

Moray Wind Energy Landscape Capacity Study

MAIN STUDY REPORT



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Final Main Study Report

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1. Introduction

Policy background

- 1.1 The Scottish Government is committed to increasing the amount of electricity generated from renewable sources. The current target is to meet 100% of Scotland's electricity requirement from renewable sources by 2020. Most of this capacity is likely to be met from hydro-electric and on-shore wind power, but in due course there is expected to be a wider range of productive renewable technologies, including off-shore wind power as well as biomass, solar, energy from waste and landfill gas and wave and tidal power.
- 1.2 Most of the energy generated to meet these targets will come from large scale, commercial developments under the Renewables Obligation which requires electricity suppliers to source a specified percentage of their energy from renewable technologies. However, the Government is also keen to encourage communities and small businesses to invest in renewable energy projects. Initiatives such as the Community and Renewable Energy Scheme and the 'Clean Energy Cashbacks', most commonly known as the 'Feed in Tariff' (for generators up to 5 MW) are examples of Government support to encourage the development of these smaller scale initiatives.
- 1.3 Scottish Planning Policy 2010 (SPP) seeks to support the initiatives set out above. It provides for a planned approach to delivering the target through setting the overall policy for preparing spatial frameworks, including the safeguarding of areas designated for their national and international natural heritage value. It gives a clear role to local authorities in relation to local interests and designated areas, in the identification of areas of search for developments over 20MW and in setting policy criteria. It however allows local planning authorities to make the decision whether to provide spatial guidance on wind farms below 20MW. SPP 2010 also recognises that there will be limits to the capacity of some areas to accept the cumulative impacts of multiple wind farm developments.
- 1.4 SPP 2010 expects planning authorities to 'support the development of a diverse range of renewable energy technologies, guide development to appropriate locations and provide clarity on the issues that will be taken into account when specific proposals are assessed'. They are also expected to clearly set out... 'the factors that will be taken into account in decision making on all renewable generation developments' within their development plans, or within supplementary guidance.
- 1.5 The Moray Structure Plan (2007) and the Moray Local Plan (2008) provide the current strategic policy framework for considering wind farm developments. Supplementary planning guidance has been produced for wind energy development and this includes identification of preferred search areas for large, medium and small wind farm developments (set out in the 2005 Wind Energy Policy Guidance). This policy has been informed by the 2004 study '*Landscape Potential for Windfarms in North and East Highland and Moray*. The Moray Structure and Local Plans will be replaced by the Moray Local Development Plan which is currently being prepared.

Study aims

- 1.6 This study has been commissioned as part of a review of the current Moray Wind Energy Policy Guidance (2005) to ensure an up-to-date framework is provided for determining wind energy proposals, taking into account existing wind farm development, the changing nature of proposals and national policy and guidance. The study considers landscape and visual sensitivities at a regional scale relative to the consideration and determination of further proposals for wind farm developments in Moray. It is a requirement of the study brief that areas where cumulative impact is, or is potentially at/or near capacity are identified and that clear siting and design guidance is given for landscapes where some capacity for development is defined. The study provides guidance on landscape and visual issues for considering development proposals for single/small turbines.
- 1.7 This capacity study considers only landscape and visual issues and a range of other environmental and technical issues also require to be considered in drawing up spatial frameworks and Supplementary Planning Guidance (SPG) for wind farm development. It is a strategic study which identifies broad landscape and visual constraints and opportunities for a defined number of wind energy development scenarios. Individual wind farm applications will therefore need to be considered on a case-by-case basis with Environmental Impact Assessment (EIA) studies, where relevant, providing more detailed information on landscape and visual issues.
- 1.8 The study area comprises the Moray administrative area but excludes the southern part of Moray lying within the Cairngorms National Park. Cross boundary issues are however considered within the National Park and within Aberdeenshire and Highland. Figure 1 shows Moray and adjoining authorities.

