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A Non-Technical Summary of the Environmental Statement is available free of charge from the above address on request.
The Environmental Statement and its accompanying Planning Statement are available at a cost of £250 in hard copy format (including postage and packaging) or on CD-ROM (price £10).

Front Cover: The image shows the proposed Brechfa Forest West Wind Farm and the existing turbines of Alltwalis Windfarm (the full photomontage for this viewpoint is contained in Figure 15.28.3).
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I. INTRODUCTION

1.1. This Environmental Statement (ES) accompanies an application to the Infrastructure Planning Commission (IPC) for development consent for the proposed Brechfa Forest West Wind Farm near Carmarthen (see Figure 1.1) under the provisions of the Planning Act 2008 and subsequent secondary legislation. The application falls under the remit of the IPC as Brechfa Forest West Wind Farm is classed as a nationally significant infrastructure project under the Act, by virtue of the fact that it is an onshore generating station with an installed capacity of over 50MW.

1.2. The ES has been prepared in line with the requirements of the Infrastructure Planning (Environmental Impact Assessment) Regulations 2009, hereafter referred to as the EIA Regulations.

1.3. The main components of the proposed wind farm (see Figure 1.2 and Chapter 3: Scheme Description and Design Strategy for further details) include:

- Installation of 28 wind turbines (each with a maximum height to blade tip of 145m);
- Construction of approximately 9.1km of new onsite access tracks and the upgrading of 12.7km of existing forestry access tracks;
- Construction of an onsite substation, hard-standing areas, external transformers, underground connecting cabling and one permanent wind monitoring mast (planning permission has already been granted for two temporary met masts which were installed in April 2006 and August 2008 respectively);
- Creation of two temporary construction compounds;
- Working of one new borrow pit for the extraction of stone.

1.4. It is anticipated that the wind farm will take approximately 22 months to construct, with four months of ground clearance and preparation and 18 months of wind farm construction. Prior to the start of construction works, a period of felling for the purposes of accommodating wind farm infrastructure will take place. Consent is being sought for a 25 year operating period. At the end of this period the wind farm will be decommissioned, unless a new planning permission is sought.

1.5. Access to the site will be obtained from the M4, via the A48 towards Carmarthen, the A485 north from Carmarthen, and an access track to the north of the existing Alltwalis Wind Farm (see Figure 9.1 and Chapter 9: Access, Traffic and Transportation). Stone that cannot be provided from the borrow pit for specification reasons (e.g. roadstone) is likely to be sourced from Dinas Quarry, located near Llansawel, and brought to site via the B4337 northbound (via Rhysycmerau), a minor road to Llanllwni, and then the A485 southbound.

1.6. The grid connection will be subject to a separate application to the IPC (or subsequent body) under the provisions of the Planning Act, submitted by Western Power Distribution. A more...
1. Introduction

detailed description is set out in Chapter 3: Scheme Description and Design Strategy and a high level assessment of the grid connection route is set out in Appendix 3.3.

1.7. The application for Brechfa Forest West Wind Farm has been prepared at the same time as another RWE npower renewables Limited (RWE NRL) scheme called Brechfa Forest East Wind Farm which is located approximately 7.5km to the east. These schemes have been developed alongside each other but are submitted as separate planning applications and are being determined by different authorities: the IPC (or subsequent body) for Brechfa Forest West Wind Farm (as the generating capacity exceeds 50MW) and Carmarthenshire County Council for Brechfa Forest East Wind Farm (as the generating capacity is less than 50MW).

About the Developer

1.8. RWE npower renewables is one of Wales’ and the UK’s leading renewable energy companies. The company is dedicated to generating electricity using sustainable, environmentally-friendly resources and has the resources and expertise to develop, build and operate high quality, commercial-scale renewable energy schemes throughout the UK.

1.9. RWE NRL is the UK subsidiary of RWE Innogy, which was recently established to pool the renewable energy expertise and generating plant of the RWE Group across Europe. Highlights in Wales include:

- Over 100 years in Wales, through a hydro-electric power station at Dolgarrog;
- RWE NRL generates almost half of Wales’ current renewable energy;
- Operation of a portfolio of seven onshore and two offshore wind farms, and six hydro-electric power stations;
- Investing in new renewable technologies - biomass, wave, tidal and micro-renewables;
- RWE NRL has invested £6m in Pembrokeshire-based micro-turbine company, Quiet Revolution.

1.10. In addition, RWE NRL has a significant portfolio of new and developing projects, which will greatly contribute to the reduction of emissions of carbon dioxide and help secure domestic energy supply in the UK.

LEGISLATIVE REQUIREMENTS FOR ENVIRONMENTAL IMPACT ASSESSMENT

1.11. The proposed development exceeds the thresholds for wind farms set out within Schedule 2 of Infrastructure Planning (Environmental Impact Assessment) Regulations 2009 and an Environmental Impact Assessment (EIA) is therefore required. Where EIA is required, the information must be provided by the applicant in an ES.

1.12. The proposed wind farm will require some felling of trees and in some cases forestry works require EIA under the Forestry EIA Regulations. However, by virtue of the fact that the proposed development exceeds the thresholds in Schedule 2 of the EIA Regulations, it does not therefore fall under the definition of ‘relevant projects’ under the Environmental Impact Assessment (Forestry) (England and Wales) Regulations 1999. Therefore a separate EIA and application for Forestry Commission consent for the associated forestry felling is not required.

RESPONSIBILITIES FOR THE ENVIRONMENTAL STATEMENT

1.13. This ES has been compiled by Land Use Consultants (LUC) for RWE NRL. Whilst LUC had overall responsibility for the ES, sub-consultants undertook specialist assessments where necessary. LUC produced the introductory chapters (Chapters 1-6), summary and conclusions chapter, and chapters on landscape and visual impacts, non-avian ecology (with specialist input by a range of specialists as detailed in Chapter 13: Non-Avian Ecology), infrastructure, telecommunications, television and air safeguarding issues and public access, amenity and socio-economic impacts. Sub-consultants undertook specialist assessments as follows:

- CgMs Ltd provided specialist input on archaeology and cultural heritage;
- Entec provided specialist input on access, traffic and transport;
- Hoare Lea Acoustics Ltd provided specialist input on noise and vibration;
- Mott MacDonald Ltd provided specialist input on geology and hydrology;
- Natural Research Projects Ltd provided specialist input on ornithology;
- Pager Power provided specialist input on telecommunications;
- Selectfor provided specialist input on land use and forestry.

STRUCTURE AND PRESENTATION OF THE ENVIRONMENTAL STATEMENT

1.14. The Environmental Statement is divided into three main sections. The first part comprises introductory Chapters 1-6:

- Chapter 1: Introduction provides a brief introduction to the scheme and the legislative requirements and outlines the structure of the ES;
- Chapter 2: Approach to the EIA provides more detail on the EIA process including consultation and a summary of the Scoping Opinion;
- Chapter 3: Scheme Description and Design Strategy provides a detailed description of the proposed development and the context of the site. It also details the design strategy that informed the scheme design and modifications made to the scheme layout;
- Chapter 4: Site Selection Process and Alternatives Considered summarises the selection of Brechfa Forest, the alternatives considered and the refinement of the site by the Welsh Government, Carmarthenshire County Council (CCC) and RWE NRL;
- Chapter 5: Energy Policy Context and Scheme Rationale provides a review of national and local energy policy and the contribution of Brechfa Forest West Wind Farm to reducing greenhouse gas emissions;
- Chapter 6: Planning Policy Context provides a review of national and local planning policy and guidance to inform the key issues assessed through the EIA.
1. Introduction

1.15. The second part of the Environmental Statement (Chapters 7-17) describes the potential environmental impacts of the proposed scheme in relation to the following environmental topic areas:

- Chapter 7: Historic Environment;
- Chapter 8: Geology, Soils and Hydrology;
- Chapter 9: Access, Traffic and Transportation;
- Chapter 10: Infrastructure, Telecommunications, Television and Air Safeguarding Issues;
- Chapter 11: Public Access, Recreation and Socio-Economics;
- Chapter 12: Land Use and Forestry;
- Chapter 13: Non-Avian Ecology;
- Chapter 14: Ornithology;
- Chapter 15: Landscape and Visual Amenity;
- Chapter 16: Noise and Vibration;
- Chapter 17: Shadow Flicker.

1.16. Within each of these chapters, the information is structured in a consistent way, as far as practicable, as follows:

- **Introduction**: identifies key objectives and issues;
- **Assessment Methodology**: summarises the methods used (desk study, surveys, consultations etc.) in undertaking the EIA;
- **Significance Criteria**: details criteria against which the significance of potential impacts is assessed;
- **Planning Policy Context**: summarises the relevant national and local planning policy;
- **Existing Conditions**: summarises the baseline situation, including field survey results, where appropriate;
- **Modifications to the scheme design**: summarises key modifications made to the scheme on the basis of initial baseline surveys and impact assessments prior to the final ‘design freeze’;
- **Identification and Assessment of Potential Impacts** associated with the construction and operational phases of the development. This includes:
  i) **Potential Impacts**: details the potential impacts (both negative and positive) of the scheme and an assessment of the significance of the impacts. Any uncertainty or risks associated with impact predictions are referred to in the text;
  ii) **Mitigation Measures**: a summary of measures envisaged to avoid, reduce or remedy potential significant adverse impacts of the scheme. For the operational phase, this also includes any future monitoring requirements;
  iii) **Residual Impacts**: a summary of impacts remaining following mitigation indicating the significance of the residual impacts;
  iv) **Cumulative Impacts**: sets out any potential impacts of a cumulative nature which may arise due to the wind farm in combination with other known schemes;
  v) **Future Monitoring Requirements**: details proposals for monitoring impacts and the effectiveness of mitigation measures;
  vi) **Future Situation without the Scheme**: provides an indication of the future situation at the site should the wind farm not be constructed;
  vii) **Summary of impacts**: a table summarising the significance of impacts, mitigation measures and residual impacts.

1.17. The assessment section of each chapter is structured in a way that is most logical for that particular topic area, whilst maintaining as far as possible the general structure identified above.

1.18. The survey area for each discipline has been defined to reflect the likely extent of potential impacts. Therefore the survey areas for each discipline differ. For example, the likely significant environmental impacts associated with operational noise of a wind farm are more localised than potential visual impacts and hence the survey area is more localised.

1.19. The third part of the Environmental Statement, **Chapter 18: Summary and Conclusions**, presents the overall findings and conclusions of the EIA, with particular emphasis on likely significant environmental impacts and mitigation measures.

1.20. The Environmental Statement includes supporting appendices as listed in the contents page (contained in **Volume 3: Environmental Statement Appendices**). A stand-alone Non-Technical Summary document has also been produced to accompany the application.
1. Introduction
INTRODUCTION

2.1. EIA involves the compilation, evaluation and presentation of all the likely significant environmental impacts of a proposed development to assist the consenting authority in considering and determining an application. Early identification of likely significant adverse environmental impacts also leads to the identification and incorporation of appropriate mitigation measures into the scheme design.

2.2. This chapter sets out the broad method of approach that has been used in the EIA for the proposed scheme. It provides an overview of the key stages that have been followed, in line with EIA best practice.

