

# Alwen Forest Wind Farm and Grid Connection

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Conwy and Denbighshire, North Wales

**Design and Access Statement**  
September 2024

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## Glossary

Term	Definition
Environmental Statement	A document reporting the findings of the Environmental Impact Assessment (EIA) and produced in accordance with the EIA Regulations.
Environmental Impact Assessment	EIA is a means of carrying out, in a systematic way, an assessment of the likely significant environmental effects from a development.
The proposed development	When referring to both the wind farm AND the grid connection.
The proposed wind farm development	When only referring to Alwen Forest Wind Farm.
The proposed grid connection	When only referring to Alwen Forest grid connection.
Site boundary	The full extent of the land available for, and being investigated for, potential development. This can be split into 'wind farm study area' and 'grid connection study area'.

## List of Abbreviations

Abbreviations	Descriptions
AIL	Abnormal Indivisible Load
AMP	Access Management Plan
AOD	Above Ordnance Datum
AONB	Area of Outstanding Natural Beauty
BESS	Battery energy storage system
CAA	Civil Aviation Authority
CCBC	Conwy County Borough Council
CDM	Construction (Design and Management)
CEMP	Construction Environmental Management Plan
CMP	Construction Management Plan
CO <sub>2</sub>	Carbon Dioxide
CTMP	Construction Traffic Management Plan
DAS	Design and Access Statement
DCC	Denbighshire County Council
DCWW	Dŵr Cymru Welsh Water

Abbreviations	Descriptions
DNS	Development of National Significance
EIA	Environmental Impact Assessment
EIA Regulations	The Town and Country Planning (Environmental Impact Assessment) (Wales) Regulations 2017
ES	Environmental Statement
GHG	Greenhouse gas
GIS	Geographical Information System
GW	Gigawatt
GWh	Gigawatt hours
HEP	Habitat Enhancement Plan
HGV	Heavy Goods Vehicles
ICP	Independent Connection Provider
km	kilometre
kWh	Kilowatt hours
kV	kilovolt
LDP	Local Development Plan
LGV	Light Goods Vehicles
LISS	Low Impact Silviculture System
LPA	Local Planning Authority
LVIA	Landscape and Visual Impact Assessment
m	Metre
m/s	Metre per second
MW	Megawatt
MWh	megawatt hours
MWSTMP	Mid-Wales Strategic Traffic Management Plan
Natural Power	Natural Power Consultants Limited
NRW	Natural Resources Wales
NMWTRA	North and Mid Wales Trunk Road Agent
PAA	Pre-Assessed Areas
PEDW	Planning and Environment Decisions Wales
PINS	Planning Inspectorate
PPIP	Pollution Prevention and Incident Plan
PPW	Planning Policy Wales

<b>Abbreviations</b>	<b>Descriptions</b>
PRoW	Public Right of Way
SAB	Sustainable drainage Approving Body
SPEN	Scottish Power Energy Networks
SuDS	Sustainable Drainage Systems
TAN	Technical Advice Note
TMP	Traffic Management Plan
UKWAS	UK Woodland Assurance Scheme
WGWE	Welsh Government Woodland Estate

# 1. Introduction

Natural Power Consultants Limited (Natural Power) on behalf of RWE Renewables UK Limited (the Applicant) is submitting a Development of National Significance (DNS) seeking consent from the Welsh Ministers for the development of Alwen Forest Wind Farm and Grid Connection (the proposed development).

This statement has been prepared in accordance with statutory legislation for DNS to be submitted to the Planning and Environment Decisions Wales (PEDW) under Part 5 of the Planning (Wales) Act 2015, which amends the Town and Country Planning Act 1990 ('the Act') and the DNS (Procedure) (Wales) Order 2016 (as amended).

The Applicant is seeking to secure full planning permission for the proposed development by way of an application made pursuant to section 62D of the Town and Country Planning Act 1990 and subsequent regulations including the Developments of National Significance (Wales) Regulations 2016 (as amended).

Any proposal to construct or operate a power generation scheme with a capacity greater than 10 MW falls within the DNS system and requires Welsh Ministers' consent. The proposed development will have a combined installed capacity of between 33-60 MW.

The proposed development also exceeds the threshold for onshore wind developments set out in Schedule 2 of The Town and Country Planning (Environmental Impact Assessment (EIA)) (Wales) Regulations 2017 (as amended) (henceforth referred to as the EIA Regulations). As a consequence of exceeding the development criteria in Schedule 2 of the EIA Regulations, this project is defined as a Schedule 2 development which requires EIA.

The statutory requirement for a Design and Access Statement (DAS) to accompany an application for a DNS is prescribed in Article 14 of The Developments of National Significance (Procedure) (Wales) Order 2016 which requires the information to support a DNS application must include a DAS to accompany the Environmental Statement (ES).

The information to support the application for consent of the proposed development, including this DAS, will be submitted alongside an ES providing a detailed description of the environmental baseline and assessment of impacts upon it, committed mitigation and anticipated residual effects.

The DAS should be read in conjunction with the other documentation accompanying the applications for consent, in particular:

- the ES (Volumes 1-4); and
- the Planning Statement (PS).

In accordance with Developments of National Significance (Procedure) (Wales) Order 2016 which states this DAS is guided by the following criteria:-

*(a) explain the design principles and concepts that have been applied to the development;*

*(b) demonstrate the steps taken to appraise the context of the development and how the design of the development takes that context into account;*

*(c) explain the policy or approach adopted as to access, and how policies relating to access in the development plan have been taken into account; and*

*(d) explain how any specific issues which might affect access to the development have been addressed*

Furthermore, as set out in Planning Policy Wales 12, Paragraph 3.1 a DAS “communicates what development is proposed, demonstrates the design process that has been undertaken and explains how the objectives of good design and placemaking have been considered from the outset of the development process”.

## 1.1. The Applicant

The Applicant, RWE Renewables UK Limited develops, builds and operates projects to generate power and extract energy from renewable sources.

RWE is a leading supplier of renewables worldwide and has wind farms, solar power and battery storage facilities in many countries. Within Wales, RWE operates three onshore wind farms in Wales (one in North Wales), and their presence within North Wales also includes three (soon to be four) offshore wind farms and six hydroelectric generating stations. Decarbonisation and sustainability are key components of their corporate strategy<sup>1</sup>. RWE is the number one renewable energy generator in Wales, involved in greater than 1 GW of low carbon generation and has invested £3 billion in Wales in the last decade.

Contributing greater than £2 million each year to local communities, RWE was able to use its local knowledge and has built upon the relationships formed from the development of the operational Clocaenog Forest Wind Farm and their offices and staff in Wales to assist its consideration of feasibility and design of the proposed development.

RWE directly employs around 300 people in Wales in dedicated offices in Baglan, Dolgarrog, and the Port of Mostyn, as well as onsite. In addition, RWE’s UK wide turbine apprenticeship hub is based in North Wales and has so far trained up over 40 apprentices to support the future of the industry, partnering with Grŵp Llandrillo Menai to establish an award-winning turbine apprenticeship programme.

## 2. Overview of the Proposed Development

The proposed wind farm development and grid connection consists of up to nine wind turbines with tip heights up to 200 metres (m), and associated infrastructure. It is expected to have an operational period of 35 years. Figure 1.1 illustrates the location of the proposed development. Figures 1.2 and 1.3 in Volume 2 of the ES illustrate the proposed wind farm development and proposed grid connection route respectively and associated infrastructure. These figures are presented again in Appendix A of this DAS.

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<sup>1</sup> Available at: <https://www.rwe.com/en/> [Accessed 07/08/2024]

It is expected the turbines will have an installed capacity of up to 6.6 MW with a total installed site capacity of between 33-60 MW. The proposed development is expected to have an operational life of up to 35 years.

The proposed grid connection corridor has been defined connecting the proposed wind farm substation to the national distribution network. The proposed grid connection would connect to the Scottish Power Energy Networks (SPEN) collector substation at Saron in the north of the Clocaenog Forest. Whether the grid connection would be largely underground cable with a short section of overhead line, or all underground cable is still under consideration and will be dependent on engineering, environmental and economic factors.

The proposed development lies approximately four kilometre (km) north-west of Cerrigydrudion within the jurisdiction of Conwy County Borough Council (CCBC) and Denbighshire County Council (DCC). The majority of the wind farm study area is located within CCBC local authority area, with a small part of the proposed wind farm development (the 'Cerrig Caws' area located in the north of the wind farm site boundary) within the neighbouring DCC local authority area. The proposed grid connection corridor lies within DCC and CCBC local authority areas.

Existing access tracks will be utilised where possible but additional site tracks will be required to link the new turbines to the existing forestry track network.

The proposed development is located to the north of Alwen Reservoir, a large man-made water body flanked by rolling, forested hills, rising to moorland. The land where the proposed wind farm is located is undulating and largely forested, reaching a high point of approximately 450 m above Ordnance Datum (AOD) in the east of the wind farm site boundary. Similarly, the proposed grid connection travels through areas of forested land (with some open areas to the south of Llyn Brenig Reservoir) and largely follows existing tracks and minor roads through the Applicant's neighbouring Clocaenog Forest Wind Farm where the proposed development will connect to the national grid network. The proposed development also lies within the vicinity of the operational Brenig, Tir Mostyn and Clocaenog Forest wind farms and consented Pant y Maen and Derwydd Bach wind farms.

The proposed development comprises the following main elements:

- Up to nine turbines up to 200 m to tip;
- Turbine foundations;
- External electrical housing/cubicle;
- Permanent crane pads and laydown areas;
- Access tracks and entrance points (new and upgrades);
- On-site substation, control building and compound;
- Battery energy storage system (BESS) facility;
- Underground electricity cables between the turbines and the on-site substation;
- Borrow pits and associated infrastructure for the wind farm and grid connection construction;
- Drainage attenuation measures to be designed by the contractor post-consent and approved by the relevant Sustainable Drainage (SuDS) Approving Body (SAB) prior to construction, as necessary;

- Concrete batching plant;
- Grid connection between the wind farm and the Scottish Power Energy Networks (SPEN) collector substation in the north of Clocaenog Forest;
- A 132 kilovolt (kV) electrical compound adjacent to the existing SPEN substation in the north of Clocaenog Forest;
- Temporary construction and storage compounds for the wind farm and grid connection; and
- Tree felling and peat restoration area/habitat management areas.

The proposed wind farm development mainly lies within commercial forestry managed by Natural Resources Wales (NRW) on land owned by Dŵr Cymru Welsh Water (DCWW). The forest consists primarily of commercial conifers and all growth stages are present, from recently felled or replanted areas, to stands of intermediate age and mature trees, although coupes of intermediate age predominate. Forestry felling and replanting will be undertaken to facilitate erection of turbines, and creation of new access tracks and/or upgrades to existing access tracks. Figure 1.2 also shows existing forestry tracks that will be required for access by general construction traffic within the proposed wind farm site boundary and will not require any widening. Other existing forestry tracks (that do not require widening) may also be employed by general construction traffic during construction for access and this would be agreed with NRW land managers.

