development while protecting and enhancing the natural and built environment in which we live, work and spend our leisure time. http://www.scotland.gov.uk/Resource/Doc/300760/0093908.pdf
Planning Advice Notes (PANs) provide information and advice on technical planning matters including:- • web based Renewables Advice http://www.scotland.gov.uk/Topics/Built-Environment/planning/National-Planning-Policy/themes/renewables • PAN 45 Annex 1 Planning for Micro Renewables (2006) http://www.scotland.gov.uk/Publications/2006/10/03093936/0
Dundee and Angus Structure Plan:- makes positive provision for renewable energy generating developments where they are compatible with other environmental and community interests.
Angus Local Plan Review aims to promote:- • renewable energy development and • low or zero carbon emissions in new development. www.angus.gov.uk/localplan/
The **Implementation Guide** aims to:- • clarify and expand policies ER34 : Renewable Energy Development and ER35 : Wind Energy Development: and • support the Council's climate change commitment
Under the **Electricity (Scotland) Act 1989**, Scottish Ministers determine applications for large scale renewable energy (Section 36) and overhead power lines and associated infrastructure (Section 37). Further information on Section 36 and Section 37 consents

procedures can be found at www.scotland.gov.uk/Topics/Business-Industry/Energy/Infrastructure/Energy-Consents/ The established thresholds are as follows:-	
Scottish Ministers	**Local Authorities**
onshore windfarms > 50MW	onshore windfarms < 50MW
	offshore wind farms < 1MW
Wave, tidal and hydroelectric schemes >50MW	Wave, tidal and hydroelectric schemes <50MW
overhead power lines and associated infrastructure	
large oil and gas pipelines	

3.2 Development Plan Context

The statutory development plan provides the basis for assessing development proposals and determining applications including those for renewable energy development. In Angus it comprises:-

- Dundee and Angus Structure Pan 2002 (DASP) - establishes strategic policy, and reflects national planning policy at the time. It makes positive provision for renewable energy generating developments where they are compatible with other environmental and community interests. Environmental Resources Policy 10: Renewable Energy also requires local plans to establish detailed criteria based policy, locational guidance and where appropriate areas of search for individual sources of renewable energy. www.angus.gov.uk/structureplan/

- Angus Local Plan Review 2009 (ALPR) - establishes the detailed policy basis for development management in Angus, including renewable energy development. That part of Angus within the Cairngorms National Park is excluded. www.angus.gov.uk/localplan/

- Cairngorms National Park Local Plan (2010) - applies to the Upper Angus Glens (see Figure 1) and is not covered by this Implementation Guide. http://www.cairngorms.co.uk/park-authority/planning/

The Planning etc. (Scotland) Act 2006 introduces Strategic Development Plans (SDPs) for the four City Regions of Aberdeen, Dundee, Edinburgh and Glasgow and Local Development Plans (LDPs) to replace current structure and local plans. The Strategic Development Plan Authority for the Dundee City Region is a partnership of Angus, Dundee City, Fife and Perth & Kinross Councils. When approved, TAYplan (the Strategic Development Plan) will replace the current approved Structure Plans of the four local authorities. Progress on TAYplan can be viewed at www.tayplan-sdpa.gov.uk

The Development Plan is supportive of renewable energy in principle, and the ALPR establishes criteria against which renewable energy proposals will be assessed. Policy ER34 addresses potential adverse impacts that could arise. Development proposals for wind energy are also considered within the context of ER35 and related text. The full wording of the policies is set out in Appendix 2. These policies provide the basis for the more detailed guidance contained within this Implementation Guide. The ALPR contains a range of other policies against which any development proposal is considered, and where relevant the Implementation Guide will refer to these in the context of renewable energy projects.

Although community owned renewable energy generation is supported in principle where proposals are compatible with development plan policy, it must be made clear that negotiating or securing local community benefit is wholly separate from the planning application process. Angus Council's position is set out in Para 3.86, page 97 of the adopted Angus Local Plan Review. It is however recognised that where renewable energy schemes accord with the development plan there may be opportunity to secure contributions from developers for local community initiatives. However any such negotiations between the community and developers and any local contributions secured are totally separate from the land use planning and planning gain processes and will not be considered as part of any planning application. Such local community benefit initiatives will therefore not fall within the obligations required under Section 75 Planning Agreements and will require to be managed by other means.

Proposals for renewable energy development in that part of Angus within the Cairngorms National Park, will be determined by the Cairngorms National Park Authority (CNPA) within the context of the polices of the Cairngorms National Park Plan. Renewable Energy proposals within Angus that may affect the National Park, or its setting, will be referred to the CNPA for comment, and their views taken into account by Angus Council in the determination of any planning application.

3.3 Applications Checklist

In accordance with the Land Use Planning Context outline above, Table 2: Applications Checklist summarises the supporting information that may be required to accompany a planning application for renewable energy development. This is an aid for applicants, and for detailed information should be read in conjunction with the rest of this Implementation Guide, the Development Plan and other relevant legislation, policy and advice.

Table 2: Applications Checklist

The checklist is designed to identify the supporting information required to determine a planning application for renewable energy development. The information should be proportionate to the proposal, and the checklist indicates the requirements for different technologies and scales of development. It is intended as an aid to applicants, and whilst it aims to be comprehensive there may be site specific considerations or changes to legislation or guidance from the Scottish Government and statutory agencies. Applications will be considered in the context of current guidance.

	Wind Energy Development (Height to blade tip unless otherwise stated)				**Other Renewable Energy Development**
	Turbine height up to 15m	**Turbine height 15 - 50m**	**Turbine height greater than 50m OR groups of 6 or more turbines in excess of 25m height**	**Projects > 50MW (Section 36 applications)**	
Landscape and Visual Representation	Technical information from the turbine supplier often adequate. Photomontage may be requested to illustrate relationship. Eight figure grid reference for each proposed turbine	Basic level of VIA should include :- • ZTV map covering an area up to 20km (radius) from the turbine; • wireline drawings and/or photomontages from a limited number of key viewpoints: • viewpoints to be agreed with Angus Council, and SNH where appropriate: • design statement may be required in the case of multiple turbines; and • eight figure grid reference for each proposed turbine	Full Landscape and Visual Impact (LVIA) should address the sensitivity, magnitude and significance of landscape and visual impact and include: • ZTV map covering an area up to 35km (radius) from the turbine; • wireline drawings and/or photomontages from key viewpoints; • assessment of landscape sensitivity, magnitude of change and residual impacts. • viewpoints to be agreed with Angus Council, and SNH where appropriate; • design statement identifying design objectives and process; and • eight figure grid reference for each proposed turbine.		VIA or LVIA may be required for larger structures depending on scale, type and location of the proposal.

	Wind Energy Development (Height to blade tip unless otherwise stated)				Other Renewable Energy Development
	Turbine height up to 15m	**Turbine height 15 - 50m**	**Turbine height greater than 50m OR groups of 6 or more turbines in excess of 25m height**	**Projects > 50MW (Section 36 applications)**	
		Where proposals are within the ALPR area but may affect the Cairngorms National Park or its setting, applicants are advised to consult the Cairngorms National Park Authority. Applications.			
Cumulative Assessment	A significant constraint to potential wind energy development. The proposals eligible for inclusion in a Cumulative Assessment is dynamic. An appropriate date for baseline data should be agreed with the authority and relevant proposals identified and agreed with Angus Council prior to commencement. Cumulative assessments will normally be required where turbines are >50m to blade tip. The assessment will require to take account of agreed existing/proposed developments over 50m. They may also require to consider agreed existing/proposed smaller turbines where they visually interact with the proposal. Cumulative assessments have not normally been required where turbines are 25-50m to blade tip, but as more turbines under 50m are constructed, a cumulative assessment may be required if turbine density within the area of a ZTV map is deemed to have a potentially unacceptable cumulative impact.				Depending on scale, type and location of the proposal there may be a requirement to assess its impact in conjunction with other existing or proposed development.
		A cumulative ZTV (CZTV) should be produced on a clear and legible 1:50k Ordnance Survey Base plan. The CZTV would typically have a radius of up to 60km, in accordance with SNH guidance. The CZTV should:- 1. include all consents and operational turbines over 50m to blade tip; 2. include extant planning consents and submitted applications which pre-date the submission and which are assessed by the Council to have a realistic expectation of a decision within 12 months; 3. include turbines under 50m (applications at an advanced stage, consents or operational) depending on their scale and location in relation to the application site i.e. visual interaction. This will only apply in specific circumstances;			

	Wind Energy Development (Height to blade tip unless otherwise stated)				Other Renewable Energy Development
	Turbine height up to 15m	**Turbine height 15 - 50m**	**Turbine height greater than 50m OR groups of 6 or more turbines in excess of 25m height**	**Projects > 50MW (Section 36 applications)**	
		4. include consented and proposed offshore proposals; 5. other relevant proposals in the public domain; 6. viewpoints for cumulative assessment, selected to provide representative views of all intervisible turbines, not from viewpoints selected to assess the application site. For example, a viewpoint may provide views in succession as defined by SNH (SNH Cumulative Effect of Windfarms (revised 2005)); and 7. Cumulative assessments to address effects in combination; in succession; in sequence and perceived in accordance with SNH Cumulative Effect of Windfarms (revised 2005) http://www.snh.gov.uk/docs/A305440.pdf Following the production of a CZTV, proposed viewpoints should be added and submitted to Angus Council for approval prior to carrying out the assessment. Angus Council does not use file share software. All submissions should be provided in a format which permits high resolution images to be provided. The use of CDs is advised.			
Environmental Impact Assessment (EIA)	An EIA will not generally be required.	Environmental Impact Assessment (EIA) may be required under the terms of The Town and Country Planning (Environmental Impact Assessment) (Scotland) Regulations 2011:- • a Screening Opinion should be sought for turbines over 15m; more that 2 turbines; or located in a 'sensitive area'* to determine whether the development requires EIA under the terms of Schedule 2 of the Town and Country Planning (Environmental Impact Assessment) (Scotland) Regulations 2011. taking account of the selection criteria in Schedule 3 of the Regulations as laid reproduced in ANNEX A of Planning Circular The Town and Country Planning (Environmental Impact Assessment) (Scotland) Regulations 2011 http://www.scotland.gov.uk/Publications/2011/06/01084419/10 • scoping for the Environmental Report should be prepared in accordance with ANNEX B of Planning Circular The Town and Country Planning (Environmental Impact Assessment) (Scotland) Regulations 2011			EIA may be required under the terms of The Town and Country Planning (Environmental Impact Assessment) (Scotland) Regulations 2011

	Wind Energy Development (Height to blade tip unless otherwise stated)				Other Renewable Energy Development
	Turbine height up to 15m	**Turbine height 15 - 50m**	**Turbine height greater than 50m OR groups of 6 or more turbines in excess of 25m height**	**Projects > 50MW (Section 36 applications)**	
		• an EIA will require to demonstrate potential impacts, including length and significance of effect and mitigation measures for all components of an application • where EIA is not be required, environmental information may still be required to consider agreed impacts. * Sensitive Areas are defined in the Regulations as :- Sites of Special Scientific Interest; Land subject to Nature Conservation Orders; International Conservation Sites; National Scenic Areas; World Heritage Sites; Scheduled Monuments; and National Parks.			
		Formal screening requests and determination will be publically available. Screening Determinations are valid for 12 months.			
Natural Heritage Designation	Applicants can use SNHi to check protected areas .	Applicants are advised to refer to SNH Small Scale Wind Energy Guidance and to use SNHi to check protected areas within a 20km radius of the proposal. http://www.snh.gov.uk/publications-data-and-research/snhi-information-service/			
	International and National Designation – Supporting information must demonstrate that proposals (including all associated works) will not affect such sites to an unacceptable degree. Where proposals may have a significant effect on European Sites (SAC or SPA), they should be screened in accordance with the Habitats Regulations Directive. A Habitats Regulation Appraisal may be required. Where mitigation measures are proposed these must be shown to be:- • achievable; • agreed with SNH and any organisation responsible for managing the designated site or with responsibility for the maintenance of				

	the site and the integrity of the reason for its designation; and • subject to planning conditions or a Section 75 agreement as appropriate.
	Other Natural Heritage designations should be accorded appropriate protection and/or mitigation http://www.taysidebiodiversity.co.uk/

	Wind Energy Development (Height to blade tip unless otherwise stated)				Other Renewable Energy Development
	Turbine height up to 15m	**Turbine height 15- 50m**	**Turbine height greater than 50m OR groups of 6 or more turbines in excess of 25m height**	**Projects > 50MW (Section 36 applications)**	
Historic Environment	Supporting information should identify historic and archaeological sites affected by the proposal, proportionate with the scale and number of turbines; the effect of the proposal and all associated works on the integrity of a site, its setting; requirements for archaeological survey and recording; and any proposed mitigation measures.				
	Guidance on assessing impacts on historic views has recently been published by English Heritage and may be used to inform the Council's assessment of wind energy developments. http://www.english-heritage.org.uk/content/publications/docs/seeing-history-in-view.pdf				
Noise Assessment	Where a noise assessment is required the methodology and cumulative considerations must be agreed with Angus Council Environmental and Consumer Protection. Failure to agree the methodology or to provide sufficient information may result in the application being recommended for refusal on the basis of lack of information. (See Section 5)				
Peat and soils	Where proposals affect peat soils, applicants should demonstrate carbon savings are calculated in accordance with Scottish Government advice and that SEPA and SNH have been consulted. http://www.scotland.gov.uk/Resource/Doc/229725/0062213.pdf A peat depth survey will be required where appropriate.				
	Development should minimise disruption to soils in accordance with the Scottish Soils Framework http://www.scotland.gov.uk/Resource/Doc/273170/0081576.pdf				
Water Environment	Development proposals should not lead to the deterioration in the condition of any water body, in accordance with the Tay Area Management Plan.				
		Where proposals are within the source catchment area of any private water supply potential impact must be considered and, if necessary, mitigation measures implemented			

	Supporting information should include a drainage assessment as appropriate.

<table>
<tr><td></td><td colspan="4">Wind Energy Development
(Height to blade tip unless otherwise stated)</td><td>Other Renewable Energy Development</td></tr>
<tr><td></td><td>Turbine height up to 15m</td><td>Turbine height 15 - 50m</td><td>Turbine height greater than 50m OR groups of 6 or more turbines in excess of 25m height</td><td>Projects > 50MW (Section 36 applications)</td><td></td></tr>
<tr><td></td><td colspan="5">Identify pollution risk and mitigate through the provision of buffer zones to protect wetland and private water supplies as appropriate</td></tr>
<tr><td>Air Quality</td><td></td><td></td><td></td><td></td><td>Proposals for bio-energy and anaerobic digestion may require an air quality impact assessment</td></tr>
<tr><td>Residential Amenity</td><td colspan="2">Assessment to include properties agreed with Angus Council subject to:-</td><td colspan="2">Assessment to include properties within a 2km radius of the proposed turbine(s) subject to:-</td><td rowspan="2">Amenity to be addressed within the context of Policy S6 and Schedule 1 as appropriate. Other amenity controls will be enforced through the relevant agencies including SEPA and HSE</td></tr>
<tr><td colspan="4">• scale of turbine and blade size;
• existence of buffers including woodland, buildings, landform; and
• location and aspect of primary rooms and garden ground,</td></tr>
<tr><td></td><td colspan="4">Turbines should generally be a minimum of 10 times rotor diameter from sensitive properties* to avoid the potential effects of shadow flicker.

