



Chapter 5

Environmental Impact Assessment

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Chapter 5

Environmental Impact Assessment

5.1 Introduction

1. This Chapter discusses the need for Environmental Impact Assessment (EIA) and sets out the approach to assessment taken in this EIA Report. This EIA Report has been prepared for the purposes of The Electricity Works (Environmental Impact Assessment) (Scotland) Regulations 2017 (as amended) (the EIA Regulations).
2. The EIA Regulations, define the proposed Development as “a generating station, the construction of which (or the operation of which) will require a section 36 consent but which is not Schedule 1 development”. In this regard, the proposed Development is of a type falling within Schedule 2 of the EIA Regulations and therefore requires to be screened as to whether or not it constitutes EIA development as envisaged by Regulation 7.
3. It was acknowledged at an early stage in the development that given the nature, location and characteristics of the proposed Development that an EIA would be required. It was therefore not considered necessary to seek a screening opinion and this EIA Report is submitted voluntarily as set out in Section 3.3.3 of the ECU EIA Guidance (Scottish Government, 2000).
4. Establishing which aspects of the environment and associated issues are relevant for a particular project is captured in the EIA scoping process. 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 would be no significant issues or likely effects resulting from the proposed Development, and hence where there is no need for further assessment to be undertaken. The Scoping exercise for the proposed Development is detailed in **Chapter 6: Scoping and Consultation**.
5. Following the identification of the scope of the EIA, individual environmental matters are subject to survey, investigation and assessment, and individual technical discipline Chapters are prepared for presentation in an EIA Report to accompany the application for a proposed Development. The assessment methodologies are based on recognised good practice and guidelines specific to each discipline area.
6. The EIA Regulations prohibit the Scottish Ministers from granting permission for EIA development unless they have taken the environmental information provided into consideration.
7. This EIA Report has been prepared in order to be taken into consideration by the Scottish Ministers in the determination of an application under Section 36 of the Electricity Act 1989 for the proposed Development.

5.2 Requirements of the EIA Directive and Regulations

8. The approach to this EIA has followed the requirements of the EIA Regulations.
9. The EIA Regulations require a description of the likely significant effects on the following factors:
 - population and human health;
 - biodiversity;
 - land, soil, water, air and climate; and
 - material assets, cultural heritage and the landscape.

10. The EIA Report must identify, describe and assess the direct and indirect significant effects of the proposed development and the interaction between those factors.
11. The description should cover the direct effects and any indirect, secondary, cumulative, transboundary, short-term, medium-term and long-term, permanent and temporary, positive and negative effects of the development.
12. Schedule 4 of the Regulations sets out the information that must be included in the EIA Report, summarised in **Table 5.1**. This also identifies where the corresponding information can be found in the EIA Report.

Required Information	Relevant Section in EIA Report
1. Description of the development, including in particular: (a) a description of the physical characteristics of the whole development and the land-use requirements during the construction and operational phases; (b) a description of the main characteristics of the production processes, for instance, nature and quality of the materials used; (c) an estimate, by type and quantity, of expected residues and emissions (water, air and soil pollution, noise, vibration, light, heat, radiation, etc.) resulting from the operation of the proposed Development.	A description of the location of the development is presented in Chapter 2 . A description of the proposed Development and its characteristics is presented in Chapter 3 . The predicted individual environmental effects of the proposed Development are reported in Chapters 7 to 16 .
2. A description of the 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.	Effects on population are discussed in relation to visual/residential amenity impacts, traffic, noise and air quality. Material assets are addressed through the effects identified for land use, soil geology and waste, hydrological and cultural heritage.
3. A description of the likely significant effects of the development on the environment, which should cover the direct effects and any indirect, secondary, cumulative, short, medium and long-term, permanent and temporary, positive and negative effects of the development, resulting from: (a) the existence of the development; (b) the use of natural resources; and (c) the emission of pollutants, the creation of nuisances and the elimination of waste; and the description by the applicant of the forecasting methods used to assess the effects on the environment.	Assumptions and limitations in the EIA process are reported as required in the relevant technical Chapters. The predicted significant effects of the proposed Development are reported as residual effects after relevant mitigation measures in each of the technical Chapters of the EIA Report (Chapters 7 to 17). The methods used to predict significant effects are explained in this Chapter and each individual Chapter as relevant. Effects have been predicted in relation to the project's construction and permanent use of the land. The operation and nature of these effects and their duration are reported.
4. A description of the measures envisaged to prevent, reduce and where possible offset any significant adverse effects on the environment.	EIA Report (Chapters 7 to 17). The overall approach to mitigation is discussed in this Chapter. Specific mitigation measures are reported in each relevant technical Chapter and are summarised in Chapter 17 .
5. A non-technical summary of the information provided under paragraphs 1 to 4 of this Part.	A Non-Technical Summary (NTS) is presented as Volume 1 of this EIA Report.
6. An indication of any difficulties (technical deficiencies or lack of know-how) encountered by the applicant in compiling the required information.	Assumptions and limitations in the EIA process are reported as required in the relevant technical Chapters.