The application seeks a 100 m micro-siting allowance for the turbines and associated infrastructure and felling. This would allow minor changes to turbine locations at the construction stage and this allowance has been accounted for in the EIA process. Figure 1.3 also shows the micro-siting areas required for the proposed grid connection that have also been accounted for within the ES.

The forest areas containing both the proposed wind farm and grid connection are certified to UK Woodland Assurance Standards (UKWAS). There is a requirement for all works taking place on the estate to be compliant with UKWAS. Habitat management and enhancement will also be undertaken within the wind farm study area. Site restoration and landscaping will aim to integrate new infrastructure elements as sympathetically as possible. Habitat management and enhancement will also be undertaken within the proposed development site boundary.

In the western section of the proposed grid connection corridor, the connection to the proposed wind farm development lies within land owned by DCWW before passing into forestry managed by NRW on land owned by the Welsh Ministers. The SPEN Clocaenog substation, in the east of the proposed grid connection corridor, lies within Clocaenog Forest, part of the Welsh Government Woodland Estate (WGWE), managed by NRW. NRW is also a statutory consultee for the proposed development providing advice on environmental matters.

Full details of the infrastructure associated with the proposed development is provided in the ES, Volume 1, Chapter 4: Project Description and associated figures in Volume 2.

### 3. Environmental Statement

The ES has been prepared in accordance with the EIA Regulations. The ES reports the findings made in the EIA of the proposed development. The scope of the EIA was the subject of two formal scoping directions (wind farm and grid connection) from the Planning Inspectorate Wales (PINS (now

PEDW)), which included input from CCBC and DCC, and from other consultees including NRW and DCWW. Further consultations, and responses to consultation comments, are detailed in each relevant topic chapter of the ES.

During the EIA process, site visits, surveys and desktop assessments, in line with relevant guidance, were carried out to ascertain the potential impacts, and mitigation measures to be made. A review of planning and other relevant policies was also made to inform the assessment process and ensure the proposed development adequately considered local and national policy. The application and ES is accompanied by a standalone Planning Statement which assesses the proposed development against the relevant policies.

## 4. Design and Access

The Applicant has provided a detailed written statement about the design principles and concepts that were applied to the proposed development before submission in Chapter 3: Site Selection and Design Evolution of the ES, as well as within individual environmental topic chapters. Access issues have also been addressed in the ES, in particular:

- Chapter 3: Site Selection and Design Evolution of the ES details the design process and the rationale for location and the design of the proposed development;
- Chapter 4: Project Description describes the arrangements for access in and around the proposed development site during construction and operational phases;
- Chapter 10: Traffic and Transport deals with access primarily of larger components to the proposed development site during the construction phase (including Appendix 10 and associated figures); and
- Chapter 14: Aviation and Existing Infrastructure describes the Public Rights of Way (PRoW) across the site and access in relation to the proposed development.

It is therefore considered that this DAS, in combination with the ES, fulfils the requirement for a statement on design and access.

## 5. Planning Policy and Guidance

The design of the proposed development has been influenced by a range of planning policy considerations, as well as good practice guidance. A separate Planning Statement has been prepared, which accompanies the DNS application for the proposed development. In this section of the DAS, relevant national and local planning policy and guidance is summarised.

The need to address climate change is embedded in law. The Climate Change Act 2008 (as amended) requires the UK to achieve a 100% reduction in greenhouse gas (GHG) emissions, otherwise known as net zero, in 2050. Welsh Ministers are bound to deliver net zero in 2050 under the Environment (Wales) Act 2016, which also requires Welsh Ministers to produce a plan to show how Wales will meet the reductions in GHG required for each five-year period to 2050.

The latest Energy Generation in Wales Report<sup>2</sup> reports on energy generation in Wales in 2022, including from renewables. The Report notes that whilst Wales generates twice as much electricity as it uses, only 27% is from renewables (which is down from 33% in 2020 due to increases in non-renewable energy generation. Whilst renewable energy generation has tripled since 2008, and doubled since 2012, it has only increased by 11% in the last five years. While renewables-based electrical capacity is increasing year-on-year, the current rate of growth will not be sufficient to meet demand, especially future electricity needs and targets and the following policies are relevant to this demand and meeting these targets.

On 14th July 2023, the Minister for Climate Change, Julie James<sup>3</sup>, published the summary of responses to the consultation and adopted scaped up targets for Wales to meet 1.5 GW of renewable energy capacity to be locally owned by 2035, and to meet the equivalent of 100% of our annual electricity consumption from renewable sources by 2035, and to continue to keep pace with consumption thereafter.

## 5.1. National Planning Policy

### 5.1.1. Future Wales: The National Plan 2040

As set out in legislation, applications for Developments of National Significance must be determined in accordance with Future Wales, which is the national development plan for Wales.

Outcome 11 of Future Wales<sup>4</sup> is to create ‘...A Wales where people live...in places which are decarbonised and climate resilient’. It expands on this to say, ‘The challenges of the climate emergency demand urgent action on carbon emissions and the planning system must help Wales lead the way in promoting and delivering a competitive, sustainable decarbonised society. Decarbonisation commitments and renewable energy targets will be treated as opportunities to build a more resilient and equitable low-carbon economy, develop clean and efficient transport infrastructure, improve public health and generate skilled jobs in new sectors.’

The key policies contained in Future Wales relevant to the proposed development are policies 9, 17 and 18. Pre-Assessed Areas for Wind Energy are shown in Figure 1.

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<sup>2</sup> Available at: <https://www.gov.wales/sites/default/files/publications/2023-11/energy-generation-in-wales-2022.pdf> [Accessed 07/08/2024]

<sup>3</sup> Available at: <https://www.gov.wales/written-statement-publication-summary-responses-consultation-wales-renewable-energy-targets> [Accessed 07/08/2024]

<sup>4</sup> Available at: <https://gov.wales/future-wales-national-plan-2040> [Accessed 07/08/2024]

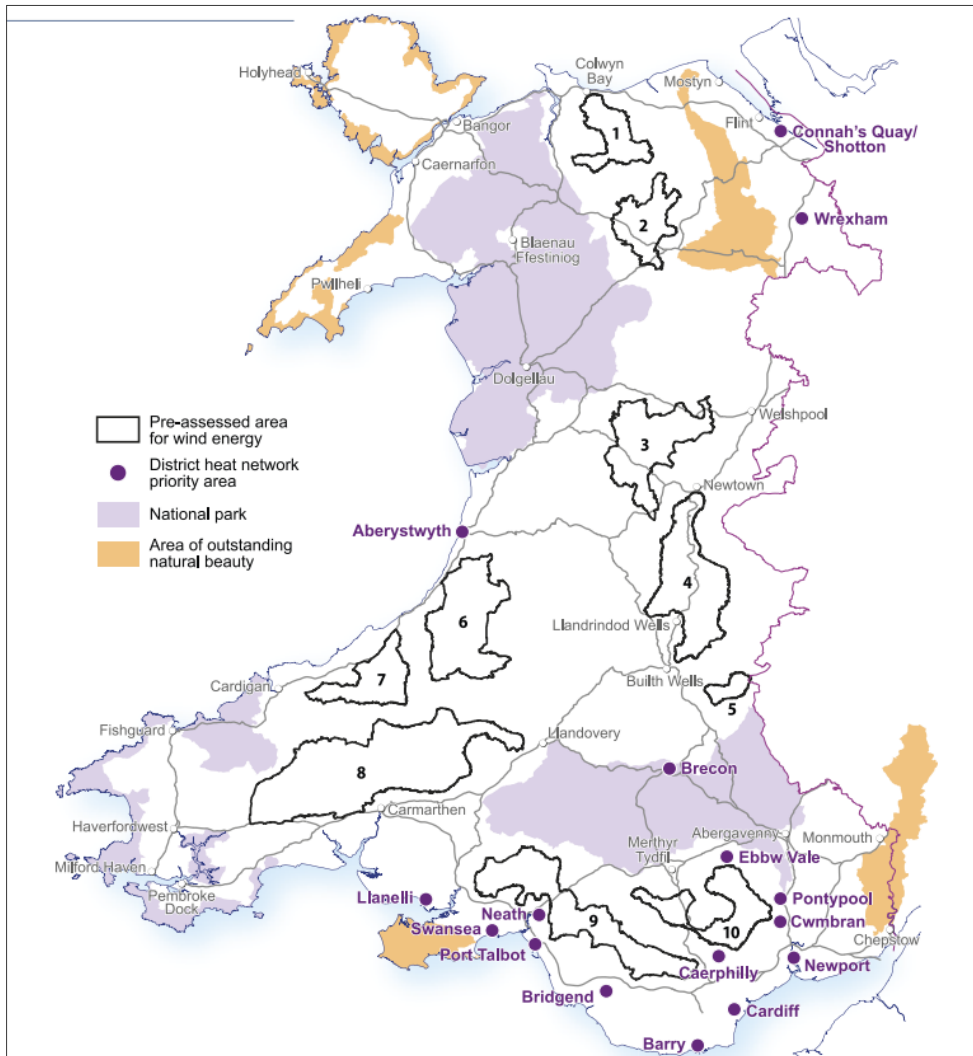


Figure 1: Pre-assessed areas for wind energy (taken from page 94, *Future Wales The National Plan 2040*)

The policies are set out as follows:

Policy 9: Resilient Ecological Networks and Green Infrastructure

*“To ensure the enhancement of biodiversity, the resilience of ecosystems and the provision of green infrastructure, the Welsh Government will work with key partners to:*

- *identify areas which should be safeguarded and created as ecological networks for their importance for adaptation to climate change, for habitat protection, restoration or creation, to protect species, or which provide key ecosystems services, to ensure they are not unduly compromised by future development; and*
- *identify opportunities where existing and potential green infrastructure could be maximised as part of placemaking, requiring the use of nature-based solutions as a key mechanism for securing sustainable growth, ecological connectivity, social equality and well-being.*

*Planning authorities should include these areas and/or opportunities in their development plan strategies and policies in order to promote and safeguard the functions and opportunities they provide. In all cases, action towards securing the maintenance and enhancement of biodiversity (to provide a net benefit), the resilience of ecosystems and green infrastructure assets must be*

*demonstrated as part of development proposals through innovative, nature-based approaches to site planning and the design of the built environment.”*

#### Policy 17: Renewable and Low Carbon Energy and Associated Infrastructure

*“The Welsh Government strongly supports the principle of developing renewable and low carbon energy from all technologies and at all scales to meet our future energy needs.*

*In determining planning applications for renewable and low carbon energy development, decision makers must give significant weight to the need to meet Wales’ international commitments and our target to generate 70% of consumed electricity by renewable means by 2030 in order to combat the climate emergency.*

*In Pre-Assessed Areas for Wind Energy the Welsh Government has already modelled the likely impact on the landscape and has found them to be capable of accommodating development in an acceptable way. There is a presumption in favour of large-scale wind energy development (including repowering) in these areas, subject to the criteria in policy 18.*

*Applications for large scale wind and solar will not be permitted in National Parks and Areas of Outstanding Natural Beauty and all proposals should demonstrate that they will not have an unacceptable adverse impact on the environment.*

*Proposals should describe the net benefits the scheme will bring in terms of social, economic, environmental and cultural improvements to local communities.*