* Sensitive properties include:- residential properties including care homes; educational buildings, hospitals, cemeteries; some visitor facilities and accommodation; and proposed development areas</td><td></td></tr>
</table>

	Wind Energy Development (Height to blade tip unless otherwise stated)				Other Renewable Energy Development
	Turbine height up to 15m	**Turbine height 15 - 50m**	**Turbine height greater than 50m OR groups of 6 or more turbines in excess of 25m height**	**Projects > 50MW (Section 36 applications)**	
Access and Traffic Management	Access likely to be feasible within existing road network Angus Council Roads Division will be consulted.		Access to be agreed with Angus Council Roads Division.	Access arrangements and traffic management plan and suitable route for large vehicles to be agreed with Angus Council Roads Division. Any required road improvements to be implemented prior to commencement of construction.	Access to be agreed with Angus Council Roads Division, including management plan and suitable route for large vehicles where necessary.
	Any new tracks to be included in the planning application, supporting information and decommissioning /reinstatement agreement.				
	Transport Scotland advise that a wind turbine should be located no closer than 1.5 x the Wind Turbine height to the nearside Trunk Road kerb line. For the avoidance of doubt the nearside kerb line is either the kerb of the live carriageway or the nearside heel kerb of the Trunk Road footway if present. Angus Council will apply this principle to all turbine proposals adjacent to a public road, for reasons of road safety.				
Other	Supporting information should include reasons for site selection and evidence of viability				
	Where proposals are within the Cairngorms National Park Area, they will be referred to, and may be called in for determination by, the Cairngorms National Park Authority.				
	Where proposals are located on the coast, applications should demonstrate they have been assessed within the context of the developer/undeveloped coast as defined in the SPP and Angus Local Plan Review and Shoreline Management Plan for Angus. Advice on the sustainable use of the Tay Estuary and adjacent coastal waters can be found in the Management Plan published by the Tay Estuary Forum (http://www.dundee.ac.uk/crsem/TEF/PDFS/Management%20Plan%20Final.pdf)				

3.4 Additional Guidance for ALPR Policies ER34 and ER35

Sections 3.4 and 3.5 expand on each of the two main policies and the specific criteria and sets out in more detail those matters that will be taken into account in considering and assessing development proposals. Interconnection with other policies and background information sources is also highlighted.

Policy ER34: Renewable Energy Developments
This policy sets the criteria against which all renewable energy proposals will be assessed, and where wind turbines are proposed should be read in conjunction with policy ER35. Other development plan policies will be applied where appropriate.

Policy ER34: Renewable Energy Developments ***Proposals for all forms of renewable energy developments will be supported in principle and will be assessed against the following criteria:-***

In all instances 'renewable energy developments' encompass all works associated with the proposal including formation and extension of, or improvement to, access tracks, areas of hard standing/external storage areas, borrow pits, landscaping and bunding, foundations, sub-stations, equipment cabins and any other related or ancillary works and structures . The following policy guidance applies to all renewable energy proposals as appropriate:-

Criterion (a)
'the siting and appearance of apparatus have been chosen to minimise the impact on amenity, while respecting operational efficiency;'

The choice of apparatus and its siting can significantly affect the appearance/impact of a renewable energy installation. 'Apparatus' includes generating equipment and ancillary structures such as transformer houses, transmission infrastructure, and storage facilities.

Wind and water powered renewable energy schemes, tend to be located within the rural landscape and their design should reflect this. Well sited and designed developments can, at best, enhance their setting or at least minimise potential impacts. Poorly sited or designed development can do the opposite – and may have an adverse impact on amenity for decades to come. Appropriate landscaping and planting can help a building or other appropriately scaled structure to blend into the landscape.

Where development proposals will impact on residential or recreational amenity, the choice of equipment may be of particular importance. Wind turbines for example should be chosen to reflect the scale of the landscape, light and visibility conditions and should respect residential amenity including noise and shadow flicker. Hydro-electric dams should be designed to respect the scale, colours and contours of the surrounding landscape.

It is accepted that wind energy technology is advancing rapidly and that there is a wide range of turbines available to the market. Initial discussions between the Council and developers should however seek to establish some basic characteristics such as proposed number and size of turbines, height (hub and blade tip), blade

number, colour and style although it is recognised that this may be amended as the project feasibility is developed. Similarly where a full planning application is submitted this must include details of all aspects of the proposal. Where a specific proposal has been approved by the Council any alteration to that project must be agreed in writing with the Council prior to implementation.

Other Relevant ALPR policies
Policy S3: Design Quality
Policy S6: Development Principles and Schedule 1: Development Principles
Policy ER10: Light Pollution
Policy ER11: Noise Pollution

Additional information
Tayside Landscape Character Assessment
http://www.snh.org.uk/pubs/detail.asp?id=310

Criterion (b)
there will be no unacceptable adverse landscape and visual impacts having regard to landscape character, setting within the immediate and wider landscape, and sensitive viewpoints;

Landscape and visual impact varies with the location, scale and type of renewable energy scheme proposed. For example wind turbines tend to be in exposed locations, and visible over a long distance; while hydroelectric schemes may be contained within a river valley; and solar panels fitted to an existing property roof tend to have a localised impact. As the extent and degree of landscape and visual impact increases so to does the need to assess potential cumulative issues and mitigation measures. The supporting information and accompanying visual/graphic information should be commensurate with the scale and location of the proposal.

It is likely the small hydro proposals will continue to come forward, and where they can be accommodated without detriment to the local environment and water courses, will be supported. Larger schemes can generate greater impact on water courses, fish, and the surrounding area as the diversion of water is much greater and more evidence of impact and mitigation will be required in order to determine any planning application. . Where river dams and associated buildings are proposed landscaping, contouring and planting can help structures blend into their setting, whilst also promoting biodiversity and habitat creation/enhancement. A range of advice is available for applicants considering hydro schemes including landscape and visual impacts. Consideration of associated infrastructure (pump house, tailrace, access, transmission, pipe routes etc) should be included in supporting information.

All forms of renewable energy development should be considered within their landscape context where applicable, Policy S6: Development Principles and Schedule 1 : Development Principles will form the basis for the assessment of small scale proposals, which have a local impact only. Scottish Natural Heritage has developed a series of Advice Notes on assessing the landscape impact of a range of renewable energy developments on the landscape, and their advice will be sought by the Council as appropriate.

Landscape and Visual Impact of Wind Turbines

Wind turbines are likely to have the greatest landscape and visual impact over the greatest distance and this aspect is addressed in Section 4 Landscape and Visual Assessment of Wind Energy Proposals.

Other Relevant ALPR policies

ER5: Conservation of Landscape Character
ER12: Development Affecting Conservation Areas
ER16: Development Affecting the Setting of a Listed Building
ER18: Archaeological Sites of National Importance
ER19: Archaeological Sites of Local Importance
ER20: Historic Gardens and Designed Landscapes
ER29: Coastal Development

Additional information

Scottish Natural Heritage (SNH) provides a comprehensive range of advice regarding landscape and visual impact on the natural heritage while Historic Scotland, Architecture and Design Scotland (ADS) and the local planning authority can advise on the built environment. Design statements can help applicants preparing development proposals to consider and articulate the processes undertaken in reaching final layout, siting and design and help inform the decision making process.

SNH Policy Statement 02/02 Strategic Locational Guidance for Onshore Windfarms in respect of Natural Heritage (updated 2009).
www.snh.gov.uk/docs/A247182.pdf
Associated Maps –
www.snh.gov.uk/docs/C208971.pdf
www.snh.gov.uk/docs/C208972.pdf
www.snh.gov.uk/docs/C208973.pdf
www.snh.gov.uk/docs/C208974.pdf
www.snh.gov.uk/docs/C208975.pdf

SNH Visual Representation of Windfarms (2006)
www.snh.gov.uk/docs/A305436.pdf

SNH Visual Assessment of Windfarms Best Practice (2002)
www.snh.gov.uk/docs/A305437.pdf

SNH Siting and designing Windfarms in the Landscape (2009)
www.snh.gov.uk/docs/A317537.pdf

Renewable energy technologies and the potential impacts on landscape and nature
http://www.snh.gov.uk/planning-and-development/renewable-energy/

Guidance on Hydro electric Schemes and the Natural Heritage
http://www.snh.gov.uk/docs/C278964.pdf

Aiding the Hydro-scheme development process - web-links to useful information sources
http://www.snh.gov.uk/docs/C252875.pdf

Tayside Landscape Character Assessment
www.snh.org.uk/pubs/detail.asp?id=310

Angus Windfarms – Landscape Capacity and Cumulative Impacts Study (2008)
www.angus.gov.uk/devcontrol/LandscapeCapacityandCumulativeImpactAssessmentFinal.pdf

Historic Scotland - Scottish Historic Environment Policy (SHEP)
www.historic-scotland.gov.uk/index/heritage/policy/shep.htm

Criterion (c)
the development will have no unacceptable detrimental effect on any sites designated for natural heritage, scientific, historic or archaeological reasons;

There are a number of sites throughout Angus designated for their built, cultural, biodiversity, and natural heritage qualities. These range in scale from individual listed properties up to extensive areas such as Montrose Basin or that part of Angus designated as part of the Cairngorms National Park. Their value is established, and they are safeguarded for present and future generations, through legislation. The integrity of such designations may be affected by activity beyond site boundaries and even into other authorities. Much will depend on the details of an individual proposal – scale, location and type. In assessing development proposals, priority will be given to the maintenance of the quality of the built and natural heritage. Where appropriate, mitigation measures should be investigated and their efficacy demonstrated to ensure compatibility with protected sites.

Natural heritage and scientific designations are subject to a range of legislation, policy, and guidance. Development proposals must be able to demonstrate that there will be no unacceptable direct or indirect adverse affects on the integrity of designated sites or the reason for their protection. There is a hierarchy of designated sites, habitats and species ranging from international to local significance with levels of protection proportionate to status. Where remediation measures can successfully redress potential adverse impact, these must be agreed with the relevant advisory agency and subject to a planning condition or legal agreement.

There are no international designations within the ALPR area, but there are a number of European sites (SPAs and SCAs) including The River Tay, River South Esk and Firth of Tay SACs and SPAs at Montrose Basin, Kinnordy and Lintrathen Lochs and the Firth of Tay.

There are no local nature conservation sites designated within Angus to guide developers, but where locally important habitat or beauty spots are affected, these should be afforded appropriate protection. Local factors will be assessed as part of the consideration of development proposals and where identified through EIA screening and scoping studies should be addressed by supporting information.

Where a proposal affects a designated site an Environmental Impact Assessment may be required, depending on the scale of the proposal and anticipated impact. Proposals which come within the provisions of the Electricity Act 1989 will require to meet the terms of the Electricity Works (Environmental Impact Assessment) (Scotland) Regulations 2000.
www.scotland.gov.uk/Topics/Business-Industry/Energy/Infrastructure/Energy-Consents/Guidance/EIA-Guidance

Sites and areas designated for historic and archaeological reasons are also subject to a range of policy, guidance and legislation. No World Heritage Sites have been identified within Angus, and Historic Scotland is responsible for the protection of sites of national and international status. Angus Council is responsible for determining applications for Listed Building Consent (LBC) and the identification of Conservation Areas and their subsequent protection. Protection of the built heritage extends beyond the actual property and curtilage to encompass its character and setting. This includes Historic Gardens and Designed Landscapes; all listed buildings; and scheduled ancient monuments. Historic Scotland and the Council's

Archaeological Service are consulted as appropriate. Where local archaeological sites and areas are known, or suspected, the Council will seek advice on the assessing and recording of any features.

Appropriate Level of Assessment

Proposals of more than two turbines or a hub height more than 15m tall, or and hydroelectric scheme with a capacity of over 0.5MW, fall within Schedule 2 of the Environmental Impact Assessment (Scotland) Regulations 2011. Such applications and those within or affecting:

- Sites of Special Scientific Interest
- Land subject to Nature Conservation Orders
- International Conservation Sites
- National Scenic Areas
- World Heritage Sites
- Scheduled Monuments and their settings
- National Parks.

may require a screening opinion from the planning authority to determine whether a formal EIA of the proposed development is required.

Where appropriate, proposals will be judged in conjunction with the consultation agencies as to whether a formal EIA is required. While only a small proportion of development proposals are likely to require EIA, an EIA is *not* discretionary if significant effects on the environment are likely and should be prepared in accordance with the relevant legislation and guidance listed below.

Where a development is of a scale or in a location where a formal EIA is deemed not necessary, the applicant must submit a planning statement on impact, including any proposed mitigation measures. In the case of wind turbines, the statement should address the constraints identified in the SAS for Onshore Wind Turbines. The level of detail should also reflect the scale and location of the proposal.

