Longhill Burn Wind Farm Tip Height Extension

Comparative Environmental Impact Assessment Report
Volume I – Main Text

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Appendices

1 INTRODUCTION

Background

1.1 Planning permission was granted for Longhill Burn Wind Farm on 17 April 2020 (reference 0359/FUL/19). The consented wind farm comprises ten wind turbines with tip heights of up to 180m and associated infrastructure. The planning application was accompanied by an Environmental Impact Assessment Report dated March 2019 (herein after referred to as the "original EIAR").

1.2 This Comparative Environmental Impact Assessment Report (Comparative EIAR) is submitted in support of an application under Section 42 of the Town and Country Planning (Scotland) Act 1997 by Energiekontor UK Ltd ("the Applicant") to vary condition 7 of planning permission 0359/FUL/19 to allow an increase in the consented tip heights at Longhill Burn Wind Farm from 180m to 200m ("the Proposed Development").

1.3 This Comparative EIAR has been prepared by Energiekontor UK Ltd with specialist input where necessary and sets out the findings of a comparative Environmental Impact Assessment which has been undertaken to consider whether the Proposed Development would result in any additional significant environmental effects not identified in the previous EIAR for Longhill Burn Wind Farm.

Site Location and Proposed Development

The Site and its Surroundings

1.4 The Site is located approximately 2km to the south east of the village of Breich, 4km to the south west of West Calder, and 2km to the north west of Woolfords. The Site is located within the West Lothian Council administrative area, although the southern boundary of the Site is marked by the administrative border with South Lanarkshire Council.

1.5 The Site lies between 260m and 360m Above Ordnance Datum (AOD), rising from the low ground at the north east of the Site to high ground in the south west. The Site lies within the Woodmuir Plantation which is dominated by Sitka spruce. Within the planning application boundary the plantation consists of mostly young trees in the west and mature trees in the east. Clear-felled areas occur in the north west and south east of the Site. The plantation forest continues beyond the Site to the south and west.

1.6 To the south east and north of the Site the habitat is semi-improved grass-dominated upland heath, used for livestock grazing. Immediately to the north of the Site lies the Pateshill Water Treatment Works (WTW). A high voltage line crosses east-west just north of the WTW, with the former Rusha opencast coal mine located beyond. The mine has recently undergone a programme of restoration works.

1.7 There are a number of burns which drain the Site and wider area, broadly flowing west to east. These include the Longhill Burn and the Harwood Water.

1.8 The operational Pates Hill Wind Farm is located immediately adjacent to the east of the Site. This is on land that previously held plantation contiguous with that at the Site, but has since been clear-felled.

1.9 The operational Tormywheel Wind Farm is located approximately 2km to the west of the Site. Other approved/operational wind farms within the vicinity of the Site include Black Law, Pearie Law, Muirhall, Harburnhead, Camilty and Heathland.

Description of Proposed Development

1.10 The key changes to Longhill Burn Wind Farm introduced by the Proposed Development are set out in Table 1.1 below.

Characteristic	Original EIAR	Proposed Development
Number of turbines	8	8
Turbine capacity	4.2MW	5.7MW
Tip height	180m	200m
Blades	3	3
Turbine colour	Light grey	Light grey
Turbine foundations	Approximately 18m diameter on an hexagonal base	Approximately 18m diameter on an hexagonal base
Predicted Annual Energy Production	142 GWh	183 GWh

Table 1.1: Summary of changes due to Proposed Development

1.11 All other elements of the existing planning permission for Longhill Burn Wind Farm would remain as previously approved.

Structure of Report

1.12 This Comparative EIAR has been prepared by Energiekontor UK Ltd and sets out the findings of a comparative Environmental Impact Assessment which has been undertaken to consider whether the Proposed Development would result in any additional significant environmental effects not identified in the original EIAR for the wind farm development.

1.13 One area with the potential for materially different effects from those reported in the original EIAR has been identified. This is in relation to the landscape and visual effects of the Proposed Development.

1.14 This Comparative EIAR is structured as follows:

- Section 1 provides a background to the Proposed Development;
- Section 2 presents a review of the key topics in the original EIAR and any specific items within these topics which have the potential for materially different environmental effects as a result of the Proposed Development;

- Section 3 provides a detailed assessment of the landscape and visual effects arising from the Proposed Development;
- Section 4 provides a summary of the findings of the comparative environmental assessment.

The Applicant

1.15 Energiekontor UK Ltd is a renewable energy development company with offices in Glasgow, Edinburgh and Leeds. The company was formed in 1999 and develops onshore wind and solar farms throughout the United Kingdom. The company operates eight existing wind farms in the UK with consents for a further eight projects, seven of which are in Scotland.

1.16 Energiekontor UK Ltd is part of the Energiekontor Group. The parent company, Energiekontor AG, was established in 1990 in Bremerhaven in Northern Germany. It has since grown to become one of the leading wind energy companies in Europe and is active in Germany, France, The Netherlands, Portugal, the USA and the UK. The company has built more than 100 onshore wind farms in Europe.

2 COMPARATIVE EIA SCREENING

Introduction

2.1 This Comparative EIAR has been prepared by Energiekontor UK Ltd and sets out the findings of a comparative Environmental Impact Assessment which has been undertaken to consider whether the Proposed Development would result in any additional significant environmental effects not identified in the original EIAR for the wind farm. This section provides an appraisal of the potential for significant environmental effects to occur as a result of the Proposed Development.

Comparative EIA Screening

2.2 Table 2.1 below sets out the findings of the comparative EIA screening exercise.

Landscape and Visual Amenity	
Key findings from original EIAR for the wind farm	In common with all onshore wind farms, the introduction of eight wind turbines would lead to significant landscape and visual effects across a range of receptors. The extent of effects upon landscape character would be limited by the topographic containment of the local area and significant effects would be contained up to 2-3km from the wind farm. This would affect parts of the Gladsmuir / Woodmuir / Camilty Upland Hill Fringe, Central Plateau Moorland and Farmlands, and Harburn/Hartwood Frings, all of which are already affected by wind energy development. There would be significant visual effects on settlements at Breich, Loganlea / Addiewell, Stoneyburn, West Calder, Longridge and Fauldhouse. Significant effects for road users would be limited to the A704.
Potential for material change / significant effects as a result of the Proposed Development	There is potential for changes to the significant landscape and visual effects associated with the wind farm as a result of the increased tip height.
Comment	Further assessment to determine the landscape and visual amenity effects associated with the Proposed Development is provided in Section 3 of this Comparative EIAR.
Ecology and Ornithology	
Key findings from original EIAR for the wind farm	In relation to ecology, no significant effects are predicted in relation to important ecological features, either within the Site itself or the wider area.