Structure of the report

- 1.9 This Main Study Report sets out the key findings of the wind farm landscape and visual capacity study for Moray. An accompanying Appendix Report contains the detailed assessments of sensitivity undertaken for landscape character types.
- 1.10 This main report outlines the methodology adopted for the study, the development typologies considered in the sensitivity assessment and the operational and consented wind energy developments which form the baseline for the study in section 2. A review of existing landscape characterisation studies follows in section 3 of the report which sets out our approach to the use of landscape character types in forming the baseline for the study.
- 1.11 The landscape and visual sensitivity assessments undertaken for wind farm developments within landscape character types/sub-types are summarised in this report within section 4 and these are followed by guidance on the micro-siting of smaller wind turbines set out in section 5. The report concludes with a summary of key findings and recommendations in section 6.

How to use the study

- 1.12 The study aims to inform both strategic planning for wind energy development and to provide guidance on the appraisal of individual wind farm and wind turbine proposals. This Main Study Report summarises the landscape sensitivity assessments that have been undertaken and it is therefore essential to also read the more detailed sensitivity assessment contained in the Appendix Report when considering individual wind energy developments.
- 1.13 The sensitivity assessments have been undertaken on the basis of defined landscape character types. Landscape character types often have 'fluid' boundaries where a gradual transition can occur between adjacent character types with some similar characteristics. Wind turbines are also tall structures likely to have an influence on adjoining landscape character types. *It is therefore recommended that when considering individual proposals, both the landscape character types are reviewed as wider sensitivities may apply.*



2. Study Methodology

Background to landscape capacity

- 2.1 Landscape capacity is described as 'the degree to which a particular landscape character type or area is able to accommodate change without significant effects on its character, or overall change of landscape character type. Capacity is likely to vary according to the type and nature of change being proposed¹
- 2.2 There is currently no formally agreed approach or methodology for assessing the sensitivity or capacity of different landscapes to wind energy development. Scottish Natural Heritage (SNH) have issued guidance on good practice in landscape capacity studies² and more detailed guidance is also provided by SNH in *Siting and* Designing Wind Farms in the Landscape which includes advice on strategic planning for wind farms.
- 2.3 Most landscape capacity studies are based on landscape character units and identify key characteristics of each landscape area or type potentially sensitive to any given development. The particular characteristics defined as key sensitivity criteria may change according to the nature of the development being considered, although the methodological approach between studies is generally similar. Visibility and views may be considered as a separate issue or may form part of the assessment of landscape sensitivity as a criterion together with key landscape characteristics. Some landscape capacity studies also consider designated landscapes and other recognised values separately in the assessment while others do not.

Definition of terms

2.4 The following definitions of terms apply to this study:

Landscape character

Landscape relates not only to the physical attributes of the land but also to the experience of the receptor. Landscape character is made up of the physical characteristics such as landform, land cover and settlement pattern (which exist whether anyone sees them or not) plus a range of perceptual responses to that landscape.

Landscape sensitivity

Sensitivity relates to landscape character and how vulnerable this is to change. In this study change relates to wind energy development and any findings on landscape sensitivity are restricted to this. Landscapes may have different sensitivities to other forms of change or development. Landscapes which are highly sensitive are at risk of having their key characteristics fundamentally altered by development. Sensitivity is assessed by considering the physical and perceptual characteristics of landscapes.

Landscape Character Assessment: Guidance for England and Scotland, Countryside Agency and Scottish Natural Heritage

^{(2002) &}lt;sup>2</sup> Grant, A et al (2010) *Landscape capacity studies in Scotland – a review and guide to good practice*, Scottish Natural Heritage Commissioned Report No. 385

Landscape capacity

This relates to how far a landscape can accommodate development without significant adverse impacts on its character. Landscape character and sensitivity are part of this, but capacity can also include visibility assessment and consideration of any values placed on the landscape (usually in the form of designations).

