

2. The Environmental Impact Assessment Process

2.1 Environmental Impact Assessment

Overview

2.1.1 Environmental Impact Assessment (EIA) is a systematic procedure that must be followed for certain categories of project (see Section 2.1.5 and 2.1.6) before they can be determined for planning permission. It aims to assess a project's likely significant environmental effects. This helps to ensure that the importance of the predicted effects and the scope for reducing effects are properly understood by the public and the relevant determining authority before it makes its decision.

2.1.2 The information on Tom na Clach Wind Farm Extension (hereafter known as the 'Proposed Development') and its environmental effects are presented in an Environmental Impact Assessment Report (EIA Report). The EIA process that culminates in the submission of the EIA Report has a number of key characteristics:

- It should be systematic, comprising a sequence of tasks defined both by regulation and by practice;
- It should be analytical, requiring the application of specialist skills from the environmental sciences;
- It should be impartial, its objective being to inform decision-making rather than to promote the project;
- It should be consultative, with provision being made for obtaining information and feedback from interested parties including local authorities, members of the public and statutory and non-statutory agencies; and
- It should be iterative, allowing opportunities for environmental concerns to be addressed during the planning and design of a project.

2.1.3 Typically, a number of design iterations take place in response to environmental constraints identified during the EIA process (in effect, incorporating mitigation measures to avoid, reduce or compensate for identified adverse effects). Further details of such measures in this case are presented in the corresponding environmental topic chapters. A summary of design iterations is included in Table 2.2 and **Figure 2.0**.

EIA regulations

2.1.4 The Electricity Works (Environmental Impact Assessment) (Scotland) Regulations 2017 will apply to the Proposed Development. The Proposed Development will be an Extension to the Operational Scheme. The combined installed capacity of the two developments (the Operational Scheme and Proposed Development) will be more than 50 MW, and so the application for consent and deemed planning permission for the construction, operation and decommissioning of the Proposed Development

will be made to the Scottish Government under the terms of Section 36 ('s36') of the Electricity Act 1989.

- 2.1.5 Schedule 1 of the EIA Regulations lists those developments for which an EIA will always be required. Schedule 2 of the EIA Regulations lists developments for which the need for an EIA is determined on a case-by-case basis (i.e. if significant environmental effects are likely), whilst Schedule 3 describes indicative thresholds to be used to determine if a Schedule 2 development is an "EIA development". Where an EIA is required, environmental information must be provided by the applicant in an EIA Report. Schedule 4 specifies the information that must be provided in the EIA Report.
- 2.1.6 Most wind energy developments fall within Schedule 2 and where the need for EIA is not certain the developer can apply to the determining authority for a screening opinion. It is clear that the potential size of the Proposed Development means that an EIA would be needed. It is recognised that the EIA process can play an important role in developing the design of proposals to minimise adverse environmental effects and to realise environmental benefits.
- 2.1.7 While it has been determined that the proposal has the potential for significant environmental effects, this does not mean that a significant effect is the ultimate conclusion of the EIA. The EIA process identifies the potential for adverse effects and then encourages environmental measures (mitigation) to be incorporated into the design of the development, or the method of construction and operation that may reduce or eliminate any negative effects or further enhance positive effects.

Topics to be addressed

- 2.1.8 Schedule 4 of the Regulations specifies that the EIA Report should describe those "...aspects of the environment likely to be significantly affected by the development, including, in particular population, fauna, flora, soil, water, air, climatic factors, material assets, including the architectural and archaeological heritage, landscape and the inter relationship between the above factors."
- 2.1.9 Establishing which aspects of the environment and associated issues are relevant for a particular project is captured in an EIA scoping process. For the Proposed Development this is described in more detail in Sections 2.1.10 and 2.1.11.

The Environmental Impact Assessment Scoping process

- 2.1.10 Scoping is the process of identifying those aspects of the environment and associated issues that need to be considered when assessing the potential effects of a particular development proposal. This recognises that there may be some environmental elements where there will be no significant issues or likely effects resulting from the development and hence where there is no need for further investigation to be undertaken.
- 2.1.11 Scoping is undertaken through consulting organisations and individuals with an interest in and knowledge of the site, combined with the professional judgement and experience of an EIA team. Scoping takes account of published guidance, the

effects of the kind of development under consideration and the nature and importance of the environmental resources that could be affected.

Spatial scope

2.1.12 In its broadest sense, the spatial scope is the area over which changes to the environment would occur as a consequence of the development. In practice, an EIA should focus on those areas where these effects are likely to be significant.

2.1.13 The spatial scope varies between environmental topic areas. For example, the effect of a proposed wind energy development on the landscape resource and visual amenity is generally assessed within a zone of up to 35km from the centre of the site (70km for cumulative effects), whilst noise effects are assessed within a much smaller area encompassing the worst affected properties close to the site.