*New strategic grid infrastructure for the transmission and distribution of energy should be designed to minimise visual impact on nearby communities. The Welsh Government will work with stakeholders, including National Grid and Distribution Network Operators, to transition to a multi vector grid network and reduce the barriers to the implementation of new grid infrastructure.”*

#### Policy 18: Renewable and Low Carbon Energy Developments of National Significance

*“Proposals for renewable and low carbon energy projects (including repowering) qualifying as Developments of National Significance will be permitted subject to policy 17 and the following criteria:*

- 1. outside of the Pre-Assessed Areas for wind developments and everywhere for all other technologies, the proposal does not have an unacceptable adverse impact on the surrounding landscape (particularly on the setting of National Parks and Areas of Outstanding Natural Beauty);*
- 2. there are no unacceptable adverse visual impacts on nearby communities and individual dwellings;*
- 3. there are no adverse effects on the integrity of Internationally designated sites (including National Site Network sites and Ramsar sites) and the features for which they have been designated (unless there are no alternative solutions, Imperative Reasons of Overriding Public Interest (IROPI) and appropriate compensatory measures have been secured);*
- 4. there are no unacceptable adverse impacts on national statutory designated sites for nature conservation (and the features for which they have been designated), protected habitats and species;*
- 5. the proposal includes biodiversity enhancement measures to provide a net benefit for biodiversity;*

6. *there are no unacceptable adverse impacts on statutorily protected built heritage assets;*
7. *there are no unacceptable adverse impacts by way of shadow flicker, noise, reflected light, air quality or electromagnetic disturbance;*
8. *there are no unacceptable impacts on the operations of defence facilities and operations (including aviation and radar) or the Mid Wales Low Flying Tactical Training Area (TTA-7T);*
9. *there are no unacceptable adverse impacts on the transport network through the transportation of components or source fuels during its construction and/or ongoing operation;*
10. *the proposal includes consideration of the materials needed or generated by the development to ensure the sustainable use and management of resources;*
11. *there are acceptable provisions relating to the decommissioning of the development at the end of its lifetime, including the removal of infrastructure and effective restoration.*

*The cumulative impacts of existing and consented renewable energy schemes should also be considered.”*

#### 5.1.2. Planning Policy Wales (PPW) 12<sup>th</sup> Edition, Welsh Government (February 2024)

PPW 12<sup>th</sup> Edition<sup>5</sup> states that meeting the objectives of good design should be the aim of those involved in the development process and applied to all development proposals. These objectives can be categorised into five key aspects of good design, shown as follows:

- Access;
- Character;
- Community Safety;
- Environmental Sustainability; and
- Movement.

These key aspects and their associated explanations are presented in Figure 2 of this statement.

PPW states in paragraph 3.17 that *‘in preparing design and access statements, applicants should take an integrated and inclusive approach to sustainable design, proportionate to the scale and type of development proposal. They should be ‘living’ documents dealing with all relevant aspects of design throughout the process and the life of the development.’*

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<sup>5</sup> Available at: <https://www.gov.wales/sites/default/files/publications/2024-07/planning-policy-wales-edition-12.pdf>  
[Accessed 07/08/2024]



Figure 2: Good design

PPW 12 also introduces the requirement to submit a Green Infrastructure Statements (GIS) with planning applications. A GIS describes the natural and semi-natural features in and around a proposed development, and how the design of the proposed development has been influenced by these constraints, including through mitigation, compensation or enhancement.

PPW 12 formalises the concept of using a step-wise approach to development in order to secure a net benefit for biodiversity. The step-wise approach consists of:

- Avoiding damage to biodiversity through site selection and design;
- Minimising impacts on biodiversity and ecosystems by maintaining the largest possible area of existing habitats; ensuring retained habitats provide connectivity for key species; using appropriate buffers to protect existing features from impacts; and maintaining existing features through use of monitoring strategies;
- Mitigating impacts that are unavoidable through the first two steps; and
- Compensating for impacts that cannot be avoided, minimised or mitigated against, usually through habitat creation or restoration.

The step-wise approach is summarised in Figure 3.

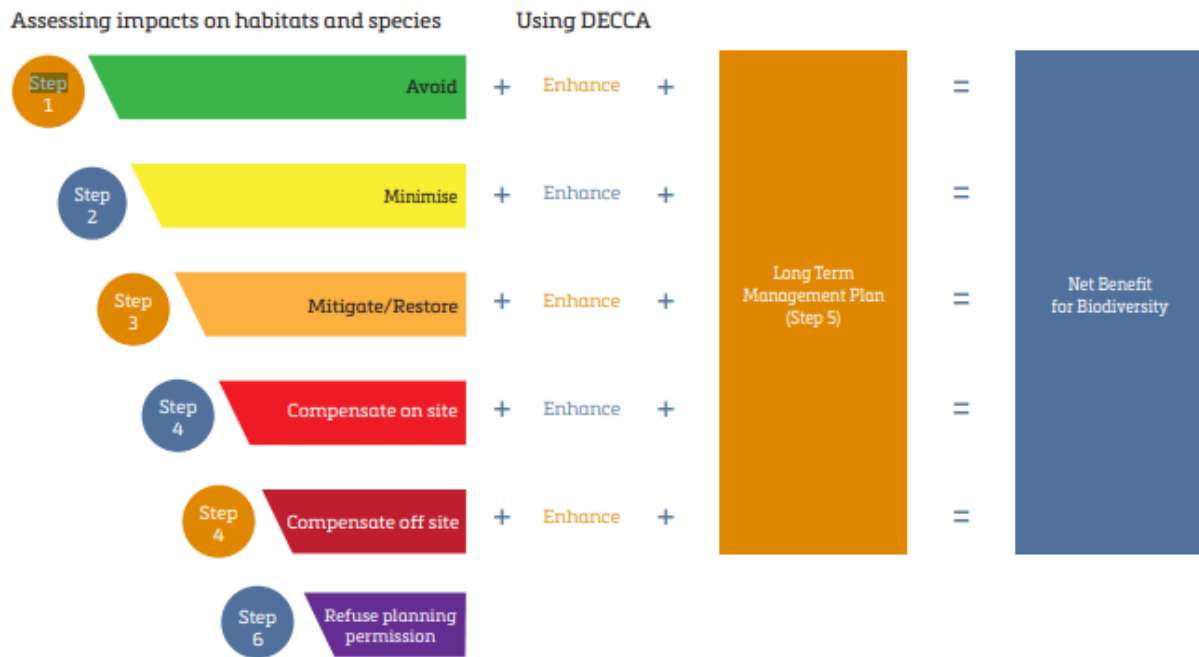


Figure 3: Summary of the step-wise approach

### 5.1.3. Technical Advice Note (TAN) 12: Design – Welsh Assembly Government (2009)

TAN 12: Design<sup>6</sup> is the principal source of design guidance for Wales and provides a broad framework with which to steer design standards and principles at the local level. It fully advocates those aspects of good design identified in PPW and presents a series of design guidelines to deliver these elements.

Appendix 1 of TAN 12 includes further detail regarding the content and form of a DAS and has informed the structure of this document. In relation to design, TAN 12 predates PPW 11, but reiterates that a DAS must explain the following:

- Access;
- Character;
- Community Safety;
- Environmental Sustainability; and
- Movement to, from and within the development.

One aspect highlighted as being of particular importance within the guidance are the contributory elements that define the character of the proposal, as set out in PPW, namely the principles of ‘amount’, ‘layout’, ‘scale’, ‘appearance’ and ‘landscaping’ and how these have been addressed within the development proposal.

<sup>6</sup> Available at: <https://gov.wales/technical-advice-note-tan-12-design> [Accessed 07/08/2024]

## 5.2. Local Planning Policy on Design

Future Wales makes it clear that applications for DNS must be determined in accordance with Future Wales which now forms part of the Development Plan. Local Development Plans (LDPs) remain relevant and there are two LDPs which cover the proposed development. The accompanying Planning Statement provides further details in regard to testing the proposed development against policy.

### 5.2.1. Conwy County Borough Council Local Development Plan 2007-2022 (adopted 2013)

The CCBC LDP<sup>7</sup> was adopted in October 2013 and sets out the vision for CCBC development plans over 2007 – 2022. CCBC is in the progress of updating their LDP and are now at Stage 5 – Preferred Strategy and carried out consultations between July and September 2019. As the replacement LDP has not been adopted yet, the LDP 2007 – 2022 has been referred to in this section. The relevant LDP policies relevant to the proposed development include:

- DP/1 Sustainable development principles;
- DP/4 Development Criteria;
- DP/6 National planning policy and guidance;
- NTE/1 The Natural Environment;
- NTE/3 Biodiversity;
- NTE/4 The Landscape and Protecting Special Landscape Areas;
- NTE/6 Energy Efficiency and Renewable Technologies in New Development;
- NTE/7 Onshore wind turbine development;
- MWS/1 Minerals and waste; and
- MWS/3 Safeguarding hard rock and sand and gravel resources.

### 5.2.2. Denbighshire County Council Local Development Plan 2006-2021 (adopted 2013)

The DCC LDP<sup>8</sup> was adopted in June 2013 and sets out the vision for DCC development plans over 2006 – 2021. DCC is in the progress of updating their LDP with a revised Delivery Agreement agreed by Welsh Government on 12 December 2022. As the replacement LDP has not been adopted yet, the LDP 2006 – 2021 has been referred to in this section.

The relevant LDP policies relevant to the proposed development include:

- RD1 Sustainable development and good standard design;
- PSE15 Safeguarding minerals;

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<sup>7</sup> Conwy County Borough Council (2013) *Local Development Plan* [Online] Available at: <https://www.conwy.gov.uk/en/Resident/Planning-Building-Control-and-Conservation/Strategic-Planning-Policy/Adopted-Local-Development-Plan-LDP/Assets-written-proposals-maps/Conwy-Local-Development-Plan-2007-2022.pdf> [Accessed 07/08/2024]

<sup>8</sup> Denbighshire County Council (2013) *Local Development Plan* [Online] Available at: <https://www.denbighshire.gov.uk/en/documents/planning-and-building-regulations/ldp/adopted-ldp/adopted-local-development-plan-2006-2021.pdf> [Accessed 07/08/2024]

- VOE1 Key areas of importance;
- VOE5 Conservation of natural resources;
- VOE9 On-shore wind energy; and
- VOE10 Renewable energy technologies.

### 5.2.3. Other Design Guidance

Other guidance that has been given regard in the preparation of this DNS application include;

- **Design and Access Statements in Wales: Why, What and How** Design Commission for Wales (April 2017)<sup>9</sup>

The guidance highlights that 'early consideration of design issues is essential and central to good development. It is a formal record illustrating the design process, allowing a co-ordinated and effective consultation process to take place.'

- **Designing for Renewable Energy in Wales**, Design Commission for Wales (November 2023)<sup>10</sup>

This is a non-statutory document for large-scale wind and solar farms, and it updates and expands upon 'Designing Wind Farms in Wales (Design Commission for Wales, 2014) guidance. The guidance sets out the key design objectives and considerations for the sensitive development of large-scale onshore wind and solar farms as well as ancillary development in Wales.

