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Landscape Capacity Study for Wind Turbine Development in Glasgow and the Clyde Valley

Overview Report

Prepared by LUC for the Glasgow and the Clyde Valley Strategic Development Plan Authority
September 2014

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Client: Glasgow and the Clyde Valley Strategic Development Plan Authority

In association with:

- Scottish Natural Heritage
- East Dunbartonshire Council
- East Renfrewshire Council
- Glasgow City Council
- Inverclyde Council
- North Lanarkshire Council
- Renfrewshire Council
- South Lanarkshire Council
- West Dunbartonshire Council

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Executive Summary

Approach and methodology

The Landscape Capacity Study for Wind Turbine Development in Glasgow and the Clyde Valley was undertaken between September 2013 and May 2014. The aim was to provide a strategic view of landscape sensitivity to wind energy development, and available capacity for further development, across the Glasgow and the Clyde Valley Strategic Development Plan area. The project was overseen by a steering group comprising Glasgow and the Clyde Valley Strategic Development Plan Authority, Scottish Natural Heritage, and the eight constituent local authorities. The outputs of the study include an Overview Report and eight local authority reports.

The foundation of the study is the characterisation presented in the Glasgow and Clyde Valley Landscape Character Assessment (1999) which provides a regional-scale classification of the landscape. The relative sensitivity and capacity of each of the defined landscape character types was assessed.

Sensitivity was evaluated through application of a series of criteria, developed from guidance on the siting and designing of wind farms which has been published by Scottish Natural Heritage. These criteria were discussed and agreed with the steering group. Sensitivity was defined for a series of wind turbine heights, ranging from 15 m up to around 150 m to represent the spectrum of turbine sizes which are currently operating or in the planning system.

Alongside the sensitivity assessment, the relative value placed on the landscape was evaluated. For the purposes of this study, this has been based on the presence of regional and local landscape designations, including regional parks, special landscape areas, areas of great landscape value and similar. Note has also been taken of country parks and landscape-related heritage assets, particularly world heritage sites.

The underlying capacity of each landscape character type was evaluated based on the assessment of sensitivity and the indicators of landscape value. The underlying capacity of each character type is considered to be relatively continuous across each of the landscape character types.

The underlying capacity is affected to a greater or lesser extent by the presence of existing wind turbine development, and by consented and proposed future development. For the purposes of the study information was gathered on operational and consented development, and development within the planning system, in October/November 2013. This information was not updated during the project lifetime, and therefore represents a snapshot of a continually changing pattern of development. Developments at scoping stage were not considered.

Following analysis of the existing and proposed wind turbines within and around each character type, an evaluation was made of the remaining capacity for further development. This has been termed *current residual capacity*, since it is based on the examination of current patterns of development, which may change in the future. Current residual capacity is found to vary across landscape character types, depending on the local level of turbine development. Some landscape character types are therefore sub-divided and conclusions are presented in relation to smaller areas.

To examine the potential for cumulative effects at a wider scale, a strategic cumulative assessment was undertaken. This seeks to examine regional patterns of development, including consideration of existing and emerging clusters of development as well as currently undeveloped areas. The cumulative assessment compared patterns of development against the assessed capacity of the landscape. A number of representative viewpoints and routes were examined to identify the potential for cumulative impacts on views.

Key findings

The present study largely confirms the pattern of underlying sensitivity which has been established in previous studies. The examination of cumulative development within the landscape built on this to provide a picture of current residual capacity for further development. This establishes that there is residual capacity in some lower sensitivity landscapes, but that the capacity threshold is being approached in others.

The study identifies that a distinct pattern of development has emerged within the Glasgow and Clyde Valley area, and that there are few locations where the observed pressures are expanding wind farms beyond this pattern. Maintenance of this pattern of development is therefore identified as a means of restricting the spread of cumulative impacts into new areas. The Campsie Fells and the Tinto and western Pentlands areas are identified as strategic gaps in the wider pattern of development across the study area.

The study also notes that some landscapes, particularly areas of the Plateau Moorland, Plateau Farmland and Southern Uplands LCTs, are reaching the point at which cumulative effects are likely to limit the potential for further development.

Limitations

The study presents a strategic view of the sensitivity and capacity of the landscape of the study area. It was undertaken at a regional scale, and a number of important caveats, or 'health warnings', are therefore set out below.

- The study is based on the Glasgow and Clyde Valley Landscape Character Assessment, which defines broad landscape character types (LCTs) and was undertaken at a scale of 1:50,000. These LCTs may not recognise local variation in landscape character, and their boundaries are generally zones of transition rather than firm lines. Reference should be made to more than one LCT assessment in considering locations close to LCT boundaries.
- The sensitivity and capacity assessments were undertaken based on the regional-scale LCTs, and may therefore overlook local detail and variation. More detailed assessment of sensitivity and capacity may be appropriate, based on local landscape character studies, where these are available.
- Capacity is not solely an inherent characteristic of the landscape, but is partly defined by the demand or need for development which may change over time. The study does not seek to place defined limits on capacity, since the level of demand may increase or decrease in future depending on political and economic factors.
- The strategic cumulative assessment was undertaken at a regional scale, and does not attempt to report on every potential cumulative effect, focusing on broad patterns of development instead.
- The study aims to give a strategic overview of capacity for wind energy development across the Glasgow and Clyde Valley area, and is designed to be complemented by more detailed, local analysis of sensitivity or capacity in published or future studies at local authority level.
- The study is intended to be a tool to inform spatial planning and development management. It does not provide guidance on specific proposals or sites, and is not intended to be used on its own to determine the suitability of a specific site for development. Reliance on this study is not a substitute for detailed examination of the potential effects of individual wind energy proposals on a case-by-case basis.

Use of this document

The guidance presented in this document is based on consideration of wind energy developments which were operational, consented or the subject of live planning applications at the time of writing, based on data gathered in October/November 2013. Patterns of development have already moved on, and will continue to change in future. In referring to the conclusions of this study, it is essential to take note of changes which have taken place since it was written. When considering cumulative development within the area, the relevant local authorities should be contacted for up to date information on the planning status of proposed wind farms.

The study draws conclusions on:

- the underlying sensitivity and capacity of the landscape, regardless of current development; and
- the current residual capacity of the landscape, based on the current level of development.

While the underlying sensitivity and capacity will not change, the current residual capacity will be affected by incremental future development. As new projects enter the planning system, and further turbines are constructed, the current level of development will change with implications for the remaining capacity of the landscape.

For example, if the current residual capacity of a landscape is judged to be low to a particular type of development, and further development of this type has been consented since this report was written, then there may be no further capacity remaining. Alternatively, where higher capacity has been identified, additional development may have had limited effect, with some of the residual capacity still remaining.

The report does not introduce a threshold beyond which development would be unacceptable, but sets out guidelines, in terms of constraints and opportunities, as to how any further development may be accommodated. Consideration of this guidance will be the key factor in determining how much of the current residual capacity remains. Decisions must be made on a case-by-case basis, drawing on the detailed information presented within this report.

1 Introduction

Background to the Study

- 1.1 LUC was appointed in September 2013 to carry out a study of landscape sensitivity and capacity in relation to wind turbine development within the Glasgow and the Clyde Valley Strategic Development Plan (GCVSDP) area. The study presents a strategic view of landscape sensitivity and capacity in relation to landscape character, and offers an overview of cumulative effects across the area, to inform judgements as to where these may limit further development.
- 1.2 The project was overseen by a steering group led by the Glasgow and the Clyde Valley Strategic Development Plan Authority (GCVSDPA), together with Scottish Natural Heritage (SNH) and representatives of the eight constituent local authorities.

Purpose of the study

- 1.3 The study is required to examine the sensitivity of the landscape to wind turbine development at a range of scales. It is intended that the study will provide evidence to underpin the preparation of spatial frameworks and supplementary planning guidance on wind energy. It will also inform development management decisions for wind turbine proposals, as well as providing assistance to developers in terms of site selection.
- 1.4 The objectives of the study are clearly set out in the project brief. The key issues are highlighted as follows:
 - “Identify **existing, consented and proposed wind turbine developments** in the study area and **adjacent areas to be considered** in the study.
 - Establish **baseline landscape character** across the study area.
 - Identify the wind farm and wind turbine **typology** to be assessed in the study.
 - Define the landscape and visual **sensitivity criteria** to be used in the assessment.
 - Field work to **assess the sensitivity** of different landscape character types to the defined development typologies using sensitivity criteria.
 - Assess **cumulative impacts**, by analysing the pattern of built, consented, applications and scoping proposals, both within the study area, and outwith if cross boundary impacts are deemed likely. These patterns must be analysed alongside the landscape sensitivity assessment to find those areas with the **lowest and highest capacity for multiple developments**.
 - Develop **guidance for smaller turbines**.
 - Provide an overview of landscape and visual sensitivities across the study area and **recommendations on strategic landscape and visual considerations**.”

Reporting

- 1.5 The study was undertaken as a single regional exercise, at a strategic scale covering the whole of the GCVSDP area. This Overview Report presents the findings of the study as a whole, and does not subdivide the assessment among the constituent local authority areas. Separate reports are available detailing the specific findings in relation to each of the eight local authorities.

2 Background

Introduction

- 2.1 This section presents a summary of the document review undertaken to inform the landscape study. This initial stage of the work looked at a range of material relating to landscape planning for wind farms in the Clyde Valley and in Scotland.
- 2.2 The document review examined:
- Scottish Planning Policy and supplementary information on onshore wind turbines;
 - Glasgow and Clyde Valley Strategic Development Plan (GCVSDP) documents and relevant background reports;
 - Available sensitivity and capacity studies and other guidance, including spatial frameworks and Supplementary Planning Guidance, relating to wind energy development in the GCVSDP area; and
 - Available sensitivity and capacity studies and other guidance for wind energy development in neighbouring local authority areas.
- 2.3 The document review also focused on available guidance on landscape sensitivity and capacity, which is summarised in the methodology (**Section 3**), and the landscape baseline (**Section 4**).

Planning policy and guidance

National policy and guidance

- 2.4 The Scottish Government has committed itself to delivering the equivalent of at least 100% of Scotland's gross electricity consumption from renewables by 2020. It is anticipated that much of this capacity will be met by onshore wind energy.¹
- 2.5 Scottish Planning Policy (SPP, 2014) sets out the Scottish Government's policy on a range of land use planning issues.² It makes clear that the planning system must support the delivery of renewable energy, including onshore wind power, while ensuring that development is guided to appropriate locations.
- 2.6 Spatial frameworks are promoted as a means to identify areas that are likely to be most appropriate for the siting of onshore wind farms. Paragraph 162 states that:
- "Both strategic and local development planning authorities, working together where required, should identify where there is strategic capacity for wind farms, and areas with the greatest potential for wind development, considering cross-boundary constraints and opportunities."*
- 2.7 Regarding cumulative impacts, SPP notes that consideration should be given to:
- "Existing developments [...], those which have permission, and valid applications which have not been determined. The weight attached to undetermined applications should reflect their position in the application process."* (page 71).
- 2.8 The Scottish Government has published an online guidance note setting out key issues in relation to onshore wind turbines.³ This document presents information on how planning authorities can

¹ Scottish Government (2013) *Electricity Generation Policy Statement*.

² Scottish Government (2014) *Scottish Planning Policy*. <http://www.scotland.gov.uk/Topics/Built-Environment/planning/Policy>

³ Scottish Government (2013) Onshore wind turbines. <http://www.scotland.gov.uk/Topics/archive/National-Planning-Policy/themes/renewables/Onshore>

best deal with wind energy through the development planning and development management processes.

2.9 The guidance recommends that development planning should:

"Ensure that wind policies provide clear guidance for applicants and:

- *cover design, including the number and height of turbines, location and supporting infrastructure*
- *take into account the scale and character of the landscape*
- *safeguard ecological, community, historic environment, aviation and defence interests*
- *consider cumulative impacts and decommissioning"* (page 2).

2.10 The potential landscape impacts of wind turbines are highlighted, and the note states that *"The ability of the landscape to absorb development often depends largely on features of landscape character such as landform, ridges, hills, valleys, and vegetation."* However, the note also states that the level of impact can be *"influenced by careful siting and the skills of the designer. Different layouts of turbines may be more or less suited to particular landscape types and the physical form and /or colour of turbines may also be relevant"* (page 5).

2.11 The present study is designed to inform development of a strategic spatial framework for wind energy development, and associated planning policies on appropriate siting and design in relation to landscape character, including cumulative effects. As such it will address the key issues identified in national policy and guidance.

Regional policy

2.12 At a strategic level, broad areas of search for wind farms of over 20 MW have been defined to inform the Glasgow and Clyde Valley Strategic Development Plan (GCVSDP).⁴ The approved plan notes the significant potential of the region, and the need to balance development against environmental impact. Diagram 16 of the approved plan defines the broad areas of search (Figure 2.1 below), which have been derived from constraints mapping of:

- Stage 1:
 - international and national designations;
 - green belt;
 - locations of existing and consented wind farms of 20 MW or over;
- Stage 2:
 - selected regional and local heritage designations;
 - nationally important historic environment assets; and
 - a 2-kilometre buffer around settlements.

2.13 Background Report 11: Wind Energy Search Areas⁵ sets out the key principles behind this spatial framework, which draws on Scottish Government guidance on preparation of spatial frameworks.⁶ Both the SDP and the Background Report make clear that individual authorities are expected to refine the identified broad areas of search at a local level.

2.14 The mapping of the broad areas of search does not include consideration of landscape sensitivity, and does not address issues of landscape capacity or seek to identify *"Where the cumulative impact of existing and consented wind farms limits further development"*, in the words of the Scottish Government guidance.

2.15 The present study addresses these aspects to fill out the detail of locational guidance, by examining landscape sensitivity and levels of cumulative effect to inform judgements of landscape capacity at a strategic scale. The study will not include a spatial framework, or define broad areas of search.

⁴ GCVSDPA (2012) *Glasgow and the Clyde Valley Strategic Development Plan*.

⁵ GCVSDPA (2011) *Proposed Plan Background Report 11: Wind Energy Search Areas*.

⁶ Scottish Government (2012) *Process for preparing spatial frameworks for wind farms*.

Figure 2.1 Broad areas of search defined in the GCVSDP

Landscape capacity and sensitivity studies

- 2.16 A number of studies have examined the landscape of all or part of the SDP area in relation to wind energy development. These studies range in scale and approach, but have all been used to inform decisions and guide development within the area, and it is important therefore that the present study takes cognisance of their findings. The review focused on landscape studies rather than planning policy or supplementary planning guidance.

Ayrshire and Clyde Valley

- 2.17 The Ayrshire and Clyde Valley Windfarm Landscape Capacity Study (2004) presents a regional evaluation of landscape capacity across part of the present study area and the whole of Ayrshire.⁷ The study included a criteria-based assessment of landscape sensitivity based on 'scoring' and separated into 'character sensitivity' and 'value sensitivity'. Development typologies are not described.
- 2.18 The second part of the study relied on GIS-based visibility analysis of 115 'sample locations' representing potential wind farm sites. The generated zones of theoretical visibility were then compared to the sensitivity assessment, and to population data, to provide indications of potential impact. The final stage modelled a number of scenarios illustrating potential strategies for delivering up to 800 wind turbines, to meet projected 2020 capacity requirements. The study did

⁷ Land Use Consultants (2004) Ayrshire and Clyde Valley Windfarm Landscape Capacity Study. Scottish Natural Heritage, Ayrshire Joint Structure Plan Committee and Glasgow and the Clyde Valley Structure Plan Joint Committee.

not draw a conclusion as to whether this or any other level of development would be acceptable across the study area.

- 2.19 While the report was presented with a number of important 'health warnings', some of the relevant conclusions are summarised below.
- The sensitivity assessment found that, of the GCVSDP area landscapes, those with the highest sensitivity were the Incised River Valleys and the Foothills character types, while the lowest sensitivity was applied to the Alluvial Plain and Fragmented Farmland types.
 - The study found greater capacity for development in areas including Whitelee Moor, the upper Clyde Valley, parts of the Renfrewshire Hills, and the plateau moorland above Airdrie – it is notable that large wind farms have since been developed in two of these areas.

North Lanarkshire

- 2.20 A 2008 study, undertaken as a strategic landscape and visual impact assessment, identified capacity for wind turbines in North Lanarkshire.⁸ The study does not define capacity in terms of a level of development to be achieved. Visual assessment was not considered useful, due to the high density of population across the area. A broad area of search was defined at the outset through analysis of landscape quality and value. Scenic and valued landscapes, as well as visually prominent landscapes, were thereby excluded from the study.
- 2.21 The remaining broad area of search was examined in terms of the sensitivity of each constituent landscape character type (as defined in the SNH Glasgow and Clyde Valley landscape assessment) to a range of development types. The study goes further, giving an indication of the potential effect on the landscape of each development type, and the likely significance of such an effect in the context of EIA Regulations. The study concluded that only the moorland in the south east of the area had capacity for larger wind farms, though there was some capacity elsewhere for single turbines or smaller machines.
- 2.22 The findings of the study are formalised in North Lanarkshire Council's Technical Report TR/NLC/05.⁹

Clyde Muirshiel Regional Park

- 2.23 A 2010 study sets out the position of the Clyde Muirshiel Park Authority,¹⁰ which is not a planning authority, that operational wind turbines have already adversely affected the regional park, and that further developments "*would have significant adverse impacts on the values that make the Regional Park distinct*" (page 1).
- 2.24 The study uses a series of criteria, including aspects of landscape as well as tranquillity, biodiversity, recreation, cultural heritage and climate change to demonstrate the multi-faceted importance of the park landscape. The present study recognises this importance through its designated status (see **Section 4**).
- 2.25 The Clyde Muirshiel study draws on the 2009 landscape capacity study for North Ayrshire,¹¹ which considered a broad buffer area including the regional park as well as most of Inverclyde. The stated aim of the study was to provide a more detailed picture of landscape capacity, and to identify areas where turbines could be sited with least impact.
- 2.26 Six typologies were identified, including extensions and single turbines. The sensitivity evaluation was based on landscape, perceptual qualities and views. Potential cumulative effects on views were analysed through examination of visualisations accompanying wind farm planning applications. The study concluded that there was no capacity for turbines in the 'Loch Thom area' which comprises most of the Regional Park within Inverclyde.

⁸ ASH Design + Assessment (2008) The Capacity of the North Lanarkshire Landscape to Accommodate Wind Turbine Development. North Lanarkshire Council.

⁹ North Lanarkshire Council (2008) Strategic Planning Study Technical Report TR/NLC/05 - Wind Farm Search Area Review.

¹⁰ Clyde Muirshiel Park Authority (2010) Framework Guidance Document for wind farm development proposals affecting Clyde Muirshiel Regional Park.

¹¹ Carol Anderson; Alison Grant (2009) Landscape Capacity Study For Wind Farm Development Within North Ayrshire. Phase One Report. North Ayrshire Council.

South Lanarkshire

- 2.27 The 2010 landscape capacity study for South Lanarkshire was revised and updated in 2013.¹² The study includes a spatial framework for wind energy development, as well as a landscape character based assessment of sensitivity and capacity. The study is based on the 2010 landscape character assessment of South Lanarkshire, which updates and refines the 1999 Glasgow and Clyde Valley character assessment (see **Section 4**).
- 2.28 The study provides detailed guidance on the capacity of the landscape to accommodate turbines of different heights and group sizes, and advises on separation distances which would limit cumulative effects. The study also defines an acceptable limit of development, in terms of a range of typologies from “*landscape with no wind turbines*” to “*wind farm landscape*”. Current and proposed levels of development are compared with these eventual limits in order to determine areas where cumulative impact limits further development. Three such areas are defined, and objectives for limiting development in each are listed. The three areas lie in the Southern Uplands, around Black Law in the north-east, and between Whitelee and Douglas in the west.
- 2.29 It is notable that the areas where cumulative impact is considered to limit further development correspond broadly with areas of the highest landscape capacity for wind turbine development, suggesting that identified capacity is being reached or exceeded in South Lanarkshire.

East Renfrewshire

- 2.30 A 2012 study examined the part of the broad area of search, as defined in the GCVSDP, within East Renfrewshire.¹³ As such the study was limited to the moorlands in the south of the local authority area. A spatial framework was defined, including a range of constraints. As part of this an assessment of landscape capacity was undertaken, incorporating consideration of landscape sensitivity based on local landscape character areas, and analysis of cumulative development.
- 2.31 Areas identified as having ‘lower capacity’ for wind energy development were considered to be ‘potentially constrained’ in the spatial framework. Areas which were already affected by wind farm development were not considered to have ‘no capacity’, on the basis that some new development could be acceptable where it would not further affect underlying landscape character.

Neighbouring areas

- 2.32 The GCVSDP area is adjoined by eight other planning authorities, all of which offer some form of locational guidance for wind energy development. The relevant documents have been reviewed to identify areas adjacent to the study area which are considered to be sensitive by neighbouring authorities. The results of this review are presented in **Appendix 1**.
- 2.33 The capacity studies which have been undertaken identify few areas for potential development around the fringes of the core area. Generally, the upland areas including the fringes of the National Park, the Campsie Fells, Pentland Hills and the Southern Uplands have been considered to be of higher sensitivity. Lower sensitivity areas have been identified in parts of the moorlands which flank the south-west edge of the core area, in Ayrshire, and in the west of West Lothian in the area of Black Law Wind Farm.

¹² Ironside Farrar (2010, updated 2013) South Lanarkshire Spatial Framework and Landscape Capacity for Wind Farms. South Lanarkshire Council.

¹³ LUC (2012) East Renfrewshire Wind Energy Study. East Renfrewshire Council.

3 Methodology

Introduction

- 3.1 The approach to the study was developed by LUC based on the requirements set out in the study brief. A method statement was prepared and circulated to the steering group and comments received were incorporated into the methodology.
- 3.2 The key sources of guidance for undertaking sensitivity and capacity studies include the landscape character assessment guidance published and its accompanying 'topic papers',^{14 15} and the more recent capacity study 'toolkit' from SNH.¹⁶ These documents discuss general approaches and issues, but do not offer detailed or prescriptive guidance on how capacity studies should be undertaken. It is necessary to develop a project-specific approach based on the demands of the brief, informed by available guidance. The review of earlier capacity studies (**Section 2**) has also informed the development of the methodology.

Definitions and principles

- 3.3 Landscape sensitivity is concerned with the inherent character of the landscape, and the likelihood that this character would be changed by the introduction of development. The sensitivity of a given landscape will vary according to the type of change which is proposed. Topic Paper 6 states that:

"Judging landscape character sensitivity requires professional judgement about the degree to which the landscape in question is robust, in that it is able to accommodate change without adverse impacts on character. This involves making decisions about whether or not significant characteristic elements of the landscape will be liable to loss... and whether important aesthetic aspects of character will be liable to change" (paragraph 4.2).

- 3.4 This indicates that the study must examine 'aspects' of landscape character, and how these could be affected by wind energy development. For the purposes of this study, we have defined 'sensitivity' as follows:

Sensitivity is the relative extent to which the character of the landscape is susceptible to change as a result of wind energy development at different scales.

- 3.5 Landscape capacity is related to landscape sensitivity, but the two are distinct. Capacity has been defined in the Landscape Character Assessment Guidance:

"Landscape capacity refers to 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 proposed" (page 53).

- 3.6 Capacity seeks to define the *level of change* in character which a landscape can accommodate, and beyond which the character of the landscape would change. From this it could be inferred that the level of change should be a distinct threshold or amount of development which can be accommodated.
- 3.7 However, when considering wind energy developments there is no such threshold, since it is widely accepted that all commercial scale wind turbine developments will result in changes to landscape character. Any such threshold must therefore be dictated by need, i.e. an ultimate level of development which must be accommodated in the study area. This question, essentially

¹⁴ Swanwick, C. and Land Use Consultants (2002) Landscape Character Assessment Guidance for England and Scotland. Countryside Agency and Scottish Natural Heritage

¹⁵ Swanwick, C. (2006) Landscape Character Assessment Topic Paper 6: Techniques and Criteria for Judging Sensitivity and Capacity. Countryside Agency and Scottish Natural Heritage.

¹⁶ Scottish Natural Heritage (n.d.) A Guide to Commissioning a Landscape Capacity Study.

"how much change in the landscape are we prepared to accept?" is outside the scope of the present study.

3.8 The SNH 'toolkit' on landscape capacity studies notes the difficulties of quantifying capacity for wind energy development in terms of a threshold. Reasons for this include:

- Changing technology;
- High visibility of wind turbines;
- Difficulty in predicting the nature, scale and type of future development; and
- Changing cumulative picture.¹⁷

3.9 Topic Paper 6 suggests that the assessment of capacity must combine judgements of sensitivity and landscape value, informed by consideration of the specific type of change proposed. The present study therefore focuses on an assessment of landscape and visual sensitivity at a strategic scale, and combines this with indicators of landscape value. Based on consideration of these factors, a judgement about landscape capacity for wind turbine development can be made. For the purposes of this study, we have defined 'landscape capacity' as follows:

Capacity is the inherent ability of a landscape to accommodate the types of change expected to arise from the introduction of wind energy development at different scales, without resulting in an overall change in character type.

3.10 While noting the difficulty of defining a threshold, the study is required to indicate areas which are approaching the limit of cumulative capacity. Further judgements must therefore take into account development which is already present in the landscape, and to a lesser extent development which will potentially be present in the landscape in the near future.

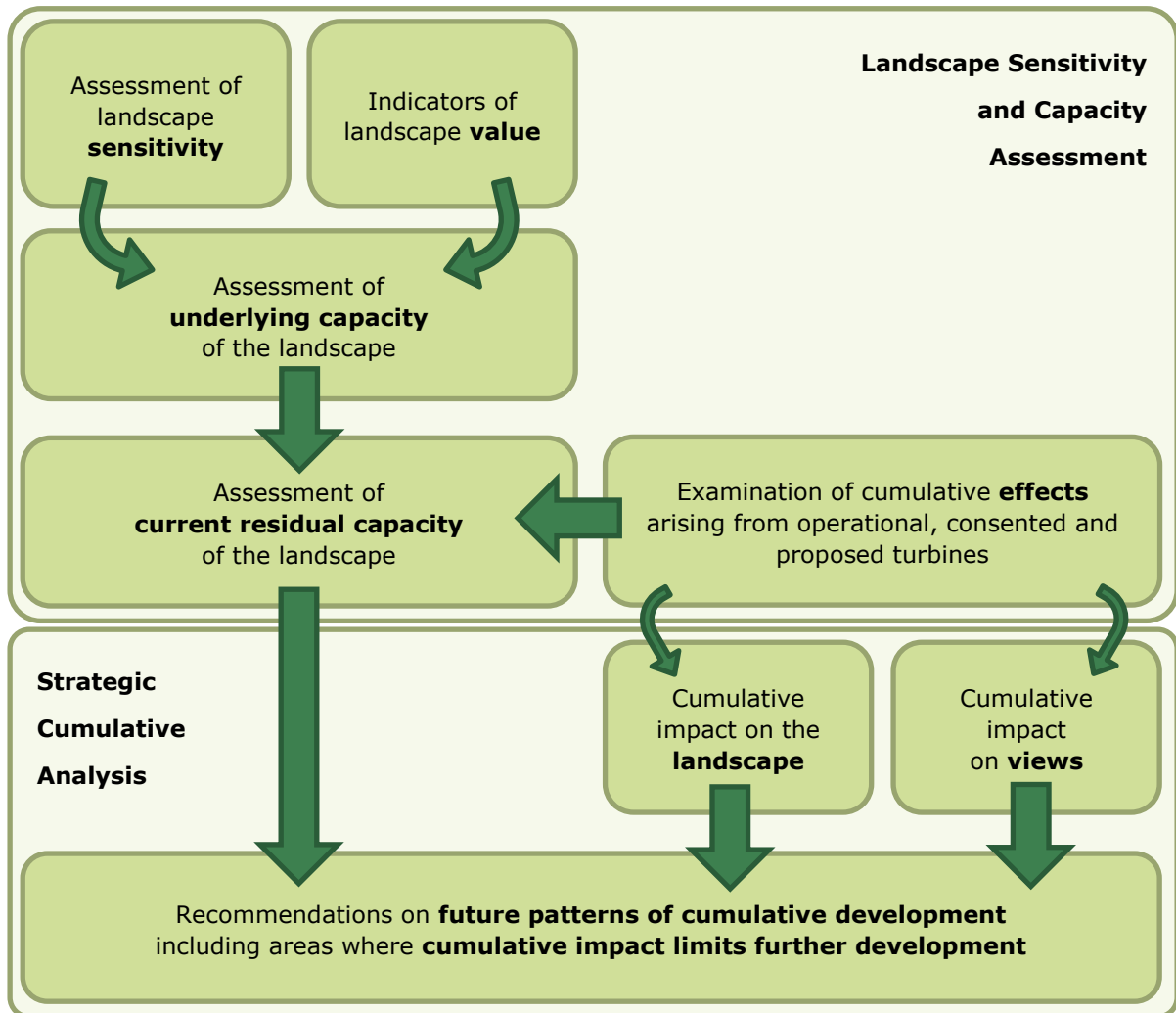
3.11 The components of the methodology must therefore be:

- An understanding of the development type(s) proposed, and how they may affect landscape character;
- A robust, criteria-based approach to the evaluation of landscape sensitivity;
- An indication of landscape value;
- A combination of these judgements to give an indication of capacity;
- An examination of current and potential future levels and patterns of wind turbine development to determine residual capacity; and
- An overall evaluation of cumulative impact at a strategic scale, to determine where the level of cumulative impact is likely to place a limit on further development in any areas.

¹⁷ Scottish Natural Heritage (n.d.) A Guide to Commissioning a Landscape Capacity Study. Pages 20-21.

Summary of methodology

3.12 The diagram below presents a summary of the stages in the methodology.



Study area

- 3.13 The focus of the study was on the landscapes and potential wind energy developments within the eight GCVSDP council areas, defined as the **core area**. The part of West Dunbartonshire which falls within the Loch Lomond and the Trossachs National Park does not form part of the core area.
- 3.14 It is important to bear in mind that landscape and visual issues continue uninterrupted across administrative boundaries, and the study must recognise the potential for cross-boundary effects beyond the GCVSDP area, particularly in relation to cumulative issues. A **buffer area** was therefore adopted. Following discussion with and feedback from the steering group, it was agreed that the simplest solution would be the adoption of a 15 km wide buffer around the core area.
- 3.15 Where the term **study area** is used, this refers to both the core area and the buffer area. **Figure 3.1** illustrates the extent of the core area and the buffer area.
- 3.16 Suggested distances at which potentially significant effects on views may arise from wind turbines are set out in Table 2 of the SNH guidance on Visual Representation of Wind Farms (2006). These distances, up to 35 km for the largest turbines, were considered as a means to define a buffer but in practice it is turbines which are closer to potential receptors which will have a bearing on the perception of cumulative effects. This has been borne out in other recent studies; for example the South Lanarkshire Spatial Framework and Landscape Capacity for Wind Farms also adopts a 15 km buffer.
- 3.17 The landscape of the GCVSDP area is relatively contained, with higher ground surrounding the Clyde basin. As such the landscapes of the core area and those in the buffer are often visually unrelated. Intervisibility mapping (see below) has been carried out to establish those areas within the buffer area which are most relevant to examination of the core area, and those which are not and need not be examined further.
- 3.18 Consideration of sequential effects, focusing in particular on the principal road corridors entering and leaving the core area, may require larger distances to be incorporated. For sequential assessment, the distance beyond the core area was determined on a case-by-case basis, informed by the intervisibility mapping.
- 3.19 The study does not draw conclusions or make recommendations in relation to the landscapes of the buffer area. However, these areas are used for the gathering of baseline data which may affect judgements as to the sensitivity and capacity of landscapes in the core area.

Intervisibility mapping

- 3.20 Computer-generated theoretical intervisibility mapping was used to determine the relative level of visibility of different turbine heights across the core area, assisting with the consideration of the potential landscape implications of different development types.
- 3.21 The analysis comprises a GIS-based calculation of the number of 'source points' which are theoretically visible to viewers within the study area. The viewshed is calculated from a viewer height of 2 m above ground level. The 'source points' are arranged in a 500 m grid covering the whole of the core area. To examine the relative visibility of different turbines, the 'source points' are assigned different heights. Visibility maps have been generated for three different heights, representing the range of turbines under consideration, as follows:
- **Figure 3.2** shows theoretical visibility of ground level (0 m), indicating the most 'visible' landscapes, and highlighting visual relationships between the core area and the buffer area;
 - **Figure 3.3** shows theoretical visibility of turbines of 80 m to tip, broadly in the middle of the range of heights being considered; and
 - **Figure 3.4** shows theoretical visibility of turbines of 150 m to tip, at the upper extent of the range of heights being considered.
- 3.22 The intervisibility mapping is based on a 'bare ground' topographical model, which takes no account of the screening effect of buildings, vegetation and small localised variations in topography. The maps therefore indicate theoretical visibility only. Colours shown are relative to the highest level of visibility, which is different in each case.

- 3.23 Areas of lower visibility are not necessarily of inherently lower sensitivity to development, nor vice-versa. The intervisibility mapping has informed the consideration of sensitivity to different development typologies as part of a wider analysis of landscape and visual characteristics.
- 3.24 The maps indicate where greatest theoretical visibility of turbines in the core area would occur, shaded in red, and areas where visibility would be more limited, shaded blue. Intervisibility mapping is discussed in relation to each LCT in **Section 5** of this report.

Potential effects of wind energy development on the landscape

- 3.25 In order to determine sensitivity, it is important to first understand the characteristics of wind energy development and how they may affect the landscape. The following sections describe the features of wind turbines and associated development, and consider potential impacts on the Glasgow and Clyde Valley landscape.

General features of wind energy development

- 3.26 The key components of wind energy development are the wind turbines, which may be grouped together into a wind farm. The majority of wind turbines consist of horizontal-axis three-bladed turbines, mounted on a steel tower. Other turbines, including two bladed turbines and vertical axis turbines, are available but less commonly deployed. Wind turbines are generally given planning permission for 25 years, although repowering¹⁸ may take place after this period has elapsed, subject to further permission.
- 3.27 The main visible components of a horizontal-axis wind turbine are:
- the tower, generally a tubular steel structure though lattice towers are occasionally used for smaller turbines;
 - the nacelle, which contains the generating equipment; and
 - the rotor blades, mounted on the hub at the front of the nacelle.
- 3.28 Depending on the scale and design of the turbine, the transformer may be located inside or outside the tower. If outside it will usually be contained in a small box-like structure adjacent to the tower base. The tower itself sits on a concrete foundation which is hidden from view underground.
- 3.29 Turbines are most commonly coloured light grey, which has been found to be less visually prominent when turbines are viewed against the sky. However, when turbines are seen against a land backdrop, which is common with smaller models, the light colour can make them appear more prominent. Smaller turbines may be darker grey or black.
- 3.30 Turbines are available in a wide range of sizes, from very small roof-mounted machines designed for domestic use, to large commercial structures. At 147 m to tip, the turbines at Calder Water wind farm in South Lanarkshire are among the tallest currently operating in the UK.
- 3.31 Besides overall size the proportions of a turbine can also vary, particularly the length of the blades in relation to the height of the tower, and the size and shape of the nacelle. Where particularly short blades are mounted on a tall tower, or where long blades are placed on a short tower, the turbine may appear unbalanced or top-heavy. Larger turbines with longer blades tend to have slower rotation speeds than smaller models.
- 3.32 Large, commercial-scale turbines are uniformly of three-bladed design, with a relatively standardised form and appearance. Smaller turbines are more varied in design, including two-bladed models which can appear less balanced, particularly when seen in conjunction with three-bladed turbines. Smaller turbines also show a greater variety of nacelle forms and colours, as well as occasional use of lattice towers in place of tubular towers.
- 3.33 In addition to the turbines themselves, developments involving large scale wind turbines typically require additional infrastructure as follows:

¹⁸ Repowering refers to the replacement of turbines at the end of their useful life, and often involves installation of larger machines on the same site.

- road access to the site and on-site tracks able to accommodate the specialised heavy goods vehicles (HGVs) which are needed to transport the long turbine components and heavy construction cranes;
- a temporary construction compound and lay-down area for major components;
- borrow pits, which may be opened on site to provide construction materials for the access tracks, avoiding the need for transportation of material to the site;
- an area of hardstanding next to each turbine to act as a base for cranes during turbine erection;
- underground cables connecting the turbines (buried in trenches, often alongside tracks);
- one or more anemometer mast(s) to monitor wind direction and speed, usually a slender lattice tower of the same height as the turbine hubs; and
- a control building to enable monitoring and operation, often combined with a small substation.

- 3.34 Lighting requirements depend on aviation and can be required on turbines. However, aircraft warning lights can be infra-red and therefore not visible to the unaided human eye. Lighting has not been considered as part of the landscape sensitivity study, although guidance advises that if lighting is required on turbines for aviation purposes, infra-red lighting should be adopted where possible to minimise visual impacts at night.
- 3.35 The District Network Operator (DNO) is responsible for establishing a connection between the substation and the national grid. For larger schemes this connection is usually routed via overhead cables on poles, but for smaller turbines may be routed underground. Since these are part of a separate consenting procedure these connections are not considered as part of the landscape sensitivity study.

Landscape effects of wind turbines

- 3.36 Wind turbines can be substantial vertical structures, and larger models will inevitably be highly visible within the landscape. The movement of the blades is a unique feature of wind energy developments, setting them apart from other tall structures in the landscape such as masts or pylons. Wind energy development may affect the landscape in the following ways:
- construction of large turbines and associated infrastructure may result in direct loss of landscape features, including forestry;
 - wind turbines are tall vertical features that may alter perception of a landscape, potentially affecting the apparent scale of landforms;
 - movement of rotor blades may affect characteristics of stillness, remoteness and solitude, as well as drawing the eye to turbines which may be a relatively small feature in the landscape;
 - the presence of turbines may increase the perceived human influence on the landscape, particularly in terms of overt modern development, and this can particularly affect landscapes which form a setting to heritage assets;
 - wind turbines, even at relatively small sizes, can appear large in the context of human-scale features such as domestic buildings and trees – at the largest scales turbines can be perceived as overbearing when they are sited very close to viewers, including residents;
 - turbines on skylines may compete with existing landmark features for prominence where prominent skylines or landmark features are characteristic of the landscape; and
 - in order to be as efficient as possible, turbines are often placed in elevated locations, where they may affect views from wide areas.
- 3.37 In undertaking any landscape sensitivity assessments it is necessary to acknowledge that varying attitudes to wind energy development are expressed by different individuals and constituencies. Aesthetic perceptions can be positive or negative depending on individual attitudes to the principle and presence of wind energy generation.

Cumulative issues

- 3.38 As larger numbers of wind farms are built, it is increasingly necessary to consider their cumulative effects. Guidance on the siting and design of wind farms and wind turbines suggests that a key consideration is understanding how different developments relate to each other, their frequency as one moves through the landscape, and their visual separation, with the aim of allowing experience of the character of the landscape in-between.¹⁹ These issues were considered in the strategic evaluation of cumulative effects (**Section 6**).

Development typologies

- 3.39 There are several substantial wind farms in the study area, with continued demand for further large-scale sites. At the same time, the feed-in-tariff has driven an increase in smaller-scale developments and single turbines. The study must therefore consider a very wide range of potential development types and the interaction between them.
- 3.40 Wind energy development 'typologies' therefore need to be defined, to allow the sensitivity assessment to be flexible enough to consider the most appropriate scales of development in each area.
- 3.41 The brief suggests consideration of turbine heights from 15 m to 150 m, although the 'size' of a wind energy development can be defined in a number of ways, including turbine numbers and power output as well as height. Power output is less useful in landscape terms as there are many combinations of different turbines which could give the same output. Discussion with the steering group indicated greater concern in relation to turbine height than turbine numbers.
- 3.42 **Table 3.1** sets out the turbine height typologies which were agreed following these discussions. These five typologies cover the range of turbine heights currently operating and proposed within the core area, ranging from small turbines often associated with farms, to the largest commercial models currently proposed. Turbines over around 150 m are not specifically considered in the study since, while such turbines have been built in Europe, there are no confirmed plans to deploy machines of this scale in Scotland. Where proposals involve turbines of heights within 5 m of a cut-off between two typologies, it is recommended that the guidance provided for both typologies is taken into account. For example, a proposal for 78 m turbines will need to be considered against the conclusions for both medium and large typologies.

Table 3.1 Wind turbine development typologies

Turbine typology	Height range
Small turbine	15-30 m to tip
Small-medium turbine	31-50 m to tip
Medium turbine	51-80 m to tip
Large turbine	81-120 m to tip
Very large turbine	over 120 m to tip, up to around 150 m

- 3.43 In terms of turbine numbers, the study considers a range of development scales, though this is dealt with in a less formal way than for turbine height, since height is the key factor in determining the compatibility of a proposal with its landscape. The following scales of development have been considered:
- single turbines;
 - cluster of turbines (2-5 turbines); and

¹⁹ Scottish Natural Heritage (2009) Siting and Designing Windfarms in the Landscape.

- wind farm (6+ turbines).

3.44 The study also requires consideration of extensions to and repowering of existing schemes. These are addressed more generally by reference to compatibility with existing developments, particularly in terms of turbine scale, rather than through the definition of additional development types. The appropriateness of repowering will depend primarily on the height and number of turbines proposed, rather than the prior existence of a wind farm, and as such these schemes can be considered as though they are 'new' developments.

Assessment of landscape sensitivity

- 3.45 The sensitivity of the landscape is assessed by examining the key characteristics of each landscape character type (LCT) with reference to a series of sensitivity criteria.
- 3.46 **Table 3.2** presents the criteria which have been adopted for this study, following discussion with the steering group. The criteria are informed by the review of the potential effects of wind energy development, and by the principles set out in a range of published guidance on landscape and visual assessment.^{20 21 22 23} They have been developed from criteria employed by LUC in previous studies.
- 3.47 The criteria relate to the key aspects of landscape character and visual amenity which may be affected by wind energy development, and which can therefore be used as 'indicators' of sensitivity. **Table 3.2** includes examples of landscape characteristics which indicate higher or lower sensitivity in relation to each criterion, and a brief rationale for the inclusion of each.

Table 3.2 Criteria for Assessing Landscape Sensitivity to Wind Farm Development

Characteristic	Aspects indicating lower sensitivity to wind turbine development	↔	Aspects indicating higher sensitivity to wind turbine development
LANDSCAPE CRITERIA			
Landform and scale: patterns, complexity and consistency	Large scale landform Simple or featureless Absence of strong topographical variety Smooth, regular and convex or flat and uniform	↔	Small scale landform Distinctive and complex Recognisable scale indicators Strong topographical variety Irregular or rugged
Larger wind turbines will generally be less dominant in larger-scale landscapes, which are simpler in form and where there are fewer features of 'human scale'. In smaller-scale landscapes, larger turbines can appear overbearing and out of place. Buildings, trees and other features can act as 'scale indicators', potentially emphasising the size of wind turbines. Smaller turbines may relate better to smaller scale landscapes, where there may be potential to utilise topography for screening purposes.			
Land cover: patterns, complexity and consistency	Simple and consistent Predictable Large-scale and/or regular patterns	↔	Complex or varied Unpredictable Small scale and/or irregular patterns
Areas of simple land cover, such as open moorland, present fewer scale indicators against which turbine size may be judged. Distinctive patterns in the landscape, particularly where these are of smaller scale, are more susceptible to being interrupted by wind turbine development. There may be more opportunity to design smaller turbines so as to fit into landscape pattern without interrupting it, and sensitivity may be reduced.			

²⁰ Landscape Institute and Institute of Environmental Management and Assessment (2013) Guidelines for Landscape and Visual Impact Assessment. 3rd edition. Routledge.

²¹ Scottish Natural Heritage (2009) Siting and Designing Windfarms in the Landscape.

²² Swanwick, C. (2006) Topic Paper 6: Techniques and criteria for judging capacity and sensitivity. Countryside Agency and Scottish Natural Heritage.

²³ Scottish Natural Heritage (2012) Siting and Design of Small Scale Wind Turbines of between 15 and 50 metres in height.