General approach to the study

- 2.5 Our approach to the study has been informed by guidance on the potential impacts and landscape sensitivities associated with wind energy development and on the practical application of methodologies used in recent landscape capacity studies we have undertaken for wind energy development. The study has been carried out in accordance with SNH guidance on good practice in relation to landscape capacity studies and it has involved the following key tasks:
 - Identifying existing and consented wind farm/turbine developments in Moray and within adjoining authorities considered to form the baseline for the study. Proposed wind farms/turbines were also considered in the study to provide background information on potential cumulative issues.
 - Review of existing baseline landscape character studies for Moray and adjoining areas and definition of landscape character types to be used as the basis for the study.
 - Identifying the wind farm/turbine development typologies to be assessed in the study.
 - Defining the landscape and visual sensitivity criteria to be used in the assessment.
 - Field work to assess the sensitivity of different landscape character types to defined development typologies using identified sensitivity criteria.
 - Developing guidance on the siting of smaller turbines, principally informed by fieldwork undertaken in Moray.
 - Providing an overview of landscape and visual sensitivities across the region and recommendations on strategic landscape and visual considerations.
- 2.6 The study brief requested that existing landscape designations should not be taken into account in the landscape capacity assessment. The key tasks listed above are summarised in the following text with further detail provided in subsequent sections of this report and in Annex C.

Operational and consented wind farms/turbines

2.7 A number of wind farm/turbines developments over 50m high to blade tip have been constructed and recently consented within Moray and these are considered to form part of the baseline landscape and visual character in the study. A cut-off date of January 1st 2012 was set for inclusion of the operational and consented wind farms and turbines listed in the following table which were considered within the study:

Wind Farm	Number	Height	Landscape character type	
	of	to blade		
	turbines	tip		
Operational wind farms	Operational wind farms and turbines over 50m height			
Rothes	28	100m	Upland Moorland and Forestry (9)	
Paul's Hill	28	100m	Open Uplands (10)	
Hill of Towie	21	100m	Broad Forested Hills within Upland	
			Farmland (8a)	
Myreton, Keith	1	80m	Upland Farmland (8)	
Balnamoon, Keith	1	70m	Upland Farmland (8)	
Consented wind farms and turbines over 50m height				
Berry Burn	32	104m	Open Uplands (10)	
Rothes extension	18	125m	Upland Moorland and Forestry (9)	
Myreton	2	89m	Upland Farmland (8)	
Netherton of Windyhills	2	92m	Upland Farmland (8)	
Dorenell	59	126m	Open Uplands with Settled Glens (10b)	
Hunthill, Rothes	3	67m	Upland Moorland and Forestry (9)	
Cluny Farm, Forres	1	61m	Rolling Farmland and Forests with Low	
			Hills (5b)	
Ardoch Farm, Mulben	1	67m	Broad Farmed Valley (7)	
Bognie Farm	1	61m	Rolling Farmland and Forests with	
			Valleys (5a)	

2.8 There are a number of operational single and small groups (usually <3) of turbines below 50m height within Moray. To date these are largely located within the 'Upland Farmland' (8), Broad Farmed Valley (7) and the Coastal Farmland (4) character types. The sensitivity assessments undertaken for individual landscape character types, set out in section 4 of this report, note the presence of some of these smaller turbines.</p>

Baseline landscape character

2.9 This capacity study has been informed by the landscape characterisation work set out in the Moray and Nairn Landscape assessment (1998) undertaken by the Turnbull Jeffrey Partnership for SNH. Review of this study was undertaken in the field and revisions were made to landscape character types and their classification for the purposes of this capacity study. These are detailed in section 3 of this report.

Development typologies

- 2.10 The height of turbines relative to other structures in the landscape is a key consideration in terms of landscape 'fit'. Different sensitivities come into play once turbines exceed the height of other common landscape features, for example trees and small wood pole lines.
- 2.11 Turbines below 20m height to blade tip have been excluded from the detailed sensitivity assessment undertaken for character types within Moray. This is because turbines of this size can be successfully accommodated within most landscapes subject to careful siting and design. Landscape and visual issues associated with turbines of this size are however generally considered within the sensitivity



assessments and within the guidance on the siting of smaller turbines contained in section 6 of this report (to be included in the draft final report).