	Similarly in relation to ornithology, to significant effects are predicted in relation to any bird species, either from the wind farm alone or in combination with other schemes.
Potential for material change / significant effects as a result of the Proposed Development	There is not considered to be any potential for material change or any alteration of the assessment of significant effects. These effects remain unchanged with the extended tip height.
Comment	No change is predicted.
Cultural Heritage	
Key findings from original EIAR for the wind farm	No cultural heritage assets would be directly affected by the wind farm. In relation to indirect effects, there would be indirect effects on the settings of three heritage assets that are assessed to be of moderate significance and indirect effects on 39 heritage assets that are assessed to be of moderate/minor significance. None of these effects are significant in EIA terms.
Potential for material change / significant effects as a result of the Proposed Development	The Proposed Development would not lead to any additional direct or indirect effects on any cultural heritage assets, whether designated or otherwise. The magnitude of effect predicted in relation to the indirect effects would remain unchanged.
Comment	No change is predicted.
Noise	
Key findings from original EIAR for the wind farm	Background noise measurements were carried out at a number of locations in order to determine suitable noise limits. The procedure for establishing noise limits is set out in the document *ETSU-R-97 Assessment and Rating of Noise from Wind Farms*. Environmental noise predictions were made for a range of wind speeds for the proposed wind farm. The predictions found that noise limits established by ETSU-R-97 would be satisfied. Operational noise from the wind farm has been assessed in accordance with national planning guidance and demonstrated to be within acceptable levels.
Potential for material change / significant effects as a result of the Proposed Development	The Proposed Development would continue to operate in accordance with the noise limits that are set out in the planning permission.
Comment	No change is predicted.
Traffic and Transport	
Key findings from original EIAR for the wind farm	Disturbance to local residents and other road users due to abnormal load deliveries is a potential negative effect. However, given the low number of vehicles involved and

	mitigation measures proposed the amount of disturbance would be limited. HGV movements delivering construction materials would also result in negative effects on road users and local residents. The significance of the effects are considered to be low given the short duration of the works, the existing levels of traffic along most of the route and the mitigation measures proposed.
Potential for material change / significant effects as a result of the Proposed Development	The Proposed Development would not materially increase the amount of construction traffic associated with the wind farm nor increase the duration of the construction period.
Comment	No change is predicted.
Soil and Water	
Key findings from original EIAR for the wind farm	The effects of the wind farm on the hydrological, hydrogeological and geological conditions of the Site are not significant in EIA terms.
Potential for material change / significant effects as a result of the Proposed Development	There is not considered to be any potential for material change or any alteration of the assessment of significant effects. These effects remain unchanged with the extended tip heights.
Comment	No change is predicted.
Forestry	
Key findings from original EIAR for the wind farm	A total area of 16.05ha of trees would be removed to facilitate construction of the wind farm. Suitable compensatory planting would be created within the wind farm application area to comply with the requirements of the Control of Woodland Removal Policy.
Potential for material change / significant effects as a result of the Proposed Development	There is not considered to be any potential for material change or any alteration of the assessment of significant effects. These effects remain unchanged with the extended tip heights.
Comment	No change is predicted.
Infrastructure and Shadow Flicker	
Key findings from original EIAR for the wind farm	Wind turbines can interfere with broadcast transmissions such as radio and television. Consultation was undertaken with those organisations whose transmissions may be affected including mobile telephone service providers, emergency services, television companies etc. From the replies received it was predicted that there would be no disturbance to communications systems with the mitigation measures proposed.

	Wind turbines have the potential to affect aviation safety both through the interference with radar and navigation systems. Rotating wind turbine blades can cast moving shadows which can affect neighbouring properties. As the blades rotate, there can be alternating light and shadow, an effect known as shadow flicker. The effect occurs inside buildings, where the shadow falls on a window. The impact of shadow flicker has been assessed for properties within an arc of 130 degrees either side of north and within 10 rotor diameters (in this case 1.17km) of any turbine position. This assessment has quantified the likelihood of shadow flicker effects occurring at nearby properties as a result of the proposed wind farm, along with their times and durations. Overall the effects have been identified as being minor.
Potential for material change / significant effects as a result of the Proposed Development	There is not considered to be any potential for material change or any alteration of the assessment of significant effects. These effects remain unchanged with the extended tip heights.
Comment	No change is predicted.

Table 2.1: Comparative EIA Screening Summary

Summary

2.3 One topic area with the potential for materially different effects from those reported in the original EIAR for the wind farm has been identified, namely landscape and visual effects. This topic is discussed further in the subsequent section.

3 LANDSCAPE AND VISUAL AMENITY

Introduction

3.1 This section presents an updated Landscape and Visual Impact Assessment (LVIA) in relation to the Proposed Development. The LVIA has been undertaken by Stephenson Halliday Ltd, chartered Landscape Architects responsible for the preparation of LVIA included in the original EIAR.

3.2 This assessment describes the existing landscape and views, considers their sensitivity to change and identifies changes likely to arise from the Proposed Development; providing judgements of the importance of the effects arising. It does so with reference to what has changed since the previous application was consented; focussing specifically on those matters where the changes to baseline, policy, guidance or the proposal design would change the effects arising.

Background

3.3 Stephenson Halliday was commissioned in April 2020 to prepare a landscape and visual impact assessment (LVIA) of the Proposed Development at Longhill Burn on behalf of EnergieKontor UK Ltd.

3.4 This assessment defines the existing landscape and visual baseline environments; assesses their sensitivity to change; describes the key landscape and visual related aspects of the proposed development; describes the nature of the anticipated changes and assesses the effects arising during construction and once completed. It does so with reference to what has changed since the previous application was consented; focussing specifically on those matters where the changes to baseline, policy, guidance or the design changes would change the effects arising.

3.5 Where there are not changes, this assessment refers to figures within the original EIA Report prepared in March 2019 – referred to as 'the Original LVIA' within this report.

The Site and Proposals

3.6 Figure 6.2 in the Original LVIA places the proposed development within its local context. There have been no changes to the surrounding landscape or views that materially change the baseline since the previous application was consented in April 2020.

3.7 The Consented Development is for 8 turbines of up to 180m tip height. The Proposed Development increases tip heights to 200m without altering turbine positions.

Competence

3.8 This chapter has been prepared by Chartered Landscape Architects at Stephenson Halliday. The Practice has strong past experience, having prepared the landscape and visual assessment for over 200 wind energy proposals throughout the UK. Key individuals

working on this project have over 18 years of experience as chartered landscape architects and work on wind farm proposals.

3.9 The Practice is a Landscape Institute and IEMA registered practice and all work is prepared and reviewed internally by senior highly experienced landscape planners with Public Inquiry experience.

3.10 To inform the assessment, site visits were made to various locations within the study area including, but not restricted to, representative viewpoints by Stephenson Halliday's assessment team during May 2020.

Stakeholder Consultation

3.11 West Lothian Council (WLC) were consulted in relation to the scope of the assessment; the selection of viewpoints; and the extent of the LVIA study area for the consented application. No additional consultation has been undertaken with respect to this assessment for the revised proposal.

Study Area

3.12 It is accepted practice within landscape and visual assessment work that the extent of the study area for a development proposal is broadly defined by the visual envelope of the proposed development. In this case a study area of 10km has been used (as shown by Figure 6.2). This study area is adequate to identify all potentially significant effects and differences in the effects, given that the change in heights is 20m and this change is not likely to be perceptible beyond 10km, and the assessment of the Consented Development did not identify significant effects beyond 5km.

3.13 A more detailed study area of 2km has been used, as previously agreed, for effects on residential amenity.

Report Structure and Terminology

3.14 This assessment refers extensively to the Original LVIA for Longhill Burn wind farm (the Consented Development); consisting of Chapter 6 of the ES and its supporting appendices. Supporting appendices have been prepared to this chapter in respect of effects on residential amenity (Appendix 6.1) and visualisation methodology (Appendix 6.2). This information is important and should be read alongside this assessment.