Guidance can be obtained from SNH, in their publication Hydroelectric Schemes and the Natural Heritage http://www.snh.gov.uk/docs/C278964.pdf

Other Relevant ALPR policies

Policy ER1: Natura 2000 and Ramsar Sites
Policy ER2: National Nature Reserves and Sites of Special Scientific Interest
Policy ER3: Regional and Local Designations
Policy ER4: Wider Natural Heritage and Biodiversity

Policy and Legislation

Scottish Government
Planning Circular 3 The Town and Country Planning (Environmental Impact Assessment)(Scotland) Regulations (2011)
http://www.scotland.gov.uk/Publications/2011/06/01084419/10

PAN 58 Environmental Impact Assessment (1998)
http://www.scotland.gov.uk/Publications/1999/10/pan58-root/pan58
EIA Screening Checklist - http://www.scotland.gov.uk/Resource/Doc/212607/0117167.pdf
PAN 2/2011 Planning and Archaeology
http://www.scotland.gov.uk/Publications/2011/081041322003/0

Scottish Government – web based Renewables Specific Advice Sheets
http://www.scotland.gov.uk/Topics/Built-Environment/planning/National-Planning-Policy/themes/renewables

The Electricity Works (Environmental Impact Assessment) (Scotland) Amendment Regulations 2008 (Revised 2009)
http://www.scotland.gov.uk/Topics/Business-Industry/Energy/Infrastructure/Energy-Consents/Guidance/EIA-Amendment-Regs-2008

Town and Country Planning (Scotland) Act 1997 (As Amended)
Environmental Impact Assessment (Scotland) Regulations 2011

EU Birds Directive and Annex1
EU Habitats Directive and Annexes 1 and 2
Habitats/protectedareas/NATURA

Additional information

IEEM
Guidelines for Ecological Impact Assessment in the United Kingdom
http://www.ieem.net/ecia/impact-assess.html

SNH
Handbook of Environmental Assessment (2009 Draft)
http://www.snh.gov.uk/docs/B460796.pdf
SNH Renewable Energy Information page
http://www.snh.gov.uk/planning-and-development/renewable-energy/
Wild Land
http://www.snh.gov.uk/protecting-scotlands-nature/looking-after-landscapes/landscape-policy-and-guidance/wild-land/
Guidance on Assessing Connectivity with Special Protection Areas (SPAs)
http://www.snh.gov.uk/docs/A675474.pdf
Soils and Natural Heritage
http://www.snh.gov.uk/docs/A327906.pdf

SNH, Perth and Kinross Council, SEPA and Angus Council
River Tay Special Area of Conservation (SAC) – Advicce to Developers
http://www.snh.org.uk/pdfs/publications/designatedareas/River%20Tay%20SAC.pdf

SNH, SEPA and Angus Council
River South Esk Special Area of Conservation (SAC) – Advicce to Developers
http://www.snh.org.uk/pdfs/publications/designatedareas/River%20South%20Esk%20SAC.pdf

Historic Scotland
Scottish Historic Environment Policy
http://www.historic-scotland.gov.uk/index/heritage/policy/shep.htm
Environmental Assessment
http://www.historic-scotland.gov.uk/index/heritage/policy/environmental-assessment.htm
Gardens and Designed Landscapes
http://www.historic-scotland.gov.uk/index/heritage/gardens.htm

Scottish Government
Historic Environment
http://www.scotland.gov.uk/Topics/Built-Environment/planning/National-Planning-Policy/themes/historic

Natural Environment
http://www.scotland.gov.uk/Topics/Built-Environment/planning/National-Planning-Policy/themes/natural-heritage

Angus Council
State of the Environment Report
www.angus.gov.uk/sustainability/pdfs/StateofEnvironment2011.pdf

Cairngorms National Park Authority
http://www.cairngorms.co.uk/resource/docs/boardpapers/22072011/CNPA.Paper.4440.Planning%20Committee.Paper.8.-..Appe.pdf

Criterion (d)
no unacceptable environmental effects of transmission lines, within and beyond the site;

Ancillary works required to transmit electricity from the site should form part of any renewable energy development proposal to ensure their inclusion in any EIA. Where deemed necessary by the planning authority, consideration will be given to undergrounding of cables and pipe work.

Most overhead power lines will be determined by Scottish Government under S37 of the Electricity (Scotland) Act 1989.

Criterion (e)
access for construction and maintenance traffic can be achieved without compromising road safety or causing unacceptable permanent change to the environment and landscape,

Renewable energy projects, by their very nature, may promote sites which have limited or no existing vehicular access. The construction, repair, maintenance and decommissioning will normally require access by heavy and/or long vehicles over the life of the project. In some cases, there may be a continuation of the life of a scheme with consequent renewal, replacement or upgrading in the longer term.

Any project proposal must therefore prepare and submit a route assessment and traffic management plan, which demonstrates:-

- how access is to be achieved;
- selected routes have been assessed and are capable of accommodating traffic generated;
- traffic management over the construction phase; and
- longer term access requirements.

If road improvements are required, these must be approved by Angus Council Roads division, part of Infrastructure Services. Site access should allow all vehicles visiting the site to have space to manoeuvre to ensure safe access and egress.

The formation of new, or upgrading of existing, tracks over open countryside/uplands should be designed to avoid generating run off/surface water flooding and be re-instated on completion of construction, where they will not be regularly in use.

Provision must be made for the re-instatement of any existing and proposed tracks when the site is decommissioned.

Other Relevant ALPR policies
Policy S2: Accessible Development
Policy S3: Design Quality
Policy S4: Environmental Protection

Policy S6: Development Principles and Schedule 1: Development Principles

Additional information
SNH – Constructed Tracks in the Scottish Uplands (2005)
http://www.snh.gov.uk/docs/A308736.pdf

SNH and Forestry Commission Scotland – Floating Roads on Peat
http://www.roadex.org/uploads/publications/Seminars/Scotland/FCE:SNH%20Floating%20Roads%20on%20Peat%20report.pdf

Scottish Renewables, SNH, SEPA and Forestry Commission Scotland – Good Practice During Windfarm Construction
http://www.snh.org.uk/pdfs/strategy/renewables/Good%20practice%20during%20windfarm%20construction.pdf

Angus Council
The Roads Division is part of the Infrastructure Services Department, Angus Council, County Buildings, Market Street, Forfar, Angus, DD8 3LG
Contact: ROADS@angus.gov.uk

Criterion (f)
that there will be no unacceptable impacts on the quantity or quality of groundwater or surface water resources during construction, operation and decommissioning of the energy plant.

Ground and surface water – including coastal waters, water courses, standing water, peat soils, wetlands and ground water – is an important environmental and commercial asset in Angus. Their identification and quality classification has been established through the Water Framework Directive and the Tay Area Management Plan sets the framework for development that affects them. Applicants will require to demonstrate that development proposals should maintain or enhance ground and surface waters features, not cause deterioration. Groundwater wetlands should be incorporated in Phase 1 Habitat surveys and where appropriate include a buffer zone of 100m between features and roads, tracks and trenches, increasing to 250m for borrow pits and foundations.

Water Supply
The protection of drinking water, both public and private supplies, will be a priority. Where a development proposal is deemed to affect a potable supply the applicant will require to demonstrate there are no unacceptable adverse effects, or how these can be mitigated if feasible. This may include the requirement for a buffer zone of 100m between features and roads, tracks and trenches, increasing to 250m for borrow pits and foundations. Any works within these distances should demonstrate (e.g. through a hydrogeological assessment) that impacts on abstractions are acceptable.

Flooding
The SPP www.scotland.gov.uk/Resource/Doc/300760/0093908.pdf establishes a risk framework which provides a basis for planning decisions where there is a potential flood risk. Development proposals located within, or affecting known flood risk areas, will be considered within the context of this framework and referred to SEPA where necessary. Angus Council Roads are the Flood Prevention Authority and advise on flood prevention and flood risk standards for new roads, car parks and footpaths.

SEPA have produced an Indicative River and Coastal Flood Map which can be viewed at www.sepa.org.uk/flooding/flood_map/view_the_map.aspx

Water Quality

The water environment is a potential constraint to renewable energy development, particularly in relation to construction works. Applicants should demonstrate that

- no unacceptable damage to the water environment will result from their development;
- all pollution risks and mitigation measures during construction, operation and decommissioning have been identified;
- developments are designed to avoid engineering activities (such as culverts) in the water environment; and
- project management is in place to mitigate potential adverse impacts during the construction phase.

Peat Soils

Where peat soils are affected by potential renewable energy development applicants should consider:-

- Ground water contamination;
- Damage to peatland habitat, especially on or adjacent to designated sites. Early consultation with SNH and SEPA is advised where a proposed development is likely to affect peatland or mire systems;
- In relation to wind energy proposals Scottish Government advice on calculating carbon savings should be used when preparing applications. Information on this is available at http://www.scotland.gov.uk/Topics/Business-Industry/Energy/Energy-sources/19185/17852-1/CSavings ;
- Measures to minimise soil disturbance during construction, operation and decommissioning to maximise carbon balance savings; and
- Potential for slippage;
- Need for a peat depth survey to demonstrate that the layout and design of the proposal avoids areas of deep peat and minimises disturbance to other areas of peat.; and
- Procedures for any extraction and disposal of peat during construction.

Applicants should consult SNH and SEPA at an early stage where proposed development is likely to affect peatland or mire systems

Other Relevant ALPR policies

Policy ER27: Flood Risk – Consultation
Policy ER28: Flood Risk Assessment
Policy ER25: Water Resource Protection

Policy and Legislation

Scottish Government
Water Framework Directive in Scotland (WFD)
www.scotland.gov.uk/Topics/Environment/Water/15561/WFD
Flood Risk Management (Scotland) Act 2009
www.scotland.gov.uk/Topics/Environment/Water/Flooding/FRMAct
A Policy Statement on Hydropower and Water Environment Protection
www.scotland.gov.uk/Topics/Business-Industry/Energy/Energy-sources/19185/17851-1/HydroPolicy

Additional information

Scottish Environment Protection Agency

The Tay Area Management Plan 2009 - 2015
www.sepa.org.uk/water/river_basin_planning/area_advisory_groups/idoc.ashx?docid=442c3ee6-588d-468f-bbd5-97cbc7de9e38&version=-1
Guidance for hydropower development
www.sepa.org.uk/water/hydropower.aspx
Planning Advice
http://www.sepa.org.uk/planning/energy.aspx
Controlled Activities Regulations (CAR); Guidance for Applicants on Supporting Information requirements for Hydropower Applications
http://www.sepa.org.uk/water/idoc.ashx?docid=358677fe-61f7-4fc9-baab-79cb93671387&version=-1
Engineering Activities in the Water Environment
http://www.sepa.org.uk/planning/engineering-water_environments.aspx

Scottish Government
Wind Farms and Carbon Savings on Peatlands
http://www.scotland.gov.uk/Topics/Business-Industry/Energy/Energy-sources/19185/17852-1/CSavings

Angus Council

Environment and Consumer Protection and Roads Division are part of the Infrastructure Services Department, Angus Council, County Buildings, Market Street, Forfar, Angus, DD8 3LG
Contact:
ROADS@angus.gov.uk
ENVHEALTH@angus.gov.uk

Policy ER 35 Wind Energy Development

Onshore wind turbines are the main subject of renewable energy proposals in Angus. The scale, location and impacts of wind energy developments raise a number of specific issues for consideration and Policy ER35 establishes criteria to aid the assessment of such planning applications.

The ALPR addresses additional issues raised by wind energy development. it identifies three geographic areas –Highland (1); Lowland and Hills (2); and Coast (3) - based on the landscape classification that was developed in the Tayside Landscape Character Assessment (1999) www.snh.org.uk/pdfs/publications/review/122.pdf and SNH Policy Statement 02/02 www.snh.gov.uk/docs/A247182.pdf. The broad geographic areas are shown in Figure 1 (see page 39). The ALPR recognises that the open and exposed nature of the Coast and Highland areas are sensitive to potential landscape and visual impact from turbines. The Lowland and Hills area is recognised as of generally lower sensitivity to turbines in terms of visual, landscape and natural heritage interests. However, there may be areas within the Lowland and Hills Area where large turbines would have an unacceptable impact, or where properly sited and designed wind energy development can be accommodated in areas of higher natural heritage, landscape and visual sensitivity.

Policy ER 35: Wind Energy Development: ***Wind energy developments must meet the requirements of Policy ER34 and also demonstrate:-***
(policy criteria a) - g) are set out and discussed below)

Criterion (a)
the reasons for site selection;

Applicants should present their rationale for site selection. Applicants should demonstrate that proposals are in locations where the technology can operate efficiently. Where a consent lapses, that proposal will be deleted from the Council's database of active proposals. Any re-application will be subject to full cumulative assessment in relation to visual, landscape and environmental impact as appropriate.

Applicants should demonstrate that site selection considered all technical, environmental, amenity, visual and landscape impact and mitigation where feasible.

Other Land Uses
Applicants should demonstrate that their selected site is compatible with other existing land uses and economic activities including:-

- tourism - proximity to visitor attractions such as historic properties, visitor centres, hotels, viewpoints and 'beauty spots';
- leisure and recreation (particularly outdoors) – foot and cycle paths, facilities (particularly outdoors) such as golf courses, activity centres;
- forestry – impact of felling for access and turbine clearance;
- quiet or remote places valued for their tranquillity;
- ancient woodland; and
- tourist routes and viewpoints.

Applicants should also demonstrate where site selection can enhance an area, and provide added value. This could include improving access, parking provision, visitor facilities on site such as interpretative facilities and amenities.

Residential Amenity

Applicants must be able to demonstrate that the site was selected to avoid unacceptable impact on the amenity of occupied residential property. The SPP advises a 2km separation distance between areas of search for windfarms over 20MW and the edge of towns and villages, and confirms the development up to this distance is likely to be a prominent feature in open landscapes. When considering potential visual impact of wind energy proposals on residential amenity, Angus Council will use 2km as a guide. Within 2km of residential properties information required will depend on the scale and location of the individual proposal.'

Applicants should be able to demonstrate that factors such as scale, location and topography will allow the development without unacceptable detrimental effect. Views from principal rooms looking towards a proposed turbine, and extent and location of garden ground will be factors in considering potential impact on residential amenity.

Additional Information

SNH
Historic and Ancient Woodlands
www.snh.gov.uk/land-and-sea/managing-the-land/forestry-and-woodlands/history/

Criterion (b)
that no wind turbines will cause unacceptable interference to birds, especially those that have statutory protection and are susceptible to disturbance, displacement or collision;

This criterion applies to areas designated under the European Habitats and the European Birds Directives for their significance to birds (Natura 2000 sites), and to the flight paths of protected species; and those protected under the Convention on Wetlands of International Importance (Ramsar sites). As well as these internationally designated sites, there are a number of nationally important sites such as Sites of Special Scientific Interest (SSSIs) and RSPB significant bird habitats (which are adjacent to and support designated sites at Kinnordy Loch and Montrose Basin). The protection afforded to these sites extends beyond their boundaries to allow for foraging, roosting and flight paths.

There is a growing body of experience on the management and design of wind farms to reduce or prevent unacceptable impact on birds which may help in the design and layout of a proposed wind farm. SNH will advise on bird surveys and guidance on assessing the impacts of wind farms on birds is available on their website at
www.snh.gov.uk/planning-and-development/renewable-energy/onshore-wind/

Other Relevant ALPR policies

Policy ER1: Natura 2000 and Ramsar Sites (4)
Policy ER2: National Nature Reserves and Sites of Special Scientific Interest
Policy ER3: Regional and Local Designations
Policy ER4: Wider Natural Heritage and Biodiversity

Policy and legislation

EU Habitats Directive and Annexes 1 and 2
EU Birds Directive and Annex1
Habitats/protectedareas/NATURA

Additional information
The RSPB and SNH have produced a Bird Sensitivity Map. Details can be found at: www.rspb.org.uk/news/details.aspx?id=tcm:9-179628

Criterion (c)
there is no unacceptable detrimental effect on residential amenity, existing land use or road safety by reason of shadow flicker, noise or reflected light;

Shadow Flicker and Reflected Light
Shadow flicker is where the moving shadow flicker appears through a narrow window opening. The occurrence of flicker can be predicted by calculation, and is therefore identifiable and can be addressed. Scottish Government on–line guidance for Onshore Wind Turbines advises that in most cases the problem can be resolved through separation between wind turbines and nearby dwellings (as general rule 10 rotor diameter).

