



Cush Wind Farm – Phase II

Environmental Impact Assessment Report

Chapter 2: Assessment of Project Alternatives

Cush Wind Limited

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2.1 INTRODUCTION

The EIA Directive requires an EIAR to describe the reasonable alternatives studied by the Developer which are relevant to the project and its specific characteristics, and to identify the main reasons for selecting the project, including a comparison of environmental effects.

The presentation and consideration of reasonable project alternatives investigated is an important requirement of the EIAR process and an effective means of avoiding likely significant effects on the environment. As described in **Chapter 1**, the EIAR process is highly iterative involving a constant interchange between project designers and competent experts, with designers continually adjusting the design in response to identified environmental constraints, and vice versa, including through the embedding of mitigation measures in the emerging project design. The purpose of this chapter is to record the key outcomes of this process and to document the assessment of the alternatives considered.

The *Guidelines on the Information to be Contained in Environmental Impact Assessment Reports* (EPA, 2022) state that it is generally sufficient to provide a broad description of each of the main alternatives considered, identifying the key issues associated with each of them, and to demonstrate how environmental constraints were taken into account. A detailed assessment (or 'mini-EIA') of each alternative is not required. The project selected following consideration of these alternatives is described in **Chapter 3**.

2.2 ALTERNATIVES ASSESSED

The consideration of alternatives is a dynamic process, with alternatives identified at various stages during the evolution of a project, from strategic site selection through to project design and layout. Consideration of alternatives at the earlier stages of a project, particularly during feasibility and scoping, provides the greatest opportunity to avoid likely significant effects on the environment.

The reasonable alternatives considered in undertaking this EIAR were as follows: -

- 'Do Nothing' alternative;
- Alternative technologies;
- Alternative locations;
- Alternative layouts;
- Alternative turbine designs;
- Alternative grid connections; and,
- Alternative haul routes.

Each of these alternatives was considered relevant to the project and its specific characteristics and is discussed in further detail below, including environmental considerations informing the selection of the preferred option, where relevant.

2.3 ASSESSMENT OF ALTERNATIVES

2.3.1 'DO NOTHING' ALTERNATIVE

National policy strongly supports the increased generation of renewable electricity, including onshore wind energy, to reduce greenhouse gas emissions and support the

transition away from fossil fuels. The *Climate Action Plan 2025* establishes a target of at least 80% renewable electricity generation by 2030, including an installed onshore wind capacity target of 9 gigawatts (GW) by 2030.

The Government's Wind Energy Development Guidelines for Planning Authorities (2006) and the Draft Revised Wind Energy Development Guidelines (2019) provide guidance for the development of wind energy projects at appropriate locations. The Offaly County Development Plan 2021-2027, and accompanying Strategic Environmental Assessment (SEA), also provide a policy framework for wind energy development within the county. The County Wind Energy Strategy incorporated in the Development Plan identifies the project site as being within an area designated 'Open for Consideration for Wind Energy Development', reflecting the strategic consideration of environmental and technical constraints undertaken in preparing the Strategy.

Under the 'Do Nothing' alternative, the project would not proceed and the existing land uses and environmental conditions at the project site would continue to evolve in the absence of the project. These include managed farmland, maturing scrub, cutover bog and cutaway bog. Ongoing and proposed peatland rehabilitation activities, including those associated with the wider Galros Bog, would be expected to continue independently of the project.

The 'Do Nothing' alternative relates to the absence of Cush Wind Farm Phase II. The permitted eight-turbine Cush Wind Farm Phase I would remain authorised for construction and operation in accordance with its permission. The likely evolution of the receiving environment would therefore include the permitted Phase I development and its associated infrastructure, together with ongoing and proposed peatland rehabilitation activities. The environmental effects avoided under this alternative would be those attributable to the additional Phase II development.

The 'Do Nothing' alternative would avoid the construction and operational environmental effects associated with the project. However, it would also mean that the additional renewable electricity generation capacity of up to 21.6 MW would not be delivered, together with the associated contribution to reducing greenhouse gas emissions.

Having regard to the objectives of the project and the national and local policy support for appropriately located wind energy development, the 'Do Nothing' alternative was considered but was not selected as the preferred option.

2.3.2 ALTERNATIVE TECHNOLOGIES

Wind energy is recognised in government policy as a proven and cost-effective renewable energy generation technology in the context of Ireland's abundant wind resource. Ground-mounted solar photovoltaic (PV) development was identified as the principal alternative renewable electricity generation technology for consideration at this location. As discussed above, the *Climate Action Plan 2025* recognises that onshore wind will continue to play a vital role in decarbonising Irish electricity generation with a target of at least 9GW by 2030. Solar energy, while a rapidly developing technology, has a corresponding target of 8GW by 2030.

