

3.0 Site Selection, Design and Alternatives

Introduction

- 3.1 The criteria used in the initial assessment to determine the suitability of the application site for the proposed Pencloe Wind Farm and the subsequent design process, including alternatives considered and layout evolution are described in **Chapter 3 of the Original ES**.
- 3.2 The granting of s.36 consent for a 19 turbine, 62.7 MW development in December 2018 has confirmed the suitability of the Pencloe site for a large-scale wind farm. As the proposed development largely involves variations within the envelope of the consented development, it is not proposed to provide any further information on site selection, but rather give a brief overview of design and other alternatives considered for the variation.

Variation Design

- 3.3 The wind turbine technology used to confirm the layout in 2014 has been superseded and will not be available for commercial development in the timescales proposed. It is also recognised that there is an opportunity to significantly increase the productivity of the site by increasing the tip height of the turbines, and utilising the additional grid capacity that is available.
- 3.4 The Applicant undertook a layout review in consultation with the Scottish Government in order to understand the parameters around an acceptable level of change and this has informed the variation layout described in detail in **Variation Chapter 4**.

Annual Energy Production

- 3.5 It has been estimated that increasing the tip height of the of the turbines from 125 m to 149.9 m to tip, and an associated increase in blade length to 67 m will (based on a 149.9 m turbines) increase the Annual Energy Production (AEP) from the site by around 48%, this represents a very significant benefit arising from the variation.
- 3.6 The relocation of turbines 6 and 15 in the consented layout to locations T1 and T2 of the original 21 turbine layout has also reduced wake and interference effects arising from the longer blades and has contributed to the increased AEP. A number of different layout revisions involving a greater number of turbines in new locations were also reviewed, however it was considered that these would lead to a greater degree of change that would be acceptable under for a s36c application, and were not progressed.

Site Layout

- 3.7 Due to the increased size of area, a detailed review of has been undertaken of the site layout and supporting site infrastructure and this has led to a number of efficiencies, for example a reduction in the amount of stone needed from borrow pits on site.

Project Design Conclusions

- 3.8 Following the site optimisation process, underpinned by the results of the EIA, the variation layout was considered to have very significant advantages in terms of increased energy production and reduced use of materials. These are additional to the assets recognised of the consented scheme including an excellent wind resource, good confirmed connectivity to the national electricity grid infrastructure and an absence of statutory designated sites/features on the application site.

This page is intentionally blank