2.2 Assessment methodology

2.2.1 Following the identification of the scope of the EIA, individual environmental topics are subject to survey, investigation and assessment, and individual topic chapters are prepared for the EIA Report. The assessment methodologies are based on recognised good practice and guidelines specific to each topic area, and details are provided in the appropriate chapter.

2.2.2 In general terms, the technical studies undertaken for each topic area and chapter include:

- Collection and collation of existing baseline information about the receiving environment and original surveys to fill any gaps in knowledge or to update any historic information, along with identification of any relevant trends in, or evolution of, the baseline;
- Consultation with experts and relevant consultees to define the scope of the assessment and study area and subsequent consultation in response to emerging study findings;
- Consideration of the potential effects of the development on the baseline, followed by identification of design changes to seek to avoid or reduce any predicted adverse effects;
- Engagement with other technical topic specialists and engineers / designers in a design iteration process seeking to optimise the scheme for the differing environmental effects and identify any appropriate mitigation measures;
- Assessment of the final scheme design and evaluation of significant effects, together with an evaluation of any residual significant effects after mitigation measures have been implemented; and
- Compilation of the EIA Report chapter.

2.2.3 In reality, many of the effects are relevant to more than one environmental topic area, and careful attention has been paid to interrelationships to avoid overlap or duplication between topic chapters. For example, the assessment of effects on cultural heritage features will be aided by the assessment in the landscape and visual chapter. Similarly, secondary effects on ecological resources arising from hydrological change would be considered in the ecology chapter with a cross-reference to the relevant direct effect in the hydrology and hydrogeology chapter.

2.2.4 The following format has been adopted for the presentation of information within the EIA Report. In some cases, technical data and analysis has been moved to a Technical Appendix that is bound separately from the main EIA Report in Volume 3:

- Summary – A short summary of each technical chapter is included at the outset, this text also forms the basis of that included in the Non-Technical Summary that accompanies the EIA Report;
- Introduction and overview – setting the scene for the topic, the nature of the receptors to be considered, and how the proposals might cause change;
- Methodology – describing how receptors were identified through a scoping process, along with the specific methods used for data gathering, predicting levels of effects and evaluating significance of effects;
- Baseline information – describing the current state and circumstances of the receptors and changes that might be expected to arise in advance of the development being implemented as well as those that might arise regardless of the development;
- Topic specific design evolution – identifying where there was potential for an effect and how the scheme (in terms of the location of elements and their scale) has been developed to address that potential;
- Predicted effects of the scheme – the effects predicted to arise as a result of implementing the final design of the project;
- Mitigation and enhancement measures – identification of non-embedded ‘design’ measures which may be necessary to control or manage identified potentially significant effects or provide enhancements;
- Assessment of residual effects – an assessment of any effects remaining after non-embedded mitigation measures have been employed; and
- References.

2.3 Defining significance of effects

2.3.1 Development proposals affect different environmental elements to differing degrees and not all of these are of sufficient concern to warrant detailed investigation or assessment within the EIA process. The EIA Regulations identify those that warrant

investigation as those that are “likely to be significantly affected by the development”. These are identified through a scoping process as described in Section 2.4.

- 2.3.2 Conclusions about significance are derived with reference to available information about the project description and the environmental receptors (or ‘receiving environment’), and to predictions about the potential changes that the proposed development would cause to the affected receptors.
- 2.3.3 In each of the environmental topic chapters, professional judgement is used in combination with relevant guidance to assess the interaction of the receptor’s sensitivity (this may be defined in terms of importance, value, rarity, quality) against the predicted magnitude of change to identify a level of effect. In general terms, and in order to assist consistent interpretation of the final results of the EIA, receptor sensitivity, magnitude of change and level of effect for each environmental topic are categorised as shown in Table 2.0.
- 2.3.4 The type of categorisation illustrated in Table 2.0 provides a guide only, and may be moderated by the professional that undertakes the assessment in accordance with judgement and experience. In particular, the divisions between categories of receptor sensitivity, magnitude of change, and level of effect should not be interpreted as definitive (and indeed different definitions for each category may be applied by different professionals), and the lines that represent the boundaries between categories should in many cases be considered as ‘blurred’. In some cases, the judgement can be guided by quantitative values, whilst in other cases qualitative descriptions are used. The significance of the effect may also need to be qualified with respect to the scale over which it may apply (e.g. local, regional, national, international).

Table 2.0 Establishing the level of effect

	Sensitivity of receptor				
	HIGH	MEDIUM	LOW	NEGLIGIBLE / NONE	
Magnitude of change	LARGE	VERY SUBSTANTIAL	SUBSTANTIAL	SLIGHT / MODERATE	NEGLIGIBLE
	MEDIUM	SUBSTANTIAL	MODERATE	SLIGHT	NEGLIGIBLE
	SMALL	MODERATE	SLIGHT	NEGLIGIBLE / SLIGHT	NEGLIGIBLE
	NEGLIGIBLE / NONE	NO EFFECT	NO EFFECT	NO EFFECT	NO EFFECT

- 2.3.5 Having defined a level of effect, professional judgement in combination with guidance and standards are then applied to identify which of those levels of effect

are then considered to be equivalent to significant effects when discussed in terms of the EIA Regulations.