Turbines can also cause flashes of reflected light, which can be visible for some distance. It is possible to ameliorate the flashing but not to eliminate it. Careful choice of blade colour and surface finish can help reduce the effect.

Noise
There are two sources of noise from wind turbines - the mechanical noise from the turbines and the aerodynamic noise from the blades. Mechanical noise can be reduced through engineering design. Good acoustical design and siting of turbines is essential to ensure there is no significant increase in ambient noise levels as they affect the environment and any nearby sensitive property/receptors. Where appropriate planning conditions will be imposed to control any impact to within reasonable levels. The evaluation of noise will be addressed on a site specific basis, given the range of factors to be considered and further detailed guidance is provided in Section 5 : Noise Assessment for Wind Energy Proposals

Other Relevant ALPR policies
Policy ER11: Noise Pollution

Policy and Legislation
Scottish Government – 1/2011 Planning and Noise
http://www.scotland.gov.uk/Publications/2011/02/28153945/0
Scottish Government - web based Renewables Specific Advice Sheets
http://www.scotland.gov.uk/Topics/Built-Environment/planning/National-Planning-Policy/themes/renewables

Additional Information
Working Group on Noise and Turbines, Final Report 1996 – ETSU-R-97
www.semantise.com/~lewiswindfarms/FOV1-00021BAE/FOV1-00021BD2/1996:00:00%20ETSU-R-97%20-%20Exec%20Summary.pdf?FCItemID=S000C081A

The Influence of Colour on the Aesthetics of Wind Turbine Generators' – ETSU W/14/00533/00/00

Angus Council Environmental and Consumer Protection is part of the Infrastructure Services Department, Angus Council, County Buildings, Market Street, Forfar, ANGUS DD8 3LG
Contact: ENVHEALTH@angus.gov.uk

Further information turbine noise level prediction can also be found in Section 5 : Noise Assessment for Wind Energy Proposals

Criterion (d)
that no wind turbines will interfere with authorised aircraft activity;

Military Aircraft

There are MOD bases, RAF Leuchars in Fife and RM Condor at Arbroath, with flight paths for landing and take-off which affect Angus. Parts of the area are also subject to low fly zones. Barry Buddon Camp is an army training facility, with live firing capacity.

The approach zones for the Air Traffic Control Radar at RAF Leuchars affect areas across south Angus.. The MOD has commented on/objected to a number of wind energy proposals in South Angus on the grounds of interference with radar resulting in false signals being recorded by air traffic controllers, which can threaten aircraft safety. The safety of military personnel and aircraft will be taken into account by Angus Council in considering planning applications.

Where radar interference is identified as a potential constraint and effective mitigation measures have been agreed with the MOD, these must be submitted in writing to Angus Council. Only where a scheme is demonstrated to be deliverable or can be secured through application of a condition, will planning permission be granted

Contact details and further information can be found at:
www.mod.uk/DefenceInternet/MicroSite/DE/WhatWeDo/Operations/ModSafeguarding.htm

Civilian Aircraft

There are two civilian facilities which affect Angus - Dundee Airport and the Gliding Club at Roundyhill, between Glamis and Kirriemuir.

No unofficial safeguarding maps are known to have been lodged with the Council e.g. for local emergency service Air Support Units or a former unlicensed airfield in the vicinity of Montrose.

Applicants must consult NERL Safeguarding, the Civil Aviation Authority (CAA) and the local authority before submitting a planning application. The applicant should provide an analysis of possible impact, and appropriate measures to alleviate any identified adverse effects on broadcast communications and signals. These consultees may advise on aircraft safety, including lighting. Where this is the case their advice will be acted upon by Angus Council.

There is an international civil aviation requirement for all structures of 91.4 metres or more to be charted on aeronautical charts. This is achieved by notifying Defence Geographic Centre prior to the construction/erection of wind turbines and/or anemometer/meteorological masts.

Any structure of 150 metres or more must be lit in accordance with the Air Navigation Order and should be appropriately marked. Smaller structures may also be required to be lit by aviation stakeholders particularly if they fall under Section 47 of the Aviation Act

Contacts:

Civil Aviation Authority	NERL Safeguarding

CAA House 45-59 Kingsway London WC2B 6TE	NATS-CTC Mailbox 23 4000Parkway Solent Business Park Whitely Hampshire PO15 7FL
Dundee Airport Riverside Dundee DD2 1UH	

Policy and Legislation

Scottish Government
Circular 2/2003 Safeguarding of Aerodromes, Technical sites and Military Explosives Storage Areas.
http://www.scotland.gov.uk/Resource/Doc/47021/0026439.pdf

Additional Information

Civil Aviaton Authority
Guidance on CAA Planning Consultation Requirements
http://www.caa.co.uk/docs/33/DAP_GuidanceOnCAAPlanningConsultationRequirements.pdf

CAP 764
CAA Policy and Guidelines on Wind Turbines
http://www.caa.co.uk/docs/33/Cap764.pdf

Criterion (e)
that no electromagnetic disturbance is likely to be caused by the proposal to any existing transmitting or receiving system, or (where such disturbances may be caused) that measures will be taken to minimise or remedy any such interference;

Wind turbines have the potential to interfere with electronic communication media, which includes television and radio (which may cause interference, loss of sound or picture and 'ghosting'), and micro wave links (which may be affected by reflection, diffraction or blocking). Operators suggest a minimum distance of 100m between the alignment of the microwave and any turbine to prevent interference. These interference effects can be reduced through changes to turbine siting and discussion with operators will confirm an appropriate distance.

Applicants must consult Ofcom (Office of Communication - which acts as the central point of contact for any television and radio broadcasting, telecommunication and wireless communication issues); the emergency services; utility companies; and the local authority before submitting a planning application.

The applicant should provide details of possible adverse effects, and proposed measures to mitigate adverse effects on broadcast communications and signals.

Applicants should contact:

Ofcom Riverside House 2a Southwark Bridge Road London	Wind Farm Team The Joint Radio Company Limited, Dean Bradley House 52 Horseferry Road

SE1 9HA Further information is available at www.**ofcom**.org.uk/	London SW1P 2AF Telephone: +44 20 7706 5197 Further information on The Joint Radio Company Limited is available at www.jrc.co.uk

Criterion (f)
that the proposal must be capable of co-existing with other existing or permitted wind energy developments in terms of cumulative impact particularly on visual amenity and landscape, including impacts from development in neighbouring local authority areas;

Although a number of consents have been granted in Angus for wind turbines of around 90m to blade tip, only one has yet been constructed. There are a number of large scale turbines close to the boundary of Angus; in Perth and Kinross (Drumderg 16 x 107m), Dundee (Michelin 2 x 120.5m) and Aberdeenshire (Tullo 8 x 100m). These developments are clearly visible from parts of Angus, but no cross local authority boundary landscape/capacity assessment has been undertaken as those commissioned are normally for and by individual local authorities or refer to a specific proposal. Major landscape features such as the highland boundary fault however can extend across several council areas.

The SAS for Onshore Wind Turbines identifies potential cumulative impact as a significant constraint for wind farms, but as noted previously, there is no cross boundary context. The potential impact changes as each development is constructed and the actual scale and potential impact of a windfarm or large turbine will vary depending on the site, layout and turbines selected. Cumulative effects of wind energy developments are a matter of great significance in determining any application. Assessment of landscape and visual impact is contentious and every effort should be made to provide accurate visual representations and to ensure potential cumulative impact on the natural and built environment is fully addressed.

The assessment of cumulative impact will reflect the operational, consented and planning applications for turbines, as well as the specific site characteristics. As this will be different for each application and over the passage of time, it is increasingly difficult to map areas of constraint imposed by cumulative impact. Each proposal should demonstrate how its particular characteristics relate to other proposals at the assessment stage. Regard should be given to the extensive advice available on assessing and representing potential cumulative visual and landscape impact.

Ecology, Ornithology and Hydrology
There is also potential for the combined effect of wind energy development to increase impact on sensitive habitats and/or protected species to an unacceptable level. Where existing development already affects a protected or vulnerable habitat, applicants must demonstrate subsequent proposals through the combined effect of development, will not cause impacts to be intensified to an unacceptable level. This will be particularly important where sites are designated as of international or national importance, but damage to all vulnerable habitats and species should be avoided. (Natura 2000 sites may require a Habitats Regulation Assessment (HRA) by Angus Council as competent authority)

Cumulative Impact

Cumulative ecological impact should be addressed through a formal EIA or an environmental statement, the terms of which should be agreed with the local authority, and other agencies as appropriate. Where the responsibility lies with the local authority to determine acceptable level of impact or viability of mitigation measures, advice will be sought from relevant agencies.

Where mitigation measures are proposed and agreed, these will be subject to the application of conditions or legal agreement as appropriate. Post operational monitoring of impact on habitat and species may be required and will be subject to the application of conditions or legal agreement as appropriate.

Cumulative landscape and visual assessments should establish search area identifying:-

- any constructed or consented windfarm;
- any undetermined windfarm application;
- any windfarm proposal which has been subject to an EIA scoping request to the relevant authority; and
- any other windfarm proposal that the Planning Authority, and/or SNH, considers relevant for study and which is within the public domain (eg as a result of a public announcement or community meeting).

Installed, consented and proposed offshore windfarms should also be presented on the base plan to enable a decision on whether to include these in the assessment.

The cumulative landscape and visual effect will be those which are additional to an agreed baseline of wind energy developments reflecting the scale of the development under consideration. The search area considered will relate to the height of the proposed turbine and the visual interaction with other turbines within an agreed distance

For larger turbines the study area should extend to a minimum of 35km from the outer margin of the application site. The size of the study area should also be influenced by the locations and ZTVs of other windfarms likely to interact with the new proposal; and by transport routes to be assessed for sequential effects. The study area may not be circular in shape but could be larger in some directions than others. Sequential impacts may need to be assessed for a distance of more than 60km from the proposed windfarm.

For smaller proposals appropriate distances will be agreed with the developer in accordance with SNH guidance

Policy and Legislation

Scottish Government - web based Renewables Specific Advice Sheets
http://www.scotland.gov.uk/Topics/Built-Environment/planning/National-Planning-Policy/themes/renewables

SNH
Assessing the Cumulaive Impacts of Onshore Wind Energy Developments
http://www.snh.gov.uk/docs/A675503.pdf
Visual Representaion of Windfarms Good Practice Guidance
http://www.snh.gov.uk/docs/A305436.pdf

Criterion (g)

a realistic means of achieving the removal of any apparatus when redundant and the restoration of the site are proposed.

The anticipated lifespan of a wind farm/turbine is currently around 25 years. Once established the operational capacity and equipment is likely to be reviewed. Extension of existing consents will be assessed in accordance with legislation and guidance pertaining at that time, and continued use of an existing location may be an appropriate option. Where time of operation is extended, the decommissioning statement and re-instatement plan will also be reviewed, updated to contemporary standards, and extended.

The applicant will be required by planning conditions or legal agreement to ensure acceptable re-instatement standards. A decommissioning statement and reinstatement plan should be submitted detailing removal of all apparatus and associated works; restoration of the site and any after care arrangements; and timescale. It is likely a financial bond will be required by Angus Council to ensure restoration is implemented should the applicant/operator cease to trade. The decommissioning statement should be updated prior to the cessation of energy generation.

Where a site has been inactive for six months, the planning authority will require the instigation of the decommissioning process within the six months of the site being confirmed inactive.

4. Landscape and Visual Assessment of Wind Energy Proposals

The potential landscape and visual impact of wind turbines, both individually and cumulatively is a major factor in the assessment of any planning application.

The Tayside Landscape Character Assessment (TLCA) was prepared by Land Use Consultants in 1999, as part of a series of assessments for Scotland prepared on behalf of SNH and the local authorities. It develops a landscape classification which identifies and describes a range of character areas. It also provides guidance on accommodating development and land use change. Whilst some of this guidance has been superseded, the definition of the landscape character areas and their vulnerability to some types of development remains valid, and should be used in conjunction with the evolving SNH guidance.

The landscape character areas form the basis of The Wind Energy Geographic Areas in the ALPR as follows (Figure 1, page 39):-

- Area 1 Highland - primarily the Angus Glens along and to the north of the Highland Boundary Fault;
- Area 2 Lowland and Hills - mainly rolling farmland and low hills;
- Area 3 Coast - a mix of sand, cliffs and, around Montrose, lowland basin.

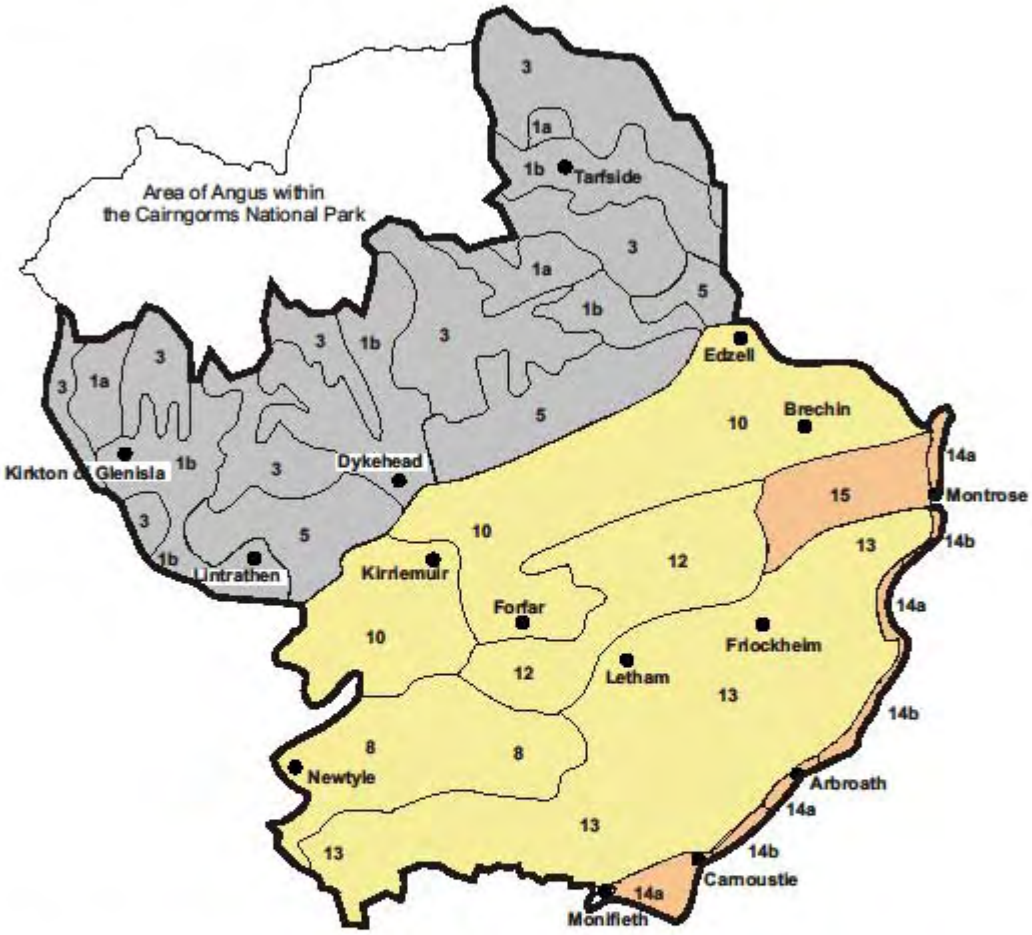
The ALPR identifies areas 1 Highland and 3 Coast as having a greater potential sensitivity to the landscape and visual impact of large turbines. This principle is developed in the Landscape Capacity and Cumulative Impacts Study undertaken by Ironside Farrar on behalf of the Council in 2008. This study primarily considered landscape capacity and cumulative impact in Angus at a strategic level in order to assist in the determination of two planning applications for wind turbines and based on the TLCA character area it identifies Landscape Capacity for Windfarms and current windfarm character type.
www.angus.gov.uk/devcontrol/LandscapeCapacityandCumulativeImpactAssessmentFinal.pdf

Area 3 Coast also has specific locational factors such as coastal flooding potentially exacerbated in future by rising sea levels, the protection of the undeveloped coast, shoreline management and the interrelationship with off-shore proposals. Development proposals on the coast will be required to address these issues as appropriate in any applications and supporting information.