THE EIA PROCESS

EIA Regulations

2.3. The ES has been prepared in accordance with the latest regulations and advice on good practice, comprising:

- The Infrastructure Planning (Environmental Impact Assessment) Regulations (2009);
- Circular 11/99 Environmental Impact Assessment (Welsh Office, 1999);

2.4. Schedule 4 of the EIA Regulations requires specifically that an Environmental Statement should include:

- A description of the development to include the physical characteristics of the whole development and land use requirements during the construction and operational phases; a description of the main characteristics of the production processes, for instance, nature and quantity of the materials used; and an estimate, by type and quantity, of expected residues and emissions (water, air and soil pollution, noise, vibration, light, heat, radiation, etc) resulting from the operation of the proposed development.

- An outline of the main alternatives studied by the applicant and an indication of the main reasons for the applicant’s choice, taking into account the environmental effects.

- A description of the aspects of the environment likely to be significantly affected by the development, including, in particular, population, fauna, flora, soil, water, air, climatic factors, material assets, including the architectural and archaeological heritage, landscape and the inter-relationship between the above factors.

- A description of the likely significant effects of the development on the environment, which should cover the direct effects and any indirect, secondary, cumulative, short, medium and long-term, permanent and temporary, positive and negative effects of the development, and the description by the applicant of the forecasting methods used to assess the effects on the environment.
2. Approach to the EIA

- A description of the measures envisaged to prevent, reduce and where possible offset any significant adverse effects on the environment.
- A non-technical summary of the above information.
- An indication of any difficulties (technical deficiencies or lack of know-how) encountered by the applicant in compiling the required information.

Good Practice Guidance

2.5. DCLG’s Environmental Impact Assessment: A Guide to Good Practice and Procedures, A Consultation Paper (2006) sets out good practice advice for the key stages to be followed in the EIA process. The key stages are as follows:

Scoping
- Undertake a scoping exercise to establish likely significant impacts.

Predicting and Assessing Impacts
- Identify and evaluate positive and negative effects of the development following accurate measurement of baseline conditions;
- Evaluate the degree to which an impact is significant using significance criteria;
- Consider the cumulative effects of the proposed development.

Preparing the Environmental Statement
- Ensure the ES includes a description of the development, a discussion of alternatives, reporting of the baseline conditions, description of the likely significant effects;
- Consider the need for mitigation measures to address potential adverse effects and enhance positive effects.

EIA and the Design Process

2.6. Good practice advises that EIA is an iterative process, rather than a one-off, post design environmental appraisal. In this way, the findings from the EIA can be fed into the design process, to avoid and minimise environmental impacts. This approach was used in the development of the Brechfa Forest West Wind Farm scheme. Where potentially adverse environmental impacts were identified through preliminary investigations or later in the detailed EIA, consideration was given as to how the design scheme should be modified to design out adverse environmental impacts, or where this was not possible, to determine appropriate mitigation measures. This process is explained in more detail in the next chapter and chapters detailing the impact assessments.

SCOPE OF THE ENVIRONMENTAL STATEMENT

2.7. The EIA process allows the developer to request a Scoping Opinion from the competent authority, which is then used to guide the EIA in terms of topic coverage and methodology. A Scoping Opinion was therefore sought from the Department of Energy and Climate Change (DECC) (under The Electricity Works (Environmental Impact Assessment) (England and Wales) Regulations 2000) since the request was submitted prior to the establishment of the IPC or publication of the EIA Regulations.

2.8. DECC issued a scoping opinion in September 2009. This details DECC’s opinion in terms of topics to be covered in the EIA and the assessment methodologies to be employed. It also includes comments on the scope of the EIA provided by statutory consultees. Table 2.1 details consultees that responded and the topics covered in their responses. Further details, in terms of methodological requirements requested in the Scoping Opinion, are included in Chapters 7 to 17, along with the details of any additional consultation. The request for a Scoping Opinion Report and the Scoping Opinion received are included in Appendix 2.1 and Appendix 2.2 respectively.

ASSESSMENT OF POTENTIAL IMPACTS

2.9. To ensure all of the potential impacts arising from the proposed scheme were identified, the following principles were applied throughout the EIA process.

Significant Impacts

2.10. Circular 11/99 (Welsh Office, 1999) provides advice on the general requirements with regards to the preparation and content of Environmental Statements. Paragraph 82 states that the focus of an ES should be on significant environmental impacts:

‘Whilst every ES should provide a full factual description of the development, the emphasis of Schedule 4 [of the EIA Regulations] is on the ‘main’ or ‘significant’ environmental effects to which a development is likely to give rise. Other impacts may be of little or no significance for the particular development in question and will need only very brief treatment to indicate that their possible relevance is being considered.’

2.11. As outlined above, the EIA Regulations emphasise the need to assess ‘significant environmental effects’ of the proposed development. However, within this ES, the specialists undertaking the respective assessments refer to ‘significant impacts’ rather than ‘effects’. Paragraph 11.2 of the Institute of Environmental Management and Assessment (IEMA) Guidelines for EIA (IEMA, 2004) highlights that distinguishing between the two terms within an ES may not be readily appreciated by those reading the ES, but that ‘there would be little loss of understanding if ‘impact’ and ‘effect’ were to be interchanged within the text of the ES’. For clarity and consistency the term ‘impacts’ is used throughout this ES.

2.12. Therefore, an assessment of the significance of impacts arising from the proposed scheme is a key stage in the EIA process. It is this judgement that is key to informing the decision-making process.

2.13. As the significance of impacts will differ depending on the context and the ‘receptors’ affected, there is no general definition of what constitutes significance. In EIA, the term significance reflects both its literal meaning of ‘importance’ and its statistical meaning where there is an element of quantification. This combination of professional judgement/subjective and quantifiable/objective tests has become the standard approach to understanding and applying the test of ‘significance’.

2.14. Specific significance criteria have been defined for the majority of topic areas, and these are detailed in the topic chapters. As the specialists undertaking each element of the assessment have defined these criteria, there is some variation. However, each of the sets of criteria is based on the following:

- type of impact (adverse/beneficial);
2. Approach to the EIA

2.15. Using the criteria in each chapter, the significance of the impacts arising from the proposed development has been categorised, wherever possible, as follows:

- major;
- moderate;
- minor;
- negligible.

2.16. Impacts of ‘major’ or ‘moderate’ significance are considered ‘significant’ under the EIA Regulations. In accordance with the Regulations, these impacts have been explored in greater depth in the EIA and reported in greater detail in the ES.

Interrelationships between Impacts

2.17. For the purposes of the ES, the potential impacts of the scheme are considered in terms of the impacts on each of the discrete environmental topic areas. In reality, topic areas such as hydrology and ecology are interrelated. The key interrelationships between the various topic areas have been considered through the EIA process and are addressed within the ES where appropriate.

Cumulative Impacts

2.18. The EIA Regulations state that the types of impact identified ‘should cover direct effects and any indirect, secondary, cumulative, short, medium and long-term, permanent and temporary, positive and negative effects.’ Cumulative effects may occur as a result of individual impacts of the scheme itself working in combination. It is also important to consider the possible impacts that the proposal may have in combination with existing, consented or other proposed developments or activities. As such, likely cumulative effects have been defined as the likely effects that the proposed Brechfa Forest West Wind Farm may have in combination with, or incremental to developments which are at application stage, consented, under construction or operational.

Mitigation and Enhancement

2.19. Part 1 of Schedule 4 of the EIA Regulations states that ‘The ES should include a description of the measures envisaged to prevent, reduce and where possible offset any significant adverse effects on the environment.’ These measures have been termed ‘mitigation measures’ for the purposes of the assessment.

2.20. Under the EIA Regulations, mitigation is to be considered in the context of likely significant impacts and not simply for any adverse impacts. Within this ES, particular attention has been placed on identifying mitigation measures for impacts predicted to be of major or moderate significance, however, where appropriate, mitigation measures have also been identified for addressing minor impacts.

2.21. Mitigation measures are designed to reduce the significance of an impact, so the residual impact (post mitigation) is no longer classed as significant in EIA terms. Pre-mitigation and residual impacts are clearly stated within the topic chapters. This demonstrates the extent to which impacts are avoided, reduced, or remedied and the likely significance of impacts in the absence of these measures. RWE NRL is committed to implementing the mitigation measures identified in this ES.

Monitoring

2.22. Technical Advice Note (TAN) 8: Planning for Renewable Energy (Welsh Assembly Government, 2005) states that it is important that local planning authorities monitor the deployment of renewable energy technologies. The monitoring of impacts of a development and the effectiveness of mitigation measures compared to predicted impacts is an essential part of the EIA process.

2.23. RWE NRL is committed to the monitoring of predicted impacts and the effectiveness of mitigation measures during the construction and operational phases of the proposed wind farm as far as reasonably possible, to ensure that impacts are minimised and the wider environmental aims of the development are met. Future monitoring requirements are set out in each topic chapter.

Difficulties Encountered

2.24. The EIA process is designed to enable informed decision-making based on the best possible information about the environmental implications of a proposed development. However, the EIA Regulations accept that difficulties may be encountered when undertaking an EIA, and where this is the case, states that such gaps should be clearly indicated in the ES.

2.25. In accordance with the EIA Regulations, this ES states where difficulties have been encountered in compiling information and if these could affect the predictions of likely significant environmental impacts. The role of the ES is to ensure that the IPC has sufficient environmental information available to enable it to identify and assess likely significant environmental impacts. In accordance with Part 1 of Schedule 4 of the EIA Regulations, the topic chapters (Chapters 7-17) within the ES state where such technical deficiencies or lack of know-how have arisen.

Whilst some information gaps are identified within this ES, it is not considered in any case that there is insufficient information to enable an informed decision to be taken on the identification and assessment of likely significant environmental impacts.

CONSULTATION

2.26. Consultation has formed an integral component of the EIA process and has included:

- obtaining initial feedback on the proposals and identifying key concerns at the Scoping stage;
- collecting baseline information and confirming survey methodologies;
- reviewing survey findings and impact predictions (including circulation of survey findings to consultees where this was felt to be appropriate);
- discussing opportunities for scheme modifications and mitigation and enhancement.
2. Approach to the EIA

2.27. Consultation responses indicate that, generally, the scope of the ES was defined appropriately. However, a number of consultees highlighted issues where further investigation or clarification was required. These have been addressed where appropriate within the ES. In addition, statutory and non-statutory consultees have been kept informed of progress throughout the duration of the EIA process. This has enabled any potential issues or concerns raised by consultees to be discussed, and to ensure the assessment process was transparent. Further details of these discussions are set out in Chapters 7-17.

2.28. Regulation 10 of the EIA Regulations sets out consultation requirements. The Regulations state that the Statement of Community Consultation, prepared under Section 47 of the 2008 Planning Act, must set out, if the development is EIA development, "how the applicant intends to publicise and consult on the preliminary environmental information". RWE NRL has also prepared a Consultation Report, outlining the consultation undertaken, responses received and how these have been taken into account, which will be submitted as a standalone document accompanying the planning application.

Consultation with Statutory and Non-Statutory Consultees

2.29. A pre-Scoping meeting was held with CCC to discuss the preliminary feasibility of the scheme and potential key issues.