3.15 Key terms used within the assessment are described in the Methodology section and Appendix 6A of the Original LVIA.

Methodology

3.16 The methodology is described in Appendix 6A of the Original LVIA.

3.17 The methodology has been retained as unaltered as far as is feasible to facilitate comparisons between the assessments for the Consented and Proposed developments. However, some methodology guidance has been updated since the Original LVIA was prepared, as follows:

- **Updated Landscape Institute Guidance TGN 06/19** – This guidance on visualisation defers to the SNH guidance in respect of wind farm developments and is not considered further in relation to this assessment apart from the provision of a description of the visuals methodology in Appendix 6.2 to meet the requirements of this guidance.
- **'An approach to landscape sensitivity assessment', Natural England 2019** is an update to guidance previously provided by Countryside Agency and Scottish Natural Heritage (2004) Landscape Character Assessment Topic Paper 6 – Techniques and Criteria for Judging Capacity and Sensitivity. This document is a development of previous guidance and relates to matters which are primarily covered in the context of this assessment by the Guidelines for Landscape and Visual Impact Assessment. In terms of this assessment it would only be used to inform a review of baseline sensitivity (and of documented studies covering that topic), however the guidance change is minimal; and the findings of the Original LVIA with respect to landscape sensitivity are adopted.

Cumulative Assessment

3.18 Cumulative assessment relates to the assessment of the effects of more than one development.

3.19 A detailed cumulative study area of 15km has been used, given the likely extent of significant effects of the proposals and the cumulative effects identified in the Original LVIA. The following projects were identified within the study area:

Table 6.2 Cumulative sites

Wind Farm	Turbines	Blade tip height (m)	Distance / Direction
Operational Wind Farms			
Pates Hill	7	107	0.6 km E
Tormywheel	15	111	2.0 km W
Pearie Law	6	125	2.8 km E
Harburnhead	22	126 (2 @ 119)	3.7 km E
Black Law Phase 1	23	126.5	5.1 km SW
Muirhall	6	125	5.2 km SE
Muirhall Extension	2	147	6.6 km SE

Black Law	54	100/105/110	6.7 km SW
Muirhall South	3	145	7.2 km SE
Black Law Phase 2	11	126.5	7.8 km SW
Torrance Farm & Extension	5	125	8.8 km NW
Drumduff	3	118	13.0 km NW
Burnhead	13	125	13.4 km NW
Consented Wind Farms			
Heathland	17	132	0.6 km SW
Tormywheel Extension	2	126.5 (proposed tip height increase to 149.9)	3.4 km SW
Camilty	6	132	6.5 km E
Brownhill Farm	2	138.5 (proposed tip height increase to 150)	9.3 km NW
Watsonhead Farm	2	135 (proposed tip height increase to 150)	13.0 km SW
Drumelzie	1	126.5	13.2 km NW
Wind Farms in Planning			
Tip height increases (see above)			

3.20 This assessment considers cumulative effects of the Proposed Development with the wind farms listed above and sets out all of the changes that have arisen since the Original LVIA was prepared and Longhill Burn wind farm was consented within the introduction to the cumulative assessment. These changes took place after the Original LVIA was prepared and before the development was consented and include the construction of some previously consented projects and some applications for tip height increases.

Residential Amenity

3.21 As set out within LI Technical Guidance Note 02//19 'Residential Visual Amenity Assessment (RVAA)':

> *"Changes in views and visual amenity are considered in the planning process. In respect of private views and visual amenity, it is widely known that, no one has 'a right to a view.' …*
>
> *It is not uncommon for significant adverse effects on views and visual amenity to be experienced by people at their place of residence as a result of introducing a new development into the landscape. In itself this does not necessarily cause particular planning concern. However, there are situations where the effect on the outlook / visual amenity of a residential property is so great that it is not generally considered to be in the public interest to permit such conditions to occur where they did not exist before."*

3.22 The methodology for and assessment of effects on residential amenity for the most affected properties within 2km is included as Appendix 6.1.

Distances

3.23 Where distances are given in the assessment, these are approximate distances between the nearest turbine and the nearest part of the receptor in question, unless explicitly stated otherwise.

Visual Aids

3.24 Photographs of the existing views and photomontages showing the proposed development are provided. The method of visualisation selected has been informed by Landscape Institute Technical Note 06/19 Visual Representation, and SNH Visual representation of wind farms - Guidance (Feb 2017) as discussed above. The methodology of production for the visualisations is described in Appendix 6.2.

3.25 Comparative wireframes for all of the viewpoints used in the Original LVIA have been provided. Visualisations produced to current SNH guidance have also been provided for the viewpoints judged most likely to be affected by the tip height increase (viewpoints 1 to 9).

Planning Policy

National Planning Policy

3.26 National planning policy remains unchanged since the development was consented.

Local Planning Policy

3.27 Current local planning policy has not changed since the development was consented, or since the Original LVIA and relevant policy remains as set out at 6.42-6.44 of the Original LVIA.

Local Guidance

3.28 Draft Supplementary Guidance on Wind Energy was consulted upon during April 2020 by West Lothian Council, but this still relies on the 2011 Landscape Capacity study in considering landscape sensitivity. The advice within the capacity study was fully considered in the Original LVIA (6.45-6.48; 6.54; 6.64-6.72, 6.143, 6.284 and Appendix 6b) and the change of turbine tip height would not alter the Original LVIA findings on landscape sensitivity given that the tip height increase of the Proposed Development would mean that the turbines remain in the largest size class considered in determining sensitivity.

3.29 South Lanarkshire updated its Tall Wind Turbines: Landscape Capacity, Siting and Design Guidance in 2019, but this primarily altered the advice on siting tall turbines within South Lanarkshire and did not alter the assessed sensitivity of areas to turbine development.

Findings in relation to landscape sensitivity within South Lanarkshire remain as set out within the Original LVIA.

Local policy and guidance considerations

3.30 Effects on landscape character, views and designated landscapes are considered within this assessment. Effects on residential visual amenity are considered within Appendix 6.1.

Baseline and effects of Consented Development

Introduction

3.31 An overview of the baseline study results is provided in this section with the full baseline description of the individual landscape and visual receptors being provided alongside the assessment of effects for ease of reference.

3.32 This section provides a review of the key local baseline studies and guidance documents and identifies those landscape and visual receptors which merit detailed consideration in the assessment of effects, and those which are not taken forward for further assessment as effects "have been judged unlikely to occur or so insignificant that it is not essential to consider them further" (GLVIA3, para. 3.19).

3.33 Both this baseline section and the effects section describe landscape character and visual receptors before considering designated areas as it is common for designations to encompass both character and visual considerations within their special qualities or purposes of designation.

Local Guidance and Baseline Studies

3.34 As noted above, local guidance documents and baseline studies have not been updated since the Original LVIA was prepared, though draft guidance has been consulted upon. Changes included within the draft guidance are minor and would not alter the LVIA findings.

ZTV study

3.35 Zone of Theoretical Visibility (ZTV) studies were generated for the Proposed Development (the data and methodology used are described in Appendix 6.2). Figures 6.1 and 6.2 show a comparison between the proposed and consented developments and indicates differences to areas of potential visibility. These indicate very limited areas of new visibility. Figures 6.5 and 6.6 show hub height and blade tip ZTV study for the Proposed Development to a distance of 35km to meet SNH standards.

3.36 Given the limited change in the extent of visibility between the consented and proposed developments, it is not considered necessary to consider any new viewpoints or receptors not considered within the Original LVIA.

3.37 Effects on landscape or visual receptors outside the areas of visibility shown on the ZTV study would be negligible and are not assessed in detail.

