

# 1 Introduction

## Introduction

- 1.1 This Environmental Statement (ES) has been prepared by LUC on behalf of North Lowther Energy Initiative Ltd (NLEI Ltd), a joint venture between 2020 Renewables Ltd (2020 Renewables) and Buccleuch Estates Ltd (Buccleuch Estates), to accompany an application for consent to construct and operate a windfarm development known as North Lowther Energy Initiative (hereafter referred to as 'the Development'). The site (hereafter referred to as 'Development Area') is located within the Queensberry Estate, approximately 5km south of Crawfordjohn, 2km north-east of Sanquhar and west of Wanlockhead, Dumfries and Galloway (see **Figure 1.1**). The Development Area encompasses approximately 4,550 hectares (ha) of open moorland with relatively steep sided valleys and associated plateaux, interspersed by pockets of commercial conifer plantation. The land is owned by Buccleuch Estates and is used primarily for a mixture of tenanted and 'in-hand farming', principally livestock grazing, as well as commercial forestry and seasonal grouse shooting.
- 1.2 As the Development will have a generating capacity of greater than 50 megawatts (MW), consent is required under Section 36 of the Electricity Act 1989 ('the Act') from Scottish Ministers, in consultation with relevant statutory consultees including Dumfries and Galloway Council. In addition, NLEI Ltd is also seeking consent for deemed planning permission under Section 57 of the Town and Country Planning (Scotland) Act 1997, as amended.
- 1.3 The application is accompanied by this ES which has been undertaken in accordance with the Electricity Works (Environmental Impact Assessment) (Scotland) Regulations 2000 ('the EIA Regulations'), as amended. The ES presents information on the identification and assessment of the likely significant positive and negative environmental effects of the Development. Further details of the statutory requirements for EIA are set out in **Chapter 2: Approach to the EIA**.

## The Proposal

- 1.4 The Development is described in detail in **Chapter 4: Scheme Description** of this ES. In summary, it will comprise:
- 35 wind turbines (including external transformers) of up to 149m (to blade tip) – currently considered candidate turbines envisage a total maximum rated capacity of 147MW<sup>1</sup>;
  - crane hardstandings for each turbine;
  - two access points (A and B);
  - onsite underground electrical cables;
  - a control building;
  - up to five temporary site construction compounds/laydown areas;
  - up to five areas within which it is proposed to win rock for construction (borrow pits);
  - two potential concrete batching plants (to be located within excavated borrow pits);
  - vehicle turning heads;
  - 36km of permanent access tracks comprising 3km of upgraded tracks and 33km of new tracks including passing places and watercourse crossings;

- felling of 69.11ha of forestry and replanting of 32.50ha, as well as an indicative 297.64ha search area for riparian planting within which 36.61ha of compensatory planting (balance between felling and replanting) will also be delivered; and
- signage.

- 1.5 The Renewable Electricity Output Calculator<sup>i</sup> published by the Scottish Government in 2016 allows users to calculate the equivalent number of households powered by a particular capacity of site. In the case of the Development, it is estimated by the calculator that approximately 343,242 (mega-watt hours) MWh could be produced annually, which is enough to power the equivalent of 78,852 households in Scotland for a year.
- 1.6 The operational life of the Development will be 25 years. Up to 24 months are required for construction (a construction programme can be found in **Chapter 4**) and, following the 25-year operational period, 18 months are set aside for decommissioning. Decommissioning will involve the removal of the turbines and all above ground components. An outline decommissioning strategy is provided as **Appendix 4.3: Outline Construction and Decommissioning Environment Management Plan (CDEMP)** and a summary of decommissioning can be found in **Chapter 4**.

## The Developer

- 1.7 2020 Renewables and Buccleuch Estates have formed a joint venture to progress the Development.
- 1.8 2020 Renewables is an established and experienced renewable energy developer based in Greenock. Established in 2010, its staff have been developing renewable energy projects since 1990. 2020 Renewables employs people with a proven track record in planning, constructing and operating windfarms, and is committed to engaging with all stakeholders throughout the development and operation of their projects.
- 1.9 Buccleuch Estates Ltd is the landowner for the Development and the enterprise represents the business interests of the Buccleuch family. Today, the organisation is a diverse enterprise focused on all aspects of land use.