2.30. Statutory and non-statutory consultees have been kept informed of progress throughout the duration of the EIA process. This has enabled any potential issues or concerns raised by consultees to be discussed, and to ensure the assessment process was transparent.

Section 47 Consultation

2.31. As required by Section 47 of the Planning Act, consultation has taken place with people living in the vicinity of Brechfa Forest West Wind Farm. Newsletters were sent to those living within 5km of the boundary of Brechfa Forest - excluding small, outlying areas (see Figure 2.1) however, other forms of consultation such as exhibitions and the website were not geographically limited and comments were welcomed from all.

2.32. Consultation took place in line with the Statement of Community Consultation as agreed with CCC and advertised in the local press. All responses received following the consultation have been recorded, reviewed, responded to and are summarised in the Consultation Report accompanying the planning application. A number of responses have resulted in changes and additions to this Environmental Statement when compared with the Draft Environmental Statement. These are set out in the Consultation Report and will not be repeated here in order to avoid duplication.

Section 42 Consultation

2.33. Under Section 42 of the Planning Act, and Regulation 3 of and Schedule 1 to the Infrastructure Planning (Applications, Prescribed Forms and Procedures) Regulations 2009, RWE npower renewables has undertaken consultation with a prescribed list of bodies, with host and neighbouring local authorities, and with those who have an interest in the land affected by the application.

2.34. These responses have additionally been recorded, reviewed, responded to and are summarised in the Consultation Report. A number of responses have resulted in changes and additions to this Environmental Statement when compared with the Draft Environmental Statement. Further details are set out in the Consultation Report and will not be repeated here in order to avoid duplication.

2.35. Section 42 and Section 47 consultation took place in parallel between February 9th and April 6th 2011. The consultation documents included a draft Environmental Statement. Full details of this process are set out in the Consultation Report.

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3 N.b. according to the Infrastructure Planning EIA Regulations 'preliminary environmental information' means information referred to in Part I Schedule 4 of the Regs. Part I Schedule 4 details information for inclusion in the ES.
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Brechfa Forest West Wind Farm: Environmental Statement  
October 2011
2. Approach to the EIA

REFERENCES
3. SCHEME DESCRIPTION AND DESIGN STRATEGY

INTRODUCTION

3.1. This chapter describes the components of the wind farm for which consent is being sought, and which have been assessed as part of the EIA and describes the construction, operation and decommissioning phases. It also describes the design strategy for the wind farm and further modifications to the scheme design which have taken place as a result of the EIA process. Finally, forestry works to be carried out by FCW on behalf of RWE NRL prior to the start of construction works on site and the likely grid connection and offsite highway works are detailed.

DESCRIPTION OF THE SITE AND THE SURROUNDING AREA

3.2. The site is located within Brechfa Forest, 10km northeast of Carmarthen, Carmarthenshire in South West Wales (see Figure 1.1) on a ridge of land forming the southwestern tail of the Cambrian Mountains. The site lies between the Cothi Valley (located to the southeast) and the Teifi Valley (located to the northwest). The elevation of the site ranges from 260mAOD in the southwest to 358mAOD in the northeast.

3.3. Brechfa Forest covers an area of approximately 5,273ha. The land is owned by the Welsh Government and managed by Forestry Commission Wales. It is comprised of plantations of exotic tree species with Sitka spruce being the primary species, although there are some areas of native trees within the Forest. The Forest is divided into two parts by the common land of Mynydd Llanfihangel, Rhos y Corn and Mynydd Llanllwni. The site of Brechfa Forest West Wind Farm is located in the western part of the Forest which lies between the village of Brechfa to the southeast, and the A485, to the northwest. The site is intersected by the Afon Pîb which flows southeast towards Brechfa.

3.4. The site occupies an area of approximately 1041 ha, although the actual development (including all infrastructure components such as access tracks, turbine bases, borrow pit, meteorological masts, and temporary and permanent compounds) will only occupy approximately 4.1% of this. The majority of the site is used for upland rotational forestry, with only 8% of the site being improved agricultural grassland used for sheep grazing.

3.5. The landscape character of the area is described in the Landscape Character Map for Wales (2007). The site is covered by the Cambrian Mountains landscape character area (LCA) which is characterised by a “landform of extensive undulating plateau and incised valleys… dense pattern of historic features and elements throughout in the form of funerary and ritual monuments” (further information on the landscape character can be found in Chapter 15: Landscape and Visual Amenity).

3.6. The operational Alltwalis Wind Farm is situated adjacent to the north-northwestern boundary of the site. The distance between the two closest turbines of Alltwalis Wind Farm and Brechfa Forest West Wind Farm is 368m. The site of the proposed Brechfa Forest East Wind Farm (submitted in December 2010) is approximately 7.5km to the east of the proposed Brechfa Forest West Wind Farm site (the distance between the two closest turbines is 7,870m). The site of the proposed Bryn Llywelyn Wind Farm (submitted in December 2010) is located close to the northeastern boundary of the site; the distance between the two closest turbines is 1,853m.

3.7. Subcatchment watercourses that drain areas of the site, or originate very close to the site boundary, include the Afon Pib, Nant Cwm-Marydd, and Afon Marlais, feeding into the Afon...
3. Scheme Description and Design Strategy

Cothi, and the Nant Hafron and Nant Aerau, which are tributaries of the Afon Gwili. The Afon Gwyddgrug, Afon Gorwydd and an unnamed tributary feed into the Afon Talog.

3.8. There are several minor roads surrounding the site which provide links to the wider road network. The A485 to the west of the site runs south to Carmarthen. An unclassified minor road runs from Brechfa to the southeast of the site to New Inn on the A485 to the northwest. The M4 motorway network is accessible via the A48 from Carmarthen.

3.9. There are five public footpaths within the site (registration numbers: 13/77, 13/83, 13/89, 13/90 and 13/91) and numerous other footpaths surrounding the site including public footpath 13/82 that runs along the western boundary of the operational Alltwalis Wind Farm. The site of Brechfa Forest West Wind Farm is also classed as dedicated open access land, whereby FCW has voluntarily dedicated the land for use for public access under the Countryside and Rights of Way Act 2000.

3.10. There are no properties within the proposed wind farm site boundary. There are, however, several properties in the surrounding area\(^4\) (none of which are financially involved with the proposed wind farm) including:

- Bryngolau (approximately 817m from the nearest turbine, located at approximately SN 48706 35173);
- Cwmyronnen Uchaf (approximately 886m from the nearest turbine, located at approximately SN 46786 30437);
- Blaengwyddgrug (approximately 945m from the nearest turbine, located at approximately SN 48323 35123); and
- Lanyllynadda (approximately 999m from the nearest turbine, located at approximately SN 45755 31375).

3.11. The closest residential settlements\(^5\) to the site are:

- Alltwalis (approximately 2.2km west of the nearest turbine);
- Gwyddgrug (approximately 2.3km northwest of the nearest turbine);
- New Inn (approximately 2.8km southwest of the nearest turbine);
- Gwernogle (approximately 3km east of the nearest turbine); and
- Brechfa (approximately 3.7km southeast of the nearest turbine).

PROJECT DESCRIPTION

3.12. The main components of the proposed wind farm include:

- Installation of 28 wind turbines (each with a maximum height to blade tip of 145m);
- Construction of approximately 9.1km of new onsite access tracks and the upgrading of 12.7km of existing access tracks;
- Construction of an onsite substation, crane hardstanding areas, external transformers, underground connecting cabling and one permanent wind monitoring mast (planning permission has already been granted for two temporary met masts which were installed in April 2006 and August 2008 respectively);
- Creation of two temporary construction compounds;
- Working of one new borrow pit for the extraction of stone.

3.13. The proposed layout of the wind farm is shown in Figure 1.2. All elements as outlined above form part of the description of works and are integral to the development. No associated development is proposed. Each component is described further below.

Wind Turbines and Other Infrastructure

Turbines

3.14. Permission is being sought for the erection of a three bladed horizontal axis turbine (capacity of around 2-3MW) with a maximum height to blade tip of 145m and a hub height of 100m (the tallest likely hub height for a turbine of this overall height). Given the rate of technological advancement, a specific turbine manufacturer has not been identified at this stage. The Vestas V90 turbine has however been selected as a candidate turbine for the noise assessments as more detail on turbine specification is required to run the noise models (see Chapter 16: Noise and Vibration for more information). Final turbine selection will be dependent on a commercial tendering exercise. The dimensions provided above are for the tallest potential wind turbine that would be erected on the site.

3.15. A turbine of this type (with indicative hub height and rotor diameter) is illustrated in Figure 3.1. The blades are likely to be made from glass fibre, and the tower from a combination of concrete and steel, or entirely steel. Grid coordinates and the height of the base of the turbines above ordnance datum (AOD) are provided in Table 3.1.

<table>
<thead>
<tr>
<th>Turbine</th>
<th>Grid Reference</th>
<th>Base Height AOD</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>SN467531322</td>
<td>327</td>
</tr>
<tr>
<td>2</td>
<td>SN47347133</td>
<td>306</td>
</tr>
<tr>
<td>3</td>
<td>SN470493213</td>
<td>316</td>
</tr>
<tr>
<td>4</td>
<td>SN473471378</td>
<td>324</td>
</tr>
<tr>
<td>5</td>
<td>SN4786531357</td>
<td>309</td>
</tr>
<tr>
<td>6</td>
<td>SN48007130919</td>
<td>302</td>
</tr>
<tr>
<td>7</td>
<td>SN48204930683</td>
<td>294</td>
</tr>
<tr>
<td>8</td>
<td>SN4778032510</td>
<td>329</td>
</tr>
<tr>
<td>9</td>
<td>SN478632140</td>
<td>322</td>
</tr>
<tr>
<td>10</td>
<td>SN49631773</td>
<td>301</td>
</tr>
<tr>
<td>11</td>
<td>SN4845631506</td>
<td>292</td>
</tr>
<tr>
<td>12</td>
<td>SN4868431065</td>
<td>308</td>
</tr>
<tr>
<td>13</td>
<td>SN4826133094</td>
<td>349</td>
</tr>
<tr>
<td>14</td>
<td>SN4852432673</td>
<td>325</td>
</tr>
</tbody>
</table>

\(^4\) Distances are measured from the nearest turbine to each residential property (the building, itself not the nearest boundary of the property as a whole) as shown on OS Master Map Address Layer 2 data.

\(^5\) Distances have been measured from the centre of the settlement to the closest turbine.
3. Scheme Description and Design Strategy

3.6m and will be coloured either green or the same colour as the turbines to minimise visual impacts. The transformer dimensions and colour may vary depending on the final turbine model chosen.

3.22. The transformers will either be oil-filled and bunded to prevent spillage, or of a solid cast resin type which is effectively non-polluting. The transformers will increase the electrical voltage to 33kV and buried cables will connect the turbines to a substation on the site.

3.23. A total of approximately 34.5km of underground cabling will be required. The 33kV cables will run parallel to the access tracks where practicable, in trenches to a depth of approximately 0.9m and width of 0.6m (for a single cable array) to 2.7m (for a four cable array). The top layer will be reinstated. Figure 3.2 shows indicative cable trenches for one, two, three and four cable arrays.