Landscape Character

3.38 Local landscape character areas in the study area are shown on Figure 6.3. The character areas boundaries have not been changed since the consent, and the following areas were judged to receive Moderate or greater effects as a result of the Consented Development within the Original LVIA:

Table 6.3 Effects on character identified for Consented Development

Character area	Distance, direction	Effects identified (significance)
LCT Upland Hill Fringes: Gladsmuir / Woodmuir /Camilty Fringe with Wind Farms	Includes site	Major/moderate within 2 - 3km (significant), reducing to Moderate/minor beyond 3km (not significant).
SL: Central Plateau Moorland and Farmlands (5 & 6) including subtypes: with Forestry & with Windfarms.	0.5 km, S	Moderate within 2 - 3km (significant), reducing to Moderate/minor beyond 3km (not significant).
WL: Upland Hill Fringes: Harburn / Hartwood Fringe (WL 2(4))	1.0 km NE	Major/moderate within 2 - 3km (significant), reducing to Moderate or less beyond 3km (not significant).

3.39 Areas with lower levels of effects are at greater distances and/or have more limited visibility and changes to the turbine tip heights would not give rise to significant effects. The above areas are considered further in the assessment of effects.

Visual Receptors

3.40 Visual receptors are "the different groups of people who may experience views of the development" (GLVIA, 3rd edition, para 6.3). In order to identify those groups who may be significantly affected the ZTV study (Figure 6.2), baseline desk study and site visits have been used.

3.41 The different types of groups assessed within this report encompass local residents; people using key routes such as roads; cycle ways, people within accessible or recreational landscapes; people using Public Rights of Way; or people visiting key viewpoints. In dealing with areas of settlement, Public Rights of Way and local roads, receptors are grouped into areas where effects might be expected to be broadly similar, or areas which share particular factors in common.

3.42 Representative viewpoints have been selected to aid the assessment of effects on visual receptors. These comprise the viewpoints used within the Original LVIA which lie within 10km of the turbines; as shown on Figure 6.2.

Baseline Visual Environment

3.43 There have been no notable changes to the baseline environment since the development was consented, or since the Original LVIA was prepared, and photography has not been updated.

Visual Receptors

3.44 The following visual receptor groups are located within the 10km study area and were considered to receive Moderate or greater effects arising from the Consented Development. For simplicity and in line with current methodology, settlements and nearby local routes (roads and footpaths) are considered together in the groups below.

Table 6.4 Visual Effects identified for Consented Development

Receptor	Distance, direction	Effects identified (significance)
Breich	1.8km, N	Major and Major/moderate (significant)
Loganlea, Addiewell, Stoneyburn, West Calder, Longridge and Fauldhouse	2.7-4km, N	Major/moderate (significant), reducing to Moderate for footpaths beyond approx. 4km NW.
Woolfords	2km SE	Major/moderate (significant)
Tarbrax and Auchengrey	4.2 – 5km SE - S	Moderate (significant)
Forth	5km SW	Moderate (not significant)
Whitburn, Blackburn Livingston, Bathgate and Armadale	5.6 – 8km N - NE	Moderate (not significant)
Hill summits within the Pentlands	7 km E	Moderate (not significant)
Cairnpapple Hill and The Knock	12 km N	Moderate (not significant)

3.45 Receptors with lower levels of effects are at greater distances and/or have more limited visibility and changes to the turbine tip heights would not give rise to significant effects. The above receptors are considered further in the assessment of effects.

Landscape Designations and Value

Designated areas

3.46 Designated areas located within the 10km study area include only the western most hills of the Pentland Hills Special Landscape Area, located 5km east/south east of the site. This was considered to receive Moderate effects, that would be not significant, arising from the Consented Development.

3.47 As indicated by Figure 6.1, the extent of visibility would not be notably increased within any designated areas, and given distance, the increased turbine scale would be barely perceptible (see comparative wirelines for viewpoints 8 and 9) and effects would not be different to the Consented development.

The Proposed Development

The Proposal

3.48 The Consented Development is for 8 turbines of up to 180m tip height. The Proposed Development increases tip heights to 200m without altering turbine positions. There are no proposed alterations to the associated infrastructure or site access arrangements which would give rise to landscape or visual effects.

Design Approach and Mitigation

3.49 The design approach and mitigation would remain as set out in the Original LVIA and Original EIA Report. The increased turbine height is relatively minor at only 20m with the main design considerations likely to be the potential for increased effects on nearby visual receptors and slightly greater scale contrasts with existing and consented adjacent wind farms. These effects are considered within this assessment.

3.50 In relation to the turbine heights, the local guidance does not differentiate between turbines of 180m or 200m.

Construction

3.51 There would be no differences in construction approach compared to the Consented Development.

Landscape and Visual Effects

Introduction

3.52 This section sets out the effects that the Proposed Development would have on landscape and visual receptors.

3.53 Effects during construction would be the same as for the Consented Development. This assessment focusses on effects during operation.

Effects on Site Fabric

3.54 Effects on site fabric would be the same as for the consented development.

Viewpoint Analysis

3.55 Viewpoint analysis has been undertaken from 17 viewpoints used within the Original LVIA and which are located within 10km of the Proposed Development.

3.56 The viewpoint locations are illustrated on Figures 6.1 and 6.2. Visualisations (comprising photographs of the existing view, wireframes and photomontages in line with SNH guidance) are provided. Comparative wireframes for all the viewpoints considered in the Original LVIA are also included.

3.57 Table 6.5 below sets out the magnitude of change at each viewpoint location only. The wider extent of the effect (beyond the individual viewpoint location) and its duration are considered in the main body of the assessment text below as part of the consideration of the significance of effects in visual receptors.

Table 6.5 Viewpoint analysis summary

Viewpoint	Distance / direction	Scale of Visual Effect for Consented Development	Scale of Visual Effect for Proposed Development
1) Breich (A71)	1.8km NW	Large	Large
2) Woolfords Cottages	2.1km, SE	Medium	Medium
3) A704 Woodmuir	2.1km, W	Large/medium	Large/medium
4) Fauldhouse	3.7km, NW	Medium	Medium
5) West Calder (A71)	3.8km, NE	Medium	Medium
6) A706 Longridge	4.1km, NW	Medium	Medium
7) Forth (A706)	4.9km, SW	Medium/small	Medium/small
8) Tarbrax	5.1km, SE	Medium/small	Medium/small
9) A70 Maiden Hill	6.2km, SE	Medium/small	Medium/small
10) B8084 near Armadale	7.9km, N	Medium/ Small	Not assessed
11) A70 Harperrig Reservoir	10.1km, E	Small	Not assessed
12) Livingston	11.1 km NE	Small	Not assessed
13) East Craigs Hill, (Blackridge Heights)	11.4 km NW	Small	Not assessed
14) West Cairn Hill	11.8 km E	Small	Not assessed
15) Cairnpapple Hill	12.4 km N	Small	Not assessed
16) Scald Law	20.3 km E	Negligible	Not assessed
17) Tinto Hill	24.1 km S	Negligible	Not assessed

3.58 Each of the viewpoints is a 'sample' of the potential effects, representing a wide range of receptors – including not only those actually at the viewpoint, but also those nearby, at a similar distance and/or direction.

3.59 From these viewpoints it can be seen that the increase in size of the turbines would have little effect on the scale of change – for most of the viewpoints the 20m height increase would be barely discernible and for those where it would be more apparent (within up to 4km), the change is insufficient to alter the assessment of scale of effect. Within approximately 2km the change would be experienced as a direct increase in the scale of the turbines and between 2-4km the change would be noticeable as a small incremental increase in the scale contrast between the proposed turbines and other existing turbines and features in the landscape. The magnitude of effects for those viewpoints assessed

within the Original LVIA, but not included in this assessment (10-17) is also assumed to be the same as for the Original LVIA as set out in the table above. These viewpoints are included in the comparative wireframes.