Characteristic	Aspects indicating lower sensitivity to wind turbine development	↔	Aspects indicating higher sensitivity to wind turbine development
Settlement and man-made influence	Concentrated settlement pattern Presence of contemporary structures eg infrastructure or industrial elements	↔	Dispersed settlement pattern Absence of modern development, presence of small scale, historic or vernacular settlement
A settled, man-modified landscape is likely to be less sensitive to further human intervention than one which has little modern development and only scattered settlement. Industrial landscapes are likely to be least sensitive in this context. However, the presence of settlement indicates potentially sensitivity visual receptors, and will present scale indicators against which turbine size may be judged.			
Movement	Prominent movement, busy	↔	No evident movement, still
Due to the dynamic nature of wind turbines, landscapes where movement is a feature are likely to be less sensitive than those which are still. Examples of movement in the landscape include traffic on busy roads, airports and shipping lanes.			
VISUAL CRITERIA			
Skylines	Simple predictable skylines Presence of existing vertical features Obscured skylines	↔	Complex unpredictable skylines Uninterrupted horizons Prominent skylines
This criterion is related to landform and scale, with simple skylines generally having fewer scale indicators against which to judge wind turbine height. Turbines placed on more complex skylines are likely to give rise to a visually confusing appearance. Where man-made features such as masts or pylons are already present on the skyline there may be reduced sensitivity to further intervention, although there is a risk of creating 'clutter' where features of different sizes and forms are viewed together. Skylines which are prominent features in views are likely to be of higher sensitivity, regardless of form. Small turbines may interrupt skylines as well as larger turbines. Some open skylines may be more sensitive to multiple smaller interruptions than to a single larger development, particularly in larger-scale landscapes.			
Key views, vistas and landmark features	Obscured landmarks, views towards/ from landmarks, absence of vistas Indistinctive or industrial settings	↔	Prominent key landmarks, views towards/ from landmarks or key vistas Distinctive settings or public viewpoints
Where open views are an important characteristic within a landscape, wind turbines may have a detrimental impact. There may be particular views or viewpoints looking outward, or landmarks which are features in wider views. In either case the landscape may be susceptible to change as a result of turbines interrupting views. Landscapes in which there are few long views, such as wooded areas or undulating landscapes, are less sensitive in terms of this criterion.			
Receptors	Unpopulated areas Inaccessible with few recreational receptors	↔	More densely populated or many receptors Landscape focused recreation and/ or visitor attraction
The most sensitive visual receptors are generally considered to be residents at home and in their communities, and people accessing the landscape for recreational purposes, such as walkers and cyclists. Settled landscapes have higher numbers of residential receptors, although unpopulated areas may attract more recreational users. Sensitivity will depend on the balance of these types of receptors. Areas where opportunities for access are actively promoted, such as long-distance paths and country parks, are considered more sensitive.			
Inter-visibility with adjacent landscapes	Limited views into and out of landscape Weak connections, self-contained area and views Simple large scale backdrops	↔	Prospects into and out from high ground or open landscapes Contributes to wider landscape Complex or distinctive backdrops
In contrast with the key views criterion, which is concerned with views within an area, this criterion examines views in and out of a landscape, and its relationship with adjacent areas. Intervisibility maps have been generated (see Section 3.32) to illustrate the relative visibility of different parts of the study area. Of particular sensitivity are landscapes which form part of the setting of adjacent landscapes, for example a distinct ridge adjacent to a valley.			

Characteristic	Aspects indicating lower sensitivity to wind turbine development	↔	Aspects indicating higher sensitivity to wind turbine development
Importance of natural and cultural heritage features to the landscape	Limited association between landscape(s) and/or features	↔	Strong association between landscape(s) and/or features
Features of natural and cultural heritage importance are often designated in their own right, and the purpose of this study is not to give detailed guidance on the sensitivities of these features. However, in some cases the natural and cultural interest of an area is readily apparent in the landscape, and contributes to the sensitivity of the landscape itself. Examples include large-scale historic environment features, such as intact designed landscapes, or areas of apparent natural heritage interest, such as deciduous native woodland.			
Perceptual aspects: sense of remoteness, tranquillity, or wildness	Close to visible or audible signs of human activity and development Low levels of wildness, as indicated on SNH mapping	↔	Physically or perceptually remote, peaceful or tranquil High levels of wildness, as indicated on SNH mapping
The landscapes of the study area vary from densely built up areas to relatively remote moorlands. SNH have produced mapping to illustrate relative wildness across Scotland, based on a range of criteria (see Section 4). While there are very few genuinely remote areas of 'wild land' character in the study area, there are landscapes which are important for their relative tranquillity in comparison to the nearby settled areas. Landscapes which are more tranquil or wild are likely to be more sensitive to the introduction of man-made structures such as wind turbines.			

Application of the criteria

- 3.48 A description of each LCT in relation to each criterion is presented, leading to a determination of sensitivity in relation to each criterion. This informs an overall assessment of sensitivity to each development height typology for each LCT. In arriving at an overall assessment, the range of criteria must be carefully balanced. Several of the criteria overlap, and some recognise qualities which are essentially opposites. No consistent weighting of criteria is applied, rather the key characteristics of the LCT are used as a guide to the relative importance of criteria. Together with observations made in the field, this allows a judgement to be made on sensitivity to the range of development typologies.

3.50 The levels of sensitivity are defined in **Table 3.3**.

Table 3.3 Sensitivity definitions

Sensitivity Level	Definition
High	Key characteristics and qualities of the landscape are highly vulnerable to change from wind turbines. Such development is likely to result in a significant change in character.
High-medium	Key characteristics and qualities of the landscape are vulnerable to change from wind turbines. There may be some limited opportunity to accommodate wind turbines without significantly changing landscape character. Great care would be needed in locating turbines.
Medium	Some of the key characteristics and qualities of the landscape are vulnerable to change from wind turbines. Although the landscape may have some ability to absorb development, it is likely to cause a degree of change in character. Care would be needed in locating turbines.
Medium-low	Fewer of the key characteristics and qualities of the landscape are vulnerable to change from wind turbines. The landscape is likely to be able to accommodate turbines with limited change in character. Care is still needed when locating turbines to avoid adversely affecting key characteristics.
Low	Key characteristics and qualities of the landscape are robust in that they can withstand change from introduction of wind turbines. The landscape is likely to be able to accommodate wind turbines without a significant change in character. Care is still needed when locating wind turbines to ensure best fit with the landscape.

3.51 These levels of sensitivity enable immediate comparison of landscape types across the study area. The findings are relative to the landscapes of the core area. That is, the levels of sensitivity are not absolute, but illustrate a distribution between the most and least sensitive landscapes within the GCVSDP area.

3.52 The assessment has been undertaken at a strategic scale appropriate to the examination of this regional area, and the results do not take into account all local variations. Where appropriate the findings make reference to other more detailed landscape sensitivity assessments.

Field work

3.53 The sensitivity assessment was initially undertaken as a desk-based review, following which field work was undertaken to confirm understanding of landscape character and sensitivity. The purpose of the site visits was to:

- Confirm the landscape baseline, in terms of any updates to key characteristics required;
- Identify visibility and key views from and to each character type/area;
- Identify potentially sensitive landscape features;
- Confirm and supplement the findings of the sensitivity evaluations;
- View existing wind energy development in the landscape and gain an understanding of the type of effects which are already present, including cumulative effects; and
- Identify locations for the training field visit at the project close.

3.54 Following the field work the sensitivity assessments and findings were confirmed and finalised.

Landscape value

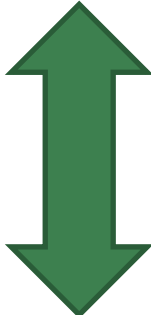
- 3.55 The European Landscape Convention,²⁴ adopted in the UK in 2006, confirms that all landscapes are important, and are valued by different people for different reasons. Value, unlike sensitivity, is not an inherent property but is placed on a landscape by society. For the purposes of a capacity study, the aim is to determine how much change can be accommodated within a landscape without compromising the value placed upon it.
- 3.56 The present study, which is strategic in nature, uses existing landscape designations as an indicator of landscape value. There are no nationally designated landscapes in the study area, though there are a number of local designations defined by the local authorities. These have been selected at different times for different reasons and purposes, and as such are not directly comparable. Designations are reviewed in **Section 4**, and it is clear that not all have detailed citations or defined 'special qualities'. However, they do highlight parts of the core area which are known to be of value. The local designations are therefore referred to under the LCTs in which they occur, and the extent to which their reasons for designation would be affected by wind turbine development is briefly explored.
- 3.57 Value can also be represented by other types of designation, including those related to cultural heritage and biodiversity, although these considerations are outside the scope of the present study. Other potential indicators of value, including wildness and tranquillity, have been incorporated into the assessment of sensitivity and are not therefore included again, to avoid 'double counting'.

Combining the judgements: landscape capacity

- 3.58 The findings of the study in relation to landscape sensitivity and landscape value are not combined in a rigid matrix since the relationships between these aspects is not linear. Judgements of capacity are made through careful balancing of each of these factors, which are not consistently weighted. In each case detailed justification is given for the level of capacity which is assessed.
- 3.59 Generally, areas with higher sensitivity and higher value are assigned lower capacity for development. Conversely, areas with lower sensitivity and lower value are assigned higher capacity. The study does not seek to define a 'threshold', such as a level of sensitivity beyond which capacity would not be identified, since the relationship between sensitivity and capacity is not linear.
- 3.60 The capacity of each LCT is summarised as 'higher', 'moderate', or 'lower'. These terms do not correspond to strictly defined categories, but are stages on a continuum. Indicators which may lead to an assessment of higher or lower capacity are presented in **Table 3.4**.
- 3.61 The identification of lower capacity does not imply that no wind farms would be acceptable, nor does the identification of higher capacity imply that any given proposal could be accommodated. The assessment has examined capacity relative to the study area, rather than as an absolute measure.

²⁴ Council of Europe (2000) European Landscape Convention. Council of Europe Treaty Series no. 176.

Table 3.4 Indicators of higher or lower capacity

Capacity	Indicators
Higher capacity	Landscapes of lower sensitivity and value, where wind turbines of the typology under discussion may be acceptable, with reference to the scale and form of the landscape, and the likely visibility of the development from sensitive receptors.
Moderate capacity	
Lower capacity	
	Landscapes of higher sensitivity and value, where wind turbines of the typology under discussion would not be easily accommodated within the scale and form of the landscape, or would be more visible from sensitive receptors.

Underlying and residual capacity

- 3.62 The outcome of combining the judgements of landscape sensitivity and value is an assessment of the **underlying capacity** of the landscape. This underlying capacity is considered to be relatively consistent across each LCT, albeit that there will be local variations in levels of sensitivity and value. However, the underlying capacity is clearly affected by operational development, and may be further affected by development which is consented or proposed. This development may occupy some of the underlying capacity, reducing the capacity which is available for future development.
- 3.63 The term **current residual capacity** has been adopted for this study. Current residual capacity is the level of capacity which remains, once operational, consented and proposed development has been considered. This measure of capacity is more likely to vary within LCTs, since levels of development will differ across each area, with different effects on the underlying capacity. It is important to note that this is *current* residual capacity, based on the pattern of development which was current at the point when the study was undertaken, and which will continue to change.
- 3.64 The analysis of cumulative development is based on data provided by the local authorities. The data was mapped according to the planning status and tip height of the turbines, and this is discussed in **Section 4**. The study has sought to include all operational and consented wind turbines, and those with valid planning applications, which are over 15 m overall tip height. Proposals at scoping stage, i.e. prior to submission of a planning application, were not considered. Further data was gathered for operational, consented and proposed wind turbines in the buffer area.
- 3.65 The pattern of cumulative development within and adjacent to each LCT was examined, and the level of development compared to the underlying capacity, to arrive at an evaluation of current residual capacity for each LCT. Where there are significant variations in levels of development, LCTs have been subdivided into areas and current residual capacity is assessed for each area. Where there are no, or very few, operational, consented or proposed turbines, only the underlying capacity is reported.

Siting and design guidance: opportunities and constraints

- 3.66 The assessment of current residual capacity informs siting and design guidance, including identification of opportunities and constraints drawing on the sensitivity and capacity analysis. If residual capacity is identified, the guidance seeks to indicate where and how additional renewable

energy development could be accommodated in terms of siting, layout and design. Guidance aimed at minimising cumulative effects is also provided. The guidance is strategic and broad-brush in nature, and must be supplemented by more detailed analysis to identify potentially suitable sites.

Strategic cumulative assessment

- 3.67 To give a wider perspective on potential cumulative effects across the core area, a strategic analysis of wind energy development was undertaken. This analysis relies on the same data referred to above, and described in **Section 4**. The wind turbines are sorted into operational, consented and proposed development.
- 3.68 Operational wind turbines are part of the existing landscape. The impacts of developments which have received planning consent, whether built or unbuilt, have been considered in the planning system and found to be acceptable. As such the combination of operational and consented development presents a 'baseline' level.
- 3.69 The study then looks ahead to developments in the planning system, and how they may affect the landscape if built, in order to reach conclusions about how much further change could be acceptable. The pattern of proposed development is compared to the assessed capacity across the core area, and against a series of representative viewpoints. The study draws a distinction between cumulative *effect*, which occurs where more than one development is visible, and cumulative *impact*, which takes account of landscape and visual sensitivities.

Cumulative zones of theoretical visibility

- 3.70 Cumulative zone of theoretical visibility (CZTV) analysis was applied to determine areas which are already experiencing high levels of cumulative visibility, based on operational schemes, and areas which are likely to experience high levels of cumulative visibility based on proposed schemes. CZTVs are computer-generated and depict maximum visibility, since they are based on 'bare earth' terrain modelling which does not consider screening by vegetation, buildings, and local topographical variation.
- 3.71 CZTVs provide a preliminary means of identifying potential areas of cumulative visibility, but do not represent the intensity or nature of the impact. There may be areas of high cumulative visibility where cumulative impacts do not occur, for example, because the turbines theoretically visible are in fact viewed across a great distance. Further analysis of cumulative patterns of visibility is therefore carried out in order to take account of size, proximity and visibility of wind energy developments.
- 3.72 The patterns of visibility identified by the CZTVs were compared against the findings of the landscape capacity assessment to provide an indication of where potential cumulative impacts are occurring, and where they may occur in future given current trends. This analysis seeks to identify which LCTs are experiencing, or are likely to experience, the greatest or least cumulative impacts.
- 3.73 The CZTVs were also compared against a visual baseline, defined as a series of key routes and viewpoints. A list of key viewpoints was selected as a representative sample of locations where people may appreciate the landscape, for example hills, public viewpoints and country parks. Due to the strategic scale of the study, the number of viewpoints was limited to a sample of approximately equal geographical distribution. Settlements and major roads were also considered. Further detail on the visual baseline is given in **Section 4**.
- 3.74 The following criteria are considered in coming to a judgement on cumulative impacts:
- The number of wind farms visible;
 - Distance and direction to the wind farm(s);
 - The extent of each wind farm likely to be viewed;
 - The visual separation of the wind farms from one another; and
 - The relative turbine size and extent of each proposal.

Limits of cumulative capacity

- 3.75 It is necessary to determine where in the core area the limits of capacity are being reached. That is:
- where the level of cumulative effect from operational and consented development is of such a level that there is no additional capacity for further development; and
 - where the level of cumulative effect from proposed development, in addition to operational and consented development, may be of such a level that there is no additional capacity for further development.
- 3.76 These issues are examined by comparing the assessed capacity of the landscape with the level of cumulative *effect*, as described above. By carrying out this comparison, an impression can be gained not only of how much development is present or visible, but how much this matters to the landscape in question. This provides the information on cumulative *impact*.
- 3.77 As noted above, there is no firm threshold. However, where high levels of cumulative effect are occurring in landscapes with lower capacity, it is likely that cumulative impacts will be higher, and that this will potentially limit further development in these areas.

4 Landscape Baseline

Introduction

- 4.1 The landscape baseline for the study is provided in published landscape character assessments for the SDP area. The baseline also includes landscape designations which are in place across the study area, consideration of wildness and wild land, and viewpoints.

Landscape character

- 4.2 The study takes as its baseline the Glasgow and Clyde Valley Landscape Character Assessment (GCVLCA),²⁵ which offers a consistent characterisation of the landscape of the SDP area, at a scale which is appropriate to a strategic examination of landscape sensitivity.
- 4.3 A more recent character assessment has been undertaken of the South Lanarkshire landscape,²⁶ to inform the development of South Lanarkshire Council's wind energy capacity study (**Section 2**). In order to avoid conflicts between the present study and the SLC capacity study, it was necessary to recognise this more detailed character assessment and the way in which the two layers of characterisation interact.

Glasgow and the Clyde Valley Landscape Character Assessment

- 4.4 The GCVLCA divides the core area into 21 LCTs. These are defined as generic types, and most occur in more than one location. For each LCT, the GCVLCA presents a narrative description, with lists of 'key issues' and 'key characteristics'. This is followed by a discussion on 'managing landscape change', which examines sensitivities and forces for change. While some of the material in the latter section is potentially dated, the baseline information on the landscape and its key characteristics is considered to be a reliable source of information. In some cases, there have been changes in baseline character arising from, for example, urban expansion, changing patterns of forestry, mineral extraction and large-scale wind farms. These changes have been noted where they potentially affect sensitivity.
- 4.5 Following discussion with the steering group, the Green Corridors (LCT9) were excluded from the study. The GCVLCA identified nine such corridors, focused on the Rivers Clyde, Kelvin and Leven and the Forth and Clyde Canal, among others, within the Glasgow conurbation. By their nature, these areas are small and constrained, and were considered unlikely to have significant capacity for wind energy development. In addition, they represent a greater level of detail than prevails across the rest of the GCVLCA: essentially the green corridors are, like parks, features within the wider urban context.
- 4.6 The remaining 20 LCTs form the basis for the study. Most of these LCTs occur in more than one local authority area. **Table 4.1** presents a summary of which LCTs lie within each of the eight local authority areas of the study area.
- 4.7 The landscape character assessment is mapped in **Figure 4.1**. The LCTs shown in this figure are based on the nationwide landscape character assessment dataset published by SNH, since the original mapping which accompanied the GCVLCA is not available digitally. The original mapping was created by hand at a small scale, and as such is less detailed than the SNH dataset. The mapping shown in **Figure 4.1** introduces more detailed urban boundaries, and has been edited to follow the outer boundaries of the core area.

²⁵ Land Use Consultants (1999) Glasgow and the Clyde Valley landscape assessment. Scottish Natural Heritage Review no. 116.

²⁶ Ironside Farrar (2010) South Lanarkshire Landscape Character Assessment. South Lanarkshire Council.

Table 4.1 Landscape character types within the core area, by local authority

Glasgow & Clyde Valley LCA Landscape Character Types	West Dunbartonshire	East Dunbartonshire	Inverclyde	Renfrewshire	Glasgow	East Renfrewshire	North Lanarkshire	South Lanarkshire
1 Raised Beach	•		•	•				
2 Alluvial Plain				•				
3 Urban Greenspace				•	•	•		
4 Rolling Farmland		•			•		•	•
5 Plateau Farmland					•	•	•	•
6 Rugged Upland Farmland			•	•		•		
7 Fragmented Farmlands					•		•	
8 Incised River Valleys					•		•	•
9 Green Corridors*	•		•	•	•			
10 Broad Valley Lowland		•		•	•		•	
11 Broad Urban Valley					•		•	•
12 Upland River Valleys			•			•		•
13 Broad Valley Upland								•
14 Upland Glen								•
15 Foothills								•
16 Drumlin Foothills	•	•						
17 Old Red Sandstone Hills								•
18 Plateau Moorlands						•	•	•
19 Moorland Hills and Ridges	•							
20 Rugged Moorland Hills	•	•	•	•			•	
21 Southern Uplands								•
Total LCTs	5	4	5	7	8	5	8	11

* Not included in the sensitivity assessment.

South Lanarkshire Landscape Character Assessment

- 4.8 The South Lanarkshire Landscape Character Assessment (SLLCA)²⁷ is described as being a review and update of the GCVLCA, providing a more detailed level of characterisation. The SLLCA sought to identify significant changes in the landscape, and to more accurately map the LCT boundaries. A greater depth of subdivision was introduced, with a number of sub-types defined based on land use, including forestry and wind farms.
- 4.9 The SLLCA introduces three new LCTs, in addition to the 11 GCVLCA LCTs already defined. These are:
- *Urban Fringe Farmland*, including settlement fringe areas around several settlements, but distinct from the *Fragmented Farmland* LCT;
 - *Rolling Moorland*, representing more elevated and topographically varied areas of the *Plateau Moorland* LCT; and
 - *Prominent Isolated Foothills*, including three distinctive hills within the *Foothills* LCT: Tinto; Black Mount; and Dungavel Hill.
- 4.10 A number of sub-types were also defined. These and other finer-grained refinements of the characterisation are fully described in the SLLCA report.
- 4.11 The SLLCA has been used as the baseline for the South Lanarkshire landscape capacity study, which has been recently updated.²⁸ The purpose of the present study is not to challenge the SLC study, but to ensure a consistent assessment at the strategic scale, which is complemented by more detailed work at the local authority scale.
- 4.12 In order to avoid inconsistencies or apparent conflicts between this study and the SLC study, it has been necessary to review the latter (see **Section 2**), and to ensure a degree of read-through between the GCVLCA and SLLCA baselines. For the purposes of this strategic study, the LCTs from the GCVLCA have been broadly aligned with those from the SLLCA as set out in **Table 4.2** and illustrated in **Figure 4.2**. These relationships are noted in the LCT assessments (**Section 5**) where reference is made to the further detail available in the SLC capacity study. Note is also taken where the boundaries between the SLLCA types is markedly different from the boundaries identified in the GCVLCA.

Table 4.2 Correspondence between the GCVLCA and SLLCA

GCV Landscape Character Types	SLLCA Landscape Character Types
4 Rolling Farmland	1 Urban Fringe Farmland 4 Rolling Farmland
5 Plateau Farmland	1 Urban Fringe Farmland 5 Plateau Farmland
8 Incised River Valleys	2 Incised River Valleys
11 Broad Urban Valley	3 Broad Urban Valley
12 Upland River Valleys	8 Upland River Valleys
13 Broad Valley Upland	9 Broad Valley Upland
14 Upland Glen	14 Upland Glen

²⁷ Ironside Farrar (2010) South Lanarkshire Landscape Character Assessment. South Lanarkshire Council.

²⁸ Ironside Farrar (2010, updated 2013) Spatial Framework and Landscape Capacity for Wind Farms. South Lanarkshire Council.

GCV Landscape Character Types	SLCA Landscape Character Types
15 Foothills	10 Foothills 11 Prominent Isolated Foothills
17 Old Red Sandstone Hills	12 Old Red Sandstone Hills
18 Plateau Moorland	6 Plateau Moorland 7 Rolling Moorland
21 Southern Uplands	13 Southern Uplands

Landscape designations

- 4.13 Landscape designations, defined for the purpose of protecting the character and quality of the landscape itself, are indicators of the value placed on landscapes by society. Within the core area there are no nationally designated landscapes, although the Loch Lomond and the Trossachs National Park lies within the buffer area. The following sections briefly discuss the regional and local landscape designations which are present in the core area. These designations are mapped on **Figure 4.3** and are referred to in the consideration of LCTs (**Section 5**). Country Parks and sites listed on Historic Scotland's Inventory of Gardens and Designed Landscapes are also referred to in **Section 5** where relevant.

Clyde Muirshiel Regional Park

- 4.14 Clyde Muirshiel is one of three Regional Parks in Scotland. Designated in 1990, it covers 28,000 ha in Inverclyde, Renfrewshire and North Ayrshire. The purpose of Regional Parks is to *"provide the oversight and resources needed to integrate recreation with other activities, to undertake wider landscape and habitat management, and to promote the area for the benefit of residents and visitors."*²⁹
- 4.15 The aims of the Park Authority which manages the area are defined as:
- *"To conserve and enhance the natural beauty, biodiversity and cultural heritage of Clyde Muirshiel Park;*
 - *To encourage and enable learning, understanding and enjoyment of Clyde Muirshiel Park; and*
 - *To promote and foster environmentally sustainable development for the social and economic well-being of the people and communities within the Clyde Muirshiel Park area."*³⁰
- 4.16 The Regional Park does not have a defined set of 'special qualities' which it seeks to protect, but it is nevertheless highly valued for its scenery and tranquillity.

Inverclyde

- 4.17 The Inverclyde Local Plan (2005) includes Policy HR5 West Renfrew Hills Scenic Area. This area, first identified in 1981, is described as a *"scenic area of regional importance"*. Its presence requires a sensitive approach to development, including consideration of the scale, siting and design of proposals. The designation is carried forward into the Inverclyde Local Development Plan Proposed Plan (2013).

West Dunbartonshire

- 4.18 The West Dunbartonshire Local Development Plan Proposed Plan (2013) introduces the Kilpatrick Hills as a Local Landscape Area, replacing the former Regional Scenic Area designation. A draft

²⁹ Scottish Natural Heritage (2012) Parks and reserves – places managed for people and nature. Page 13.

³⁰ Clyde Muirshiel Park Authority (2010) Park Strategy 2008 – 2011: Extension to 2012. Page 6.

statement of importance for the area was published with the proposed plan.³¹ This provides a detailed description of the area in relation to clearly-defined special qualities.

East Dunbartonshire

- 4.19 The East Dunbartonshire Local Plan 2 (2011) defines the Kilpatrick Hills and Campsie Fells as Regional Scenic Areas, though no special qualities are identified. Recent work has refined the boundary of the Kilpatrick Hills Regional Scenic Area to match the boundary of the Local Landscape Area defined by West Dunbartonshire Council, and it is stated that both the Regional Scenic Areas will be identified as Local Landscape Areas in the forthcoming Local Development Plan.^{32 33} East Dunbartonshire Council have indicated that special qualities for the Campsie Fells will be closely aligned with those set out in Stirling Council's proposed supplementary guidance on local landscape areas,³⁴ which defines special qualities for the 'Southern Hills' including the Campsies, and reference is therefore made to this document.
- 4.20 East Dunbartonshire Council have also defined three Special Landscape Areas, described in a planning guidance note.³⁵ The three areas are described as exemplars of the landscape character types which occur in the council area, and include the Glazert Valley, the farmlands around Torrance, and part of the valley of the Luggie Water. The planning note presents detailed descriptions and justification of their boundaries.

Glasgow

- 4.21 The Glasgow City Plan 2 identifies a large number of Sites of Special Landscape Importance, many of which are small scale open spaces and parks in the urban context. Some of the landscapes surrounding the urban area fall within these designations, including Pollok Park and the Cathkin Braes. It is not clear if this designation will be retained in the forthcoming Local Development Plan. Given the small scale of the areas; that special qualities for the designated areas are not available; and that the purpose of the designation is not primarily focused on protecting scenic quality, this designation is not considered further.

Renfrewshire

- 4.22 Neither the Renfrewshire Local Plan (2006) or the Renfrewshire Local Development Plan Proposed Plan (2013) includes any reference to local landscape designations.

East Renfrewshire

- 4.23 Neither the East Renfrewshire Local Plan (2011) or the Proposed Local Development Plan (2012) includes any reference to local landscape designations.

North Lanarkshire

- 4.24 The North Lanarkshire Local Plan (2012) identifies both Regional Scenic Areas and Areas of Great Landscape Value. The Proposals Maps show one Regional Scenic Area covering the Kilsyth Hills, and one Areas of Great Landscape Value along the River Clyde south of Motherwell. Special qualities are not stated. In relation to the Kilsyth Hills, reference is made to Stirling Council's proposed supplementary guidance on local landscape areas, which describes special qualities for the adjacent area.

South Lanarkshire

- 4.25 A 2010 study reviewed local landscape designations in South Lanarkshire, and recommended the definition of six Special Landscape Areas to replace the former Regional Scenic Areas and Areas of Great Landscape Value.³⁶ The report provides detailed descriptions and statements of significance

³¹ West Dunbartonshire Council (September 2013) Proposed Kilpatrick Hills Local Landscape Area – Draft Statement of Importance

³² East Dunbartonshire Council (2013) Making the most of our environment. Main Issues Report Background Report 5.

³³ East Dunbartonshire Council (2013) Green Belt. Main Issues Report Background Report 6. Appendix 3 "Review Of The Outer Green Belt Boundary With The Kilpatrick Hills RSA Within East Dunbartonshire."

³⁴ Stirling Council (2012) Proposed Supplementary Guidance SG27: Protecting Special Landscapes.

³⁵ East Dunbartonshire Council (2010) Special Landscape Area Designation: Planning Guidance Note.

³⁶ Ironside Farrar (2010) Validating Local Landscape Designations. South Lanarkshire Council.

for each of the areas. These designated areas have since been approved and are included in the South Lanarkshire Local Development Plan Proposed Plan (2013).

Heritage designations

- 4.26 The aim of this study is not to provide a comprehensive heritage assessment. However where there is a clear relationship between heritage assets and landscape this has been addressed.
- 4.27 Two World Heritage Sites lie wholly or partly within the study area. The Antonine Wall World Heritage Site passes through the core area, and has a designated Buffer Zone designed to protect the amenity and setting of the monument. As such the designated area has a strong landscape element, and often has an important visual relationship with areas to the north that the wall was placed to overlook. New Lanark World Heritage Site lies within South Lanarkshire, and also has a Buffer Zone taking in a broad area to the south of Lanark, and focused on the Clyde Valley in which the mill village was constructed.
- 4.28 Sites listed on Historic Scotland's Inventory of Gardens and Designed Landscapes have also been referenced where they contribute to the wider character of the landscapes in which they occur. Other historic environment assets, such as scheduled monuments, are not considered.

Wildness

- 4.29 SNH has produced nationwide mapping of relative wildness, based on an analysis of four aspects: absence of modern artefacts; perceived naturalness; remoteness from roads and ferries; and rugged or challenging terrain. **Figure 4.4** shows the wildness mapping for the core area. This indicates a generally lower degree of wildness across most of the core area, compared with other parts of Scotland. The highest levels of wildness character are in the hills that fringe the core area, including the Southern Uplands, Renfrewshire Heights and Campsie Fells.
- 4.30 SNH has recently defined a series of Core Areas of Wild Land, of which one lies within the Renfrewshire Heights on the fringe of the core area.³⁷ This study focuses on the relative wildness character as mapped in **Figure 4.4**, rather than 'wild land' which is less likely to be relevant to this part of Scotland.

Visual baseline

- 4.31 The visual baseline for the strategic cumulative assessment (**Section 6**) comprises locations where people view the landscape. Groups of people who are most sensitive to their visual environment are usually considered to be residents in their homes and communities, and people accessing the countryside for recreation, e.g. hill walkers.
- 4.32 A series of key viewpoints was selected to represent recreational users of the landscape. The list seeks to identify locations where potentially sensitive viewers have views of the landscape of the core area, which may be affected by present or future wind energy development. The list was identified based on desk study and advice from the local authorities. The viewpoints are located on **Figure 4.5** and are listed in **Table 4.3**.
- 4.33 Road users are usually considered to be of lower sensitivity to their visual environment, due to their transient nature. However, the roads are a key consideration for the examination of sequential effects, where a series of developments is seen one after the other in the course of a journey. For the purposes of this study, all major roads (motorways and A roads) in the core area and buffer area have been considered in the examination of cumulative effects.

³⁷ Scottish Natural Heritage. Mapping Scotland's wildness and wild land. <http://www.snh.gov.uk/protecting-scotlands-nature/looking-after-landscapes/landscape-policy-and-guidance/wild-land/mapping/> Retrieved 5 September 2014.

Table 4.3 Key viewpoints

	Location	Local authority	Grid reference	Reason for selection
1	Cornalees Bridge Centre	Inverclyde	224696 672048	One of the main access points for the Clyde Muirshiel Regional Park
2	Dumbarton Castle	West Dunbartonshire	239937 674489	Elevated point on the Clyde, panoramic views from the castle
3	Duncolm, Kilpatrick Hills	West Dunbartonshire	247081 677464	Highest point in the Kilpatrick Hills
4	Castle Hill, Bearsden	East Dunbartonshire	252423 672714	Located on the Antonine Wall World Heritage Site, with views south across Glasgow and the Clyde basin
5	Ruchill Park	Glasgow	257790 667998	Flagpole viewpoint on open high point within the city
6	Crow Road, Campsie Glen	East Dunbartonshire	261257 680088	Accessible viewpoint with open views to the south
7	Tak Ma Doon Road, Kilsyth Hills	North Lanarkshire	273389 681266	Accessible viewpoint with open views to the south
8	Castle Semple Country Park	Renfrewshire	236176 658738	Open loch-side location within a country park
9	Gleniffer Braes	Renfrewshire	245755 660639	Popular outlook to the south of Paisley overlooking the Clyde basin
10	Neilston Pad	East Renfrewshire	247651 655158	Westward views across East Renfrewshire from this popular viewpoint
11	Cathkin Braes	Glasgow/South Lanarkshire	261808 658621	Popular viewpoint overlooking Glasgow and the Clyde basin
12	Bedlay Cemetery, Moodiesburn	North Lanarkshire	269763 670003	Located on an open ridge close to settlements
13	Blawhorn Moss	West Lothian	287479 667648	Nature reserve in an elevated location on the plateau at the edge of the study area
14	A706, Gladsmuir Hills	West Lothian	295514 658457	Elevated location on the Pentland fringe looking across North Lanarkshire
15	Chatelherault Country Park	South Lanarkshire	273623 653967	Country park with views over Hamilton and areas to the north

	Location	Local authority	Grid reference	Reason for selection
16	Loudoun Hill	East Ayrshire	260869 637904	Landmark hill at the watershed of the Avon and Irvine Valleys
17	Black Hill	South Lanarkshire	283184 643557	Accessible viewpoint on a summit within the Clyde Valley
18	Black Law	South Lanarkshire	307874 652200	Summit in the Pentland Hills
19	Culter Fell	South Lanarkshire	305222 629184	Popular summit for hill walkers in the Southern Uplands
20	Tinto Hill	South Lanarkshire	295299 634380	Landmark hill within Lanarkshire, and a popular summit with walkers
21	Green Lowther	South Lanarkshire	290028 612039	Popular summit for hill walkers in the Southern Uplands

Wind turbine development

- 4.34 To inform the assessment of cumulative effects, data has been gathered on existing and proposed wind energy development across the study area.

Development in the core area

- 4.35 Data was requested from the eight local authorities on wind energy applications within the core area. This data was received in October 2013, and has not been updated. It therefore represents a 'snapshot' of a constantly changing situation. This snapshot is considered to provide a reasonable representation of the patterns of development and development pressure, at a strategic scale across the region.
- 4.36 The locations of all operational, consented and proposed turbines are shown on **Figure 4.6**. Developments at scoping stage were not included. The total numbers of wind turbines in the core area are summarised in **Table 4.4**. Based on the data supplied, there are 524 operational wind turbines in the core area, of which four-fifths are in the large or very large categories. This includes 152 turbines at Clyde wind farm (very large) and 140 at Whitelee (large).
- 4.37 Consent has been granted for a further 249 individual turbines. Planning applications and appeals relating to 307 turbines are currently pending resolution. The majority of these are very large turbines, reflecting a trend towards taller machines with greater generating capacity.
- 4.38 Turbines of small to medium typologies are more likely to be single turbines or small clusters, while large and very large turbines are more likely to be deployed in larger wind farms.

Table 4.4 Wind turbines in the core area (October 2013)

	Operational and under construction	Consented	Proposed (valid planning application or appeal)	Total
Small (15-30 m)	45	78	3	126
Small-medium (31-50 m)	12	28	20	60
Medium (51-80 m)	62	30	25	117
Large (81-120 m)	225	42	24	291
Very large (over 120 m)	186	64	252	502
Total	530	242	324	1096

- 4.39 **Figure 4.6a** illustrates the overall pattern of development in the area. At the broadest scale, existing and proposed wind turbines are most concentrated along the flanks of the upper Clyde Valley, to the south and east of Glasgow, within East Renfrewshire, North Lanarkshire and South Lanarkshire. Within these clusters, set either side of the Clyde itself, the larger wind farms are set on the highest ground at the edge of the study area, while smaller single turbines tend to be located on farmland closer to the river. These patterns of development are discussed further in **Section 6**.

Development in the buffer area

- 4.40 The 15 km buffer area includes parts of a number of local authorities. For the purposes of this study development identified on the SNH wind farm footprint map, supplemented by data already held by LUC, was used rather than contacting all the neighbouring local authorities. While this approach does not identify every development, particularly at the lower end of the height range, it does present a general picture of the patterns of development which are emerging. The data was checked to ensure that all larger-scale developments are included. This is considered to be sufficient for a strategic study. Wind turbine development within the buffer area is shown in **Figure 4.7**. Patterns of development are discussed in detail in the strategic cumulative assessment (**Section 6**).

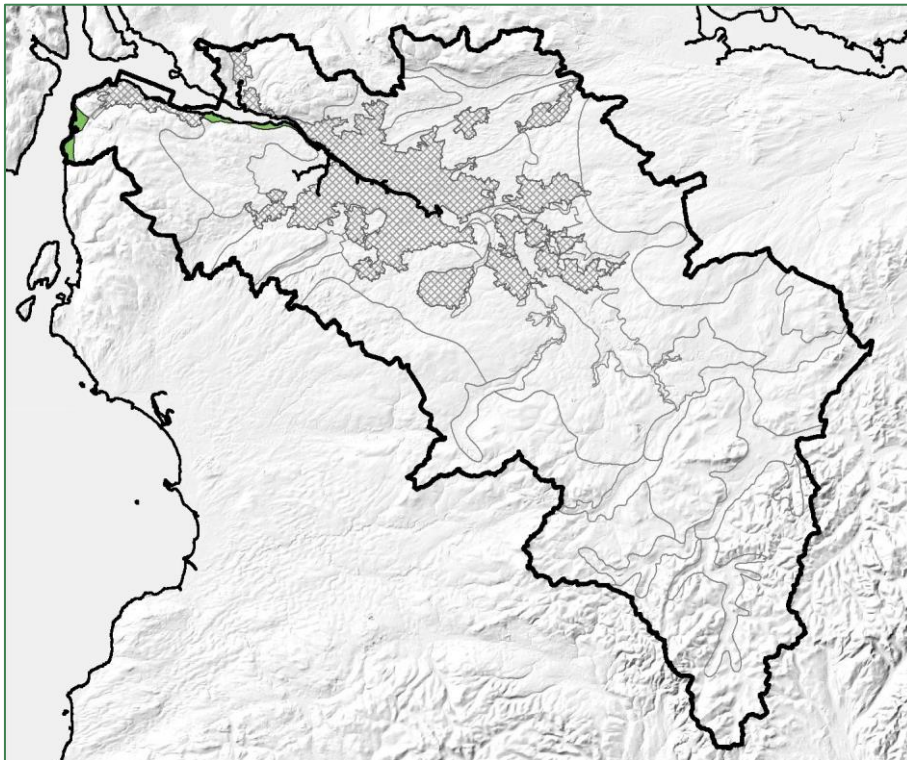
5 Sensitivity and Capacity Assessment

LCT 1 Raised Beach

Location and Extent

- 5.1 Raised beaches are the result of post-glacial sea level changes, resulting in a distinctive scarp set back from the coastline, which represents the former cliff, with a level platform of the former beach in front.
- 5.2 This LCT occurs in two areas: along the western coast of Inverclyde; and within the Firth of Clyde, where it occurs on both sides of the river; in Renfrewshire and in West Dunbartonshire.
- 5.3 The LCT comprises narrow strips of land including the former beach platform and cliffs, and some areas above the cliff line. The flat platforms have long been used for transport, settlement, and industry. These areas are characterised by road and rail corridors and other man-made features, though native woodland remains on many steeper slopes.

Figure 5.1 Raised Beach (refer to Figure 4.1 for more detail)



Key Characteristics

- 5.4 The key characteristics, features and qualities of this LCT, as defined in the GCVLCA, are:
 - steep scarp, representing the former cliff line, and narrow platform, representing the former beach, with estuarine mudflats along the inner part of the Firth of Clyde;
 - 'hanging' broadleaf woodland on many of the steeper slopes;
 - coastal settlements;
 - defensive sites, castles, historic houses and designed landscapes;
 - dominance of horizontal landscape elements; and

- prominent area with extensive views.

5.5 No significant changes have been identified to this area since 1999. There are no operational wind turbines in this LCT.

Table 5.1 Assessment of LCT1 Raised Beach

Refer to **Table 3.2** for full details of the evaluation criteria.

	Lower sensitivity		↔	Higher sensitivity	
Landform and Scale					
	The landscape is of a small scale, comprising linear coastal or estuarine edges forming narrow platforms, backed by steep escarpments. The distinctive topographical shape appears as a dramatic, defensive setting, in views across the Clyde. The landform has a strong horizontal dimension due to its linearity and relationship with the Firth of Clyde / Clyde Estuary.				
Land Cover					
	Historically, the <i>Raised Beach</i> LCT would have been covered with hanging broadleaved woodland, and remnants of this are an important feature. In other areas the slopes have been developed, where slopes are more gentle, parts of the scarp are farmed.				
Settlement and Man-made Influence					
	Settlement, industry and transport are highly influential in this landscape, much of which is associated with ship building or port facilities. Many settlements echo the shape of the LCT, long and linear along the coastline, occupying both flat platforms and steep slopes.				
Movement					
	The level of movement in the LCT reflects the concentration of settlement and transport in the area. A number of major roads pass through this LCT, including the A8, A78 and A82.				
Skylines					
	The steep slopes of the former cliff lines enclose the low platforms, forming a short field of distance in views inland. The skyline in views from the coast opens out across Clyde Basin, or from the western coast of Inverclyde, across to Argyll and Bute.				
Key Views, Vistas, Landmarks					
	Views within the <i>Raised Beach</i> LCT are predominantly those across or along the Clyde, including framed views along the estuary, and more open views west towards the Cowal Peninsula. Landmarks include various modern and historic elements of different scales, including castles, forts, and historic houses, ships, harbours and warehouses.				
Receptors					
	The area is well populated and there are high numbers of receptors, including those living in the area and those visiting as tourists to attractions such as castles and historic houses, and people using coastal routes.				
Inter-visibility with Adjacent Landscapes					
	As this LCT is located on the coast and includes steep enclosing topography, views in and out of this landscape tend to be across water, while neighbouring inland LCTs may have less inter-visibility despite being nearer. There are important views of this area from Argyll and Bute, such as from Dunoon.				
Natural and Cultural Heritage Features					
	The landscape contains a number of cultural heritage features including forts, castles, historic houses and designed landscapes, many of which are highly				

	Lower sensitivity	↔	Higher sensitivity
	visible in the landscape. Deciduous woodlands are of natural heritage interest.		
Perceptual Aspects			
	While the area includes many visible and audible man-made features, it does also comprise more tranquil settings, such as those associated with policy landscapes, and coastal edges.		

Sensitivity

- 5.6 Whereas the strong human influence, high levels of movement, and limited relationship to adjacent LCTs inland indicate reduced landscape sensitivity to development, the topography of the landscape is distinctive and provides an important indicator of scale. From a visual perspective the LCT is of higher sensitivity. There are high numbers of receptors, some important open views across water from Argyll and Bute, and a relatively high presence of cultural heritage features. Medium, large or very large turbines could affect perception of the former cliff landforms in views from across the Clyde.

Table 5.2 Sensitivity of LCT1 Raised Beach

Turbine typology	Sensitivity
Small turbine (15-30 m to tip)	Medium
Small-medium turbine (31-50 m to tip)	High-medium
Medium turbine (51-80 m to tip)	High
Large turbine (81-120 m to tip)	High
Very large turbine (over 120 m to tip)	High

Landscape value

- 5.7 The Raised Beach along the west coast of Inverclyde lies partly within the edges of the Clyde Muirshiel Regional Park. The wooded slopes above Wemyss Bay and Lunderston Bay lie at the north-west fringes of the Regional Park.

Underlying capacity

- 5.8 The sensitivity of this landscape, combined with the higher value of parts of the area, indicate lower capacity for wind turbine development, with no capacity at medium, large or very large scales.

Cumulative development and current residual capacity

Inverkip area

- 5.9 There are two consented turbines at the edge of this LCT, both located east of Wemyss Bay at the transition between the raised beach and the Rugged Moorland Hills. It is likely that these small-medium turbines will be visible from across the Clyde, in combination with the pylons which climb the hillside at this point. Overall, including consideration of cumulative development, there is very limited capacity for wind energy development in this area except at the small typology. There is some capacity for small turbines only, well-sited so as not to affect perception of the raised beach, i.e. by diminishing the apparent elevation of the scarp.

Inner Firth areas

- 5.10 The Inner Firth area comprises a narrow strip of land between Greenock and the Erskine Bridge, and on the north side of the Clyde west of Dumbarton. There is a single small turbine operating at the east end of Greenock, at the western edge of this area. On the south shore is the Finlaystone inventory-listed designed landscape. There is little or no capacity for turbines within this physically restricted area, though small turbines could be sited in association with more developed areas.

Constraints

- 5.11 The narrow, horizontal form of the *Raised Beach* areas, combined with high visibility in views across open water, is such that large turbines are likely to appear out of scale. Even medium turbines placed on the raised beach platform can diminish the perception of the scarp, with larger turbines potentially rising above it.
- 5.12 Turbines of any scale placed on higher ground, i.e. on or above the escarpment, will be set against the skyline when seen from within the LCT, and would be prominent in views across and along the Clyde. The escarpments are particularly sensitive to the location of vertical elements which break the skyline. The apparent height of these elements is emphasised due to their elevation above lower-lying settled areas on the raised beach platform.
- 5.13 There is a potential for cumulative effects to arise if turbines within this LCT are viewed in combination with turbines in the adjacent upland landscapes. The linear nature of the *Raised Beach* means that sequential effects must be considered. Care should be taken that incremental development of individual turbines along the Raised Beach does not lead to a detrimental cumulative effect on the escarpment skyline, particularly when seen across water.