**Substation Compound and Control Building**

3.24. There will be one onsite substation (SN 48809, 31110) (see Figure 3.2). The substation will consist of an enclosed hardstanding compound of approximately 4080m² within which a control building to house switchgear and control equipment will be located. It is proposed that the substation building will be designed to be in keeping with the locality.

**Meteorological Masts**

3.25. There will be one meteorological mast within the site boundary at grid reference SN 46544 31212 as shown in Figure 1.2. An indicative drawing is shown in Figure 3.3. The mast will have a hardstanding of approximately 1000m².

3.26. The following data will be recorded by the mast:
- Wind speed;
- Wind direction;
- Temperature.

**Site Access**

3.27. A number of options were considered for accessing the site for the delivery of turbines and other construction parts and machinery. Following discussions with CCC and an assessment of the routes using swept-path analysis, a preferred access route has been assessed in the EIA (illustrated in Figure 9.1).

3.28. The preferred access route to the site assumes that vehicles will leave the M4 at Junction 49 and travel north-northeast on the A48 towards Carmarthen. At Carmarthen, vehicles will then travel north on the A485 for approximately 16km before turning north of the Alltwalis Wind Farm onto a new access track across agricultural land to the west of the site. This route is described further in Chapter 9: Access, Traffic and Transportation, with the alternative routes considered described in Appendix 9.1: Access Report.

3.29. Two alternative access points from the A485 were considered in some detail. The existing access track to the Alltwalis Wind Farm, which lies to the south of the proposed route was considered both at the initial stages of the project and then revisited post-consultation in May 2011. On both occasions it was not possible to reach an agreement with the landowner to secure access to the wind farm site.

### Table 3.3: Turbine Grid Reference and Base Height AOD

<table>
<thead>
<tr>
<th>Turbine</th>
<th>Grid Reference</th>
<th>Base Height AOD</th>
</tr>
</thead>
<tbody>
<tr>
<td>15</td>
<td>SN4895532320</td>
<td>312</td>
</tr>
<tr>
<td>16</td>
<td>SN4911031992</td>
<td>307</td>
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<tr>
<td>17</td>
<td>SN4832234134</td>
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<td>18</td>
<td>SN4821033713</td>
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<tr>
<td>19</td>
<td>SN4863833537</td>
<td>336</td>
</tr>
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<td>20</td>
<td>SN489933213</td>
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<tr>
<td>21</td>
<td>SN499632723</td>
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<td>22</td>
<td>SN493132414</td>
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<td>SN4890934382</td>
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<tr>
<td>24</td>
<td>SN492743419B</td>
<td>341</td>
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<td>25</td>
<td>SN4940033566</td>
<td>318</td>
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<td>26</td>
<td>SN4942433163</td>
<td>315</td>
</tr>
<tr>
<td>27</td>
<td>SN497342835</td>
<td>308</td>
</tr>
<tr>
<td>28</td>
<td>SN4997433494</td>
<td>306</td>
</tr>
</tbody>
</table>

3.16. Most turbines will generate power at all wind speeds between about 4m/s (9mph) and 25m/s (56mph or gale force 10). When the average wind speed over a 10 minute period is greater than 25m/s the turbines will shut down for self-protection.

3.17. The MoD has confirmed that the Brechfa Forest West Wind Farm site will be suitable for infrared (IR) lighting. IR lighting is invisible to the naked eye but visible to aircrew wearing night vision goggles. Approximately one in three of the perimeter turbines and one central turbine will be marked with IR lights.

**Turbine Bases and Crane Hardstandings**

3.18. Each turbine base will comprise a steel reinforced concrete base slab measuring approximately 400m² x 1m deep with an upstand of 1m (Figure 3.10). Typically the foundations will be constructed to a depth of 2.5-3m depending on the terrain and backfilled with spoil over the foundation. Suitable excavated material will be reused on site in track construction and borrow pit reinstatement.

3.19. Water ingress to the base excavations may occur due to rainfall or localised small seepages in the soil or bedrock. In such cases, temporary pumping measures will be required to keep the base excavations dry during construction. Water from such excavations would be pumped to controlled settlement ponds or flat grassed areas. Mobile silt traps would be used where required to reduce sediment content to acceptable levels prior to discharge. Further information on the proposed mitigation measures relating to hydrological issues are set out in Chapter 8: Geology and Hydrology.

3.20. An area of crane hardstanding of up to 1000m² will be constructed adjacent to each turbine base to enable erection of the turbines. The hardstandings will be formed with aggregate laid on geotextile to a depth of at least 0.5m.

**Transformers and Cables**

3.21. The turbine transformers will be located outside the tower, adjacent to the base of each turbine. Including housing, the transformers will measure up to 6.25m x 4m, with a height of 3.6m and will be coloured either green or the same colour as the turbines to minimise visual impacts. The transformer dimensions and colour may vary depending on the final turbine model chosen.
3. Scheme Description and Design Strategy

3.30. The access via an Unclassified Road at New Inn was also considered and the detailed swept path analysis sets out the various challenges associated with this route. The conclusions of the report set out at Appendix 9.1 state that ‘The swept path analysis has shown that in order to deliver a turbine blade of 44m in length to the Western PDA (historical reference to Brechfa Forest West Wind Farm), via the preferred route (i.e. from the A485 onto the Unclassified Road at New Inn), it will be necessary to undertake various improvement works within the highway as well as works within some areas of third party land. Some of these works are considered to be significant at the New Inn / Unclassified Road junction, due to the potential works needed and requirements for third party land.’

3.31. These potential works included off site access works on the A485 at the S-bend at Gwyddgrug; the creation of a significant hardstanding area at the junction with the Unclassified Road; hedge trimming along the unclassified road; removal of mature trees; and redesign of the Tower access onto FCW managed land. In addition, due to the location of the turning onto the Unclassified Road within the centre of the village of New Inn, it was considered that the significant works required at this point would have a detrimental impact on the residents of the village as well as pedestrians walking through the village.

3.32. Stone that cannot be provided from the onsite borrow pit for specification reasons (e.g. roadstone) is likely to be sourced from Dinas Quarry, located near Llansawel, and brought to site via the B4337 northbound (via Rhydcymerau), a minor road to Llanllwni and then the A485 southbound. Tarmac, the owner of Dinas Quarry, has confirmed that the site has sufficient capacity and the appropriate permissions in place to supply the needs of Brechfa Forest West Wind Farm. Extraction of aggregate from Dinas Quarry and the routes used by vehicles leaving the site have been agreed by CCC as part of the quarry’s planning permission, including consideration of associated environmental impacts of extraction and transportation.

Access Tracks

3.33. Approximately 9.1km of new onsite access tracks will be constructed, and 12.7km of existing track will be upgraded.

3.34. The objectives for the design of the track layout were to:

- Maximise the use of existing forest tracks where possible;
- Minimise numbers of watercourse crossings;
- Avoid areas of environmental constraints including sensitive habitats and waterbodies;
- Keep overall track length to a minimum to reduce stone requirements and associated potential environmental impacts (e.g. from borrow pit operation);
- Maintain acceptable gradients for turbine delivery vehicles;
- Comply with Forestry Commission road specification;
- Ensure an appropriate drainage system for all track types is provided as dictated by local conditions.

3.35. The evolution of the access track design and the alternatives considered are detailed further below under Modifications to the Scheme Design: Access Tracks.

3.36. Typical track cross-sections are outlined in Figure 3.4. New tracks and existing tracks (once upgraded) will have a typical minimum running service width of 5m on straight sections, with wider curves at bends and bellmouths. The total width of access tracks will be 7m taking into account 1m shoulders on either side, and the 7m width will be surfaced with crushed stone. All tracks will be engineered in accordance with the specification set out in the Forestry Civil Engineering Handbook (incorporating the Department for Transport’s ‘Design Manual for Roads and Bridges’).

3.37. Although the running width of the tracks will be maintained, natural, non-woody vegetation growth will occur on the verges and on cut or fill slopes and managed as such.

Overtaking/Passing Places

3.38. To allow safe passing of construction vehicles onsite passing places may be required. Passing places will be located to minimise impact on environmental receptors during detailed engineering design.

Drainage

3.39. New and existing tracks that require upgrading will incorporate appropriate drainage measures to prevent the discharge of drainage water with a high sediment load into adjacent watercourses. The draft Construction Method Statement sets out further information on drainage requirements (see Appendix 3.1); a typical loose rock check dam is illustrated in Figure 3.7.

3.40. Final track drainage design will be determined prior to the commencement of construction.

Watercourse Crossings

3.41. No new watercourse crossings are required at the site. Two existing culverted watercourse crossings were identified on 1:25,000 scale OS maps and investigated during site reconnaissance, work for the hydrological assessment. Nine further existing culverted watercourse crossings (not visible on 1:25,000 scale OS maps) were identified during site reconnaissance. These culverts will be extended or replaced if necessary during the construction period. During the course of the construction programme culverts may be required at watercourse channels not identified during site reconnaissance, but will only be installed where there is a need to prevent significant disruption to the natural drainage pattern. Further detail on watercourse crossings is presented in Chapter 8: Geology and Hydrology and Appendix 8.2.

Borrow Pit

3.42. One new borrow pit, located at approximately SN 47929 32499, will be worked for the extraction of stone. The borrow pit will be approximately 10,000m² by 6m depth. Suitable locations for a borrow pit were identified through a desk-based study (of information relating to topography, geology, hydrology and past mineral exploitation) and a site reconnaissance survey.

Temporary Construction Compounds

3.43. There will be two temporary construction compounds of approximately 2500m²: one civil compound (SN 48089 33104) and an electrical compound located adjacent to the substation (SN 4868 31107). The civil compound will consist of an enclosed area of hardstanding, within which a temporary office and staff welfare buildings will be located. Both compounds will contain storage space.
Concrete Batching

3.44. The wind farm will require around 11,312m³ of concrete in its construction. Concrete batching will take place offsite, with ready-mixed concrete imported from the Carmarthenshire area.

CONSTRUCTION DETAILS

Indicative Construction Programme

3.45. It is anticipated that construction will be completed over a 22 month period, with four months of ground clearance and preparation and 18 months of wind farm construction. A period of felling works will take place prior to construction and will be undertaken by FCW staff and contractors on behalf of RWE NRL prior to the commencement of construction works. The construction phase will include, but not be limited to, the following principal activities:

- Ground clearance and preparation;
- Upgrading of existing access tracks and construction of new sections;
- Preparing the site, including extraction of stone from a borrow pit;
- Construction of temporary construction compounds;
- Construction of turbine foundations, bases and hardstandings;
- Construction of onsite substation and meteorological masts;
- Cable laying adjacent to site tracks;
- Connection of distribution and signal cables;
- Transport and erection of wind turbines;
- Commissioning of site equipment;
- Site restoration.

3.46. **Figure 3.5** shows the indicative construction programme.