## Project Background

- 1.10 The Development is part of a wider renewable energy and land use strategy that can deliver social, economic and environmental benefits on a wider scale. The Development reflects the latest stage in a series of renewable energy developments between 2020 Renewables and Buccleuch Estates, which include:
- Coaling and restoration of coal mine;
  - Glenmuckloch Energy Park;
  - Glenmuckloch Community Energy Park;
  - Glenmuckloch Windfarm; and
  - Glenmuckloch Pumped Storage Hydro.
- 1.11 These projects aim to provide community owned renewables, renewable energy generation capacity and the ability to store renewable energy within the south of Scotland for use when it is most needed by the electricity grid operator. The Development also provides the opportunity for habitat enhancement, and further details on this are provided in **Chapter 8: Ecology** and **Appendix 8.6: Outline Conservation Management Plan (OCMP)**.

## Climate Change and Renewable Energy Legislation and Policy

- 1.12 The impacts of climate change are widely recognised as being one of the greatest global economic, environmental and social challenges facing the world today. A major cause of climate change is a rise in the concentration and volume of greenhouse gases in the atmosphere, a significant contributor to which

<sup>1</sup> The total MW capacity of 147MW equates to 35 4.2 MW turbines. A range of turbine models with varying capacities is available with a maximum 149m tip height and the final turbine selection will be subject to a tendering process if the application receives consent.

is the use of fossil fuels to generate power. The Development is being proposed in response to this challenge.

- 1.13 **Chapter 5: Policy Context** provides an outline of UK and Scottish legislation and policy on climate change and on energy. This includes The Climate Change (Scotland) Act 2009<sup>ii</sup>, which creates the statutory framework for greenhouse gas emission reductions in Scotland. This set an interim 42% reduction target for 2020, with power for this to be varied on expert advice, and an 80% reduction target for 2050. In January 2017, the Scottish Government published the Draft Climate Change Plan<sup>iii</sup> calling for greenhouse gas emissions to be reduced by 66% on 1990 levels by 2032. The 2032 target will include legally binding annual targets.
- 1.14 Scotland's current renewable energy target is to deliver the equivalent of 100% gross annual electricity demand from renewable sources by 2020<sup>2</sup>. In January 2017, the Scottish Government also published Scotland's first Draft Energy Strategy<sup>iv</sup> which is a free-standing companion document to the Draft Climate Change Plan. The draft strategy sets out a target for Scotland to achieve almost complete decarbonisation of energy, and sets a new 2030 'all-energy' target for the equivalent of 50% of Scotland's heat, transport and electricity consumption to be supplied from renewable sources, with Scotland a world leader in renewable and low carbon technologies and services.
- 1.15 Scottish legislation and policy acknowledges targets set for the United Kingdom (UK) by the European Commission under the European Union (EU) Renewables Directive (2009/28/EC)<sup>v</sup> which include a 16% reduction in UK greenhouse gas emissions by 2020 and for 15% of all energy consumed in the UK to come from renewable resources by 2020. EU legislation and policy is, in turn, driven by international co-operation to cut the emission of greenhouse gas emissions, through the United Nations Framework Convention on Climate Change (UNFCCC). This includes the 'Kyoto Protocol'<sup>vi</sup>, which became a legally binding treaty on 16 February 2005, and the 'Paris Agreement'<sup>vii</sup>, established through the 21st session of the Conference of Parties ('COP 21'). Ratified in the UK in November 2016, the Paris Agreement sets out the ambition of holding the increase of global average temperature to "well below 2°C" and pursuing efforts to limit temperature increase to 1.5°C.

## Benefits of Wind Power

### Avoided Pollutant Emissions

- 1.16 The principal atmospheric pollutants produced by burning fossil fuels are CO<sub>2</sub>, sulphur dioxide (SO<sub>2</sub>), and oxides of nitrogen (NO<sub>x</sub>). In contrast, the harnessing of wind energy is non-consumptive and produces no gases or other by-products. The key environmental benefit of the Development will be the generation of electricity from a renewable energy source that will reduce or avoid the use of fossil fuels through the displacement of electricity generated from other sources of energy.

### Energy Balance

- 1.17 The comparison of the energy used during the manufacture and construction of a power station with the energy generated during its operation is known as the energy balance. The energy balance can be expressed in terms of energy pay-back time, which is the time needed to generate the equivalent amount of energy used in manufacturing and constructing the power station.
- 1.18 An Economic Development Committee of The Welsh Assembly Government Review of Energy Policy in Wales<sup>viii</sup> states that wind power has the shortest energy pay-back time, typically taking only a few months of operation for a wind turbine to pay for itself in energy terms. The energy invested in manufacturing a wind turbine is typically paid off within six to nine months of operation<sup>3ix</sup>.