Opportunities

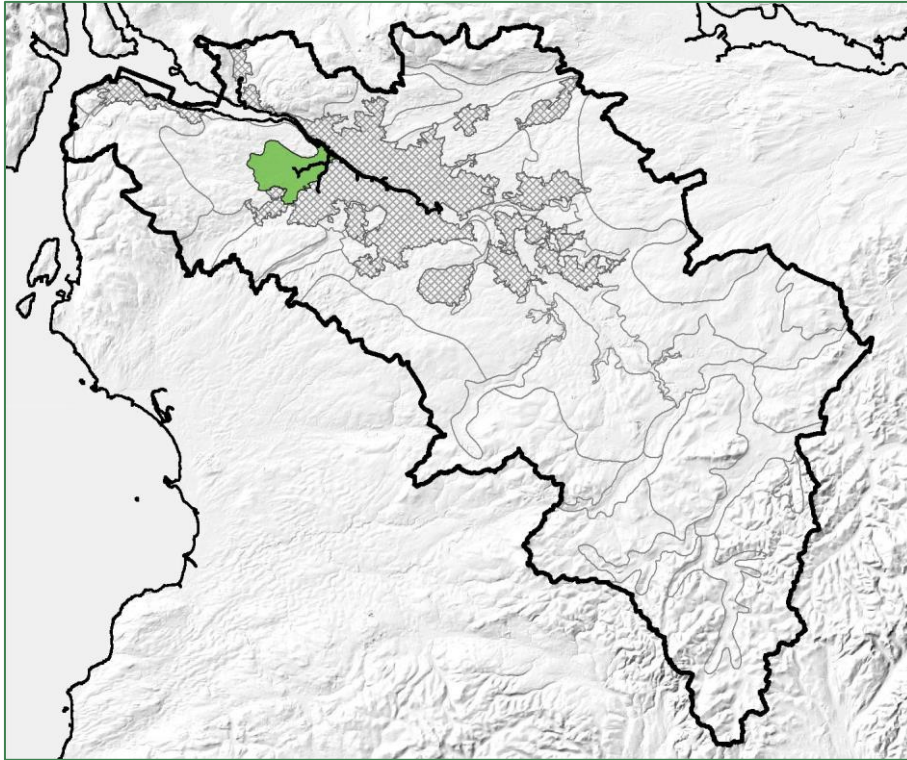
- 5.14 Whilst a number of industrial or man-made elements exist within the LCT, these tend to be wide and flat (such as major roads, harbours or warehouses) rather than tall vertical structures. Small turbines will therefore be best accommodated within these flatter parts of the LCT, associated with agriculture or industry, and taking opportunities for screening from buildings and trees.

LCT 2 Alluvial Plain

Location and Extent

- 5.15 The *Alluvial Plain* LCT occurs in only one area, in Renfrewshire. It is a flat and expansive landscape, highly influenced by settlement fringes, large scale industry and transport infrastructure.
- 5.16 The LCT includes Houston in the west and Bishopton in the north, and is bordered by Renfrew in the east and Johnstone in the south. The LCT includes most of the former Royal Ordnance Factory (ROF) site south of Bishopton, and Glasgow Airport.

Figure 5.2 Alluvial Plain (refer to Figure 4.1 for more detail)



Key Characteristics

- 5.17 The key characteristics, features and qualities of this LCT, as defined in the GCVLCA, are:
- distinctive, low-lying landform;
 - generally open character though woodland blocks and remnant field boundary trees create containment in some areas;
 - lush pastures, arable fields and a number of surviving mosses; and
 - significant urban influences in some areas, resulting from urban expansion, transport infrastructure and activities such as waste disposal.
- 5.18 Since 1999, when ROF Bishopton closed, significant remediation works have been underway, and plans for residential redevelopment of the site brought forward. Construction of Dargavel Village on part of the ROF site is now underway, with much of the remainder of the site to become parkland. There are no operational wind energy developments within this LCT.

Table 5.3 Assessment of LCT2 Alluvial Plain

Refer to **Table 3.2** for full details of the evaluation criteria.

	Lower sensitivity	↔	Higher sensitivity
Landform and Scale			
	This is a simple, relatively flat landscape with little topographical variation. There are few scale indicators in the topography of the area. As such it is a medium to large scale landscape.		
Land Cover			
	Landcover comprises large agricultural fields and blocks of coniferous forestry. These regular features are interspersed with more naturalistic remnants of designed landscape and policy woodland, and riparian woodland.		
Settlement and Man-made Influence			
	The area is close to a number of settlements, and is strongly human-influenced. Particularly in the east where the airport and the site of ROF Bishopton (currently under redevelopment) are substantial influences on landscape character. To the west this industrial influence declines somewhat, though the arable land is intensively farmed and pylons cross the area.		
Movement			
	The airport is a principal source of movement, with aircraft passing overhead on a regular basis. Traffic on the M8 is also a key influence on the eastern part of the landscape. The less industrial western areas experience less movement, particularly away from A and B roads which cross this area.		
Skylines			
	Skylines in this flat landscape are open and distant. Forestry often presents an immediate skyline of dense conifers. In longer views, higher ground to the north and south is visible, though often punctuated by pylons closer at hand.		
Key Views, Vistas, Landmarks			
	Some parts of this landscape are indistinct, particularly the eastern area around the airport, M8 and associated business parks and urban fringe. The extensive ROF site, surrounded by dense woodland, is also a barrier to views, though opening up where redevelopment is taking place. Though there are long views, to the Kilpatrick Hills to the north for example, these are often interrupted by features near at hand, and are not highly scenic views.		
Receptors			
	This is a settled landscape, with a number of scattered farmsteads, villages and suburban developments both within and at its periphery. It is also crossed by transport routes carrying large numbers of potential receptors, although these are likely to be of lower sensitivity. There are relatively few opportunities for access and outdoor recreation, though several core paths cross the area.		
Inter-visibility with Adjacent Landscapes			
	The area is intervisible with the Rugged Upland Farmland (LCT6), where it lies adjacent to the west, and where it lies beyond urban areas to the south. Longer views to the Kilpatrick Hills (LCT20 Rugged Moorland Hills) are also available from many locations. In most cases these are distant views, with the neighbouring landscapes making a limited contribution to the Alluvial Plain.		
Natural and Cultural Heritage Features			
	The principal natural heritage features of the area are the mosses, low-lying areas which relate strongly to the relatively flat landform of the area. Cultural heritage features are the remnant designed landscapes, and the remains of ROF Bishopton, which have presence in the landscape though they relate less strongly to the underlying landform		

	Lower sensitivity		↔	Higher sensitivity	
Perceptual Aspects					
	The area is not tranquil, with human activity and infrastructure visible at most times, and the aural influence of the M8 and Glasgow Airport.				

Sensitivity

- 5.19 The sensitivity of this landscape is reduced by its open, flat landform and extensive human influence. Small or small-medium turbine sizes could potentially relate to the industrial and settlement fringe areas of this LCT. The largest turbines would, however, appear out of scale with the lowland surroundings.

Table 5.4 Sensitivity of LCT2 Alluvial Plain

Turbine typology	Sensitivity
Small turbine (15-30 m to tip)	Low
Small-medium turbine (31-50 m to tip)	Low
Medium turbine (51-80 m to tip)	Medium-low
Large turbine (81-120 m to tip)	Medium
Very large turbine (over 120 m to tip)	High

Landscape value

- 5.20 This LCT is not designated for its scenic qualities, nor are there other indicators that this landscape is valued at more than a local level.

Underlying capacity

- 5.21 The reduced sensitivity of this landscape, and the lack of indicators of value, suggest that there is higher capacity for wind energy development at small, small-medium or medium scales, and potentially some capacity for large turbines, though little or no capacity for very large turbines. While turbine of different sizes may be accommodated in this landscape, it will be important to avoid confusion arising from a range of sizes in the same area.

Cumulative development and current residual capacity

- 5.22 There are no consented or proposed wind turbines in the area which would alter this finding.

Constraints

- 5.23 Although flat and extensive, this is a settled landscape of human scale, in which large turbines would appear very tall in relation to existing features such as trees, buildings and pylons. Proximity to settlements will be a key issue for siting of any turbines in this LCT.
- 5.24 Key receptors in this area include the M8 and A737 corridors, though at present there are very few turbines visible from these routes and sequential cumulative effects are not foreseen.
- 5.25 While technical issues are not within the scope of this study, it is nevertheless clear that Glasgow Airport represents a major constraint on development in this area.

Opportunities

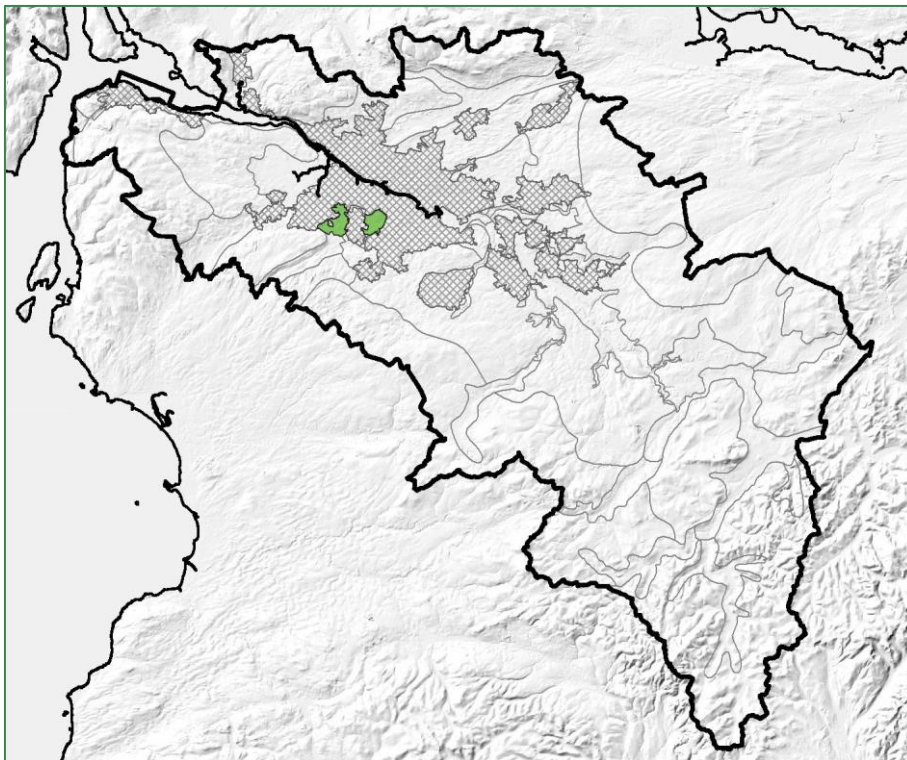
- 5.26 The area would, in general, be less sensitive to small, small-medium or medium turbines which would result in less contrast of scale. There would be reduced sensitivity to turbines, particularly small, small-medium or medium types, in or around industrial settings.

LCT 3 Urban Greenspace

Location and Extent

- 5.27 This LCT represents remnant estate landscapes which have become 'fossilised' as open spaces within the greater Glasgow urban area. These have become important green spaces, connected to the countryside by green corridors, and forming a contrast to the surrounding city.
- 5.28 There are two areas of this LCT. Pollok Park is located entirely within the City of Glasgow, and provides recreational parkland, as well as the setting for Pollok House and the Burrell Collection. The Hurlet Policies area lies between Glasgow, Paisley and Barrhead, straddling the boundaries of City of Glasgow, Renfrewshire and East Renfrewshire. This is a more fragmented area of settlement fringe, including policy woodlands, pasture and a golf course.

Figure 5.3 Urban Greenspace (refer to Figure 4.1 for more detail)



Key Characteristics

- 5.29 The key characteristics, features and qualities of this LCT, as defined in the GCVLCA, are:
- remnant policy woodlands and landscapes creating distinctive pockets of open countryside landscape within the urban area;
 - visual influence of surrounding urban areas and activities; and
 - the decline in landscape management and the increase in development and urban fringe pressures means these are landscapes under stress.
- 5.30 No significant changes have been identified to the Pollok area since 1999. Renovation and redevelopment of former hospital sites has taken place at the edges of Hurlet. There are no operational wind turbines in this LCT.

Table 5.5 Assessment of LCT3 Urban GreenspaceRefer to **Table 3.2** for full details of the evaluation criteria.

	Lower sensitivity		↔	Higher sensitivity	
Landform and Scale					
	These are medium-small scale landscapes, with gently undulating landform, cut by watercourses.				
Land Cover					
	The remnant estate woodlands, together with arable and pastureland, parkland and golf courses, provides variety of landcover. There are areas of small scale landscape, particularly in the watercourses and wooded estate lands.				
Settlement and Man-made Influence					
	There is limited settlement within this landscape, but the presence of the city nearby is always apparent. Pylons run through the Hurlet area, while Pollok has the M8 alongside.				
Movement					
	These areas have busy roads running through and alongside them, but at their heart there are still areas which, although small, provide important contrast to the busy urban areas around.				
Skylines					
	Skylines tend to be obscured by woodland within much of this landscape. Where they are more open, for example in the south of Hurlet, they are simple and gently undulating, often defined by low drumlin landforms. Hurlet skylines are also interrupted by pylons.				
Key Views, Vistas, Landmarks					
	Key landmarks of the area include the water tower of Leverndale Hospital, and Pollok House at the heart of Pollok Park. Views within the Pollok area are very limited due to the density of tree and woodland cover.				
Receptors					
	This landscape is overlooked by residential areas from all sides, including properties with views over the greenspace. In addition, Pollok is a valued recreational resource within Glasgow and the wider area, attracting people to the park and museums. Hurlet is less of an attraction, though there are footpaths along the White Cart and a golf course.				
Inter-visibility with Adjacent Landscapes					
	These areas are generally self-contained, and are almost surrounded by urban areas. The only physical connection is between Hurlet and the Rugged Upland Farmland at the south-west. There are important links via green corridors but these play less of a role as visual relationships.				
Natural and Cultural Heritage Features					
	These areas are defined by their past history as designed estate landscapes, and there are several historic buildings and features contributing to their character. The presence of these green areas within the urban context has also increased their natural heritage value, including native woodlands and riparian wildlife corridors.				
Perceptual Aspects					
	This landscape provides a mix of both tranquil areas and highly disturbed areas around the motorway and major roads. 'Wildness' features little in this landscape, though the tranquil areas are highly valued in their context.				

Sensitivity

- 5.31 The small-medium scale and high number of receptors indicate high sensitivity particularly to large turbines. There may be opportunities to make use of screening, suggesting reduced sensitivity to small turbines which would also respond to the urban fringe location and land uses. The Hurlet area, which is more fragmented and less frequented, is in general considered to be slightly less sensitive than the Pollok Park area.

Table 5.6 Sensitivity of LCT3 Urban Greenspace

Turbine typology	Sensitivity
Small turbine (15-30 m to tip)	Medium
Small-medium turbine (31-50 m to tip)	High-medium
Medium turbine (51-80 m to tip)	High
Large turbine (81-120 m to tip)	High
Very large turbine (over 120 m to tip)	High

Landscape value

- 5.32 Pollok Park is a country park and is highly valued both as an Inventory-listed designed landscape and a recreational resource within the urban context. The Hurlet area does not have the same level of formal designation but is likely to be locally valued for its open space and recreation opportunities.

Underlying capacity

- 5.33 The higher sensitivity of this landscape, combined with its high value, indicates low capacity for wind energy development at all scales. There are potential opportunities for small turbines within this landscape, albeit limited, taking advantage of screening by local woodland.

Cumulative development and current residual capacity

- 5.34 There are no consented or proposed developments which would alter this finding.

Constraints

- 5.35 Residential receptors in adjacent settlements and built up areas are a key consideration in this LCT. Other key receptors in the area include users of major roads, though there is little or no potential for sequential cumulative effects based on the current pattern of development pressure.
- 5.36 Care should be taken to avoid siting any turbines where they would impinge upon highly valued landscapes, including designed landscapes and recreational parkland. It will be important to avoid any impacts on views of landmark buildings and features in the area.
- 5.37 The medium-small scale of the landscape will limit the potential for anything larger than small turbines, which are least likely to affect the often intimate nature of these green spaces.

Opportunities

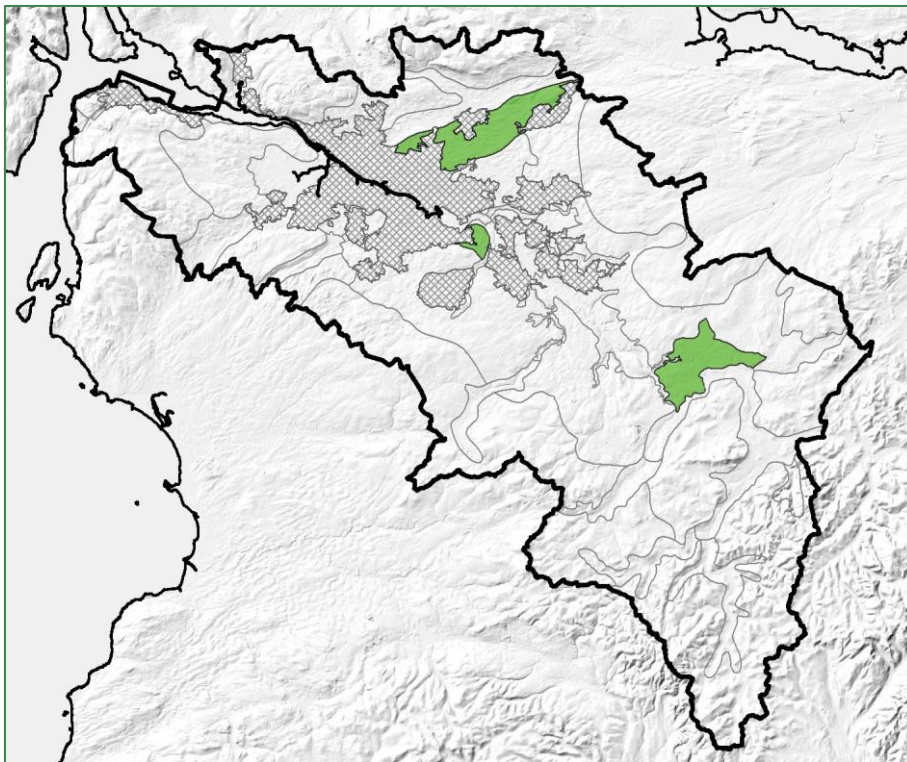
- 5.38 There would be reduced sensitivity to small turbines in more overtly urban or urban fringe parts of this LCT. It may be possible to site small turbines so as to be screened by trees and buildings.

LCT 4 Rolling Farmlands

Location and Extent

- 5.39 This LCT comprises undulating, generally pastoral, farmland overlying post-glacial landforms. These landforms, including drumlins and kettle-holes, are of medium-small scale.
- 5.40 This LCT occurs in three areas across the core area:
- The largest area lies at the boundary of East Dunbartonshire and North Lanarkshire and extends into Glasgow, and is here referred to as the Kirkintilloch and Cumbernauld area;
 - The Blantyre area in South Lanarkshire; and
 - The Lanark area in South Lanarkshire.

Figure 5.4 Rolling Farmlands (refer to Figure 4.1 for more detail)



South Lanarkshire

- 5.41 The area covered by this LCT is primarily classified by the South Lanarkshire Landscape Character Assessment (**Figure 4.2**) as:
- Type 1 Urban Fringe Farmland (covering the Blantyre area);
 - Type 4 Rolling Farmland; and
 - Type 5 Plateau Farmland.

Further information on the sensitivity and capacity of these landscapes can be found in the relevant sections of the South Lanarkshire Spatial Framework and Landscape Capacity for Wind Farms (2013).

Key Characteristics

- 5.42 The key characteristics, features and qualities of this LCT, as defined in the GCVLCA, are:
- distinctive undulating landform created by fluvio-glacial action;
 - dominance of pastoral farming, varying in productivity according to elevation and exposure; and

- importance of woodland in structuring the landscape and providing shelter for agriculture and rural settlement.

5.43 Since 1999, the upgraded M80 has been constructed through the North Lanarkshire portion of the LCT. Some further urban expansion has occurred around Cumbernauld and other settlements. There are no operational wind turbines in the Blantyre area of the LCT. In the Kirkintilloch area there is a single operating turbine at Orchardton Road on the edge of Cumbernauld (medium). There are ten turbines operating in the area around Lanark. Four of these are small-medium, the rest are small. Five are single turbines, with the rest forming two small clusters.

Table 5.7 Assessment of LCT4 Rolling Farmlands

Refer to **Table 3.2** for full details of the evaluation criteria.

	Lower sensitivity		↔	Higher sensitivity	
Landform and Scale					
	A landscape of medium-scale landforms, this LCT is gently undulating. The variety in elevation results in changes to the degree of scale and enclosure, from medium scale and enclosed, to open and exposed on hilltops. There are distinctive fluvio-glacial features such as drumlins, kettleholes and eskers, which give rise to a topography of long hills and ridges.				
Land Cover					
	The landscape is mainly pastoral, with occasional arable fields. There are small farm woodlands and field boundary trees, though the majority of tree cover is coniferous plantations and shelterbelts. Stands of pine and beech are occasional but distinctive features. Occasional lochans and wetlands in hollows.				
Settlement and Man-made Influence					
	Several towns are located in and around this landscape, including compact settlements such as Lanark which sit in the landscape, and more extensive suburban development in the area between Glasgow and Cumbernauld. The latter area includes other settlement fringe land uses and coal bings. There are mineral workings in several locations.				
Movement					
	The M80 and numerous large feeder roads pass through the northern area of this LCT, as well as the Edinburgh-Glasgow railway, and these have a strong influence. Other areas are also crossed by transport corridors, lending a degree of movement to this landscape.				
Skylines					
	Open skylines, formed by gently convex drumlins and low ridge lines, without strongly distinctive features. Deciduous trees are often seen on skylines, and forestry occasionally obscures the horizon line.				
Key Views, Vistas, Landmarks					
	There are relatively few landmarks within this landscape, though church steeples act as local foci. Key views tend to be outward looking (see Intervisibility below).				
Receptors					
	Receptors in this area include the many road users who travel the routes through this area on a daily basis, including commuters. There are residential areas on the fringes of this landscape.				
Inter-visibility with Adjacent Landscapes					
	This LCT has a strong relationship to the north with key views from hills such as Bar Hill overlooking the Kelvin Valley (LCT10) to the Campsie Fells and Kilsyth Hills (LCT20). This landscape has a transitional relationship with the Fragmented Farmland (LCT7) in its northern area. In the south there are views				

	Lower sensitivity	←→	Higher sensitivity
	along the Clyde towards Tinto and the Southern Uplands. The small area near Hamilton overlooks the Clyde Valley.		
Natural and Cultural Heritage Features			
	The northern edge of this landscape represents the line of the Antonine Wall, built along the rim of the Kelvin Valley. The landscape in this area allows the strategic importance of the site to be appreciated. The Forth and Clyde Canal cuts across the LCT north of Bishopbriggs. Elsewhere there are fewer features of natural and/or cultural heritage importance which are closely related to this landscape.		
Perceptual Aspects			
	This landscape is not remote, being associated with settlements and transport corridors, although there are pockets of rural tranquillity which are more frequent in the southern area of the LCT than the northern areas.		

Sensitivity

- 5.44 The medium scale of this landscape, and the opportunities for screening offered by woodlands and plantations within this LCT, indicate relatively reduced sensitivity to small and small-medium turbines. These lower height turbines could be accommodated within this landscape. There is locally reduced sensitivity to medium and potentially large turbines within the more developed areas in the north of the LCT, where they could relate to industrial and commercial land uses. Due to the medium scale of this landscape very large turbines, and those at the upper end of the large typology, are less likely to be compatible with this LCT.

Table 5.8 Sensitivity of LCT4 Rolling Farmlands

Turbine typology	Sensitivity
Small turbine (15-30 m to tip)	Medium-low
Small-medium turbine (31-50 m to tip)	Medium-low
Medium turbine (51-80 m to tip)	Medium
Large turbine (81-120 m to tip)	High-medium
Very large turbine (over 120 m to tip)	High

Landscape value

- 5.45 Within East Dunbartonshire, a small area of this LCT has been designated as a Special Landscape Area (SLA). Located to the south-east of Kirkintilloch, the Badeneath and Bedcow SLA is a small area of the Luggie Burn valley, south of the railway line. Reasons for designating this area as stated in the Planning Guidance Note include:
- pleasant open landscape providing an attractive contrast to surrounding urban development;
 - no history of mineral working or relict features as seen elsewhere;
 - field boundaries reflect the historic patterns of enclosure; and
 - plantations, particularly at Gartshore Moss and Grayshill, add interest to wider views.
- 5.46 Part of this landscape to the east of Cambuslang is within the Lower Clyde and Calderglen Special Landscape Area (SLA) in South Lanarkshire. This SLA is focused on the Calder Water which flows

along the eastern boundary of the LCT, but includes some of the adjacent farmland which is less representative of the special qualities of the SLA.

- 5.47 The landscape around Lanark is within the Middle Clyde SLA. The special qualities of this SLA evident in the area include:
- scenic qualities in the combination of large valleys contrasting with the surrounding farmlands;
 - cultural features including designed landscapes, historic buildings and settlements, and historic and literary associations; and
 - Accessibility to urban and local populations via footpaths and walkways.
- 5.48 The Antonine Wall, which runs along the northern edge of this LCT from Bar Hill in East Dunbartonshire to Castlecary in North Lanarkshire, is a World Heritage Site. The designated area is narrow, though there is a buffer zone which extends south into this LCT.

Underlying capacity

- 5.49 The sensitivity of this landscape, together with indications of value, suggest that there is moderate capacity for wind turbine development, particularly at small and small-medium scales. There is little capacity for medium or large turbines, and no capacity for very large turbines.

Cumulative development and current residual capacity

Kirkintilloch and Cumbernauld area

- 5.50 There are no consented turbines in this area, which includes the landscape around Bishopbriggs, Kirkintilloch and Cumbernauld, and only one proposal for a 67 m single turbine near Bridgend. The operating 67 m turbine at Orchardton Road indicates that this scale of development, in the middle of the medium typology, would in general be acceptable in this landscape, though key sensitivities include residential receptors and the presence of the Antonine Wall World Heritage Site. A moderate level of capacity for small or small-medium turbines remains, with limited capacity for medium or large turbines and no capacity for very large turbines.

Blantyre area

- 5.51 There are no consented or proposed turbines in the Blantyre area of the LCT. Considered on its own, there is higher sensitivity to development within this area due to its small extent and its proximity to adjacent settlements, as well as the SLA designation. It is considered that there is only limited capacity for turbines in this area, restricted to the small typology which would be less likely to affect key receptors.

Lanark area

- 5.52 A further eight turbines have been consented in the Lanark area: four small, three small-medium and two medium. One proposed turbine (medium) is also within this area. Along with the operating turbines, these are dispersed across the area, though most are located within 1.5 km of the A721, avoiding the SLA-designated areas to the south and west. In this area of the LCT, the available capacity is therefore reduced. In the present scenario, the largest consented turbines are 64 m to tip, and the introduction of large turbines would likely give rise to significant cumulative effects as a result of clear scale differences. Cumulative sequential effects may occur along the A721 as a result of the pattern of consented development, particularly when longer views to Black Law wind farm are considered. It is considered that remaining capacity in this area is very limited for all but the smallest turbines.

Constraints

- 5.53 Any development within this area must avoid significant effects on the landscape setting of the Antonine Wall. Developments should have regard to the presence of the World Heritage Site and the extent of its defined buffer area. The Antonine Wall runs along the northern edge of this LCT, following the ridge on the south side of the Kelvin Valley. Turbines placed on this ridge could also have adverse effects on the landscape of the valley (LCT10), which also includes the Forth and Clyde Canal. Within the northern area of this LCT, views northward to the Campsie Fells and Kilsyth Hills are an important aspect of the landscape. Large or very large turbines may adversely affect the northern outlook from the Rolling Farmland, as well as longer views towards the Campsie Fells and Kilsyth Hills (LCT20) from the south.
- 5.54 The density of settlement will be a limiting factor on wind turbine development, due to the potential for high numbers of sensitive residential receptors. Areas of industrial and commercial land use will be of locally reduced sensitivity to small, small-medium or medium development.
- 5.55 This landscape does not contain larger open areas that could accommodate large or very large wind farms. The changing pattern of the landcover and the variations in elevation would limit the potential extent, in terms of turbine numbers, of wind energy developments.
- 5.56 Sequential effects on the A706 and A721 must be considered in relation to the Lanark area, as well as cumulative effects on views from Black Hill (viewpoint 16, see **Appendix 2**).
- 5.57 Proposals must give due consideration to the special qualities of Special Landscape Area designations in this LCT.

Opportunities

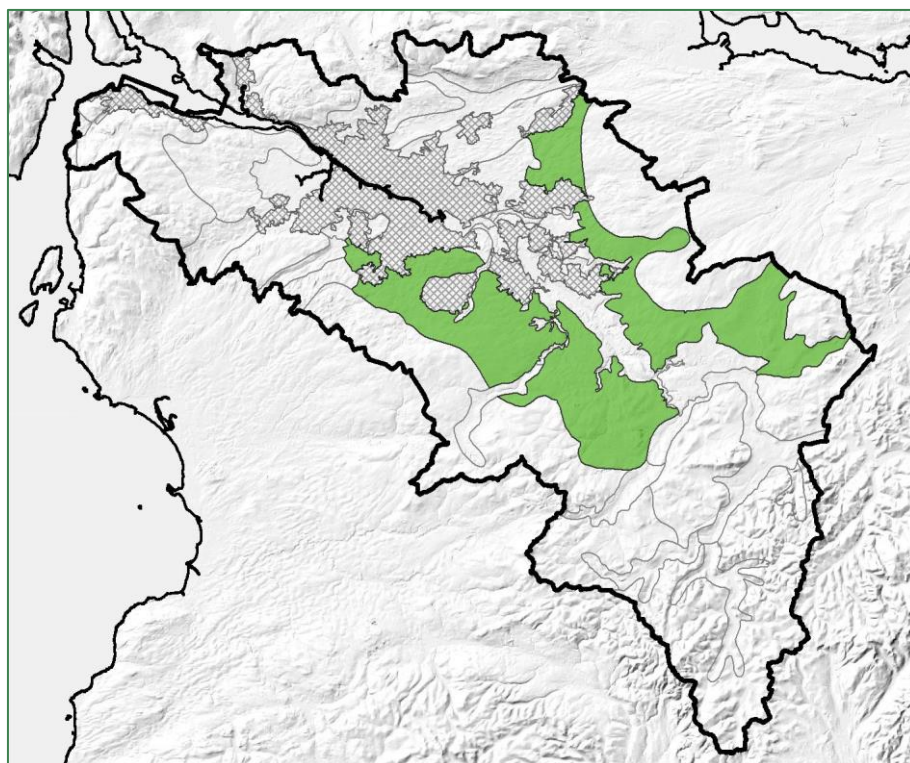
- 5.58 Turbines in this LCT should be sited to reflect underlying topography which varies between relatively open hills, enclosed shallow valleys, and flatter areas. Placement of medium turbines in particular should avoid sites where perception of topography would be adversely affected, i.e. by emphasising the scale of turbines in relation to the landscape, or conversely by diminishing the apparent elevational change in the landscape.
- 5.59 Medium turbines will be better suited to flatter areas, while there are potential opportunities to site small or small-medium turbines tucked in between the hills, where they would be partially screened from key views.
- 5.60 There are opportunities for the siting of single turbines and small clusters, of up to medium typology, though avoiding the more sensitive landscapes inset within the wider LCT.

LCT 5 Plateau Farmlands

Location and Extent

- 5.61 This LCT occurs in two broad areas which lie parallel to the River Clyde. Broken up by incised river valleys and urban areas, the LCT occurs on the lower slopes of the Clyde Valley, and represents a transitional landscape between the more sheltered valley and the open moors and uplands to east, south and west.
- 5.62 There are two main areas of this LCT: one to the north-east of the Clyde which extends across North and South Lanarkshire; and one to the south-west of the Clyde, extending from Barrhead through East Renfrewshire and into South Lanarkshire.

Figure 5.5 Plateau Farmlands (refer to Figure 4.1 for more detail)



South Lanarkshire

- 5.63 The area covered by this LCT is primarily classified by the South Lanarkshire Landscape Character Assessment (**Figure 4.2**) as:
- Type 1 Urban Fringe Farmland;
 - Type 4 Rolling Farmland;
 - Type 5 Plateau Farmland;
 - Type 6 Plateau Moorland; and
 - Type 8 Upland River Valley.

Further information on the sensitivity and capacity of these landscapes can be found in the relevant sections of the South Lanarkshire Spatial Framework and Landscape Capacity for Wind Farms (2013).

Key Characteristics

- 5.64 The key characteristics, features and qualities of this LCT, as defined in the GCVLCA, are:
- extensive, gently undulating landform;

- dominance of pastoral farming, but with some mosses surviving;
- limited and declining tree cover;
- visually prominent settlements and activities such as mineral working; and
- the rural character of the Plateau Farmland has suffered as tree cover has declined and the visual influence of settlements, transport infrastructure and mineral working has increased.

- 5.65 Since 1999, localised changes have occurred across this broad area, including settlement expansion and ongoing mineral extraction.
- 5.66 There are several operational turbines in this LCT, including small wind farms and single turbines at a range of sizes. On the west side of the Clyde, there are single turbines at Cathkin Braes (very large typology) and East Kilbride (medium), and the six-turbine Blantyre Muir wind farm (large). Further south are the single turbine near Larkhall and the three turbines at Lochhead (large) and a further 11 single turbines of small to medium typologies in the area around Kirkmuirhill and Lesmahagow.
- 5.67 East of the Clyde, there are four turbines (small to medium) between Airdrie and Cumbernauld, and a single small-medium turbine south of Shotts. Further south is the six-turbine Muirhall wind farm (very large). There are two single turbines near Carluke (small and small-medium), and nine small turbines in three groups east of Yieldshields.

Table 5.9 Assessment of LCT5 Plateau Farmlands

Refer to **Table 3.2** for full details of the evaluation criteria.

	Lower sensitivity	↔	Higher sensitivity
Landform and Scale			
	This LCT is large in scale, and exposed, with a simple, generally smooth topography. It is a predominantly flat or gently undulating landscape, cut by streams in shallow valleys.		
Land Cover			
	Landcover is uniformly pastoral, with large, even fields divided by post and wire fencing. Pasture includes both improved and unimproved areas, with remnant mosses in places. Large coniferous plantations occur, as well as patterns of deciduous and coniferous shelterbelts. The few field trees are wind-blown, though localised areas have some larger groups of trees, for example occasional remnant policy woodlands.		
Settlement and Man-made Influence			
	There are some large urban areas inset within this landscape, which are widely visible due to the open nature of the terrain. Further south settlement is more limited and dispersed, including a number of small towns set within a more rural context, with lower levels of man-made influence. Also widely visible are the transport and infrastructure routes which traverse the plateaux. There are extensive mineral workings, mainly for coal within the LCT.		
Movement			
	Traffic on the major infrastructure routes has an impact on landscape character, particularly the M74 which traverses this LCT, as well as other major roads and rail lines. Other areas are less affected by man-made influence where they are located away from busy main roads, and the Glasgow conurbation.		
Skylines			
	Skylines in this landscape are open and simple, with occasional pylons and turbines interrupting the horizon in places. Skylines within this landscape are not generally a prominent feature.		
Key Views, Vistas, Landmarks			
	There are wide views across this LCT, but few visual foci within the landscape.		

	Lower sensitivity	←→	Higher sensitivity
	Views are focused beyond the LCT, for example to key hills or to urban landmarks. The open nature of the landscape allows broad prospects, increasing its sensitivity.		
Receptors			
	There are a number of settlements within this landscape, including small towns and villages, and densely populated areas at its northern fringe. There are some opportunities for outdoor recreation, often at settlement edges and including Cathkin Braes and Calderglen Park. Other receptors include those travelling on main and minor roads.		
Inter-visibility with Adjacent Landscapes			
	An open transitional landscape, this LCT appears in the foreground when seen in views from or views towards the adjacent moorland and hills. The edges of this landscape are visible from within the Clyde Valley, forming the backdrop to the valley lowlands.		
Natural and Cultural Heritage Features			
	There are few features of natural heritage significance within this landscape of pasture and coniferous forest, aside from the surviving mosses. Cultural heritage is represented by designed landscape influences, including orchards, associated with valleys and valley fringes.		
Perceptual Aspects			
	This landscape is not especially tranquil, though in parts it does offer some tranquillity associated with more rural areas.		

Sensitivity

- 5.68 Overall, the visual sensitivity of the Plateau Farmlands LCT is higher than the landscape sensitivity, due to relatively high numbers of receptors and high levels of inter-visibility with adjacent landscapes. The larger scale of the smooth and simple landform, the regular and even land cover, and the existing presence of man-made features and associated levels of movement, suggest that there is likely to be relatively lower sensitivity to wind turbines within the LCT.
- 5.69 Sensitivity will vary locally, dependent on proximity to receptors and levels of inter-visibility. This is an extensive LCT, covering a broad area from urban edges in the north to upland fringes in the south. As such, sensitivity will vary locally from the overall values presented in **Table 5.10**, depending on proximity to receptors, and on the sensitivity of adjacent landscapes.

Table 5.10 Sensitivity of LCT5 Plateau Farmlands

Turbine typology	Sensitivity
Small turbine (15-30 m to tip)	Low
Small-medium turbine (31-50 m to tip)	Medium-low
Medium turbine (51-80 m to tip)	Medium
Large turbine (81-120 m to tip)	High-medium
Very large turbine (over 120 m to tip)	High-medium

Landscape value

- 5.70 Parts of this landscape are at the fringes of Special Landscape Areas (SLA) within South Lanarkshire. Areas associated with the Clyde Valley and its tributaries the Nethan and Avon are included within the Middle Clyde SLA. The areas of Plateau Farmland are relatively peripheral to the SLAs, forming part of the setting of the valley. The special qualities of this SLA evident in the area include:
- scenic qualities in the combination of large valleys surrounding major rivers; enclosure contrasting with the surrounding farmlands; dramatic side gorges; extensive woodlands; shelter and tranquillity;
 - cultural features including the New Lanark World Heritage Site, designed landscapes, historic buildings and settlements, extensive orchards and historic and literary associations;
 - extensive semi-natural woodlands, orchards, meadows; and
 - accessibility to urban and local populations via footpaths walkways minor roads and the A72 tourist route.
- 5.71 East of Newbigging the Plateau Farmlands is within the Pentland Hills and Black Mount SLA. The special qualities of this SLA evident in the area include:
- scenic qualities of moorland and rounded hills contrasting with sheltered pastoral valley and farmland around the edges;
 - proximity of accessible and open countryside via the A70 and A702; and
 - crossed by footpaths and tracks and part of a larger designated and highly popular area.
- 5.72 There are also country parks at Chatelherault (South Lanarkshire) and Palacerigg (North Lanarkshire).

Underlying capacity

- 5.73 The sensitivity of this landscape, combined with the indicators of landscape value, suggest that across this area there is moderate to higher overall capacity for wind turbine development at a range of scales, up to large typology. However, this finding is moderated by the level of operational and consented development in different areas of the LCT, as set out in the paragraphs below. As with sensitivity, noted above, there are significant local variations in capacity, with more limited scope for development in areas which are close to adjacent sensitive landscapes. Capacity is most restricted within and in proximity to designated SLAs. While turbine of different sizes may be accommodated in the landscape, precedent will determine which turbine sizes should be deployed in order to avoid the confusion that would arise from a range of sizes in the same area.

Cumulative development and current residual capacity

Barrhead to East Kilbride area

- 5.74 West and north of East Kilbride there is one proposed turbine (small). Sensitivities in these areas include proximity to residential areas, and the relative prominence of high ground when viewed from the north. Further development along this urban edge could be highly visible alongside the Cathkin Braes turbine from locations across Glasgow. Visibility is therefore the main factor limiting capacity in this area. The extent of operational development to the immediate south, including Whitelee Wind Farm, gives rise to a high potential for cumulative impacts to arise from development in these locations. However, the presence of the Cathkin Braes turbine demonstrates the principle of large turbines in this area. The residual capacity in this area is considered to be lower for all turbine scales, except for small or small-medium turbines.

East Kilbride to Strathaven area

- 5.75 In the area between East Kilbride, Hamilton and Strathaven there are nine consented single turbines, and two proposals. These are dispersed throughout this area, and all are within small, small-medium or medium typologies. Whitelee is visible across much of this area, along with Blantyre Muir within the area. Further capacity for large or very large turbines is very limited in this area, assuming the presence of proposed turbines, though there is some further capacity for

small, small-medium or medium turbines. Sequential effects may occur along the A726 and A723, depending on the siting of new development. There is also the potential for cumulative effects on views from the north-east, in which this landscape forms the backdrop to Hamilton.

Lesmahagow area

- 5.76 In the area south of Larkhall and Stonehouse there are over 30 consented turbines, including a two-turbine extension to Lochhead, and three large turbines at the M74 Eco-park near junction 11. The remainder are mainly medium or small-medium single turbines. In addition, there are undetermined proposals for a similar number of turbines. The latter include the seven-turbine Broken Cross wind farm and part of the Dalquhandy wind farm, and three additional turbines at Lochhead (all very large). Other proposals are medium or smaller, and include three-turbine clusters as well as single turbines. The consented and proposed developments are dispersed across the area, and would further intensify the level of development across this area.
- 5.77 Considering consented turbines, the area south of Larkhall and Stonehouse would appear to be approaching the limit of capacity, where turbines could become a key characteristic of the landscape. Remaining capacity for medium, large or very large turbines is reduced in this area, and the cumulative impact of current and future proposals must therefore be very carefully considered. The setting of the Clyde Valley, and the special qualities of the Middle Clyde SLA, are key considerations in this area. Sequential effects along the M74 already occur where turbines of different sizes are seen in close proximity, along with more distant views to Hagshaw and other wind farms.

Cumbernauld to Airdrie area

- 5.78 East of the Clyde there are three consented single turbines between Airdrie and Cumbernauld, including one very large turbine at Stirling Road. The consented Greengairs wind farm lies on the eastern edge of this area. There are fewer indicators of landscape value applying to this area, and sensitivity is locally reduced due to industrial areas and former mineral workings. The consenting of Greengairs and the single turbine north of Airdrie indicate some very large turbines are acceptable, though there is limited scope for further development at this scale, associated with areas of locally reduced sensitivity. Elsewhere moderate capacity remains for small, small-medium or medium development. Cumulative considerations will include the visual relationship of turbines at different heights, as perceived in views from settlements.

Airdrie to Shotts area

- 5.79 South of Airdrie the pattern of proposed development is more dispersed. A large single turbine has been consented at Gartness, and a small turbine at Shotts. The proposed Starryshaw wind farm extends into this area north-east of Shotts, and together with the adjacent Shotts and West Benhar proposals would form a large turbine cluster on the edge of this LCT, opposite Black Law wind farm to the south. Based on the current pattern of development, there would be potential for cumulative effects on views from the Shotts area which would limit further capacity in the eastern end of the area. Elsewhere moderate capacity would remain for small, small-medium or medium development. There would be lower capacity for large or very large turbines.

Carluke, Auchengray and Newbigging area

- 5.80 A two turbine extension to Muirhall wind farm (very large) has been approved, along with six medium to small single turbines between Carluke and Newbigging. Proposals include the six-turbine Calla wind farm and five-turbine Crofthill (both very large) and four single turbines (medium and small-medium). Cumulative effects in this area would be likely in relation to Black Law wind farm to the north, and turbines in the Rolling Farmland (LCT4) to the south. Cumulative effects on the Pentlands will arise from further development between the A70 and A706. Cumulative effects on the A70 and A706 would occur, particularly if developments in West Lothian, such as Tormywheel or Fauch Hill, are constructed. There is low residual capacity for further wind farms in this area, and low to moderate capacity for single turbines, at all scales, due to the potential for cumulative effects.
- 5.81 In the area south-east of the A70, including Newbigging, it is judged that there is no capacity for medium, large or very large turbines, due to the location of the Plateau Farmland which here lies between the Pentlands and Black Mount, and where turbine development could interrupt the

relationship between these features. There is limited capacity for small or small-medium turbine types in this area.

Constraints

- 5.82 As noted above, capacity varies across this LCT, with more limited capacity in locations visible to high numbers of sensitive receptors, particularly residential viewers, or to receptors in adjacent LCTs of high sensitivity, particularly those which are designated as SLAs. Proposals must give due consideration to the special qualities of Special Landscape Area designations in this LCT.
- 5.83 It is unlikely that there are opportunities to develop large wind farms in this LCT, as there are few large open areas.
- 5.84 Effects on prominent skylines should be considered, where this LCT forms the horizon as viewed from within or across the Clyde Valley and its tributaries, for example the ridge to the west of Hamilton.
- 5.85 Cumulative effects may occur where several individual developments (including single turbines) are present along a skyline landform. Sequential effects could occur along the M74, and on localised sections of other A roads in this LCT.