- **Siting and Designing Wind Farms in the Landscape** – Version 3a, NatureScot (Updated 2017)<sup>11</sup>

NatureScot has produced guidance entitled 'Siting and Designing Wind Farms in the Landscape', Version 3a, August 2017. Good design principles for wind farms are becoming established following approximately two decades of wind farm development in Scotland and with around 300 wind farms constructed and operating. NatureScot believes that good siting and design of wind farms is important for all parties involved, helping to produce development which is appropriate to a landscape whilst delivering the renewable energy targets.

## 6. Design Statement

This section considers the steps that were undertaken during the process of site selection and design. This includes a summary of the iterative design process that has been undertaken to arrive at the final design contained within this application. A full description of the approach to the selection of the site and to deciding on the specific design is set out in Chapter 3: Site Selection and Design Evolution of the ES.

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<sup>9</sup> Available at: <https://www.gov.wales/sites/default/files/publications/2018-09/design-and-access-statements.pdf> [Accessed 07/08/2024]

<sup>10</sup> Available at: <https://www.gov.wales/sites/default/files/publications/2023-12/designing-for-renewable-energy-in-wales.pdf> [Accessed 07/08/2024]

<sup>11</sup> Siting and Designing Wind Farms in the Landscape – Version 3a, NatureScot (Updated 2017). Available at: <https://www.nature.scot/sites/default/files/2017-11/Siting%20and%20designing%20windfarms%20in%20the%20landscape%20-%20version%203a.pdf> [Accessed 07/08/2024]

## 6.1. Site Selection

The Applicant has a well-established process for selecting sites and identifying land for wind farm development, especially within Wales. The overall approach to wind farm site selection is to identify areas of land where the siting of a wind farm would result in minimal environmental effects, be free from overriding technical constraints, and be economically viable. This initial site identification exercise involved:

- A review of current and emerging planning policy (at the national and local level).
- Geographical Information System (GIS) constraints analysis, including analysis of wind speed data; and
- A review of suitable site access points and related transportation issues.

After undertaking a site selection process, RWE identified the Alwen Forest site as a favourable site for wind farm development, the Applicant sought to realise the opportunity to develop the site when NRW sought to then bring it to market through a tender process, on behalf of the Welsh Ministers.

As highlighted in Section 5.1.1 of this DAS, Future Wales sets out a series of Pre-Assessed Areas (PAA) for wind energy, within which, the principle of developing large scale wind farms (i.e. turbines of up to 250 m to tip height) is supported subject to assessment of the proposals against the policy direction in Future Wales Policy 18. Indeed, the case for wind energy development across the whole of Wales, even outside the PAAs, is also much stronger under Future Wales than previous superseded policies such as TAN 8.

Future Wales stipulates that in areas outside National Parks and Areas of Outstanding Natural Beauty (AONB), *“Proposals for renewable and low carbon energy projects (including repowering) qualifying as Developments of National Significance will be permitted”*, subject to having no unacceptable landscape impacts (if outside the PAAs) and no unacceptable impacts on the various criteria for protecting visual amenity, ecological sites, heritage assets, surrounding amenity (noise, shadow flicker, etc), defence interests or transport and that materials for construction are sustainably sourced, suitable decommissioning and taking account of cumulative effects. Given the proposed development’s location within and immediately adjacent to PAA No.2, the site was considered to be generally policy compliant and therefore a good candidate for further assessment as having potential for wind farm development.

In 2017, NRW invited tender proposals for developing the site for wind energy on behalf of the Welsh Ministers, receiving numerous bids including that of Innogy (now known as RWE Renewables UK Ltd.) for this application. As part of the tender process, bidders were required to undertake and present sufficient technical analysis across a number of topics (including technical layout, grid proposals, access to site, impact on forestry, and impact on ecology, peat and soils) to be scored highly enough to pass a stage-gate process and, in combination with scores in other aspects of their proposals, to place first or high enough amongst bids for final consideration.

Following the tender process (Section 3.5 of Chapter 3 provides further details on this) and successful award of the site to the Applicant, the evolution of the site design and layout continued through the EIA and a series of design workshops.

## 6.2. Design Strategy

The following key considerations have been taken into account during the design process of the proposed development:

- A commercially viable development;
- Relationship to the surrounding landscape;
- Relationship with existing and consented developments; and
- Technical and environmental constraints.

A key aim of the design process has been to limit the overall footprint of the development, whilst maximising the positive renewable energy generation and other benefits and minimising the environmental impacts wherever possible.

A further aim of the site design has been to avoid areas of peat as far as is possible. It is recognised that utilisation of existing tracks and existing borrow pits and hardstanding wherever possible will minimise disturbance to peat and in other areas avoid peat altogether. It was determined early on that peat probing surveys would be required in order to determine the areas of peat across the site and to optimise the layout and as such, more than 2,500 peat probes have been collected to inform the design. For further detail on how peat has been considered throughout the design evolution, see Appendix 9.4 Peat Considerations in Design Evolution in Volume 3 of the ES.

Another key design aim was to achieve a simple and coherent layout that responds well to the landform and integrates in a well-mannered fashion with the pattern of existing wind farms on the horizon to the east. The layout has been influenced by landscape and visual receptors within 30 km of the site, as this is the distance within which significant effects are most likely to occur. The design ethos also considered the effects on Eryri National Park and the Clwydian Range and Dee Valley AONB due to the sensitivities associated with these designated areas. Within and close to the site, the assessment considered effects on recreational users of the trails for walkers and cyclists around Alwen Reservoir and Llyn Brenig as well as visual effects on individual and small groups of properties close to the site boundary and closest larger communities further afield. Early design iterations also wanted to align the design of the layout with the boundary of the Pre-Assessed Area (PAA) as described in Chapter 3. However, as further survey information and feedback was received, and further assessment was undertaken, it was concluded that moving some of the turbines into an area that lay outside of the PAA boundary would in fact result in reduced environmental impacts (to peat, water quality, birds for example), including reduced landscape and visual effects with more compact views and minimising the effects on residential visual amenity.

Design iterations considered lower-lying views from Eryri National Park where the turbines will be seen on the skyline forming a relatively evenly spaced group. In more elevated and distant views including the summit of Yr Wyddfa the turbines will be backclothed and seen as part of a spread of operational and under construction wind farms across the horizon, including Tir Mostyn, Brenig, Clocaenog Forest, and Wern Ddu. From Moel Famau in the AONB, the wind turbines will be seen in the context of Clocaenog and will not be seen in front of the distinctive skyline of the mountains of the National Park including Yr Wyddfa.

The proposed development layout aims to make best use of the site characteristics for the scale of the project proposed, including use of slopes and improving existing forestry tracks, rather than

building new tracks. The site boundary has an extensive system of forestry tracks that been used to assist with the layout design. The forestry tracks tend to run along the contours and aims to optimise the improvement of existing tracks rather than building new tracks.

The elements considered during the design process included (but were not limited to):

- Local and national planning policies;
- Sufficient wind resource;
- Proximity to grid supply point;
- Traffic and transport and access;
- Existing land use;
- Proximity of dwellings (to consider noise, shadow flicker, visual etc.);
- Landscape and visual;
- Ecology and ornithology;
- Hydrology, hydrogeology and soils (including peat);
- Cultural heritage;
- Forestry;
- Existing infrastructure; and
- Aviation.

Key constraints are illustrated against the final turbine layout shown on Figure 3.1 of the ES which is presented again in Appendix A of this document. Other more topic specific constraints are discussed in the individual topic chapters.

### 6.3. Design Evolution

The layout has been informed by surveys and site visits and has evolved under guidance and considerations from DCWW, SPEN and NRW, acting as landowner, in respect of forestry management. Consideration has also been given to issues raised by consultees as well as the community at, and following, public exhibition events. A number of different wind farm layouts were devised and, following extensive investigation and consultation, an optimum layout was chosen through numerous design iterations.

The different design layouts for the proposed wind farm layout are illustrated in Figure 3.2 in Volume 2 of the ES which is also presented in Appendix A of this document. Please note that in Figure 3.2, turbine numbers for the first three layouts (old turbine numbers) are different to Layout 4 (which shows the turbine numbers as they were presented at Pre-Application Consultation (PAC) and in the final layout).

The proposed grid layout is also presented in Figure 3.1 Site Constraints (shown in Appendix A) and has been designed taking into consideration the following constraints:

- technical (gradients/slopes and river/water crossings);
- hydrology, peat and private water supplies;
- forest operations, forestry and woodland;

- adjacent wind farms and existing infrastructure (e.g. utilities and PRoW);
- Tir Mostyn Habitat Enhancement Plan (HEP) area which is currently under a Section 106 agreement;
- ecology;
- landscape and visual; and
- cultural heritage assets.

Prior to the scoping exercise, design workshops attended by the environmental consultant teams in 2019 were held to consider the environmental constraints of the seven possible routes for the grid connection. This led to the elimination of five of the routes and the emergence of the two favoured indicative grid connection corridors, Corridor 1 and Corridor 2, which were presented in the scoping report submitted to PINS in November 2019 (see Appendix 1.3 in Volume 3 of the ES).

Since 2019, RWE appointed Power Systems UK as RWE's Independent Connection Provider (ICP) to formally liaise with SPEN for the design stage of the grid route. Further design workshops (including where NRW and DCWW attended) were undertaken and extensive consultation with NRW, DCWW and SPEN has been ongoing continuously through 2023 resulting in a route that largely follows the Corridor 1 option presented at scoping.

It is expected that the grid route will require 2 x 33 kV cables approximately 10 km in length from the on-site substation to the SPEN collector substation located in the north of the Clocaenog Forest Wind Farm. The grid connection design could also accommodate a 132 kV connection should this be required. A 132 kV connection would require the additional small compound however, adjacent to the SPEN collector substation and a 132 kV transformer at the on-site substation.

As with the proposed wind farm development, the proposed grid connection has also been informed by on-site survey site visits, which gathered onsite data on peat, ecology, ornithology, archaeology and hydrology. The final proposed route is designed employing data collected from on-site surveys, through avoiding constraints (e.g., avoiding a range of habitats relating to dormouse, red squirrel or peat) as well as meeting consultee requirements. Civil engineering design inputs were also employed to ensure that the works to install the cables would be carried out in a sensitive manner near watercourses. Another consideration on the route and engineering works involved in the installation of the cable required SPEN criteria would be met as it is intended that this company will adopt the grid connection once it is built. Repeated consultations with NRW and DCWW have identified amendments to design iterations in order to reduce impacts on biodiversity and forestry operations.

Ongoing consultation has resulted in two options for the grid connection to pass through the Isgaerwen plantation (Route A and Route B as shown on Figure 1.3) in order to investigate the potential to reduce impacts on NRW forestry operations in this location. **Only one of these options will be built out.**

More detail on the site selection of the proposed grid connection is presented in Section 3.3 of Chapter 3: Site Selection and Design Evolution of the ES.

Section 3.5 of Chapter 3 provides more details on each of the layouts described below.

### 6.3.1. Layout 1: Tender and Scoping (2017-2018)

Figure 3.2 illustrates the original wind farm layout submitted in 2017 as part of the tender to NRW which was also submitted for scoping to PINS in August 2018 (see Appendix 1.1 in Volume 3 of the ES). The construction is widespread across the site which includes the section south of the Alwen Reservoir called South Alwen and excludes the Cerrig Caws land in the north.