Solar energy development generally requires a larger overall land area per MW of installed capacity than the direct infrastructure footprint associated with wind energy development. In contrast, a wind energy project can generally accommodate the continuation of existing agricultural and other land uses between turbines and

associated infrastructure. A solar energy development with an installed capacity equivalent to the proposed project (18.3–21.6 MW) would require approximately 23–27 hectares of land (approximately 1.25 ha/MW, indicatively), compared with the substantially smaller direct infrastructure footprint of the proposed wind energy development.

The project comprises a three-turbine extension to the permitted eight-turbine Cush Wind Farm (Phase I) (Reference: ABP-318816-24). The addition of three turbines would increase the overall generating capacity of the wind farm by up to 21.6 MW, while providing opportunities to utilise infrastructure and logistical arrangements already required for Phase I, including the turbine delivery haul route. This would allow greater renewable electricity generation relative to the overall infrastructure requirements of the combined development, providing for more efficient utilisation of infrastructure associated with the permitted wind farm and potentially reducing the additional environmental effects associated with this infrastructure provision.

The project site is partially located on Galros Bog, which was formerly subject to industrial peat extraction. The *Climate Action Plan 2025* identifies peatland rehabilitation as a national climate action priority, including a target to rehabilitate 65,900 hectares of exploited peatlands by 2030. Bord na Móna has a legal obligation pursuant to its Integrated Pollution Control (IPC) Licence (Reg. No. P0500-01) to rehabilitate the bog and has developed the Draft Galros Bog Rehabilitation Plan (2026) to this end. The relatively limited and dispersed footprint of wind energy infrastructure provides opportunities for renewable electricity generation to coexist with peatland rehabilitation whereas the more extensive land occupation associated with a solar energy development could place greater constraints on these activities.

Having regard to the available wind resource, the relative land requirements, the opportunities to make efficient use of infrastructure associated with the permitted Cush Wind Farm (Phase I), the potential to accommodate ongoing and proposed peatland rehabilitation activities and the continuation of existing land uses and the anticipated electricity generation characteristics of the technologies considered, wind energy was selected as the preferred renewable electricity generation technology for the project.

2.3.3 ALTERNATIVE LOCATIONS

The project comprises a 3 no. turbine extension to the permitted 8 no. Cush Wind Farm – Phase I (Reference: ABP-318816-24). The location of the proposed extension was therefore principally informed by its relationship with the permitted development, rather than a new strategic search for an independent wind farm location.

The selection of the Cush Wind Farm Phase I location was informed by an assessment of alternative locations in the submitted EIAR. This assessment considered two alternative locations in County Offaly having regard to environmental constraints, residential amenity, landscape sensitivity, accessibility, wind resource and planning policy. The Cush location was identified as the preferred option following this assessment, and An Coimisiún Pleanála subsequently granted planning permission for the 8 no. turbine Cush Wind Farm Phase I development (Reference: ABP-318816-24).

The opportunity to extend the permitted wind farm was a principal consideration in selecting the project location. Developing three additional turbines adjoining the permitted Cush Wind Farm Phase I provides an opportunity to increase renewable electricity generation while making more efficient use of infrastructure and logistical

arrangements associated with the permitted development, including the turbine delivery haul route. This approach also has the potential to avoid some of the additional infrastructure requirements and associated environmental effects that could arise from developing an equivalent wind energy project at a separate location.

The *Offaly County Development Plan 2021–2027* Wind Energy Strategy identifies the locality as an 'Area Open for Consideration for Wind Energy Development'. This designation, together with the previous assessment of alternative locations and the permission granted for Cush Wind Farm Phase I, provided a relevant planning and environmental context for the selection of the Phase II site.

No further strategic alternative locations were studied for the project, having regard to its specific purpose as an extension of the permitted Cush Wind Farm. The environmental effects of the project, including cumulative effects with Cush Wind Farm Phase I and other relevant developments, are assessed in the relevant chapters of this EIAR.

2.3.4 ALTERNATIVE LAYOUTS

The assessment of the alternative layouts of the project was informed by the previous assessment of alternatives undertaken for Cush Wind Farm Phase I. The original Cush Wind Farm proposal comprised 11 no. turbines with an anticipated generating capacity of 79.2 MW and was determined by An Coimisiún Pleanála to constitute Strategic Infrastructure Development (SID) following pre-application consultation (Reference: ABP-313778-22).

As documented in Chapter 2 of the Cush Wind Farm Phase I EIAR, an 11 no. turbine layout (Option D2) was initially identified as the emerging preferred layout. Following the SID determination, and prior to submission of the Phase I planning application, the Developer elected to omit 3 no. turbines following further commercial and technical assessments. This resulted in the 8 no. turbine layout (Option D3), which was subsequently granted planning permission (Reference: ABP-318816-24).