### CO<sub>2</sub> Emissions

- 1.19 The purpose of the Development is to generate electricity from a renewable source of energy, offsetting the need for power generation from the combustion of fossil fuels. Consequently, the electricity that will be produced by the Development results in a saving in emissions of carbon dioxide (CO<sub>2</sub>) with associated

environmental benefit. The 'payback time' is defined as the length of time (in months) required for the Development to be considered a net avoider of emissions rather than a net emitter. The calculation of payback time includes a consideration of emissions resulting from the construction and operational phases, and the quantification of the carbon storage loss as a result of loss of peat and forestry within the Development Area (expressed as CO<sub>2</sub> emissions).

- 1.20 Use of the Scottish Government's latest carbon calculator<sup>x</sup> with best estimate values, based on available information and using a maximum case scenario, indicates that the Development will pay back the carbon emissions associated with its construction, operation and decommissioning in 3.0 years or 36 months. Further details are provided in **Chapter 14: Other Issues** and **Appendix 14.1: Carbon Report**.

## Legislative Requirements for Environmental Impact Assessment

- 1.21 As the Development exceeds thresholds outlined within Schedule 2 of the Electricity Works (Environmental Impact Assessment) (Scotland) Regulations 2000, and as it is considered the Development could give rise to potentially significant effects, an EIA is required.

## Environmental Statement

- 1.22 This ES reports the findings of the assessment of the likely environmental effects of the Development during construction and operation. The assessment forms part of the wider process of EIA, which is undertaken to ensure that the likely significant effects, both positive and negative, of certain types of development are considered in full by the decision maker prior to the determination of an application for development consent or planning permission. Whilst an assessment of effects during the decommissioning phase has not been undertaken as detailed further in **Chapter 4**, a method statement will be prepared and agreed with the relevant statutory consultees prior to decommissioning of the Development. An outline decommissioning strategy is provided as **Appendix 4.3** as mentioned above.
- 1.23 The objectives of the ES are summarised as follows:
- to establish the existing environmental baseline conditions of the Development Area and surrounding area;
  - to identify both positive and negative potential effects that may arise from the construction and operation of the Development, taking into account its size and location, the sensitivity of the local environment, the concerns of stakeholders, and the requirements of statutory consultees;
  - to predict and evaluate the extent and significance of potential effects;
  - to identify and evaluate possible mitigation measures to reduce any adverse effects; and
  - to identify residual effects.
- 1.24 The general methodology for the ES is detailed in **Chapter 2**. The ES has been compiled by LUC on behalf of NLEI Ltd. Whilst LUC had overall responsibility for the ES, sub-consultants prepared specialist chapters and provided input into the EIA as outlined in **Table 1.1** below.
- 1.25 The ES comprises three volumes: Volume I: Written Text and Figures (this volume), Volume II (Part 1): LVIA Visualisations, Volume II (Part 2): LVIA Visualisations, Volume II (Part 3): LVIA and Cultural Heritage Visualisations and Volume 3: Appendices.
- 1.26 **Chapters 1-5** together provide an introduction to the applicant, a description of Development, details of the EIA process and consultation undertaken, details of the way in which the Development has been designed in response to key constraints, and the planning and legislative context. **Chapters 6-14** describe the potential environmental effects of the Development on each of the topic areas assessed and **Chapter 15: Summary of Significant Effects**, presents the overall summary of the EIA, with particular emphasis on predicted significant effects and committed mitigation measures. Figures are presented at the end of each ES chapter where relevant.

<sup>2</sup> Target announced by then First Minister Alex Salmond on 18<sup>th</sup> May 2011.

<sup>3</sup> The figure of six to nine months relates only to the manufacture of the wind turbines. The assessment of pay-back time also takes into account several other factors associated with construction of the Development including transportation and carbon loss through felling.

**Table 1.1: Structure of Volume 1: Written Text and Figures and Responsibilities**

Chapter Number	Description	Organisation Responsible
Chapter 1	<b>Introduction</b> provides a brief introduction to the Development, the legislative requirements and outlines the structure of the ES.	LUC
Chapter 2	<b>Approach to the EIA</b> provides detail on the EIA process, including consultation.	LUC
Chapter 3	<b>Site Selection and Design Strategy</b> summarises the reason for selection of the chosen site. The approach to the design strategy and layout modifications is also detailed.	LUC, NLEI Ltd and MvGLA
Chapter 4	<b>Scheme Description</b> provides a detailed description of the Development.	LUC, NLEI Ltd, Mouchel and Bidwells
Chapter 5	<b>Policy Context</b> summarises the national, regional and local planning policy relevant to the Development.	Montagu Evans and JLL
Chapter 6	<b>Landscape and Visual Amenity</b>	MvGLA
Chapter 7	<b>Hydrology, Hydrogeology, Geology and Soils</b>	Mouchel
Chapter 8	<b>Ecology</b>	MacArthur Green
Chapter 9	<b>Ornithology</b>	MacArthur Green
Chapter 10	<b>Cultural Heritage</b>	CFA
Chapter 11	<b>Noise</b>	TNEI
Chapter 12	<b>Access, Traffic and Transport</b>	Systra
Chapter 13	<b>Socio-Economics, Tourism and Recreation</b>	BiGGAR Economics
Chapter 14	<b>Other Issues</b>	LUC, NLEI Ltd and Mouchel
Chapter 15	<b>Summary of Significant Effects</b>	LUC