As part of preparing the tender proposals, the Applicant undertook reviews of energy and planning policy; various environmental and technical aspects (including landscape and visual; cultural heritage; noise; geology, peat and soils, hydrogeology, hydrology and flood risk; shadow flicker; wind resource; aviation and radar; telecommunications; coal mining; and construction) in developing a proposed layout.

Work for the tender and during the preparation of the scoping report also entailed working with a number of expert consultants, carrying out site visits and surveys, the accumulation of design constraints, and the production of visualisations, which following an iterative work-shop process resulted in a proposed scheme of nine turbines, each of up to 200 m to blade tip with a grid connection between South Alwen running across Alwen Reservoir to the turbines in the northern site boundary.

A key aim of the site design at this early stage was to minimise impacts on water quality (due to proximity to the Alwen and Llyn Brenig reservoirs) and also to avoid areas of > 0.35 m peat depth as far as is possible. This threshold on peat was based on the Applicant's experience at the time from consultations whilst developing Clocaenog Forest Wind Farm. It was also recognised that utilisation of existing tracks wherever possible will minimise impacts to water quality and disturbance to peat and in other areas avoid peat altogether.

### 6.3.2. Layout 2: Post - Scoping Layout (2020)

Figure 3.2 illustrates the layout produced after the scoping exercise was undertaken. Following further feedback from landowners and members of the public during public exhibitions, this layout investigated the potential opportunity of revising the South Alwen turbine locations and tracks as well possibly moving turbines into North Alwen.

A scoping direction was provided by PINS in September 2018 (see Appendix 1.2 in Volume 3 of the ES) and as a result of the scoping responses received, as well as public exhibitions in January 2020, ongoing consultations with DCWW landowners and NRW land managers, further revisions to the layout were considered.

Design workshops were held in 2020 between the Applicant and specialist consultants including; planning, ecology and ornithology, hydrology, civils, traffic and transport, cultural heritage, landscape and visual, forestry, noise, and aviation. The aims of the workshops were to review the layout following receipt of the scoping direction, consultee responses and the results of further desk study and site survey data.

The design drivers that fed into this layout included forestry, water quality, Phase 1 peat data as well as landscape and visual impacts.

Given the proposed wind farm development's proximity to the Alwen and Llyn Brenig reservoirs, water quality constraints were considered early on in the design process and through the subsequent

various design iterations. Detailed considerations were given to the hydrology of the site, including an assessment of each turbine's proximity to water bodies and water courses, in particular the Alwen catchment. Other elements of the proposed development assessed from a hydrological viewpoint include track locations, lengths and gradients as well as impacts to peat resources on site.

Throughout the design process, water quality impacts were key for the Applicant who, upon the request of DCWW, and in consultation with DCWW and NRW as land manager, prepared a Pollution Prevention and Incident Plan (PPIP) which has now been agreed with stakeholders. In recognising the importance of the Alwen Reservoir as a public water supply, and Llyn Brenig as a river-regulating reservoir for the River Dee, the PIPP gives due consideration to the sensitivity of the reservoirs, the potential water discolouration due to peat run-off and impacts from peat disturbance and identifies and ensures that appropriate measures and systems are put in place to protect each catchment.

### 6.3.3. Layout 3: North Alwen Layout (2021-2022)

Further design workshops were held in 2021 and 2022 between the Applicant and specialist consultants. These workshops occurred following further landowner and land manager consultation. Additionally, further desk study and site survey data became available. The consultation and additional survey information instigated further layout iterations. The December 2021 design workshop was also attended by DCWW and NRW land management representatives to provide further input in regard to water quality and forestry constraints. Additional consultation had also been undertaken with NRW as a statutory consultee in late 2020 where the initial peat survey results were shared and NRW comments were provided which have subsequently been addressed and resolved in subsequent layouts.

The outcomes of these design workshops and consultations resulted in Layout 3 shown in Figure 3.2.

As a result of ongoing DCWW concerns relating to the infrastructure in South Alwen and to the high hydrological connectivity with Alwen Reservoir, as well as NRW concerns in regard to the location of infrastructure on deep peat in this area, the Applicant further investigated the potential for locating turbines in the area of Cerrig Caws in the north of North Alwen. This area had previously been dismissed from the early layouts due primarily to the forestry Low Impact Silvicultural System (LISS) management. This area is also further constrained due to the requirement for turbines to meet tip height buffers for the public road (B4501). Further site visits and surveys were commissioned, and additional consultation was undertaken in order to ascertain the potential for replacing South Alwen turbines with turbines located in Cerrig Caws. Design reviews for South Alwen were continuing at the same time as reviews for Cerrig Caws turbines and therefore the turbines located within the Cerrig Caws region were numbered Turbines 10,11 and 12.

As a result of these further investigation and consultations, it was concluded that Cerrig Caws was indeed viable and the Applicant decided to replace the South Alwen turbines with the turbines located in Cerrig Caws. Aside from the consultation and site investigations which resulted in the decision to focus on the Cerrig Caws locale, severe storms during winter 2021/2022 resulted in forestry wind blow in the Cerrig Caws area which removed some of the LISS constraint reduced the impact of the turbine locations on the forestry management in this area (especially Turbine 10a). This resulted in

the proposed development maintaining nine turbines, however all turbines were now located north of the Alwen Reservoir.

Although the location of turbines in Cerrig Caws would increase the overall length of new tracks due to the limited use of existing tracks in Cerrig Caws compared to what was proposed in South Alwen, overall, consolidating the proposed wind farm development within North Alwen would result in:

- Fewer turbines within the Alwen catchment with connectivity to the Alwen reservoir;
- Less infrastructure on steep ground;
- Significantly reduced cable lengths;
- Reduced length of tracks to be improved;
- Reduced impacts on peat;
- Avoidance of impacts on moorland breeding raptors and waders;
- Reduce impacts on black grouse (a traditional lek was identified near Turbine 7 in South Alwen);
- Reduced impacts on forestry; and
- Improved access for forest management and the Public Right of Way (PRoW) that cuts across Cerrig Caws by connecting Cerrig Caws to the main Alwen Forest track systems to the south.

Although moving the turbines from South Alwen meant that a greater number of turbines would lie outside of the PAA boundary, this move was considered to provide benefits relating to the environmental impacts (as listed above), as well as producing an improvement in regard to landscape and visual effects. Placing the turbines in Cerrig Caws removed the unavoidable gap within the layout of having turbines on both sides of the Alwen reservoir and also reduced the 'surrounding effect' that would have been particularly noticeable on some of the popular lakeside walks. Moving the turbines to North Alwen also removed the additional landscape and visual effects that would have been experienced to the south of the site with the South Alwen turbines and moved the turbines further away from residential properties that minimised residential visual amenity effects. Section 3.5 of Chapter 3 provides more details.

#### 6.3.4. Layout 4: PAC Layout (2023)

During late 2022 and 2023, further design iterations were driven by the results provided by multiple rounds of Phase 2 detailed peat surveys, further civil engineering work and additional consultations with NRW. In parallel, DCCW were content that the PPIP, together with the removal of turbines from South Alwen, addressed their concerns.

The PAC layout (shown as Layout 4 on Figure 3.2) is similar to the final layout. Figure 3.1 Site Constraints (in Appendix A) illustrates the site constraints for the proposed development which were also relevant for the PAC layout.

The ES outlines in extensive detail how environmental matters and stakeholder and public feedback influenced the process of reaching the PAC layout, in addition to the prominent issues which affected the design including:

- Minimising impacts on watercourses and the aquatic environment;
- Reducing potential landscape and visual effects by moving turbines;

- Avoiding the areas of deepest peat;
- Minimising impacts on forestry;
- Reducing impacts on plants and animal species;
- Protecting archaeological and cultural heritage features; and
- Adapting the design to ensure the wind farm adheres to cumulative noise limits.

Many of the changes made to produce this layout resulted from additional data being collected in relation to the peat resource and moving infrastructure to avoid deeper peat or minimise impacts on peat, as well as additional civil engineering investigation and design.

### 6.3.5. Final Layout (2024)

Following the PAC exercise, changes were made to Layout 4 design as a direct result of PAC consultee comments.

Figures 1.2 and 1.3 in Volume 2 of the ES illustrate the final layout for the proposed development. Figure 3.1 illustrates the final layout against site constraints for the proposed development.

The design changes between Layout 4 and the Final layout include:

- Replacing T3-T4 track with a track alignment between T2 and T4 to move to shallower peat;
- Then, being able to relocate T3 to shallower peat (and existing track) as a result of removing the access track between T3 and T4;
- Relocating the concrete batching plant to avoid peat; and
- Relocating the grid connection construction compound at Denbigh crossroads (Carnedd Ci) onto existing hardstanding to avoid peat.

These layout changes demonstrate the continued commitment to the step-wise approach advocated in PPW 12 throughout the design employed to avoid and minimise damage to biodiversity as far as possible as the first priority of the step-wise approach.

Embedded mitigations (e.g. the CEMP) will be employed to facilitate the avoidance of impacts. Each topic chapter has identified the embedded mitigations considered.

The list below outlines elements of the step-wise approach relevant to the design evolution of the proposed development, commencing with measures to avoid impacts, and iteratively working through steps to minimise, mitigate and compensate for impacts as far as possible. For each step a summary of how the design has incorporated these elements is provided.

- **Step 1 – Avoid:**

Avoidance through design has been achieved through following;

- Initial site selection as part of the NRW Invitation to Tender process was based in part on the avoidance of National Parks, AONB, and protected designated sites such as Special Protection Areas (SPAs), Special Areas of Conservation (SACs), National Nature Reserve etc. Subsequent design iterations avoided the Site of Special Scientific Interest (SSSI) nearby.
- Retention of the beech woodland at Coed Tai-isaf and avoidance of impacts on trees used by roosting bats.

- Retention of the buildings at Hafod-y-Illan Uchaf and avoidance of impacts on roosting bats.
- The removal of turbines from South Alwen during the design evolution enabled the avoidance of potential impacts on moorland breeding raptors and waders.
- Use of turbine buffers to avoid potential displacement of black grouse from historic lekking sites and areas managed for this species.
- Another key aim of the design process was to avoid water quality impacts given the proximity of the proposed wind farm development to the Alwen Reservoir and Llyn Brenig Reservoir, removing turbines from South Alwen reduced the amount of infrastructure in the Alwen catchment;
- Avoidance of scrub and corridors of broadleaved woodland along the grid connection route to prevent risk of disturbance and destruction of habitat for dormouse.
- All turbines and associated infrastructure (apart from tracks) have been sited at least 50 m (and mostly 100 m) in order to avoid impacts to mapped watercourses;
- Through Phase 1 and repeated Phase 2 peat surveys undertaken, the proposed wind farm and grid connection infrastructure has avoided areas of deep peat and is largely sited on average peat depths of 0.5 m or less. Only two out of the nine turbines are located on average peat depths of greater than 0.5 m but less than 1 m.
- All infrastructure has been sited to avoid areas of Groundwater Dependent Terrestrial Ecosystem potential;
- All infrastructure has avoided impacts to potential areas of blanket bog and irreplaceable habitat.
- Retention of LISS woodland and stands of mature Norway spruce within the wind farm site; and avoidance of an area of Norway Spruce PAWS in the grid connection site to benefit red squirrel and provide continued nesting opportunities for forest raptors.
- All turbines have been sited to avoid forest coupes important to NRW land manager operations.