Effects on Landscape Character

3.60 As set out at section 6.49 and Table 6.3 above, the Consented Development was judged to give rise to significant effects within 2-3km of the turbines, where the presence and intensify the influence of wind energy development would be increased. Character areas likely to be affected are shown by Figure 6.3.

LCT Upland Hill Fringes: Gladsmuir / Woodmuir /Camilty Fringe with Wind Farms (includes site)

3.61 The Original LVIA identified this character area as being of Medium/low sensitivity to the development of turbines of 180m, and that sensitivity would not be different for turbines of up to 200m, given that the increase in scale is relatively minor.

3.62 The increase in tip heights would not give rise to notable new areas of visibility as discussed at section 6.40 above. As noted at section 6.64 above, there would be a very slight increase in the visual effects within approximately 4km (including near viewpoints 1 and 3 which lie within this character area), though these changes would not be sufficient to generate an increased magnitude of effects on character within those areas.

3.63 Effects on character arising from the proposed development would remain Large scale up to 2km north and Large/medium scale up to 2-3km east and west of the site, leading to Substantial/moderate magnitude effects within 2-3km of the site. These effects would be Major/moderate (significant) and Adverse within 2-3km, reducing to Moderate/minor (not significant) and Adverse beyond 3km.

SL 5&6: Central Plateau Moorland and Farmlands including subtypes: with Forestry & with Windfarm (0.5km, south)

3.64 The Original LVIA identified this character area as being of Medium/low sensitivity to the development of turbines of 180m, and that sensitivity would not be different for turbines of up to 200m, given that the increase in scale is relatively minor.

3.65 The increase in tip heights would not give rise to notable new areas of visibility as discussed at section 6.40 above. As noted at section 6.64 above, there would be a very slight increase in the visual effects within approximately 4km (including near viewpoint 2 which lies within this character area) with changes being less perceptible with distance (including near viewpoints 7 and 8 within this character area), though these changes would not be sufficient to generate an increased magnitude of effects on character within those areas.

3.66 Effects on character arising from the proposed development would remain Medium scale up to 2-3km from the site due to the existing influence of nearby wind farms, leading to Moderate magnitude effects within 2-3km of the site. These effects would be Moderate (significant) and Adverse within 2-3km, reducing to Moderate/minor (not significant) and Adverse beyond 3km.

WL 2(4): Upland Hill Fringes: Harburn / Hartwood Fringe (1km, northwest)

3.67 The Original LVIA identified this character area as being of Medium sensitivity to the development of turbines of 180m, and that sensitivity would not be different for turbines of up to 200m, given that the increase in scale is relatively minor.

3.68 The increase in tip heights would not give rise to notable new areas of visibility as discussed at section 6.40 above. As noted at section 6.64 above, there would be a very slight increase in the visual effects within approximately 4km (including near viewpoint 4 which lies within this character area) with changes being less perceptible with distance, though these changes would not be sufficient to generate an increased magnitude of effects on character within those areas.

3.69 Effects on character arising from the proposed development would remain Large/medium scale up to 2-3km from the site, leading to Substantial/moderate magnitude effects within 2-3km of the site. These effects would be Major/oderate (significant) and Adverse within 2-3km, reducing to Moderate or less (not significant) and Adverse beyond 3km.

Visual Effects

3.70 Based on the assessments of the scale of effects at viewpoints as set out in Table 6.5 above and section 6.64, visual receptors which lie within approximately 4km of the site would potentially experience increased effects. These receptors (as set out in Table 6.4 above) are considered below. Visual receptors at greater distance would experience effects as set out within the Original LVIA and are not considered further.

Breich (1.8km, north)

3.71 Viewpoint 1 represents this settlement. As indicated by the assessment of effects on viewpoints set out in Table 6.5 above, effects would remain large scale, as for the Consented Development. The turbines would be set behind the forested skyline, which slightly reduces their apparent height. The increased height of the proposed turbines would increase their prominence in the open views south from the village, particularly in the case of turbine 1 which is the closest. Effects would remain as set out within the Original LVIA, and as summarised in Table 6.4 above, would be Major and Adverse. Effects on residential receptors are considered within Appendix 6.1.

Loganlea, Addiewell, Stoneyburn, West Calder, Longridge and Fauldhouse (2.7-4km, North)

3.72 Viewpoints 4, 5, and 6 represent these settlements and the routes around them. As indicated by the assessment of effects on viewpoints set out in Table 6.5 and at section 6.64 above, effects would remain similar to those assessed for the Consented Development and the increased height would be noticeable primarily as a difference in scale contrast with other turbines and landscape features (for example the pylons seen looking towards the site from West Calder). Effects would remain as set out within the Original LVIA, and as summarised in Table 6.4 above, would be Major-Moderate (significant) and Adverse, reducing to Moderate (not significant) and Adverse beyond approx. 4km.

Woolfords (2km, southeast)

3.73 Viewpoint 2 represents this settlement. As indicated by the assessment of effects on viewpoints set out in Table 6.5 above, effects would remain medium scale, as for the Consented Development. The increased height would be noticeable primarily as a difference in scale contrast with other turbines seen in the view towards the site. Effects would remain as set out within the Original LVIA, and as summarised in Table 6.4 above, would be Major-Moderate (significant) and Adverse. Effects on residential receptors are considered within Appendix 6.1.

Visual receptors beyond 4km

3.74 There would be no change to visual effects for visual receptors beyond 4km as set out within Table 6.5 and section 6.67 above. Effects would remain as assessed within the Original LVIA and summarised in Table 6.6 below:

Table 6.6 Visual effects on receptors beyond 4km

Receptor	Distance, direction	Effects identified (significance)
Tarbrax and Auchengrey	4.2 – 5km SE - S	Moderate (significant)
Forth	5km SW	Moderate (not significant)
Whitburn, Blackburn Livingston, Bathgate and Armadale	5.6 – 8km N - NE	Moderate (not significant)
Hill summits within the Pentlands	7 km E	Moderate (not significant)
Cairnpapple Hill and The Knock	12 km N	Moderate (not significant)

Night-time effects

3.75 Figure 6.4 shows a ZTV study which illustrates the potential additional areas of visibility of turbine aviation lighting as a result of the higher turbine hub height of the Proposed Development compared to the Consented Development. Such areas are limited and not affecting any particularly sensitive visual receptors within 5km of the site. The main are where lights may be seen by the local community where they would not have been visible before are from local roads around the eastern edge of Forth, 5-6km to the southeast of the site. Night-time effects are judged to be the same as set out within the Original LVIA for the Consented Development.

Residential Amenity

3.76 In summary, taking account of the findings of the Original LVIA; the increased turbine heights; the requirements of the current guidance on RVAA; the ZTV study and visualisations; and site visits – some properties would experience significant effects on their outlook, but none are identified as receiving effects which would exceed the RVAA threshold; "where the effect on the outlook / visual amenity of a residential property is so great that it is not generally considered to be in the public interest to permit such conditions to occur where they did not exist before." (TGN 02/19)

Cumulative effects

3.77 Since the Original LVIA was prepared and the April 2020 consent for Longhill Burn wind farm, the following changes have arisen in respect of wind farms within the 15km study area (listed at Table 6.2 above):

- Consented turbines at Moss Hall Farm, Covanhill and Muldron have been constructed.
- Applications have been made to increase tip heights at the previously consented Tormywheel Extension, Brownhill Farm and Watsonhead Farm.

3.78 Taking into account the above changes; the only cumulative effects that would not have been taken into account in considering the Consented Development are:

- Effects arising from the tip height increase for the Proposed Development;
- Effects arising from the combined effects of the Proposed Development and increased tip heights at Tormywheel Extension, Brownhill Farm and Watsonhead Farm.