The Cush Wind Farm Phase I EIAR expressly identified that further evaluations of the 3 no. omitted turbine locations were ongoing, with a view to their potential development at a future date, subject to a separate consenting process. The proposed Cush Wind Farm Phase II comprises these 3 no. previously omitted turbines. The design of Cush Wind Farm Phase II was therefore informed by the earlier assessment of the wider wind farm layout, the relationship with the permitted Phase I development and further technical and environmental assessments undertaken in respect of the proposed extension.

As part of the Phase II design process, two alternative layouts were considered: a 3 no. turbine layout comprising the turbines previously omitted from the Phase I application (18.3–21.6 MW), and a 4 no. turbine layout comprising these three turbines together with an additional turbine to the south (24.4–28.8 MW).

An assessment process was undertaken to refine the siting, design and layout of the wind turbines and associated infrastructure. This process was informed by environmental constraints, technical design considerations, wind resource, land availability, proximity to existing and permitted infrastructure, grid connection requirements, access arrangements and the need to avoid or reduce likely significant effects on the environment. The indicative layouts of the 3 no. turbine and 4 no. turbine alternatives are illustrated in **Figure 2.1**.

The 4 no. turbine layout would provide an additional 6.1–7.2 MW of renewable electricity generation capacity compared with the 3 no. turbine layout. While the additional turbine would require associated infrastructure and result in a greater development footprint, the environmental constraints identified during the design process did not, in themselves, determine the selection between the two layouts.



Figure 2.1: Indicative 3 no. and 4 No. Turbine Site Layouts

However, the additional southern turbine was located in proximity to an existing 400kV overhead electricity line, presenting a technical constraint to its development. Having regard to this constraint, the 4 no. turbine layout was not progressed further, and the 3 no. turbine layout was selected as the preferred design for Cush Wind Farm Phase II.

2.3.5 ALTERNATIVE TURBINE DESIGNS

As described in **Chapter 1** of this EIAR, the project incorporates a defined range of turbine dimensions, rather than a specific turbine model, to provide flexibility in the final selection of turbine technology. This approach is consistent with the Design Flexibility Opinion issued by Offaly County Council under Section 32I of the Planning Act 2000. The EIAR assesses the likely significant environmental effects of the project having regard to alternative turbine models and dimensions within this defined range, with the relevant parameters considered in each environmental assessment chapter, as appropriate.

2.3.6 ALTERNATIVE GRID CONNECTIONS

The method of connection to the national electricity grid is an integral element of the overall project and has been considered as part of the assessment of alternatives.

The identification of a suitable grid connection is influenced by technical requirements and engagement with EirGrid and ESB Networks, as the relevant electricity network operators. During the development of the project, consideration was given to the available grid connection options, having regard to the anticipated generating capacity of the project, the permitted Cush Wind Farm Phase I development, existing and proposed electricity infrastructure, environmental constraints, land availability and technical feasibility.

Two principal grid connection alternatives were considered:

- Ballaghanoher Grid Connection: Construction of a new 110kV loop-in loop-out electricity substation on lands at Ballaghanoher, Co. Offaly, adjacent to the existing Dallow T 110kV overhead electricity line, together with approximately 2.5km of underground electricity line to connect the proposed switch room to the substation; and,
- Mullanafawnia Grid Connection: Installation of approximately 5km of underground electricity line from the proposed switch room to the proposed Mullanafawnia 110kV substation, Mullanafawnia, Co. Offaly.

The alternative grid connection arrangements are illustrated at **Annex 2.1**.

The Ballaghanoher grid connection was initially progressed to an advanced feasibility and pre-application consultation stage. A request for pre-application consultation was submitted to An Coimisiún Pleanála under Section 182E of the 2000 Planning Act 2000 (Reference: ACP-323956-25) in respect of the proposed substation and associated underground electricity line. A pre-application consultation meeting was held in March 2026.

The identification and development of the Ballaghanoher grid connection included consideration of environmental constraints, including biodiversity, geology, hydrology, flood risk, landscape and visual amenity, cultural heritage and proximity to residential properties. However, following further technical engagement with ESB Networks and EirGrid, it was established that a connection to the existing Dallow T 110 kV overhead electricity line was not technically feasible. Accordingly, the Ballaghanoher grid connection was not progressed further.

The Mullanafawnia grid connection was subsequently identified as the preferred option. This comprises approximately 5km of underground electricity line, located within private lands, extending from the proposed electrical switch room building to the proposed Mullanafawnia 110 kV substation¹.

