

3 The Proposed Development

3.1 Introduction

3.1.1 This chapter provides a description of the proposed development and its geographical context. It should be read alongside Chapter 4 'Construction and Decommissioning'.

3.2 Site Status and Context

Site Description

3.2.1 The site of the proposed wind farm lies approximately 25 km south of Dalwhinnie and 14 km west-north-west of Kinloch Rannoch. The site is centred at OS Grid Ref 253489,759190 within the Talladh-a-Bheithe Estate. The Estate extends from the far north western end of Loch Rannoch northwards to the Talladh-a-Bheithe Forest and the southern end of Loch Ericht. The Estate boundary is shown in Figure 2.1.

3.2.2 The landscape is characterised by open grassland and intermittent coniferous and on part of which exists hydro energy infrastructure comprising power buildings, overhead power lines, large diameter pipework and roads. The Estate has been a producer of renewable hydroelectricity since the 1930's. It is partially within the Loch Rannoch and Glen Lyon National Scenic Area (NSA) and the Coire Bhachdaidh Site of Special Scientific Interest (SSSI). The surrounding land uses and physical

Environmental Designations

3.2.3 The individual topic based ES chapters provide the assessment of the proposed development with respect to the potential impact upon designations. The key nature conservation, landscape and visual related designations are described below.

- The Cairngorms National Park (approximately 10 km to site);
- The Loch Lomond and the Trosachs National Park (approximately 30 km to the site);
- Loch Rannoch and Glen Lyon NSA (Southern portion of the site is within the designation although no wind turbines would be constructed within it);
- Ben Nevis and Glen Coe NSA (approximately 12km from the site);
- Loch Tummel NSA (approximately 25 km from the site);
- Coire Bhachdaidh SSSI (Approximately 250m to the west of the site);
- Coire Bhachdaidh SSSI (Approximately 250m to the west of the site);
- River Spey SAC (320 m east of Dalwhinnie site);
- River Tay SAC (5km to the southwest of the site);
- Rannoch Lochs SPA (5km to the southwest of the site);
- Rannoch Lochs SSSI (Lochan Loin nan Donnlaich)(5km to the southwest of the site);
- Black Wood of Rannoch SSSI (5km to south of the site);
- Ben Alder and Aonach Beag SPA (5.5km to the north west of the site);
- Ben Alder and Aonach Beag SSSI (5.5km to the north west of the site);

- Drumochter Hills Special Protection Area SPA (5.8km to the north of the site); and
- Drumochter Hills Site of Special Scientific Interest (5.8km to the north of the site).

3.3 Description of the Proposed Development

3.3.1 The proposed development layout is illustrated in Figures 1.2 and 4.1. The key components of the proposed development are described in the following section and more fully within Chapter 4.

Turbines and Turbine Foundations

3.3.2 The proposed development will comprise 24 wind turbines with up to 80 m hub height and up to 90 m rotor diameter (resulting in a maximum height from ground to blade tip, when vertical, of up to 125 m).

3.3.3 The proposed final locations of the turbines have been defined in order to enable the EIA to fully describe the proposed development for which permission is being sought. The British National Grid coordinates denoting where each of the turbines are proposed to be located are listed in Table 3.1.

Table 3.1 – Wind Turbine Coordinates (British National Grid)

| Turbine Number | Coordinates |
|----------------|-----------------|
| 1 | X=251604.7400 |
| 2 | X=252069.0200 |
| 3 | X=252263.0800 |
| 4 | X=252914.9900 |
| 5 | X=253297.5900 |
| 6 | X=251974.6900 |
| 7 | X=252260.8800 |
| 8 | X=252999.0100 |
| 9 | X=253417.8900 |
| 10 | X=253805.3600 |
| 11 | X=252559.2000 |
| 12 | X=252856.4900 |
| 13 | X=253426.0700 |
| 14 | X=253977.7261 |
| 15 | X=252999.0500 |
| 16 | X=253277.0600 |
| 17 | X=254191.4200 |
| 18 | X=253660.2400 |
| 19 | X=253968.9300 |
| 20 | X=254622.9300 |
| 21 | X=253608.6900 |
| 22 | Turbine dropped |
| 23 | X=254706.8600 |
| 24 | X=255158.6300 |
| 25 | X=255097.0000 |