Avoidance will also be achieved through employment of best practice and controls as identified within the CEMP (e.g. pollution prevention measures, pre-construction surveys to facilitate avoidance of damage or disturbance to breeding sites or resting places).

- **Step 2 – Minimise:**

- The proposed wind farm layout was designed to minimising collision risk to bats by siting turbines away from areas of higher bat activity levels in South Alwen.
- Minimise the potential disturbance and collision risk of osprey by applying a suitable buffer distance between known nest sites and turbine locations.
- The peat data collected significantly influenced the design evolution with the main objective of avoiding peat and where that is not possible, siting infrastructure in the shallowest peat depths to minimise impacts on peat whilst balancing competing constraints (see Appendix 9.4 Peat Considerations in Design Evolution). Peat surveys were undertaken repeatedly at different layouts and over 2,500 peat probes were employed to inform the design changes and final layout.

- Use of existing access tracks was also considered a key design criterion to minimise impacts on the peat resource, habitats and water courses.
- Inclusion of a 50 m blade tip to forest edge buffer for each turbine was implemented to minimise collision related effects on bats.
- In consultation with NRW land management, rather than employing a coupe felling approach for the construction of the proposed development, a key holing approach was agreed as the most appropriate felling strategy to accommodate the proposed development which minimises the area required to be felled for wind farm construction and operation.
- **Step 3 – Mitigate/Restore:**
  - Reinstatement of disturbed habitats adjacent to the footprint of infrastructure and cable trenches by retention, appropriate storage, and re-use of topsoil and turves.
  - Restoration of heathland and peatland habitats (where peat is present) within keyholed areas.
  - Pitching turbine blades out of the wind (feathering) at certain times when turbines are not generating a useable output.
  - Post-construction monitoring of bat activity and collision mortality, and osprey flight activity (by vantage point survey and / or GPS tracking) to inform the need for further turbine curtailment.
- **Step 4 – Compensate on site:**
  - Replanting in situ will take place where forestry areas are felled for temporary construction infrastructure or for good forest practice measures.
  - Enhancement of grassland and heathland habitats through removal of regenerating conifer cover across identified areas within the proposed development and heathland management within the Tir Mostyn Habitat Enhancement Plan (HEP) area secured via s106 agreement. This will increase biodiversity in areas where species diversity is poor and provide structural diversity to benefit species such as black grouse and breeding birds.
- **Step 4 – Compensate off site:**
  - Following the NRW guidance on developments in woodland, provision for compensatory planting will be made off-site for the area of forestry loss required to be felled for the wind farm construction and operation, which is not replanted on site or that is not mitigated as part of the HMP. The Applicant's land agreement with Welsh Ministers (and DCWW) secures the requirement for compensatory planting.
  - A funding contribution (secured via s106 agreement) will also be provided to DCWW for additional planting of approximately 1.2 ha broadleaved woodland on DCWW land at Llyn Brenig. The precise location of the planting will be determined following further assessment of ground suitability, maximum ecological benefit (considering connectivity with existing woodland), and land tenancy agreements.
- **Step 5 – Long term management:**
  - Post-construction management of habitats within the wind farm and proposed grid connection site will be undertaken for the operational life of the proposed development (35 years). The precise management regime will be detailed in a full HMP and will build on the outline

objectives and measures provided in the Outline Habitat Management Plan (OHMP) provided in Appendix 5.3.

- On-site bat and bird population monitoring will also take place during operation at a frequency set out in the HMP and agreed by stakeholders. The outcome of on-site monitoring will be assessed in each annual management review and will inform changes to the breadth of management for subsequent years. This will allow for a dynamic HMP to ensure that residual effects on all species are maintained at or below the level predicted in this ES.
- A Conservation Management Plan, as agreed with Cadw, NRW and DCWW, will also set out detailed proposals for heritage enhancements within the proposed wind farm site boundary and the Bryn y Gors-goch Historic Landscape which will comprise interpretation of historic assets and landscape elements along a new heritage trail employing the already improved connectivity of the footpaths provided by the proposed design of the wind farm and existing forestry tracks.

### **Enhancements**

- Enhancements to the existing habitat mosaic will allow the development and retention of heathland and bog habitats, but will also include measures to develop soft, broadleaved forest edge adjacent to afforested areas, improve water quality of the Nant y Gors Goch (that feeds Alwen Reservoir) through riparian zone enhancement, and restore degraded peatland. The measures will also benefit species for which loss of habitat is predicted to occur during construction and operation of the proposed development, including dormouse, otter, water vole, red squirrel, pine marten, and reptiles. Note that all new broadleaved tree planting will be restricted to small-seed species (such as birch, rowan and willow) to avoid encouragement of grey squirrel (which has been confirmed to be present in Cerrig Caws). The habitat management enhancements (as well as public access and forestry operations access enhancements) will create improved foraging opportunities and habitat connectivity for dormouse, bats, pine martin and red squirrel as well as improved water quality which will benefit water vole and otter. Habitat management will also benefit breeding and foraging birds within the site and predicted to benefit species such as red kite, kestrel, nightjar and goshawk.
- Enhancement of 16.8 hectares of bog habitats (outline in the OHMP in Appendix 5.3) within the proposed wind farm area through removal of conifer plantation and specific peatland restoration. This will contribute to the long-term vision of the Forest Resource Plan, and will improve local biodiversity, support a diverse invertebrate assemblage, provide a foraging resource for bats, and play a role in carbon sequestration (thereby helping to slow climate change).
- In addition to mitigation measures within the site, a funding contribution secured via a s106 agreement will be provided to the Brenig Osprey Project to support conservation efforts and monitoring of the local population. This will aim to ensure continued delivery of objectives set out in the Llyn Brenig Osprey Conservation Plan.
- The layout of the proposed wind farm development will also improve linkages across the site as it will provide improved connectivity between the Cerrig Caws forest area (and public right of way) to the southern part of the wind farm site boundary. New tracks will also provide a new route across the site which is not currently available due to existing footpaths being

inaccessible (i.e. new track from T9 to the existing track leading to the substation and a new track from the substation down to the B4501). These enhancements across the site will contribute to ongoing efforts of landowners, local authorities and land managers of ensuring that the environment and natural resources of Wales are suitably maintained, enhanced and used for the benefit of the people, environment and economy of Wales (now, and in the future) under the Sustainable Management of Natural Resources (SMNR) framework as required by the Environment (Wales) Act 2016 – which also aligns with the Well-being of Future Generations Act.

## 6.4. Final Design

### 6.4.1. Character

The table below identifies the old (as shown in Figure 3.2 Layouts 1-3) and new numbering of turbines (as in Layout 4 and final layout) and turbine tip heights.

Table 1: Final layout

New Number	Old Number	Easting	Northing	Max Tip Height (m)
1	10a	295366	357224	200
2	11	295579	356880	200
3	12	295542	356363	200
4	2a	295678	355821	200
5	1a	294738	355508	200
6	3a	294859	355036	200
7	5	295663	354983	200
8	6b	295027	354452	200
9	4	295537	354281	200

The final maximum tip height is proposed at up to 200 m; all with rotor diameters of up to 155 m. At this application stage of a project the final turbine selection is not known and therefore a possible range of turbines that could fit the maximum turbine height criteria is considered. For the purpose of the Landscape and Visual Impact Assessment (LVIA), the maximum rotor diameter from the turbine models currently available to fit this maximum tip height criterion was used for the visuals. All information on turbine dimensions is discussed in Chapter 4: Project Description and included in Figure 4.1 in Volume 2 of the ES. It is expected that detail of final turbine dimensions and appearance will be a requirement of a consent condition to be agreed with the PEDW prior to commencement of construction.

Chapter 4: Project Description provides a detailed description of the proposed development. The selected turbines would be of a modern design with three blades mounted on a horizontal axis, attached to a nacelle, housing the generator, gearbox, and other operating equipment. The nacelles would be mounted on a tubular tower which allows access to the nacelle. It is expected that the turbine cut in wind speed will be around 3 metre per second (m/s) and will rotate clockwise direction.

The specific choice of wind turbine is dependent on the final commercial and technical choice by the Applicant, however, would not exceed the physical parameters specified in the consent (and as assessed in the ES). The turbines would be supported by a transformer which is likely to be located immediately adjacent to the turbine tower (although they can be incorporated into the nacelle or base of the tower, and this will be dependent on final turbine choice.).

Chapter 14: Aviation and Existing Infrastructure provides details of an aviation lighting scheme proposed for the turbines which the Civil Aviation Authority (CAA) has approved.

It is proposed that the turbine tower, nacelle, and blades be finished in a semi-matt, off-white/pale grey colour, and the final finish will be agreed through a planning condition with the local planning authorities. In order to comply with Health and Safety requirements for the proposed development, the Applicant would propose to apply identification numbers to the sides of the turbines.

The wind farm has been designed to be operational for up to 35 years and will include site management to ensure that site facilities associated with the wind farm are maintained. At the end of the operational life of the turbines, there are two possible options. Firstly, to decommission the wind farm and remove the turbines; or apply to install new equipment on the site (for which a further planning consent would be required).

The Applicant has received an offer of a grid connection from SPEN. One key benefit of the location of the proposed development is its proximity to grid connection via a relatively short ~10 km distance back to the SPEN Clocaenog 132 kV collector substation which feeds into the North Wales distribution network via St. Asaph. This connection to the wider distribution grid network has been secured at the existing Clocaenog substation maximising use of the remaining spare capacity on the connection to St. Asaph. Whether the grid connection would be overhead line or underground cable, or a combination is still under consideration and will be dependent on engineering, environmental and economic factors. If overhead line is employed, it will only be for a short 1.2 km length from the eastern edge of the B4501 (opposite the southern substation entrance shown on Figure 1.3 of the ES also shown in Appendix A of this document) to where the grid route diverts south to cross the Afon Brenig, south of Llyn Brenig dam. The rest of the grid connection will be underground.

The substation area would accommodate a single storey building which will house metering, protection and control equipment, storage and welfare facilities as well as a BESS as shown in Figure 4.5 of the ES.

#### 6.4.2. Community Safety

Wind turbines are designed, erected and maintained as a safe form of technology. The Applicant would commit to installing wind turbines and components that meet BS EN IEC 61400-1:2019 or IEC 16400 as appropriate.

Turbine models being considered for the site would operate automatically and have sensors to detect any instabilities or unsafe operation during high wind speeds. Should sensors placed on the nacelle and/or tower of the turbine detect any other malfunction in operation or should wind speeds increase over maximum operational thresholds, the turbines would be automatically shut down.

Typically, vibrometers are located in the nacelles and would detect rotor imbalance in blades caused by icing and the wind turbine's control and monitoring system would shut the turbines down under

these conditions. The turbines and substation compound will also be equipped with lightning protection equipment so that strikes will be conducted from the nacelle down the tower into the earth.