**Figure 3.5: Indicative Construction Programme**

<table>
<thead>
<tr>
<th>Construction Task</th>
<th>Programme of construction in months</th>
</tr>
</thead>
<tbody>
<tr>
<td>Access to site</td>
<td></td>
</tr>
<tr>
<td>Mobilisation &amp; Enabling Works</td>
<td></td>
</tr>
<tr>
<td>Borrow Pit Establishment</td>
<td></td>
</tr>
<tr>
<td>Site Compound</td>
<td></td>
</tr>
<tr>
<td>Access Tracks Within Site</td>
<td></td>
</tr>
<tr>
<td>Foundations</td>
<td></td>
</tr>
<tr>
<td>Hardstanding Areas Within Site</td>
<td></td>
</tr>
<tr>
<td>Substation, Control Building &amp; Met Masts</td>
<td></td>
</tr>
<tr>
<td>Cabling and Electrical Works</td>
<td></td>
</tr>
<tr>
<td>Turbine Components Erection</td>
<td></td>
</tr>
<tr>
<td>Commissioning &amp; Restoration</td>
<td></td>
</tr>
</tbody>
</table>

3.47. Many of these operations will be carried out concurrently, although predominantly in the order identified. This will help to minimise the overall length of the construction programme. Site restoration will be programmed and carried out to allow restoration of disturbed areas to take place as early as possible and in a progressive manner.

3.48. The measures envisaged to avoid or minimise impacts during construction are discussed on a topic-by-topic basis in Chapters 7 to 17.

Vehicle Movements

3.49. It is anticipated that over the 22 month construction period there will be a total of 13,946 vehicle movements. The majority of these trips will be generated by the construction and construction phase will include, but not be limited to, the following principal activities:

- Connection of distribution and signal cables;
- Transport and erection of wind turbines;
- Commissioning of site equipment;
- Site restoration.

3.50. A draft Construction Method Statement (CMS) has been prepared (see Appendix 3.1). The draft CMS details measures to avoid or mitigate particular potential impacts associated with key construction activities reflecting and expanding upon measures identified within the ES. The draft CMS includes measures to minimise potential environmental impacts, and will be agreed with CCC, EAW, CCW, FCW and other stakeholders where appropriate prior to construction.

Jobs Created

3.51. It is estimated that up to 150 people will be employed on the site during this construction period post-felling, which is the equivalent of approximately 30 full time equivalent (FTE) jobs. There will also be additional workers employed by FCW to undertake the felling required to accommodate the development (see below).

Forestry Works

3.52. Brechfa Forest is managed according to a set of two Forest Design Plans (FDPs) which show felling proposals for 30 years and future proposed species for restocking. These are approved every 10 years and reviewed mid-term. The site is covered by one of these FDPs and following construction of the wind farm, the FDP will be updated by FCW.

Felling for construction

3.53. Forested areas create turbulence due to the wind passing over and through the trees. As such, the hub heights of turbines within forested areas need to be high enough to ensure that the blades are raised above the worst effects of turbulent areas. Studies have shown that it is necessary to increase the hub height up to 5-6 times the height of the forest or the clearance between the rotor and the ground should be at least twice the height of the forest when the prevailing wind direction (south westerly) is perpendicular to the clear-cut axis. Greater clearance around the turbines would not help since studies have shown that the turbulence intensity peaks at around 100-200m from the forest edge and that turbines should either be
3. Scheme Description and Design Strategy

placed close to the forest edge or a substantial distance from the forestry edge to minimise the effects of high turbulence.

3.54. RWE NRL won the right to develop a wind farm project on land managed by FCW on behalf of the Welsh Government through a competitive tendering exercise. A key aspect of this tender was that wind farm developments are intended to be delivered as an integrated part of the forest, rather than as a replacement land use. FCW wished to see wind turbines within woodland, integrated into the forest, rather than wind farms that replace woodland. In addition, there must be due regard to “the national interest in maintaining and expanding the forestry resources of … Wales…”, which ensures that the permanent loss of tree cover is to be minimised during the development of wind farms where existing trees provide demonstrable social, economic or environmental benefits.

3.55. Felling plans setting out areas to be felled to accommodate wind farm infrastructure have been prepared by RWE NRL in consultation with forestry specialists and FCW (see Figures 3.6a and 3.6b). The risk of windthrow in the stands adjacent to those to be felled was the main factor taken into consideration when designing felling areas. Another key factor was the need to minimise the extent and scale of felling and the need to avoid areas of Ancient Semi-Natural Woodland (ASNW) and Plantation on Ancient Woodland (PAWS). As such, the felling areas have been designed to avoid ASNW and PAWS as much as possible and the temporary felling construction activities but limiting the area of forest that needs to be felled (impacts on ASNW and PAWS are discussed further in Chapter 13: Non-Avian Ecology). However, trees above 15m are considered likely to suffer from significant windthrow risk. Therefore tree stands with a higher windthrow risk were designed to be felled to the nearest windfirm edge (such as a track or the start of a new stand), often beyond the 100m radius. Felling will be carried out by FCW ahead of RWE NRL’s construction works.

Restocking

3.56. Once felling to accommodate the wind farm is complete, the felled areas within a 47m radius of each turbine will be leased to RWE NRL for the lifetime of the development. This area will remain clear of trees. Post construction, the felled areas beyond the 47m radius will remain under the control of FCW in line with the agreed FDP. All ground will be left by RWE NRL in a state that is suitable for ground preparation and subsequent establishment of tree crops.

Reinstatement Post-Construction

3.57. Temporary construction areas beyond the 47m cleared buffer around each turbine will be left by RWE NRL such that they are suitable for ground preparation and subsequent establishment of tree crops by FCW. Areas leased to RWE NRL (47m radius) will be managed to avoid the growth of tree species and to enhance their ecological value in line with a Habitat Management Plan (see Chapter 13: Non-Avian Ecology) and Restoration Statement (a draft of which is contained in Appendix 3.2).

OPERATIONAL DETAILS

Operational Maintenance

3.58. Wind farm operation will include ongoing maintenance of access tracks and twice-yearly scheduled maintenance of each turbine which will take place on a rolling programme. The regular scheduled maintenance will typically consist of visual inspections, safety checks, grease application, and electrical and mechanical inspection and maintenance as required. Oil changes will occur every five years generally, but the oil will be topped up as required.

3.59. Six monthly servicing will take place during the months when wind speeds are lowest and will involve carrying out checks, inspections, general maintenance (e.g. changing oil filters) and non-essential repairs to blades, gearboxes and generators.

3.60. Operational activity will require an average of approximately 40-50 vehicle movements per month.

3.61. All abnormal loads or HGVs will follow the construction access route (as detailed in Chapter 9: Access, Traffic and Transportation). Normal operational vehicles may use other access points into Brechfa Forest.

Jobs Created

3.62. Up to 4-5 full time equivalent (FTE) jobs will be required to operate the wind farm over its operational lifetime.

DECOMMISSIONING

3.63. The wind farm has been designed with an operational life of 25 years. At the end of this period, unless further planning permission is sought, the turbines will be dismantled and removed from the site. The dismantling and removal of the turbines will be undertaken in a manner similar to that of their erection. The bases of the turbines and other above ground infrastructure (excluding access tracks) will be broken out to a depth of 1m below ground level. Any cabling at a depth of less than 1000mm will be made safe and removed. Any cabling at a depth of more than 1000mm will be made safe and either left in place or removed depending on requirements at the time.

3.64. All tracks will be retained for the use of FCW and recreational visitors to the site. Overall, it is estimated that the decommissioning period for a wind farm of this size will be approximately 12 months and will be considerably less than the duration of construction.

DESIGN STRATEGY

3.65. The relationship of a wind farm to the landscape in which it is located is a key consideration in wind farm design and therefore the consideration of alternative layout options. The inherent nature of turbines as large scale structures means that they cannot be hidden and the layout of turbines in a wind farm is therefore extremely important. A clear design strategy is necessary to set out the overall approach to the design development of the wind farm.
3.66. The need for ‘good design’ is reinforced in national policy including Overarching National Policy Statement for Energy (EN-1) (DECC, 2011) which seeks to ensure that energy infrastructure developments are “as attractive... as they can be”, and was reinforced in the Scoping Opinion from DECC. EN-1 goes on to state that “whilst the applicant may not have any or very limited choice in the physical appearance of some energy infrastructure, there may be opportunities for the applicant to demonstrate good design in terms of siting relative to existing landscape character, landform and vegetation”. This section details the design strategy that was adopted for Brechfa Forest West Wind Farm. It describes the characteristics of the site that informed the design strategy. It then details the landscape-led design of the turbine layout and goes on to discuss the layout of other scheme infrastructure.

3.67. The overall aims of the design strategy were to:

- Produce a cohesive layout which would be legible in views from the surrounding landscape and be easy to understand, whilst respecting other environmental constraints including those relating to hydrology, ecology, archaeology and telecommunications;
- Develop a layout that reflects the landform and topography of the landscape and helps to conserve valued landscape features;
- Develop a layout that seeks to match the scale of the turbines, and the scale of the overall development, with the scale of the landscape;
- Develop a layout that relates to other wind farms in the local area as well as being coherent in its own right.

Characteristics of the Site

3.68. The site is located on a ridge of high land which forms the southwestern tail of the Cambrian Mountains, and lies between the Cothi Valley to the southeast and the Teifi Valley to the northwest. The topography of the area around the wind farm site is characterised by gently convex plateaux, incised by steep valleys as shown in Diagram 3.1.

Diagram 3.1: Topography of the Site

3.69. Landscape scale is large as a result of the extensive plateaux tops, scale of the hills (reaching 408m AOD at Mynydd Llanbyther), and extensive forestry plantations.

3.70. A visual survey showed that from many nearby viewpoints the eye is drawn up and down the valleys, to the dramatic landforms on the edges of the plateaux. From other more distant or elevated viewpoints the eye is drawn to the higher ground of the Special Landscape Area to the northwest of the wind farm site, and particularly the cluster of communications masts located at Mynydd Llanybyther.

3.71. The most valued landscape features within the wind farm site include areas of semi-natural broadleaved woodland, semi-natural mixed woodland and burial mounds within the forest.

Application of the Landscape-Led Design Strategy to Turbine Layout

3.72. The starting point for the design of the turbine layout was to apply the design strategy to a review of the layout produced by RWE NRL for their tender to the FCW National Forest Estate Wind Farm Programme. As described in Chapter 1: Introduction, the planning application for Brechfa Forest West Wind Farm is being prepared at the same time as an application by RWE NRL to CCC for Brechfa Forest East Wind Farm. The two schemes were designed alongside each other from the outset due to their proximity and the need to ensure consistency in their designs.

3.73. The outcome of the design review showed that the turbines for both schemes in the tender layout were generally located on the plateau tops, avoiding the highest ridge of the hills and steep valley sides, and were of an appropriate scale to reflect the scale of the landscape. The
3. Scheme Description and Design Strategy

main issue to arise however was the difference in spacing of turbines between the two sites. Therefore, the two schemes did not sit comfortably together in views from viewpoints where the two schemes would be seen together, for example from the Mynydd Llanfihangel-Rhos-y-Corn Cairn summit. From such viewpoints, the western group appeared clustered while turbines in the eastern group appeared widely, and unevenly, spaced.

Design Workshop

3.74. The tender layouts for each scheme were taken forward to a design workshop in October 2009. The design strategy aims were used to modify the layouts to ensure they were coherent as standalone developments, but related well to each other and to other developments in the area.