- 3.3.4 The locations of the turbines and infrastructure are shown on Figures 1.2 and 4.1. Whilst these locations have been determined through an iterative environmental based design process, there is the potential for these exact locations to be altered through micro-siting allowances prior to construction. A micro-siting allowance of 50 m in all directions is being sought in respect of each turbine and all infrastructures in order to address any potential difficulties which may arise in the event that pre-construction surveys identify unsuitable ground conditions or environmental constraints. It is proposed that the final positioning will be agreed and secured by way of an appropriately worded condition of consent.
- 3.3.5 Each of the turbines comprises the following components:
- blades;
 - tower;
 - nacelle;
 - hub; and
 - transformer.
- 3.3.6 Each turbine will be mounted on a tapered tubular steel tower and consist of a nacelle containing the gearbox, generator and associated equipment, to which are attached a hub and rotor assembly including three blades.
- 3.3.7 An elevation drawing of a typical turbine is illustrated in Figure 4.5. The turbines will be of a typical modern, three-blade, horizontal axis design in semi-matt white or light grey with no external advertising or lettering except for statutory notices. The specific turbine manufacturer and model has not yet been selected as this is subject to an ongoing tendering exercise and will be confirmed post consent. Therefore, for the purposes of the EIA potential turbine dimensions and operational attributes have been established as a maximum development scenario
- 3.3.8 The turbines may be required to carry red or infra-red aviation lighting – it is proposed that the requirements for any such lighting would be addressed through an appropriately worded condition and agreed with PKC in consultation with the MoD.
- 3.3.9 A transformer will be sited either within the base of each tower or externally sited adjacent to the turbine tower. For the purposes of the EIA it has been assumed that the transformers would be external, Figure 4.4 shows an indicative elevation drawing of an external transformer (not to scale) next to the wind turbine elevation. The dimensions of external transformer are approximately to 4 m long by 3 m wide by 2.5 m in height.

Crane Hardstandings

- 3.3.10 To enable the construction of the turbines, a crane hardstanding area and turning circle at each turbine location will be required to accommodate assembly cranes and construction vehicles. This will comprise a crushed stone hardstanding area measuring, at the widest point, approximately 45 m long by 25 m wide with a typical thickness of approximately 500 mm (refer to Table 3.2), but subject to the specifications required by the selected crane operator and following detailed ground investigations prior to construction.
- 3.3.11 The crane hardstandings will remain in place during the lifetime of the proposed development to facilitate maintenance works.
- 3.3.12 The crane hardstandings are illustrated as part of the site layout on Figures 4.5 and 4.6.

Site Access and Access Tracks

- 3.3.13 The wind turbines will be transported to the Talladh a Bheithe Estate via several different methods. The majority of the components will be shipped to Corpach near Fort William and transported via rail to Rannoch Station. Upon arrival at Rannoch Station, abnormal load vehicles will collect the turbine components and deliver these sections to the site via the A846.
- 3.3.14 The site access proposal involves the enhancement of the current estate access with the A846 at the south western edge of the site. The site access will replace the existing access and be constructed in the form of a priority junction with the B846 adjacent to Ericht Cottage, which lies approximately 7 miles east of Rannoch Railway Station. Construction vehicles will access the site via the same location, however, will route to the site via the A9 in the east.
- 3.3.15 From the site access junction with the B846, a series of new tracks will be constructed to enable access to be gained to each of the proposed turbine locations. This access will be maintained following completion of the construction phase and used as the main site entrance for maintenance access and continued access to Loch Ericht.
- 3.3.16 Larger component parts which cannot be transported by rail will be loaded onto barges on Loch Ericht and transported to the site from the head of the Loch at Dalwhinnie. The arrangements for transporting the turbine components from the barges to on land vehicles is to be determined post consent and is illustrated by way of an indicative hard standing area on Figure 1.2. The component parts will be transported to the head of Loch Ericht by abnormal load vehicles via the A9 and the A889. Currently access to the head of the loch is available via two locations, the existing railway bridge and the level crossing via Ben Alder Road. However, these routes host several constraints and will be unable to support such vehicle types and, as a result, the components will require to be hoisted over the railway line which will involve the use of cranes and the construction of crane pads. The two routes to the head of Loch Ericht described above will however be suitable to accommodate construction traffic associated with the delivery of cranes and material for construction of set-down areas and access tracks.