Cumulative effects arising from the increased tip heights

3.79 Given the limited extent and degree of change in effects arising from the tip height increase identified above; the cumulative effects arising from the Proposed Development would be the same in terms of magnitude and significance as for the Consented Development. The nature of the effects would be slightly altered, with the difference in scale contrast between the development and the adjacent turbines at Pates Hill becoming slightly more pronounced. This is most noticeable in views from the southeast (see viewpoints 2, 7 and 9).

Cumulative effects with increase tip heights at other wind developments

3.80 The three proposed tip height increases are as follows:

- Tormywheel extension (3.4km, SW) – Proposed tip height increase from 126.5 to 149.9m
- Brownhill Farm (9.3km, NW) - Proposed tip height increase from 138.5 to 150m, and
- Watsonhead Farm (13km, SW) - Proposed tip height increase from 135 to 150m.

3.81 As shown by Figure 6.3, these developments are all located beyond other intervening wind farms. In each case, the tip height increase is relatively minor and would not entail the addition of aviation lighting. The effects of each of these increases is likely to be very localised, with only Tormywheel Extension close enough to interact with the effects arising from the proposed development. The combined effects of both tip height increases would very slightly intensify the cumulative effects in the area to the south of Breich and Fauldhouse as shown by viewpoints 1 and 5, but not to the degree that effects would be greater than for the Proposed Development alone.

4 CONCLUSIONS

Introduction

4.1 Planning permission was granted for Longhill Burn Wind Farm on 17 April 2020 (reference 0359/FUL/19). The consented wind farm comprises ten wind turbines with tip heights of up to 180m and associated infrastructure. The planning application was accompanied by an Environmental Impact Assessment Report dated March 2019 (herein after referred to as the "original EIAR").

4.2 This Comparative Environmental Impact Assessment Report (Comparative EIAR) is submitted in support of an application under Section 42 of the Town and Country Planning (Scotland) Act 1997 by Energiekontor UK Ltd ("the Applicant") to vary condition 7 of planning permission 0359/FUL/19 to allow an increase in the consented tip heights at Longhill Burn Wind Farm from 180m to 200m ("the Proposed Development").

4.3 This Comparative EIAR has been prepared by Energiekontor UK Ltd with specialist input where necessary and sets out the findings of a comparative Environmental Impact Assessment which has been undertaken to consider whether the Proposed Development would result in any additional significant environmental effects not identified in the previous EIAR for Longhill Burn Wind Farm.

Comparative EIA Screening

4.4 One topic area with the potential for materially different effects from those reported in the original EIAR has been identified, namely:

- Landscape and visual effects.

Landscape and Visual Effects

4.5 Overall, there are no additional significant effects identified on landscape character, landscape designations and visual receptors in the day and night as a result of the Proposed Development.

Overall

4.6 The potentially significant environmental effects associated with the Proposed Development have been considered. There are no new potentially significant environmental effects arising from the Proposed Development which have not already been considered as part of the original EIAR.

A. Appendix 6.1: Residential Visual Amenity

A.1 Introduction

Background

A.1.1 This Residential Visual Amenity Assessment (RVAA) has been prepared by Stephenson Halliday in accordance with Landscape Institute Technical Guidance Note 2/19: Residential Visual Amenity Assessment (15 March 2019). The Technical Guidance Note (TGN) identifies that:

"The purpose of carrying out a Residential Visual Amenity Assessment (RVAA) is to form a judgement, to assist decision makers, on whether a proposed development is likely to change the visual amenity of a residential property to such an extent that it becomes a matter of 'Residential Amenity'."

A.1.2 It further notes that:

"Changes in views and visual amenity are considered in the planning process. In respect of private views and visual amenity, it is widely known that, no one has 'a right to a view.' …

It is not uncommon for significant adverse effects on views and visual amenity to be experienced by people at their place of residence as a result of introducing a new development into the landscape. In itself this does not necessarily cause particular planning concern. However, there are situations where the effect on the outlook / visual amenity of a residential property is so great that it is not generally considered to be in the public interest to permit such conditions to occur where they did not exist before."

A.1.3 This assessment considers only what the resident may see from a property. Views or 'visual amenity' are just one component of residential amenity and the two should not be confused. The latter is a planning matter and may also include aspects such as noise, air quality, traffic, etc., in addition to residential visual amenity. RVAA does not consider or provide information on other aspects of residential amenity and it is for decision makers to weigh all these aspects, and documents/assessments relating to them, in determining the acceptability of a proposal.

A.1.4 This assessment, and the process of RVAA, seeks to identify where effects on residential visual amenity are of such a nature or magnitude that they may need to be considered in the overall balance of 'Residential Amenity' or 'Living Conditions'. The point at which this happens is referred to as the Residential Visual Amenity Threshold.

A.2 Approach

A.2.1 TGN 2/19 advocates a four step process to RVAA with the first three falling broadly within the scope of LVIA where the magnitude and significance of visual effects is assessed.

A.2.2 The fourth step involves a further assessment of the change to visual amenity of individual properties identified as "having the greatest magnitude of change" and identifying whether the RVA threshold is reached.

Methodology

Study Area and Initial Assessment

A.2.3 There are no standard criteria for defining the RVAA study area and this is determined on a case by case basis. The guidance note identifies that for large structures, such as wind turbines, a preliminary study area of 1.5-2km radius may be appropriate to begin identifying properties for inclusion within RVAA, but for other developments the study area would be much reduced in proportion to their size. In this case, a study area of 2km has been used, in line with the Original LVIA for the Consented Development.

A.2.4 Within the RVAA study area all residential properties are identified. An initial appraisal is undertaken to identify those properties likely to experience the greatest effects, therefore requiring further detailed assessment, and those where effects would be less and unlikely to approach the RVA threshold. This process may draw on the findings of the LVIA as a starting point and is supplemented by other tools including ZTV maps, wireframes and field work.

Further Detailed Assessment

A.2.5 For those properties that have been identified at the initial stage as requiring further detailed assessment the process follows the following key stages:

- Evaluation of baseline visual amenity;
- Assessment of likely change to the visual amenity of properties; and
- Forming the RVAA judgement.

A.2.6 Properties are usually assessed individually but may be considered in groups where the outlook or views are essentially the same; for example, a row of houses that all share an open outlook towards the site. Where properties are grouped for assessment this will be clearly identified and reasons for grouping described.

Baseline Visual Amenity

A.2.7 The existing baseline visual amenity is described for each property and is informed by desk study and field work. Site visits to all individual properties included within the detailed assessment are undertaken where access can be agreed with property owners. Where access is not possible this step is informed by visits to nearby publicly accessible areas. Visual amenity is described 'in the round' and considers both views from the dwelling itself, the domestic curtilage and views experienced when arriving or leaving the property.

A.2.8 It has been noted where the owners of a dwelling have a financial involvement in the project, however all properties have been treated equally in terms of the potential effects upon residential visual amenity.

Likely Change to Visual Amenity

The change to baseline views and visual amenity as a result of the proposed development is described for each property and a judgement on the magnitude of effects likely to be experienced is provided. This may involve consideration of the following factors:

- Distance between the property and proposed development and their relative locations (e.g. up/down hill)

- Nature of available views (e.g. panoramic, enclosed) and the effect of daily or seasonal variations
- Direction of view or aspect of property affected
- Extent to which the proposed development may be visible from various parts of the property (e.g. dwelling, rooms, access, garden)
- Scale of change to views, including the proportion of view occupied by the proposed development
- Compositional changes (e.g. loss/addition of landscape features such as woodland)
- Contrast or integration of new features with the existing views
- Duration and nature of changes (e.g. temporary/permanent, intermittent/continuous)

Mitigation opportunities

This stage may be supported by a range of visual aids as required including maps, ZTV studies, photography and visualisations. The choice of visual aids is determined on a case by case basis and may be informed by consultation. In line with best practice guidance the type of visualisation should be proportionate to the nature of the proposed development and assessment stage.