Opportunities

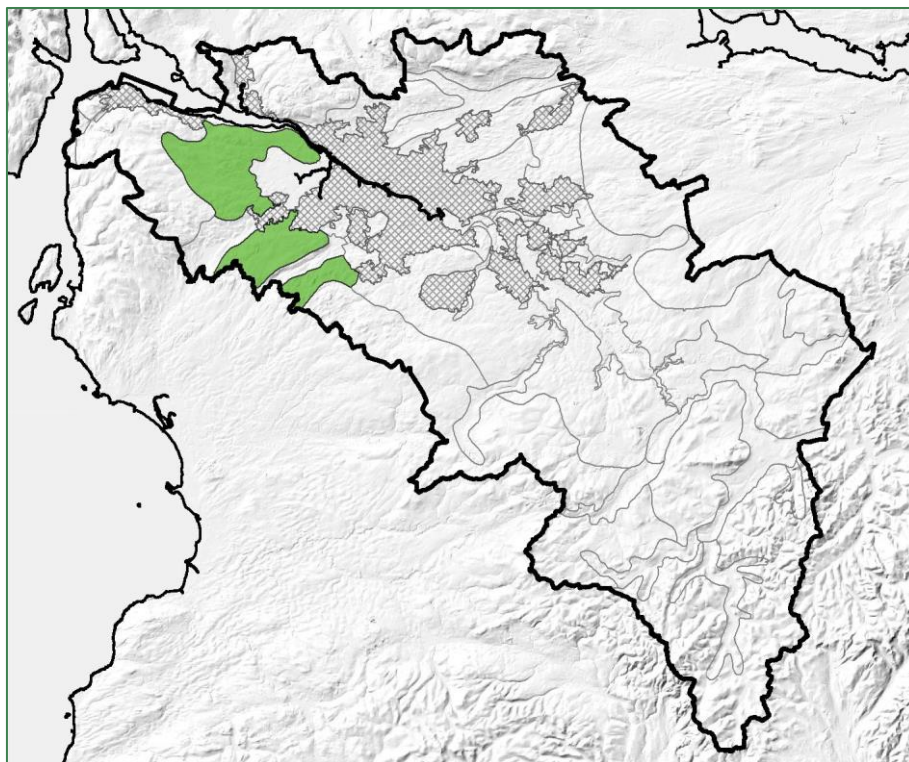
- 5.86 Turbines will be most suited to intensive agricultural or industrial settings. Turbine size should be selected to match with what has been deployed already, to minimise adverse cumulative effects.
- 5.87 Single turbines and clusters (2-5 turbines) are most likely to be accommodated given the settlement pattern and inter-visibility of this landscape. Regard should be had to the level of cumulative development in each area of the LCT in siting and designing proposals which would be compatible.

LCT 6 Rugged Upland Farmland

Location and Extent

- 5.88 This landscape is similar to the Plateau Farmland (LCT5), though characterised by more rugged, hummocky landforms and craggy bluffs. It occurs across Inverclyde, Renfrewshire and East Renfrewshire, divided by river valleys into three discrete areas.
- 5.89 The character type extends across three main areas:
- an area between the River Clyde and the Black Cart Water including Kilmacolm, Bridge of Weir and Erskine. This area straddles Inverclyde and Renfrewshire, and takes in Strathgryffe and parts of the former Royal Ordnance Factory (ROF) site south of Bishopton;
 - the hills which lie between Paisley and Johnstone in the north, and Neilston in the south, covering Renfrewshire and East Renfrewshire; and
 - the hills south of Neilston, in East Renfrewshire.

Figure 5.6 Rugged Upland Farmland (refer to Figure 4.1 for more detail)



Key Characteristics

- 5.90 The key characteristics, features and qualities of this LCT, as defined in the GCVLCA, are:
- rugged landform comprising rocky bluffs and shallow troughs;
 - dominance of pastoral farming; and
 - tree cover often emphasising landform, for example concentrated on bluffs and outcrops.
- 5.91 No major changes to this landscape since 1999 have been identified, though part of the former ROF Bishopton in this LCT has been demolished and is being redeveloped as Dargavel Village. There are four operational turbines in the southern part of the LCT, comprising the Neilston Community wind farm (very large) south-west of Neilston. A single small turbine is located at Capellie north of Neilston.

Table 5.11 Assessment of LCT6 Rugged Upland FarmlandRefer to **Table 3.2** for full details of the evaluation criteria.

	Lower sensitivity		↔	Higher sensitivity	
Landform and Scale					
	This LCT is a rugged, hummocky landscape of steep, craggy bluffs interspersed with gentler farmland, and is small to medium in scale.				
Land Cover					
	Land cover is typically improved pasture or occasional arable land, with rougher pasture on high ground and moorland edges. There are large woodlands, with many of the rugged hillocks covered in stands of beech or pine. Many of the troughs and valleys are flooded, providing reservoirs for urban areas to the north.				
Settlement and Man-made Influence					
	The northern area contains villages such as Kilmacolm and Bridge of Weir. Other human influences include electricity infrastructure and masts, some forestry and isolated suburban development. In the hills around Johnston and Neilston, farms and villages tend to be concentrated in the more sheltered parts of the LCT.				
Movement					
	There is more movement in the northern area of this LCT, related to traffic travelling along the M8 and A761. Traversing the valley slopes above Neilston and Johnston there is a less busy network of minor roads. Aircraft approaching and leaving Glasgow Airport can be perceived from this LCT.				
Skylines					
	Skylines are relatively complex in more rugged areas, becoming smoother and simpler where the landform is more plateau-like. There are some low but relatively distinctive landforms. Elsewhere there are power lines and masts seen on the skyline, and wind turbines in the southern area of the LCT.				
Key Views, Vistas, Landmarks					
	Views are relatively contained within western areas of this landscape, which are fringed by higher ground. The valley of Strathgryffe channels views locally. This landscape offers many attractive views over undulating wooded farmland. There are some distinctive landforms though few are highly prominent as landmarks. To the south and east there are longer views, where features such as Gleniffer Braes are prominent in views from the north.				
Receptors					
	There are farms and villages, as well as larger settlements in the Kilmacolm area. There are recreational receptors e.g. visitors to Gleniffer Braes Country Park and golf courses. Other recreational resources include the railway path through Strathgryffe (NCN Route 75) and walks to summits such as Neilston Pad.				
Inter-visibility with Adjacent Landscapes					
	Both the northern and southern areas have high inter-visibility with the surrounding landscapes, and the southern areas form the backdrop to views from the Glasgow conurbation. There are views across the Glasgow conurbation and beyond, from the northern area of this LCT. Features such as Gleniffer Braes are prominent in views from the north. There are views from the LCT across the adjacent Broad Valley Lowland (LCT 10) and Upland River Valleys (LCT 12). The Strathgryffe area has important relationships with the Rugged				

	Lower sensitivity	↔	Higher sensitivity
	Moorland Hills (LCT20) to the west, and longer views to the Kilpatrick Hills to the north.		
Natural and Cultural Heritage Features			
	Beech hedgerow trees are a distinctive feature in many parts of this landscape, often associated with estate landscapes.		
Perceptual Aspects			
	Human activity and development is present across the northern area, and the aural influence of the M8 and Glasgow Airport contribute to lower levels of tranquillity. The southern areas are more peaceful, although roads and settlement in the LCT and adjacent valleys remain apparent.		

Sensitivity

- 5.92 The sensitivity assessment suggests that this LCT will be of lower sensitivity to small or small-medium turbines, particularly the more human-influenced areas. However the rugged and smaller-scale areas of landscape are more sensitive to turbines generally. In the south, there are larger-scale upland fringe areas which are locally less sensitive to large or very large turbines, although turbines in this area are likely to be highly visible in the wider landscape, with large numbers of receptors nearby.

Table 5.12 Sensitivity of LCT6 Rugged Upland Farmland

Turbine typology	Sensitivity
Small turbine (15-30 m to tip)	Medium
Small-medium turbine (31-50 m to tip)	Medium
Medium turbine (51-80 m to tip)	High-medium
Large turbine (81-120 m to tip)	High
Very large turbine (over 120 m to tip)	High

Landscape value

- 5.93 This landscape is not designated, though the Strathgryffe area in Inverclyde is on the fringe of the Clyde Muirshiel Regional Park, and is valued for its outdoor recreational opportunities. Gleniffer Braes Country Park is within this LCT, south of Paisley. Other areas are valued at a local level.

Underlying capacity

- 5.94 The sensitivity of this landscape, combined with the indicators of value, suggest that there is moderate to lower capacity for wind energy development at small or small-medium scales, with limited capacity for medium or large development and no capacity for very large turbines. While turbine of different sizes may be accommodated in the landscape, it will be important to avoid the confusion that would arise from a range of sizes in the same area.

Cumulative development and current residual capacity

Neilston area

- 5.95 In the southern area of the LCT, there are three consented turbines of medium and small typologies, all located close to Neilston Community wind farm. Two more small turbines have

been consented near Plymuir north of Uplawmoor. Cumulative effects may occur within these areas and in the Upland River Valley (LCT12) between Uplawmoor and Barrhead. There are consented turbines within the valley also, and further afield the operational Middleton wind farm can be seen from the hills. The landscape either side of the valley has some residual capacity for turbines, up to medium size and potentially large if very carefully sited. Views from residential areas and the more rugged hills are the key local sensitivities which will limit capacity, as well as cumulative effects, although the general conclusion on underlying capacity is applicable.

Renfrewshire area

- 5.96 Within Renfrewshire there are no consented or proposed turbines which would alter the general conclusion on capacity. The less settled, more upland fringe area south of Johnstone and Howwood has locally higher capacity for development of turbines, due to its less settled and larger-scale nature.

Strathgryffe area

- 5.97 Within Inverclyde there is a single medium turbine consented in western Strathgryffe, as well as further medium and small-medium consented turbines in the neighbouring Rugged Moorland Hills (LCT20). This area is a relatively enclosed valley, and is close to the edge of Clyde Muirshiel Regional Park. As such it is likely to be of locally higher sensitivity to large turbines and clusters/wind farms, though further single turbines may be accommodated in upland fringe areas, away from the most intricate parts of the landscape. The current level of wind turbine development does not alter the general conclusion on capacity for this area, although local landscape sensitivity suggests limited capacity for medium turbines and no capacity for large or very large turbines.

Constraints

- 5.98 There are prominent skyline landforms which are key features in views from surrounding areas. Examples include the Gleniffer Braes as viewed from Paisley and Johnstone; and the high ground facing the River Clyde, above the Raised Beach (LCT1) as viewed from West Dunbartonshire. These features are likely to be more vulnerable to the impact of wind energy development.
- 5.99 Rugged, rocky landform is a key characteristic of this LCT, and local areas which clearly exhibit this character will tend to be more sensitive than less characteristic farmland areas within the LCT. Overhead power lines are prominent features across parts of this LCT, and turbines in close proximity to pylons may give rise to cumulative effects on landscape and views.
- 5.100 Consideration should be given to the potential for impacts, cumulative and otherwise, on the landscape of the Clyde Muirshiel Regional Park.
- 5.101 Based on current patterns of development, sequential impacts may arise in views from the A736, which passes between two areas of this LCT, though at present the level of effect is very localised to the Uplawmoor and Neilston area.

Opportunities

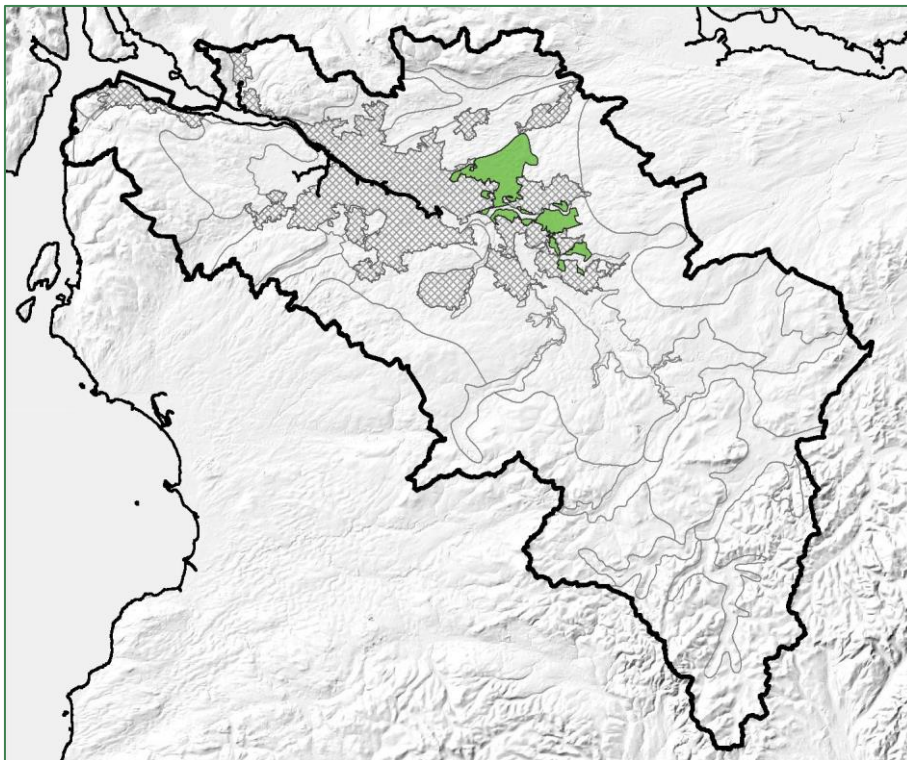
- 5.102 The opportunities within this landscape lie in the more upland fringe areas, where the landscape is larger in scale and less distinctively rugged, and where settlement is more limited. These areas could accommodate sensitively sited single turbines and small groups of turbines, though as above cumulative effects will be a principal consideration.

LCT 7 Fragmented Farmland

Location and Extent

- 5.103 The LCT occurs on the urban fringe to the east of Glasgow, in a broad triangle between the city, Cumbernauld and Wishaw, and is partly defined by its fragmented settlement fringe character. It occurs in Glasgow and North Lanarkshire.
- 5.104 This LCT extends across three main areas: the most northern area broadly follows the corridor of the M73, between Glasgow and Coatbridge, crossing the boundary between Glasgow City and North Lanarkshire; and there are two areas to the south, following the valleys of the North Calder and South Calder in North Lanarkshire. The Fragmented Farmlands are divided by urban areas and by watercourses (LCT8).

Figure 5.7 Fragmented Farmland (refer to Figure 4.1 for more detail)



Key Characteristics

- 5.105 The key characteristics, features and qualities of this LCT, as defined in the GCVLCA, are:
- a landform which ranges from gently undulating topography associated with the plateau farmlands to more hummocky patterns where fluvio-glacial action has created drumlins and eskers;
 - pockets of remnant pastoral farming, in some areas retaining a strong structure of hedges and trees, but in others suffering serious decline;
 - visual influence of the urban edge, of former and current industrial sites and transport infrastructure; and
 - urban fringe issues including blight, management decline and anti-social behaviour such as flytipping.
- 5.106 Since 1999 further commercial and residential development has taken place, such as at Ravenscraig and Eurocentral, with the result that some areas are more fragmented. On the other hand, large areas of derelict land have been restored, as at Gartcosh. There are no wind turbines currently operating in the Fragmented Farmland LCT.

Table 5.13 Assessment of LCT7 Fragmented FarmlandRefer to **Table 3.2** for full details of the evaluation criteria.

	Lower sensitivity		↔	Higher sensitivity	
Landform and Scale					
	This LCT is small-medium in scale and contained by the surrounding urban areas. The landform varies but is predominantly undulating farmland, except to the north of Easterhouse where there is a low lying tract of ground characterised by a series of lochs and wetlands. In many parts of the landscape, the landform has been visibly altered by mining and quarrying.				
Land Cover					
	Land cover is varied, with tracts of both farmed and unfarmed land, areas of semi-natural vegetation in the undeveloped river valleys, the remains of older estate landscapes and a large amount of industrial or ex-industrial land.				
Settlement and Man-made Influence					
	Typical settlement patterns include scattered farmsteads, often enclosed by urban or industrial development. While there are older villages it is areas of more recent suburban housing which predominate. There are also major transport routes within the LCT including the A8/M8 and M73, and elements such as pylons and masts. The decline of industry in the area has left a legacy of derelict works, bings, tips, quarries and disused railways, some of which are now undergoing major redevelopment (e.g. at Ravenscraig).				
Movement					
	Traffic movement on the major infrastructure routes, which include the A8/M8, M73 and railway lines, has an impact on landscape character. A number of wind turbines are also visible, from some parts.				
Skylines					
	Former and current industrial sites and transport infrastructure on the edge of the Glasgow conurbation have a strong visual influence on the skyline, often interrupted by pylons. Skylines in this landscape are not prominent or characteristic features, often being screened by buildings and trees.				
Key Views, Vistas, Landmarks					
	The landscape has an urban and industrial setting, with trees and woodlands associated with field boundaries screening and filtering views between these areas, reinforcing the partially agricultural identity of the landscape. The few landmarks within the LCT are mainly built features, with some visual clutter associated with electrical infrastructure. There are views across some of the Seven Lochs.				
Receptors					
	Within the LCT there are scattered farmsteads, villages, towns and areas of new housing, including settlement expansion on the fringes of the LCT. The Monklands Canal and Drumpellier Country Park are important recreational resources.				
Inter-visibility with Adjacent Landscapes					
	The LCT is visible from some areas of higher ground. Inter-visibility with Plateau Moorland (LCT 18) to the east is generally limited. Peripheral parts of neighbouring lowland areas, such as the Incised River Valleys (LCT 8) of the North and South Calder have some visibility and are more closely integrated				

	Lower sensitivity		↔	Higher sensitivity	
	with this LCT.				
Natural and Cultural Heritage Features					
	There is some evidence of archaeological and industrial heritage, from remnants of crannogs and old coal workings to the site of the 20th century steelworks at Ravenscraig. There are also remains of older estate landscapes. The Seven Lochs area is being promoted as a wetland park, recognising features of nature conservation importance.				
Perceptual Aspects					
	This landscape is contained by the outer edges of the Glasgow conurbation and associated with major transport corridors, therefore levels of remoteness and tranquillity are low. Industrial features are prevalent throughout the area. There are some areas of relative tranquillity in the Seven Lochs area.				

Sensitivity

- 5.107 The presence of existing industrial features, relatively low levels of inter-visibility, and the generally developed nature of the landscape, suggests that there is reduced sensitivity to small and small-medium turbine typologies within this LCT. The scale of the LCT and the high number of receptors within and around the LCT are the key aspects that are most vulnerable to change from wind turbines. The LCT is therefore of much higher sensitivity to turbines of the large or very large typology.

Table 5.14 Sensitivity of LCT7 Fragmented Farmland

Turbine typology	Sensitivity
Small turbine (15-30 m to tip)	Low
Small-medium turbine (31-50 m to tip)	Low
Medium turbine (51-80 m to tip)	Medium-low
Large turbine (81-120 m to tip)	High-medium
Very large turbine (over 120 m to tip)	High

Landscape value

- 5.108 The Fragmented Farmlands are not designated for landscape reasons. However, due to their proximity to settlement they are often valued as recreational resources. Well-visited locations include Hogganfield Loch and Drumpellier Country Park as well as numerous areas with more informal access. The Seven Lochs area is being promoted as a wetland park with a focus on community access to this relatively undeveloped section of the Fragmented Farmlands.

Underlying capacity

- 5.109 The sensitivity of this landscape, combined with the indicators of value, suggest that there is higher capacity for small and small-medium turbines, moderate capacity for medium turbines, and lower capacity for large or very large wind turbines.

Cumulative development and current residual capacity

- 5.110 One small turbine has been consented in this area, close to Glenboig. There are proposed turbines at Glenboig (medium) and Cleland (small-medium). There are also proposed turbines within the Plateau Farmlands adjacent to this area. Based on current patterns of development, cumulative effects are unlikely to be a limiting factor on development capacity in this area, and the underlying capacity will not be affected.

Constraints

- 5.111 Sensitive receptors in this area include the residential areas within and adjacent to this settled landscape, as well as recreational locations and country parks. It is a settled landscape, with frequent human-scale references, in which the largest turbines would appear out of place.
- 5.112 There are numerous overhead power lines and other vertical features in this landscape, other than wind turbines. Proposals for turbines should be sited to avoid visual confusion with these existing features, and perceptions of 'clutter' particularly on skylines.

Opportunities

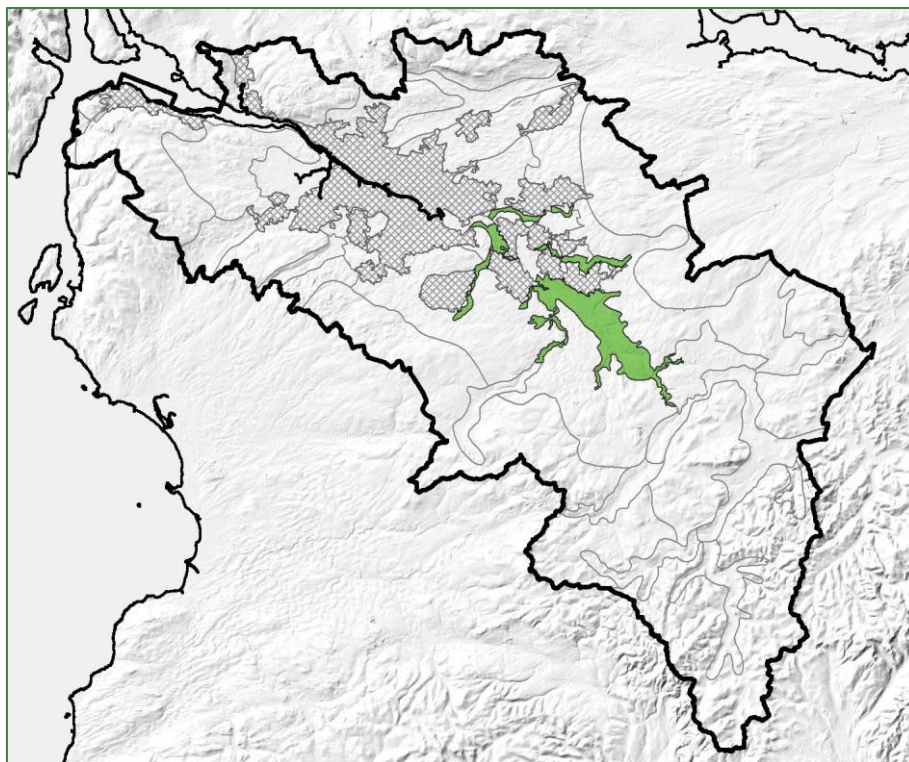
- 5.113 There will be opportunities in this LCT to site single turbines or clusters (2-5 turbines) at small to medium scales, in association with existing industrial features, making the link between generation and consumption. Larger scale commercial buildings present less scale contrast with medium turbines, than domestic buildings. Restoration of derelict former industrial land could be enabled through development of wind energy schemes.
- 5.114 There is scope for turbines of a medium scale where located at greater distance from sensitive visual receptors, and considered carefully in relation to the small-medium scale of the landform and land cover.

LCT 8 Incised River Valleys

Location and Extent

- 5.115 This LCT follows the incised valleys of the River Clyde and its tributaries, as they flows north-eastwards to Glasgow. The tributary valleys tend to be narrow and steep sided, with the lower Clyde Valley being broader.
- 5.116 The LCT occurs in North Lanarkshire and South Lanarkshire, and covers:
- the North Calder;
 - the South Calder;
 - the Rotten Calder;
 - the Avon from Stonehouse to Hamilton; and
 - the Clyde from Lanark to Hamilton.

Figure 5.8 Incised River Valleys (refer to Figure 4.1 for more detail)



South Lanarkshire

- 5.117 The area covered by this LCT is primarily classified by the South Lanarkshire Landscape Character Assessment (**Figure 4.2**) as:
- Type 1 Urban Fringe Farmland; and
 - Type 2 Incised River Valley.

Further information on the sensitivity and capacity of these landscapes can be found in the relevant sections of the South Lanarkshire Spatial Framework and Landscape Capacity for Wind Farms (2013).

Key Characteristics

- 5.118 The key characteristics, features and qualities of this LCT, as defined in the GCVLCA, are:
- narrow, steep sided valleys cut deeply into the plateau farmlands;

- rich broadleaf woodlands on steep valley sides;
- agriculture where valleys are wide enough with a mixture of pastures, arable, market gardens and orchards;
- series of policy landscapes, castles and other historic sites;
- linear villages and winding roads;
- focal role of rivers and tributaries; and
- rich, sheltered and settled areas, often hidden within the wider landscape.

5.119 Although development has occurred within this LCT, this has not substantially altered these key characteristics. There are no operational wind turbines within this LCT.

Table 5.15 Assessment of LCT8 Incised River Valleys

Refer to **Table 3.2** for full details of the evaluation criteria.

	Lower sensitivity		↔	Higher sensitivity	
Landform and Scale					
	This LCT is generally small in scale, with narrow, steep valley sides, and gorges where the burns and rivers have cut through harder rocks to create vertical cliffs e.g. at the Falls of Clyde. The riversides are broader where it joins adjacent valley landscapes, and narrow sections are occasionally interrupted by broad sections. The broader sections of the LCT tend to comprise wide, flat floodplains.				
Land Cover					
	The land cover in the main Clyde Valley comprises a mixture of pastoral farming, arable cultivation and market gardening, contained by beech or hawthorn hedges and remnants of field boundary trees. Orchards (both managed and derelict) are found on valley slopes in parts of the main Clyde Valley. In the narrower tributary river valleys, deciduous woodland is the prevalent land cover, including some ancient woodland.				
Settlement and Man-made Influence					
	Transport routes tend to run along the valley floor, with perpendicular roads running up the valley sides. Small villages and individual farmsteads are the main settlement type, and are often in a linear form along these roads. A number of larger towns in neighbouring LCTs are visible from the valleys. There are a relatively high number of garden centres and plant nurseries within the LCT, and a notable absence of pylons.				
Movement					
	There is some movement in the river valleys, limited to the main transport routes on the valley floors. Otherwise the LCT is comparatively still.				
Skylines					
	Skylines are formed by the valley edge and valley sides, often wooded. There are few existing vertical features within the LCT.				
Key Views, Vistas, Landmarks					
	There are views across and along the valley, as well as some views out to neighbouring LCTs such as Plateau Farmland (LCT5). Views are sometimes screened by woodland.				
Receptors					
	There are a number of farmsteads and small villages within the LCT, with local traffic. A number of the valleys also provide an important recreational resource,				

	Lower sensitivity	←→	Higher sensitivity
	e.g. the North Calder Heritage Trail.		
Inter-visibility with Adjacent Landscapes			
	There is a visual relationship between the river valleys and the surrounding Plateau Farmland (LCT 5), where it locally overlooks the valley. Overall, the LCT is relatively enclosed or self-contained.		
Natural and Cultural Heritage Features			
	The LCT contains remnants of policy landscapes such as castles, country houses, woodlands, walls, and bridges. Inventory-listed designed landscapes include Dalzell House and Chatelherault. New Lanark, Robert Owen's model settlement, is a World Heritage Site. The older woodlands have considerable conservation value and there are a number of SSSIs, SACs and SINC's within this LCT.		
Perceptual Aspects			
	This landscape has pockets of tranquillity, away from the major population centres and transport corridors, largely influenced by the presence of water and woodland.		

Sensitivity

- 5.120 Overall this landscape of relatively high landscape and visual sensitivity, as a result of its scale, landform, varied land cover, relatively high numbers of residential and recreational receptors, presence of natural and culture heritage features, and sense of tranquillity. The variation within the LCT is reflected in variations in sensitivity, with enclosed tranquil riverside locations being of higher sensitivity than broader sections of farmed floodplain.
- 5.121 Sensitivity to the small typology is slightly lower where turbines of this scale can be associated with farms and take advantage of the potential for woodland screening. The larger the typology, the greater the likelihood of incompatibility with the small landscape scale, and the greater the visual influence. Therefore the LCT is considered to have high sensitivity to turbines of the large and very large typology. The sensitivity of this LCT to small-medium and medium typologies is high-medium, again chiefly due to the scale of the landscape, and higher number of receptors.

Table 5.16 Sensitivity of LCT8 Incised River Valleys

Turbine typology	Sensitivity
Small turbine (15-30 m to tip)	Medium
Small-medium turbine (31-50 m to tip)	High-medium
Medium turbine (51-80 m to tip)	High-medium
Large turbine (81-120 m to tip)	High
Very large turbine (over 120 m to tip)	High

Landscape value

- 5.122 The Rotten Calder section of this LCT between East Kilbride, Hamilton, Bothwell and Cambuslang is largely within the Lower Clyde and Calderglen Special Landscape Area (SLA) in South Lanarkshire. The special qualities of this SLA evident in the area include:
- scenic qualities in the combination of dramatic landform, meandering rivers, waterfalls, extensive woodland shelter and tranquillity;

- cultural features including Bothwell Castle, Torrance House, designed landscapes, and historic and literary associations;
 - extensive semi-natural woodlands and a high quality water environment; and
 - accessibility due to proximity to urban areas, paths and walkways, and Calderglen Country Park.
- 5.123 The Clyde Valley between Hamilton and Lanark, and tributaries including the Avon and Nethan, are within the Middle Clyde Valley SLA. The special qualities of this SLA evident in the area include:
- scenic qualities in the combination of large valleys surrounding major rivers; enclosure contrasting with the surrounding farmlands; dramatic side gorges; extensive woodlands; shelter and tranquillity;
 - cultural features including the New Lanark World Heritage Site, designed landscapes, historic buildings and settlements, extensive orchards and historic and literary associations;
 - extensive semi-natural woodlands, orchards, meadows; and
 - accessibility to urban and local populations via footpaths walkways minor roads and the A72 tourist route.
- 5.124 Within North Lanarkshire, the part of the Clyde Valley within this LCT is designated as an Area of Great Landscape Value. No special qualities have been published, but as with the adjacent Middle Clyde SLA it is an accessible landscape with attractive scenery. Features include the Clyde Walkway, Baron's Haugh Nature Reserve, and Cambusnethan Priory.
- 5.125 There are country parks at Calderglen and Chatelherault.

Underlying capacity

- 5.126 The high sensitivity of this landscape, and the value placed upon it, suggests that there is lower capacity for wind turbine development at small to medium scales, and no capacity for large or very large turbines.

Cumulative development and current residual capacity

- 5.127 Over the several river valleys within the LCT, there is only one proposed turbine, at Skellyton Farm near Larkhall, and no consented development. There are operational and proposed turbines in adjacent landscapes, such as the Plateau Farmland (LCT5), in areas which are visible from within the valleys. Cumulative effects, although not occurring within the valleys, may arise from multiple developments seen on the skyline. This could affect residential and recreational receptors within the valleys, and potentially lead to sequential effects on routes through the valleys. The conclusion on underlying capacity remains applicable.

Constraints

- 5.128 Siting of small or small-medium wind turbines will be largely directed by the scale and form of this landscape. Enclosed valleys and small-scale wooded landscapes do not generally form suitable sites for turbines, and would be highly sensitive to development.
- 5.129 The apparent scale of turbines in views from within the valleys should not be excessive in relation to the scale of the valley itself. The presence of multiple turbines along valley skylines may contribute to cumulative impacts on views from within the valley.
- 5.130 Siting of turbines should minimise adverse impacts on characteristic woodlands, designed landscapes and other important cultural and natural heritage features.
- 5.131 Proposals must give due consideration to the special qualities of Special Landscape Area designations in this LCT.

Opportunities

- 5.132 More open areas at valley fringes offer more opportunity for siting small or small-medium turbines, but consideration must be given to views from within the valleys of turbines seen on the skyline.
- 5.133 Turbines in the valley landscape should be sited in association with more open farmed landscapes, and be located close to farms and other buildings to make the link between generation and consumption.

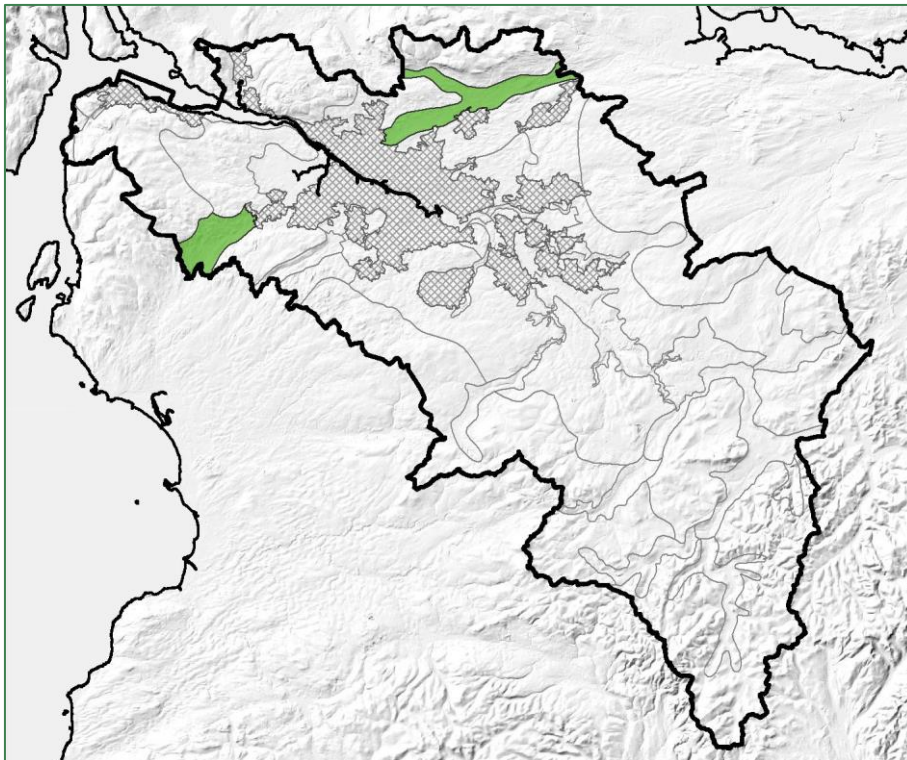
LCT 10 Broad Valley Lowland

Location and Extent

5.134 These broad, open valleys occur in two locations:

- an area surrounding the settlement of Lochwinnoch in Renfrewshire, following the valley of the upper Black Cart, which is part of a lowland corridor between the Clyde basin and the Ayrshire basin; and
- the Kelvin Valley, part of a lowland route between the Clyde and the Forth, and covering parts of East Dunbartonshire (including the tributary Glazert Water), Glasgow City and North Lanarkshire.

Figure 5.9 Broad Valley Lowland (refer to Figure 4.1 for more detail)



Key Characteristics

5.135 The key characteristics, features and qualities of this LCT, as defined in the GCVLCA, are:

- wide flat bottomed valley;
- presence of water bodies, wetlands and rivers;
- transport routes and settlements along the valley sides;
- transition from arable to rough grazing from the valley floor to the high valley sides;
- historic sites and communication routes along the valley sides; and
- presence of farm and policy woodland.

5.136 Although development has occurred within this LCT, this has not substantially altered these key characteristics. There is currently a single small turbine operating at the fringe of the Kelvin Valley near Auchenreoch, East Dunbartonshire.

Table 5.17 Assessment of LCT10 Broad Valley LowlandRefer to **Table 3.2** for full details of the evaluation criteria.

	Lower sensitivity		↔	Higher sensitivity	
Landform and Scale					
	The LCT is a medium scale landscape of broad, low-lying valleys. The relatively flat valley floors are often wet, containing lochs and drainage channels, with occasional undulations. There are also craggy hills to the south west of Johnstone, and Bar Hill and Croy Hill, to the south of Kilsyth.				
Land Cover					
	Agricultural land use is dominated by improved grassland with some arable cultivation on the valley floors and rougher grassland on the valley slopes. Hedgerows and hedgerow trees are features of lower and middle valley slopes. There are small areas of policy woodland, and narrow broadleaf woods along the short, steep burns which drain the valley sides.				
Settlement and Man-made Influence					
	Settlements include Kilsyth and Lochwinnoch, with urban influences growing as the valleys approach the urban areas on the north and south western edges of Glasgow, respectively. Farmsteads are usually located on knolls within the valley floor or higher on valley slopes. The valleys also provide lowland routes for electricity pylons, and other modern features present include communication masts on the valley slopes, railways (both existing and disused) and road corridors. The Forth and Clyde Canal runs along the southern side of the Kelvin Valley, and there is also some evidence of coal and ore mining in the form of bings.				
Movement					
	There is movement along a number of important transport corridors which run along the valley floors, including the A737, A807, A803 and railway lines.				
Skylines					
	The Kelvin Valley has distinctive skylines to north, in the Kilsyth Hills and Campsie Fells, and to a lesser extent the south, overlooked by the ridge including Bar Hill. From the Black Cart, there are low but distinctive hills to the south and west. The broadness of the valley generally results in a wide, open skyline, particularly in views along the length of the valley.				
Key Views, Vistas, Landmarks					
	Views are focused along the valleys. Some views are screened by woodland, while other more open areas offer views across and along the valleys, from the valley floor and sides. From the Kelvin Valley there are long views south to Glasgow landmarks, while the Rugged Moorland Hills (LCT20) to the north form a distinct backdrop to the LCT. Views along the Black Cart Valley are an important aspect of this landscape.				
Receptors					
	Residential receptors include people living in villages and towns on the valley sides. In the Lochwinnoch area Barr Loch and Castle Semple Loch are of recreational importance, as is the Forth and Clyde Canal in the Kelvin Valley.				
Inter-visibility with Adjacent Landscapes					
	Long outward views are relatively limited as the valleys are relatively contained. However, the LCT is overlooked by adjacent LCTs, such as the Rugged Moorland Hills (LCT20), and Rugged Upland Farmland (LCT6), creating important relationships between the valley landscapes and the higher ground which frames them to both north and south.				

	Lower sensitivity	↔	Higher sensitivity
Natural and Cultural Heritage Features			
	Barr Loch, Castle Semple Loch and Bardowie Loch are important landscape features and are also of nature conservation value, particularly for birds e.g. the RSPB Reserve at Lochwinnoch. Both valleys are historically important communication routes. The Kelvin Valley contains the Forth and Clyde Canal, and the Roman Antonine Wall, a World Heritage Site, runs along the southern side of the valley.		
Perceptual Aspects			
	This is a quiet, settled landscape, with low levels of wildness due to settlement and other development, but with some pockets of tranquillity. There are busy transport routes through the valleys. There is a transition in character from agricultural floodplain, settled valley edges to less populated valley sides, and then to the adjacent hills. The adjacent rugged hills have a key influence over parts of the LCT.		

Sensitivity

- 5.137 This medium scale valley landscape has some potential opportunity for the development of turbines of a small or small-medium scale, particularly where they would be associated with existing agricultural or industrial elements, and where they would have some screening by woodland and back-clothing by valley sides or hills. Carefully selected areas may be less sensitive to medium turbines, although they are likely to be visible to relatively high numbers of receptors.
- 5.138 Large and very large turbine typologies are likely to be incompatible with the landscape character of the LCT, as a medium scale valley landscape, and would be highly visible both with this LCT and in close proximity to sensitive neighbouring LCTs such as Rugged Moorland Hills (LCT20).

Table 5.18 Sensitivity of LCT10 Broad Valley Lowland

Turbine typology	Sensitivity
Small turbine (15-30 m to tip)	Medium-low
Small-medium turbine (31-50 m to tip)	Medium
Medium turbine (51-80 m to tip)	High-medium
Large turbine (81-120 m to tip)	High
Very large turbine (over 120 m to tip)	High

Landscape value

- 5.139 Within Renfrewshire, the Clyde Muirshiel Regional Park covers the valley of the Black Cart Water, taking in Castle Semple Loch and the hillsides to the north-west. Castle Semple Loch and its context is a country park and a popular recreational centre within the Regional Park.
- 5.140 The Glazert Valley within East Dunbartonshire is designated as a Special Landscape Area, including the settlements of Lennoxton and Milton of Campsie. The reasons for designating this area include:
- the lower lying valley contrasts dramatically with the steep, sometimes craggy, escarpments of the Campsie Fells to the north;
 - the valley landscape is important to the settings of Lennoxton and Milton of Campsie; and

- numerous policy woodlands associated with several designed landscapes.

5.141 A second East Dunbartonshire Special Landscape Area covers the north side of the Kelvin Valley around Torrance, extending into the Drumlin Foothills (LCT16) to the north. The reasons for designating this area include:

- a particularly charming locality of hummocks and hollows associated with fluvio-glacial depositional processes;
- settled pastoral landscape, with a historic pattern of hamlets and villages; and
- particularly high visual qualities and standards of land management.

5.142 Within North Lanarkshire and East Dunbartonshire, the Campsie Fells and Kilsyth Hills to the north of the Kelvin Valley and Glazert Valley are designated as a Regional Scenic Area, and this extends south into the fringes of the Broad Valley Lowland, to the east and west of Kilsyth.

5.143 The Antonine Wall follows the southern boundary of this LCT. Although the World Heritage Site is outside the Broad Valley Lowland, the designated buffer zone extends north to the A803 and the southern edge of Kilsyth, and taking in large areas of the valley floor.

Underlying capacity

5.144 The sensitivity of this landscape, and the value indicated by designations, suggests that there is moderate to lower capacity for small or small-medium turbine sizes, little capacity for medium turbines, and no capacity for large or very large turbines.

Cumulative development and current residual capacity

5.145 There is presently no consented or proposed development within this LCT which would alter the conclusions on underlying capacity. Capacity is most likely to vary due to the context of the valley landscape: where the adjacent hills are particularly prominent, as in the Kelvin Valley around Kilsyth and in the Glazert Valley, capacity will be locally reduced.

5.146 As with other valley landscapes, this LCT could be affected by development in immediately adjacent landscapes that would be visible on the skyline. Based on current patterns of development this type of effect is unlikely to occur.

Constraints

- 5.147 Poorly sited turbines have the potential to diminish the presence of surrounding hills from within the valleys, and in wider views. Throughout this landscape, turbines should be of a size appropriate to the local scale of the valley landscape.
- 5.148 These areas are important as communication corridors, for road, rail and water transport, as well as walking and cycling. There is potential for sequential impacts to affect these routes, though based on the current pattern of development such impacts are not likely to occur, but may if additional development is proposed.
- 5.149 The relationship of any turbines with the scale and form of the valley and valley sides is a key consideration for this landscape. In the upper Kelvin Valley around Kilsyth, and in the Glazert Valley, the steeply rising slopes of the Campsie Fells and Kilsyth Hills are a landmark feature and present a particular constraint to medium or larger development in these areas. The hills to the south of the Kelvin are also locally significant to the valley setting.
- 5.150 Siting of turbines should seek to minimise adverse impacts on cultural heritage features such as designed landscapes. In the Kelvin Valley area particular consideration should be given to the presence of the Antonine Wall World Heritage Site and its defined buffer zone.
- 5.151 Locations within and adjacent to this LCT are highly valued for recreation, including Regional and Country Parks and the Forth and Clyde Canal. Consideration should be given to effects on recreational receptors accessing these areas. Proposals must give due consideration to the special qualities of Special Landscape Area designations in and adjacent to this LCT.

Opportunities

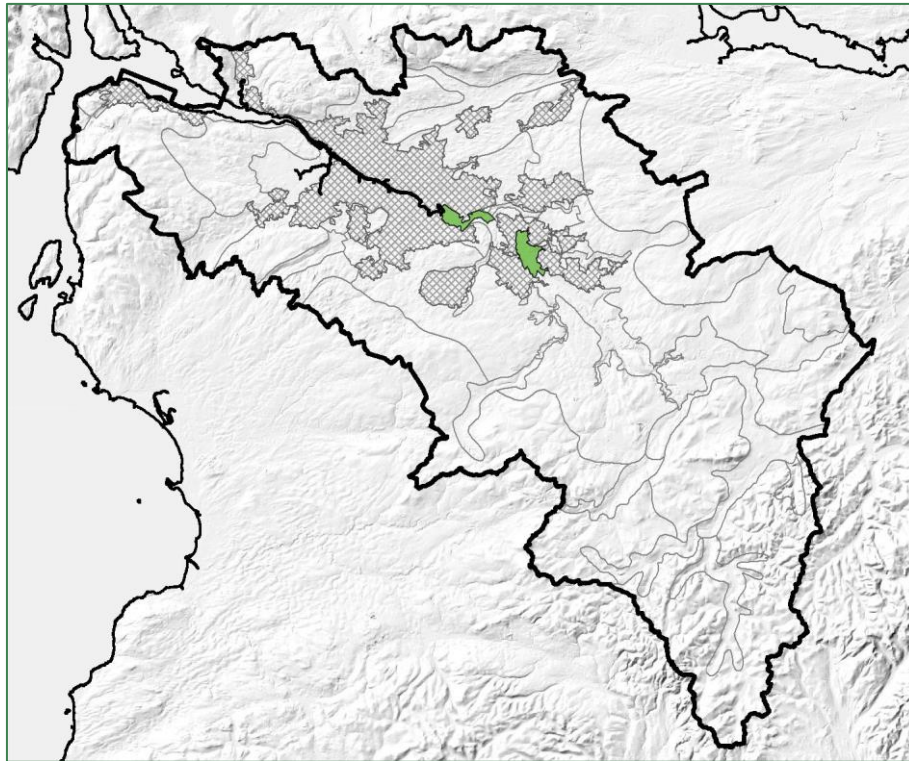
- 5.152 There are developed areas within the valleys where single turbines or clusters (2-5 turbines) of small or small-medium turbines could be sited in conjunction with commercial buildings, or with large-scale agricultural buildings.
- 5.153 Away from the more prominent hills, such as the scarp of the Campsie Fells or Kilsyth Hills, or individual hills such as Croy Hill, the lower slopes and valley edges offer limited opportunities for small and small-medium single turbines. In these locations, turbines could be sited where they will not impede views along the valleys, and will be back-clothed by the less distinctive areas of higher ground, thus reducing the potential for effects on adjacent landscapes.
- 5.154 Locations with a greater level of enclosure provided by topography or vegetation have relatively greater potential to accommodate small wind turbines, subject to other constraints including the cumulative effect of a dispersed development pattern.