- 2.3.6 A definition of how the terms are derived for each topic is set out in the corresponding chapter along with the relevant explanation and descriptions of receptor sensitivity, magnitude of change and levels of effect that are considered significant in terms of the EIA Regulations.

Type of effect

- 2.3.7 The EIA Regulations (Schedule 4, Part 1) require consideration of a variety of types of effect, namely direct/indirect, secondary, cumulative, positive/negative, short/medium/long-term, and permanent/temporary. In this EIA Report, effects are considered in terms of how they arise, their valency (i.e. whether they are positive or negative) and duration. Each will have a source originating from the development, a pathway and a receptor.

- 2.3.8 Most predicted effects will be obviously positive or negative, and will be described as such. However, in some cases it is appropriate to identify that the interpretation of a change is a matter of personal opinion, and such effects will be described as 'subjective'.

- 2.3.9 The temporal scope of environmental effects is stated where known. Effects are typically described as:

- Temporary – these are likely to be related to a particular activity and will cease when the activity finishes. The terms 'short-term' and 'long-term' may also be used to provide a further indication of how long the effect will be experienced; and
- Permanent – this typically means an unrecoverable change.

- 2.3.10 Effects are generally considered in relation to the following key stages of the development:

- Construction – effects may arise from the construction activities themselves, or from the temporary occupation of land. Effects are often of limited duration although there is potential for permanent effects. Where construction activities create permanent change, the effects will obviously continue into the operational period;
- Operation – effects may be permanent, or (as is typical with wind power developments) they may be temporary, intermittent, or limited to the life of the development until decommissioning; and
- Decommissioning - effects may arise from the decommissioning activities themselves, or from the temporary occupation of land. The effects would generally be temporary and of limited duration and additional permanent change would normally be unlikely unless associated with restoration.

2.4 The scope of the Environmental Impact Assessment for the Proposed Development

Screening

2.4.1 Formal screening was not undertaken, as it was recognised at an early stage that due to the size of the Proposed Development an EIA would be required.

The Scoping request and Scoping Opinion

2.4.2 The content of the EIA Report and the identification of receptors requiring assessment for the proposed development were determined through the advice provided to the Applicant through a Scoping process. A Scoping Report was submitted on 14th October 2020 to the Energy Consents Unit to define the information to be provided in the EIA Report (see **Appendix 2.A**). The environmental disciplines included in the Scoping Report are listed below:

- Planning;
- Ecology;
- Ornithology;
- Landscape and Visual Impact;
- Hydrology, Hydrogeology, Geology & Peat;
- Cultural Heritage;
- Traffic and Transport;
- Noise;
- Carbon Balance;
- Infrastructure;
- Shadow Flicker & Safety;
- Socio-Economic.

2.4.3 The Energy Consents Unit of the Scottish Government issued a formal response to the Scoping Report on 9th June 2021, which can be seen in **Appendix 2.B**. The scoping responses and where they are addressed in the EIA Report are summarised in **Table 2.1** below.