RVAA Judgement

This final stage is concerned with identifying "*whether the predicted effects on visual amenity and views at the property are such that it has reached the Residential Visual Amenity Threshold, therefore potentially becoming a matter of Residential Amenity*". This is the key concern of RVAA and judgements on the RVA threshold are set out clearly and unambiguously.

Cumulative

RVAA is undertaken against the baseline, as described in the accompanying LVIA. As stated in the TGN, future cumulative visual effects are not assessed within the RVAA, as the focus of the RVAA is on the existing visual amenity.

This assessment also considers the effects of forestry removal as much of the existing forestry within the RVAA study area is likely to be felled in the short to medium term or during the lifetime of the proposed development.

Distances/Directions

Where distances and directions are given within the assessment, these are distances between the nearest part of the property (including the domestic curtilage) and the nearest turbine, unless explicitly stated otherwise. Distances given are rounded to the nearest 10m to account for the level of accuracy available in techniques used to measure (usually based on aerial photography within a GIS).

A.3 Assessment

Introduction

A.3.1 Figure 6.14 in Appendix 6g of the Original LVIA illustrates the 2km RVAA study area and identifies all nearby residential properties. In total there are 11 properties/clusters of properties located within the RVAA study area.

Initial Assessment

A.3.2 The initial assessment draws on the Original LVIA findings in order to identify those properties with the highest magnitude of change where there is potential for the RVA threshold to be reached; modifying the findings as required to reflect the design change from 180m to 200m to tip turbines during the consenting process. This is supported by the ZTV in Figure 6.2, the visualisations for Viewpoint 1 located in Breich and site visits undertaken to assess views from individual properties.

A.3.3 In a number of cases, assessments of magnitude of change and level of effect have been reduced in this assessment compared to the Original LVIA. This relates primarily to the requirements of current guidance in relation to taking account of the extent to which the property is affected; the importance of the views affected to the amenity of the property; and the nature of the existing views towards the site. The Original LVIA judgements of magnitude and level of effect were focussed on the effects on the most affected view from the property – ie. they reflected the 'worst case' visual effect rather than the effects on residential amenity.

A.3.4 Where it is considered that effects at properties have the potential to reach the RVA threshold this is identified and further detailed assessment is provided on individual property assessment sheets in the following section. The initial assessment is provided in Table A.1.

Table A.1 Initial Assessment

Ref	Property	Comments	Magnitude of Change	Level of Effect
P1	Breich (1.86km, north west - see Viewpoint 1)	Original LVIA: *"The outlook to the rear of properties on Woodmuir Road is orientated in a south easterly direction with direct views towards the Proposed Development. … the hubs/upper towers and rotors of all 8 turbines would potentially be seen on the skyline, with the lower tower and infrastructure screened by intervening plantation woodland and topography*." The increased tip height would not alter effects at these properties.	Substantial	Major
P2	Woodmuir Farm (1.58km, north west)	Original LVIA: "*The rear elevation of this property faces southeast with views south from principal rooms partially filtered by garden vegetation and hedgerow cover. … the towers and rotors of all 8 turbines would potentially be seen on the skyline, with the lower tower and infrastructure screened by intervening plantation woodland and topography."* The increased tip height would not alter effects at this property.	Substantial	Major
P3	Woodmuir House (1.39km, north west)	Original LVIA: "*The rear elevation of this property faces southeast with views south from principal rooms partially filtered by garden vegetation and hedgerow cover. … the towers and rotors of all 8 turbines would potentially be seen on the skyline, with the lower tower and infrastructure screened by intervening plantation woodland and topography."* The increased tip height would not alter effects at this property.	Substantial	Major
P4	Longfords Farm (1.52km, north)	Original LVIA: *"The main views from the primary living space of the house are orientated in a southerly easterly direction and views towards the Proposed Development would be part oblique. There would be views towards the proposed turbines seen in views from the access drive on approaching the property from the east… the hubs/upper towers and rotors of all 8 turbines would potentially be seen on the skyline, part screened by intervening plantation woodland and topography."* The increased tip height would not alter effects at this property.	Substantial	Major
P5	Pateshill Cottages (1.07km, north)	Original LVIA: *"The main views from the primary living space of the house are orientated in a southerly direction and views towards the Proposed Development would be direct… All 8 proposed turbines would be seen at close range at a distance of 1.07km appearing in close association with the existing turbines."* The increased tip height would not alter effects at these (financially involved) properties.	Substantial	Major

Ref	Property	Comments	Magnitude of Change	Level of Effect
P6	Longford East (1.93km, north west)	Original LVIA "*The main views from the primary living space of the house are orientated in a southerly easterly direction and views towards the Proposed Development to the south would be relatively open… the hubs/upper towers and rotors of all 8 turbines would be seen on the skyline*." The increased tip height would not alter effects at this property.	Moderate	Major / moderate
P7a	Rusha Farm (1.74km, north)	Original LVIA: *"The main views from the primary living space of the house are orientated in a southerly easterly direction and views towards the Proposed Development would be part oblique. There would be views towards the proposed turbines seen in views from the access drive on approaching the property from the east… hubs/upper towers and rotors of all 8 turbines would potentially be seen on the skyline, part screened by intervening plantation woodland and topography."* The increased tip height would not alter effects at this property.	Substatial	Major
P7b	Rusha Farm Cottages [Viewpark and Roshinado] (1.8km, north east)	Original LVIA: *"The main views to the rear of the cottages are orientated in a southerly direction and views towards the Proposed Development would be part oblique. There would be views towards the proposed turbines seen in views from the access drive on approaching the property from the west."* The turbines *"would be seen on the skyline, part screened by intervening plantation woodland and topography."* The increased tip height would not alter effects at this property.	Moderate	Major / moderate
P8	Riven Lea [part of West Mains Croft], (2km, north east)	Original LVIA: *"The main views to the rear and side elevation would be oblique. There would be views towards the proposed turbines seen in views from the access drive on approaching the property from the north… The proposed turbines would be larger in scale and would be seen on the skyline."* The increased tip height would not alter effects at this property.	Moderate	Major/ moderate
P9	West Mains Croft [Plots 7, 9, 10 and 11]	Original LVIA: *"views would substantially screened by the tree cover and any potential visibility should be limited to glimpsed views towards the upper tower / rotors potentially during winter months."* The increased tip height would not alter effects at this property.	Slight	Moderate
P10	West Mains Crofts [Plot 17] (1.1km, north east)	Original LVIA: "*The main views from the primary living space of the house are orientated in a southerly westerly direction and views towards the Proposed Development would be completely screened by retained coniferous woodland. "* The increased tip height would not alter effects at this property.	Slight/ negligible	Moderate /minor
P11	Baad's Mill Farmhouse (1.3km, north east)	Original LVIA: *"The main views from the primary living space of the house are orientated in a southerly easterly direction and views towards the Proposed Development would be part oblique. There would be views towards the proposed turbines seen in views from the side elevation of the property, the access drive and parking area… hubs/upper towers and rotors of all 8 turbines would potentially be seen on the skyline, part screened by intervening plantation woodland and topography."* The increased tip height would not alter effects at this property.	Substantial	Major

A.4 Summary and Conclusions

A.4.1 In summary, taking account of the findings of the Original LVIA; the increased turbine heights; the requirements of the current guidance on RVAA; the ZTV study and visualisations; and site visits – 7 no. properties or clusters of properties are identified as receiving effects of Substantial magnitude and thus having the potential for effects over the RVAA threshold.