3.75. Computer modelling was used as a tool to aid design. In particular, wireframes were generated for views from key locations around the site.

3.76. During the design workshop, consideration of all site constraints (not just landscape and visual issues) drove the layout changes that were made. For example, turbines were moved to avoid buffers around watercourses, telecommunications links and areas of high bat activity, and to ensure satisfactory energy yields.

3.77. Revisiting the design strategy objectives throughout the workshop enabled the tender layout to be altered, a number of alternatives considered, leading to more satisfactory turbine spacing and a better overall relationship with Brechfa Forest East Wind Farm and the operational Alltwalis Wind Farm. In summary, the following objectives were achieved as far as possible:

- Turbines were grouped to create a balanced and coherent image;
- Avoidance of ‘tangles’ of turbines, i.e. situations where multiple turbines can be seen one behind the other;
- Avoidance of ‘stray’ turbines which are remote from the rest of the group;
- Brechfa Forest West Wind Farm was kept compact, so that it reads as a single wind farm, with regular spacing between turbines;
- Turbines were placed to relate to the topography of the landscape;
- Avoidance of turbines seen at a great variety of levels;
- Turbines specifically located at high points were avoided, which would look prominent above the rest;
- The scheme was designed to be ‘tidy’ and to look designed and organised

3.78. For further information on layout iterations and therefore alternative layout options considered, see Table 3.2 and Figure 3.9. A comparison of the proposed indicative Brechfa Forest West turbines and those at Alltwalis Wind Farm are shown in Figure 3.8.

Design of Other Scheme Infrastructure

3.79. Other scheme infrastructure, generally being less visible across the wider area, was designed around ecological, hydrological, archaeological and landscape sensitivities, and technical requirements. The following principles were applied when designing the layout of other scheme infrastructure:

- Existing tracks to be used where possible to minimise the amount of land-take required for new tracks and track widening;
- New tracks to follow the contours of the landform and avoid steep gradients (thus reducing the need for cut and fill and associated disturbed or engineered slopes, which may be prone to erosion);
- Avoid watercourses where possible to minimise the number of watercourse crossings required;
- Buried cables to follow tracks to minimise impact on the site;
- Construction compounds and the borrow pit to be sited in felled areas or on unforested land where possible to minimise their impact on the character of the site.

Modifications to Scheme Design

3.80. Throughout the EIA process a number of modifications have been made to the scheme layout to avoid and minimise environmental impacts without compromising the overall design strategy (detailed above). A key process was the identification of site constraints through baseline studies. Constraints were identified for each topic area included in this ES and included telecommunications links, sensitive habitats, protected species, watercourses, dwellings, and cultural heritage features. The wind farm was then designed as far as possible to avoid constraints whilst also achieving the aims of the design strategy.

3.81. A summary of the modifications that were made to the design of the scheme throughout the EIA process is set out in Table 3.2. These modifications have included the relocation of turbines, access tracks, the borrow pit and other infrastructure to:

- Increase distances between turbines to improve technical performance;
- Minimise the visual impacts of the development;
- Allow sufficient distances between development components and watercourses and waterbodies;
- Minimise the number of watercourse crossings;
- Avoid key habitats of nature conservation interest and impacts on protected species;
- Avoid areas of archaeological interest.

3.82. Further information of the design iterations of the access tracks follows Table 3.2.

Table 3.2: Modifications to Scheme Design

<table>
<thead>
<tr>
<th>Layout Number</th>
<th>Modification Date</th>
<th>Purpose of Modification</th>
<th>Design/Revision</th>
<th>Resulting layout</th>
</tr>
</thead>
<tbody>
<tr>
<td>Layout 1</td>
<td>08/10/2009</td>
<td>To maximise wind yield,</td>
<td>Two turbines were deleted to increase the space between turbines for operational reasons. Several other turbines moved to maintain spacing.</td>
<td></td>
</tr>
<tr>
<td>Initial turbine layout submitted as part of RWE NRL’s Strategic Search Area G Variant bid to FCW</td>
<td>turbine spacing and address noise constraints.</td>
<td>Layout 2</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Brechfa Forest West Wind Farm: Environmental Statement 18 October 2011
### 3. Scheme Description and Design Strategy

#### 3.83. Access Tracks

Following the ‘design freeze’ of the Brechfa Forest West Wind Farm turbine layout, the access tracks were designed to create a continuous access route to each of the turbines and other infrastructure. This involved desk top studies and site visits.

#### 3.84. Main Brief from FCW

The main brief from FCW was to follow existing forestry roads as much as possible, resulting in environmental benefits by reducing the requirement for additional felling due to access tracks.

#### 3.85. Initial Desk Top Survey

An initial desk top survey was conducted including the use of maps, contour plans and aerial photographs to plot provisional track locations. In the event that it was not possible to follow existing roads then existing breaks in the trees and ‘forest rides’ were used where possible. Finally, priority was given to keeping each track within the same ‘felling coupe’ as the turbine where possible so that no additional felling would be required.

#### 3.86. Initial Site Visit

Following this initial work, a site visit was conducted to confirm (or otherwise) the suitability of each track. Particular attention was paid to gradients and sharp turns.

#### 3.87. Plans Submission

Plans were submitted to FCW for agreement. A further site visit was conducted with staff from FCW to explain the reasoning for the design, particularly where questions were raised about the location of the tracks.

#### 3.88. Track Locations

In the main, the track locations did not change substantially from the initial layout with the following exceptions:

- Track leading to T17 after taking a left hand turn from the main access point to the forest: This track has been removed from the plans as substantial work would have been required to widen the left hand turn and additional felling would have been required. As such, it was considered unnecessary as the traffic movement could turn right and follow the track to T13 before heading north to T17, T18, T23 and T24.

- Track leading to T17: As per the brief, the access track to this turbine followed an existing road (running north-south to the east of T17), however, having a track in that location would have resulted in additional, unnecessary felling, therefore the track was relocated to within the same ‘coupe’ of trees as the turbine to minimise felling.

- Track leading to T22: The track to this turbine was originally located within a coupe of trees. As felling plans materialised and it was discovered that it was not necessary to fell an entire coupe, it was decided to relocate the track to follow an existing forestry road.

#### 3.89. Amended Tracks

The following tracks were amended slightly (a few metres) to better follow ridges in the trees or to reduce the felling required:

- Track to T3
- Track to T25
- Track to T26.

#### 3.90. Raised Questions

The following tracks raised some questions regarding their location (either by RWE NRL following the site visit or at the request of FCW) but ultimately, following further investigation, the original position was found to be the most suitable and the tracks were not moved:
3. Scheme Description and Design Strategy

- Access track around T10: The question was raised whether the existing access track to the south of the turbine could be utilised instead of creating a new track. The reason for creating this new track in the first instance was the presence of a 90 degree left hand turn. During the site visit it was confirmed that the turn would take considerable reconstruction work to make it viable. A ‘dip’ in the existing road also made it difficult for the larger loads to continue to T11. The decision was made that the track should remain in its original position.

- Access track around T11: It was decided to create a new track to and around T11 as the gradient between the existing road and the turbine was too steep.

- Access track to and around T5 and T6: The gradient of the existing road in between these turbines was greater than is acceptable for the abnormal indivisible loads, therefore a new track is proposed.

MICROSITING

3.91. Dependent on ground conditions it may be necessary to further microsite turbines and other components of site infrastructure. To ensure that the final position of the turbines and other works are not varied to such a degree as to cause a notable change in the possible environmental impacts outlined in the ES, it is proposed that micrositing would be used to allow adjustment within a defined radius of the indicative turbine and infrastructure locations (up to 50m).

3.92. The Development Consent Order will provide for a zone of micrositing 'tolerance' for the works set within prescribed limits of deviation. Micrositing, as referred to throughout this ES, will be referred to in the Development Consent Order as 'Limits of Deviation' in accordance with the Planning Act 2008. Implementation of micrositing will be controlled through the Construction Method Statement, a draft of which is provided in Appendix 3.1.

3.93. The potential for micrositing was considered when the detailed survey and assessment work was undertaken on the basis that the turbines could be subject to micrositing. Surveys covering the full area of the application site were undertaken for all aspects of the environment (with some more specific/detailed surveys focused on infrastructure locations but still covering a wide enough area such that information is available on areas which may be affected by micrositing).

OTHER ASSOCIATED WORKS

Grid Connection

3.94. The wind farm is located in the operating area of Western Power Distribution. It is anticipated that the wind farm will be connected to the grid network at Swansea North Substation, located approximately 34.7km southeast of the wind farm. It is likely that the connection will be a combination of a 132kV overhead line on wooden poles and 33kV underground cables to the substation within the site boundary.

3.95. The connection to the grid will be subject to a separate application to the IPC under the provisions of the Planning Act, submitted by Western Power Distribution. In accordance with Overarching National Policy Statement for Energy EN-1, the IPC must be satisfied that there are no obvious reasons why a grid connection would not be possible, therefore, a further description and high level assessment of the grid connection route is set out in Appendix 3.3.

Offsite Access Works

3.96. A number of upgrades to the public highway will be required to allow turbines and other components and machinery to be brought to the site. These are detailed further in Appendix 3.4, which also presents a summary of potential impacts and mitigation requirements, and Appendix 9.1, which contains details of the swept path analysis undertaken. These works do not form part of the application to the IPC.

REFERENCES


4. SITE SELECTION PROCESS AND ALTERNATIVES CONSIDERED

INTRODUCTION
4.1. To meet targets for onshore wind energy production, a technical report was commissioned by the Welsh Government (then Welsh Assembly Government, WAG) in 2005 (Arup, 2005). This concluded that “for efficiency and environmental reasons…large scale (over 25MW) onshore wind developments should be concentrated into particular areas defined as Strategic Search Areas (SSAs)”. This process resulted in the identification of seven SSAs suitable for large scale wind farm development. These findings were incorporated into national planning policy through the Ministerial Interim Planning Policy Statement on Renewable Energy 01/2005 (now superseded by Planning Policy Wales (WAG, 2011)), and in more detail in Technical Advice Note 8: Planning for Renewable Energy (TAN 8) (WAG, 2005). This chapter describes this process and the subsequent involvement of RWE NRL in identifying a suitable area for the Brechfa Forest West Wind Farm development, including the alternatives considered.

SITE SELECTION

Strategic Search Areas
4.2. Brechfa Forest was identified as a SSA (known as SSA G) by WAG (Figure 4.1), along with six other locations throughout Wales.

Figure 4.1: Strategic Search Area G - Brechfa Forest


4.3. The identification of SSAs at the strategic level followed a ‘broad brush’ approach identifying “sufficient suitable land…to deliver the Assembly Government’s energy policy aspirations”. However,
4. Site Selection Process and Alternatives Considered

due to this approach, land within the areas chosen may not be technically, economically and/or environmentally suitable. Local planning authorities were charged with refining the SSAs to “guide and optimise development”. TAN 8 also states that local planning authorities can consider the use of land outside the SSAs for wind farm development if there is robust evidence for its suitability (WAG, 2005).