LCT 11 Broad Urban Valley

Location and Extent

- 5.155 This character area extends across the boundary of Glasgow City, North Lanarkshire and South Lanarkshire. It occurs along the Clyde Valley as it enters the built up areas of Hamilton, Motherwell and south-east Glasgow. The LCT is dominated by road infrastructure, including the M74, and form gateway transport corridors into the Glasgow conurbation. There are two areas of this LCT: one between Carmyle and Newton, and the other between Bothwell and Motherwell.

Figure 5.10 Broad Urban Valley (refer to Figure 4.1 for more detail)



South Lanarkshire

- 5.156 The area covered by this LCT is primarily classified by the South Lanarkshire Landscape Character Assessment (**Figure 4.2**) as:

- Type 3 Broad Urban Valley.

Further information on the sensitivity and capacity of these landscapes can be found in the relevant sections of the South Lanarkshire Spatial Framework and Landscape Capacity for Wind Farms (2013).

Key Characteristics

- 5.157 The key characteristics, features and qualities of this LCT, as defined in the GCVLCA, are:
- broad sections of main river valley with well-defined floodplain;
 - past developments have resulted in significant modifications to landscape character;
 - between Bothwell and Motherwell, a large part of the valley is occupied by Strathclyde Country Park, comprising a large water body, woodland, grassland and a limited amount of recreation-related development. However, neighbouring urban areas and the M74 have a significant visual influence also; and
 - between Carmyle and Newton, the valley comprises a mosaic of derelict, contaminated, restored and active industrial sites. The M74 is also a significant feature here.

- 5.158 Since 1999 further development has occurred particularly within the Carmyle/Newton area, where the M74 completion has also been constructed. There are no operational wind turbines in this LCT.

Table 5.19 Assessment of LCT11 Broad Urban Valley

Refer to **Table 3.2** for full details of the evaluation criteria.

	Lower sensitivity		↔	Higher sensitivity	
Landform and Scale					
	The LCT is a small scale, fragmented landscape, characterised by wide floodplains up to approximately 1km in width and bordered by valley slopes, above which are neighbouring urban areas. The landform is relatively simple.				
Land Cover					
	Much of the LCT is developed with settlement, roads and pylons and contains relatively low levels of planting or woodland. Strathclyde Country Park is an important area of land cover, comprising a loch, woodland and grassland (within the Bothwell-Motherwell section). Elsewhere historic patterns of farm and policy woodlands have been fragmented.				
Settlement and Man-made Influence					
	The LCT contains major components of transport infrastructure, as well as a high number of industrial/business parks. Some infill housing development has occurred within the LCT, but the main urban influence is from the settlements on higher ground, visible from the valley slopes. The landscape is highly influenced by industrial, minerals and waste activities.				
Movement					
	There are high levels of movement along a number of major transport corridors, including the M74, A-roads and railway lines. Strathclyde Park represents an area of comparative stillness in relation to other parts of the LCT.				
Skylines					
	Settlements such as Hamilton and Motherwell have a strong visual relationship with the valley, particularly where tall buildings are present, being located above the valley slopes. These adjacent areas provide prominent skylines for the lower-lying urban valley.				
Key Views, Vistas, Landmarks					
	Neighbouring urban areas have a strong visual influence. Visual effects of dereliction, contamination and fragmentation of land result from industrial land uses and transport corridors. Within Strathclyde Country Park there are views available across to loch, and from the M74 Hamilton Mausoleum is a landmark feature.				
Receptors					
	Residential receptors are mainly above the valley slopes, in the neighbouring urban areas. Recreational receptors include users of Strathclyde Country Park. There are also high numbers of travelling receptors on the roads and railways which pass through the LCT.				
Inter-visibility with Adjacent Landscapes					
	Inter-visibility is generally low, as the valleys are relatively contained, although there are views in from neighbouring urban areas above the valley slopes. There are occasional channelled views along the River Clyde.				

	Lower sensitivity	↔	Higher sensitivity
Natural and Cultural Heritage Features			
	Historic patterns of farm and policy woodlands have been fragmented in this landscape. Remnants of the designed landscape associated with Hamilton Palace are visible on the south west side of the Hamilton to Bothwell section of valley, particularly the mausoleum.		
Perceptual Aspects			
	Major transport corridors have a strong visual, aural and severance effect, with low levels of wildness as indicated by SNH mapping. The lower South Calder is a small pocket of relative tranquillity in this context.		

Sensitivity

- 5.159 This small scale fragmented landscape is set within and overlooked by adjacent urban areas. While it already contains and has views of modern development, the scale of the area and its inter-visibility with well-settled areas suggests higher sensitivity to medium, large or very large turbines, which could significantly alter its character. The more developed parts of the landscape, away from residential areas, are of relatively lower sensitivity to small or small-medium turbine types. Strathclyde Park as a comparatively open, quieter recreational area will be of locally higher sensitivity to all turbine types.

Table 5.20 Sensitivity of LCT11 Broad Urban Valley

Turbine typology	Sensitivity
Small turbine (15-30 m to tip)	Low
Small-medium turbine (31-50 m to tip)	Medium-low
Medium turbine (51-80 m to tip)	High-medium
Large turbine (81-120 m to tip)	High
Very large turbine (over 120 m to tip)	High

Landscape value

- 5.160 Parts of this LCT are within the Lower Clyde and Calderglen Special Landscape Areas (SLA) in South Lanarkshire. This includes the area between Hamilton and Strathclyde Loch, as well as a part of the Clyde corridor near Cambuslang. The special qualities of this SLA evident in the area include:
- scenic qualities in the combination of meandering rivers and extensive woodland shelter;
 - cultural features including Hamilton Mausoleum, the remnant designed landscape of Hamilton Palace, and historic associations with the Battle of Bothwell Brig;
 - extensive semi-natural woodlands and a high quality water environment;
 - accessibility due to proximity to urban areas, paths and walkways, and Strathclyde Country Park.

Underlying capacity

- 5.161 The sensitivity of this landscape, and the value indicated by designations, suggests that there is moderate capacity for small or small-medium turbines, lower capacity for medium turbines, and little or no capacity for large or very large turbines. Capacity will be reduced in locations close to residential areas, and also in Strathclyde Country Park.

Cumulative development and current residual capacity

- 5.162 There are no consented or proposed wind turbines in this LCT. Based on current patterns of development, it is unlikely that cumulative impacts will be an issue affecting capacity in this area.

Constraints

- 5.163 These landscapes are surrounded by residential areas, and views from these areas will be a primary consideration. The M74 is the main route through the LCT. Other sensitive receptors include users of Strathclyde Park, a key recreational centre, and the River Clyde Walkway.
- 5.164 Proposals must give due consideration to the qualities of local landscape designations in this LCT.

Opportunities

- 5.165 It is likely that opportunities for small, small-medium and medium turbines will exist alongside large scale industrial or commercial buildings. Large industrial estates are of locally lower sensitivity due to the lack of receptors, and tend not to be near valued landscapes.
- 5.166 While there are limited opportunities for topographical screening, there is some potential for screening small turbines around areas of woodland.

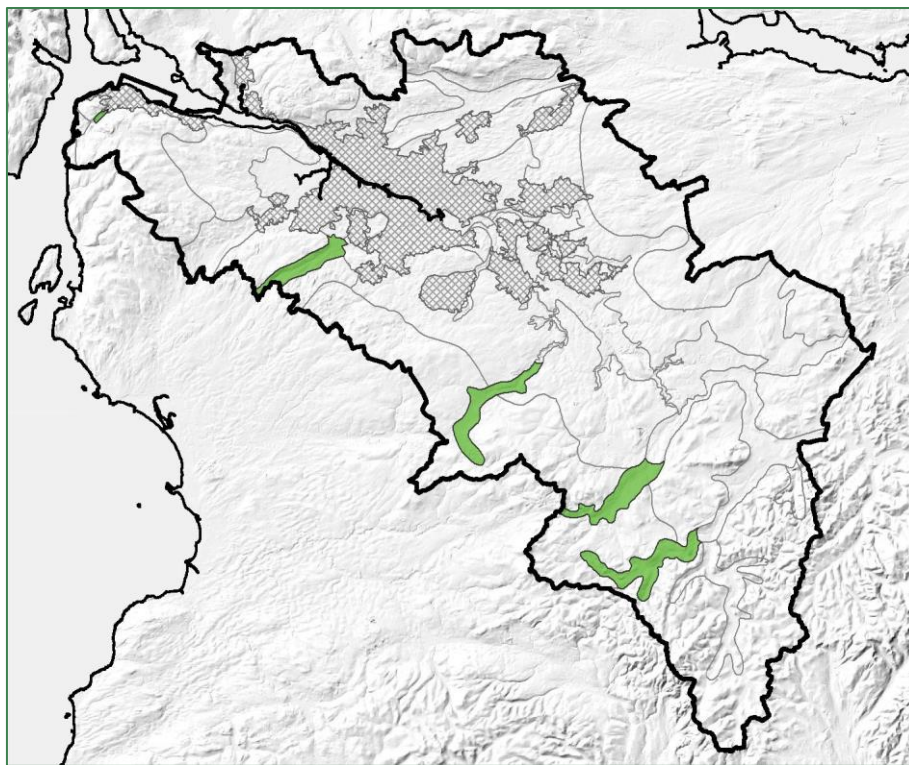
LCT 12 Upland River Valley

Location and Extent

5.167 There are five distinct river valleys which comprise this LCT: three are in South Lanarkshire; with one in East Renfrewshire and one in Inverclyde. The character of these valleys is united by their south-west to north-east orientation, and by their relationship to the surrounding moorlands, although each of the five valleys has distinct characteristics. The five valleys are:

- a small area between Inverkip and Greenock;
- the Levern Valley around Neilston;
- the upper Avon and Glengavel Water Valley;
- the Douglas Water Valley; and
- the Duneaton Water Valley.

Figure 5.11 Upland River Valley (refer to Figure 4.1 for more detail)



South Lanarkshire

5.168 The area covered by this LCT is primarily classified by the South Lanarkshire Landscape Character Assessment (**Figure 4.2**) as:

- Type 8 Upland River Valley.

Further information on the sensitivity and capacity of these landscapes can be found in the relevant sections of the South Lanarkshire Spatial Framework and Landscape Capacity for Wind Farms (2013).

Key Characteristics

5.169 The key characteristics, features and qualities of this LCT, as defined in the GCVLCA, are:

- a series of valleys formed along fault lines through the Plateau Moorlands and paired with valleys to the south and west in Ayrshire;

- strong contrast between the wooded and settled character of the valleys and the exposed enclosing uplands; and
- transition from the exposed upper reaches to more sheltered lowland areas.

5.170 No major changes to these characteristics have been identified. There are no operational turbines within this LCT, although turbines adjacent to the valleys are visible in places. Neilston Community wind farm can be seen from the Levern Valley, Bankend Rig wind farm stands at the head of the Glengavel Valley, and Hagshaw Hill wind farm can be seen from the Douglas Valley.

Table 5.21 Assessment of LCT12 Upland River Valley

Refer to **Table 3.2** for full details of the evaluation criteria.

	Lower sensitivity		↔	Higher sensitivity	
Landform and Scale					
	These valleys are generally small in scale, and in many places narrow with steep side slopes. Even where shallow and more open there is a sense of enclosure to these valleys. Occasional craggy hills mix with moorlands to frame the valleys.				
Land Cover					
	Rivers comprise a central and formative element in these landscapes. The floodplains tending to host improved or semi-improved pasture, and rougher grazing on the valley sides. There are limited areas of broadleaf woodland in most of the valleys, occasional shelterbelts and some coniferous plantations.				
Settlement and Man-made Influence					
	Settlement within the valleys is comparatively limited, and human influence decreases in the more southerly of these valleys. There are scattered farmsteads throughout, with larger villages in towns in some of the valleys (e.g. Neilston, Barrhead, Douglas). All the valleys serve as transport corridors, carrying roads and pylons, and there are extensive mineral workings in the Douglas and Duneaton Valleys.				
Movement					
	All of the valleys provide important transport corridors and, with the exception of Duneaton, contain A-roads. The M74 also passes through the Douglas Valley, in which the movement of Hagshaw Hill wind farm is also perceived.				
Skylines					
	The skylines are formed by the valley sides, which tend to be formed by smooth moorland, and are open and mostly uninterrupted. There are occasional more craggy skylines. The nature of these narrow valleys is such that the skyline is always prominent and often close at hand.				
Key Views, Vistas, Landmarks					
	Views within the valleys are framed by the valley sides, and are therefore restricted. Sequential views are available from roads through the valleys. Loudoun Hill, a volcanic plug, is a prominent feature in views from the Avon Valley, in neighbouring Ayrshire.				
Receptors					
	Receptors include residents in scattered farmsteads, villages and towns, as well as road users. Recreational receptors will also be present, with the valleys used as access points for walks into the neighbouring uplands, and as destinations in themselves, as at Douglas.				

	Lower sensitivity		↔	Higher sensitivity	
Inter-visibility with Adjacent Landscapes					
	Inter-visibility is comparatively lower in the valleys than in the surrounding upland plateaux. There are few outward views, though the valleys are overlooked by neighbouring landscapes.				
Natural and Cultural Heritage Features					
	There is evidence of historic industry and mineral working in the valleys. The designed landscape of Douglas Castle survives at Douglas. The historic role of the valleys as communication corridors is evidenced by the presence of castles, mottes and a Roman road along the Avon.				
Perceptual Aspects					
	The influence of settlement decreases through the valleys moving north to south, away from denser areas of population. Some parts of the valleys are perceived as wild and undeveloped, particularly in their upper reaches.				

Sensitivity

- 5.171 The small-scale, contained nature of this landscape indicates increased sensitivity to turbines. While some locations are less sensitive to small or small-medium turbines, for example the more human influenced areas, the majority of this landscape would be highly sensitive to large or very large turbines due to the scale and enclosure, and the presence of receptors within the valleys.

Table 5.22 Sensitivity of LCT12 Upland River Valley

Turbine typology	Sensitivity
Small turbine (15-30 m to tip)	Medium
Small-medium turbine (31-50 m to tip)	High-medium
Medium turbine (51-80 m to tip)	High
Large turbine (81-120 m to tip)	High
Very large turbine (over 120 m to tip)	High

Landscape value

- 5.172 Two of these upland valleys are designated as Special Landscape Areas (SLA) in South Lanarkshire. The Douglas Water is the focus of the Douglas Valley SLA. The special qualities of this area include:
- scenic compositional qualities of a meandering upland river passing through a sheltered, mature pastoral landscape enclosed by moorland hills;
 - cultural features include the designed landscape of Douglas Castle and the historic village of Douglas with their historic and literary associations;
 - a network of mature policy woodlands and shelterbelts; and
 - frequently visited and accessible with well-maintained footpaths through the designed landscape.
- 5.173 The Duneaton Water Valley is at the northern edge of the Leadhills and Lowther Hills SLA. The special qualities of this area include:

- extensive area of high, smooth, rolling hills and varied upland glens;
- sense of emptiness engendered by a lack of extensive forestry or wind farm development;
- cultural features include the remains of settlements on the glen sides; and
- access to walking routes via the B740 through the valley.

Underlying capacity

- 5.174 The higher sensitivity of this landscape, combined with the value placed upon it, suggests that there is lower capacity for wind turbine development at all scales. Although there will be local variation, the scale and enclosure of these valley landscapes limits their capacity for all but the smallest developments, with no capacity for medium, large or very large turbines.

Cumulative development and current residual capacity

- 5.175 Cumulative effects in these landscapes will arise as a result of development on high ground adjacent to the valleys, as well as within the valleys themselves. Where several developments appear on skylines in views from within valleys, cumulative effects may be a limiting factor on further development.

Inverkip area

- 5.176 The small valley between Greenock and Inverkip contains no consented or proposed developments. The surrounding hills are part of the Rugged Moorland Hills (LCT20). The only turbine potentially visible is a consented small-medium single turbine to the north-west. The hills to the south of this valley are within the Clyde Muirshiel Regional Park. Cumulative effects on the valley landscape are unlikely, given current patterns of development. The capacity of this small area is likely to be restricted mainly by its scale and extent.

Levern Valley

- 5.177 Within the Levern Valley, there are three consented turbines between Uplawmoor and Neilston. The hills adjacent to the valley are part of the Rugged Upland Farmland (LCT6). In the hills to the south, there are three consented turbines of medium and small typologies, all located close to Neilston Community wind farm. Three more small turbines have been consented, as well as one operational turbine, in the hills north of Uplawmoor. Cumulative effects may occur within the valley between Uplawmoor and Barrhead, particularly where turbines are viewed on both north and south valley sides, and within the valley. Where this is occurring, as it is around Uplawmoor, it is likely that this will present a limit to further development. Sequential effects on the A736 may also occur.

Upper Avon Valley

- 5.178 Within the upper Avon Valley there is a single small consented turbine near Strathaven. The consented Dungavel wind farm is likely to be visible to the south, within the adjacent Plateau Moorlands (LCT18). Calder Water wind farm lies to the north-west, with Whitelee beyond. Also within the Plateau Moorlands are a number of proposed and consented medium and small-medium single turbines, and the proposed Kype Muir wind farm. Part of this valley is set within the Plateau Farmland (LCT5). Within the Avon Valley, cumulative impacts may arise from the combination of single turbines in the immediate landscape, combined with views of larger wind farms in the surrounding hills, and leading to contrasts in scale. Within the Glengavel side valley, impacts may arise from the presence of wind farms to south-west and north-east, though these are both consented/operational. Capacity within the upper parts of the valley is considered to be more limited, due to the smaller scale and higher potential for contrasts between turbines of different heights. There is some remaining capacity for small or small-medium development within the lower part of the valley, based on the current level of development.

Douglas Valley

- 5.179 There are three proposed turbines (large) at Poniel near the M74, within the valley of the Douglas Water. Hagshaw Hill wind farm, and the consented Galawhistle wind farm, are just to the north, extending into the western part of the valley. Also within the surrounding Plateau Moorlands (LCT18) is the consented Andershaw wind farm and proposed Glentaggart and Kennoxhead schemes, all of which are likely to be visible from within the valley to some extent. Upstream

from Douglas, the valley is constrained topographically, and combined with views of turbines on the hills, there is little or no capacity for further development. Capacity in the lower valley is limited by the sensitivity of the designed landscape, although there are potential opportunities around the M74 subject to consideration of sequential effects. The Douglas Valley SLA covers most of the valley, though it is noted that Hagshaw Hill wind farm is within the recently designated area.

Duneaton Valley

- 5.180 There is no consented or operational development in the Duneaton Water Valley. The consented Andershaw wind farm is just to the north, within the Plateau Moorlands (LCT18). Adjacent is the proposed Middle Muir wind farm. To the south in the Southern Uplands (LCT21) is the proposed Leadhills wind farm. As with the other valleys, the main consideration will be cumulative impact arising from development on adjacent hills, since there is little capacity within the constrained upland valley. Most of the Duneaton Water Valley is within the Leadhills and Lowther Hills SLA.

Constraints

- 5.181 The more physically constrained areas of the valley landscapes are unlikely to offer scope for development even at the smallest scale.
- 5.182 The contrast between the valley and hills, and the transitional edges, are both listed as key characteristics of this LCT. Skylines at the valley edges are key features of the valleys, and will be particularly sensitive where they appear in key views.
- 5.183 Each of the valleys is a transport corridor, and sequential effects on views from these routes must be carefully considered, including the effects of turbines beyond the extent of the valleys.
- 5.184 Proposals must give due consideration to the special qualities of Special Landscape Area designations in this LCT.

Opportunities

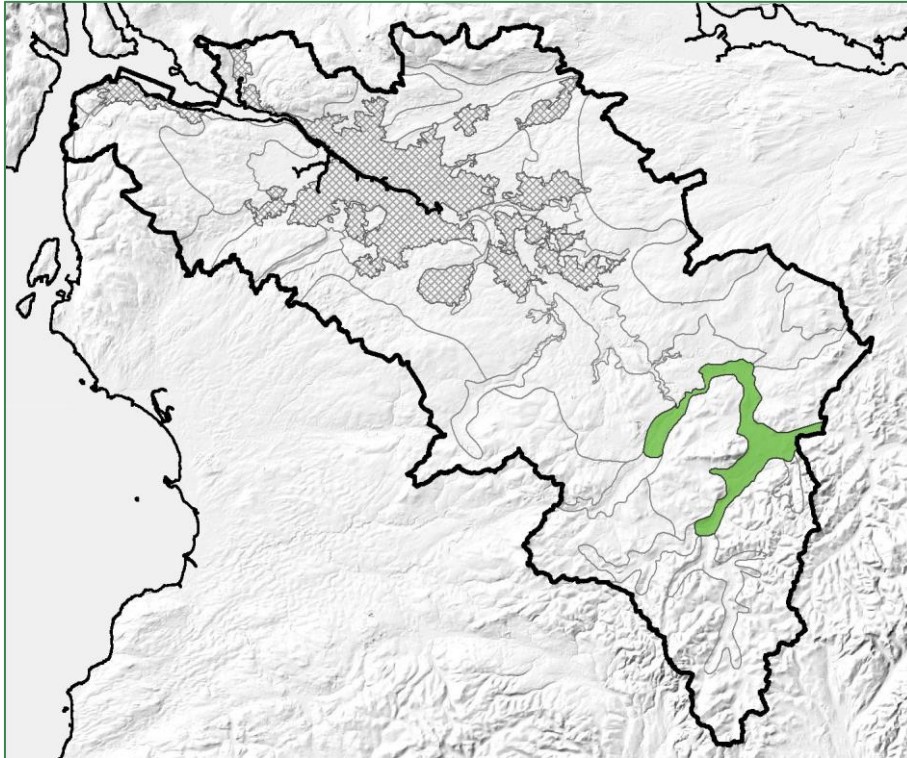
- 5.185 Small or small-medium single turbines could be sited in association with farms and other development types, within more open parts of this LCT.
- 5.186 There are opportunities to site small turbines on valley sides, though these should be carefully designed to avoid effects on the perceptions of the valley, including sense of enclosure and depth.

LCT 13 Broad Valley Upland

Location and Extent

- 5.187 The Broad Valley Upland occurs only in South Lanarkshire. It is defined around the upper Clyde Valley and its tributaries, in a sinuous loop between Abington, Biggar and Douglas.

Figure 5.12 Broad Valley Upland (refer to Figure 4.1 for more detail)



South Lanarkshire

- 5.188 The area covered by this LCT is primarily classified by the South Lanarkshire Landscape Character Assessment (**Figure 4.2**) as:

- Type 9 Broad Valley Upland.

Further information on the sensitivity and capacity of these landscapes can be found in the relevant sections of the South Lanarkshire Spatial Framework and Landscape Capacity for Wind Farms (2013).

Key Characteristics

- 5.189 The key characteristics, features and qualities of this LCT, as defined in the GCVLCA, are:
- large scale landscape comprising a broad, flat bottomed valley enclosed by the rounded foothills to the north and the Southern Uplands to the south;
 - distinctive pattern of tree cover comprising shelterbelts on lower hill slopes and lines of mature trees along field boundaries; and
 - scattered pattern of rural settlement.
- 5.190 No significant changes to these key characteristics have been identified. Within this landscape there are two small turbines at Douglas Water and at Wiston. There are further small turbines just beyond this LCT, in the transition with the adjacent hills.

Table 5.23 Assessment of LCT13 Broad Valley UplandRefer to **Table 3.2** for full details of the evaluation criteria.

	Lower sensitivity	↔	Higher sensitivity	
Landform and Scale				This medium-large scale valley landscape broadens as it meets with the Southern Uplands. The landform comprises a wide U-shaped valley with an open basin-like topography, partially enclosed by the Southern Uplands to the south, and foothills to the north and west. Overall the LCT is broader in the south than in the north.
Land Cover				Broadleaved and mixed woodland tree groups or shelterbelts are commonly located on the lower sides of the valley, with a more open floodplain within the lowest areas having some waterside vegetation including trees and hedgerows. Fields within the LCT tend to be medium or large scale, and lined by mature trees or remnant hedgerows.
Settlement and Man-made Influence				The LCT is comparatively settled but rural in nature, comprising a network of villages, hamlets and farmsteads. The A73 road and West Coast Mainline railway pass through the broad valley, in the southern parts of the LCT, and the A70 passes through the northern section. There is a notable lack of pylons.
Movement				The main source of movement in the LCT is from transport infrastructure, including roads and rail. Away from these routes, the LCT is less busy, but with lower levels of movement associated within small settlements and agriculture.
Skylines				The skyline to the north and west extends to the relatively near distance in views to the south, north and west, enclosed by topography, with a more distant horizon in views east. The number of vertical features in the LCT is limited.
Key Views, Vistas, Landmarks				Views tend to be channelled along the length of the valley, with some broad views across wider parts of the valley. The key focus of views tends to be towards lower parts of the LCT, and along the rivers and roads which pass through this LCT.
Receptors				Receptors within this LCT include users of road and rail infrastructure and those living and working in the area, in farmsteads, hamlets and villages, who are likely to use the riverside for recreation
Inter-visibility with Adjacent Landscapes				Inter-visibility with more distant LCTs is relatively limited due to the enclosed nature of the broad valley. Important visual relationship with surrounding high ground, particularly the Foothills (LCT15) and Southern Uplands (LCT21). From western parts of the LCT, there is some inter-visibility with Plateau Farmlands (LCT5), including Broken Cross Muir open cast site.
Natural and Cultural Heritage Features				Semi natural woodland, and the distinctive pattern of shelterbelts and field boundaries are important features in this LCT. The presence of cultural heritage features is relatively limited.
Perceptual Aspects				The LCT is largely rural in character with some quiet areas, but includes main roads and railway which contribute to localised areas of noise.

Sensitivity

- 5.191 While this landscape is largely rural in character with some quiet areas, it is also well-used for transport infrastructure and contains a relatively dense network of minor roads, farms and villages. The landscape is of lower sensitivity to turbines of a small or small-medium scale, and is of reduced sensitivity to single turbines or small groups, due to the scale and shape of the landform. The scale of the valley, and the existing density of settlement suggests much higher sensitivity to large and very large turbines are limited, and particularly for larger wind farms.

Table 5.24 Sensitivity of LCT13 Broad Valley Upland

Turbine typology	Sensitivity
Small turbine (15-30 m to tip)	Medium-low
Small-medium turbine (31-50 m to tip)	Medium
Medium turbine (51-80 m to tip)	High-medium
Large turbine (81-120 m to tip)	High
Very large turbine (over 120 m to tip)	High

Landscape value

- 5.192 Almost the whole of this LCT is within the Upper Clyde and Tinto Special Landscape Area. The special qualities of this area include:
- scenic qualities of a meandering river in a broad semi-upland valley setting that contrasts with the enclosing hills of the Southern Uplands and the prominent Tinto Hill;
 - cultural features include: country houses set in designed policies; small settlements and the historic burgh of Biggar; and many signs of prehistoric settlement in the hills; and
 - frequently visited as it is traversed by major transport routes, and provides access to popular hillwalking destinations such as Tinto Hill and Culter Fell.

Underlying capacity

- 5.193 The sensitivity of this landscape, together with the value implied by designation, indicates that there is lower capacity for wind energy development at small and small-medium scales, with little or no capacity for turbines of medium, large or very large scales.

Cumulative development and current residual capacity

- 5.194 Consented developments include several small turbines, mostly located at the transition of the valley to the neighbouring hills. Near Douglas Water there is a consented small-medium turbine, and the consented Eastertown wind turbine (medium). There are no further proposed developments. The dispersed pattern and small size of these developments does not affect the underlying capacity across most of the LCT. In the area around Douglas Water, there are further proposals within the adjacent Plateau Farmland (LCT5) which, if built, would limit the potential for additional development within this area, due to the potential for cumulative effects of turbines within and beside the valley.

Constraints

- 5.195 There are key sensitive views over this area from several locations in surrounding landscapes. The view from Tinto looks down to this LCT in several directions, and could be affected by cumulative development which could give the impression of the hill becoming encircled by dispersed development within the valleys.
- 5.196 Consideration of cumulative effects within this landscape will be essential, particularly in terms of scale contrasts between turbines of different sizes where these are viewed from static locations and on routes.
- 5.197 Proposals must give due consideration to the special qualities of Special Landscape Area designations in this LCT.

Opportunities

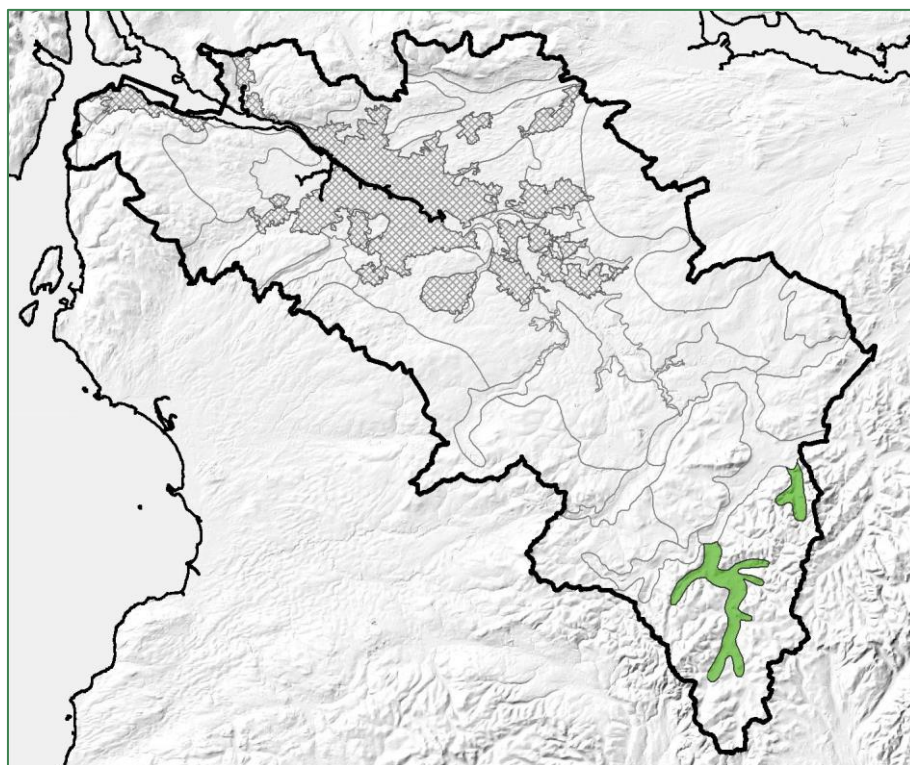
- 5.198 Siting of small and small-medium turbines should take cognisance of local topography and screening available. Turbines will be most appropriately sited within farmed areas where seen in association with other agricultural buildings.

LCT 14 Upland Glen

Location and Extent

- 5.199 The Upland Glen LCT is located in South Lanarkshire only, and comprises two areas: the larger southern area following the Upper Clyde and its tributaries; and a smaller eastern area around Culter Water. The U-shaped glens cuts through the *Southern Uplands* (LCT21), tending to be enclosed by steep sided slopes, and feeding into *Broad Valley Upland* (LCT13) to the north.

Figure 5.13 Upland Glen (refer to Figure 4.1 for more detail)



South Lanarkshire

- 5.200 The area covered by this LCT is primarily classified by the South Lanarkshire Landscape Character Assessment (**Figure 4.2**) as:
- Type 9 Broad Valley Upland; and
 - Type 14 Upland Glen.

Further information on the sensitivity and capacity of these landscapes can be found in the relevant sections of the South Lanarkshire Spatial Framework and Landscape Capacity for Wind Farms (2013).

Key Characteristics

- 5.201 The key characteristics, features and qualities of this LCT, as defined in the GCVLCA, are:
- glacially enlarged, smoothly contoured, U-shaped valleys cutting into the upland mass of the Southern Upland;
 - transition from moorland vegetation on upper slopes, through rough grassland and pastures on valley floor;
 - limited amounts of broadleaf woodland which tends to be concentrated along the course of rivers, on steeper sheltered slopes and in gullies and side glens;
 - important corridors for communication and settlement; and
 - significant cumulative impacts of transport infrastructure in the glen of the River Clyde.

- 5.202 No significant changes to these key characteristics have been identified. There are no operational wind turbines within the valleys, however the Clyde Wind Farm is arranged along the hills to the east of the upper Clyde. Removal of forestry and introduction of turbines has changed the skyline along this section of the valley.

Table 5.25 Assessment of LCT14 Upland Glen

Refer to **Table 3.2** for full details of the evaluation criteria.

	Lower sensitivity	↔	Higher sensitivity
Landform and Scale			
	The distinctive shape of the <i>Upland Glen</i> LCT has been formed by glacial erosion, creating a smooth-contoured, U-shaped valley carved into the Southern Uplands. The glen floor is of a small scale in comparison with the enclosing slopes of the Southern Uplands.		
Land Cover			
	The glen floor and lower, shallower slopes comprise pasture and rough grassland, with moorland vegetation occupying upper slopes. Some small broadleaf tree group exist, associated with field boundaries, watercourses and farmsteads.		
Settlement and Man-made Influence			
	The southern part of the LCT forms part of a key communications corridor associated with the M74 and West Coast Mainline railway, and includes the linear villages of Abingdon, Crawford and Elvanfoot. The area to the east has less human influence. The turbines of Clyde Wind Farm are visible at close range from parts of this LCT.		
Movement			
	The main source of movement within the southern part of the LCT is from transport and electrical infrastructure, as well as the wind turbines, while the eastern part tends to be more still.		
Skylines			
	Within the southern part of the LCT area numerous vertical elements are visible, including pylons, wind turbines and masts. The presence of vertical elements in the eastern part of the LCT is limited to telegraph poles. The shape of the surrounding topography encloses sky views.		
Key Views, Vistas, Landmarks			
	The enclosing slopes of the glen channel views along its length, with features on the steep sided slopes clearly visible. While there are a number of industrial features within the LCT, the topography forms distinctive vistas.		
Receptors			
	Receptors in the landscape include local residents, and those travelling along the M74 or on the West Coast Mainline railway. Receptors are mainly located in the valley floor at the centre of the LCT, rather than on side slopes. Levels of recreation in this area are relatively limited.		
Inter-visibility with Adjacent Landscapes			
	The <i>Southern Uplands</i> (LCT21) enclose the <i>Upland Glen</i> LCT and are the main areas of inter-visibility, while longer distance inter-visibility is more limited. There is also some inter-visibility with the slightly lower <i>Broad Valley Upland</i> (LCT 13).		
Natural and Cultural Heritage Features			
	There are a number of cultural heritage features associated with the glen sides, including earthworks, settlement sites and castle remains. The transition in		

	Lower sensitivity	↔	Higher sensitivity
	vegetation associated with topography is a key feature.		
Perceptual Aspects			
	While the southern part of the LCT is influenced by the visibility and noise of the communications corridor, the eastern part is more rural and quieter in character.		

Sensitivity

- 5.203 The presence of the motorway within the upland glens indicates a locally decreased sensitivity to development, although this is not a pervasive influence throughout the LCT. The enclosed, small-scale, occasionally remote, nature of the landscape suggests that there would be higher sensitivity to large or very large turbines. Higher sensitivity to large or very large wind turbines is also indicated by the intervisibility between this area and the adjacent hills, and the higher numbers of receptors using transport in the valley.

Table 5.26 Sensitivity of LCT14 Upland Glen

Turbine typology	Sensitivity
Small turbine (15-30 m to tip)	Low
Small-medium turbine (31-50 m to tip)	Medium
Medium turbine (51-80 m to tip)	High-medium
Large turbine (81-120 m to tip)	High
Very large turbine (over 120 m to tip)	High

Landscape value

- 5.204 Parts of these glens are designated as Special Landscape Areas (SLA). The Culter Water Valley is part of the Upper Clyde and Tinto SLA. The special qualities of this area include:
- scenic qualities of a meandering river in a broad semi-upland valley setting that contrasts with the enclosing hills of the Southern Uplands;
 - vast areas of heather moorland and rough grasslands;
 - many signs of prehistoric settlement in the hills; and
 - frequently visited as it provides access to popular hillwalking destinations such as Culter Fell.
- 5.205 The upper Glengonnar and Daer glens are within the Leadhills and Lowther Hills SLA. The special qualities of this area include:
- extensive area of high, smooth, rolling hills and varied upland glens;
 - sense of emptiness engendered by a lack of extensive forestry or wind farm development;
 - cultural features include the remains of settlements on the glen sides; and
 - access to walking routes via the M74 and valley roads.

Underlying capacity

- 5.206 The sensitivity of the landscape and the value indicated by designation suggests that there is moderate to lower capacity for small or small-medium development, and lower capacity for turbines of medium, large or very large sizes.

Cumulative development and current residual capacity

- 5.207 There is no consented development within the valleys. Proposed development is limited to one scheme at Crookedstane (very large turbines) which lies at the transition between this LCT and the Southern Uplands. Residual capacity in this landscape is limited by development on the adjacent hills, including the operational Clyde and proposed Clyde Extension, Crookedstane and Lion Hill wind farms. Based on the current pattern of development, there is some limited remaining capacity for carefully sited and designed small, small-medium or medium proposals, but due to the potential for cumulative effects little or no capacity for large or very large turbines.

Constraints

- 5.208 Turbines, even at small or small-medium scales, will have a greater impact on character in less human-influenced parts of the valleys, such as the Daer Water and Culter Water.
- 5.209 Visual effects of turbines within this landscape require careful consideration, even at small or small-medium scales. There are long views along the valleys which could be interrupted by turbines on the valley floor, or on the valley sides. Local topography will dictate the suitability of some sites, depending on prominence within such views.
- 5.210 Cumulative effects may occur as a result of turbines being present in the valley landscape in locations where turbines are also visible on the uplands. In particular, the contrast between small turbines in the valley and large turbines on the hills could give rise to a confusing visual picture. There may also be some blurring of the distinction between upland and valley landscapes should turbine development spread across both.
- 5.211 Proposals must give due consideration to the special qualities of Special Landscape Area designations in this LCT.

Opportunities

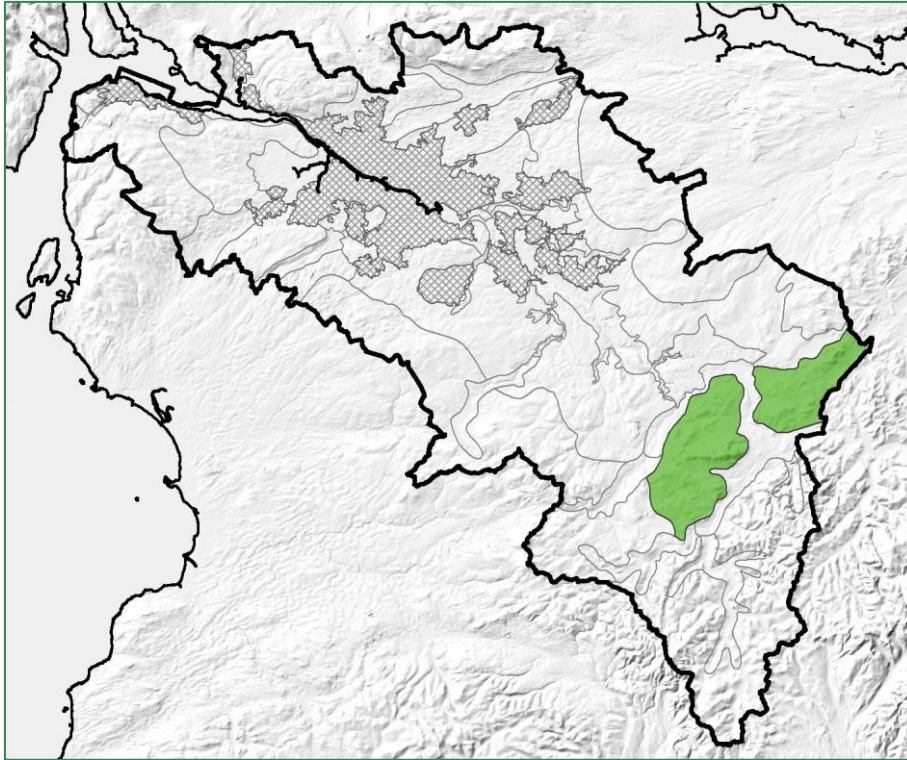
- 5.212 Small or small-medium turbines could be sited in parts of the valleys which are settled and farmed, or which are close to transport and other infrastructure.

LCT 15 Foothills

Location and Extent

- 5.213 This character area is located in two parts, to the north-west of the Southern Uplands Fault, comprising rounded hills between around 200-700m AOD, and separated by *Broad Valley Upland* (LCT13). This LCT occurs only in South Lanarkshire.

Figure 5.14 Foothills (refer to Figure 4.1 for more detail)



South Lanarkshire

- 5.214 The area covered by this LCT is primarily classified by the South Lanarkshire Landscape Character Assessment (**Figure 4.2**) as:
- Type 4 Rolling Farmland;
 - Type 5 Plateau Farmland;
 - Type 10 Foothills; and
 - Type 11 Prominent Isolated Hills.

Further information on the sensitivity and capacity of these landscapes can be found in the relevant sections of the South Lanarkshire Spatial Framework and Landscape Capacity for Wind Farms (2013).

Key Characteristics

- 5.215 The key characteristics, features and qualities of this LCT, as defined in the GCVLCA, are:
- rounded, sometimes conical hills, forming a transition between the Plateau Moorlands and the Southern Uplands;
 - hilltops dominated by heather moorland, with a transition to rough grazing and enclosed pastures on lower slopes; some areas of coniferous woodland; and
 - the hills have little in the way of modern settlement.

- 5.216 No substantial changes to these characteristics have been identified. There are five operational turbines, all small, within the area between Elsrickle and Quothquan. There is also a single small turbine north of Thankerton.

Table 5.27 Assessment of LCT15 Foothills

Refer to **Table 3.2** for full details of the evaluation criteria.

	Lower sensitivity	↔	Higher sensitivity
Landform and Scale			
	The large scale rounded hills, tend to be conical in form with long shoulder slopes, and form a change between the <i>Plateau Moorlands</i> (LCT18) and the <i>Southern Uplands</i> (LCT 21). A number of watercourses cut into LCT creating small valleys between hills.		
Land Cover			
	Land cover in this landscape echoes variations in elevation and exposure according to topography. Heather moorland occupies the open hills tops with rough grazing and pasture on lower, more sheltered areas. Tree groups and shelter belts are associated with the fields, and minor policy landscapes.		
Settlement and Man-made Influence			
	Agriculture is the main man-made influence in this landscape, with settlement being relatively sparse, other than for the town of Biggar located on the boundary next to <i>Broad Valley Upland</i> (LCT13). Where farmsteads and hamlets do existing they tend to be located on lower peripheral slopes. A number of mainly minor roads pass through this LCT.		
Movement			
	The relatively sparse nature of settlement in this landscape, means that the main movement is associated with agriculture, and is therefore relatively still, particularly on the moorland hill tops. The movement of wind turbines in neighbouring LCTs is noticeable in outward views.		
Skylines			
	Skylines in this landscape tend to be relatively simple and open, with Tinto Hill forming a recognisable shape, and more variable horizons forms by the steep hills and valley slopes associated with the Southern Uplands (LCT 21) to the south. In some views wind turbines break up the skyline.		
Key Views, Vistas, Landmarks			
	The main landmarks within this landscape are the hills themselves, particularly Tinto and Black Mount, and other smaller hills including Quothquan Law and Castle Hill. Views from these hill tops are important, with the view at Tinto Law being recognised as an OS marked viewpoint.		
Receptors			
	Numbers of residential receptors within this landscape are relatively low, but it is visited by larger numbers of recreational walkers, and is visible from other walking destinations.		
Inter-visibility with Adjacent Landscapes			
	The Foothills LCT is visible from a number of surrounding LCTs, but particularly from Broad Valley Upland (LCT13) which separates the two parts of the Foothills. There is also inter-visibility with the Southern Uplands (LCT21) to the south, and with Rolling Farmland (LCT4) and Plateau Farmland to the north (LCT5). Long distance views to Tinto from areas far to the north. The eastern area has some intervisibility with the Pentlands to the north-east, and with the Upper Tweeddale National Scenic Area to the east.		

	Lower sensitivity		↔	Higher sensitivity	
Natural and Cultural Heritage Features					
	There are a high number of historic sites within the LCT, including ceremonial and settlement sites, hill forts, castles and cairns, which form important features highly linked to the form of the landscape, though not always immediately apparent as the topography itself is the key feature of the LCT.				
Perceptual Aspects					
	The moorland hills tops have a somewhat wild character, while areas of rough grazing and pasture are more rural in character.				

Sensitivity

- 5.217 The Foothills LCT marks a transition between lower-lying LCTs to the north, and more elevated LCTs to the south, and has relatively high levels of inter-visibility with adjacent LCTs. The sensitivity of the landscape to different typologies reflects this, with lower sensitivity to small or small-medium turbines due to their more limited visual influence, and potential for siting at lower elevations to take advantage of backclothing. As well as being more visible, large or very large turbines are more likely to be seen against the skyline.