A.4.2 Given the level of detail included in the Original LVIA, the additional assessment required for this threshold has, in any event, been previously undertaken at that stage and has informed this assessment's findings.

A.4.3 The assessment has considered the potential for significant effects, and whether those significant effects would be of such intensity that they would result in serious harm to living conditions. Taking account of the increased turbine height, it is considered that *"in no case would any property become an unattractive place to live, when judged objectively in the public interest. While turbines would be seen from some properties, that presence would not be dominating or overbearing. This is due to the physical separation and, in some circumstances, intervening buildings, property aspect, landform and vegetation."*

A. Appendix 6.2: Visual Aids

A.1 Guidance and Standards Used

A.1.1 All Visibility Maps (ZTVs), photography, visualisations (wirelines and photomontages) and their graphical presentation has been undertaken in line with the Landscape Institute's Technical Guidance Note 06/19, Visual Representation of Development Proposals and Visual Representation of Wind Farms: v2.2. Scottish Natural Heritage, February 2017.

A.2 The Computer Model

A.2.1 To generate wireline visualisations and photomontages, a computer model of the proposed site and study area has been has been produced using Resoft WindFarm software and Autodesk 3DS Max / POV-Ray This software is used to create a 3D computer model of the proposed development representing the specified geometry and position of the proposed development, and the existing landform (terrain). The landform information is derived from 50m resolution terrain data incorporating 5m resolution terrain data around the site and each viewpoint.

A.2.2 The computer model includes the entire study area and all calculations take account of the effects caused by atmospheric refraction and the Earth's curvature. The computer model does not take account of the screening effects of any intervening objects and forestry, so does not show any vegetation, buildings, woodland or other non-terrain features, unless expressly stated.

A.2.3 The computer model combines the existing landform with the model of the proposed development and detailed data collected in the field to enable the output of accurate visual and graphical information and associated data for presentation as finished figures.

A.3 Visibility Maps: Zone of Theoretical Visibility

A.3.1 Zone of Theoretical Visibility (ZTV) maps have been generated using GIS software to assist in viewpoint selection, illustrate areas from where part or all of the proposed development may be visible and to indicate its potential influence in the wider landscape. The data used is described in detail on each of the relevant figures.

A.3.2 Unless expressly stated, all of the visibility maps present the extent of potential visibility on the basis of a 'bare ground' scenario: They do not account for the effects of screening and filtering of views as a result of intervening features (e.g. buildings, trees, hedgerows, etc) and so tend to over-estimate visibility, both in terms of the land area from which the project can potentially be seen and potentially in terms of the extent of the development visible from a particular viewpoint .

A.4 Visualisations: Photomontages (Type 4)

A.4.1 Baseline photography has been undertaken at each agreed representative viewpoint location using a high-quality digital SLR camera with full frame sensor and a 50mm fixed focal length lens, in combination with a panoramic head equipped tripod at 1.5m height Above Ground Level (AGL) unless stated otherwise – in accordance with the relevant guidance identified above. The resulting photos are combined into panoramas using Adobe Photoshop and/or PTGui photo stitching software and saved as cylindrical and planar projection versions for use in visualisation production.

A.4.2 The Resoft WindFarm computer model is used to generate a perspective view from each viewpoint of the proposed development, using landform in the computer model and the specified geometry and position of the proposed development.

A.4.3 Using the computer model, a wireline diagram showing the proposed development (and any cumulative sites as required) is generated for each viewpoint to meet the relevant requirements of guidance (e.g. blades upwards, numbered, facing the viewpoints, etc).

A.4.4 To produce a photomontage, the above wireline is combined with the photographic panorama using Resoft WindFarm. Detailed viewpoint information as recorded on site (e.g. GPS grid co-ordinates; ground level information; compass bearings; and any other known references; etc) is used to enable the accurate alignment of the photographs with the computer model. A perspective match is achieved between the computer-generated wireline and the photographs by iteratively adjusting the parameters until all the major features in the image are aligned satisfactorily. The proposed development is then rendered using Resoft WindFarm or POV-Ray taking into account the time and conditions occurring on the day of the photography to provide a realistic image. Elements such as proposed planting and some surface textures are added using Adobe Photoshop, guided by elements within the wireline model and information on growth rates.

A.4.5 A minimal amount of image processing is undertaken. Where necessary, the contrast between the background photograph and the proposed development is increased to ensure that the development is apparent in the photomontage, as far as possible. It should be noted that there is an element of professional judgement inherent in the illustration of the changes represented by any photomontage.

A.4.6 The information shown on the visualisations and within the LVIA is generated via the computer model or from mathematical calculations.

A.4.7 The completed base photography, wirelines, photowires, photomontages and accompanying data are then presented as figures using desktop publishing/graphic design software to meet the relevant guidance requirements.

A.5 Image Verification

A.5.1 Should the user wish to undertake verification of the images, please refer to ANNEX E of the Visual Representation of Wind Farms: Version 2.2 (SNH, 2017) for full details of the methods required.

A.5.2 Technical details meeting TGN 06/19 requirements for type 4 visualisations as identified in Appendices 10 and 11 of the TGN are set out either in this methodology, or on the individual visualisations, with the exception of the make and model of panoramic head and elements used to check vertical and horizontal alignment. TGN 06/19 suggests that these will vary by project, but in practice these may vary by viewpoint (e.g. if photography is undertaken at separate times or by different photographers; or where viewpoints are sufficiently distant from each other that they do not share the same elements suitable for matching). These details and the 'additional imagery' requirements of a photograph of the tripod location and a 'composite view' showing the underlying construction of a photomontage are recorded for each viewpoint and can be provided if required for verification purposes.

A.6 Data Accuracy

A.6.1 The Ordnance Survey (OS) provides accuracy figures for the following terrain data products expressed statistically as root-mean-square error (RMSE) in metres:

- OS Terrain®50 (50m resolution): 4m RMSE.
- OS Terrain®5 (5m resolution): Urban and major communication routes 1.5m RMSE; Rural 2.5m RMSE; Mountain and moorland 2.5m RMSE.

A.7 SNH Visualisation Guidance Annex A: Information on limitations of visualisations.

"Visualisations of wind farms have a number of limitations which you should be aware of when using them to form a judgement on a wind farm proposal. These include:

- *A visualisation can never show exactly what the wind farm will look like in reality due to factors such as: different lighting, weather and seasonal conditions which vary through time and the resolution of the image;*
- *The images provided give a reasonable impression of the scale of the turbines and the distance to the turbines, but can never be 100% accurate;*
- *A static image cannot convey turbine movement, or flicker or reflection from the sun on the turbine blades as they move;*
- *The viewpoints illustrated are representative of views in the area, but cannot represent visibility at all locations;*
- *To form the best impression of the impacts of the wind farm proposal these images are best viewed at the viewpoint location shown;*
- *The images must be printed at the right size to be viewed properly (260mm by 820mm);*
- *You should hold the images flat at a comfortable arm's length. If viewing these images on a wall or board at an exhibition, you should stand at arm's length from the image presented to gain the best impression.*
- *It is preferable to view printed images rather than view images on screen. If you do view images on screen you should do so using a normal PC screen with the image enlarged to*

the full screen height to give a realistic impression. Do not use a tablet or other device with a smaller screen to view the visualisations described in this guidance."