Due to the industrial operations occurring during construction, signs are required for safe day-to-day navigation for works traffic and personnel; access for emergency vehicles; and for the health and safety of the public. The construction site will be managed and operated in accordance with Health and Safety at Work etc. Act 1974<sup>12</sup> and comply with relevant Health and Safety Regulations, including:

- The Management of Health and Safety at Work Regulations 1999<sup>13</sup>;
- Construction (Design and Management) Regulations 2015<sup>14</sup> (CDM 2015);
- Electricity Safety, Quality and Continuity Regulations 2002<sup>15</sup>.

As shown on Figure 3.1 (and in Figure 14.2 of the ES), the wind farm site boundary hosts a number of PRow, including a bridleway and public footpaths and NRW recreational routes. Based on the worst-case candidate turbine, footpaths were given a blade over sail length (77.5 m) distance buffer from turbine locations during the design process which was agreed with the PRow officers from both CCBC and DCC during a meeting held in September 2022. Furthermore, discussions with the PRow officer from DCC resulted in agreement that the turbines proximities to this bridleway were considered to be acceptable.

The proposed grid connection route largely follows existing roads and tracks. There are a few NRW recreational multi-use routes within and in proximity to the site boundary of the proposed grid connection route, although these are limited to the southern aspects of the grid connection to the south and east of Llyn Brenig as well as around Llyn Brenig. There are also a few footpaths in the vicinity of the proposed grid connection, and bridleway (05) from Cerrigydrudion that crosses the proposed grid connection to the east of Llyn Brenig and forms the Clwydian Way long distance footpath (not formally recognised).

The forest area is actively managed on either a clear felling or a continuous cover system, with some areas being subject to minimum intervention practices. The management objectives of NRW within the Alwen and Clocaenog forests include increasing the areas managed as peatland bog, continue to maintain a sustainable supply of timber production through felling design and restock species, identify and restore ancient woodland, increase improvement of habitat resilience and landscape scale habitat linkages, maintain and improve recreation and community benefits including footpaths and cycle paths. Although the wind farm site boundary is not dedicated for open access under the Countryside and Rights of Way Act 2000, the wind farm area can be accessed in areas by walkers, horses and cycles allowed on the forest roads on a permissive basis only or via designated footpaths/bridleways. Accordingly, given the extent of routes across the site, maintaining public access safety across the site is considered to be key during forest management activities and activities that have been considered for the proposed development.

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<sup>12</sup> Available at: <https://www.legislation.gov.uk/ukpga/1974/37/contents> [Accessed 07/08/2024]

<sup>13</sup> Available at: <https://www.legislation.gov.uk/ukxi/1999/3242/contents/made> [Accessed 07/08/2024]

<sup>14</sup> Available at: <https://www.legislation.gov.uk/ukxi/2015/51/contents/made> [Accessed 07/08/2024]

<sup>15</sup> Available at: <https://www.legislation.gov.uk/ukxi/2002/2665/contents/made> [Accessed 07/08/2024]

During construction and decommissioning, as is the case with ongoing forestry operations, health and safety requirements will make it necessary to manage the use of PRoW, permissive paths and recognised routes where they come within close proximity to infrastructure. It is likely that temporary closure orders will be required and arranged through consultation with the local planning authorities. Where possible, temporary alternative routes will be provided, utilising existing forest roads where practicable. Prior to any temporary closures, notices will be posted in publicly available documents e.g., local media and the routes will be clearly marked with warning signs to discourage the public from entering the construction area. The aim is to have temporary closure orders in place for as little time as possible without compromising the health and safety of members of the public.

It is proposed that an Access Management Plan (AMP) will be prepared to indicate the restrictions for users during construction and any mitigation measures. Final details will be confirmed post-consent through an appropriate planning condition, to be approved by NRW as land managers and the relevant local authorities. Throughout construction, measures to manage diversion routes would be put in place where required on PRoW and these would be in accordance with an agreed AMP. The diversion routes would be clearly marked, and for safety reasons would direct the user away from any areas of construction.

Throughout the construction phase of the proposed development the relevant statutory requirements would be adhered to. All potentially hazardous areas would be fenced off and all unattended machinery would be stored in the site compounds or immobilised to prevent unauthorised use. Appropriate levels of security will be employed during the construction phase which may include on site personnel, fencing and CCTV. In addition, temporary construction safety signs, as well as access and information signs, would be placed at each possible entrance to the site, areas where there may be further danger (such as settlement lagoons and borrow pits).

Traffic risks to workers and the general public from construction activities relating to the proposed development will be managed by the construction contractor post-consent. This will be done through a detailed, site specific Construction Traffic Management Plan (CTMP) to be agreed with the relevant local authorities. No resulting safety risks are expected as a result of public access to the proposed wind farm site.

During the operation of the wind farm, it is envisioned that there would be no restrictions placed on the movement of the public using the existing PRoW across the site, other than in exceptional circumstances e.g., health and safety during turbine component replacement. Access by the public into the turbines, substation and BESS infrastructure would be prohibited.

Additionally, safety and/or directional signs would be placed at strategic points across the site area, particularly for PRoW or permissive routes, to inform members of the public that they are entering a wind farm area or grid connection area, to make them aware of potential hazards and provide direction for emergency services should the need arise.

Companies supplying products and services to the wind energy industry operate to a series of international, European and British standards which ensures that all equipment is safe. Appropriate warning, directional and identification signs would be installed on the wind turbines, transformers and on-site electrical control building, and access to these would be restricted to wind farm/grid connection personnel. Fire risks from the proposed battery energy storage facility are also low as

the BESS design incorporates fire prevention and suppression measures, and installation would be required to comply with relevant safety standards.

It is concluded that the proposed wind farm development or the proposed grid connection would not present a significant safety risk to the public.

#### 6.4.3. Movement

Due to the location of the proposed development, it is unlikely that transport to and from the site by staff will be undertaken by public transport, walking or cycling, although it is assumed that there will be an element of car sharing.

However, PRoW exist on site, therefore the public will have access to the area. As stated in Section 6.4.2, although the wind farm site boundary is not dedicated for open access under the Countryside and Rights of Way Act 2000, the wind farm area can be accessed in areas by walkers, horses and cycles allowed on the forest roads on a permissive basis only or via designated footpaths/bridleways. Accordingly, given the extent of routes across the site, maintaining public access safety and movement across the site is considered to be key during forest management activities and activities that have been considered for the proposed development. Therefore, during construction and decommissioning, as is the case with ongoing forestry operations, health and safety requirements will make it necessary to manage the use of PRoW, permissive paths and recognised routes where they come within close proximity to infrastructure.

The need to close, divert and/or provide alternative permissive routes is to protect members of the public from potential conflict with construction works and traffic. It is proposed that an AMP will be prepared to indicate the restrictions for users during construction and any mitigation measures.

Inspection of some of the PRoW on site has revealed that some footpaths are currently impassable or challenging due to dense forestry or poor ground conditions. During the operational phase of the proposed development, access will be largely unimpeded from that at present, apart from access to the land on which the electricity and battery energy storage compounds and the wind turbines themselves are situated. No significant adverse effects are predicted on PRoW during the operational phase of the proposed development however, long term positive effects are expected through the resultant access improvements across the site. Access enhancements will include a new track from T9 to existing track that leads to the substation where the footpath is currently impassable, and a new track from the substation down to the B4501 to improve linkages between Alwen Forest and Llyn Brenig. In addition, the inclusion of turbines in the northern Cerrig Caws area provides improved access arrangements for forest management in this area as well as improved PRoW access by connecting the Cerrig Caws bridleway to the main Alwen Forest track systems to the south. These enhancements across the site will contribute to ongoing efforts of landowners, local authorities and land managers of ensuring that the environment and natural resources of Wales are suitably maintained, enhanced and used for the benefit of the people, environment and economy of Wales (now, and in the future) under the Sustainable Management of Natural Resources (SMNR) framework as required by the Environment (Wales) Act 2016 and which also ties in with the Well-being of Future Generations (Wales) Act 2015<sup>16</sup> goals, a Healthier Wales, 'A society in which

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<sup>16</sup> Available at: <https://www.legislation.gov.uk/anaw/2015/2/contents/enacted> [Accessed 07/08/2024]

*people's physical and mental well-being is maximised and in which choices and behaviours that benefit future health are understood.*<sup>1</sup>.

The approach to ensuring safe access in the construction phase will be also specified by the CTMP, as part of the Construction Environmental Management Plan (CEMP) and AMP.

#### 6.4.4. Environmental Sustainability

In 2023, the Welsh Government has set a target for 100% of electricity consumption in 2030 to be provided by renewable sources. Dependant on the final turbine choice, the proposed development it is anticipated that the proposed development, which proposes an installed capacity range of between 33-60 MW, could generate between 121,414 and 220,752 megawatt hours (MWh) per year<sup>17</sup>.

Based on this range of installed capacity, it is estimated that the average annual generation expected at the site could be equivalent to the approximate annual domestic needs<sup>18</sup> of between 38,800 and 70,600 average households<sup>19</sup>.

The essential benefits of using wind energy for the generation of electricity is that it is renewable and safe. It also provides for diversity and security of supply which remain part of the Government's energy policy.

When generating electricity, the wind turbines would offset the generation of a similar amount of electricity that would otherwise be generated by conventional fossil fuel power stations.

While the displacement or offset figure would change as the generation mix changes, the proposed development based on the current UK generation mix, will offset the production of over 80,027 tonnes of carbon dioxide (CO<sub>2</sub>) equivalent per year by replacing energy generated from more carbon intensive methods (see Appendix 9.7 Carbon Balance Assessment). This CO<sub>2</sub> offset would make an important contribution towards meeting government targets.

Based on the findings of the carbon balance assessment, see Appendix 9.7 in Volume 3 of the ES, the proposed development is expected to result in the net emission of 114,043 tonnes of CO<sub>2</sub> equivalent. The carbon payback time for the wind farm is then calculated by comparing the net loss of CO<sub>2</sub> from the site due to wind farm development with the carbon savings achieved by the wind farm while displacing electricity generated from coal-fired generation, grid-mix generation or fossil-fuel mix electricity generation. On the basis of the methodology used in that assessment, this could result in a carbon-payback time for the proposed development of 1.4 years<sup>20</sup> (for the expected scenario based on replacement of fossil fuel-mix electricity generation).

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<sup>17</sup> Employing the capacity factor of 42% derived from a conservative net capacity (P50) for the smallest capacity candidate turbine, site met mast data, turbine data and accounting for losses. Calculation is 33-60 MW x 8760 hours in a year x 42% capacity factor = 121,414 MWh – 220,752 MWh. Figures all rounded.

<sup>18</sup> Based on 3,126 kilowatt hours (kWh) - the mean domestic electricity consumption (kWh per household) in Wales in 2022, Department for Energy Security and Net Zero (DESNZ) Energy Consumption in Great Britain. Available at: <https://www.gov.uk/government/statistics/regional-and-local-authority-electricity-consumption-statistics> [Accessed 07/08/2024]

<sup>19</sup> 121,414,000 – 220,752,000 kWh divided by 3,126 kWh (the mean domestic electricity consumption (kWh per household) figure in Wales 2021) = 38,800 – 70,600 households. Figures all rounded.