Table 5.28 Sensitivity of LCT15 Foothills

Turbine typology	Sensitivity
Small turbine (15-30 m to tip)	Medium-low
Small-medium turbine (31-50 m to tip)	Medium
Medium turbine (51-80 m to tip)	High
Large turbine (81-120 m to tip)	High
Very large turbine (over 120 m to tip)	High

Landscape value

- 5.218 Large parts of this LCT are designated as Special Landscape Areas in South Lanarkshire for their scenery and recreational value. The area around Tinto and the area north of Biggar are part of the Upper Clyde and Tinto SLA. The special qualities of this area include:
- scenic qualities of a meandering river in a broad semi-upland valley setting that contrasts with the prominent Tinto Hill;
 - vast areas of heather moorland and rough grasslands;
 - cultural features include country houses set in designed policies; small settlements and the historic burgh of Biggar; and many signs of prehistoric settlement in the hills; and
 - frequently visited as it is traversed by major transport routes, and includes popular hillwalking destinations such as Tinto.
- 5.219 The area of Foothills to the north of the A721 is part of the Pentland Hills and Black Mount Special Landscape Area. The special qualities of this area include:
- scenic qualities of moorland and rounded hills contrasting with sheltered pastoral valley and farmland around the edges;
 - proximity of accessible and open countryside via the A70 and A702; and

- crossed by footpaths and tracks and part of a larger designated and highly popular area.

Underlying capacity

- 5.220 The higher sensitivity of this landscape, and the value indicated by designation, suggests that there is generally lower capacity for small or small-medium wind turbine development across this LCT, with little or no capacity for medium, large or very large turbines. This is particularly the case within the designated sections of the LCT, and the more prominent of the foothills.

Cumulative development and current residual capacity

Tinto area

- 5.221 South of Tinto there are two consented small turbines, near Wiston. These are both within the transitional landscape with the Broad Valley Upland, and do not affect the residual capacity. No proposed developments are identified. In the wider landscape, there is the operational Clyde wind farm to the south, and the consented Andershaw wind farm to the west. Large wind turbines are also visible to the north and north-west, reinforcing the importance of Tinto as a 'gap' within a wider pattern of development clusters (see **Section 6**). There is therefore judged to be no capacity for small-medium, medium, large or very large development in this area.

Biggar and Elsrickle area

- 5.222 There are several consented turbines in the eastern area of the LCT, all within the small typology, and with a loose cluster developing around Elsrickle and westward towards Quothquan. This pattern of small-scale development indicates that further development should be restricted to the same level, to avoid cumulative impacts arising from contrasting turbine sizes. There are large wind farms visible from this area, including Clyde to the south, though these are more distant and separate than when seen from the Tinto area.

Constraints

- 5.223 Consideration of cumulative effects should be given to proposals in the periphery of this LCT, to ensure that the higher sensitivity hills are not effectively encircled by dispersed development on and around their lower slopes. Views from the summit of Tinto should be a key consideration for proposals in this area.
- 5.224 Tinto itself is considered to be a particularly sensitive feature, as a prominent and iconic element of the South Lanarkshire landscape. The skylines of Tinto and Black Mount in particular, as well as other more locally prominent ridges and hills, will be highly sensitive to development at all scales.
- 5.225 Proposals must give due consideration to the special qualities of Special Landscape Area designations in this LCT.

Opportunities

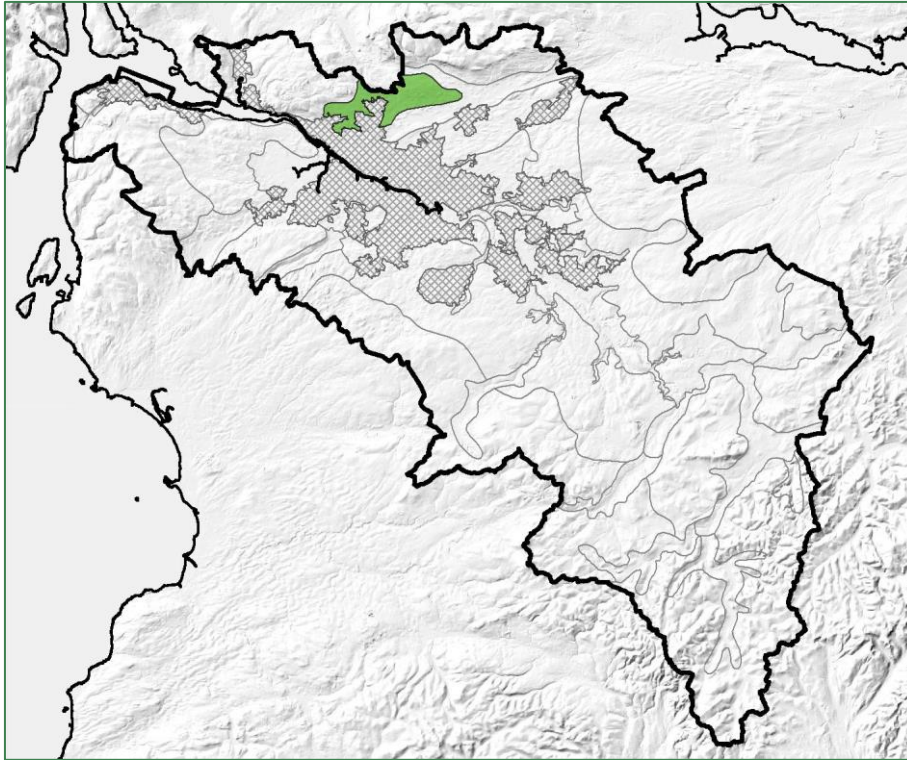
- 5.226 There are potential opportunities to site small, or potentially small-medium turbines, particularly in association with farm buildings to retain the link between generation and consumption. Small turbines could be best sited in the more wooded areas of the Foothills, to make use of available screening

LCT 16 Drumlin Foothills

Location and Extent

- 5.227 This relatively small single area extends across three different local authorities: located principally within East Dunbartonshire, but extending into small parts of West Dunbartonshire and Glasgow.
- 5.228 The topography of the landscape ranges in height between 150-200m AOD, with the density and height of the drumlins being the distinguishing feature of the landscape. The western extent of the LCT is located north of Bearsden and Milngavie, while the east of the LCT extends to the area south of Lennoxton.

Figure 5.15 Drumlin Foothills (refer to Figure 4.1 for more detail)



Key Characteristics

- 5.229 The key characteristics, features and qualities of this LCT, as defined in the GCVLCA, are:
- distinctive undulating landform created by glacial deposition subsequently modified by fluvial erosion;
 - area of transition from lowlands areas to the Rugged Moorland Hills;
 - dominance of pastoral farming in lower parts of the hills, giving way to areas of moorland vegetation in more elevated and exposed areas; and
 - combination of semi-natural woodlands along incised burns, farm woodlands, small conifer plantations and, along the northern edge of the hills, more extensive areas of mixed and coniferous woodland.
- 5.230 There has been some urban expansion into this LCT, around Milngavie. There are no operational wind turbines in the Drumlin Foothills.

Table 5.29 Assessment of LCT16 Drumlin FoothillsRefer to **Table 3.2** for full details of the evaluation criteria.

	Lower sensitivity	↔	Higher sensitivity
Landform and Scale			
	The undulating landform created by the distinctive pattern of drumlins is of a small-medium scale, with a complex drainage pattern. The drumlins are higher and steeper at their western end, gently sloping to a tapered tail at the eastern end. This is the distinguishing feature of the LCT. The landform in the eastern part of the LCT appears as a small plateau, with fewer drumlins.		
Land Cover			
	The land cover is predominantly improved pasture, with some pockets of semi-natural vegetation and rough grassland. West of Lennoxton there is some coniferous plantation and small areas of deciduous woodland. The land is also given over to a number of golf courses.		
Settlement and Man-made Influence			
	Settlement within the LCT mainly comprises scattered farmsteads and small villages, though the LCT borders some larger villages and towns. There are a number of main roads which pass through the LCT, including the A81, A810, A807 and A809. There are also a number of sand and gravel quarries, and the extensive water works complex north of Milngavie. A number of pylons cross this landscape, radiating from the substation at Faifley.		
Movement			
	Movement levels within the LCT are moderate, focussed mainly around the road network and settlements, with some stiller areas in the north east.		
Skylines			
	The shape of the skyline in views tends to correspond with the undulating topography of the LCT making it slightly complex, however from higher locations the skyline will appear more open. The skyline is more open in the east of the LCT where there are fewer drumlins.		
Key Views, Vistas, Landmarks			
	Views tend to appear and disappear with the undulating topography, with a general absence of focussed or channelled views, though there are long-distance views across Glasgow from some locations. There are a mix of agricultural and some industrial visible as localised features in the landscape. The hills in adjacent Rugged Moorland Hills (LCT20) are a landmark in views north.		
Receptors			
	Receptors in this landscape include those travelling on the road network, and recreational receptors in Mugdock Country Park, the reservoirs and on golf courses. There are also large numbers of residential receptors both within and around this landscape, including views from Kirkintilloch, Milngavie, Bearsden and Drumchapel.		
Inter-visibility with Adjacent Landscapes			
	Views into adjacent landscapes are from higher points or peripheral areas, with lower areas more locally contained. There is likely to be high inter-visibility with the Campsie Fells and Kilsyth Hills to the north, in short foreground views across the Glazert. There are occasional long views to the south, across the Glasgow basin, with the Kelvin Valley (LCT10) in the foreground.		
Natural and Cultural Heritage Features			
	The geomorphology of the area is a key feature in the form of Drumlins. The Antonine Wall World Heritage Site passes through this landscape, with its visual buffer either side of Bearsden. There are locally important designed landscapes		

	Lower sensitivity	↔	Higher sensitivity
	and castles, such as Bardowie, and the historic waterworks at Mugdock.		
Perceptual Aspects			
	The area is relatively close to visible and audible signs of human activity, and includes a number of manmade features, but retains a mainly rural character.		

Sensitivity

- 5.231 The small-medium scale of the Drumlin Foothills LCT is likely to be sensitive to the development of large or very large turbine typologies, particularly in the central and western parts of the LCT, where the presence of Drumlins is more prevalent. The eastern part of the LCT contains fewer drumlins, forming a small forested plateau, and is less sensitive to development of the medium typology.

Table 5.30 Sensitivity of LCT16 Drumlin Foothills

Turbine typology	Sensitivity
Small turbine (15-30 m to tip)	Low
Small-medium turbine (31-50 m to tip)	Medium-low
Medium turbine (51-80 m to tip)	High-medium
Large turbine (81-120 m to tip)	High
Very large turbine (over 120 m to tip)	High

Landscape value

- 5.232 East Dunbartonshire Council has designated the area between Craigmaddie, Bardowie Loch and Milton of Campsie as a Special landscape Area. The reasons for designating this area include:
- a particularly charming locality of hummocks and hollows associated with fluvio-glacial depositional processes;
 - settled pastoral landscape, with a historic pattern of hamlets and villages; and
 - particularly high visual qualities and standards of land management.
- 5.233 The western fringes of the LCT are at the edge of the Kilpatrick Hills Regional Scenic Area (East Dunbartonshire) and Local Landscape Area (West Dunbartonshire), though these designations are focused primarily on the adjacent hills. The boundary of this area within East Dunbartonshire is under review, and may be extended further into this LCT.

Underlying capacity

- 5.234 The sensitivity of this landscape, combined with the value placed upon it, indicates moderate capacity for small or small-medium development, with some capacity for medium turbines, and little or no capacity for large or very large wind turbines.

Cumulative development and current residual capacity

- 5.235 The only consented or proposed development is a single small turbine north-west of Milngavie, which would not alter the underlying capacity of the landscape.³⁸

Constraints

- 5.236 This is a small-scale landscape, particularly in the west, in which turbines of more than small-medium size would appear out of scale. Pylons are a feature in parts of this area, and care should be taken in siting turbines such that visual confusion does not arise and that turbines do not contrast in scale.
- 5.237 The occasional long views south over the Clyde basin are an important feature in this landscape, particularly from recreational locations. The Drumlin Foothills also provide the foreground to the Campsie Fells in longer-distance views, and the potential for turbines to interrupt these views must be considered.
- 5.238 Care is needed to located turbines where their potential effects on important recreational areas, including Mugdock Country Park, Milngavie Reservoirs, Kilpatrick Hills and Bardowie Loch, would be minimised. Proposals must give due consideration to the special qualities of local landscape designations in this LCT.
- 5.239 The Antonine Wall World Heritage Site runs through this landscape, and must be a key consideration for siting of any turbines in the Milngavie, Drumchapel and Faifley areas.

Opportunities

- 5.240 This mainly agricultural landscape is less sensitive to small or small-medium single turbines sited in association with agricultural and commercial elements such as large farmsteads. The lower-lying areas of this LCT will be less sensitive due to topographical containment and opportunities for woodland screening. The more open and forested moorlands have some potential opportunity for single turbines, though in these areas turbines would be more visible in wider views. There are no identified opportunities for large wind farms.

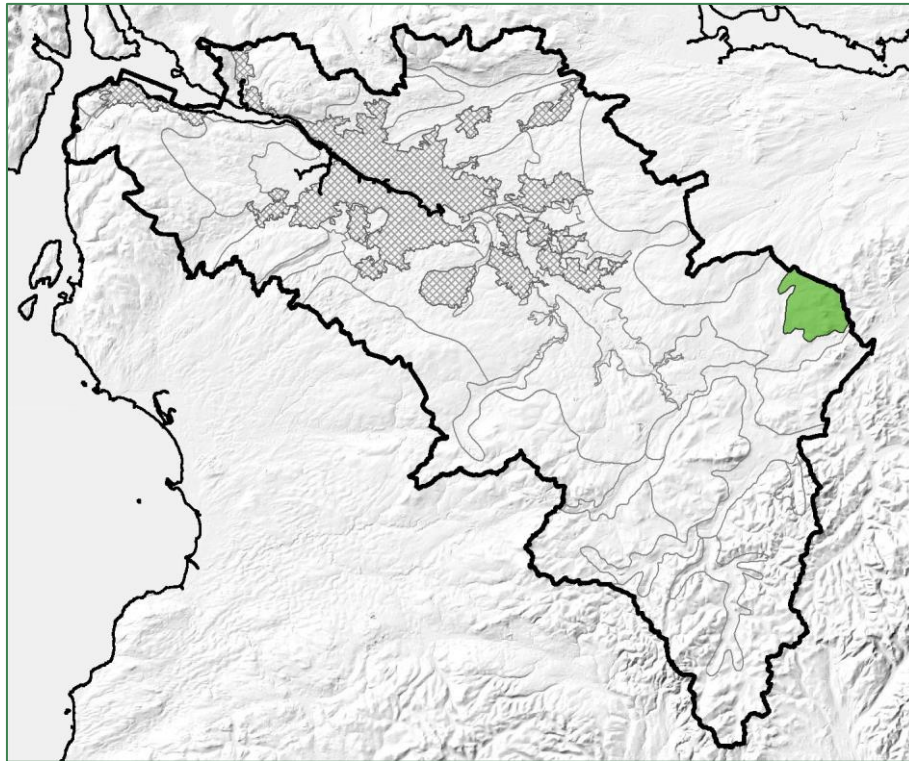
³⁸ There is consent for ten vertical-axis turbines at Tambowie, but these are of a different form to traditional horizontal-axis turbines and are not considered to affect overall capacity. Cumulative effects would need to be considered on a site specific basis.

LCT 17 Old Red Sandstone Hills

Location and Extent

- 5.241 This area forms the western extent of the Pentland Hills, and is located solely within South Lanarkshire. The LCT comprises a number of moorland-covered hills, with topography varying in height between 250-450m AOD. Many of the hills merge into each other, flat and wide, while others are more distinctive, such as the steep-sided Dunsyre Hill. The Pentland Hills extend north-east into the Borders and the Lothians.

Figure 5.16 Old Red Sandstone Hills (refer to Figure 4.1 for more detail)



South Lanarkshire

- 5.242 The area covered by this LCT is primarily classified by the South Lanarkshire Landscape Character Assessment (**Figure 4.2**) as:

- Type 17 Old Red Sandstone Hills.

Further information on the sensitivity and capacity of these landscapes can be found in the relevant sections of the South Lanarkshire Spatial Framework and Landscape Capacity for Wind Farms (2013).

Key Characteristics

- 5.243 The key characteristics, features and qualities of this LCT, as defined in the GCVLCA, are:
- western tail of the Pentland Hills, comprising areas of moorland dropping steeply in places to the surrounding lowlands;
 - dominance of heather and peat moorland and rough grazing with small areas of coniferous plantation; and
 - largely unsettled landscape though with areas of archaeological interest.
- 5.244 No changes to this LCT have been noted. There are no operational wind turbines, though the six-turbine Muirhall Wind Farm is located immediately to the west.

Table 5.31 Assessment of LCT17 Old Red Sandstone Hills

Refer to **Table 3.2** for full details of the evaluation criteria.

	Lower sensitivity	↔	Higher sensitivity
Landform and Scale			
	The main underlying geology of the area is Upper Red Sandstone of the Devonian period, with some peripheral areas of igneous rock. Though there are some steeper slopes within the LCT, many of the hills create a wide and gently sloping plateau of a large scale.		
Land Cover			
	The land cover comprises heather and peat moorland on the upper slopes of the hills, with rough pasture on lower slopes, as well as some small areas of coniferous plantation.		
Settlement and Man-made Influence			
	The area is largely unsettled, with the main man-made influence being sheep farming, and small scale forestry. There are very few built structures in the landscape.		
Movement			
	There is little in the way of movement associated with human features, other than associated with sheep farming and forestry on lower slopes.		
Skylines			
	Skylines tend to be open and uninterrupted by vertical features. There are distinctive features including Black Law, which forms part of the overall Pentland skyline which is viewed from the north and south in the wider landscape.		
Key Views, Vistas, Landmarks			
	Long panoramic views are available from this LCT, from hills tops and elevated slopes. Hill tops and cairns form the key landmarks within the LCT, with numerous landmarks visible in the surrounding landscapes.		
Receptors			
	Although this part of the Pentland Hills does not form part of the Pentlands Regional Park, the key receptors in this landscape are hill walkers. Stoneypath is a visitor attraction. Receptors numbers are higher in adjacent LCTs, including residential viewers, and users of the A70 which links Edinburgh and New Lanark.		
Inter-visibility with Adjacent Landscapes			
	There is a high level of inter-visibility between this and other surrounding landscapes including <i>Plateau Farmland</i> (LCT5), <i>Foothills</i> (LCT15) and <i>Rolling Farmland</i> (LCT4) , though less so from lower slopes and localised depressions..		
Natural and Cultural Heritage Features			
	There are a number of archaeological features generally located on lower slopes, including cairns, cultivation terraces, towers and henges.		
Perceptual Aspects			
	The lack of settlement, and elevated and exposed nature of the landscape contrasts with relatively well-settled surrounds, creating a feeling of remoteness or wildness, as reflected by the level of wildness indicated in SNH mapping.		

Sensitivity

- 5.245 While the scale and simplicity of the landform and land cover of this LCT suggest lower sensitivity, the notable lack of existing man-made features, means that the introduction of turbines would likely result in a change in landscape character. Importantly, this LCT forms part of the Pentland Hills, which have high recreation value as an area of relative remoteness in comparison to

adjacent LCTs. The Pentlands also represent a significant area of undeveloped upland in close proximity to densely settled landscapes of the Central Belt, and are highly visible from many locations.

- 5.246 The core upland part of the LCT is highly sensitive to all turbine typologies. The lower slopes to the south and west are less sensitive to small or, at most, small-medium turbines where associated with farmsteads or agricultural buildings.

Table 5.32 Sensitivity of LCT17 Old Red Sandstone Hills

Turbine typology	Sensitivity
Small turbine (15-30 m to tip)	Medium
Small-medium turbine (31-50 m to tip)	High-medium
Medium turbine (51-80 m to tip)	High-medium
Large turbine (81-120 m to tip)	High
Very large turbine (over 120 m to tip)	High

Landscape value

- 5.247 The entirety of this LCT is within the Pentland Hills and Black Mount Special Landscape Area in South Lanarkshire, which is valued for its scenery and recreational value. The special qualities of this area include:
- scenic qualities of moorland and rounded hills contrasting with sheltered pastoral valley and farmland around the edges;
 - cultural features include the designed landscape of Little Sparta and sites of archaeological significance;
 - extensive areas of peatland, heather and moorland vegetation
 - proximity of accessible and open countryside via the A70 and A702; and
 - crossed by footpaths and tracks and part of a larger designated and highly popular area.
- 5.248 This LCT forms part of the Pentland range which extends into the Scottish Borders and West Lothian, and which is covered by local landscape designations in these neighbouring local authorities.

Underlying capacity

- 5.249 The high sensitivity of this landscape, and the value placed upon it, indicates low capacity for wind energy development at all scales, with little or no capacity for medium turbines and no capacity for large or very large sizes.

Cumulative development and current residual capacity

- 5.250 There are two small single turbines consented at the edges of this LCT, one near Tarbrax and one near Dunsyre. Two further consented turbines have been consented at Muirhall Wind Farm, and there are nearby proposals at Calla and Crofthill. All of these are peripheral to the Pentland Hills, and while they do not directly affect the landscape of the Pentlands, a proliferation of turbines in these locations could potentially have the effect of surrounding the hills, resulting in significant impacts on the open character of the Pentlands. Development at the edges of this LCT and adjacent parts of the Plateau Farmland (LCT5), particularly of large or very large turbines, should be carefully controlled to avoid such a scenario.

- 5.251 Two kilometres to the north, in West Lothian, a substantial wind farm has been proposed at Fauch Hill on the slopes of the Pentlands. Should this be constructed, then the maintenance of an undeveloped landscape within this LCT would be of greater strategic importance (see **Section 6**).

Constraints

- 5.252 This LCT is part of the Pentland Hills, a range which extends north-east well beyond the study area, and which is highly valued both for its recreational opportunities and its contribution to the wider landscape of the Central Belt and northern Borders. The Pentland range is viewed as a whole when seen in the wider landscape. The introduction of turbines on part of the hills could therefore have an impact upon this wider aspect.
- 5.253 The cumulative effects of proposed turbines at the periphery of this LCT should be carefully considered to ensure that the sensitive Pentland landscape is not encircled by dispersed development around the foothills.
- 5.254 Proposals must give due consideration to the special qualities of Special Landscape Area designations in this LCT.

Opportunities

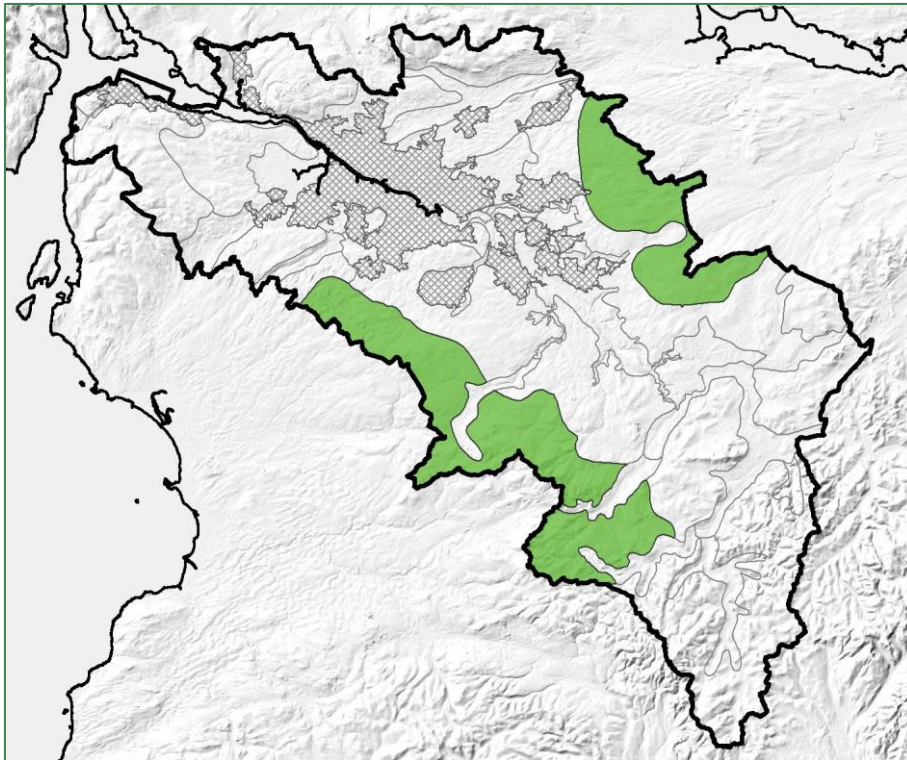
- 5.255 Siting of small turbines in association with farm buildings and plantation forestry provides some opportunity for development within this LCT. There are no identified opportunities for multiple-turbine developments, particularly within the hills.

LCT 18 Plateau Moorlands

Location and Extent

- 5.256 This character type is located in two areas, one in the west of the study area (described as Western (Ayrshire) Plateau), and one in the east (described as Central Plateau). The landscape occurs in North Lanarkshire, South Lanarkshire and East Renfrewshire.
- 5.257 The topography of the landscape varies, and grows progressively higher in southern parts. The landscape ranges in height between 300-600m AOD in the Western Plateau, and between 250-350m in the Central Plateau.

Figure 5.17 Plateau Moorlands (refer to Figure 4.1 for more detail)



South Lanarkshire

- 5.258 The area covered by this LCT is primarily classified by the South Lanarkshire Landscape Character Assessment (**Figure 4.2**) as:
- Type 5 Plateau Farmland;
 - Type 6 Plateau Moorland; and
 - Type 7 Rolling Moorland.

Further information on the sensitivity and capacity of these landscapes can be found in the relevant sections of the South Lanarkshire Spatial Framework and Landscape Capacity for Wind Farms (2013).

Key Characteristics

- 5.259 The key characteristics, features and qualities of this LCT, as defined in the GCVLCA, are:
- distinctive upland character created by the combination of elevation, exposure, smooth, plateau landform, moorland vegetation and the predominant lack of modern development; and
 - these areas share a sense of apparent naturalness and remoteness which contrasts with the farmed and settled lowlands.

- 5.260 This LCT contains the greatest numbers of turbines within the core area, comprising a number of large wind farms. These developments have some effect on characteristics such as lack of modern development and remoteness.
- 5.261 Whitelee wind farm is within the northern part of the Western Plateau, with the Ardoch and Over Enoch clusters to the north, and West Browncastle and Calder Water to the east. Further west is the Middleton wind farm. South of the Avon Valley is the Bankend Rig wind farm, and Hagshaw Hill and Nutberry are located to the north of the Douglas Valley.
- 5.262 Within the southern part of the Central Plateau is the Black Law wind farm. Pates Hill wind farm is at the edge of this area, to the east. Further north are several single turbines: two large; one medium; two small-medium and three small. Torrance wind farm is operational at the eastern edge of the core area.

Table 5.33 Assessment of LCT18 Plateau Moorlands

Refer to **Table 3.2** for full details of the evaluation criteria.

	Lower sensitivity	↔	Higher sensitivity	
Landform and Scale				The two different areas are distinguished apart by their geology, with the Western Plateau underlain by basalts and tuffs, and the Central Plateau by coal measures, igneous intrusions and dykes. The large scale landform is comparatively level and regular and is not particularly elevated, though with some notable variation as in the more undulating hills to the south-west of the Clyde.
Land Cover				The land cover of the landscape comprises blanket bog, heather and grass moorland, with some areas of farmland on lower slopes. There are also numerous areas of coniferous plantation.
Settlement and Man-made Influence				Settlement is historically relatively sparse, though the Central Plateau contains a number of villages such as Harthill and Forth. There are several operational wind farms in this landscape, including Black Law, Hagshaw Hill, and Whitelee. The Central Plateau is also influenced by open cast coal mining, both historic and ongoing, and the Western Plateau by extensive coniferous plantation.
Movement				There are several east-west transport corridors in the Central Plateau, including the M8, A89, A71 and railway lines, which contribute to movement. The wind turbines present in this landscape introduce movement, particularly in relation to the Western Plateau, which has less in the way of transport infrastructure.
Skylines				Skylines in this landscape tend to be relatively simple, formed by relatively even, slightly undulating topography. The open nature of these skylines is characteristic and prominent in certain views. Turbines and electrical infrastructure occasionally break the skylines, which are elsewhere obscured by forestry.
Key Views, Vistas, Landmarks				Where coniferous plantation permits, views tend to be relatively open across the surrounding valleys, and to adjacent hill groups. There are a number of man-made features visible, particularly road corridors and electrical infrastructure, though few visual foci.
Receptors				Receptor numbers are relatively low within this landscape, more so in the Western Plateau than in the Central Plateau where the number of residential receptors in particular tend to be higher. Receptors include those travelling by

	Lower sensitivity	↔	Higher sensitivity
	road or rail and recreational receptors such as hill walkers and cyclists.		
Inter-visibility with Adjacent Landscapes			
	The landscape has inter-visibility with neighbouring LCT, particularly <i>Plateau Farmland</i> (LCT5) and <i>Upland River Valleys</i> (LCT12), and other LCTs in the buffer area. These areas are also visible within wider views along and across the Clyde Valley and the Glasgow conurbation.		
Natural and Cultural Heritage Features			
	Overall, there are relatively low levels of natural or cultural heritage features of landscape importance within these areas, though some archaeological features may be obscured by forest.		
Perceptual Aspects			
	Wildness levels in the Western Plateau are slightly higher than those in the Central Plateau, and are mainly associated with higher, exposed areas of moorland, though there are visible signs of human activity in most areas of the LCT.		

Sensitivity

- 5.263 The key sensitivities of the two areas of Plateau Moorland differ slightly. While the Central Plateau is relatively well-settled, and contains a higher number of receptors, the Western Plateau is more remote but contains fewer receptors. Overall, the LCT is of lower landscape sensitivity than visual sensitivity. The landscape is large in scale, comprising a number of man-made features, including a number of existing wind farms.
- 5.264 There are some areas of relative wildness, and inter-visibility with adjacent landscapes within the study area is high, particularly for outward-facing slopes, though to a lesser degree where the LCT meets the edges of the study area.
- 5.265 This is an extensive area with important local variations which affect the level of sensitivity. More detailed analysis may identify different sensitivities in, for example, the rolling hills south of the Douglas Valley, or the relatively rugged moorland west of the M77 corridor.

Table 5.34 Sensitivity of LCT18 Plateau Moorlands

Turbine typology	Sensitivity
Small turbine (15-30 m to tip)	Medium-low
Small-medium turbine (31-50 m to tip)	Medium-low
Medium turbine (51-80 m to tip)	Medium
Large turbine (81-120 m to tip)	High-medium
Very large turbine (over 120 m to tip)	High-medium

Landscape value

- 5.266 Only very limited areas of this landscape are designated within South Lanarkshire. The Douglas Valley and Leadhills and Lowther Hills Special Landscape Areas include small parts of this LCT, but are focused on Upland River Valley and Southern Upland landscapes respectively. The Douglas Valley SLA includes parts of the Plateau Moorland which are within the visual envelope of the valley, and takes in Hagshaw Hill wind farm.

Underlying capacity

- 5.267 The sensitivity of this landscape, combined with the indicators of value, suggest that there is moderate to higher capacity for small, small-medium or medium scale wind turbine development, and moderate capacity at large or very large scales. However, this finding is moderated by the level of operational and consented development in different areas of the LCT, as set out below.
- 5.268 There is reduced sensitivity to small or small-medium typologies, particularly where associated with agricultural settings, mainly in peripheral areas. Larger scale, more open and elevated areas are of reduced sensitivity to medium, large and very large turbines, particularly where associated with landscapes disturbed by mineral extraction or coniferous plantation. While turbine of different sizes may be accommodated in the landscape, it will be important to avoid the confusion that would arise from a range of sizes in the same area. The ability of this LCT to accommodate wind farm development varies locally as set out below.

Cumulative development and current residual capacity

Harelaw Dam to the Avon Valley area

- 5.269 Within the northern part of the Western Plateau there is limited consented and proposed development, comprising single turbines at the fringes of the area. The presence of Whitelee in particular in this area limits the remaining capacity of the landscape for large-scale development. Further development in this part of the LCT will give rise to cumulative effects on views from the north if multiple developments are visible along the skyline, though there is potential capacity for development which is set back from the ridge. Locally, sensitivity in this area increases to the west, where the smoother moorland begins to give way to the Rugged Upland Farmland (LCT6).

Avon Valley to the Duneaton Water area

- 5.270 South of the Avon Water, Dungavel wind farm is consented close to the operational Bankend Rig, while Kype Muir and Auchrobert await determination. Adjacent to Hagshaw and Nutberry, Galawhistle is consented and Dalquhandy is proposed further east, at the edge of this LCT and extending into the Plateau Farmland (LCT5). Further south is the consented Andershaw wind farm, and the proposed Glentaggart and Middlemuir on either side. To the west are the proposed Kennoxhead and Penbreck wind farms. Considering this pattern of development, in addition to operational developments, there would be limited remaining capacity in the area, should all the proposals be constructed. The hills in this area are more rolling than the smoother moorland to the north, and operational and proposed wind farms occupy distinct hill groups. To minimise cumulative impacts, the aim should be to maintain a degree of separation between those hill groups with turbines, with open hills between.

Forth area

- 5.271 In the southern part of the Central Plateau, the Black Law Phase II awaits determination. Tormywheel is consented to the east, between Black Law and Pates Hill. There are also consented single turbines in the area. The proposed Crofthill wind farm is to the south east, with Muirhall wind farm and a consented extension beyond Auchengray. Given the scale of Black Law and proposed development, there is limited further capacity within this part of the LCT, though there is potential capacity for extension schemes. Small or small-medium turbines may give rise to scale conflicts when seen in proximity to larger developments.

Cumbernauld to Shotts area

- 5.272 The northern part of the Central Plateau includes a greater variety of consented and proposed development. The nine-turbine Greengairs wind farm is consented, and an eight turbine extension to the east is proposed. Two large single turbines have been consented, and a cluster of three proposed at Bracco. To the south, a group of three proposed wind farms (Shotts, West Benhar and Starryshaw) form a single cluster near Shotts. To the east is the consented Burnhead wind farm, in Falkirk.
- 5.273 The greater diversity of existing and proposed development in this part of the LCT creates a more complex cumulative picture. The scattered pattern of smaller developments tends to disperse cumulative effects. On the other hand, the larger wind farms focus such effects in more limited areas. For example, the cluster of proposed wind farms near Shotts will be relatively close to both Black Law to the south and Torrance to the north. There remains moderate capacity for

further development at a range of scales, though the challenge for this area will be to prevent the dispersed cumulative effects, arising from both small and large developments, coalescing to create a landscape defined by wind energy. Further development must be carefully sited and designed to avoid such coalescence, either by building on existing foci or establishing new discrete clusters. It will also be important to avoid the confusion that would arise from a range of turbine sizes in the same area, and where turbines are already present in the landscape, this will set a precedent as to the size of turbine likely to be compatible with the existing situation.

Constraints

- 5.274 To maintain the distinction between this LCT and the adjacent Plateau Farmland (LCT5), recognised in the key characteristics, siting should be carefully considered. Developments which straddle the transition from farmland to moorland may blur this distinction, leading to a lack of definition. At present larger wind farms of large or very large turbines are located in the moorlands, while single turbines are more common in the farmland LCT. The maintenance of this distribution of development will assist in maintaining the distinction between the areas, emphasising the larger scale of the moorlands.
- 5.275 Given the quantity of existing and proposed development, the current pattern of wind turbines will be a key determinant of future siting and design. There are few substantial areas of this LCT which do not host existing or consented development.

Opportunities

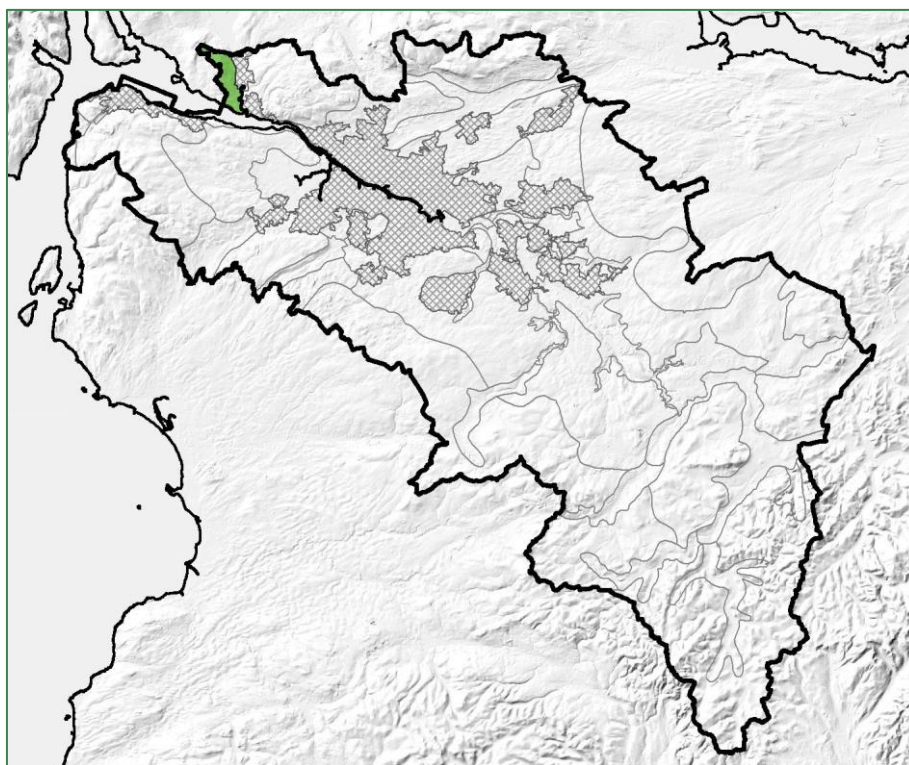
- 5.276 Larger-scale areas of moorland are less sensitive to a single large development than to a number of individual turbines spaced across the area, which would interrupt a greater part of the skyline and disperse cumulative effects.
- 5.277 Extensions to existing developments, or establishment of new, discrete clusters, will assist in concentrating cumulative effects, as opposed to dispersing development across the area.

LCT 19 Moorland Hills and Ridges

Location and Extent

- 5.278 This LCT occurs in one area within West Dunbartonshire. The hills to the west of the Vale of Leven are classed as Moorland Hills and Ridges, with the LCT extending west beyond the core area, into Argyll and Bute, and north into the National Park. These hills are distinguished from other uplands in the core area by their sandstone geology which gives rise to smoother landforms.

Figure 5.18 Moorland Hills and Ridges (refer to Figure 4.1 for more detail)



Key Characteristics

- 5.279 The key characteristics, features and qualities of this LCT, as defined in the GCVLCA, are:
- smooth, convex area of upland, lacking in the terraced or craggy features that characterise surrounding areas of upland; and
 - open heather moorland on the summit giving way to pastures, broad leaf woodland and policies on the lower slopes.
- 5.280 No significant changes to these characteristics have been identified. There are no operational wind turbines in the LCT.

Table 5.35 Assessment of LCT19 Moorland Hills and Ridges

Refer to **Table 3.2** for full details of the evaluation criteria.

	Lower sensitivity		↔	Higher sensitivity	
Landform and Scale					
	The sandstone hills rise steadily from sea level to 300 m, so although not high they are of comparatively large scale. Most of the land within the LCT is sloping, rising up to Bromley Muir.				
Land Cover					
	A mixed landcover of farmland, moorland and woodland. On the lower slopes				

	Lower sensitivity		↔	Higher sensitivity	
	are enclosed pastures and deciduous or mixed woodlands, while the upper slopes have rough grazing, heather moorland and large coniferous plantations.				
Settlement and Man-made Influence					
	There are several farmsteads along the eastern fringe of the LCT, as well as urban fringe land uses such as waterworks and a cemetery. On the hills there is a mast and the ridge is crossed by a line of pylons.				
Movement					
	There is evident movement within the Vale of Leven to the east and the Firth of Clyde to the south, though the LCT itself is generally still.				
Skylines					
	Skylines are smooth and rounded, sloping up to moorland summits. The skylines are steep in places, and interrupted by pylons.				
Key Views, Vistas, Landmarks					
	The high point of Bromley Muir is a local landmark in views from the Vale of Leven.				
Receptors					
	There are relatively few receptors in this area, which is not settled and does not provide significant opportunities for recreation. However there are large numbers of receptors in the immediately adjacent Vale of Leven settlements of Alexandria and Dumbarton.				
Inter-visibility with Adjacent Landscapes					
	There are views north to Loch Lomond and the wider National Park from the summit of Bromley Muir, as well as views south over the Firth of Clyde. Views along the Vale of Leven are framed by this LCT.				
Natural and Cultural Heritage Features					
	There are several broadleaf and mixed woodlands of local biodiversity importance, several of which are the remains of policy landscapes. These are located along the lower slopes by the A82, and also include the stables of the now demolished Tullichewan Castle. A hill fort overlooks the Vale of Leven from Overton Muir.				
Perceptual Aspects					
	Wildness mapping indicates this area has moderate wildness character, strongly influenced by adjacent settlement and transport corridors. The moorland summits do have a degree of perceptual separation from the settlements.				

Sensitivity

- 5.281 The development of turbines within this landscape would introduce large-scale vertical features on the skyline viewed from the Vale of Leven. Large or very large turbines could potentially be viewed as overbearing when seen from the adjacent settled areas, and would be widely visible from the Firth of Clyde and surrounding uplands. The lower parts of this landscape would be less sensitive to small or small-medium turbine typologies, particularly as some of these areas are already influenced by settlement fringe land uses.

Table 5.36 Sensitivity of LCT19 Moorland Hills and Ridges

Turbine typology	Sensitivity
Small turbine (15-30 m to tip)	Medium
Small-medium turbine (31-50 m to tip)	High-medium
Medium turbine (51-80 m to tip)	High
Large turbine (81-120 m to tip)	High
Very large turbine (over 120 m to tip)	High

Landscape value

- 5.282 This landscape is not designated for scenic value, though it does lie at the southern edge of the Loch Lomond and the Trossachs National Park. The framing of the Vale of Leven by these hills is an important part of the approach and arrival into the National Park along the A82.

Underlying capacity

- 5.283 The sensitivity of the landscape, combined with the indicators of value suggest this LCT has lower capacity for small or small-medium wind turbine development, with no capacity for medium, large or very large development.

Cumulative development and current residual capacity

- 5.284 There are no consented or proposed wind turbines within this LCT which would alter this finding.

Constraints

- 5.285 Development of turbines in this landscape would potentially impinge upon the approach and setting of the southern edge of the National Park. The hills frame the southern 'gateway' into the National Park through the Vale of Leven and turbines on these hills would adversely affect this approach. Turbines sited on these hills would also be visible from within the National Park, in long views down Loch Lomond.
- 5.286 The high level of visibility of this landscape from densely populated areas in the Vale of Leven, including Dumbarton and Alexandria, will be a constraint on larger-scale development.

Opportunities

- 5.287 Small, or possibly small-medium, single-turbine development could potentially be sited on lower slopes where it would appear in the context of settlement and agricultural buildings, and would be less prominent in the wider landscape. Opportunities are more likely to be located in the south, away from the National Park 'gateway'.

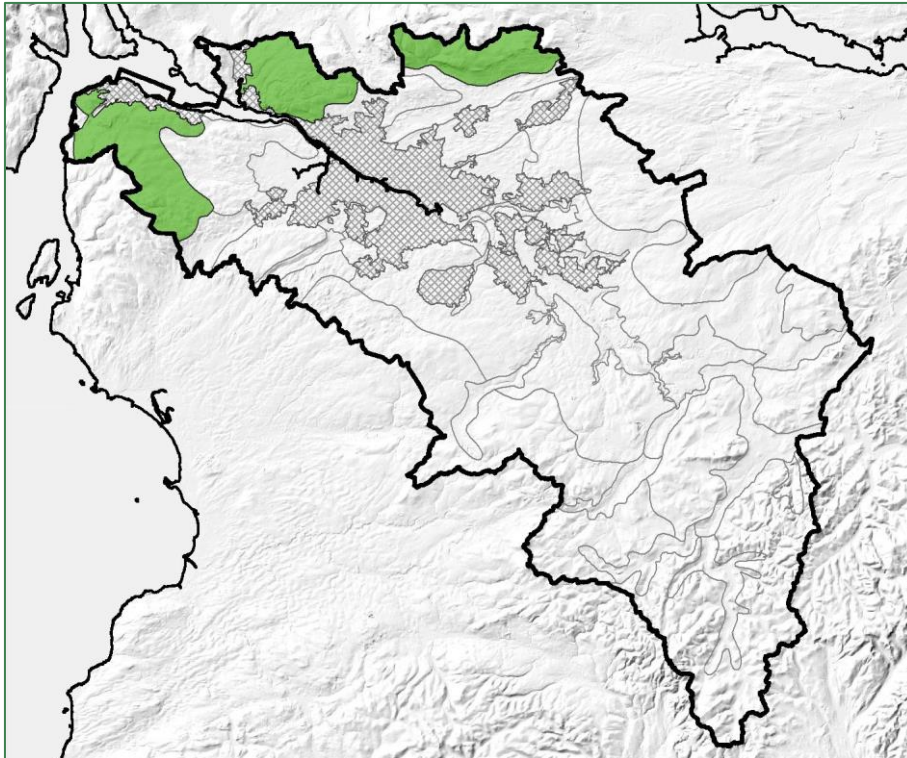
LCT 20 Rugged Moorland Hills

Location and Extent

5.288 This LCT extends across three large upland areas in the north of the core area. Each area is underlain by resistant basalt geology, leaving rugged moors with summits up to 500 m. The three areas are:

- Renfrewshire Heights within Inverclyde and Renfrewshire;
- Kilpatrick Hills within West and East Dunbartonshire; and
- Campsie Fells and Kilsyth Hills within East Dunbartonshire and North Lanarkshire.