The ALPR and TLCA form the basis for the strategic assessment of landscape capacity and potential visual and landscape impact. Applicants will require to establish the parameters for their individual site assessment with the Council taking cognisance of the detailed landscape and visual implications and suitable representations Where proposals are for turbines between 15 and 50m are proposed a basic VIA should be submitted and for turbines over 50m a full LVIA should be undertaken as detailed in Table 2.

Scottish Natural Heritage has developed a series of Advice Notes on the impacts of windfarms on the landscape, and their advice will be sought by the Council as appropriate.

Figure 1 - Wind Energy Development Geographic areas



TCLA Designation		TCLA Designation		TCLA Designation	
1a	Upper Highland Glens	8	Igneous Hills	14a	Coast with sand
1b	Mid Highland Glens	10	Broad Valley Lowland	14b	Coast with cliffs
3	Highland Summits & Plateaux	12	Low Moorland Hills	15	Lowland Basin
5	Highland Foothills	13	Dipslope Farmland		

Map extract from Angus Local Plan Review (adopted Feb 2009)

The 'Landscape Capacity and Cumulative Impacts Study' is a strategic level study providing a context for the consideration of the cumulative effects of existing and potential future windfarm developments. It develops a classification of landscape types in terms of the degree of wind turbine development (Table 3) which is applied in Table 4: Levels of Acceptable Landscape Character Change.

Table 3: Landscape Classification

Landscape	Type	Landscape Character Visual Experience
Landscape with no Windfarms	A landscape type or area in which no windfarms or wind turbines are present and none are clearly visible form neighbouring areas	There would be no discernable effects on visual receptors.
Landscape with Views of Windfarms	A landscape type or area within which, or immediately adjacent, there are no windfarms or wind turbines physically located, but from which windfarms are clearly visible in a separate landscape character area. Character may vary considerably according to proximity and scale of neighbouring windfarm(s).	The experience of a visual receptor would be noticeably affected, but windfarms are a background feature clearly not associated with the landscape in which the receptor is located. Visual effects may vary considerably according to proximity and scale of neighbouring windfarm(s)
Landscape with Occasional Windfarms	A landscape type or area in which windfarms or wind turbines are located or are very close to and visible. However they are not of such a size, number, extent or contrast in character that they become one of the defining characteristics of the landscape's character.	Visual receptors would experience occasional close-quarters views of a windfarm or turbines and more frequent background views of windfarms or turbines. Some turbines may or may not be perceived as being located in the landscape character area. No overall perception of windfarms being a defining feature of the landscape.
Landscape with Windfarms	A landscape type or area in which a windfarm, windfarms or wind turbines are located and visible to such an extent that they become a defining characteristic of the Landscape Character. However, they are clearly separated and not the single most dominant characteristic of the landscape	Visual receptors would experience frequent views of windfarms or wind turbines as foreground, mid-ground or background features, affecting their perception of the landscape character. However there would be sufficient separation between windfarms and turbines and sufficient areas from which wind turbines are not visible such that they would not be seen as dominating the landscape over all other landscape features.
Windfarm Lands	A landscape type or area in which windfarms or wind turbines are extensive, frequent and nearly always visible. They become the dominant, defining characteristic of the landscape. Nevertheless there is a clearly defined separation between developed areas.	Visual receptors would experience views of windfarms as foreground, mid-ground and background features, to the extent that they are seen to dominate landscape character. Few areas would be free of views of wind turbines
Windfarm	Landscape fully developed as a windfarm with no clear separation between groups of turbines. Few if any areas where turbines not visible.	Visual receptors would always be close to and nearly always in full view of wind turbines.

Table 4: Levels of Acceptable Landscape Character Change also incorporates the SNH classification of landscape and visual cumulative effects :-

a) *'in combination - where two or more features are seen together at the same time from the same place, in the same (arc of) view where their visual effects are combined;*

b) *in succession - where two or more features are present in views from the same place (viewpoint) but cannot be seen at the same time, together because they are not in the same arc of view - the observer has to turn to see new sectors of view whereupon the other features unfold in succession;*

c) *in sequence - where two or more features are not present in views from the same place (viewpoint) and cannot, therefore, ever be seen at the same time, even if the observer moved round the arc of view, the observer has to move to another viewpoint to see the second or more of them, so they will then appear in sequence. The frequency of occurrence in the sequence may be highly variable, ranging from frequently sequential when the features keep appearing regularly and with short time lapses between (clearly speed of travel influences this as well as distance between the viewpoints) down to occasionally sequential where there may be long time lapses between appearances, because the observer is moving very slowly and / or the there are large distances between the viewpoints (even if not between the features);*

d) *perceived - where two or more features are present but one or more is never seen by he observer, for example, because they are screened, or the observer is unable or unwilling to attend a viewpoint from where they would be seen. However, the observer is aware that others are there because, for example, they may have read or heard about them or seen signs to them; this is an apprehended or perceived effect but can be strongly felt; it could also, nevertheless, be mistaken because the observer's information or interpretation of it is wrong.' (David Tyldesley for SNH at PLI – Proposed Windfarm, An Suidhe, Inveraray, Argyll. November 2002).*

New large scale proposals close to established wind farm or turbine development in landscape and/or visual terms should consider their relationship with existing turbine type, scale, colour and layout from all directions from which the wind farms or turbines are viewed in combination.

As the number of sites generating energy from wind increase, so does potential for conflict between different scales of development, and between proposed and existing development. Where proposals are submitted, the relative height and style of turbine (e.g. tower construction, number of blades, blade length) should increasingly reflect those already consented to promoted a harmonious development pattern.

The Levels of Acceptable Landscape Character Change established in Table 4 provides guidance on the Councils assessment of the potential impact of wind energy development in Angus.

Additional Information
SNH Cumulative Effect of Windfarms (revised 2005)
http://www.snh.gov.uk/docs/A305440.pdf

Table 4: Levels of Acceptable Landscape Character Change

Within **Development Boundaries** (as defined in the ALPR) it is not possible to define maximum turbine heights. Proposals for turbine development in towns and villages will be considered in the context of the ALPR policies and take account of the following considerations:

- Scale and location
- Landscape setting
- Residential amenity including noise, shadow flicker, visual impact etc
- Historic environment including townscape
- Compatibility with adjacent uses
- Proximity to sensitive receptors such as educational buildings, open space and leisure facilities, hospitals, residential care homes, cemeteries, visitor facilities and accommodation and proposed development areas
- Access
- Design
- Security of equipment/facility
- Ancillary works

Outwith development boundaries, in countryside locations it is considered that there is scope for turbines to be accommodated within the following defined landscape types. The guide heights are extrapolated from sources including the Tayside Landscape Character Assessment, the Landscape Capacity and Cumulative Impacts Study, Reporters findings from planning appeals, responses from statutory consultees and reflect the particular scale and landscape of Angus.

There may be scope for turbines of greater height, where this can be demonstrated by the applicant. This will be strongly influenced by the elevation of the turbine site, the scale of the landscape and proximity of scale features and buildings.

ALPR Zone	Landscape Type (LT) Landscape Units (LU)	Existing Windfarm Character	Acceptable Future Windfarm Character	Guidance (Height to blade tip unless otherwise stated)
1	1a. Upper Highland Glens • Glen Isla • Glen Lethnot • Milton and Upper Tarf Valley	Landscape with no Windfarms & Landscape with Views of Windfarms	Landscape with Views of Windfarms	This LT is of medium scale; predominantly unsettled; with wild/slightly tamed level of naturalness and with narrow corridor views. Accordingly, it is considered to have no scope for turbines other than domestic scale turbines (less than 25m in height).

ALPR Zone	Landscape Type (LT) Landscape Units (LU)	Existing Windfarm Character	Acceptable Future Windfarm Character	Guidance (Height to blade tip unless otherwise stated)
	1b. Mid Highland Glens • Glen Esk • West Water Valley • Glen Clova • Glen Prosen • Glen Isla	Landscape with no Windfarms & Landscape with Views of Windfarms	Landscape with Occasional Windfarms	Due to the small to medium scale of this LT and the corridor nature of views, it is considered to have scope for turbines circa 50m in height.
	3. Highland Summits & Plateaux • Caenlochan Forest/ Glen Doll Forest	Landscape with Views of Windfarms	Landscape with Views of Windfarms	Considered to have no scope for wind turbines.
	5. Highland Foothills • Alyth Foothills • Kirriemuir Foothills • Menmuir Foothills • Edzell Foothills	Landscape with Views of Windfarms	Landscape with Occasional Windfarms	The Highland Foothills provide a dramatic transition between highland and lowland. The contrast between the rolling topography of Strathmore (LT 10) and the foothills is important in defining the character of both LT 10 & 5. Whilst the Foothills appear big next to Strathmore, they are relatively low lying hills. In order to avoid the risk of turbines adversely affecting perceived scale, it is considered that there is scope for turbines less than circa 80m tall located on lower ground only, where they do not adversely affect the setting of landscape features and monuments such as Airlie Monument and the White & Brown Caterthuns.
2	8. Igneous Hills • Sidlaws	Landscape with Views of Windfarms	Landscape with Occasional Windfarms	Considered to have scope for turbines circa 80m in height which do not disrupt the principle ridgelines or adversely affect the setting of important landscape features monuments such as Kinpurney Monument and Auchterhouse hillfort.

ALPR Zone	Landscape Type (LT) Landscape Units (LU)	Existing Windfarm Character	Acceptable Future Windfarm Character	Guidance (Height to blade tip unless otherwise stated)
	10. Broad Valley Lowland • Strathmore	Landscape with Views of Windfarms	Landscape with Occasional Windfarms	Considered to have scope for turbines circa 80m in height.
	12. Low Moorland Hills • Forfar Hills	Landscape with Views of Windfarms	Landscape with Occasional Windfarms	Considered to have scope for turbines circa 80m in height which do not disrupt the principle ridgelines or adversely affect the setting of important landscape features and monuments such as Balmashanner Monument; and Finavon and Turin hillforts.
	13. Dipslope Farmland • SE Angus Lowland	Landscape with Views of Windfarms	Landscape with Occasional Windfarms	Considered to have scope for turbines circa 80m in height.
3	14a. Coast with Sand • Barry Links • Elliot • Lunan Bay • Montrose	Landscape with Views of Windfarms	Landscape with Views of Windfarms	Due to the often open nature of the Angus coastline and in order to avoid the risk of turbines being visually prominent and therefore adversely affecting the character of the undeveloped coast, it is generally considered there is scope for domestic turbines of circa 25m in height.
	14b. Coast with Cliffs • Carnoustie • Auchmithie • Usan	Landscape with Views of Windfarms	Landscape with Views of Windfarms	
	15. Lowland Basins • Montrose Basin	Landscape with Views of Windfarms	Landscape with Views of Windfarms	

Figure 2: Scale Buildings in Angus

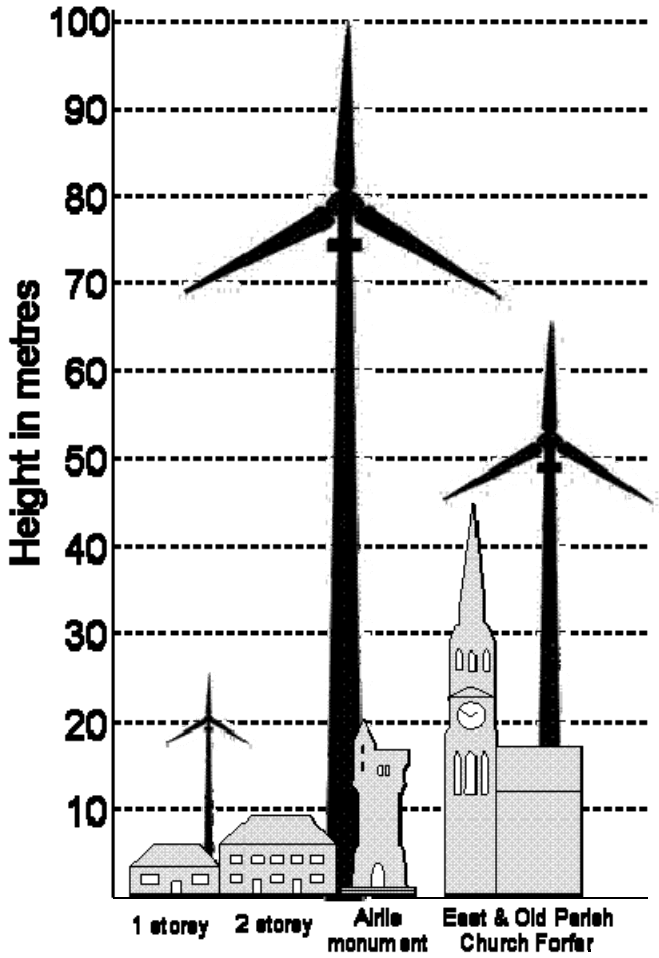
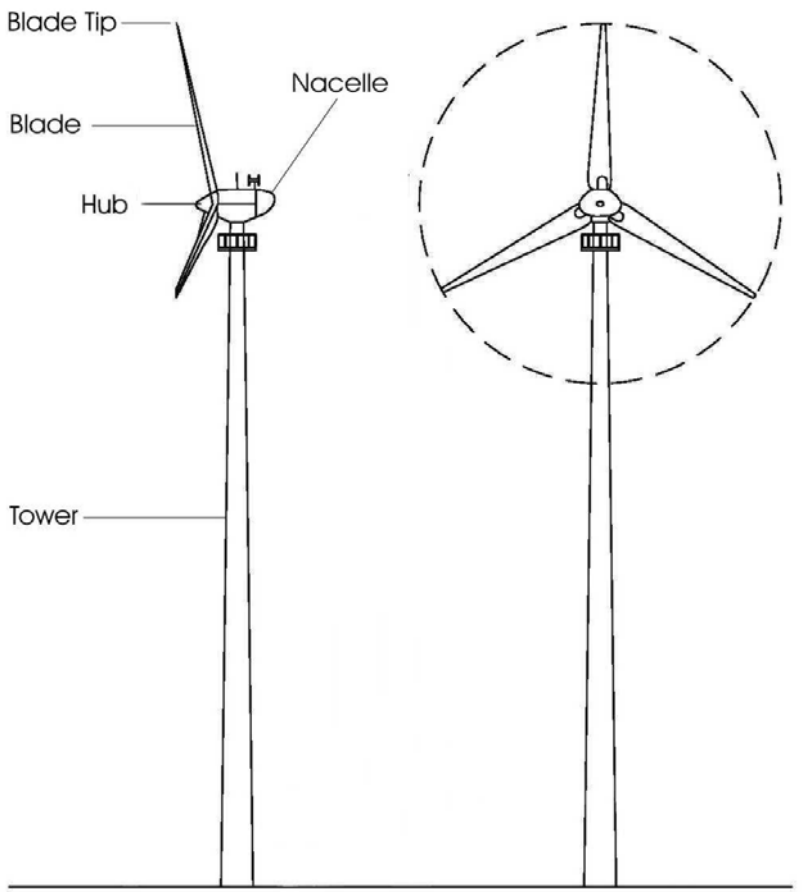