Table 2.1 Scoping responses

Consultee	Summary of Main Issues	How Addressed in EIA Report
The Highland Council ('THC')	<p><u>Planning</u> – the EIAR should recognise existing land uses affected by development, particular regard for THC's Development Plan inclusive of all statutorily adopted Supplementary Guidance. Particular attention paid to provisions of Onshore Wind Energy SG inclusive of any Landscape Sensitivity Appraisal. Planning Statement should explore compliance with Development Plan and Scottish Planning Policy, Planning Advice Notes and other relevant guidance. Progress of National Planning Framework 4 (NPF4) should be noted.</p> <p>Sustainability – Energy storage should give consideration to capacity, electricity network benefits and possibility of other generating uses. Consideration of electric car charging facilities.</p> <p>Landscape and Visual – Submission needs to include photomontages which confirm to THC's and NatureScot's Visualisation standards. Assessment also needs to consider impact of on-site borrow pit and access roads.</p> <p><u>Transport</u> – Transport Scotland should also be consulted. A detailed Construction Traffic Management Plan (CTMP) should be submitted for approval by THC. Transport Assessment should be submitted and High National Traffic Forecast be applied. Detailed guide advises what should be incorporate within this document.</p> <p><u>Noise</u> – Noise Assessment required with regard operational phase, in accordance with ETSU-R-97. Target noise level are either simplified 35dB LA90 (windspeed 10 m/s) or a composite standard of 35dB LA90 (daytime) and 38dB LA90 (night time) or up to 5dB above background noise levels at up to 12 m/s. Noise assessment must take into potential cumulative noise effects, including map showing location of these wind farm/s. Increase in exposure time to noise should also be considered and construction noise.</p> <p>Socio-Economic, Tourism and Recreation – Application should estimate who may be affected by the development and include relevant economic information connected with the project. Potential impact on and mitigation for public access should be considered. An Access Management Plan is required to be submitted with the application, or one to be required via a condition.</p>	<p>Chapter 4 Policy & Statutory Framework</p> <p>Chapter 3: Description of the Proposed Development</p> <p>Chapter 7 Traffic & Transport</p> <p>Chapter 8 Noise</p> <p>Chapter 6 Socio Economic</p>
NatureScot	<p>Key Issues –</p> <ul style="list-style-type: none"> – Landscape and visual impacts, including the effects of the proposed development on the Special Landscape Qualities (SLQs) of the Cairngorms National Park. – Potential impacts to peat, peatland habitats and carbon rich soils. – Potential impacts to wider countryside birds, including the Natural Heritage Zone (NHZ) 10 population of golden eagle and the North of Scotland population of red kites. – Potential impacts to capercaillie from nearby Special Protection Areas (SPAs). 	Chapter 9 LVIA, 11 Ecology & 12 Ornithology
SEPA	Unable to provide details site specific advice at scoping stage following cyber-attack. Detailed generic guidance provided as to what planning application is expected to provide to avoid objection.	Chapter 13 Hydrology, Hydrogeology, Geology & Peat
Historic Environment Scotland (HES)	Cultural Heritage – Note significant effects on the setting of Lochindorb Castle for operational TNC scheme and again raise this as concern with Proposed Development. Assessment of potential impacts robustly assessed including formal/informal car park areas on minor road that runs up the east side of Lochindorb. Recommendations on which national important assets should be considered.	Chapter 10 Cultural Heritage
Scottish Forestry	The proposed development area included no woodland...therefore...no further comments to make at this point.	n/a
Marine Scotland	No longer respond at application stage, but offer detailed generic advice to Applicant.	Chapter 11 Ecology
The Crown Estate	Not affects by proposal and therefore no comments to make.	n/a

Consultee	Summary of Main Issues	How Addressed in EIA Report
Defence Infrastructure Organisation (MoD)	MoD have concerns about the proposed development, as they will cause unacceptable interference to the ATC radar used by Lossiemouth. Recommend fitting of 25 candela omni-direction red lighting or infrared to address Low Flying Training impacts.	Await submission of planning application.
Mountaineering Council of Scotland (MCS)	No response.	Chapter 9 LVIA
NATS Safeguarding	The proposed development has been examined from a safeguarding aspect and does not conflict with our safeguarding criteria, therefore no safeguarding objection.	Chapter 15 Infrastructure
Transport Scotland	Detailed comments via SYSTRA Limited, including requirement for Abnormal Loads Assessment. Transport Scotland satisfied with approach towards assessment proposed in scoping report.	Chapter 7 Traffic & Transport
River Findhorn District Salmon Fishery Board	No response received.	Chapter 11 Ecology
Fisheries Management Scotland	Developed, in conjunction with Marine Scotland, advise for Fishery Boards in dealing with applications. Recommended local board is contacted directly.	Chapter 11 Ecology
Civil Aviation Authority	No response.	n/a
Highland and Islands Airports Limited	In current configuration the turbines could affect the Instrument Flight Procedures, would require an IFP Impact Assessment. HIAL would work with the developer towards a resolution...HIAL likely to object on IFP grounds.	Chapter 15 Infrastructure
Scottish Water	No objection to the application.	n/a
Office for Nuclear Regulation	Have no comment to make in relation to the request for Scoping Opinion.	n/a
The Joint Radio Company (JRC)	Does not foresee any potential problems based on known interference scenarios and the data provided.	Chapter 15 Infrastructure
BT	Should not cause interference with to BT's current and presently planned radio network.	Chapter 15 Infrastructure
British Horse Society	Concerns for all riders diminishing access to safe off-road riding. Obligations of access to most land, provided that they behave responsibly, under Land Reform (Scotland) Act 2003.	Chapter 6 Socio Economic
Scottish Wildlife Trust	No response received	Chapter 11 Ecology, 12 Ornithology
Cairngorms National Park Authority	NatureScot will be responding, in accordance with working protocol.	Chapter 9 LVIA
Visit Scotland	No response	Chapter 6 Socio Economic
ScotWays	No record of rights of way that cross/are close to the application site.	Chapter 6 Socio Economic
John Muir Trust	Considers that two Wild Land Areas within the study area should also be considered.	Chapter 9 LVIA
RSPB	Concerns raised in relation to Capercaillie, Golden Plover (objection raised in relation to this species on operational TNC Wind Farm scheme). Recommend Ornithological Monitoring Plan. Use of Golden Eagle Topographical. Habitat Management Plan submitted for operational scheme should be extended to Proposed Development if granted consent.	Chapter 12 Ornithology & 11 Ecology

Consultee	Summary of Main Issues	How Addressed in EIA Report
Carrbridge	No response	n/a
Cawdor and West Nairnshire CC	Scoping report appears thorough, have raised concern about increase of 25m height of proposed turbines in relation to operational TNC wind farm and potential visual impacts and on birdlife.	Chapter 12 Ornithology & 9 LVIA
Dava Residents Association	No response	n/a
Dulnain Bridge CC	No response	n/a
East Nairnshire CC	Support the application, which is believed to be a measured approach and would like to continue to be consulted through the process.	n/a
Strathdearn CC	No response	n/a

Further evolution in the scope

2.4.4 The process of completing topic specific investigations inherently involves further discussions with consultees. Any topic specific refinements to scope and the detailed assessment methods employed are provided within each of the relevant chapters of the EIA Report.