4.4. The SSAs were identified as they display the following characteristics:

- Extensive areas with good wind resources;
- Upland areas (typically over 300m AOD) with flat plateaus;
- Generally sparsely populated;
- Dominated by conifer plantation and/or improved/impoverished moorland;
- General absence of nature conservation or historic landscape designations;
- Sufficient area to accommodate developments over 25MW;
- Largely unaffected by broadcast transmission, radar, MoD Mid Wales Tactical Training Areas and other constraints.

4.5. In 2006 CCC commissioned Ove Arup & Partners to undertake a study for SSA G: Brechfa Forest “with a view to providing an evidence base for subsequent planning policy formation and decision-making” and to “identify a Preferred Area or Areas for large-scale wind farms broadly within the boundaries of the [SSA]” (Ove Arup & Partners, 2006). The report assessed the TAN 8 SSA G boundary against landscape and visual impact criteria and provided a refined TAN 8 SSA G boundary. This revised boundary however has not been adopted by CCC in its Supplementary Planning Guidance on wind farm development (CCC, 2008) as it recognises the need to assess the site against a wider range of criteria than just landscape and visual impact. It states that given the “variety of factors which can only be evaluated in the light of comprehensive environmental assessment, and also given the lack of CCC resources to pay for such assessment, this SPG does not refine the SSA boundaries identified in TAN8”.

Identification of Brechfa Forest West

4.6. In November 2005, following the publication of TAN 8, a tender process commenced for the wind farm development rights on land owned by WAG and managed by FCW. This process was called the National Forest Estate Wind Farm Programme (NFEWFP). RWE NRL undertook detailed analysis of six of the seven SSAs, considering the constraints and opportunities in each area. The results of the detailed analysis led RWE NRL to tender for the option to develop at Brechfa Forest through the NFEWFP tendering process, and were subsequently awarded an exclusive option to develop a wind farm on two areas of land managed by FCW in the Brechfa Forest. Brechfa Forest West is one of those areas.

4.7. To inform RWE NRL’s tender, a number of studies of SSA G were carried out to identify site constraints and provide further information on the characteristics of the area. This led to the refinement by RWE NRLF of land managed by FCW within the SSA boundary to identify two Potential Development Areas (PDAs) for turbines focussing on the most unconstrained areas of the SSA (see Figure 4.2). Alternative areas within SSA G were considered but not opted for due to a number of environmental constraints including proximity to homes, which ruled out the edges of the forest. Where small developable areas emerged through the constraint mapping process these were considered but later ruled out due to landscape considerations and the desire to avoid small groups of turbines scattered throughout the forest.

4.8. Further desktop assessments were undertaken to inform indicative site designs for the tender proposal and identify potential constraints to a successful wind farm development. Constraints assessed included ecology, electro-magnetic interference, recreation, forestry, archaeology, wind resource, proximity to residential properties, noise, topography, geology and hydrology, and landscape and visual characteristics.

4.9. The two PDAs constitute what are now termed Brechfa Forest West Wind Farm (the subject of this ES) and Brechfa Forest East Wind Farm (the application for which was submitted to CCC in December 2010). Further information about turbine and track layout alternatives considered is set out from paragraph 3.74 to 3.90 in Chapter 3.

REFERENCES


5. ENERGY POLICY CONTEXT AND SCHEME RATIONALE

INTRODUCTION

5.1. This chapter sets out the rationale for wind farm development at Brechfa Forest West in terms of the energy policy context and the scheme’s contribution towards reducing greenhouse gas emissions.

RENEWABLE ENERGY POLICY

The Changing Climate

5.2. Global climate change, resulting from increasing emissions of greenhouse gases, is widely recognised as being one of the greatest environmental challenges facing the world today. The UK Climate Impact Programme (UKCIP) has defined a range of possible climate change scenarios (low to high), reflecting assumptions about the direction of socio-economic change. For each scenario predicted, changes in climate variables are presented, such as changes in rainfall and temperatures up to the end of the century.

5.3. The Intergovernmental Panel on Climate Change (IPCC) Fourth Assessment Report on Climate Change (IPCC, 2007) updates the evidence for climate change, the effects on ecosystems and physical processes which have already taken place, and the predicted future effects including the loss of coastal wetlands; increasing damage from coastal flooding; increasing occurrence of infectious diseases, disease vectors and thermal stress; loss of various species as habitats are lost; and the migration of other species. It points to the important role of sustainable development in reducing vulnerability to climate change by increasing resilience, and states that a portfolio of mitigation and adaptation measures is required to reduce the risks associated with climate change.

5.4. Renewable energy sources (such as wind, solar, hydro and tidal power) do not rely on finite carbon based energy sources, but instead seek to harness continually replenished energy provided by the forces of nature. Using renewable energy to generate electricity, as opposed to gas, oil and coal, significantly lowers the release of carbon dioxide (CO₂) and other air pollutants, and can therefore help to mitigate the effects of climate change.

5.5. In response to the threats posed by climate change and the clear role that renewable energy must play in addressing the causes of climate change, by helping to reduce emissions of greenhouse gases, the UK and Welsh Governments have introduced a raft of renewable energy policies and targets. These are described further below.

UK Government Policy Context

Climate Change and Carbon Reduction

5.6. Reducing dependency on fossil fuels is a key element in tackling climate change and there is now a great deal of support for sustainable energy solutions. At the United Nations Framework Convention on Climate Change in Kyoto (1997), the UK made legally binding commitments to reduce its greenhouse gas emissions.

5.7. The Stern Review on the economics of climate change (Stern, 2006) was commissioned to assess the evidence and build an understanding of the economics of climate change. One of the key conclusions of the review was that “the benefits of strong and early action far outweigh the economic costs of not acting” and stabilising the climate requires the reduction of annual emissions.

* Climate Change: The UK Programme (2006)
5. Energy Policy Context and Scheme Rationale

5.8. As a further demonstration of the commitment to addressing both the causes and consequences of climate change, the UK Government has passed the Climate Change Act 2008. The Act creates ‘a new approach to managing and responding to climate change in the UK through: setting ambitious targets; taking powers to help achieve them; strengthening the institutional framework; enhancing the UK’s ability to adapt to the impact of climate change; and establishing clear and regular accountability to the UK Parliament and devolved legislatures”10. The Act provides the UK Government with the powers necessary to achieve the binding CO₂ emissions reductions target of at least a 26% reduction from 1990 levels by 2020 and to reduce greenhouse gas emissions by at least 80% below 1990 levels by 2050. The Climate Change Act sets legally binding ‘carbon budgets’ to cap emissions over five-year periods, with three budgets set at a time, to help the UK stay on track for the 2050 target to cut emissions by 80%. The first three carbon budgets will run from 2008-12, for which point a 22% reduction on 1990 levels has been set, 2013-17 (a 28% reduction on 1990 levels) and 2018-22 (a 34% reduction on 1990 levels)11. One of the proposals set by the Government to meet these ‘carbon budgets’ is investment in clean energy technologies such as renewables.

5.9. As a result of the 2009 Copenhagen Climate Summit (COP15), the UK’s Department of Energy and Climate Change published a Climate Change Action Plan entitled “Beyond Copenhagen” (DECC, 2010) which sets out aims to deliver at least a 34% cut in UK emissions by 2020 and at least 80% reductions by 2050.

**Renewable Energy**

5.10. Renewable energy generation is a key strand of the Government’s approach to reducing emissions of CO₂. In May 2007, the UK government published a White Paper (DTI, 2007) with the aim of defining a long-term strategic vision for energy policy. Within this paper the Government identified technologies such as onshore and offshore wind, in addition to biomass, as being potentially the most cost-effective ways of limiting carbon emissions.

5.11. The UK Government passed the Energy Act 2008, in November 2008, which implemented the legislative aspects of the 2007 Energy White paper. The passing of this Act was driven by the twin aims of tackling climate change by reducing CO₂, and the need to ensure secure, clean and affordable energy: the two long-term energy challenges facing the UK.

5.12. In 2007, European Union (EU) leaders agreed to adopt a binding target requiring 20% of the EU’s energy (electricity, heat and transport) to come from renewable energy sources by 2020. The UK has signed up to the EU Renewable Energy Directive (formally agreed in April 2009) and agreed to legally binding targets of 15% of energy from renewable sources by 2020. The UK’s Renewable Energy Strategy (RES) (Department of Energy and Climate Change (DECC), 2009), published alongside The UK Low Carbon Transition Plan (DECC, 2009) sets out how the UK will increase its energy generation from renewable sources and meet emission reduction targets. The RES imposes biennial reporting requirements to monitor progress towards the achievement of targets.

To ensure Member States stay on track to meet their targets, the EU Renewable Energy Directive requires Member States to submit National Action Plans detailing how they intend to achieve their targets. The UK Renewable Energy Strategy (DECC, 2009) provides the basis for the UK National Action Plan which was submitted to the European Commission in July 2010. The Strategy sets out the path for the UK to meet the legally binding renewable energy target by 2020. The Strategy will help to tackle climate change, reducing the UK’s emissions of CO₂ by over 750 million tonnes between now and 2030.

5.13. The lead scenario in the UK Renewable Energy Strategy to reach 15% of energy from renewable energy sources by 2020 indicates that 30% of our electricity, 12% of heat and 10% of transport could be generated from renewables by 2020. The Government plans to deliver this through:

- Putting in place financial support for renewable electricity and heat worth around £30 billion between now and 2020.
- Driving delivery and clearing away barriers through establishing the Office for Renewable Energy Development to drive delivery of targets.
- Increasing investment in emerging technologies and pursuing new sources of supply.
- Creating new opportunities for individuals, communities and business to harness renewable energy.

5.14. The UK Low Carbon Transition Plan, a White Paper, outlines the policies and proposals that will be put in place to decarbonise the UK economy and sets out how the UK’s energy needs will be met in the coming decades, building on the strategic vision set out in the 2007 Energy White Paper. The UK has committed to sourcing 15% of its total energy from renewable sources by 2020. As in the 2007 Energy White Paper, the Government believes this will come primarily in the form of onshore and offshore wind generation.

5.15. The Energy Act (2010) received Royal Assent on 8 April 2010 and follows on from The Low Carbon Transition Plan. The Act implements some of the key measures outlined in the Low Carbon Transition Plan to deliver a low carbon agenda. Some of the key measures include, introducing a carbon capture and storage incentive, tackling fuel poverty by lowering energy bills for vulnerable consumers, and increasing fairness in the energy market.

5.16. DECC has published six National Policy Statements (NPSs) to guide planning decisions by the IPC on nationally significant energy infrastructure projects, including renewable energy. These set out the energy policy context (as described above) and key principles which the IPC will use in determining applications for energy infrastructure (these aspects of the NPSs are described further in Chapter 6: Planning Policy Context).

**Welsh Government Targets**

5.17. The Welsh Government has published One Wales: One Planet (WAG, 2008) which sets out the sustainable development programme for Wales. This contains a commitment to reduce greenhouse gas emissions in Wales, and sets out how Wales will deliver its share of UK targets contained in the UK Climate Change Act 2008. The programme recognises that Wales will need to reduce its use of carbon based energy by 80-90%, resulting in a similar reduction in greenhouse gas emissions. WAG has set a target to reduce greenhouse gas emissions by 3% per year from 2011 in areas of devolved competence.
5.19. The Climate Change Strategy – High Level Policy Statement (Consultation) (Welsh Assembly Government, 2009a) and the Climate Change Strategy – Programme of Action (Consultation) (Welsh Assembly Government, 2009b) set out policy intentions that expand on One Wales. The results from these two consultation documents were used to produce a final Climate Change Strategy for Wales, published in October 2010. The Strategy sets out how Wales will act to reduce greenhouse gas emissions, including enabling the development of larger scale renewable energy generation.