Figure 3: Wind Turbine Components



5. Noise Assessment for Wind Energy Proposals

Noise from wind turbines can be an important factor in the assessment of wind energy developments. Applicants are advised to contact the Environmental and Consumer protection Service at Angus Council at an early stage to establish an agreed methodology for noise assessment. Initial guidance is outlined below:-

Assessment Criteria

1. Subject to the points below the criteria specified in ETSU-R-97; the assessment and rating of noise from wind farms should be used as appropriate noise assessment criteria.
2. If absolute lower noise limits are to be used then the significance of these in relation to the existing background noise levels should be considered.
3. Amplitude modulation should be considered in terms of the current level of technical knowledge on the subject. Angus Council will consider the use of appropriate Planning Conditions to control AM on a case by case basis.
4. Where it is suggested that any property benefits financially from the scheme and the higher absolute lower limit of 45 dB(A) maybe applied to that property, full details of the financial benefit and how the occupiers of the relevant property will receive that benefit for the life of the development should be clearly stated. A valid financial benefit is considered to be one which relates directly to the power or income generated by the turbine. One-off lump sum payments are unlikely to be considered acceptable because occupiers could change during the life of the development.
5. Where criteria are derived from background noise measurements the additional points below should be taken into account.
6. It is generally considered that the ETSU-R-97 simplified method criteria is not suitable for small wind turbines i.e. those with a rotor diameter of less than 16m. For developments involving small turbines a noise limit of 40 dB LAEQ(10mins) assessed using the BWEA method referred to below is considered appropriate.

Background noise measurements

1. It is recommended that the type of noise meter, microphone and protection kit for each monitoring location is agreed. An appropriate windshield (usually double skinned) is required in order to prevent any wind over the microphone affecting readings.
2. It is recommended that the exact position of the monitoring equipment is agreed not just the general location and photographic evidence of the location is taken. Where monitoring data is to be used for more than one property this should be agreed before hand in order to ensure that sufficient locations are monitored to represent all of the neighbouring properties. It is recommended that a list of properties is drawn up and monitoring positions allocated to each for discussion.
3. Monitoring should be avoided next to running water or trees in leaf (unless the measurement location solely represents a single property and the noise environment is not likely to alter seasonally) or on the noisy side of a building (unless it faces the proposed turbine location)
4. It is recommended that the method for determining periods of heavy rainfall and the measurement period to be excluded due to heavy rain is agreed prior to the commencement of monitoring. Heavy rainfall should be taken to mean periods of more than 4mm per hour.
5. The period of monitoring should be sufficient to obtain a reasonable amount of data at each wind speed from 3-12m/s.Depending upon weather conditions this can take longer than 7 days so this should be considered a minimum only.

6. The method for Simultaneous wind speed measurement should be agreed before hand with Environmental & Consumer protection Service. Derived not measured 10m high wind speeds may need to be used to take account of site specific wind shear.

Turbine noise level prediction

1. Wind turbine noise predictions should follow the methodology used in ISO 9613 and take into account the detailed guidance published in The Institute of Acoustics bulletin Vol 34 no 2 2009.
2. For small wind turbines i.e. those with a rotor diameter of less than 16m the BWEA small wind turbine performance and safety standard, Feb 2008 guidance maybe used as an alternative methodology to predict the separation distance required to comply with the relevant noise criteria.
3. Turbine noise data must be referenced to test reports.
4. Where any type of noise calculator is used a detailed explanation of the formulae used and the data used should be given.
5. The noise level prediction should take into account the cumulative impact of other turbines.

Appendices

APPENDIX 1: Renewable Energy Development in Angus

Renewable Energy provides opportunities to develop locally based sources of power, with minimal impact on the local, national and global environment. It can aid progress towards sustainable development, reduce dependence on energy imports, broaden the energy supply base, and create jobs and investment. The growing number of development enquiries and proposals reflects increasing awareness of renewable energy capacity, financial incentives and technological advances all contributing to renewable energy generation across Angus. The current position is set out below.

Planning Applications and Consents (as at May 2012)
The following Tables will provide the base line for monitoring the Implementation Guide and future renewable energy development within Angus.

Table 1 - Status of Applications for Single Turbines (May 2012)

Year	<25m			25-50m			>50		
	App	Ref	Pen	App	Ref	Pen	App	Ref	Pen
2004	1	1	-	-	-	-	-	-	-
2005	2	-	-	-	-	-	-	-	-
2006	9	-	-	-	-	-	-	-	-
2007	8	-	-	-	-	-	-	-	-
2008	9	-	-	-	-	-	-	-	-
2009	10	1	-	-	-	-	2	-	-
2010	13	2	-	2	-	-	2	-	-
2011	6	1	-	7	1	8	3	3	4
2012	-	-	3	4	1	1	-	-	2
Total	58	5	3	13	2	9	7	3	6

App – planning application approved
Ref – planning application refused
Pen – decision pending

Table 2 - Status of Applications for Multiple Turbines (May 2012)

Year	No of turbines 2			No of turbines 3-6			No of turbines >6		
	App	Ref	Pen	App	Ref	Pen	App	Ref	Pen
2004	-	-	-	-	-	-	1	-	-
2005	-	-	-	-	-	-	-	-	-
2006	-	-	-	-	-	-	-	-	-
2007	-	-	-	-	3	-	-	1	-
2008	-	-	-	-	-	-	-	-	-
2009	-	-	-	-	4	-	-		-
2010	4	-	1	1	-	-	-	-	-
2011	12	1	2	-	-	1	-	-	2
2012	2	-	1	-	-	1	-	-	-
Total	18	1	8	1	7	2	1	1	2

App – planning application approved
Ref – planning application refused
Pen – decision pending

Table 3 – Operating and Consented Onshore Renewable Energy Development in Angus (May 2012)

Generation Method	Location	Capacity (MW*)	Status
Wind Turbines			
Wind farm/cluster - over 50m or 3 x 15m	Ark Hill (8 x 81m turbine)	10.4	Approved
	Scotston Hill, Auchterhouse (1 x 80m turbine)	0.8	Operational
	Former Tealing Airfield (1 x 93.5m turbine)	2.5	Approved
	Cononsyth, Arbroath (1 x 67m turbine)	0.33	Approved
	East Memus (1 x 86.6)	0.8	Approved
	Castleton of Eassie (3 x 25)	0.33	Approved
	Total	**15.16**	
Landfill Gas			
	Lochhead Landfill Site	1.0	Operational
	Total	**1.0**	
Hydro			
Run of River	Rottal Estate, Glen Clova	0.45	Operational
	Glenmarkie, Glen Isla	0.75	Operational
	Clova Farms, Glen Clova	0.18	Approved (CNPA)
	Glamis Sawmill	0.06	Operational
	WWTP, Tannadice, Forfar	0 78	Approved
	Total	**2.12**	
Biomass- commercial			
Fuel Production Unit	Padnaram, By Forfar		Operational
All Operational and/or approved		**18.28**	

Table 4 – Other Renewable Energy Proposals in Angus (November 2011)

Generation Method	Location	Capacity (MW*)	Status
Wind Turbines			
Wind farm/cluster over 50m or 3 x 15m	Nathro Hill (S36)	50+	Scoping
	Carrach	7.2	Application
	Land at Nether Kelly (Corse)	17.5	Application
	Total	**74+**	

Other Energy Related Projects

Transmission Network

SHETL has indicated that once the Beauly-Denny transmission line has been upgraded, the upgrade along the western side of Strathmore will proceed. This will utilise existing towers and renew cables and insulation to increase capacity from 275 to 400KV. Grid access licences are normally subject to this upgrade being implemented.

APPENDIX 2: Development Plan – Renewable Energy Policies

Dundee and Angus Structure Plan Environmental Resources Policy 1: Renewable Energy

Proposals for renewable energy development will be favourably considered where they deliver quantifiable environmental and economic benefits and any significant or cumulative adverse impacts on the natural and historic environment, landscape and local communities can be satisfactorily addressed.

Development proposals will be considered in the context of the wider environmental policies of the Structure Plan. Detailed criteria based policy, locational guidance and, where appropriate, areas of search for individual sources of renewable energy will be established by Local Plans. An Environmental Statement will be required for all large scale proposals or where development is likely to have significant effects on the environment.

Angus Local Plan Review Policy ER34: Renewable Energy Developments

Proposals for all forms of renewable energy developments will be supported in principle and will be assessed against the following criteria:

(a) the siting and appearance of apparatus have been chosen to minimise the impact on amenity, while respecting operational efficiency;
(b) there will be no unacceptable adverse landscape and visual impacts having regard to landscape character, setting within the immediate and wider landscape, and sensitive viewpoints;
(c) the development will have no unacceptable detrimental effect on any sites designated for natural heritage, scientific, historic or archaeological reasons;
(d) no unacceptable environmental effects of transmission lines, within and beyond the site; and
(e) access for construction and maintenance traffic can be achieved without compromising road safety or causing unacceptable permanent change to the environment and landscape, and
(f) that there will be no unacceptable impacts on the quantity or quality of groundwater or surface water resources during construction, operation and decommissioning of the energy plant.

Angus Local Plan Review Policy ER35: Wind Energy Development

Wind energy developments must meet the requirements of Policy ER34 and also demonstrate:

(a) the reasons for site selection;
(b) that no wind turbines will cause unacceptable interference to birds, especially those that have statutory protection and are susceptible to disturbance, displacement or collision;
(c) there is no unacceptable detrimental effect on residential amenity, existing land uses or road safety by reason of shadow flicker, noise or reflected light;
(d) that no wind turbines will interfere with authorised aircraft activity;
(e) that no electromagnetic disturbance is likely to be caused by the proposal to any existing transmitting or receiving system, or (where such disturbances may be caused) that measures will be taken to minimise or remedy any such interference;
(f) that the proposal must be capable of co-existing with other existing or permitted wind energy developments in terms of cumulative impact particularly on visual amenity and landscape, including impacts from development in neighbouring local authority areas;
(g) a realistic means of achieving the removal of any apparatus when redundant and the restoration of the site are proposed.

APPENDIX 3: Other Relevant Development Plan Policies

Dundee and Angus Structure Plan (2002)*

The Structure Plan was approved by Scottish Ministers in October 2002. The document can be viewed and down loaded at http://www.angus.gov.uk/structureplan/
The main policies relevant to energy proposals are listed below:

Environmental Resources Policy 1: Natural Heritage Designations
Environmental Resources Policy 2: The Wider Natural Heritage
Environmental Resources Policy 3: Coastal Development and Protection
Environmental Resources Policy 4: Flooding and Development
Environmental Resources Policy 5: Historic Environment

Angus Local Plan Review (2009)*

The Angus Local Plan was adopted by Angus Council in February 2009. The document can be viewed and downloaded at www.angus.gov.uk/localplan
The main policies that may be relevant to energy proposals are listed below under the document headings:

General Policies
S1: Development Boundaries
S2: Accessible Development
S3: Design Quality
S4: Environmental Protection
S5: Safeguard Areas
S6: Development Principles and Schedule 1 : Development Principles

Building Sustainable Communities
SC19: Rural Employment

Environment and Resources
ER1: Natura 2000 and Ramsar Sites
ER2: National Nature Reserves and Sites of Special Scientific Interest
ER3: Regional and Local Designations
ER4: Wider Natural Heritage and Biodiversity
ER5: Conservation of Landscape Character
ER6: Trees, Woodlands and Hedgerows
ER7: Trees on Development Sites
ER10: Light Pollution
ER12: Development Affecting Conservation Areas
ER16: Development Affecting the Setting of a Listed Building
ER18: Archaeological Sites of National Importance
ER19: Archaeological Sites of Local Importance
ER20: Historic Gardens and Designed Landscapes
ER25: Water Resource Protection
ER27: Flood Risk – Consultation
ER28: Flood Risk Assessment
ER29: Coastal Development
ER30: Agricultural Land

*Hard copies of these documents can also be viewed at Angus Council libraries and ACCESS offices; and at Planning & Transport Reception County Buildings Forfar

APPENDIX 4: Print Version Maps

The print maps are illustrative of detailed information that can be accessed via the web-based version of the Implementation Guide, They are intended to indicate the location and range of International, National and Local designations and other considerations within the ALPR area.