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2.5 Consideration of alternatives

2.5.1 National planning and energy policy makes it clear that there is no requirement for renewable energy developments to demonstrate an overall need for new renewable generation or a need to be located in a specific location. Nevertheless, **Section 2.7** does describe the site identification process and design criteria. In EIA terms, the requirement is only to report on alternatives that have been considered. The examination of alternatives in this EIA Report is therefore restricted as appropriate to alternative design solutions that were considered for the site in question in terms of factors such as site layout/design/turbine height and turbine numbers, and the environmental effects of the options considered.

2.6 Selection of the site

2.6.1 The Proposed Development was progressed to the detailed EIA and project design stage because it exhibited attributes that include the following:

- the site does not lie within an ecological designation;
- due to the topography of the site is well contained in visual terms, particularly from nearby residential properties;

- the distances from the nearest residential properties are such that potential noise impacts can be minimised (2.7 km from nearest turbine to Ballochrochin);
- the land lies near a trunk road and there is good access to the site;
- there is a proven delivery route for turbine components from Inverness harbour undertaken during the construction of the Operational Scheme;
- there is an existing 12 km access track, purpose-built from a junction at the B9007, for the Operational Scheme;
- there is the potential to re-open the borrow pit used for constructing the Operational Scheme which has proven winnable material;
- the land on the site itself has been heavily grazed, and in parts agriculturally improved and artificially drained;
- there are existing electricity lines near the site that can be used to make a grid connection;
- the average wind speed at the site is above 7 m per second (m/s) at a height of 45 m;
- the Operational Scheme has a predicted load factor of 47.6% against a 26.6% UK average which the Proposed Development will be approximate to;
- the site adjoins the Operational Scheme and therefore the Proposed Development will be seen in the context of existing turbines; and,
- the EIA undertaken on the Operational Scheme established that the Proposed Development is relatively free of environmental constraints.

2.7 Selection of the strategic access route

- 2.7.1 Most of the turbine components (blades, tower sections and nacelle) are categorised as abnormal loads for road transportation purposes, so a number of strategic routes for the delivery of these components were identified and assessed during the initial stages of the EIA for the Operational Scheme.
- 2.7.2 It was established during the construction of the Operational Scheme, that the turbine components would be delivered by sea to the local port at Inverness.
- 2.7.3 The possibility of transport by rail was investigated at an early stage. This confirmed that there is not suitable rail stock in this country to transport the turbine components.

2.8 Selection of the access track route

- 2.8.1 The access track included in the application for the Operational Scheme was selected because it would require fewer bends and cuttings and have less significant visual and ecological impacts than other options.
- 2.8.2 The 12 km access track route utilised for the Operational Scheme did not receive any adverse comments from key consultees. It was therefore decided to utilise the same access track route for Proposed Development, with new access tracks being designed to connect wind farm infrastructure being as required.
- 2.8.3 The requirement for new internal access tracks was minimised by utilising existing access tracks and where possible connecting up proposed turbines with existing tracks.
- 2.8.4 Areas of deep peat were avoided where possible and the impact on key ecological constraints (specifically Ground Water Dependent Ecosystem (GWDTE's) were kept to a minimum.

2.9 Selection of the borrow working area locations

- 2.9.1 As explained in more detail in **Chapter 3: Description of the Proposed Development**, it is estimated that approximately 59,862 tonnes of crushed rock will be required to construct the wind farm. It is calculated that importing crushed rock from the nearest off-site active quarry would result in over 3,271 lorry movements (this figure is an estimate of the total number of loads) on the highway network. The use of on-site borrow workings therefore represents the best environmental option.
- 2.9.2 During the EIA for the Operational Scheme a comprehensive process was followed to decide upon the preferred locations for borrow pits, from which material was won from.
- 2.9.3 The planning permission for the Operational Scheme incorporates the location of two borrow pits, one of which was successfully utilised and hence forms part of the Proposed Development planning application.
- 2.9.4 Prior to construction of the Operational Scheme, comprehensive geotechnical investigation works strongly suggest there is sufficient winnable material available for the construction of the Proposed Development.
- 2.9.5 The location of the borrow pit for the Proposed Development can be seen in **Figure 3.1**.