Smaller typologies

2.12 We have categorised 'smaller' turbines as being those under 50m height to blade tip. We have found during our field assessments (and observations of existing smaller turbines in the landscape) that there is a noticeable 'threshold' at around 35m height to blade tip where over this height a turbine will quickly become a dominant feature in many lowland/more settled landscapes. Two 'smaller' typologies have therefore been assessed in detail in the study based on turbines 20-35m and 35m-50m height to blade tip. These smaller typologies have not been considered in detail within more sparsely populated upland landscape character types as demand for this height of turbines is likely to be limited. A brief appraisal of key sensitivities relating to smaller typologies is however included in the summary and guidance sections of the sensitivity assessments for these upland character types.

Larger typologies

2.13 In terms of larger developments (turbines 50m -130m) we have principally considered the height of turbine within the sensitivity assessment. We have not specifically considered pre-determined numbers of turbines within the typologies assessed although some indication is given of the likely extent of development that may be accommodated where the sensitivity assessment indicates some capacity within the guidance set out for each landscape character type.

Summary of development typologies to be considered

2.14 We have considered the following development typologies in the study:

Typology	Height	Scale	
Small	20-35m	Single turbines or small groups of	
Small/medium	35-50m	turbines. These smaller typologies	
		are assessed separately in the study.	
Medium	50-80m	Single turbines/groups of turbines	
Large	80-130m	Single turbines/groups of turbines	

2.15 In addition, extensions to existing wind farm developments have been considered in the guidance provided within each sensitivity assessment with recommendations given on the appropriate height of turbines and the general extent of development that could be accommodated.

The sensitivity assessment

2.16 The capacity study considers the sensitivity of key characteristics of each landscape character type or sub-type to different types of wind farm or turbine development. The assessment process uses a range of sensitivity criteria to do this based on key landscape and visual characteristics and cumulative landscape and visual effects.

Landscape sensitivity criteria

- 2.17 The sensitivity assessment considers the following criteria in assessing landscape sensitivity to wind energy development:
 - Landscape context
 - Scale and openness
 - Landform
 - Land cover pattern
 - Built environment
 - Perceptual qualities
 - Visual amenity
 - Cumulative effects

A detailed description of the factors considered within the sensitivity assessment is contained in Annex C.

Visual tools used during fieldwork

2.18 Computer-generated visualisations from relevant Environmental Statements were used, where available, to inform the assessment of potential cumulative issues. A number of 'photo wire' visualisations illustrating a range of turbine heights from identified viewpoints were also produced to inform the sensitivity assessment in the field.

Sensitivity levels

2.19 We have used a five point scale of 'scoring' in the assessment of each sensitivity criterion. This is also adopted in the overall sensitivity scores accorded to each landscape character type. This is interpreted in the following table relating to overall sensitivity ratings:

Overall	Definition
Sensitivity rating	
Low	The development typology relates well to key
	landscape characteristics and change is able to be
	accommodated with minimal impact.
Medium - Iow	There are some limited sensitivities although
	opportunities exist to accommodate the development
	typology within much of the character type.
Medium	Some key landscape characteristics are sensitive but
	there is scope to accommodate development in some
	situations without significant character change/or the
	development typology relates to a number of key
	aspects of landscape character.
High-medium	Most of the key landscape characteristics are
	sensitive and development would incur significant
	adverse impacts. There may be limited opportunities
	in some restricted parts of the character type.
High	The majority or all of the key landscape
	characteristics are vulnerable to change.

Development would conflict with key aspects of landscape character with widespread and significant
adverse impacts likely to arise.

2.20 The overall sensitivity level is judged by considering the combined weight of evidence on landscape sensitivity rather than using a numerical scoring system for each sensitivity criterion. We have additionally considered potential cumulative landscape and visual issues prior to coming to a judgement on opportunities and constraints to different development typologies within each landscape character type.