Figure 5.19 Rugged Moorland Hills (refer to Figure 4.1 for more detail)



Key Characteristics

5.289 The key characteristics, features and qualities of this LCT, as defined in the GCVLCA, are:

- distinctive upland character created by the combination of elevation, exposure, rugged landform, moorland vegetation and the predominant lack of modern development;
- these areas share a sense of apparent naturalness and remoteness which contrasts strongly with the farmed and developed lowland areas; and
- presence of archaeological sites on hilltops and sides.

5.290 No significant changes to these key characteristics have been identified. There are few operating wind turbines in this LCT: there is a single small turbine at Dyke Farm, East Dunbartonshire, at the foot of the Kilpatrick Hills; and four small turbines on the fringes of the Renfrewshire Heights. There are operating wind farms to the north of the Kilsyth Hills, in Stirling.

Table 5.37 Assessment of LCT20 Rugged Moorland HillsRefer to **Table 3.2** for full details of the evaluation criteria.

	Lower sensitivity		↔	Higher sensitivity	
Landform and Scale					
	This is a large scale landscape. Relatively high summits for the study area, and emphasised by proximity to low-lying valleys and coastal areas. Often a simple landscape of moorland hills, there are occasional strong features within the hills, and distinctive scarp slopes along edges particularly along the Kelvin Valley.				
Land Cover					
	Open land cover of grass and heather moorland, without enclosure except remnant historic field boundaries, and at its farmed edges. Some areas of coniferous plantation but generally a landscape of simple landcover. Small areas of woodland are associated with gullies and coastal braes, and in more settled areas.				
Settlement and Man-made Influence					
	Very limited settlement except at its fringes. Human influence is limited to coniferous plantations and occasional reservoirs. Pylons cross the Kilpatrick Hills and Renfrewshire Heights and have a local influence. Densely settled areas lie very close to these landscapes, though this serves to highlight their relative lack of human influence.				
Movement					
	Movement is not a feature of this landscape, which is still and not traversed by roads or railways. From the edges of these areas there are views down into and across more settled areas, including roads, railways, and movement on the Clyde.				
Skylines					
	Skylines are generally simple, open and uninterrupted. However, more rugged features within the hills introduce complexity to the skyline in some areas. The skyline of the southern ridge is an important feature in wider views (see Intervisibility).				
Key Views, Vistas, Landmarks					
	These landscapes are open and offer long views across rolling plateaux. Within the hills are landmark features including distinctive scarps and hilltops. It is a landscape with several accessible viewpoints.				
Receptors					
	Though unpopulated, these areas have high levels of recreational use and many opportunities for outdoor access, due to their proximity to large population centres. The Renfrewshire Heights area is partly located within Clyde Muirshiel Regional Park. There are views of this LCT from numerous settled areas including the Kelvin Valley and the Clyde corridor.				
Inter-visibility with Adjacent Landscapes					
	The edges of these areas provide important backdrops to neighbouring landscapes. For example, the scarp of the Campsie Fells is essential to the setting of Lennoxton and the wider Kelvin Valley. There are broad views out from the high points within this landscape, both across the Clyde basin, as well as north from the Kilpatrick Hills to Loch Lomond.				
Natural and Cultural Heritage Features					
	There are a number of significant archaeological features within these hills, and on lower slopes, including a section of the Antonine Wall World Heritage Site to the south of the Kilpatrick Hills. Large parts of the extensive peatland and heather moorland within this landscape is protected for its natural heritage				

	Lower sensitivity	↔	Higher sensitivity
	value. There are small but important areas of native woodland.		
Perceptual Aspects			
	Wildness mapping (Figure 4.2) indicates that these areas have some of the strongest wildness character in the study area. Contrast with adjacent densely populated urban areas increases their sense of apparent naturalness.		

Sensitivity

- 5.291 Although the underlying landform and simple landcover of this LCT suggests lower sensitivity, the majority of characteristics indicate higher sensitivity to wind turbines. Key sensitivities include the higher level of recreation use within each of the three areas, and their relative wildness, in contrast to the nearby urban areas. These hills contain distinctive scarps which are highly visible in the wider landscape, and which provide important backdrops to the adjacent lowlands.
- 5.292 The steep scarp of the Campsie Fells and Kilsyth Hills contrasts with the Broad Valley Lowland (LCT10) and wider low-lying urban area immediately to the south. There are similar landscape relationships between the other hills and adjacent lowlands, e.g. between the Kilpatrick Hills and Vale of Leven; and between the Renfrewshire Heights and the raised beach landscapes. Wind turbines could interrupt these key relationships if placed on the edges of the hill groups, which are therefore the most sensitive part of this LCT.
- 5.293 Those areas which are set back from the highly visible edges of the hill groups are of locally reduced sensitivity, although turbine development in open, unforested interior locations could diminish the relative wildness which is a key characteristic of this LCT. Lower slopes will be less sensitive to small turbines where these would have more localised effects, and would not be seen to disrupt the scale of the hills in wider views.

Table 5.38 Sensitivity of LCT20 Rugged Moorland Hills

Turbine typology	Sensitivity
Small turbine (15-30 m to tip)	Medium
Small-medium turbine (31-50 m to tip)	High-medium
Medium turbine (51-80 m to tip)	High
Large turbine (81-120 m to tip)	High
Very large turbine (over 120 m to tip)	High

Landscape value

- 5.294 In Inverclyde and Renfrewshire, most of this LCT falls within the Clyde Muirshiel Regional Park, and a small area within this is designated as the West Renfrew Hills Scenic Area. The Regional Park is of high value for recreation as well as its natural heritage interests.
- 5.295 Large areas of this LCT are valued as local landscape designations. The Kilpatrick Hills is currently designated as a Regional Scenic Area by East Dunbartonshire and West Dunbartonshire Councils. The latter has developed a revised Local Landscape Area designation, with an accompanying detailed description of the area. The special qualities of the Kilpatrick Hills are described as:
- Strong sense of remoteness, wildness and open horizons;
 - Distinctive landforms; and
 - A unique diversity of views.

- 5.296 East Dunbartonshire and North Lanarkshire have also defined contiguous Regional Scenic Areas covering the Campsie Fells and Kilsyth Hills. While there is no published background to these specific designations, Stirling Council's proposed supplementary guidance on local landscape areas defines special qualities for the 'Southern Hills' which apply to these areas. The special qualities relevant to the study area include:
- Seemingly towering hills defining and confining adjacent lowland and conveying a strong sense of a physical barrier. Precipitous south facing slopes appear much higher and larger than they really are because of lack of scale indicators. Distinctive and dramatic rock outcrops and corrie landforms appear unassailable.
 - A sense of remoteness and isolation: The core, largely uninhabited, simple, large-scale landscapes still convey a sense of remoteness, despite the proximity of the whole hill mass to major settlements.
- 5.297 The Stirling Council document notes the impact of wind turbines on remoteness in particular, and highlights the sensitivity of the hills to further large-scale change.

Underlying capacity

- 5.298 The sensitivity of this landscape, combined with the high value placed upon it, suggest that this LCT has lower capacity for wind turbine development at all scales, with little or no capacity for medium turbines and no capacity for large or very large turbines.

Cumulative development and current residual capacity

Renfrewshire Heights area

- 5.299 There are several small and small-medium turbines consented in the Renfrewshire Heights area, mostly at the fringes of the LCT. One turbine is close to the summit of Burneven Hill, south of Gourrock, and there are two consented turbines near Cornalees. At the eastern edge, two medium turbines have been consented south of Port Glasgow. There are no proposed turbines in this part of the LCT. This LCT extends south into the buffer to where the operational Kelburn, Millour Hill and Wardlaw Wood wind farms are located.
- 5.300 The area is almost all within the Clyde Muirshiel Regional Park, and large-scale development is likely to be visible from across the Firth of Clyde, from Helensburgh and parts of the National Park. Capacity in this landscape is restricted to small-medium or small turbines, following the pattern of smaller-scale development at the edges of the area, and seeking to protect the remote qualities of the interior.

Kilpatrick Hills area

- 5.301 There are no consented or proposed turbines within the Kilpatrick Hills. The proximity of the Kilpatrick Hills to the National Park is an additional consideration for this part of the LCT.

Campsie Fells and Kilsyth Hills area

- 5.302 There are no consented or proposed turbines in the Campsie Fells and Kilsyth Hills. This LCT extends to the north into the buffer area: to the north of the Kilsyth Hills is an emerging cluster of wind turbine development including the operational Craigengelt and Earlsburn wind farms, and the consented Earlsburn North. These would not alter the underlying capacity of this landscape, which is already limited. The introduction of turbines within these hills could lead to cumulative effects on the landscape and views as perceived from areas to the north including the Carron Valley.

Constraints

- 5.303 Medium, large and very large turbine typologies are unlikely to be successfully accommodated within this landscape. The prominent scarp slopes and uplands associated with the LCT will render large turbines highly visible across the wider landscape. Some of the key skylines, for example the southern aspects of the Campsie Fells, Kilsyth Hills and Kilpatrick Hills, are of particular importance to the settlements and landscapes they overlook.
- 5.304 The northern aspect of the Kilpatrick Hills faces into the National Park, and there are long views to these hills from Loch Lomond. These views will be a key concern for any development in this location. Proposals must also give due consideration to the special qualities of Special Landscape Area designations across this LCT.
- 5.305 The Rugged Moorland Hills contain some of the highest levels of wildness in the study area. This is a highly valued resource given the close proximity to densely settled urban areas. Larger turbine developments within the hills, or prominently sited developments at all scales, would tend to erode this important aspect of this LCT.

Opportunities

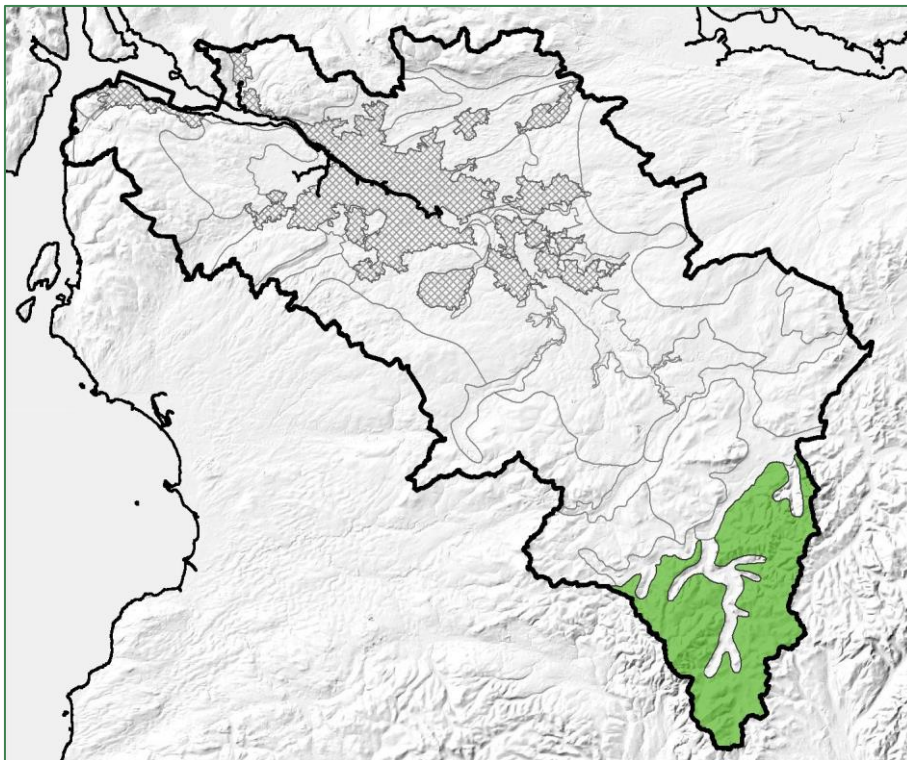
- 5.306 Single turbines or clusters (2-5 turbines) in the small or small-medium typologies could potentially be sited at the fringes of the LCT, where the open upland gives way to enclosed farmland and, in some areas, settlement fringe landscapes.
- 5.307 There will be limited locations where single turbines or groups of small or small-medium turbines, set well back from the prominent edges of these hills, can be sited in such a way that their visibility in the wider landscape would be reduced. Any proposals would need to demonstrate a high level of care in siting and design.
- 5.308 Within the Renfrewshire Heights and, to a lesser extent the Kilpatrick Hills, the outer edges of the LCT are more developed, and have important interfaces with the settled raised beach landscape along the Clyde. The fringes of this area are locally less sensitive to wind turbine development placed in the context of past and present engineering and industrial land uses, where features such as cranes were and still are a presence in views.

LCT 21 Southern Uplands

Location and Extent

- 5.309 This LCT occurs in the southern part of South Lanarkshire, covering the highest continuous group of hills in the core area (up to 575 m AOD). The Southern Uplands LCT extends into Dumfries and Galloway and the Scottish Borders, and is dissected by the Upland Glens (LCT14). The LCT lies to the south of the Southern Upland Fault which runs along the Duneaton and Clyde Valleys, between Crawfordjohn and Coulter.
- 5.310 The landscape is distinctly different to the moorlands further north, owing to the higher elevation and underlying geology. A sub-type, Southern Uplands with Forestry, is identified in the GCVLCA in recognition of the extensive areas of coniferous plantation.

Figure 5.20 Southern Uplands (refer to Figure 4.1 for more detail)



South Lanarkshire

- 5.311 The area covered by this LCT is primarily classified by the South Lanarkshire Landscape Character Assessment (**Figure 4.2**) as:
- Type 13 Southern Uplands; and
 - Type 14 Upland Glens.

Further information on the sensitivity and capacity of these landscapes can be found in the relevant sections of the South Lanarkshire Spatial Framework and Landscape Capacity for Wind Farms (2013).

Key Characteristics

- 5.312 The key characteristics, features and qualities of this LCT, as defined in the GCVLCA, are:
- large scale upland landscape with strong but smooth relief;
 - glacial carved and smoothed landforms, including U-shaped valleys, hanging valleys and corries;
 - extensive mosaics of heath and rough grassland;

- significant archaeological sites, particularly from the Bronze and Iron Age periods;
- prominent isolated conifers plantation and old stands of Scots pine; and
- largely undeveloped, except for occasional upland farms and shielings.

5.313 Since 1999, changes in forestry cover have occurred and the 152-turbine Clyde wind farm has been constructed in the eastern part of the LCT.

Table 5.39 Assessment of LCT21 Southern Uplands

Refer to **Table 3.2** for full details of the evaluation criteria.

	Lower sensitivity	↔	Higher sensitivity
Landform and Scale			
	This is an extensive, large-scale landscape. It comprises smooth, simple landforms: steep hills with rounded summits and subdivided by U-shaped valleys. The contrast with the lower moorland to the north emphasises the elevation of the hills.		
Land Cover			
	The open parts of this LCT are covered in rough grassland and occasional heather moor. It is an unenclosed landscape without field-boundary patterns. Plantation forestry is a major influence on some areas, with very extensive blanket plantations as well as smaller, occasionally distinctive, stands.		
Settlement and Man-made Influence			
	There is little settlement in the LCT, with occasional dwellings located within the glens. There are prominent masts and radar installations, for example on Green Lowther. Clyde Wind Farm covers a large area in the centre of this LCT, and the M74 exerts a localised influence on the areas surrounding the upper Clyde. Blanket coniferous forestry also reflects human influence in the area. In the south and east there are more extensive areas which are unaffected by such influences.		
Movement			
	The turbines of the Clyde Wind Farm and the M74/railway corridor introduce movement into this landscape. Elsewhere this landscape tends to be very still.		
Skylines			
	Skylines in this landscape are simple and open, formed by the rounded hills and high moors. Steep hill and valley slopes add variety when viewed on the skyline. Turbines and masts appear on the skyline in many views of the area.		
Key Views, Vistas, Landmarks			
	The hills of this LCT are high but not distinctive in form. Some of the more visible peaks are landmarks in views from the surrounding areas and from the M74. Views are channelled along valleys.		
Receptors			
	There are few receptors in this landscape, away from the M74 corridor and A702 tourist route. The Southern Upland Way passes through, and there is a museum and heritage railway at Leadhills. Several of the summits in this LCT, and within the adjacent areas, are popular with hill walkers.		
Inter-visibility with Adjacent Landscapes			
	The Southern Uplands form a backdrop for the Upland Glens (LCT14) as well as the Douglas (LCT12) and Clyde Valleys (LCT13). There are long views in and out of this landscape to the south and east, into contiguous areas of upland. There are also views of this upland area from Tinto (LCT15).		
Natural and Cultural			
	There are several bronze age and iron age hill forts on summits, and a Roman		

	Lower sensitivity	←→	Higher sensitivity
Heritage Features	Road passes through this landscape.		
Perceptual Aspects			
	The hills have a strong perception of remoteness and tranquillity though this is diminished locally by the presence of the M74. SNH wildness mapping indicates this as the most extensive area of wild character in the core area, particularly to the south and east with a number of relatively remote valleys.		

Sensitivity

- 5.314 The underlying landscape of this LCT indicates a lower sensitivity to wind turbines. The landscape is large in scale, open and extensive, and is generally uncomplicated. The landform does vary significantly, with some relatively dramatic vistas among the less distinctive hills. Within this LCT the M74 corridor is strongly human-influenced not only by the motorway and railway but also by the presence of masts and forestry. However, the wider part of this LCT is much less man-modified, and includes a number of more remote valleys and hills which display significant levels of wildness.
- 5.315 The areas to the north are more visible in the wider landscape. Conversely, the areas to the south and around the edges of the core area are less visible, but exhibit greater levels of wildness, especially on the high summits and remote glens away from the motorway.

Table 5.40 Sensitivity of LCT21 Southern Uplands

Turbine typology	Sensitivity
Small turbine (15-30 m to tip)	Medium-low
Small-medium turbine (31-50 m to tip)	Medium-low
Medium turbine (51-80 m to tip)	Medium
Large turbine (81-120 m to tip)	High-medium
Very large turbine (over 120 m to tip)	High-medium

Landscape value

- 5.316 Parts of this landscape are designated as Special Landscape Areas (SLA). The northern fringe of the LCT along the Clyde and the Culter Water Valley is part of the Upper Clyde and Tinto SLA. The special qualities of this area include:
- scenic qualities of a meandering river in a broad semi-upland valley setting that contrasts with the enclosing hills of the Southern Uplands;
 - vast areas of heather moorland and rough grasslands;
 - many signs of prehistoric settlement in the hills; and
 - frequently visited as it is traversed by major transport routes to the south, and includes popular hillwalking destinations such as Culter Fell.
- 5.317 The area south-west of the M74 corridor forms the Leadhills and Lowther Hills SLA. The special qualities of this area include:
- extensive area of high, smooth, rolling hills and varied upland glens;
 - sense of emptiness engendered by a lack of extensive forestry or wind farm development;

- cultural features including mining heritage around Leadhills; and
- Southern Upland Way and other walking routes accessible via the M74 and main roads.

Underlying capacity

- 5.318 Based on the sensitivity of the landscape, and the value placed upon it, this LCT has moderate capacity for development at large or very large scales, though capacity for medium, small-medium and small turbines is limited by cumulative effects. This finding is moderated by the level of operational and consented development in different areas of the LCT, as set out in the paragraphs below. Capacity is lower in areas within local landscape designations.

Cumulative development and current residual capacity

East of the Clyde and Daer Water

- 5.319 The Clyde Wind Farm, comprising 152 turbines, occupies a large area at the centre of this LCT, lying to the east of the upper Clyde Valley. The wind farm is split into several groups of turbines, with the largest groups located on either side of the M74, and smaller groups along ridges to the north. These turbines are in the 'very large' typology at 125 m to tip. To the east of this area, within Scottish Borders, is the Glenkerie Wind Farm.
- 5.320 There are undetermined proposals for a 57-turbine extension to Clyde, to the north-east of the operational turbines, as well as a proposed western extension to Glenkerie, and the Earlshaugh proposal east of the Tweed. There are smaller proposed extensions to the south-west of Clyde at Lion Hill and Crookedstones. Including consideration of these proposals, there is limited further capacity for development in this area, which will be restricted to further extensions. In particular, it is important that new schemes do not have the effect of closing existing gaps between the current proposals. Development further north than the operational turbines would begin to have a greater effect on the landscapes around Tinto (LCT15) and the Broad Valley Upland (LCT13).
- 5.321 The presence of the large Clyde turbines on high ground limits the capacity for small or small-medium development within the valleys or lower-lying areas, due to the scale contrasts which would arise.

West of the Clyde and A702

- 5.322 There are currently no operational turbines west of the upper Clyde and Potrail Water. An application for a 14-turbine scheme at Windy Dod to the north-west of Leadhills has been submitted, located at the edge of this LCT and the adjacent Duneaton Water Valley (LCT14). There are no operational and proposed wind farms within this hill group where it extends west into Dumfries and Galloway. There is some potential capacity in this area, albeit limited, where small discrete groups of turbines could be located, subject to careful site selection to minimise cumulative effects. In particular, cumulative impacts arising from interactions with Clyde wind farm should be avoided as far as possible.

South of Wintercleugh

- 5.323 There are currently no operational turbines to the south of Wintercleugh at the head of the Daer Water. Beyond the South Lanarkshire boundary is the large Harestanes wind farm, and a proposed extension to the north of Queensberry. Further development in this area could result in the closing of the gap between Clyde and Harestanes. Capacity in this area is therefore considered to be very limited, and any development would need to be very carefully sited to avoid cumulative interactions with either or both of these schemes.

Constraints

- 5.324 It is considered that the eastern and southern parts of this LCT represent a landscape which is approaching the point where cumulative effects will begin to limit any further capacity. Cumulative effects will be the key consideration for further development in this area.
- 5.325 It would be preferable to retain an undeveloped area in the south, to ensure the maintenance of a gap between Clyde and Harestanes.
- 5.326 The development of small or small-medium turbines risks dispersing cumulative effects across a wider area of the LCT, extending development into valleys as well as the hilltops. The development of small or small-medium turbines can lead to visual confusion when seen in combination with much larger operational and proposed turbines.
- 5.327 Proposals must give due consideration to the special qualities of Special Landscape Area designations in this LCT.

Opportunities

- 5.328 There is some capacity for additional large turbines within this landscape, though a key aim must be to avoid extending development across the entire LCT. Opportunities in the east of the LCT will be limited to extensions to the existing and proposed schemes.
- 5.329 In the western part of the LCT, there is some potential opportunity for further discrete developments to be sited in such a way that they do not converge with Clyde wind farm or other developments.

Summary of underlying landscape sensitivity and capacity

5.330 **Table 5.41** presents a summary of the findings of landscape sensitivity across the core area. This table presents the underlying sensitivity, based on the analysis of landscape characteristics, and not taking into account landscape value or future development. This is included within capacity, see **Table 5.42**. Sensitivity to each height range is mapped in **Figures 5.21** to **5.25**.

Table 5.41 Summary of underlying landscape sensitivity

LCT	Turbine size				
	S	SM	M	L	VL
1 Raised Beach	M	HM	H	H	H
2 Alluvial Plain	L	L	ML	M	H
3 Urban Greenspace	M	HM	H	H	H
4 Rolling Farmland	ML	ML	M	HM	H
5 Plateau Farmland	L	ML	M	HM	HM
6 Rugged Upland Farmland	M	M	HM	H	H
7 Fragmented Farmlands	L	L	ML	HM	H
8 Incised River Valleys	M	HM	HM	H	H
10 Broad Valley Lowland	ML	M	HM	H	H
11 Broad Urban Valley	L	ML	HM	H	H
12 Upland River Valley	M	HM	H	H	H
13 Broad Valley Upland	ML	M	HM	H	H
14 Upland Glen	L	M	HM	H	H
15 Foothills	ML	M	H	H	H
16 Drumlin Foothills	L	ML	HM	H	H
17 Old Red Sandstone Hills	M	HM	HM	H	H
18 Plateau Moorlands	ML	ML	M	HM	HM
19 Moorland Hills and Ridges	M	HM	H	H	H
20 Rugged Moorland Hills	M	HM	H	H	H
21 Southern Uplands	ML	ML	M	HM	HM

L = low : **ML** = medium-low : **M** = medium : **HM** = high-medium : **H** = high

Summary of landscape capacity

- 5.331 **Table 5.42** presents a summary of the capacity of the landscapes within the core area to absorb further development. This is reported as underlying capacity, based on the underlying landscape sensitivity and value, and current residual capacity, which takes into account the level of operational, consented and proposed wind energy development in each LCT. The difference between underlying capacity and current residual capacity is discussed further in the methodology (**Section 3**). The areas into which the LCTs have been subdivided for the purpose of reporting current residual capacity are shown on **Figure 5.26**.
- 5.332 This summary table is provided for summary and comparison purposes only, and should not be consulted without reference to the detailed statements of capacity in relation to each LCT and area which are presented in **Section 5**.

Table 5.42 Summary of landscape capacity

LCT	Underlying capacity	Areas (if defined)	Current residual capacity
1 Raised Beach	Lower capacity for wind turbine development, with no capacity at medium, large or very large scales	Inverkip area	Some capacity for small turbines only
		Inner Firth areas	As underlying capacity
2 Alluvial Plain	Higher capacity for wind energy development at small, small-medium or medium scales, and potentially some capacity for large turbines, though little or no capacity for very large turbines	N/A	As underlying capacity
3 Urban Greenspace	Low capacity for wind energy development at all scales, limited opportunities for small turbines	N/A	As underlying capacity
4 Rolling Farmland	Moderate capacity for small and small-medium turbines. Little capacity for medium or large turbines and no capacity for very large turbines	Kirkintilloch and Cumbernauld area	A moderate level of capacity for small or small-medium turbines remains, with limited capacity for medium or large turbines and no capacity for very large turbines
		Blantyre area	Limited capacity for turbines in this area, restricted to the small typology
		Lanark area	Capacity in this area is very limited for all but the small typology

LCT	Underlying capacity	Areas (if defined)	Current residual capacity
5 Plateau Farmland	Moderate to higher overall capacity for wind turbine development at a range of scales, up to large typology	Barrhead to East Kilbride area	Lower capacity for all turbine scales, except for small or small-medium
		East Kilbride to Strathaven area	Capacity for large or very large turbines is very limited in this area, though there is some further capacity for small, small-medium or medium turbines.
		Lesmahagow area	Approaching the limit of capacity: remaining capacity for medium, large or very large turbines is reduced in this area
		Cumbernauld to Airdrie area	Limited scope for large or very large turbines, associated with areas of locally reduced sensitivity. Moderate capacity remains for small, small-medium, or medium turbines.
		Airdrie to Shotts area	Moderate capacity remains for small, small-medium or medium turbines, and lower capacity for large or very large turbines.
		Carluke, Auchengray and Newbigging area	There is low residual capacity for further wind farms in this area, and low to moderate capacity for single turbines at all scales No capacity for medium, large or very large turbines in the area south-east of the A70
6 Rugged Upland Farmland	Moderate to lower capacity for wind energy development at small or small-medium scales, with limited capacity for medium or large development and no capacity for very large turbines	Neilston area	As underlying capacity
		Renfrewshire area	As underlying capacity
		Strathgryffe area	Limited capacity for medium turbines and no capacity for large or very large turbines

LCT	Underlying capacity	Areas (if defined)	Current residual capacity
7 Fragmented Farmlands	Higher capacity for small and small-medium turbines, moderate capacity for medium turbines, and lower capacity for large or very large wind turbines	N/A	As underlying capacity
8 Incised River Valleys	Lower capacity for wind turbine development at small, small-medium and medium scales, and no capacity for large or very large turbines	N/A	As underlying capacity
10 Broad Valley Lowland	Moderate to lower capacity for small or small-medium turbine sizes, little capacity for medium turbines, and no capacity for large or very large turbines	N/A	As underlying capacity
11 Broad Urban Valley	Moderate capacity for small or small-medium turbines, lower capacity for medium turbines, and little or no capacity for large or very large turbines	N/A	As underlying capacity
12 Upland River Valleys	Lower capacity for wind turbine development at all but small scale, with no capacity for medium, large or very large turbines	Inverkip area	As underlying capacity
		Levern Valley	As underlying capacity
		Upper Avon Valley	Some remaining capacity for small or small-medium turbines
		Douglas Valley	Little or no capacity for further development
		Duneaton Valley	As underlying capacity
13 Broad Valley Upland	Lower capacity for wind energy development at small and small-medium scales, with little or no capacity for turbines of medium, large or very large scales	N/A	As underlying capacity
14 Upland Glen	Moderate to lower capacity for small or small-medium development, and lower capacity for turbines of medium, large and very large sizes	N/A	Some limited remaining capacity for carefully sited small, small-medium or medium proposals, but little or no capacity for large or very large turbines

LCT	Underlying capacity	Areas (if defined)	Current residual capacity
15 Foothills	Lower capacity for small or small-medium turbines across this LCT, with little or no capacity for medium, large or very large turbines	Tinto area	No capacity for small-medium, medium, large or very large turbines
		Biggar and Elsrickle area	As underlying capacity
16 Drumlin Foothills	Moderate capacity for small or small-medium turbines, with some capacity for medium turbines, and little or no capacity for large or very large wind turbines	N/A	As underlying capacity
17 Old Red Sandstone Hills	Low capacity for wind energy development at all scales, with little or no capacity for medium turbines and no capacity for large or very large sizes	N/A	As underlying capacity
18 Plateau Moorlands	Moderate to higher capacity for medium turbines, and moderate capacity at large or very large scales	Harelaw Dam to the Avon Valley	Potential capacity for development which is set back from the ridge
		Avon Valley to the Duneaton Water	Limited remaining capacity in the area should all proposals be constructed
		Forth area	Limited further capacity, though there is capacity for extension schemes
		Cumbernauld to Shotts area	Moderate capacity for further turbines at a range of scales: development must be carefully sited and designed to avoid coalescence
19 Moorland Hills and Ridges	Lower capacity for small or small-medium wind turbine development, with no capacity for medium, large or very large development	N/A	As underlying capacity
20 Rugged Moorland Hills	Lower capacity for wind turbine development at all scales, with little or no capacity for medium turbines and no capacity for large or very large turbines	Renfrewshire Heights	Restricted to small-medium or small turbines at the edges of the area
		Kilpatrick Hills	As underlying capacity
		Campsie Fells and Kilsyth Hills	As underlying capacity

LCT	Underlying capacity	Areas (if defined)	Current residual capacity
21 Southern Uplands	Moderate capacity for development at large or very large scales, though capacity for medium, small-medium and small turbines is limited by cumulative effects	East of the Clyde and Daer Water	Limited further capacity, restricted to extensions
		West of the Clyde and A702	Some limited capacity for small, discrete groups of turbines subject to careful site selection to minimise cumulative effects
		South of Wintercleugh	Very limited due to potential for cumulative effects

6 Strategic Cumulative Assessment

Introduction

- 6.1 This section presents an overview of current and potential future cumulative effects of wind turbines across the GCVSDP area. It is not an impact assessment, in that it does not attempt to examine every potential cumulative impact. Rather, the assessment seeks to examine regional patterns of development, including consideration of existing and emerging clusters of development, and undeveloped areas which remain between such clusters. The assessment seeks to recommend where future development could be fitted into this pattern, either by building on existing clusters or by protecting important open areas.
- 6.2 The methodology for the assessment is set out in **Section 3**. The assessment only considers turbines of over 50 m to tip height (i.e. medium, large or very large turbines), and considers two 'scenarios': firstly operational and consented developments which form a baseline of acceptable impact; and secondly operational, consented and proposed developments. The latter scenario is speculative, since it includes undetermined proposals, but it reflects the current pattern of development pressure.
- 6.3 The assessment has been informed by examination of cumulative zone of theoretical visibility (CZTV) maps and comparison with the assessed sensitivity of the landscape, and by examination of potential cumulative impacts on views from a number of representative viewpoints and routes across the study area.

Patterns of development

- 6.4 Turbine development over 50 m is concentrated, broadly in the south and north-east of the study area. Considering operational development, there are essentially three main clusters of development:
- One group is centred on Whitelee, and extends to Neilston and Middleton in the north-east, Cathkin Braes and Blantyre Muir in the north, and Hagshaw Hill in the south;
 - The second group is somewhat looser, centred on Black Law and including Muirhall, Pates Hill, and Greendykeside; and
 - Clyde wind farm forms a group of its own in the south, with Glenkerie to the east.
- 6.5 These groups are almost wholly within the Plateau Moorland, Plateau Farmland and Southern Uplands LCTs.
- 6.6 Within the buffer, there are clusters of development at: Ardrossan, Kelburn and Millour Hill to the west; Craigengelt and Earlsburn to the north; and Harestanes to the south.
- 6.7 Consented development will serve to consolidate these three areas, rather than significantly expand them. The main change is the number of consented single turbines of over 50 m, mainly in the Plateau Farmland (LCT5).
- 6.8 Proposed development is also largely within these three groups, though the locations of some consented and proposed wind farms may begin to close the present gap between Hagshaw Hill and Clyde. A new, separate cluster of development is emerging to the south, around New Cumnock and Sanquhar in the buffer area.
- 6.9 Almost all of the operational, consented and proposed development is located south and east of Glasgow, within East Renfrewshire, North Lanarkshire and South Lanarkshire. The remaining council areas host very few developments of this scale.

Examination of CZTVs

- 6.10 The cumulative ZTV for operational and consented turbines is shown in **Figure 6.1**. This indicates that the highest levels of theoretical turbine visibility do not necessarily coincide with the highest levels of development. The areas with most visibility of turbines lie in the centre of the study area, broadly the area between Whitelee and Black Law, and including the flanks of Clydesdale. High visibility occurs on the higher ground, with relatively low or no visibility within valley areas.
- 6.11 High levels of visibility also occur in the north of the study area, across the Kilpatrick Hills and Campsie Fells (LCT20), and the Drumlin Farmlands (LCT16) between them. There are intermittently high levels of visibility across Glasgow, but these are likely to be largely screened by buildings.
- 6.12 There are lower levels of visibility across Inverclyde and much of Renfrewshire and East Renfrewshire, though south-facing areas have visibility, attributable to Ardrossan and Kelburn, and Whitelee. The area around Clyde wind farm and across the Southern Uplands (LCT21) also indicates relatively much lower visibility.
- 6.13 The cumulative ZTV for operational, consented and proposed turbines is shown in **Figure 6.2**. This indicates a very similar pattern of relative visibility, due to the overall patterns of development remaining similar, as noted above. There is a notable intensification of visibility across the Plateau Moorland (LCT18) and Plateau Farmland (LCT5) in North Lanarkshire, and across the higher parts of these types within South Lanarkshire.
- 6.14 There remains more limited visibility of large turbines in Inverclyde and Renfrewshire, and northern parts of West Dunbartonshire, as well as along the upper Clyde Valley and around Biggar.

Comparison of CZTVs and sensitivity

- 6.15 Overlaying the cumulative ZTV for operational, consented and proposed turbines onto the mapped underlying sensitivity seeks to highlight areas of higher sensitivity which are experiencing extensive cumulative visibility. This is shown in **Figure 6.3**, using the underlying sensitivity to medium turbines as an indicator of relative sensitivity across the core area. It must be noted that the cumulative ZTV shows theoretical visibility only, and does not show areas where cumulative impacts are necessarily occurring. However, it does provide a useful indication, at a regional scale, of where such impacts are most likely to arise.
- 6.16 The cumulative ZTV, including proposed turbines, in **Figure 6.3** shows that the greatest levels of theoretical visibility will occur across the Plateau Moorland (LCT18) and Plateau Farmland (LCT5). This is to be expected since these landscapes will host the greatest numbers of turbines. These are landscapes of medium sensitivity. Other landscapes which will experience high levels of visibility include parts of the Rolling Farmlands (LCT4) (medium sensitivity), and the Fragmented Farmland (LCT7) (medium-low).
- 6.17 High levels of cumulative visibility will also occur within more sensitive landscapes. In the Foothills (LCT15), the western slopes of Tinto in particular show concentrations of theoretical visibility (refer to viewpoint 18 in **Appendix 2**). The western Pentlands area also shows relatively high levels of visibility. Parts of the Clyde Valley, within the Incised River Valley (LCT8), indicate high levels of visibility from upper side slopes, though in reality these would be largely filtered by trees in this wooded landscape. More open views of multiple turbines are indicated in the Drumlin Foothills (LCT16) and Rugged Moorland Hills (LCT20) across the north of the core area, though these landscapes are more distant from operational and proposed turbines (refer to, e.g. viewpoints 4 and 5 in **Appendix 2**).

Examination of viewpoints

- 6.18 A series of 21 viewpoints across the study area was selected and agreed with the steering group. These are listed in **Table 4.3** and are shown on **Figure 4.5**.
- 6.19 The CZTV maps, and the underlying visibility data on which they are based, were examined to identify consented and proposed development which may be visible from these locations in future. No wireframe visualisations have been generated as part of the study.
- 6.20 The 21 viewpoints are individually described in **Appendix 2**. For each location, the existing view is briefly described, and the operational, consented and proposed wind energy developments which are or will be visible are noted. Observations are made on the pattern of development and remaining open areas, and the potential benefit of maintaining undeveloped areas.
- 6.21 In general, the patterns outlined above are represented in the viewpoint analyses. The viewpoints in the northern part of the study area have much less visibility of turbines than those in the south. While there is some potential for cumulative effects to occur at the northern viewpoints, the main observations relate to the southern areas.
- 6.22 As noted above the pattern of development can be divided into three broad groups. Several of the viewpoint analyses highlight the importance of the gaps between these groups in views. In particular, several of the locations reveal the importance of the area between Tinto, the Southern Uplands, and the Pentlands in preventing the coalescence of these groups.

Routes

- 6.23 The following sections discuss potential sequential cumulative effects on key routes through the study area, again focusing firstly on operational and consented development, then proposed development. The aim is to identifying any strategic undeveloped areas, the retention of which would reduce the potential for cumulative effects. Routes are shown on **Figure 6.4**.
- 6.24 Major routes within the study area are generally restricted to lowlands and valleys, and there are fewer locations on routes where broader views of the landscape are seen.

Road routes

- 6.25 In the north and west of the study area, where there are fewer large turbines, main routes have limited visibility of turbines, and this is not considered likely to change based on the observed patterns of development pressure. There are currently no large turbines which affect the experience of travelling on routes in the north-west of the study area, including the A82 through Strathleven, the A78 around Inverclyde, and the western M8. The A737 enables views of turbines to the south, at Ardrossan and Kelburn/Millour Hill, but these decrease in the study area and there are no turbines to the north.
- 6.26 Entering the study area from the west, the A736 has limited views of turbines, though the M77 enables views of Whitelee and associated sites, as well as more distant views to Ardrossan and Millour Hill. Proposed development may intensify views in this locality, but these are limited to the area around the East Renfrewshire boundary, and so sequential effects will be limited.
- 6.27 There are no views of operational or proposed turbines which would affect views from the main routes within the central Clyde basin, including routes across Renfrewshire and Glasgow city
- 6.28 Along the M80 and A803 routes entering the study area from the north-east, there are views of Craigmelt and Earlsburn within the buffer area. Passing through North Lanarkshire there will be views of consented development at Greengairs, and large single turbines in this area. The undeveloped skyline of the Campsie Fells is to the north.
- 6.29 From the M8, there are views of Torrance wind farm entering the study area, then views of Whitelee and Blantyre Muir to the west, and glimpses of Black Law to the south. Proposed development would add Hartwood wind farm and some single turbines to the view. However, the affected section of the overall route is short.

- 6.30 In this area sequential effects may be more noticeable along the A89 and A71. The A89 passes relatively close to Torrance and the consented Burnhead, then the emerging cluster of development around Greengairs/Greendykeside, and with views of other large operational, consented and proposed single turbines.
- 6.31 The A71, entering the study area from the east, passes Pates Hill, Tormywheel (consented) and Black Law, all at relatively close range. In this area proposed development would add Harburnhead to the east, and Hartwood to the north. Continuing along the A71, there will be long views of several developments to the west and south-west, including Whitelee and Lochhead. Through Stonehouse and Strathaven the route tends to be set within a valley, though there are some views to Calder Water, Bankend Rig and other schemes. Proposed developments at Kype Muir and Dungavel will also be seen.
- 6.32 To the north of the A71, the routes linking Strathaven with Hamilton and East Kilbride cross open farmland with views of single turbines at close range, and numerous larger developments on the moorlands.
- 6.33 The M74 already passes several developments on uplands and moorlands, with Hagshaw, Nutberry, Clyde and Harestanes all clearly visible from the route, as well as single turbines and small groups closer at hand, including Lochhead. The consented and proposed developments would add to the number of turbines visible, but the motorway is not considered to be particularly sensitive. Of more importance to this high-speed route are the gaps between Harestanes, Clyde and (consented) Andershaw.
- 6.34 The A72 is the more sensitive route within the Clyde Valley, and is set within the more incised section with limited views. The A721 and A706 cross the more open farmland, passing close to Black Law to the north, and with views over the Clyde to wind farms in the west. The A706 passes through Tormywheel, as well as several operational and proposed single turbines. There are views of Muirhall and the proposed Calla scheme from both routes. From the A721 visibility of turbines greatly reduces to the east of Carnwath and into the Borders.
- 6.35 The nearby A70 enters the study area from the north, passing Muirhall wind farm and consented turbines at Burnhouse. South of Hyndford Bridge the A70 follows elevated land with long views north to Black Law and east to Hagshaw Hill. After crossing the M74 the route is within the narrow Douglas Valley, although Hagshaw remains visible to the north. Proposed development is located along this route, including Harburnhead and Fauch Hill to the north, Calla near Carnwath, and several developments which would be visible from the Rigside area, including Broken Cross Muir, Poniel and Dalquhandy.
- 6.36 The A702 enters the study area from the north-east, with little or no view of turbines along the south side of the Pentlands and through Biggar all traverse the area between the Pentlands, Tinto and the Southern Uplands, and enable views of Tinto in its landscape setting. The A702 between Biggar and Abington, and the A73 around to Hyndford Bridge, allow views of the northern part of Clyde wind farm to the south, though to the north-west the prominent undeveloped skyline of Tinto can be seen. South of the M74 the southern parts of Clyde wind farm are visible on entering the study area from the south. Proposed developments are unlikely to change this pattern, though there may be glimpses of the Clyde extension.

Rail routes

- 6.37 There are a number of rail routes through the study area, which often broadly follow road routes but offer a different experience of the landscape. There are few views of turbines in the north of the core area, including from the Inverclyde Line south of the Clyde and the North Clyde Line through Milngavie, Clydebank, Dumbarton and Balloch. To the south-west of Glasgow the Ayrshire and South Western lines run in the Black Cart and Lovern Valleys respectively. There are some glimpsed views of turbines at Neilston from the latter but otherwise views of turbines are limited.
- 6.38 The main Edinburgh to Glasgow route, via Falkirk, also has limited visibility of turbines within the core area. The Airdrie-Bathgate and Shotts lines enable greater visibility of turbines across the Plateau Farmland (LCT5) and Plateau Moorland (LCT18) in North Lanarkshire, with close views of wind farms including Torrance, Black Law and Pates Hill, although often filtered by trackside vegetation.

- 6.39 Black Law is also viewed from the West Coast Main Line, in the area around Carlisle where it passes through the Plateau Farmland (LCT5). Whitelee is also viewed from here, as well as a number of other developments along the Clyde Valley to east and west. The Edinburgh to Carlisle Line has close views of Pates Hill and Muirhall wind farms, as well as Black Law in the distance, and will also enable views of Tormywheel, Harburnhead and Crofthill, among others. Continuing south on the West Coast Main Line, there are fewer views of turbines as the route passes east of Tinto, until Clyde wind farm appears to the south. As with the M74, Clyde is a significant presence in views over a considerable stretch of the route.

Summary

- 6.40 The analysis of routes indicates that sequential cumulative effects are occurring, and are likely to continue to occur, principally along routes through South and North Lanarkshire. Routes which cross the Plateau Farmland (LCT5) generally have the most open views, with turbines on either side of the Clyde Valley being visible. The analysis highlights the importance of the western Pentlands, Tinto and the Clyde Valley around Biggar as a significant area without development. Along the M74, which enables views of more wind farms than any other route, the strategic gaps are between Clyde and Andershaw, and more substantially between Clyde and Harestanes to the south.