- *Design Layout Considerations*: describes the constraints taken account of in designing the layout and any modifications to it as part of the iterative design process.
- *Assessment of Effects*: provides an overview of the type of effects considered in the assessment:
  - *Construction Effects*: describes the predicted effects, proposed mitigation and residual effects associated with construction of the Development.
  - *Operational Effects*: describes the predicted effects, proposed mitigation and residual effects associated with operation of the Development.
  - *Cumulative Assessment*: describes the incremental construction/operation effects associated with adding the Development to the other windfarms being considered in the cumulative assessment, i.e. the additional effects resulting from the Development if all other developments are assumed to be constructed or operational. Proposed mitigation measures and residual cumulative effects are also described.
- *Interrelationship between Effects*: describes the indirect and secondary effects resulting from the interaction of separate direct effects arising both within a topic area and interrelated with other topics areas.
- *Further Survey Requirements and Monitoring*: describes any additional survey work or monitoring proposed.
- *Summary of Effects*: includes a table summarising the significance of effects including mitigation measures and residual effects.

1.28 The ES is prefaced by a Non-Technical Summary (NTS) of its findings. A stand-alone NTS has also been produced to accompany the application.

1.29 In addition, a separate Planning Statement has been prepared. The Planning Statement does not form part of the ES. Its purpose is to assess the Development in the context of current planning policy and other material planning considerations.

1.30 A Design and Access Statement for the Development has also been prepared. This explains the design principles and concepts that have informed the Development. Information on how the layout has been generated and a discussion on the scale and appearance of the Development are included, together with consideration of issues associated with vehicular access and transport links. The Design and Access Statement does not form part of the application for Section 36 consent and deemed planning permission or the ES.

1.31 A Pre-Application Consultation Report has been prepared which details the public and stakeholder consultation undertaken by NLEI Ltd prior to the application being submitted.

1.27 **Chapters 6 to 14** of this ES are structured in a consistent way, as far as possible, as follows:

- *Introduction*: provides a description of the study area and outlines the effects which have been assessed in full, and those which have been 'scoped out' of the EIA.
- *Scope of the Assessment*: details key issues appropriate to the chapter topic that the assessment has addressed.
- *Assessment Methodology*: summarises the key methods used in the assessment (desk based study, field survey, consultation and consideration of significance of effect).
- *Existing Conditions*: summarises the baseline situation, including field survey results where appropriate. A description of how the baseline situation might change if the Development were not to be built is also provided.
- *The 'Do Nothing' Scenario*: describes the predicted environmental conditions and proposed or likely changes anticipated to occur in the absence of the Development.

<sup>i</sup> Scottish Government (2016), Renewable Electricity Output Calculator (<http://www.gov.scot/Topics/Statistics/Browse/Business/Energy/onlinetools/ElecCalc>)

<sup>ii</sup> OPSI (2009), The Climate Change (Scotland) Act 2009.

<sup>iii</sup> Scottish Government (2017), The Draft Climate Change Plan – the draft Third Report on Policies and Proposals (RPP3).

<sup>iv</sup> Scottish Government (2017), The Draft Scottish Energy Strategy: The Future of Energy in Scotland.

<sup>v</sup> Directive 2009/28/EC of the European Parliament and of the Council of 23 April 2009 on the Promotion of the Use of Energy from Renewable Sources.

<sup>vi</sup> United Nations (1998) Kyoto Protocol to the United Nations Framework Convention on Climate Change.

<sup>vii</sup> United Nations (2015) The Paris Agreement.

<sup>viii</sup> Welsh Assembly Government (2003), Economic Development Committee (2003) Review of Energy Policy in Wales

<sup>ix</sup> Vestas Wind Systems (2005), Life Cycle Assessment of Offshore and Onshore sited wind power plants based on Vestas V90-3.0MW Turbines, Vestas Wind Systems A/S

<sup>x</sup> Scottish Government (2016): Carbon Calculator Tool V1.0.1, <http://informatics.sepa.org.uk/CarbonCalculator/>