2.10 Selection of the construction compound locations

- 2.10.1 The location of the construction compound, adjoining the access track and the substation compound, was selected for the following reasons:

- it is beneficial to have the compound near the wind farm access route so that delivery vehicle trip length can be reduced and deliveries can be managed effectively;
- the land is flatter than the other land available near the access route;
- it is the same location where a borrow pit forming part of the Operational Scheme was located, but never utilised due to the quality of the winnable material, so there is a good understanding of ground conditions present following geotechnical site investigations.
- the depth of peat in this location is less than other areas near the access route;
- the land is geologically suitable for a borrow working, thereby enabling a compound and working to be designed in an integrated way to reduce impacts;
- there are burns nearby which are suitable as a water supply for a concrete batching plant. At the same time, the location is large enough to enable 30 m buffer zones to be provided between the compound and these burns for pollution control purposes;
- the land does not lie within a catchment where there is a public or private water supply abstraction;
- the location minimises potential disruption to the on-site workforce (when blasting takes place at borrow pits, a safe distance is imposed which could lead to staff being evacuated from an area if located too close to a construction compound), and also minimises risk to the workforce;

2.11 Selection of the substation, control maintenance site and Battery Energy Storage System

2.11.1 A site is required for a permanent electricity sub-station and it is considered appropriate to provide a wind farm control and maintenance building in the same location (together with the Battery Energy Storage System (BESS)). The location for the substation control and maintenance building and BESS shown was selected for the following reasons:

- a location in the centre of the site reduces the overall length of site cabling required and is therefore better in terms of electrical efficiency;
- the location lies within a lower part of the Proposed Development thereby reducing its visibility;
- the location is adjacent to the existing substation & control building for the Operational Scheme thereby extending a visual impact already in the baseline;

- the location does not lie within an ecologically sensitive area;
- the peat at the location is not particularly deep.

The evolution and design of the wind farm

2.11.2 The Design Evolution of the Proposed Development is outlined in **Chapter 9: LVIA** of the EIA Report.

Design Evolution

2.11.3 Based on the anemometer data collected during the development of the Operational Scheme, and operational wind data collected, it was determined that the site considered suitable for the Proposed Development offered an outstanding wind speed, and had the potential to work financially in a non-subsidy operating environment.

2.11.4 Early studies, based on an assessment of landscape and visual capacity of the Proposed Development, some limited environmental and technical constraints and what was then considered the restriction on grid capacity, determined that the site was suitable for up to 10 turbines (see Iteration 1/Table 2.2 and **Figure 2.0**).

2.11.5 Following feedback from SSE, the Distribution Network Operator (DNO), about the availability of grid capacity on the local network, and the feedback received from the THC Pre Application Process (see **Appendix 2.C**) in relation to landscape and visual impacts, a further revision was made by removing 2 turbines (Iteration 2). In addition, indicative locations for a construction compound, substation/control building and BESS were sited guided by technical requirement and from experience of constructing the Operational Scheme; these formed the Scoping Report layout.

2.11.6 Subsequent Iterations (Iterations 3 – 8) emerged as further environmental baseline data was collected (in particular, Phase I & II peat depth surveys and location of location of Ecological constraints such as GWDTE's) and an understanding of on-site environmental constraints was mapped. In addition, further feedback from the DNO indicated a 7-turbine scheme was appropriate for the grid capacity available.

2.11.7 The candidate turbine model changed from a Nordex N133 (4.8MW turbine) to a Vestas V136 turbine (4.5MW), to reflect further analysis of (development/operational) wind data, and which turbine model would maximise the characteristics of the wind resource on site and wind speed.

2.11.8 The final site layout for the Proposed Development, Iteration 9 ('Design Freeze' on which this EIA Report/planning application is based on) showed further micro-siting in turbine locations following the collection of baseline environmental data and consideration of environmental & technical constraints. This layout was presented to the local community, and feedback was invited during Community Open Days (see Section 2.12).

2.11.9 In addition, for Iteration 9, civil engineering input using 3D Modelling was used to design internal access tracks connecting the turbines and related infrastructure.

This achieved the balance of taking into account known environmental/technical constraints, balanced against what was achievable when it came to constructing the wind farm (subject to receiving a planning permission). This includes:

- limiting the amount of earthworks required when excavating the site to prepare for turbine foundations by avoiding steep slopes/re-routing track layout;
- avoiding steep slopes for the location of internal access tracks where both delivering turbines would become problematic (no greater <10% gradient) and increases Health & Safety risk to construction workers;
- Minimising the amount of internal access tracks required, whilst ensuring an efficient construction process for the delivery of turbine components and construction materials;
- Re-routing internal access tracks and micro-siting a turbine (turbine T6) to avoid an underground 33kV power line which connects the Operational Scheme (see **Figure 3.0**);

2.11.10 The Proposed Development comprises seven additional turbines to the south-east of the Operational Scheme. The sensitivity of this area to the potential landscape and visual effects of wind farm development is recognised. As a result, a rigorous and lengthy Iterative Design process has been undertaken to ensure that the Proposed Development will minimise the potential effects through successful integration with landscape character and the layout and appearance of the Operational Scheme. This process has highlighted the remaining capacity for wind farm development in the area to the south-east of the Operational Scheme.