Conclusions

- 6.41 The strategic cumulative assessment indicates that a distinct pattern of development has emerged within the Glasgow and Clyde Valley area. It is notable that this pattern has largely followed the distribution of lower sensitivity landscapes as identified in the Ayrshire and Clyde Valley Windfarm Landscape Capacity Study (2004). There is also a close correspondence between these areas and the defined broad areas of search as set out in the GCVSDP (see **Section 2.16**).
- 6.42 The present study largely confirms this pattern of underlying sensitivity, as shown in **Figures 5.21 to 5.25**. For the very large turbine size, relatively lower sensitivity is identified for the Plateau Farmland (LCT5), Plateau Moorland (LCT18) and Southern Upland (LCT21). Considering large turbines, relatively lower sensitivity is also assessed for the Rolling Farmland (LCT4), Fragmented Farmland (LCT7) and Alluvial Plain (LCT2). For medium turbines, the lowest sensitivity is found in the urban-fringe landscapes of the Alluvial Plain (LCT2) and Fragmented Farmland (LCT7), with highest sensitivity reserved for the prominent hills of the Rugged Moorland Hills (LCT20) and Foothills (LCT15), and the Upland River Valleys (LCT12). For small-medium and small turbines a similar pattern is identified, though with reducing levels of relative sensitivity, reflecting the likely reduced impacts of smaller turbines.
- 6.43 The capacity study examined the level of cumulative development within the landscape, and found that there is residual capacity in some of these lower sensitivity landscapes, but that the capacity threshold is being approached in others. **Table 5.42** summarises the levels of underlying and current residual capacity, indicating that there is highest landscape capacity for turbines in the Alluvial Plain (LCT2), Plateau Farmland (LCT5), Fragmented Farmland (LCT7), with moderate or lower levels of capacity identified for several other LCTs. Current residual capacity within these LCTs varies significantly, particularly in areas which are already hosting higher levels of cumulative development.
- 6.44 The strategic cumulative assessment focuses on cumulative effects on views, noting that generally, the proposed developments will be seen in the context of existing or consented developments. There are few areas where the observed pressures are expanding wind farms into previously undeveloped parts of the core area (although it is noted that unsuccessful proposals have been brought forward in such areas in the past).
- 6.45 The present pattern of loose clusters on either side of the Clyde Valley, upstream of Glasgow, and in the Southern Uplands, is one which is likely to continue to manifest in future applications. Maintenance of this pattern of development would assist in restricting the spread of cumulative impacts into new areas. The study has highlighted the importance of the undeveloped landscape of Tinto, Black Mount and the western Pentlands as a strategic gap between the three identified clusters. The Campsie Fells, Kilsyth Hills and Kilpatrick Hills to the north together provide an important backdrop to the landscapes of the Clyde basin, and also serve as a strategic gap

between wind farm developments in North Lanarkshire, and those on the north side of the Campsie Fells and Kilsyth Hills which are visible from Stirling.

- 6.46 In concentrating the pattern of development, it is recognised that some landscapes are approaching their cumulative capacity. Within the core area, areas of the Plateau Moorland, Plateau Farmland and Southern Uplands LCTs are reaching the point at which cumulative effects are likely to limit the potential for further development.
- 6.47 Within the Plateau Farmland the construction of single turbines and small groups of turbines, at varying scales, is leading to significant effects on landscape character, most notably in the area around Kirkmuirhill and Lesmahagow. In the Plateau Moorland, the development of medium and large wind farms is resulting in several areas having development on several adjacent hill groups, as is the case around the upper Avon. The eastern part of the Southern Uplands LCT is almost entirely filled by the Clyde and proposed Clyde extension developments.
- 6.48 Other areas are experiencing lesser cumulative effects, particularly in the north and west where there are fewer large developments. Maintenance of the present pattern of clusters seeks to retain these areas as undeveloped gaps on a regional scale.

Appendix 1

Review of wind energy sensitivity in neighbouring areas

This appendix presents a summary of the review of available wind energy sensitivity and capacity studies, and other locational guidance, published by the planning authorities which lie adjacent to the SDP area.

Argyll and Bute

A wind energy capacity study for Argyll and Bute was published in 2012. This included an assessment of landscape and visual sensitivity, as well as landscape value, and was based on an updated landscape character assessment of the area. The 15 km buffer covers the fringes of the Firth of Clyde including part of Bute, eastern Cowal, Rosneath and the Helensburgh area. The LCTs within these areas are mostly assigned high sensitivity to large and medium turbines, and high or high-medium sensitivity to small-medium turbines. The Ridgeland and Farmland landscapes are considered to have medium sensitivity to small turbines.

Loch Lomond and the Trossachs National Park

The National Park Authority have prepared Supplementary Planning Guidance (SPG) on renewable energy development.³⁹ This suggests there is limited potential for wind power development in the National Park, restricted to “*some opportunities to locate single wind turbines up to 15m high*” and “*limited opportunities to site single wind turbines up to 30m high*” (paragraphs 5.4-5.5). The SPG does not provide locational guidance for wind turbines, but offers general advice on what is likely to be acceptable.

Given the protected status of the National Park, and the limited potential identified, it can be assumed for the purposes of this study that the landscape is of the highest sensitivity. The SPG also refers to wind energy development outside the National Park boundary, which may have an adverse effect on its landscape setting.

Stirling

The 15 km buffer includes Strathblane, the Campsie Fells/Fintry Hills/Touch Hills, and the Carse of Forth as far north as Bridge of Allan.

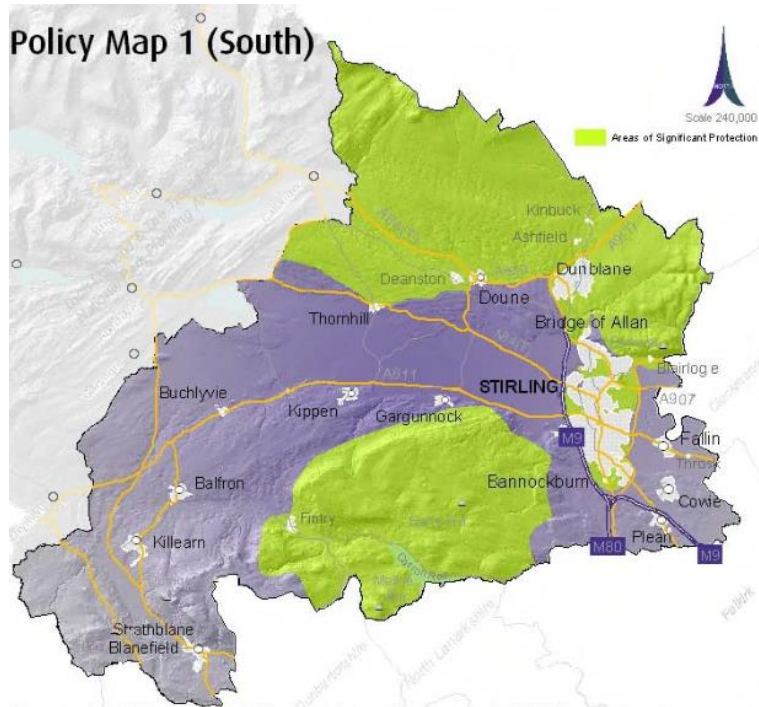
A 2007 capacity study for wind energy development examined the Stirling landscape.⁴⁰ The study comprised an area-wide analysis of landscape capacity, together with landscape character based siting and design guidance. The study defines capacity through a series of detailed analyses of landscape and views, and identifies areas with no capacity for different development typologies. The level of capacity for further wind farm development is considered to be limited, particularly in the hill ranges which lie in the 15 km GCV buffer area.

Subsequently, Stirling Council adopted a wind turbine SPG in 2011. The SPG identifies ‘areas of significant protection’, including the hills between Fintry and Stirling. Areas of search for smaller turbines are identified in Strathblane and south of Stirling, and for larger turbines in the lower Forth Valley. The SPG refers to the capacity study for landscape and visual guidance.

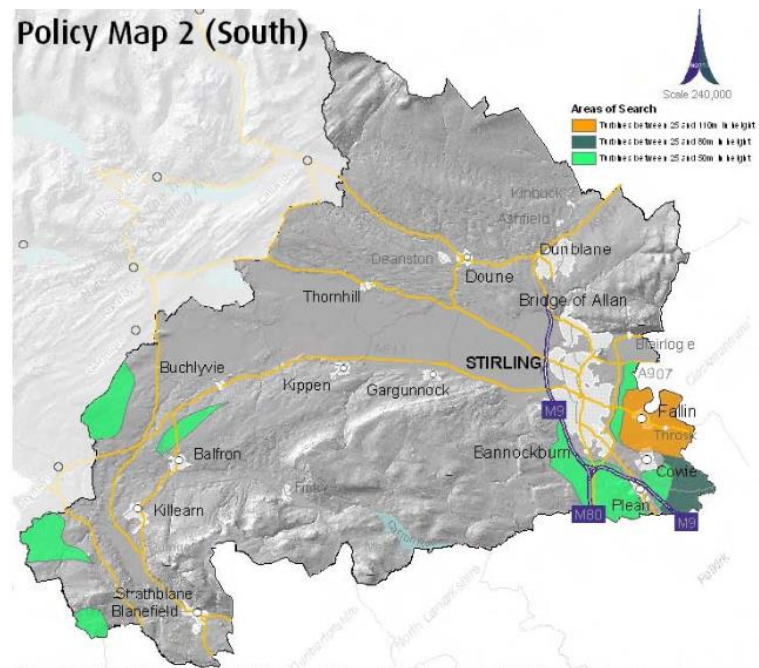
³⁹ Loch Lomond and the Trossachs national Park Authority (n.d.) Supplementary Planning Guidance: Renewable Energy.

⁴⁰ Horner + McLennan (2007) *Stirling landscape sensitivity and capacity study for wind energy development*. Stirling Council, SNH and LLTNPA.

Figure A1.1 Stirling Wind Energy SPG Policy Maps



Areas of significant protection (green).



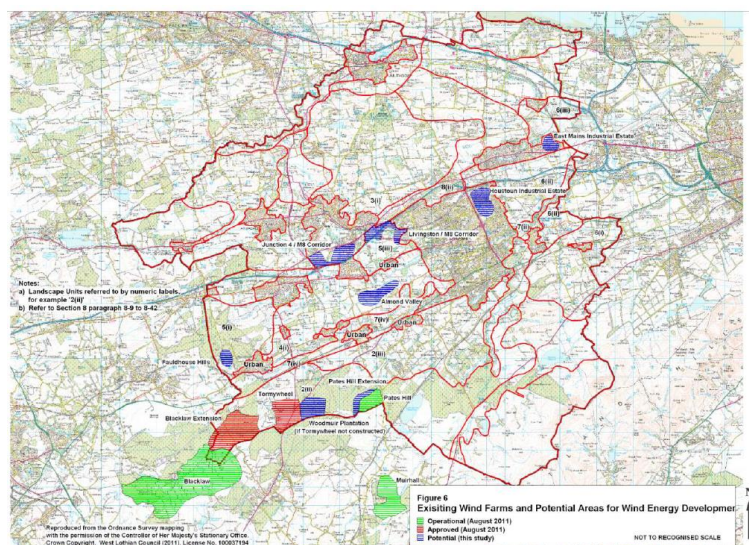
Areas of search for turbines up to 50m (green), up to 80m (dark green) and up to 110m (orange).

West Lothian

A landscape capacity study for wind energy in West Lothian was published in 2011.⁴¹ This study assessed landscape sensitivity based on a detailed character assessment, and assigned sensitivity ratings from highest to low. No areas of low sensitivity were recorded. An examination of landmark features and their settings identified further protection for certain locations. A visual sensitivity assessment focused on key routes and important viewpoints, with defined 'view cones'.

The study concluded that, along the core area boundary, the Blackridge Heights and Pentland Hills areas were highly sensitive in terms of both landscape and visual considerations. The area between the A70 and Hartwood is considered to be of medium sensitivity. Consideration of cumulative effects and landscape objectives based on protection, accommodation or change informed selection of areas with potential for wind energy development. These areas are small, and include locations between Black Law and Pates Hill wind farms, and north of Fauldhouse.

Figure A1.2 Potential areas for wind energy development in West Lothian



Potential areas for development (blue) with existing (green) and consented (red) development.

Scottish Borders

SPG published by Scottish Borders Council in 2011 includes a detailed spatial strategy for wind energy development.⁴² The strategy incorporates a range of potential constraints, including landscape designations, sensitive landscape character, views from routes and key viewpoints. A systematic assessment of landscape sensitivity and capacity was not undertaken. The majority of the part of the Borders within the buffer area is defined as either area of significant protection or of moderate constraints.

Dumfries and Galloway

A landscape capacity study for Dumfries and Galloway was undertaken by the same consultants that completed the Argyll and Bute study, following a similar methodology.⁴³ Most of the area of Dumfries and Galloway which is within the buffer area is characterised as Type 19 Southern Uplands, which are assigned high landscape sensitivity and high visual sensitivity to medium and large turbines, with 'no scope' for large turbines, and some limited opportunities for medium turbines.

⁴¹ David Tyldesley and Associates (2011) Landscape Capacity Study for Wind Energy Development in West Lothian. West Lothian Council and Scottish Natural Heritage.

⁴² Scottish Borders Council (2011) Supplementary Planning Guidance: Wind Energy.

⁴³ Carol Anderson and Alison Grant (2011) Dumfries and Galloway Wind Farm Landscape Capacity Study. Dumfries and Galloway Council.

East and North Ayrshire

A landscape capacity study for wind energy in North Ayrshire was undertaken in 2009,⁴⁴ covering the mainland of North Ayrshire, and the area of Inverclyde to the north. It was undertaken by the same consultants who completed the Argyll and Bute and Dumfries and Galloway studies, again following a similar methodology. This study is discussed in **Section 2** of the main report.

A landscape capacity study for the whole of Ayrshire was then undertaken by the same consultants. This study was published in 2013 as three separate reports covering the three Ayrshire Councils.⁴⁵

The North Ayrshire report is described as supplementary to the 2009 study, and does not include the area of Inverclyde previously examined. Limited capacity for development over 50 m is identified, with potential only within the 'Coastal Lowlands with Industry' LCT, and none within the uplands along the study area boundary.

The East Ayrshire study identifies that the Plateau Moorlands LCT which lies along the South Lanarkshire boundary has some reduced sensitivity to medium and larger scale wind energy development, along with other areas affected by forestry or mining. The presence of Whitelee and nearby developments is highlighted as a limiting factor in terms of cumulative effects.

⁴⁴ Carol Anderson; Alison Grant (2009) Landscape Capacity Study For Wind Farm Development Within North Ayrshire. Phase One Report. North Ayrshire Council.

⁴⁵ Carol Anderson Landscape Associates (2013) North Ayrshire Wind Farm Landscape Capacity Study. North Ayrshire Council.
Carol Anderson Landscape Associates (2013) East Ayrshire Wind Farm Landscape Capacity Study. East Ayrshire Council.

Appendix 2

Viewpoint analysis

Viewpoint 1 Cornalees Bridge Centre

- 6.1 The Cornalees Bridge Centre is relatively low-lying, beside a reservoir in the Rugged Moorland Hills LCT. From the summit of nearby Dunrod Hill (298 m), a much wider view can be gained, looking south and west across the Firth of Clyde, and north across Rosneath with the Arrochar Alps behind. To the east there are views across Loch Thom and into Strathgryffe towards Kilmacolm. Southward views are restricted by the rising ground of the Renfrewshire Heights.
- 6.2 The closest operational turbine is a small turbine at Downies, above Loch Thom, some 3 km to the south-east. Consented turbine likely to be visible include those nearby at Cornalees Farm (small) and Shielhill (small-medium). To the north-west a small-medium turbine has been consented near the mast at Leitchland, 4 km away. Further afield to the east, medium scale consented turbines at High Mathernock and Cairncurran may be visible, in the transitional landscape between the moors and the Rugged Upland Farmland LCT. Kelburn Wind Farm is 16 km to the south but is not seen from this area due to intervening topography. There are no proposed turbines likely to be visible from this location.
- 6.3 From this viewpoint, the dispersed nature of small-scale development within Inverclyde will be apparent. Single turbines or pairs of turbines will be viewed in relative isolation, with no larger schemes visible. At present, the moors around Cornalees form part of a wider landscape around the Firth of Clyde which is unaffected by large-scale wind turbines. The development of further turbines within the central part of the Inverclyde moorlands, which this viewpoint overlooks, could lead to a reduction in the apparent wildness.

Viewpoint 2 Dumbarton Castle

- 6.4 Dumbarton Castle is sited on a prominent volcanic rock on the Firth of Clyde. The elevated summit of the rock is frequented by visitors to the castle, and overlooks a long stretch of the firth, as well as the town of Dumbarton. The view is most open to the west, looking down the Clyde to Cowal. To the north there are views along the Vale of Leven to the mountains of the National Park. Views to the north-west, north-east and south are generally contained by rising ground.
- 6.5 At present there is no prominent wind energy development visible in this view. Two consented turbines at High Mathernock, some 8 km to the west-south-west, will be theoretically visible on the ridge above Port Glasgow. There are no turbines currently proposed that are likely to be visible from this location.
- 6.6 Dumbarton Castle stands within the inner Firth of Clyde, which at present represents an area without views of large turbines. The raised beach and its hinterland to the south, viewed across the Clyde, is particularly prominent in views from this location, and turbines placed here could have an impact on views. To the west as the raised beach becomes more developed, so the ridge behind becomes higher and more prominent in views from the castle and from the Firth of Clyde generally.

Viewpoint 3 Duncolm, Kilpatrick Hills

- 6.7 From Duncolm, there are views north to Loch Lomond and Ben Lomond, and to the west the Firth of Clyde is glimpsed, with the Cowal hills beyond. To the east are the Campsie Fells, and to the south-east there are very long views across the Clyde basin to Lanarkshire, with Tinto visible in the distance on clear days, some 65 km away.
- 6.8 There are no operational turbines over 50 m within 20 km of Duncolm. To the north-east there are wind farms on the Campsie Fells, and to the south turbines at Cathkin Braes, Neilston and Whitelee can be seen in the distance. The only consented developments closer than these are currently two turbines at High Mathernock, and a single turbine at Cairncurran Farm, some 15-18 km to the south-west. There are no proposed turbines which would substantially alter the present pattern of visible development.
- 6.9 At this northern edge of the core area, there are important northward views to Loch Lomond and the National Park, and the introduction of turbines to these views would likely alter their character. **Figure 4.4** illustrates the comparatively high wildness levels within the Kilpatrick Hills in comparison to the core area as a whole, reflected in part by their local landscape designation. Development within the Kilpatrick Hills could lead to a reduction in the apparent wildness.

Viewpoint 4 Castle Hill, Bearsden

- 6.10 Castle Hill is the site of a Roman Fort on the western outskirts of Bearsden, at a height of 118m AOD. The hill is one of a series of former forts along the Antonine Wall, a World Heritage Site. There is a distinctive stand of beech trees encircling the hill summit, which partially screen views from the hill top itself, although views are available from the surrounding slopes. Relatively localised views are available to the west and north, over Milngavie, with long-distance views over the Glasgow conurbation looking east and south.
- 6.11 The nearest operational turbine over 50 m in height is at Cathkin Braes to the south of Glasgow, around 17 km away. Other operational wind farms which may be visible from this location include Middleton and Neilston, around 20 km to the south-west. Two single turbines near Cumbernauld are consented, and may be visible in views east around 18 km away. Operational turbines at Earlsburn and proposed turbines at Craigton and Spittal Hill are not likely to be visible from this location due to screening by intervening topography. Operational developments including Whitelee are glimpsed over 25 km to the south.
- 6.12 Views north are relatively contained by the Kilpatrick Hills and Campsie Fells. There are some industrial elements within the foreground or middle-ground of these views, including electrical infrastructure and masts which, along with settlement and forestry, provide an indication of the scale of the landform. Cumulative effects on views from this location are likely to arise in views east and south of this location, in relation to the existing groups of more distant turbines and wind farms and their relationships to one another.

Viewpoint 5 Ruchill Park

- 6.13 Ruchill Park is a recreational space located in the north of Glasgow, with a panoramic view of Glasgow available from an artificial mound, marked by a flagpole. Views are available across the city, north towards the Kilpatrick Hills and Campsie Fells, east in the direction of Stepps, west towards Clydebank and Gleniffer Braes, and south across Glasgow City Centre toward Cathkin Braes.
- 6.14 The single turbine at Cathkin Braes is visible at around 10 km in views south, with Whitelee (and other surrounding developments) visible beyond, around 20 km away. Blantyre Muir Wind Farm is visible in views south-east at a distance of around 17 km. Two single turbines near Cumbernauld are consented, and may be visible in views east around 15 km away, with another proposal for a single turbine in the same direction (located at Moodiesburn) likely to be visible if consented.
- 6.15 The current view from Ruchill Park is mainly affected by relatively long-distance visibility of turbines and wind farms to the south of Glasgow. It is likely that cumulative effects will arise from ongoing development in this area, as the panoramic view south becomes more occupied by turbines, and how new developments tie in with the existing pattern will be an important consideration. Developments located to the north of this location, in views towards the Kilpatrick Hills and Campsie Fells may cause successive cumulative effects, in that the viewer would be aware of wind farms in several directions from this 360° viewpoint.

Viewpoint 6 Crow Road, Campsie Glen

- 6.16 This viewpoint, from a car park on the lower slopes of the Campsie Fells, has open, long-distance views south-east across eastern Glasgow and associated settlement. To the west views are contained by the topography of the Drumlin Foothills LCT in East Dunbartonshire to the south and Rugged Moorland Hills (Campsie Fells) to the north. Views are channelled along the Broad Valley Lowlands LCT towards Strathblane, with the Kilpatrick Hills visible in the distance. From the car park there is a well-used path up to Cort-ma Law which offers wider views.
- 6.17 Operational wind farms located to the north of the Campsie Fells (including Earlsburn and Craigengelt) are not visible from this location due to screening from the intervening hills. Developments at Whitelee and beyond are visible in clear conditions, 30 km and more away to the south. A small number of single turbines at Cumbernauld are likely to be visible around 12 km away in views south-east along Crow Road, with the consented Greengairs Wind Farm visible beyond, around 20 km away.

- 6.18 Existing and proposed turbines visible from this location tend to follow the pattern of smaller single turbines being located within rolling or plateau farmland, with larger wind farms located within the Plateau Moorland LCT. Cumulative effects on receptors at this viewpoint are likely to arise in relation to the pattern of single turbines associated with farmland nearer at hand.

Viewpoint 7 Tak Ma Doon Road, Kilsyth Hills

- 6.19 A signposted viewpoint on this minor road through the Kilsyth Hills offers panoramic views to the south and east. The view takes in the Firth of Forth to the east, the Slamannan Plateau and Pentland Hills to the south-east, and looks south across Cumbernauld. On clear days Tinto is visible in the distance.
- 6.20 The closest operational turbines are at Greendykeside (13 km), with consented development adjacent at Greengairs and to the south-east at Burnhead (19 km). More distant views of Black Law (29 km) and Whitelee (36 km) are available in conditions of good visibility. Developments to the north are not visible from this location. Currently proposed developments are at similar distances, the closest being Greengairs East.
- 6.21 Existing and proposed developments are seen from this viewpoint in the context of the settled plateau to the south, with Cumbernauld in the foreground, and are at a lower elevation. Cumulative effects on this location are limited. Development of turbines closer to the viewpoint could increase the level of effect, particularly if turbines were sited on the ridge north of Cumbernauld which forms the south side of the Kelvin Valley.

Viewpoint 8 Castle Semple Country Park

- 6.22 This low-lying viewpoint at the southern end of Castle Semple Loch overlooks the village of Lochwinnoch. There are open views across the water, north towards Castle Semple Country Park and south towards the RSPB visitor centre, with the Ayrshire Coast Line railway passing along the eastern side of the loch. Views are relatively contained by local topography.
- 6.23 The CZTVs indicate low levels of turbine visibility. It is likely that this theoretical visibility arises in views south-west, with potential visibility of turbines at Millour, Kelburn and Dalry, south-east of Largs, around 12 km away. Wind farms located to the east, including Neilston and Middleton, are not visible from this location.
- 6.24 Due to the low-lying position of this viewpoint, and low levels of current visibility indicated from mapping, it is likely that viewers in this location are relatively unaware of wind farms located over 10km away. Set within the Broad Valley Lowland LCT, there is unlikely to be much scope for wind energy development within close vicinity. Therefore, cumulative effects are more likely to arise in relation to turbines located in adjacent LCTs, perhaps most likely in relation to the Rugged Upland Farmlands LCT to the south-east.

Viewpoint 9 Gleniffer Braes

- 6.25 This north-facing viewpoint to the south of Paisley forms part of an OS-marked picnic spot within Gleniffer Braes Country Park. The view overlooks the built up area of the Clyde Basin, across to the Kilpatrick Hills and Campsie Fells, and to Ben Lomond within Loch Lomond and the Trossachs National Park beyond. Views south and west are contained by topography.
- 6.26 There is currently little or no visibility of turbines from this location, and the CZTVs reflect low levels of visibility. The Cathkin Braes turbine is visible 15 km away to the east. The larger operational wind farms to the south of this viewpoint are not visible, including Whitelee, Over Enoch and Ardoch, Middleton and Neilston.
- 6.27 The Kilpatrick Hills and Campsie Fells form an important backdrop to this view, with the skyline currently uninterrupted by the presence of vertical structures. Much of the view from this location is urban, and cumulative effects are very limited, however future development within farmland LCTs surrounding developed areas could give rise to cumulative effects.

Viewpoint 10 Neilston Pad

- 6.28 Neilston Pad is a high point at the top of a small steep-sided hill (261 m), directly south of the village of Neilston, and is accessed mainly by walkers. Panoramic views are available from this

point in all directions, extending over Glasgow and the Clyde Basin, and Cunninghame. Views on clear days extend as far as Tinto to the south-east, Ben Lomond in the north, and Arran in the west.

- 6.29 The majority of turbines visible from this location are in views south, including two operational wind farms in close proximity: both Neilston to the south-west, and Middleton to the south-east are within 5 km. Views in the direction of Middleton also take in Whitelee and surrounding developments between 8 km and 15 km away. The single turbine at Cathkin Braes is visible in views east, at a distance of around 13 km.
- 6.30 Existing and proposed developments are principally seen from this viewpoint in the context of Rugged Upland Farmland LCT locally, and Plateau Moorland LCT in longer-distance views to the south-east. Cumulative effects in this location arise from the relationship between smaller nearby wind farms, and larger, extensive wind farms further afield, particularly the grouping around Whitelee. Further developments within the Plateau Moorland LCT may extend the angle of view occupied by turbines, and result in additional cumulative effects. However, the open aspect to the north would reduce the impact of this. The introduction of turbines in northern views would lead to successive cumulative effects.

Viewpoint 11 Cathkin Braes

- 6.31 Cathkin Braes is a popular country park. The viewpoint overlooks the built up area of the Glasgow conurbation, with panoramic northward views. There are long views across to the Kilpatrick Hills and Campsie Fells, with the city centre landmarks seen in the middle distance. There are views to north-east across to North Lanarkshire, though southward views are more limited by rising topography.
- 6.32 The Cathkin Braes turbine is less than 1km to the south-west of this viewpoint: although a single turbine it is a significant presence, but is seen in the context of the conurbation immediately to the north. Whitelee and Blantyre Muir are not visible, though they are seen from some nearby locations. Operational turbines within North Lanarkshire can be seen, 15-20 km away. The consented and proposed turbines which will be visible are in the same area, including Greengairs and Burnhead (consented) and Braco and Greengairs East (proposed).
- 6.33 Leaving aside Cathkin Braes turbine, all of the operational, consented and proposed turbines in the wider view are within one area, and do not affect the panoramic views across the Glasgow basin. The developments are all within the relatively distant Plateau Moorland. Development extending in to the Plateau Farmland and Rolling Farmland would increase the presence of turbines in this particular view, and would appear in front of the Campsie Fells.

Viewpoint 12 Bedlay Cemetery, Moodiesburn

- 6.34 The cemetery is located on a low ridge in the west of North Lanarkshire, with relatively open views. To the north the Kilsyth Hills and Campsie Fells form a prominent backdrop. Views in other directions are less extensive, but overlook areas of the surrounding Fragmented Farmland and Plateau Farmland.
- 6.35 The consented Greengairs wind farm (9 km) will be theoretically visible from this location, along with other single turbines in the Plateau Farmland to the east. Wind farms in the wider landscape are unlikely to be visible under most conditions, due to surrounding topography and built developments.
- 6.36 Views from this location emphasise the visual importance of the Kilsyth Hills as a visual backdrop, and turbines in the Rolling Farmland to the north could interrupt this or similar views to the hills. Views of turbines to the east will be less prominent from this location due to rising topography, and will be viewed in the context of the settled plateau.

Viewpoint 13 Blawhorn Moss

- 6.37 Blawhorn Moss is a National Nature Reserve at the western edge of West Lothian. From the reserve there are views across the moorland landscape of the Plateau Moorlands, with the edge of the Kilsyth Hills visible to the north-west.

- 6.38 Torrance wind farm is visible 4 km to the south-east, with Pates Hill wind farm seen behind, around 15 km away. To the south Black Law can be seen at 11 km. The consented Burnhead wind farm is located immediately to the north, and the consented Greengairs 8 km to the west. Turbines will be seen in most directions. Proposed turbines around this viewpoint include Greengairs East 6 km to the west, and West Benhar/Starryshaw/Shotts wind farm 5 km to the south.
- 6.39 The existing and proposed turbines visible from this location are all sited within Plateau Moorland LCT, and similar landscape types in West Lothian and Falkirk. Further development in this LCT could result in the surrounding of this and other viewpoints in the area, though as noted there are already views of turbines in most directions. To reduce potential cumulative impact, a strategy of discrete clusters of development would have benefit over dispersal of turbines throughout the plateau.

Viewpoint 14 A706, Gladsmuir Hills

- 6.40 This location on the A706 is on the north side of the Gladsmuir Hills in the south-west of West Lothian. From this location there are panoramic views northwards across the foreground moorland. To the north-west there are views over Fauldhouse to the moorland plateau which lies between North Lanarkshire and West Lothian. The Campsie Fells and Kilsyth Hills are seen in the distance to the north-west, and the Ochils are also visible to the north-east.
- 6.41 The closest wind farms, Pates Hill and Black Law, are not seen from this location due to local topography. Torrance wind farm, 8 km to the north, is visible. The consented Tormywheel wind farm will be located either side of the road at this location, and the future view will therefore be seen through these turbines. The consented Burnhead wind farm will be seen behind Torrance to the north. Proposed turbines at West Benhar/Starryshaw/Shotts wind farm 6 km north-west will be visible, and development on the plateau beyond will be theoretically visible at greater distances, e.g Greengairs East at 17 km.
- 6.42 Based on the pattern of existing and proposed development, turbines are likely to become a feature of views to the north and north-west from this location, though open views to the north-east, away from the study area, will remain.

Viewpoint 15 Chatelherault Country Park

- 6.43 From the 18th-century pavilion at Chatelherault there are long views to the north, extending across the Clyde basin to the Kilsyth Hills, and to the Kilpatrick Hills in the north-west. Hamilton and the M74 are in the foreground, with the horizon in the middle distance formed by a low ridge with houses, tower blocks, commercial buildings and pylons all visible. Behind this the steep scarp of the Campsie Fells and Kilsyth Hills is a striking feature.
- 6.44 There are presently no turbines visible in this view, though operational and consented development within North Lanarkshire is theoretically visible at between 10 and 15 km to the north-east, including Greengairs wind farm and single turbines. Similarly, proposed development including Bracco and West Benhar/Starryshaw/Shotts wind farms is theoretically visible.
- 6.45 In this view, it is the nearer horizon formed by the ridge which runs from Tannochside to Holytown and round to Motherwell and Wishaw that is most prominent. Development behind this ridge will not have a significant impact. However, development which does affect this ridge is likely to be viewed in front of the Kilsyth Hills, and could interrupt this open and valued view from the country park. While much of the ridge is urban, there are sections of Fragmented Farmland, Incised River Valley and Broad Urban Valley.

Viewpoint 16 Loudoun Hill

- 6.46 Loudoun Hill (316 m) is a low but prominent hill at the watershed of the Irvine and Avon Valleys, just within East Ayrshire. The view from the summit is focused north-east and west along the valleys. The view south is restricted by higher moorlands in the near distance, rising to Dungavel Hill in eastern views. Looking along the Avon Valley there are long views into the wider Clyde Valley. To the north are lower-lying moors, gently rising to the north. Westwards there are long views down the Irvine Valley into Ayrshire.

- 6.47 Whitelee and Calder Water wind farms are clearly visible to the north, the closest turbines less than 4 km away, and extending around to the north-west. Bankend Rig is around 6 km to the south, across the Avon Water. In longer views to the north-east the Lochhead turbines are seen 19 km away, with Black Law visible on the horizon, 33 km away. Consented development will be seen at Dungavel Hill 7 km to the east, and at the Lochhead Extension. Proposed developments including Kype Muir, 11 km east, will be visible. Single turbines within the Avon Valley will be visible, as well as further development around Lochhead.
- 6.48 The views of wind turbines from this location are illustrative of the way that, in parts of the Plateau Moorland LCT, the cumulative capacity of the landscape is being reached. Should Dungavel and Kype Muir be constructed there would be large wind farms in most parts of the Plateau Moorland which are visible from Loudoun Hill. The presence of single turbines within the valley illustrates the transition from large upland wind farms to large single farm turbines, with potential for cumulative effects resulting from dispersal of development. It is notable that there are no operational or proposed turbines to the west and south-west, within the adjacent areas of Ayrshire.

Viewpoint 17 Black Hill

- 6.49 This is a relatively low summit (290 m) set within the Clyde Valley, and located on National Trust for Scotland property. Despite its height, it offers relatively long views along and across the Clyde. Looking north there are views into the incised Clyde Valley, with the Glasgow conurbation glimpsed beyond, and the Campsie Fells in the distance. Eastwards along the river is Lanark, with the Pentlands rising behind. Tinto is a significant presence in views to the south-east, while to the south and west there are views looking up to the Plateau Moorlands which surround the Clyde Valley.
- 6.50 The Lochhead turbines are visible 6 km to the north-west, and Black Law is visible 10 km to the north-east. To the south-west Nutberry and Hagshaw Hill are visible, 11-13 km away. Whitelee can be seen, 20 km to the west on the moorland. A number of consented developments will be visible, including single turbines to the north-west and west within the Plateau Farmland, and to the south the M74 cluster and Eastertown turbine, all within 6-8 km. Proposed developments are likely to intensify this pattern of single turbines and small clusters in the Plateau Farmland, while adding the larger Broken Cross and Dalquhandy proposals to the south, and the Kype Muir wind farm on higher ground 12 km to the west.
- 6.51 The current pattern of proposed development is likely to substantially change the outlook from this viewpoint, with numerous large turbines consented and proposed within the lowland and lowland fringe landscapes. The views north into the Clyde Valley and east to Lanark will be largely unaffected even if all proposals are built, and the south-east aspect to Tinto will remain relatively open. Seen from within the valley, Black Hill represents a skyline feature, and the maintenance of an open area around this hill and its surround would continue to protect the setting of the incised valley. There is therefore merit in maintaining the present pattern of development, focused along and to the west of the M74.

Viewpoint 18 Black Law

- 6.52 Black Law (445 m) is at the western end of the Pentland Hills, and offers broad views to westward. The view south is to the Southern Uplands, and Tinto is clearly visible some 20 km to the south-west across the Clyde Valley. To the west the view looks down to the Plateau Farmland and Plateau Moorland landscapes, with long views to the Campsie Fells to north-west and the Ochil Hills to the north. Eastward views are restricted by the rising Pentland Hills.
- 6.53 The closest operational turbines are at Muirhall, 7 km to the west. Beyond this is Pates Hill (10 km) and Black Law wind farm (16 km). Clyde and Glenkerie are around 24 km to the south, while Hagshaw is in the distance, 34 km to the south-west. Consented development which will be seen includes the two-turbine Muirhall extension, and Tormywheel 13 km to the north-west. Consented large turbines within the upper Clyde Valley may be visible. There are proposed extensions to Clyde and Glenkerie which will be visible from this hill, as well as Crofthill and Calla wind farms within the Plateau Farmland to the west. To the north are the Fauch Hill and Harburnhead developments, 5 km and 7 km away respectively. Other proposed development is more distant.

- 6.54 The western and southern aspects from the Pentlands are currently seen without wind energy development within 20 km, though there are distant turbines on several hills. Wind farms populate the lower moorland and farmland to the north-west, and proposed developments at Crofthill, Calla and Fauch Hill may intensify this. However, even with all proposed development, there will be an open aspect south-west to Tinto and south to Culter Fell, looking across upper Clydesdale.

Viewpoint 19 Culter Fell

- 6.55 The summit of Culter Fell (748 m) is on the boundary between South Lanarkshire and the Scottish Borders, and offers panoramic views across the surrounding landscape. There are views from Culter Fell down to the Upper Tweeddale NSA with the Broughton Heights behind. To the east and south there are views across the Tweedsmuir Uplands, and south-west across the upper Clyde hills. To the west Tinto is seen 11 km away, a prominent isolated hill within the wider lowland landscape to the north-west, which extends in a long view towards the distant Campsie Fells and Ochil Hills. The Pentlands are seen to the north and north-east.
- 6.56 Glenkerie wind farm is around 3 km to the east, and Clyde is viewed, between 6 km and 12 km away, to the south and west. More distantly, Hagshaw Hill is 24 km to the west, Muirhall is around the same distance north, and Black Law is viewed at 28 km to the north. Consented development which will be visible includes Andershaw 20km to the west, and Galawhistle in the same direction behind Hagshaw. Proposed extensions at Clyde and Glenkerie will bring turbines closer to the viewpoint around the southern aspect. Other proposed developments will be visible at Middlemuir (19 km west), Dalquhandy (25 km west) and Calla (20 km north). Consented and proposed turbines in the Clyde Valley will largely be screened by the presence of Tinto.
- 6.57 The current view from Culter Fell is affected by turbines across its southerly aspect, and this is likely to intensify should the extensions be constructed. However, the northern aspects remain open. Even considering all the proposed development, there would be no large turbines or turbine groups visible within 20 km to the north-west, north and north-east. The views toward the NSA and the Broughton Heights, toward the Pentlands, and to Tinto, would all be retained by seeking to maintain an area without large wind farms to the north of Culter Fell.

Viewpoint 20 Tinto Hill

- 6.58 Tinto is an iconic landmark within South Lanarkshire, and a popular hillwalking destination. As a relatively high (711 m), yet isolated summit, Tinto offers panoramic views in all directions. The Clyde Valley lies below, leading away to the north-west where the Campsie Fells can be seen in the distance. The Ochils are to the north, and the Pentlands and Black Mount are viewed to the north-east. Eastward there are views across Biggar towards the Tweedsmuir uplands and Culter Fell in the south-east. To the south there are views of the Southern Uplands and the upper Clyde, merging into the plateau moorlands to the west.
- 6.59 Clyde wind farm is clearly visible to the south and south-east, within the Southern Uplands, 8 km at its closest. Glenkerie is also to the south-east. To the west Hagshaw Hill (15 km) and Nutberry can be seen, with Whitelee visible under good conditions, over 35 km to the north-east. 19 km to the north is Black Law, with Muirhall a similar distance to the north north-east. To the north and north-west, within the wider Clyde Valley, a number of smaller developments are visible within the farmland, including single turbines and small clusters. Consented developments which will be visible include Andershaw 13 km to the south-west, and Galawhistle to the west by Hagshaw. Most of the larger proposed developments are located in similar areas – Dalquhandy, Kennoxhead and Leadhills to the west, Clyde Extension to the south-east, and Calla, Crofthill and Harburnhead to the north-east.
- 6.60 There are smaller proposed and consented developments in the lowland landscape. The Broken Cross Muir proposal, with nearby consented development, would increase the presence of turbines to the north-west, within the lowland landscape. There are a large number of consented and proposed turbines in this north-western sector, which could potentially change the character of views in this direction. Assuming that all the currently proposed developments were built, the importance of the open aspect from Tinto east and north-east towards the Broughton Heights, Black Mount and the Pentland Hills will be increased.

Viewpoint 21 Green Lowther

- 6.61 Green Lowther, at 732 m, is one of the highest points in the study area. Though topped by several communications masts, the summit is a popular ascent for hillwalkers. There are panoramic views in all directions, looking across the Southern Uplands. To the east there are views across the upper Clyde towards the Tweedsmuir Uplands, and Tinto is clearly visible, 23 km to the north.
- 6.62 Clyde wind farm is seen to the east, spread across hilltops and occupying a large angle of view between 7 km and 17 km away. Harestanes is visible 16 km to the south. To the north the consented Andershaw wind farm will be viewed 13 km to the north, and the consented Sanquhar and Whiteside wind farms 18 km to the west. Proposed wind farms which will be visible include the Clyde Extension to the east behind Clyde, with Crookedstane and Lion Hill slightly closer. Harestanes Extension will be visible to the south-east. To the west several developments will be seen including Sandy Knowe (19 km) and Twentysilling (13 km). Wester Dod will be 8 km to the north, with Middlemuir beyond, adjacent to Andershaw.
- 6.63 Operational and consented developments are visible in all segments of this view, and the currently proposed developments will intensify this, though all are over 6 km from the summit. It is notable that the view to Tinto, the most prominent hill in this view, is not interrupted by any operational or proposed development. The gap between Harestanes Extension and Clyde wind farm can also be clearly seen in this view (see LCT21). The maintenance of a degree of openness as viewed from these upland summits will be a key consideration for future development in the area, to avoid the coalescence of development and the creation of a wind farm landscape.

Appendix 3

Guidance for small-scale development

The following provides some generic guidance on siting small-scale wind energy development, focussing on minimising landscape and visual effects. It is recognised that turbines need to be sited and designed to ensure a reasonable output. In all cases the findings of the sensitivity assessment for the relevant LCT should be considered when considering potential sites for wind energy development. This is not an exhaustive list of factors for consideration, but focuses on the points of most relevance to the Glasgow and Clyde Valley landscape.

Further detail is provided in the SNH publications *Siting and Designing Wind Farms in the Landscape* (2009) and *Siting and Design of Small Scale Wind Turbines of between 15 and 50 metres in height* (2012).

When considering small-medium and medium single turbines, and clusters of such turbines, it should be borne in mind that, while their landscape and visual effects are much less than those of larger commercial-scale development, these effects can be proportionally large in relation to both the size of the development, and the benefit gained in terms of energy output.

The following general guidance relates to minimising impacts on the landscape.

- Ensure that wind energy development does not override or subsume the key characteristics of the landscape as recorded in the Glasgow and Clyde Valley Landscape Character Assessment and/or the South Lanarkshire Landscape Character Assessment.
- Consider siting turbines so they are perceived as part of other built development, or are seen in association with a building group where effects on amenity allow, creating an association between generation and consumption. For example, there may be some opportunity to site small or small-medium single turbines in relation to farm buildings or community buildings, with larger scale single turbines sited in relation to larger businesses or industrial sites. Development should be commensurate with (or reflect) the scale of the associated buildings.
- Site wind energy developments away from dramatic landforms or valued distinct landform features (including prominent steep slopes).
- Seek to avoid impacts on areas which are free from overt human influence and modern development, and which are valued for their perceived rural tranquillity, including where areas are located close to settlements, such as the incised valleys.
- Consider opportunities for locating turbines on reclaimed, industrial and man-made landscapes, particularly where this can be linked to landscape restoration, or in association with business parks or industrial estates, where other landscape sensitivities are not compromised.

The following general points relate to minimising impacts on views and visual amenity.

- Significant effects on views from important viewpoints, including hill summits, popular outlooks, or views with heritage significance, should be avoided where possible, or minimised through careful siting.
- It is generally less distracting to see a substantial part of a turbine rather than blade tips only – this may be a particular consideration for views from sensitive viewpoints or those frequented by a larger number of viewers.
- It is preferable to site turbines where they do not distract from views of, or prevent the appreciation of, landmarks including natural and built features.
- It is preferable to site turbines in locations where they do not conflict with other man-made skyline features, such as pylons, and where the addition of turbines could create visual confusion.
- Consider sites where areas of existing vegetation and woodland could screen views of small turbines, or at least screen ground-level features of wind energy developments (such as fencing, tracks and transformers).
- Avoid selecting sites on important undeveloped or distinctive skylines or ridge lines, or skylines with important cultural or historic landmark features.

When considering the potential for cumulative impacts, the following guidelines may be particularly relevant.

- Avoid siting smaller turbines in close proximity to existing large turbines where contrasts of scale could occur. This may also affect longer views where smaller turbines appear in the foreground, and may lead to a confusing visual image.
- Consider the visual relationship between larger wind farms which are seen on upland and high ground, with smaller turbines and single turbines in farmland areas. Seek to maintain the distinction between the types of development which are present within these types of landscape. Transitional locations between upland and farmland may therefore be sensitive if development leads to the blurring of boundaries.
- Avoid siting smaller turbines of different design in close proximity, which could lead to unattractive visual contrasts. Design elements including height, rotor diameter, number of blades, tower construction and nacelle shape should all be considered.
- Colour smaller turbines appropriately: pale grey may be less suitable for turbines which will be primarily viewed against a background of trees, as opposed to the sky.

In all cases, the key aims should be to ensure compatibility between the proposed development and the receiving landscape, and to minimise the extent and likely significance of effects on views and landscape character.