The selection and design of the Mullanafawnia grid connection also had regard to environmental constraints along the proposed underground electricity line route, including existing habitats, watercourses and drainage features, ground conditions, cultural heritage, residential properties and access arrangements. The proposed route is located within private lands, thereby limiting the extent of works required within the public road network. The potential environmental effects associated with the proposed underground electricity line are assessed in the relevant chapters of this EIAR.

2.3.7 ALTERNATIVE HAUL ROUTES

2.3.7.1 Turbine Components

There are a number of ports through which turbine components may be imported into Ireland, including the Port of Galway, Dublin Port, Shannon Foynes Port and the Port of Waterford. The final port of entry will depend on the turbine manufacturer and logistical requirements at the time of delivery and cannot be confirmed until

¹ The proposed Mullanafawnia 110 kV substation is currently the subject of Strategic Infrastructure Development pre-application consultation with An Coimisiún Pleanála (Reference: ACP-324608-26). The substation is being proposed by a separate developer and does not form part of the project assessed in this EIAR. However, the potential cumulative effects of the proposed substation in combination with the project are assessed in this EIAR, where relevant.

completion of the turbine tendering process.

The proposed Cush Wind Farm Phase II development is an extension of the permitted Cush Wind Farm Phase I development. Accordingly, the assessment of alternative turbine delivery routes has been informed by the haul route previously identified and assessed for Phase I, including the potential to utilise the same national and regional road network and associated delivery arrangements.

For the purposes of this EIAR, the Port of Galway has been adopted as the assumed port of entry for the assessment of turbine component deliveries. The assessed haul route follows the national road network, including the N6, M6, N52 and N62, towards the project site. In the event that an alternative port is selected, turbine components would be transported principally via the national and regional road network. Any alternative haul route would be subject to confirmation of its suitability, including the identification of any necessary accommodation works and consideration of potential environmental effects not assessed in this EIAR.

An updated Route Access Survey was undertaken having regard to the proposed turbine dimension range for Phase II. This confirmed that the previously assessed haul route remains suitable, subject to minor variations to the accommodation works required to facilitate turbine deliveries.

The proposed turbine delivery route and associated accommodation works are described in **Chapter 3** of this EIAR, with the updated Route Access Survey provided at **Annex 3.5**.

2.3.7.2 Construction Materials

The construction phase of the project will require materials, such as stone, aggregates and concrete, to be imported to the project site from selected suppliers. No concrete batching will be undertaken at the project site, and all concrete will be imported from local suppliers.

A range of potential local suppliers have, therefore, been identified and the potential haul routes to the main site entrance are illustrated at **Annex 2.2**. Potential suppliers include: -

- Whytes Concrete, Mackney (Kelly), Co. Galway;
- McKeons Sand and Gravel – Culliaghbeg, Co. Roscommon;
- Banagher Concrete, Banagher, Co. Offaly;
- Smyths Sand and Gravel, Whigsborough, Fivealley, Co. Offaly;
- Smyths Sand and Gravel, Lelagh, Co. Tipperary;
- Loughnane Concrete, Ballynaguilsha, Birr, Co. Offaly; and,
- Carroll Quarries, Bohernaghty, Portlaoise, Co. Laois.

The selection of construction material suppliers will be subject to a competitive tendering process prior to the commencement of development. Therefore, it is not currently possible to determine the precise material haul routes. The identification of potential haul routes has had regard to the existing road network, the suitability of roads for construction traffic and the potential effects on other road users and third-party access.

To minimise potential traffic-related effects, construction material deliveries will utilise

motorway, national and regional roads and avoid local roads, insofar as is practicable. Accordingly, while the indicative haul routes presented at **Annex 2.2** do not necessarily represent the most direct routes to the project site, they have been identified having regard to the suitability of the existing road network for construction traffic.

The potential traffic and transport effects associated with construction material deliveries are assessed in Chapter 14 of this EIAR.

2.4 CONCLUSION

The design of the project has been informed by the consideration of reasonable alternatives relevant to the nature, scale and location of the project. These have included the 'Do Nothing' alternative, alternative renewable electricity generation technologies, locations, turbine layouts and designs, grid connections and haul routes.

The consideration of alternatives has been informed by the previous assessment and consenting process for Cush Wind Farm Phase I, together with further environmental and technical assessments undertaken during the development of the project.

The preferred project comprises a 3 no. turbine extension to the permitted Cush Wind Farm Phase I development, together with associated infrastructure and off-site works. The principal reasons for selecting this option are described in the preceding sections, including the relationship with the permitted development, environmental constraints and technical feasibility considerations.

The likely significant environmental effects of the selected project, including cumulative effects with other relevant developments, are assessed in the subsequent chapters of this EIAR. A detailed description of the proposed project, including its design, infrastructure and construction arrangements, is provided in **Chapter 3** of this EIAR.