Cumulative landscape and visual effects and issues

- 2.21 Cumulative effects are considered as a key criterion within the detailed sensitivity assessment. This assessment judges sensitivity on the basis of operational and consented wind farm/turbine developments both within the landscape character type and the surrounding area. This includes an assessment of likely 'cross-boundary' issues which are likely to arise for each landscape type, and for all relevant typologies.
- 2.22 In addition, we have provided further appraisal of the specific landscape and visual effects of operational and consented wind farm and turbine development and identified a number of key issues that may occur if multiple wind farms or turbines were constructed. These potential cumulative issues provide a checklist that can be used when considering individual developments and when undertaking periodic monitoring.

Guidance for siting smaller turbines

2.23 Guidance on the siting of wind turbines below 50m height is provided in the study in accordance with the requirements of the brief. This work supplements SNH's published guidance *Siting and Designing Windfarms in the Landscape* (2009) and *Siting and designing of small scale wind turbines of between 15 and 20 metres in height* (2012) and is specifically related to Moray.

3. Baseline landscape character

The Moray and Nairn Landscape Assessment

- 3.1 The Moray and Nairn landscape assessment was undertaken by Turnbull Jeffrey Partnership in 1998 and formed part of the national programme of landscape character assessment commissioned by SNH in partnership with local authorities. This regional study identifies 10 landscape character types across Moray and Nairn. Local authority boundaries have since been redrawn with the Nairn area allocated to Highland Council. The south-western boundary shown in the Moray and Nairn landscape assessment has also changed with the new Moray boundary extending further up the Spey Valley and to include Ben Rinnes to the Avon Valley which forms the boundary with the Cairngorms National Park.
- 3.2 The Moray and Nairn landscape assessment identifies broad character types. The original GIS 1: 50 000 scale mapping of character types is no longer available, and they were redrawn for the purposes of this study from the small-scale map within the study report. It was noted that these were required to be re-assessed to relate better to features on the ground.

Cross-boundary characterisation

- 3.3 Landscape character assessments have been undertaken under the SNH programme of national characterisation for South and Central Aberdeenshire (1998), Banff and Buchan (1997) and the Cairngorms (1998). Reorganisation and the formation of the Cairngorms National Park have resulted in changes to some local authority boundaries. An updated and detailed character assessment was undertaken for the Cairngorms National Park in 2010.
- 3.4 Where there are obvious extensions to landscape character types beyond the boundaries of Moray, these are noted in the relevant sensitivity assessments with reference made to the adjacent landscape character assessments.

Detailed review of landscape character within Moray

- 3.5 During our review and field work we focused on verifying the descriptions within the Moray and Nairn Landscape assessment against the key characteristics likely to be sensitive to wind farm development and noted the following:
 - The 'Soft Coastal Shore' (1), 'Hard Coastal Shore' (2) and some of the 'Coastal Forest' (3) character types are likely to have similar sensitivities to turbine development due to the presence of historic settlements, the often naturalistic and diverse coastal landform and high recreational activity associated with these coastal areas.
 - The 'Coastal Farmlands' (4) have a generally consistent character although the broad gently undulating plain becomes more rolling to the east at the transition with the 'Upland Farmland' (8).
 - The character type of the 'Rolling Farmlands and Forest' (5) is very diverse in its landform, land cover and settlement pattern but also in terms of its context in relation to the adjacent 'Upland Moorland and Forestry' (9), where

cumulative issues could arise with existing wind farm development. The western area comprises small hills with extensive woodlands and policies. The central area forms a distinct pattern of ridges cut by the valleys of the upper Lossie and Pluscarden while the eastern area between the Lossie and Spey features rolling hill fringes, conforming more to the description of this character type in the Moray and Nairn landscape assessment.