The Proposed Development

2.11.11 The principal action in the mitigation of the potential effects has been carried out through the iterative design of the layout. This involved identifying the key visual receptors across the Study Area that would be especially sensitive to the appearance of the Proposed Development. These locations were used to test subsequent iterations at a Design Workshop held on 3rd June 2021 to ensure effects were being mitigated as best as was practically possible, having regard to other environmental, technical and performance constraints.

2.11.12 The most sensitive visual receptors were considered to be represented by the following viewpoints (out of a total of 17 viewpoints used for the assessment):

- Viewpoint 2: Carn Glas Choire
- Viewpoint 5: Minor Road north of Drynachan.
- Viewpoint 6: B9007 near Lochindorb;
- Viewpoint 10: A9 (T) River Findhorn Bridge;

- Viewpoints 14 & 15: Shore Road Lochindorb;

2.11.13 A large number of iterations were made to the layout during and after the design workshop, each seeking to improve on the previous one in terms of reducing the potential landscape and visual impact whilst at the same time respecting the technical and environmental constraints of the Proposed Development.

2.11.14 The key principles guiding this iterative process are outlined below:

- Identify those visual receptors that are key to the assessment and understand the extent of the area over which potential effects may occur, so that when testing iterations, the full extent of the area is being tested;
- Consider the cumulative effects with the adjacent Operational Scheme, with the aim to achieve consistency in appearance through the use of similar sized and proportioned turbines, arranged following a similar layout and contained in the same landscape;
- Ensure the Proposed Development fits as an extension to the Operational Scheme, avoiding incidents of overlap and cluttering between the existing and proposed turbines, reducing the occurrence of outliers and ensuring an even appearance in terms of the horizontal spacing and vertical elevation of the turbines;
- Design the Proposed Development in combination with the existing influence from the Operational Scheme, the relatively small and contained extent of the extension, the separation distances between the viewpoints and the proposed turbines, the limited extents of additional visibility and the close association the proposed turbines have with the Operational Scheme turbines;
- The Proposed Development should be designed to use existing infrastructure as much as possible (including access tracks, sub-station location and reopening a proven borrow pit), and minimise impacts on existing infrastructure (33kV underground powerline) whilst demonstrating the constructability of the final design by using AutoCad Civil 3D Modelling;
- The Proposed Development should be designed to maximise wind energy yield but mitigate to limit the number of significant environmental effects which could arise.

2.11.15 The final design of the original proposal that arose through the design evolution process described above and presented in more detail in **Table 2.2** below, is the wind farm design that has been adopted for the Proposed Development described in this EIA Report. The main design iterations are shown in **Figure 2.0**.

Table 2.2

Design Iteration	Description	Design Principles/Reasons for Change from previous iteration
1. THC Major Pre-App (IT1)	<ul style="list-style-type: none"> • 10 turbines • Maximum installed capacity 48 MW (Nordex 4.8MW turbine) 	<p>The Applicant submitted a request for a Highland Council Major Pre-App Meeting. The 10-turbine layout (see Figure 2.0) in the request considered limited constraints:</p> <ul style="list-style-type: none"> • Keep tip height of turbines below <150m to avoid requirement for aviation lighting to be installed; • 50m Water course buffer • Indicative Blanket bog areas (based on TNC Wind Farm); • Indicative Peat depth; • 3 Rotor Diameter spacing between turbine locations. • Consideration of landscape visual impacts, especially from the following viewpoints (out of 17 in total): <ul style="list-style-type: none"> ○ Carn Glas Choire ○ Shore Road Lochindorb; ○ B9007 near Lochindorb; ○ A9 River Findhorn Bridge; ○ Minor Road north of Drynachan.
2. Scoping Report layout (IT2)	<ul style="list-style-type: none"> • 8 turbines • Blade tip height of up to 149.9m • maximum installed capacity of 38.4MW • feedback from NGET/DNO as to grid capacity constraint 	<p>Based on the limited environmental constraints considered in IT1.</p> <p>In addition, indicative locations for sub-station, control building/Battery Energy Storage System and borrow pit were included based on locations for utilised for Operational Scheme. Indicative internal access track layout was designed.</p>
3. Pre-Design Workshop (IT3)	<ul style="list-style-type: none"> • 7 turbines with a blade tip height of up to 149.9m • Maximum installed capacity of 33.6MW 	<p>Following completion of Phase I & Phase II Peat and Ecology (GWDTEs) surveys; key changes:</p> <ul style="list-style-type: none"> • Turbine T5 moved NE into shallower peat area; • Turbine T1 moved NW to reduce overlap with T2; • Turbine T2 moved NE to reduce overlap T3 to broader area of shallower peat
4. Design Workshop (IT4)	<ul style="list-style-type: none"> • 7 turbines with a blade tip height of up to 149.9m 	<p>Wind Resource considered in addition to other environmental/technical constraints:</p>