7. The main alternatives studied by the applicant and the main reasons for his choice, taking into account the environmental effects.	The alternatives considered are covered under Chapter 2 .
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Table 5.1: EIA Report information

5.2.1 Legislation and guidance

13. The EIA has been completed in accordance with the latest regulations and advice on best practice, including the following:
- The Electricity Works (Environmental Impact Assessment) (Scotland) Regulations 2017 (as amended)
 - Scottish Government Guidance on The Electricity Works (Environmental Impact Assessment) (Scotland) Regulations 2000;
 - Scottish Government Web Based Guidance Onshore wind turbines (first published in February 2011 and last updated in May 2014);
 - Planning Advice Note (PAN) 1/2013 Environmental Impact Assessment (2013);
 - Scottish Government Web Based Guidance Onshore wind turbines (first published in February 2011 and last updated in May 2014);
 - Scottish Planning Series Planning Circular 1/2017 Guidance on The Town and Country Planning (Environmental Impact Assessment) (Scotland) Regulations 2017;
 - Institute of Environmental Management and Assessment (2004) Guidelines for Environmental Impact Assessment; and
 - Scottish Natural Heritage (SNH) (2013) A Handbook on Environmental Impact Assessment: Guidance for Competent Authorities, Consultees and other involved in the Environmental Impact Assessment Process in Scotland (4th Edition).

5.3 EIA and the design process

14. The EIA was treated as an iterative process, rather than a one-off, post design environmental appraisal. This has allowed the findings from the EIA to be fed into the design process, to avoid, reduce and where possible, mitigate environmental effects. Where potentially adverse environmental effects were identified through preliminary investigations as part of feasibility work, or later in the detailed EIA, consideration was given as to how the scheme design could be modified to design out adverse environmental effects, or where this was not possible, to identify appropriate mitigation. This process is explained further in **Chapter 2: Site Description and Design Evolution**; and in the subsequent technical assessment Chapters (**Chapters 7 to 16**).

5.4 Determining the scope of the EIA Report

15. The EIA Report is the applicant's statement on the proposed Development, its likely significant environmental effects, and the measures proposed to avoid, reduce and where possible mitigate adverse effects.
16. The scope of the EIA Report has been established through a combination of informal Scoping consultation with various stakeholders, and an EIA Scoping process that culminated in the preparation of a Scoping request to Scottish Ministers.
17. The Scoping Report was submitted to the Energy Consents Unit on 29 October 2018. A Scoping Opinion was received from the Energy Consents Unit on 6 February 2019 with responses from consultees included as annexes.
18. The Scoping consultation undertaken as part of the EIA process is detailed in **Chapter 6: Scoping**, of this EIA Report. The responses of all consultants collated during the Scoping process are addressed in this EIA Report and referred to as appropriate in each technical EIA Report Chapter.