- The 'Narrow Wooded Valley' (6) has a consistent character and likely sensitivity to wind energy development. The 'Broad Farmed Valley' (7) is also largely consistent in its character although some of the boundaries do not relate to key landscape features (for example, the immediate ridges which contain the valley). The valleys of the Fiddich and Rinnes to the south-east of the Spey have a similar character to this landscape type.
- There is considerable variation in the character of the 'Upland Farmland' (8) which is extensive and includes expansive forested and sparsely settled upland plateau, broad farmed shallow valleys but also more contained valleys with a smaller scale. The valley of the River Fiddich between Dufftown and Craigellachie which falls in this character type is more similar in character to the adjacent 'Broad Farmed Valley' (7).
- The 'Upland Moorland and Forestry' (9) has a generally homogenous character although the northern and southern boundaries of this character type feature smaller scale settled and farmed landscapes on lower hill slopes which lie at the transition with the 'Broad Farmed Valley' (7) and the 'Rolling Farmlands and Forest' (5).
- The 'Open Uplands' (10) are found in the west and south-east of Moray. These character types have a very different context. The south-eastern area has been affected by boundary changes since the Moray and Nairn character assessment was undertaken. There are also more settled and farmed valleys within this broad upland area which have different sensitivities to wind farm development.

Baseline characterisation used in the study

- 3.6 The Moray and Nairn landscape assessment has informed our own definition of more detailed character areas for the purposes of this sensitivity assessment. We have adopted the names of the broad character types defined in the landscape assessment but have introduced sub-divisions which reflect key characteristics and the specific landscape context of landscapes which would potentially be sensitive to wind farm and turbine development. New characterisation has also been undertaken for the 'gaps' where boundary changes have occurred and boundaries have been altered to better reflect landscape features seen on the ground.
- 3.7 The table below sets out how we have addressed each of the landscape character types identified in the Moray Landscape Character Assessment within the detailed sensitivity assessment for this study:

No	Character type	Approach adopted for assessment
1.	Soft Coastal Shore	This character type has been amalgamated with the 'Hard Coastal Shore' (2) and much of the 'Coastal Forest' (3) and a single sensitivity assessment undertaken.

2.	Hard Coastal Shore	As above
3	Coastal Forest	As above
4	Coastal Farmland	A sub-division of this character type has been defined to the east and is called the 'Coastal Farmland with Rolling Hills' (4a). This area has a more rolling landform and greater extent of woodland than the main type; it also lies in close proximity to the 'Broad Forested Hills within Upland Farmland' (8a). Separate sensitivity assessments have been undertaken for the main type (4) and this sub-type (4a)
5	Rolling Farmlands and Forest	Two sub-divisions of this character type have been defined; the 'Rolling Farmlands and Forest with Valleys' (5a) and the 'Rolling Farmlands and Forest with Low Hills' (5b) to the west. The narrow band of rolling hill fringes found between the Spey and Lossie valleys has been retained as 'Rolling Farmlands and Forest' (5). Separate sensitivity assessments have been undertaken for the main type (5) and for sub- types (5a) and (5b).
6	Narrow Wooded Valley	This character type has been largely retained in the sensitivity assessment but with some minor amendments made to the boundaries
7	Broad Farmed Valley	This character type has been extended to include the Rinnes and Fiddich valleys and Ben Aigan which lies between these valleys and forms a key landmark feature.
8	Upland Farmland	The broad farmland centred on the shallow valley of the Isla and its northern tributaries has been retained as 'Upland Farmland' (8). Two sub-types have additionally been defined within this character type, the 'Broad Forested Hills within Upland Farmland' (8a) and the 'Valleys within Upland Farmland' (8b)
9	Upland Moorland and Forestry	This character type has been largely retained but with some amendments made to the southern boundary to exclude the settled hill fringes at the transition with the Spey Valley and to the northern boundary to exclude the settled valley of the Upper Lossie.
10	Open Uplands	The western part of this character type is retained as 'Open Uplands' (10). The eastern area of this character type has been sub-divided into the 'Open Uplands with Settled Valleys' (10a) and the 'Open Uplands with Steep-sided Slopes' (10b).