Watercourse Crossings

- 3.3.17 Seven watercourse crossings are required for the access tracks. Five crossings were identified on the OS 1:50,000 scale digital mapping and therefore require authorisation under CAR (known as regulated crossings).
- 3.3.18 The remaining two watercourse crossings were identified during the site visit. These crossings do not require authorisation under CAR. Some of the crossings are very minor headwater channels and it is expected that a range of other small natural ephemeral channels, artificial drainage channels and flushes will be encountered during the detailed design stage prior to construction.
- 3.3.19 It is proposed that the final location and construction methodology for the watercourse crossings will be agreed post consent through the CMP.

Electrical Connection

- 3.3.20 The electrical power produced by the individual turbines will be fed to an onsite substation via underground cables. The substation is located on the access track between turbines 2 and 3 towards the west of the site, as this is the closest point within the site to the most likely grid connection point at Rannoch Power Station. The proposed location for the substation is as shown on Figure 4.1.

3.3.21 It is proposed that there will be a micro-siting allowance of 50 m in all directions for the substation to allow for local variations in ground conditions, topography or environmental constraints identified by pre-construction surveys. It is proposed that the final positioning will be addressed through an appropriately worded condition.

3.3.22 The connection from the onsite substation to the grid will be subject to with the appropriate consents being obtained by SHE Transmission.

Meteorological Monitoring Mast

3.3.23 Up to two permanent onsite meteorological monitoring masts will be required to monitor wind speeds for the operational life of the proposed development. It is expected that the masts will be of a height no greater than 80 m (the hub height of the proposed turbines).

3.3.24 The final locations and heights of the meteorological masts will be determined in consultation with PKC and the wind turbine manufacturer prior to construction of the proposed development. It is proposed that these details and any requirements for aviation lighting will be addressed through an appropriately worded condition of consent.

Temporary Construction Compounds

3.3.25 One secure, temporary construction and material storage compound will be required during the construction period. The location of this compound is shown on Figure 4.1.

3.3.26 The Compound will be a rectangular area, constructed from crushed stone to a depth of approximately 500 mm.

3.3.27 The detailed location, size and engineering properties of the construction compounds will be confirmed prior to the start of construction, after the turbine supplier and model have been confirmed. It is proposed that there will be a micro-siting allowance of 50 m in all directions for the construction compounds in order to allow operational flexibility. It is proposed that the final positioning will be addressed through an appropriately worded condition of consent.

Borrow Pits

3.3.28 There will be up to four borrow pits required for the proposed development and Figure 4.1 shows each borrow pit search area location. It is anticipated that the final locations will be agreed with PKC post consent and secured by an appropriately worded condition of consent.

3.4 Operation and Maintenance

3.4.1 During operation, only site maintenance vehicles and local utility company vehicles will normally be required on the site. Daily visits to the control building by maintenance personnel in four wheel drive or conventional passenger vehicles will occur following the commissioning phase.

3.4.2 Any diesel or oil stored on-site will be held within an appropriately bunded location within the substation building.

3.4.3 Health and safety will also be controlled as set out in the construction phase.

3.4.4 Once the proposed development is operational, daily routine maintenance inspections and servicing visits by technicians in one to two vehicles are expected.

- 3.4.5 In the unlikely event that a major turbine component requires replacement, vehicles will use the new access tracks and crane pads.

Carbon Emissions Savings

- 3.4.6 A technical review of energy displacement by the UK Energy Research Centre (UKERC) considered over two hundred studies and papers from all round the world for the UK Government and concluded that *"it is unambiguously the case that wind energy can displace fossil fuel-based generation, reducing both fuel use and carbon dioxide emissions"* (UKERC, 2006).
- 3.4.7 A comparison of the carbon payback periods associated with the proposed development, when compared to other forms of energy generation are illustrated below in Table 3.2. The Carbon balance assessment is a detailed assessment and is presented within Chapter 17.

Table 2.2 - Payback Comparison

| Electricity generation fuel | Minimum Years | Maximum Years | Expected Years |
|-----------------------------|---------------|---------------|----------------|
| Coal | • 0 | • 2.7 | • 1.1 |
| Grid Mix | • 0.1 | • 5.6 | • 2.3 |
| Fossil Fuel Mix | • 0.1 | • 3.8 | • 1.6 |

3.5 Summary

- 3.5.1 This chapter has provided a description of the site and the surrounding area, with details of the proposed development provided, in addition to a summary of the associated infrastructure. A description of the likely activities to occur during the construction, operation and decommissioning phases are provided in Chapter 4 'Construction and Decommissioning'.

3.6 References

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