5.5 Approach and methods

5.5.1 Introduction

19. The assessments that have been undertaken as part of the EIA have been based upon the proposed Development Site (the Site) and study areas. The Site is the area contained within the redline boundary shown on **Figure 1.2**.
20. The EIA Regulations require a description of the likely significant effects on the factors specified in Section 5.2:
21. Unless qualified elsewhere, the following interpretation is applied with regard to effects. Short term effects are those which extend over a short period only and, in the context of the windfarm, are typically those associated with the construction or decommissioning periods or other limited period. Other temporary effects which persist for less than the life of the windfarm are described as medium term, with those extending to the full lifetime of the windfarm described as long term. Any effects which persist beyond the life of the windfarm are considered permanent. Effects with duration of up to long term are considered reversible, whereas permanent effects are considered irreversible. Where any effect is identified, its duration is described.
22. Assessment criteria have been used to evaluate environmental effects. Significance is generally determined through a combination of the sensitivity of a receptor to an effect and the magnitude of the change. This process is outlined below:
- identification of baseline conditions of the Site and its environs, including the sensitivity of receptors which may be affected by changes in the baseline conditions;
 - consideration of the magnitude of potential changes in the environmental baseline;
 - assessment of the significance of effect taking account sensitivity of receptors and magnitude of effect;
 - identification of appropriate mitigation measures; and
 - assessment of significance of residual effects taking account of any mitigation measures
23. Where significant environmental impacts are predicted in the EIA process, then the EIA Report provides measures which would be employed to eliminate or ameliorate the impact to acceptable levels. Mitigation measures can be in the form of changes to operational practice, or changes/additions to the design.
24. The above approach does not, however, apply to all disciplines addressed in the EIA Report, and alternative approaches were therefore developed as appropriate. These are described and justified in the relevant EIA Report Chapter.

5.5.2 Baseline conditions

25. A fundamental aspect of the EIA is to determine the baseline environmental conditions prevailing at the Site. These form the benchmark against which predicted changes resultant from the proposed Development are assessed to determine the magnitude of any impact. The baseline conditions have been determined by a number of different methods, including desktop studies, Site surveys, use of analytical models and the acquisition of data from third parties.
26. The assessment of each environmental parameter was undertaken in comparison to baseline conditions. This describes the existing environmental conditions at the Site (and in the wider area as pertinent to the particular environmental parameter).
27. The sensitivity of the baseline conditions has been defined according to the relative sensitivity of existing environmental features on or in the vicinity of the Site, or by the sensitivity of receptors which would potentially be affected by the proposed Development. Criteria for the determination of sensitivity or importance have been established based on prescribed guidance, legislation, statutory designation and/or professional judgement. The criteria for each environmental parameter are outlined in the EIA Report according to the technical subject area.
28. Relevant windfarms that are under construction, operational and consented, are considered to be part of the baseline for the purposes of this EIA Report, unless specifically stated otherwise within relevant topic Chapters.

5.5.3 Consultation

29. Consultation has formed an integral part of the EIA process and both the EIA team and SPR have contacted a number of interested parties to determine their views on the proposed Development, collected baseline information and refined survey methodologies. Replies received in response to Scoping are detailed within the relevant technical Chapters of the EIA Report.

Consultation has been undertaken with the relevant consultees for the technical disciplines and is reported in **Chapter 6: Scoping and Consultation**, and in the topic specific Chapters of the EIA Report.

30. Engagement with the local community was undertaken through public information days held on 13 and 14 November 2018 and 26 and 28 February 2019 and between SPR and Community Councils, Further details on this can be found in **Chapter 2** and in the Pre-Application Consultation (PAC) Report submitted as part of the application for consent for the proposed Development.

5.5.4 Assessment of effects

31. The assessment of potential effects, using a range of appropriate methodologies, will take into account the construction, and operation of the proposed Development in relation to the Site and environs. Methodologies for predicting the nature and magnitude of any potential environmental impacts vary according to the technical subject area. Numerical or quantitative methods of assessment are used to predict values which can be compared against published thresholds and indicative criteria contained in relevant guidance and standards.

32. Not all technical subject areas are capable of being assessed numerically or quantitatively, and thus qualitative assessments are used in certain cases. Such assessments rely on previous experience of similar projects, environments and professional judgement.

5.5.5 Sensitivity of receptors

33. Criteria for the determination of sensitivity (e.g. 'high', 'medium', or 'low') or of importance (e.g. 'international', 'national', 'regional' or 'authority area') have been established based on prescribed guidance, legislation, statutory designation and/or professional judgement. The criteria for each environmental parameter are provided in the relevant Chapter of the EIA Report.