Map 1 ALPR Boundary

Map 2 International Designations

Map 3 National Designations

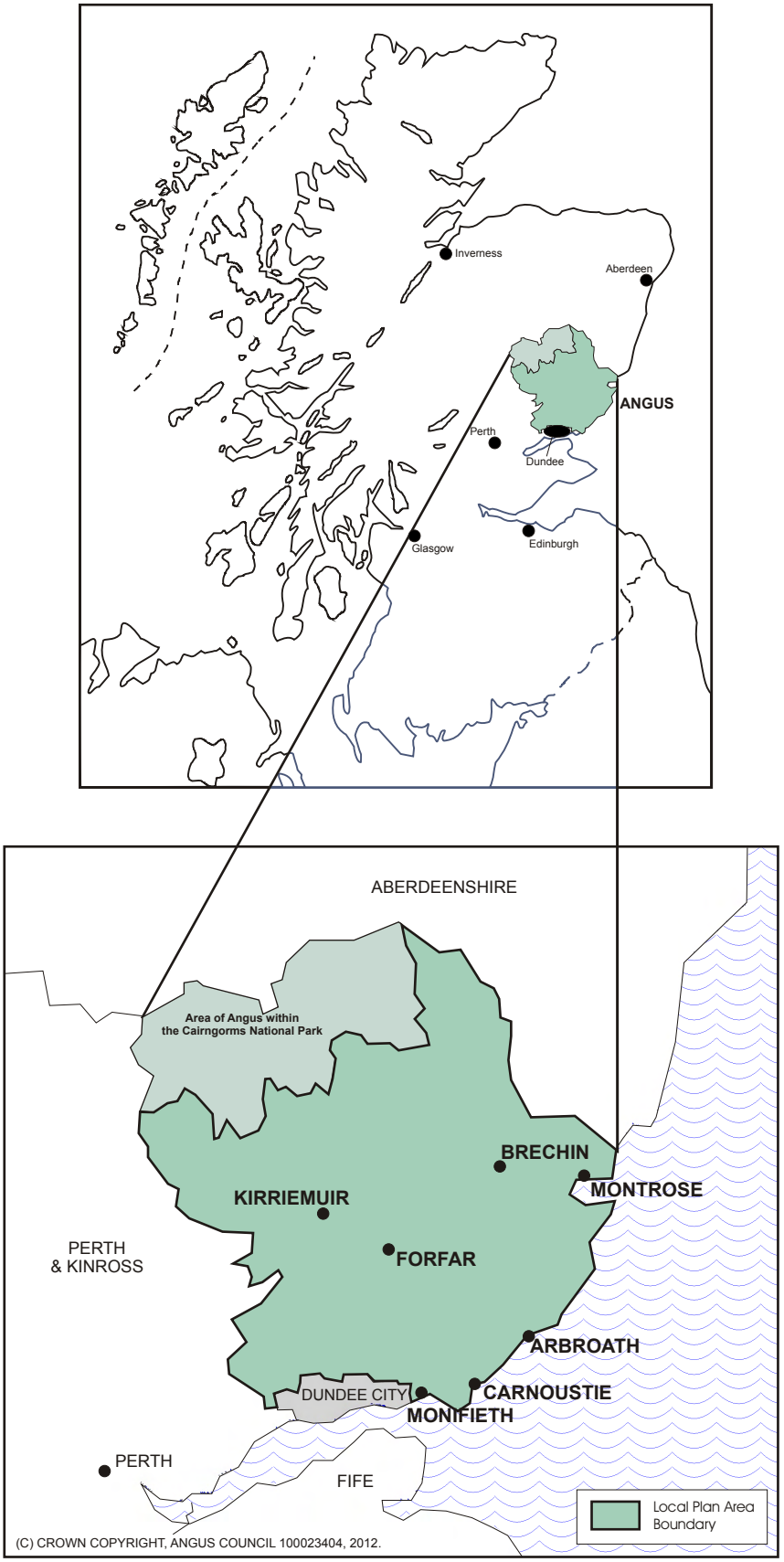
Map 4 Local Designations

Map 5 Other Considerations

Map 1

Angus - Location

The National Context



Note: The Angus Local Plan Review excludes that part of northern Angus which lies within the designated boundary of the Cairngorms National Park.

International Designations

- Angus Council Boundary
- Area of Angus within Cairngorms National Park
- Special Areas of Conservation (SAC)
- RAMSAR sites
- Special Protection Areas (SPA)

0 5 10 20 Kilometers

Angus Council
Infrastructure Services
Planning & Transport
County Buildings
Market Street
Forfar
DD8 3LG

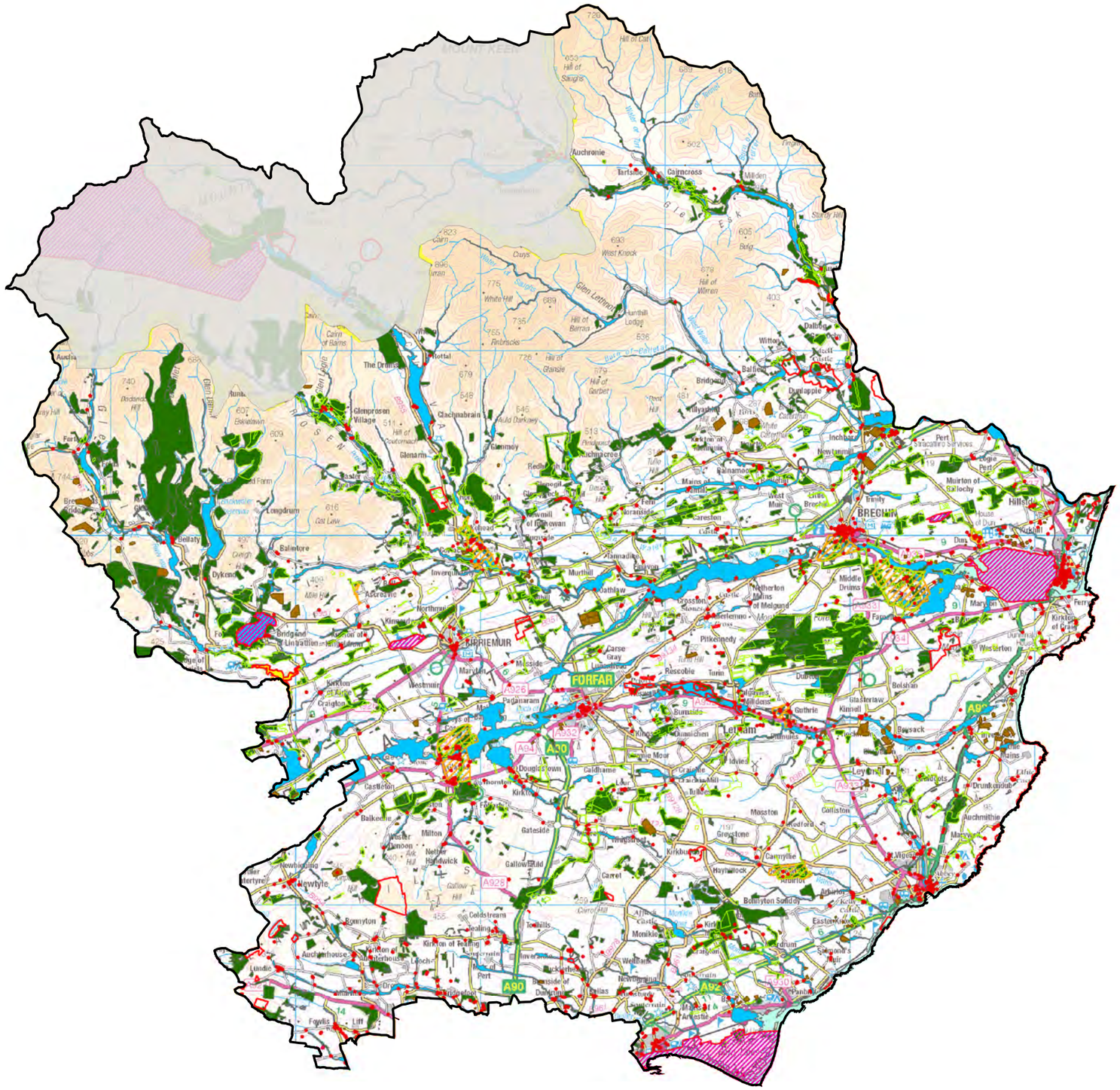
Map 2 - International Designations

Date Produced: 30/01/2012

Drawn by: CM

Scale: 1:250,000

N W E S



National Designations

- Angus Council Boundary
- Area of Angus within Cairngorms National Park
- RSPB Important Bird Areas
- Historic Scotland Listed Buildings
- Sites of Special Scientific Interest (SSSI)
- Historic Scotland Scheduled Ancient Monuments
- National Nature Reserves (NNR)
- Scotland Ancient Woodland Inventory
- Historic Gardens and Designated Landscapes (HGDL)
- Woodland Map of Scotland
- 200yr SEPA map Coastal Flooding
- 200yr SEPA map Fluvial Flooding

0 5 10 20 Kilometers

Angus Council
Infrastructure Services
Planning & Transport
County Buildings
Market Street
Forfar
DD8 3LG

Map 3 - National Designations

Date Produced: 30/01/2012

Drawn by: CM

Scale: 1:250,000

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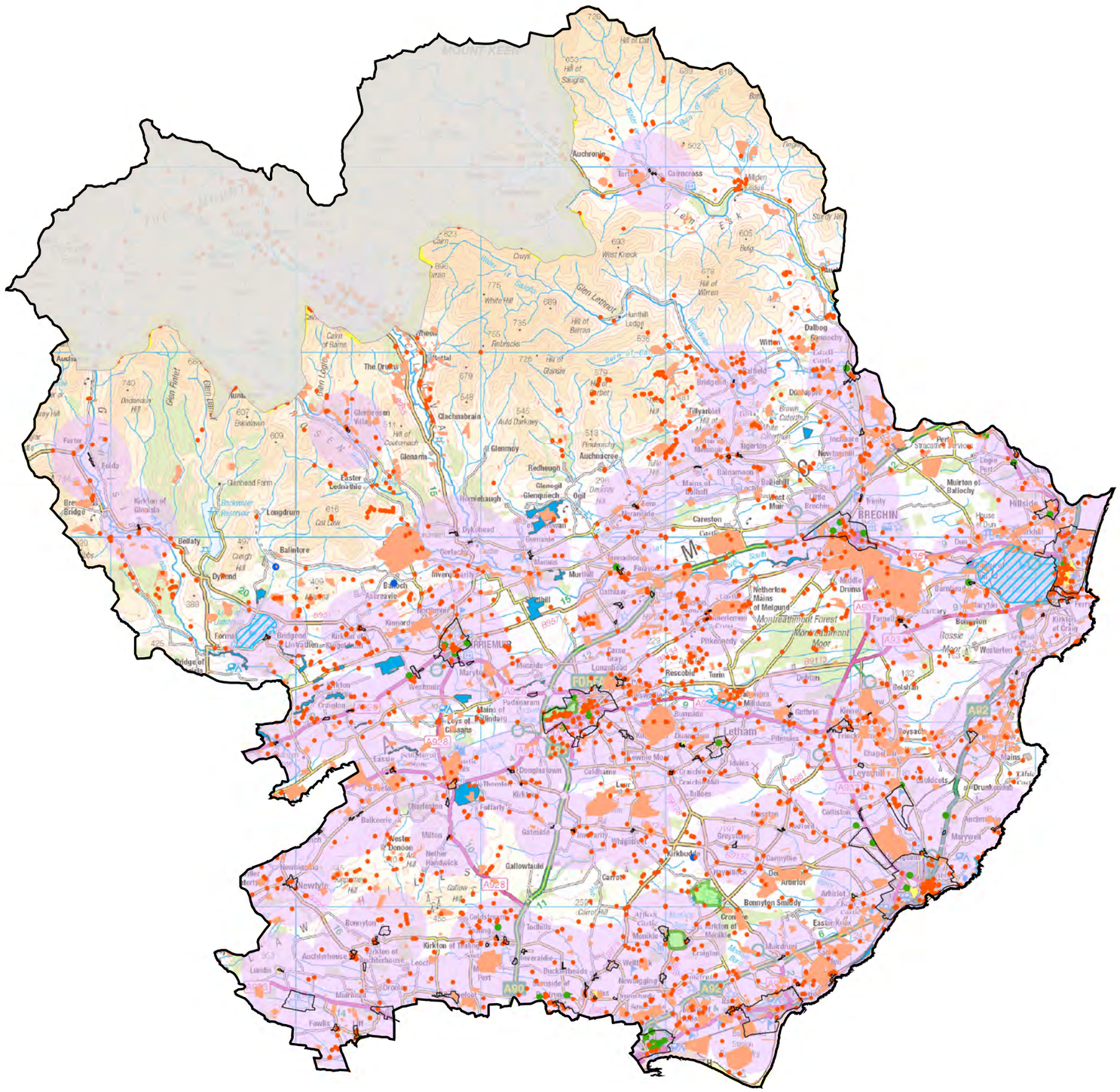

Local Designations

- Angus Council Boundary
- Area of Angus within Cairngorms National Park
- Development Boundaries
- Scottish Wildlife Trust Reserves
- Archaeological Points
- Country Parks
- Archeological Areas
- Angus Wildlife Sites (Points)
- Angus Wildlife Sites (Areas)
- Tree Preservation Orders (Point)
- Tree Preservation Orders (Polygons)
- Conservation Areas
- Local Nature Reserves
- Development Boundaries Plus 2km

0 5 10 20 Kilometers

Angus Council
Infrastructure Services
Planning & Transport
County Buildings
Market Street
Forfar
DD8 3LG

Map 4 - Local Designations

Date Produced: 30/01/2012

Drawn by: CM

Scale: 1:250,000

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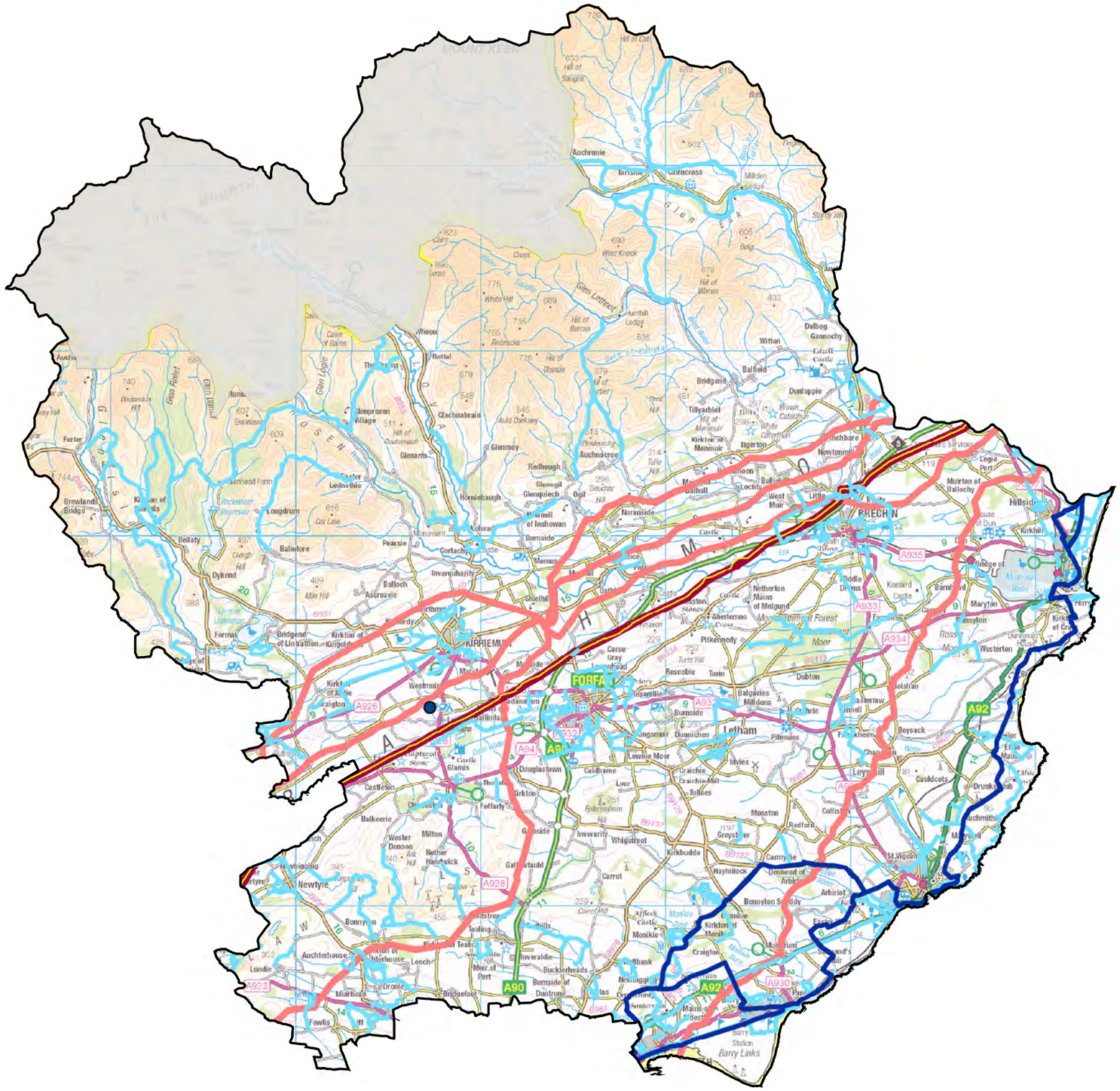