<sup>20</sup> 114,043/80,027 = 1.4 years payback

In terms of greenhouse gas emissions reduction, the net impact of the proposed development will be positive overall, as over the 35-year lifespan, it is expected to generate over 33 years' worth of clean energy after the carbon emissions from the construction of the wind farm have been paid back. In addition, over the expected 33 years that the proposed development is likely to be generating carbon-free electricity, this would result in an expected CO<sub>2</sub> emission savings of over 2,640,891 tonnes<sup>21</sup> of CO<sub>2</sub> when replacing fossil fuel electricity generation.

Onshore wind farms provide an important contribution towards making Wales and the UK more energy self-sufficient. If constructed, the proposed development would help improve this self-sufficiency and narrow the energy supply gap.

Once the operational life of the proposed development has ended, a decision will be made about whether to refurbish, remove or replace the turbines.

As Chapter 12: Forestry and Chapter 5: Ecology of the ES describe, the proposed development mainly lies within commercial forestry managed by NRW on land owned by DCWW. The forest consists primarily of commercial conifers and all growth stages are present, from recently felled or replanted areas, to stands of intermediate age and mature trees, although coupes of intermediate age predominate. Forest felling and replanting will be undertaken to facilitate erection of turbines, and creation of new access tracks and/or upgrades to existing access tracks and the felling areas for the proposed development is less than will take place under the existing NRW Forest Resource Plans. The overall net loss of trees resulting from the proposed development will be zero as any hectares of trees felled for the development and not replanted will be subject to compensatory planting elsewhere.

Section 6.3.5 of this statement has already highlighted the step-wise approach taken to avoid and minimise impacts to biodiversity and ecosystem resilience throughout the design process, and also identifies the enhancements that have been achieved with the final design. Further narrative within the ES, in Appendix 9.4 Peat Considerations in Design Evolution, provides further details on how competitive constraints were considered for the siting of each turbine location and other infrastructure.

Furthermore, Chapter 5: Ecology provides details on the site restoration measurements and habitat management that will aim to integrate the new infrastructure elements as sympathetically as possible. Appendix 5.3: Outline Habitat Management Plan describes measures undertaken within the proposed wind farm development site boundary which will aim to provide peat restoration measures to improve the carbon sink properties of areas of degraded modified bog. Measures are also proposed to improve biodiversity throughout the site improving heathland and broadleaved woodland and also enhancing riparian zones which will provide wider ecosystem benefits through improving biodiversity net benefits and water quality improvements.

Chapter 7: LVIA describes that the proposed development is located in an upland plateau landscape of working forest. It is sited away from settlement and other sensitive receptors, including nationally designated landscapes, and is therefore considered to be of lower sensitivity to development (as recognised by its partial inclusion within a PAA). The proposed development will be located in the

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<sup>21</sup> Calculation is 33 years x 80,027 tCO<sub>2</sub> = 2,640,891 tCO<sub>2</sub> equiv. (as shown in Appendix 9.7 Carbon Balance Assessment in Volume 3 of the ES, Table A9.7.4 and online submission).

vicinity of existing wind farms and will therefore not be out of character with the existing baseline. The layout of the proposed wind farm development has been designed to present a coherent group of turbines that avoids key views from sensitive receptors and relates to the scale and landform of the underlying forested plateau. The majority of the proposed grid connection will be underground and will be routed mostly through working forests. The other project elements, such as the substation, will also be located within the forest. These factors result in a proposed development that will only have localised effects on landscape and visual receptors. It is recognised under Future Wales Policy 17 that the Welsh Government has already modelled the likely impact on the landscape within the PAA for turbines of up to 250 m to tip and has found them to be capable of accommodating development in an acceptable way. Although some of the proposed development lies outside the PAA, the iterative design process concluded that moving some of the turbines into an area that lay outside of the PAA boundary would in fact result in reduced environmental impacts (to peat, water quality, birds for example), including landscape and visual effects producing more compact views and minimising effects on residential visual amenity. Therefore, although some localised significant effects are concluded, it is not considered that the presence of the proposed turbines would exceed the capacity of the landscape to accommodate the development.

Chapter 9: Hydrology, Hydrogeology and Soils outlines a series of embedded measures including good working practices, drainage and materials management and management of water discharges which would support appropriate management of the hydrological environment, water quality and resources and flood risk during the construction phase. This chapter also presents a Soils and Peat Management Plan in Appendix 9.6 of the ES. Measures such as a detailed drainage design utilising SuDS principles and appropriate fuel storage would be implemented in the operational phase such that no residual significant effects are concluded for the water or soils environment.

## 7. Access Statement

The proposed development will require vehicular access during construction, operation and decommissioning. The traffic impacts during these phases are discussed together with any implications for public and disabled access.

### 7.1. Access/Construction Traffic

Chapter 10: Traffic and Transport describes that general construction traffic and material deliveries will travel to site via the A5, A55, A543, A544, A548, B5435 and B4501 depending on their origin. A preliminary TMP for Heavy Goods Vehicles (HGVs) and Light Goods Vehicles (LGVs) is presented in Appendix 10.1 of the ES.

An Abnormal Indivisible Load (AIL) Route Survey has been undertaken for the major component deliveries and is included in Appendix 10.2 of the ES. Two AIL routes are currently under consideration as described within Chapter 10: Traffic and Transport and Appendix 10.2. The AIL route assumes a Port of Entry at Birkenhead and generally utilises trunk roads. The final approved AIL route will not be known until the turbine supplier is appointed and they have in turn reached contractual agreements with the port, sea freight/shipping company and a road haulier.

### 7.1.1. Site Access

There are five different site access points which are proposed for AILs, HGVs and LGVs where appropriate, for accessing and egressing the proposed development. These are described in detail in Chapter 10: Traffic and Transport, see also Figure 10.1 in Volume 2 of the ES (also shown in Appendix A of this document).

- **Access Point 1 – AIL Deliveries**

Access Point 1, referred to as northern Cerrig Caws entrance, is located to the north of the proposed wind farm development. This access will be for AIL deliveries only. Once unloaded, the delivery vehicles will be reduced in size to HGVs and will exit the site from Access Point 2. No HGVs or LGVs, other than those accompanying AIL vehicles, will be permitted to use Access Point 1 and AIL access will be under traffic management control.

- **Access Point 2 – Main HGV/LGV Site Access**

Located on the B4501 to the east of the proposed wind farm development, this access will be the main access point for HGV and LGV vehicles. No AIL vehicles will be permitted access at the point.

- **Access Point 3 – Southern Substation Access**

Located on the B4501 to the southern end of the proposed wind farm development this access point will be used for all types of vehicles to access the substation and BESS area.

- **Access Point 4 – Grid Connection Access West End**

Located on the B4501 opposite Access Point 3, this existing junction would be used by HGVs and LGVs for the construction of the proposed grid connection.

- **Access Point 5 – Grid Connection Access East End**

Accessed from the B5435 using unclassified roads, grid connection construction traffic may access site through this location. This access point was used for the construction of the Applicant's now operational Clocaenog Forest Wind Farm. Approaching on the B5435, vehicles would turn right on to the unnamed road signposted to Saron. At the next junction, adjacent to Bryn Glas Caravan Park, the route turns right again on to the unnamed road leading southbound to the access.

### 7.1.2. On-site Construction Traffic

Figures 1.2 and 1.3 shows the proposed new access tracks, temporary tracks and existing tracks to be widened for the proposed development. The tracks allow plant to dig new cable trenches alongside new and existing tracks and thereafter to access the site for operational and eventual decommissioning purposes. The design makes use of existing tracks wherever possible to minimise environmental effects.

### 7.1.3. Traffic Assessment

Chapter 10 assessed vehicle movements during the construction period. As a worst case, the scenario included the vehicle movements for the consented Pant y Maen Wind Farm in the programme of the proposed development such that the predicted peak months for both developments coincide. The likelihood of this occurring is considered to be low but is of sufficient

possibility to be considered worthy of assessment as a worst-case scenario as opposed to assessing the potential effects of the proposed development alone.

During an assumed up to a 17-month construction period, the peak traffic levels were found to be in month 11 of the construction programme. It is anticipated that a peak average of 188 HGV movements a day will be using the local road network during this peak time.

During the operational phase the expectation is that the proposed development would require the maintenance of turbines at six monthly intervals and at other times when faults occur. More maintenance may be required early in the 35-year operation life and towards the end of the period.

No significant residual effects are predicted for the construction or operation of the proposed development alone or cumulatively with other relevant projects. Draft TMPs have also been prepared to manage daily delivery profiles and control construction vehicle movements and routing of AILS and HGVs/LGVs to/from the site in Appendix 10.1 and 10.2 of the ES. It is expected a planning condition will be applied to the planning consent for a final combined CTMP to be prepared for approval by North and Mid Wales Trunk Road Agent (NMWTRA), CCBC and DCC post consent and prior to construction works commencing.

## 7.2. Access for All

Public access via PRow and permissive routes are also considered in sections 6.4.2 and 6.4.3 of this document.

The type of proposed development is such that it is not designed to enable access for members of the public regardless of levels of mobility. Therefore, specific provisions for disabled access have not been incorporated into the design.

The proposed development will be an operational wind farm, therefore the access tracks that will be built as part of the overall development are there to facilitate construction and maintenance vehicle access. Whilst these new access tracks will provide additional walking opportunities for all, they have not been designed for this purpose and measures such as hard surfacing or reducing gradients have not been considered in relation to specific disabled access.

## 8. Conclusion

The proposed development positively contributes to the achievement of the UK and Wales' goal to increase renewable energy generation to help combat the challenges posed by climate change. The design of the proposed development has been informed by consideration of technical, environmental and policy constraints. Additionally, the iterative design process has been informed by consultation with key stakeholders and the local community.

The design has also been informed by the EIA process. The ES demonstrates that the effects on a range of human and environmental receptors have been assessed and a range of measures have been proposed to reduce, off-set and avoid impacts of the proposed development on the environment where possible. Enhancement and compensatory measures have also been included within the proposals.

The proposed development design and layout has been informed by the environmental and technical information gathered over a seven-year design period. The consideration of environmental aspects during design has enabled many potential environmental impacts to be mitigated through design. The anticipated residual effects are described in Volume 1 of the ES that accompanies this DAS and are summarised in Chapter 16: Residual Effects, Mitigation and Enhancement.

Whilst the ES identified that some significant residual environmental effects are predicted to occur at a local level, national policy highlights that these are often inherent in the development of onshore wind energy and that the level of effect should be balanced against the socio-economic benefits and environmental benefits arising from the mitigation for specific receptors as well as the overall considerable contribution to reducing greenhouse gases to mitigate climate change.

Access during construction will be carefully managed using an AMP and CTMP to ensure minimal disruption to members of the public as well as safeguard their health and safety. Impacts on road users and local communities in the vicinity of the proposed development will also be managed during construction via the CTMP. During the operational phase of the proposed development, access will be largely unimpeded from that at present, apart from access to the land on which the electricity and battery energy storage compounds and the wind turbines themselves are situated. The design of the wind farm site will actually result in a modest benefit for walkers/recreational users of the wind farm access track network which will provide more linkages across the site.