5.5.6 Magnitude of effects

34. The magnitude of effects on environmental baseline conditions is identified through detailed consideration of the proposed Development, taking due cognisance of any legislative or policy standards or guidelines, and / or the following factors:

- the degree to which the environment would be affected, e.g. whether the quality is enhanced or impaired;
- the scale or degree of change from the baseline situation;
- whether the effect is temporary or permanent, indirect or direct, short term, medium term or long term;
- any in-combination effects; and
- potential cumulative effects.

35. In some cases the likelihood of effect occurrence may also be relevant, and where this is a determining feature of the assessment this will be clearly stated.

5.5.7 Mitigation

36. Mitigation is considered as an integral part of the overall design strategy for the proposed Development, including 'embedded' mitigation (e.g. altering and refining the proposed Development to reduce landscape and visual impact, watercourse crossings or avoid sensitive species and habitats) rather than relying solely on 'add-on' measures to prevent or reduce significant environmental effects. SPR adopts an iterative approach whereby mitigation is assessed and considered at all stages of the project, and the final design of the proposed Development has evolved over the project life time, systematically being optimised during the EIA process in response to increasing knowledge of the Site and potential environmental effects.

37. Some of the measures described within **Chapters 7 to 16** of this EIA Report do not relate only to likely significant adverse effects, but have been included as good practice to reduce the level of adverse effects, or enhance the level of beneficial effects, of the proposed Development. Where relevant, these 'good practice measures' are described in the topic Chapters.

38. Where significant environmental effects are predicted in the EIA process, the EIA Report provides measures which would be employed to eliminate or ameliorate the effect to acceptable levels. Mitigation measures are envisaged through the consideration of alternatives, changes/additions to the design of the proposed Development, project management or operation to prevent, reduce or, where possible, offset any adverse significant effects.

39. In some cases, environmental mitigation through compensation may be appropriate to provide replacement features or assets (e.g. habitat to replace that which has been disturbed or lost due to the construction of the proposed Development). However,

compensation may not initially be effective at remedying effects, as compensation may take time to mature sufficiently to enable the effect of the disturbance or loss to be offset.

40. Where complete avoidance of potential effects is not feasible during refinement of the Site design, additional measures are identified to reduce effects. These include a range of mitigation proposals such as the use of construction methods, avoidance of sensitive habitats, landscaping and Site operation activities. Mitigation measures follow standard techniques and best practice, and are therefore considered to be effective for the purposes of assessment.

5.5.7.1 Monitoring

41. Also incorporated, where appropriate, are monitoring measures to ensure that the proposed Development and any mitigation measures perform as required.

42. The EIA Report sets out details of any post-consent monitoring which is proposed. This includes, where appropriate, proposals to measure the effectiveness of the identified mitigation measures.

5.5.8 Statement of significance

43. Assessing the significance of effects relies, at least in part, on value judgements including placing weight or value on the environment likely to experience the change. The significance of effects at the assessment stage relates back to the effects deemed to be significant at the Scoping stage.

44. The significance of an effect is derived from an analysis of:

- the sensitivity of the receiving environment or receptor to change, including its capacity to accommodate the kinds of changes the proposed Development may bring about;
- the amount and type of change, often referred to as the impact magnitude which includes the timing, scale, size and duration of the impact;
- the likelihood of the impact occurring - which may range from certainty to a remote possibility;
- comparing the impacts on the environment which would result from the proposed Development with the changes that would occur without the proposed Development - often referred to as the "do nothing" or "do minimum" comparison; and
- expressing the significance of the effects of the project, usually in relative terms, based on the principle that the more sensitive the resource, the more likely the changes and the greater the magnitude of the changes, compared with the do nothing comparison, the greater would be the significance of the effect.

45. As the significance of effects would differ depending on the context and the 'receptors' affected by the proposed Development, there is no general definition of what constitutes significance. In EIA, the term significance reflects both its literal meaning of 'importance' and its statistical meaning where there is an element of quantification. This combination of judgemental/subjective and quantifiable/objective tests has become the standard approach to understanding and applying the test of 'significance'.

46. Significant effects are defined in each of the topic specific Chapters. Any effects associated with the proposed Development are considered to be negative except where it is stated that they are positive.