		<ul style="list-style-type: none"> • Turbine T2 moved SE to reduce overlap; • Turbine T5 moved SW to reduce overlap.
5. Design Workshop (IT5)	<ul style="list-style-type: none"> • 7 turbines with a blade tip height of up to 149.9m 	<ul style="list-style-type: none"> • Turbine T2 moved NE; • Turbines T3, T4 & T5 moved NE; • Turbines T7 moved SE.
6. Design Workshop (IT6)	<ul style="list-style-type: none"> • 7 turbines with a blade tip height of up to 149.9m 	<ul style="list-style-type: none"> • Turbine T1 moved west to increase wind yield, improve visual impact; • Turbine T2 moved north increase wind yield & improve visual impact; • Turbine T3 moved north avoid GWDTE & increase wind yield; • Turbine T4 moved north-east avoid GWDTE/deep peat; • Turbine T5 moved north avoid GWDTE & watercourse; • Turbine T7 moved north-west avoid deep-peat.
7. Design Workshop (IT7)	<ul style="list-style-type: none"> • 7 turbines with a blade tip height of up to 149.9m 	<ul style="list-style-type: none"> • Turbine T2 moved SE to avoid deep peat; • Turbine T7 moved NE to avoid GWDTE.
8. Design Workshop (IT8)	<ul style="list-style-type: none"> • 7 turbines with a blade tip height of up to 149.9m 	<ul style="list-style-type: none"> • Turbine T1 moved S to avoid GDWTE; • Turbine T6 moved S to area of higher wind resource.
9. Design Freeze (IT9): Proposed Development	<ul style="list-style-type: none"> • 7 turbines with a blade tip height of up to 149.9m • Vestas V136 Candidate turbine • Related infrastructure micro-sited • Internal access tracks fixed 	<p>Community Open Days were staged 27th & 28th October, as a result of very limited feedback from the local community (see section 2.12, which included online events and live website), as a direct consequence no changes were made to the turbine layout.</p> <ul style="list-style-type: none"> • Turbine T1 moved north, to avoid deep peat; • Turbine T2 moved north-east to avoid deep peat; • Turbine T3 crane hardstanding rotated, avoiding deep peat;

		<ul style="list-style-type: none"> • Turbine T4 micro-sited to north, crane hardstanding rotated west; • Turbine T5 moved south to avoid deep peat; • Turbine T6 moved north to minimise peat slide risk, avoid 33kV underground cable where practicable, minimising amount of earthworks required and avoid GWDTE; • Turbine T7 crane hardstanding minor movement avoid peat slide risk; • Construction compound micro-sited taking into account legal/property limitation and onsite ground conditions; <ul style="list-style-type: none"> • Internal access tracks & crane pads were micro-sited, using AutoCad Civil 3D Modelling, to deliver a project that can be constructed by: <ul style="list-style-type: none"> ○ avoiding excessive earthworks, ○ reducing fill height (reduces vehicle deliveries); ○ ensuring steepness of access tracks acceptable for turbine component deliveries, and; ○ avoiding requirement of turbine component deliveries to make risky reversing manoeuvres. <p>Consultation on this final layout will take place post-submission of the application to ECU/Scottish Government, and in the format of a newsletter to the local community.</p>
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2.12 Consultation with local residents

2.12.1 Community consultation is at the centre of Infinergy's approach to development, not only in the pre-application stage, but also throughout the life of the project. This is delivered through an online consultation website (www.tomnaclachwindfarm.co.uk), a freephone telephone number, newsletters, virtual community liaison, Community Open Days (CODs) and advertisements in local newspapers.

2.12.2 In October 2020 Infinergy distributed 843 newsletters to the local community, including residents, community, businesses and local authority councillors. The newsletter provided an overview of the Proposed Development and invited recipients to two CODs. The CODs were also advertised in two local newspapers.

2.12.3 Two CODs were held on 27th October in Tomatin (2pm – 7pm) and 28th October in Carrbridge (1pm – 5pm). Timings and platform for these events had been discussed and agreed with the Community Council in order to ensure as many stakeholders

as possible had the opportunity to engage. Based on the open day register a total of 26 people attended the CODs over the two days.

- 2.12.4 As well as being able to discuss the Proposed Development alongside the wider issues of climate change, energy security, government support etc and community benefit, members of the development team were able to demonstrate the difference in landscape impact between the Operational Scheme tip height turbines and the Proposed Development tip height turbines via photomontages.
- 2.12.5 26 people attended the exhibitions and at the exhibitions, 3 opinion forms were received about the Proposed Development. Of these, two thirds stated they were very supportive or supportive with one third being opposed.
- 2.12.6 A Statement of Community Consultation has been provided to support the planning application for the Proposed Development.

References

Greencoat UK Wind Share Issuance Programme 03/09/20

Renewables UK average <https://www.renewableuk.com/page/UKWEDEExplained>
Accessed 02/02/22