Other Considerations

- Angus Council Boundary
- Area of Angus within Cairngorms National Park
- Private Airfields
- National Cycle Network
- Adopted Core Paths
- Shell Pipeline
- BP Pipeline
- National Grid High Pressure Gas Pipe

0 5 10 20 Kilometers

Angus Council
Infrastructure Services
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Market Street
Forfar
DD8 3LG

Map 5 - Other Considerations

Date Produced: 30/01/2012

Drawn by: CM

Scale: 1:250,000

N W E S

County Buildings Market Street Forfar DD8 3LG

Tel: 01307 461460

Fax: 01307 461 895

Email: plnprocessing@angus.gov.uk

Applications cannot be validated until all necessary documentation has been submitted and the required fee has been paid.

Thank you for completing this application form:

ONLINE REFERENCE 000096508-001

The online ref number is the unique reference for your online form only. The Planning Authority will allocate an Application Number when your form is validated. Please quote this reference if you need to contact the Planning Authority about this application.

Type of Application

What is this application for? Please select one of the following: *

We strongly recommend that you refer to the help text before you complete this section.

- [x] Application for Planning Permission (including changes of use and surface mineral working)
- [ ] Application for Planning Permission in Principle
- [ ] Further Application, (including renewal of planning permission, modification, variation or removal of a planning condition etc)
- [ ] Application for Approval of Matters specified in conditions

Description of Proposal

Please describe the proposal including any change of use: * (Max 500 characters)

Installation of two wind turbine generators, temporary anemometer mast and associated infrastructure on land 600m west of Witton Farm, Lethnot, Edzell

Is this a temporary permission? * ☐ Yes ☑ No

If a change of use is to be included in the proposal has it already taken place? (Answer 'No' if there is no change of use.) * ☐ Yes ☑ No

Have the works already been started or completed? *

☑ No ☐ Yes - Started ☐ Yes - Completed

Applicant or Agent Details

Are you an applicant, or an agent? * (An agent is an architect, consultant or someone else acting on behalf of the applicant in connection with this application) ☐ Applicant ☑ Agent

Agent Details

Please enter Agent details

Company/Organisation:	Roddy Yarr Consulting Ltd
Ref. Number:	
First Name: *	Roddy
Last Name: *	Yarr
Telephone Number: *	07881247955
Extension Number:	
Mobile Number:	
Fax Number:	
Email Address: *	roddy@thewindfarmer.co.uk

You must enter a Building Name or Number, or both:*

Building Name:	61
Building Number:	
Address 1 (Street): *	Spottiswoode Gardens
Address 2:	
Town/City: *	St Andrews
Country: *	UK
Postcode: *	KY16 8SB

Is the applicant an individual or an organisation/corporate entity? *

☑ Individual ☐ Organisation/Corporate entity

Applicant Details

Please enter Applicant details

Title: *	Mr
Other Title:	
First Name: *	Greg
Last Name: *	Yarr
Company/Organisation:	
Telephone Number:	
Extension Number:	
Mobile Number:	
Fax Number:	
Email Address:	

You must enter a Building Name or Number, or both:*

Building Name:	Witton Farm
Building Number:	
Address 1 (Street): *	Glen Lethnot
Address 2:	Edzell
Town/City: *	Brechin
Country: *	Scotland
Postcode: *	DD9 7UF

Site Address Details

Planning Authority: Angus Council

Full postal address of the site (including postcode where available):

Address 1:	WITTON FARMHOUSE	Address 5:	
Address 2:	LETHNOT	Town/City/Settlement:	BRECHIN
Address 3:	EDZELL	Post Code:	DD9 7UF
Address 4:			

Please identify/describe the location of the site or sites.

Northing	770097	Easting	356320

Pre-Application Discussion

Have you discussed your proposal with the planning authority? * ☑ Yes ☐ No

Pre-Application Discussion Details

In what format was the feedback given? *

☑ Meeting ☐ Telephone ☑ Letter ☑ Email

Please provide a description of the feedback you were given and the name of the officer who provided this feedback. If a processing agreement [note 1] is currently in place or if you are currently discussing a processing agreement with the planning authority, please provide details of this. (This will help the authority to deal with this application more efficiently.) * (Max 500 characters)

Scoping Response; Communications regarding former application 13/00257/Full; Noise mitigation requirements; Requirements for new application. Officer dealing with the discussions is Damian Brennan.

Title:	Mr	Other title:	
First Name:	Damian	Last Name:	Brennan
Correspondence Reference Number:	13/00257/full	Date (dd/mm/yyyy):	20/03/13

Note 1. A processing agreement involves setting out the key stages involved in determining a planning application, identifying what information is required and from whom and setting timescales for the delivery of various stages of the process.

Site Area

Please state the site area: 1.10

Please state the measurement type used: ☑ Hectares (ha) ☐ Square Metres (sq.m)

Existing Use

Please describe the current or most recent use: (Max 500 characters)

Grazing land as part of farm unit

Access and Parking

Are you proposing a new or altered vehicle access to or from a public road? * ☐ Yes ☑ No

If Yes please describe and show on your drawings the position of any existing, altered or new access points, highlighting the changes you propose to make. You should also show existing footpaths and note if there will be any impact on these.

Are you proposing any changes to public paths, public rights of way or affecting any public rights of access? * ☐ Yes ☑ No

If Yes please show on your drawings the position of any affected areas highlighting the changes you propose to make, including arrangements for continuing or alternative public access.

How many vehicle parking spaces (garaging and open parking) currently exist on the application site? * 0

How many vehicle parking spaces (garaging and open parking) do you propose on the site (i.e. the total of existing and any new spaces or a reduced number of spaces)? * 0

Please show on your drawings the position of existing and proposed parking spaces and identify if these are for the use of particular types of vehicles (e.g. parking for disabled people, coaches, HGV vehicles, cycle spaces).

Water Supply and Drainage Arrangements

Will your proposal require new or altered water supply or drainage arrangements? * ☐ Yes ☑ No

Do your proposals make provision for sustainable drainage of surface water? (e.g. SUDS arrangements) * ☑ Yes ☐ No

Note: -

Please include details of SUDS arrangements on your plans

Selecting 'No' to the above question means that you could be in breach of Environmental legislation.

Are you proposing to connect to the public water supply network? *

☐ Yes

☐ No, using a private water supply

☑ No connection required

If No, using a private water supply, please show on plans the supply and all works needed to provide it (on or off site).

Assessment of Flood Risk

Is the site within an area of known risk of flooding? * ☐ Yes ☑ No ☐ Don't Know

If the site is within an area of known risk of flooding you may need to submit a Flood Risk Assessment before your application can be determined. You may wish to contact your Planning Authority or SEPA for advice on what information may be required.

Do you think your proposal may increase the flood risk elsewhere? * ☐ Yes ☑ No ☐ Don't Know

Trees

Are there any trees on or adjacent to the application site? * ☐ Yes ☑ No

If Yes, please mark on your drawings any trees, known protected trees and their canopy spread close to the proposal site and indicate if any are to be cut back or felled.

Waste Storage and Collection

Do the plans incorporate areas to store and aid the collection of waste (including recycling)? * ☐ Yes ☑ No

If Yes or No, please provide further details:(Max 500 characters)

No waste will be generated by the development.

Residential Units Including Conversion

Does your proposal include new or additional houses and/or flats? * ☐ Yes ☑ No

All Types of Non Housing Development - Proposed New Floorspace

Does your proposal alter or create non-residential floorspace? * ☐ Yes ☑ No

Schedule 3 Development

Does the proposal involve a form of development listed in Schedule 3 of the Town and Country Planning (Development Management Procedure (Scotland) Regulations 2013 * ☑ Yes ☐ No ☐ Don't Know

If yes, your proposal will additionally have to be advertised in a newspaper circulating in the area of the development. Your planning authority will do this on your behalf but will charge you a fee. Please check the planning authority's website for advice on the additional fee and add this to your planning fee.

If you are unsure whether your proposal involves a form of development listed in Schedule 3, please check the Help Text and Guidance notes before contacting your planning authority.

Planning Service Employee/Elected Member Interest

Is the applicant, or the applicant's spouse/partner, either a member of staff within the planning service or an elected member of the planning authority? * ☐ Yes ☑ No

Certificates and Notices

CERTIFICATE AND NOTICE UNDER REGULATION 15 – TOWN AND COUNTRY PLANNING (DEVELOPMENT MANAGEMENT PROCEDURE) (SCOTLAND) REGULATIONS 2013

One Certificate must be completed and submitted along with this application form. This is most usually Certificate A, Form 1, Certificate B, Certificate C or Certificate E.

Are you/the applicant the sole owner of ALL the land ? * ☑ Yes ☐ No

Is any of the land part of an agricultural holding? * ☑ Yes ☐ No

Do you have any agricultural tenants? * ☐ Yes ☑ No

Certificate Required

The following Land Ownership Certificate is required to complete this section of the proposal:

Certificate E

Land Ownership Certificate

Certificate and Notice under Regulation 15 of the Town and Country Planning (Development Management Procedure) (Scotland) Regulations 2013

Certificate E

I hereby certify that –
(1) – No person other than myself/the applicant was the owner of any part of the land to which the application relates at the beginning of the period 21 days ending with the date of the application.

(2) - The land to which the application relates constitutes or forms part of an agricultural holding and there are no agricultural tenants

Or

(1) – No person other than myself/the applicant was the owner of any part of the land to which the application relates at the beginning of the period 21 days ending with the date of the application.

(2) - The land to which the application relates constitutes or forms part of an agricultural holding and there are agricultural tenants.

These People are:

Name:

Address:

Date of Service of Notice: *

(3) - I have/The applicant has taken reasonable steps, as listed below, to ascertain the names and addresses of the other agricultural tenants and *have/has been unable to do so –

Signed: Roddy Yarr

On behalf of: Mr Greg Yarr

Date: 03/08/2014

☑ Please tick here to certify this Certificate. *

Checklist - Application for Planning Permission

Town and County Planning (Scotland) Act 1997

The Town and Country Planning (Development Management Procedure) (Scotland) Regulations 2013

Please take a few moments to complete the following checklist in order to ensure that you have provided all the necessary information in support of your application. Failure to submit sufficient information with your application may result in your application being deemed invalid. The planning authority will not start processing your application until it is valid.

a) If this is a further application where there is a variation of conditions attached to a previous consent, have you provided a statement to that effect? *

☐ Yes ☐ No ☑ Not applicable to this application

b) If this is an application for planning permission or planning permission in principal where there is a crown interest in the land, have you provided a statement to that effect? *

☐ Yes ☐ No ☑ Not applicable to this application

c) If this is an application for planning permission, planning permission in principle or a further application and the application is for development belonging to the categories of national or major developments (other than one under Section 42 of the planning Act), have you provided a Pre-Application Consultation Report? *

☐ Yes ☐ No ☑ Not applicable to this application

Town and County Planning (Scotland) Act 1997

The Town and Country Planning (Development Management Procedure) (Scotland) Regulations 2013

d) If this is an application for planning permission and the application relates to development belonging to the categories of national or major developments and you do not benefit from exemption under Regulation 13 of The Town and Country Planning (Development Management Procedure) (Scotland) Regulations 2013, have you provided a Design and Access Statement? *

☐ Yes ☐ No ☑ Not applicable to this application

e) If this is an application for planning permission and relates to development belonging to the category of local developments (subject to regulation 13. (2) and (3) of the Development Management Procedure (Scotland) Regulations 2013) have you provided a Design Statement? *

☐ Yes ☐ No ☑ Not applicable to this application

f) If your application relates to installation of an antenna to be employed in an electronic communication network, have you provided an ICNIRP Declaration? *

☐ Yes ☐ No ☑ Not applicable to this application

g) If this is an application for planning permission, planning permission in principle, an application for approval of matters specified in conditions or an application for mineral development, have you provided any other plans or drawings as necessary:

☑ Site Layout Plan or Block plan.

☑ Elevations.

☐ Floor plans.

☐ Cross sections.

☐ Roof plan.

☐ Master Plan/Framework Plan.

☐ Landscape plan.

☑ Photographs and/or photomontages.

☑ Other.

If Other, please specify: * (Max 500 characters)

A supporting Environment and Planning Report with a set of appendices with supporting drawings and diagrams and text will be placed on a CD and delivered to Angus Council.

Provide copies of the following documents if applicable:

A copy of an Environmental Statement. *	☑ Yes	☐ N/A
A Design Statement or Design and Access Statement. *	☑ Yes	☐ N/A
A Flood Risk Assessment. *	☐ Yes	☑ N/A
A Drainage Impact Assessment (including proposals for Sustainable Drainage Systems). *	☐ Yes	☑ N/A
Drainage/SUDS layout. *	☐ Yes	☑ N/A
A Transport Assessment or Travel Plan. *	☑ Yes	☐ N/A
Contaminated Land Assessment. *	☐ Yes	☑ N/A
Habitat Survey. *	☑ Yes	☐ N/A
A Processing Agreement *	☐ Yes	☑ N/A

Other Statements (please specify). (Max 500 characters)

Declare - For Application to Planning Authority

I, the applicant/agent certify that this is an application to the planning authority as described in this form. The accompanying plans/drawings and additional information are provided as a part of this application .

Declaration Name: Roddy Yarr

Declaration Date: 03/08/2014

Submission Date: 07/08/2014

Payment Details

Cheque: Witton Farms, 00358

Created: 07/08/2014 17:34