5.5.9 Consideration of cumulative effects

47. In accordance with the EIA Regulations, the assessment has considered 'cumulative effects'. By definition these are effects that result from incremental changes caused by past, present or reasonably foreseeable projects, together with the proposed Development. Likely cumulative effects have been defined as the likely effects that the proposed Development may have in combination with other windfarm developments in the local area which are at application stage, consented, under construction or operational (i.e. the incremental effects resulting from the proposed Development if all other developments are assumed to be constructed/operated). The extent to which the potential combined effects through that co-existence is considered, is described as appropriate throughout **Chapters 7 to 16** of this EIA Report.

48. The study area for considering cumulative effects varies per technical discipline. In general most specialisms have considered cumulative effects to approximately 10 km from the Site which includes the following schemes detailed in **Table 5.2**.

Name	Windfarm Status
Arecleoch	Operational
Craigbrae Pinwherry	Operational
Kilgallioch	Operational
Mark Hill	Operational
Chirmorie	Consented
Stranoch i	Consented
Stranoch ii	In Planning
Arnsheen	In Planning
Clauchrie	In Planning
Kilgallioch Extension	In Planning

Table 5.2: Cumulative Windfarms 10 km

49. The study area for considering cumulative effects on landscape and visual amenity is up to approximately 45 km from the Site. Consented and operational windfarms up to 45 km from the proposed Development turbines are detailed in **Table 5.3**. The cumulative cut-off date is 3 April 2019.

Name	Windfarm status
Airies Farm	Operational
Arecleoch	Operational
Artfield Fell	Operational
Artfield Fell Extension	Operational
Assel Valley	Operational
Barlockhart Moor	Operational
Carscreugh	Operational
Craigbrae Pinwherry	Operational
Dersalloch	Operational
Dowhill Farm	Operational
Glen App	Operational
Glenchamber	Operational
Hadyard Hill	Operational
Kilgallioch	Operational
Knocknain Farm	Operational
Mark Hill	Operational
Meikle Float Farm	Operational
North Rhins	Operational

Penwhapple	Operational
Windy Standard	Operational
Windy Standard Extension	Operational
Torrs Hill	Under Construction
Tralorg	Under Construction
Bartlockhart Moor Extension	Consented
Benbrack	Consented
Chapleton Farm	Consented
Chirmorie	Consented
Craigoch Park Moor	Consented
Gass	Consented
Kirk Hill	Consented
Knockshinnoch	Consented
Larbrax	Consented
North Threave	Consented
Polquhairn	Consented
South Kyle	Consented
Stranoch 1	Consented

Table 5.3: Cumulative windfarms 45 km

5.5.10 Consideration of transboundary effects

50. In accordance with the EIA Regulations, the assessment has considered 'transboundary effects'. Regulation 29 of the EIA Regulations refers to development with significant transboundary effects as being "Development in Scotland likely to have significant effects in an EEA State other than the United Kingdom". The nature of the proposed Development and the location of the application Site are such that significant transboundary effects are not predicted for the proposed windfarm.

5.5.11 Assumptions, limitations and technical difficulties

51. The EIA Process is designed to enable good decision-making based on the best possible available information about the environmental implications of a proposed Development. A number of assumptions have been made during preparation of the EIA Report, which are set out below. Assumptions specific to certain environmental aspects are discussed in the relevant Chapters of the EIA Report.
52. Assumptions made during the EIA include:
- the principal land uses adjacent to the Site would remain as they are at the time of the EIA Report submission, except in cases where permission or consent has already been granted for development. In these cases, it is assumed that the approved development will take place, and that these would be treated as contributing to either baseline or cumulative effects, with the maximum impact scenario assessed within the relevant Chapter; and
 - information provided by third parties, including publicly available information and databases is correct at the time of publication.
53. The assessment has been subject to the following limitations:

- baseline conditions have been assumed to be accurate at the time of the physical surveys but, owing to the dynamic nature of the environment, conditions may change during the Site preparation, construction and operational phases; and
- the assessment of cumulative effects has been reliant on the availability of information on other developments.

5.6 References

IEMA (2004). Guidelines for Environmental Impact Assessment.

Scottish Government (2017). Scottish Planning Series Planning Circular 1/2017: Environmental Impact Assessment Regulations 2017, Guidance on The Town and Country Planning (Environmental Impact Assessment) (Scotland) Regulations 2017.

Scottish Government (2014). Web Based Guidance Onshore wind turbines (first published in February 2011 and last updated in May 2014).

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