5.20. In 2009 the Welsh Government produced a Green Jobs Strategy (Welsh Assembly Government, 2009c) aiming to help deliver the commitment to “combat the causes of climate change”. The strategy promotes the “greening of existing jobs”, the stimulation of “new green jobs” and the “strengthening of the low carbon energy sector in Wales”. The ‘Low Carbon Economy’ is one of the sectors to be prioritised for research and development (R&D) and commercialisation funding within Wales with important implications for “opportunities arising from large scale renewables and other low carbon technologies”. The strategy also recognises the value of the low carbon and environmental goods and services (LCEGS) sector to the domestic and global markets and highlights the “attractive opportunity for the UK’s manufacturing base to exploit current and emerging technologies”. Wind energy is noted as being one of the largest LCEGS industries in Wales in terms of the employment and market value, and also one of the fastest growing. One of the supporting indicators used to measure the success of this strategy will include electricity generated from renewable and other low carbon resources.

5.21. The Welsh Government has recently set out bold targets for new renewable energy capacity by 2025. The Low Carbon Revolution Energy Policy Statement (Welsh Assembly Government, 2010) calls for a total output of 22.5GW, including 2GW of onshore wind by 2017. The document also sets out proposals for moving Wales towards self-sufficiency in renewable electricity in a generation, whilst at the same time moving towards greater energy efficiency. In particular, WAG believes that it is feasible for Wales to produce more electricity from renewables than it consumes as a nation by 2050.

**Contribution of the Brechfa Forest West Wind Farm**

5.22. With a likely output of between 56MW and 84MW (28 x 2 or 3MW) per annum, the proposed Brechfa Forest West Wind Farm will make a significant contribution to meeting renewable energy targets in Wales by saving 115,386 tCO₂ per annum after a 1.1 year payback period as calculated in accordance with the AUMLURI guidance (Nayak et al., 2008). This equates to a total saving of 2,757,725 tCO₂ over the 25 year lifetime of the development. The Assessment of Carbon Savings and Payback Period is set out in Appendix 5.1.

5.23. The average annual generation expected at the site would be equivalent to the approximate domestic needs of up to 39,700 average UK households.¹⁴

5.24. This offset will make a significant contribution to the UK Government’s target of cutting emissions of CO₂ by 34% on 1990 levels by 2022.

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**REFERENCES**


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¹² As outlined in Chapter 3, a specific turbine manufacturer has not been identified at this stage and therefore the power output of the turbine is not known. The power output for a turbine of up to 145m to tip height is likely to be between 2 and 3MW.

¹³ Aberdeen University Macaulay Land Use Research Institute

¹⁴ Equivalent homes supplied is based on an annual electricity consumption per home of 4700 kWh. This figure is supported by recent domestic electricity consumption data available from The Digest of UK Energy Statistics and household estimates and projections from the UK Statistics Authority.
5. Energy Policy Context and Scheme Rationale
6. PLANNING POLICY CONTEXT

INTRODUCTION

6.1. This chapter describes the planning and regulatory framework of relevance to the proposed Brechfa Forest West Wind Farm. Its purpose is to outline the main policies of relevance to the determination of the application and to provide background to the consideration of the potential environmental impacts of the proposed development as set out in Chapters 7 to 17. The energy policy set out in Chapter 5: Energy Policy Context and Scheme Rationale will also be an important material consideration in the planning process.

6.2. A more detailed discussion of the planning policy context for each of the topics considered in the EIA is contained within the relevant topic chapters.

6.3. Further details of the planning policy framework and discussion as to how the proposal accords with this framework is included in a Planning Statement, that has been prepared to support the application, but which does not form part of this ES.

PLANNING AND REGULATORY FRAMEWORK

6.4. This ES accompanies an application to the IPC for development consent under the provisions of the Planning Act 2008 and subsequent secondary legislation.

6.5. As stated in Section 31 of the Planning Act “consent under this Act is required for development [that] forms part of a nationally significant infrastructure project”. Brechfa Forest West Wind Farm is classed as a nationally significant infrastructure project (as defined in Section 15(2) of the Planning Act), by virtue of the fact that it is an onshore generating station with an installed capacity of over 50MW.

6.6. The application will be determined by the IPC (or subsequent body) in accordance with relevant National Policy Statements, except where this would result in any breaches of international obligations, duty or law, or where the adverse impacts of the development outweigh the benefits (Section 104 of the Planning Act).

NATIONAL POLICY STATEMENTS

6.7. National Policy Statements (NPSs) are the main policy documents for nationally significant infrastructure projects and form the primary basis for decisions by the IPC. In the case of renewable energy projects the following NPSs apply:

- Overarching National Policy Statement for Energy (EN-1).

6.8. The NPSs are the primary policy documents for decision making.

Overarching National Policy Statement for Energy (EN-1)

6.9. This overarching NPS is part of a suite of NPSs issued by the Secretary of State for Energy and Climate Change. It sets out the Government’s policy for delivery of major energy infrastructure. In summary:

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15 Details of how to obtain copies of the Planning Statement are provided in the preface of the ES.
6. Planning Policy Context

- Part 1 states that in accordance with the Planning Act 2008, the IPC must decide an application for energy infrastructure in accordance with NPSs except to the extent it is satisfied that to do so would:
  - lead to the UK being in breach of its international obligations;
  - be in breach of any statutory duty that applies to the IPC;
  - be unlawful;
  - result in adverse impacts from the development outweighing the benefits; or
  - be contrary to regulations about how its decisions are to be taken.

- Part 2 sets out the policy context for the development of nationally significant energy infrastructure, and it reflects the ‘UK Low Carbon Transition Plan – National strategy for climate and energy’. This is further described in Chapter 5 of this ES.

- Part 3 sets out the need for new energy infrastructure (again further described in Chapter 5 of this ES). In summary EN-1 identifies that net additional electricity generating infrastructure will be needed to ensure adequate supplies as we move towards low carbon forms of energy, specifically around 30% of electricity generation will come from renewable sources by 2020, which will come primarily in the form of large amounts of onshore and offshore wind generation. EN-1 states that “there is an urgent need for new (and particularly low carbon) energy NSIPs [Nationally Significant Infrastructure Projects] to be brought forward as soon as possible” and states that “The IPC should…assess all applications for development consent for the types of infrastructure covered by the energy NPSs on the basis that the Government has demonstrated that there is a need for those types of infrastructure and that the scale and urgency of that need is as described for each of them”.

- Part 4 sets out assessment principles and generic impacts.

6.10. The following key principles are identified in Part 4:

- Given the level of need for energy infrastructure, if the development is in accordance with the NPS and any relevant technology-specific NPS, then the IPC should operate on the basis that consent should be given (subject to the exceptions set out in Part 1 of the NPS described above);
- The Planning Act requires the IPC to have regard to other matters in addition to any relevant NPS, including any local impact report submitted by a relevant local authority;
- The IPC should take account of national, regional and local benefits (environmental, social and economic) including the contribution to the need for energy infrastructure, job creation and any long-term or wider benefits which may be identified in the NPS, technology-specific NPS or the application or elsewhere;
- If the IPC is satisfied that the adverse impacts identified outweigh the benefits (taking into account measures to avoid, reduce or compensate for those adverse impacts) consent should be refused.

6.11. Part 4 also provides overarching policy in relation to a range of issues, including the following, of relevance to Brechfa Forest West Wind Farm:

- Environmental Statements and their content
- Habitats Regulations Assessment
- Consideration of alternatives
- Criteria for ‘good design’ for energy infrastructure
- Grid connection, which states that “the IPC will want to be satisfied that there is no obvious reason why a grid connection would not be possible”
- Pollution control and other environmental regulatory regimes
- Safety
- Health
- Security considerations.

6.12. It goes on to identify a range of generic impacts which should be considered as appropriate, including an introduction to the issue, what the applicant’s assessment should cover and the IPC’s approach to decision making and mitigation requirements. Many of these are discussed in more detail in the technology specific NPS (see below). The specific policy requirements for each topic are also described further in Chapters 7 to 17.

National Policy Statement for Renewable Energy Infrastructure (EN-3)

6.13. EN-3 contains policy specifically relating to renewable energy infrastructure and is designed to be read in conjunction with EN-1. The NPS contains information on assessment requirements for renewable energy infrastructure and a range of technology specific information. Section 2.7 specifically covers onshore wind.

6.14. The introductory section of Part 2 of EN-3 ‘Assessment and Technology-Specific Information’ starts by reiterating the statement in EN-1 that:

“the IPC should act on the basis that the need for infrastructure covered by this NPS has been demonstrated”.

6.15. In terms of the relationship with Welsh renewable energy policies, EN-3 states that planning policy and advice issued by the Welsh Government relevant to renewables will provide important information to applicants, and that the IPC should have regard to these policies and expect applicants to have taken them into account when working up their proposals. Applicants are required to explain in their applications how their proposals fit with the guidance and support its targets. However, EN-3 states that whether or not an application conforms to the guidance or targets will not, in itself, be a reason for approving or rejecting the application.

6.16. In terms of onshore wind, EN-3 identifies a number of factors influencing site selection by the applicant for information purposes (including predicted wind speed, proximity of the site to dwellings, capacity of the site, electricity grid connection and access).

6.17. A number of technical considerations for the IPC to take into account when determining onshore wind farms are detailed:
Applicants should assess the full extent of the access tracks necessary to connect onshore wind farms to the public road network and their effects.

Applications should set out details of project lifetimes and what will be decommissioned and removed from the site at the end of the operational life of the plant. EN-3 notes that consents should be time-limited by a condition, and that the time-limited, non-permanent nature of wind farms is likely to be an important consideration for the IPC when assessing impacts such as landscape and visual effects and potential effects on the setting of historic assets.

EN-3 notes the need for flexibility in project details due to the fact that exact turbine types are unlikely to be known at the point of the submission. Where specific details of the design are uncertain this should be made clear and a 'maximum-case' scenario assessed. The likely need for flexibility in respect of micrositing of proposed elements of a wind farm is also noted.

6.18. IPC 'Impact Assessment Principles' are outlined in EN-3 as follows:

- In sites with nationally recognised designations, consent for projects should only be granted where it can be demonstrated that the objectives of designation of the area will not be compromised and the significant adverse effects are clearly outweighed by environmental, social and economic benefits;
- EN-3 makes it clear that the IPC should not use a sequential approach to locational considerations e.g. giving priority to the re-use of previously developed land, since most renewable energy resources can only be developed where the resource exists and where economically feasible.

6.19. EN-3 goes on to summarise potential areas of impact, including what the applicant's assessment should cover, as appropriate, the IPC's approach to decision making, mitigation and the need for future surveys and monitoring for the following topics:

- Biodiversity and geological conservation
- Historic environment
- Landscape and visual
- Noise and vibration
- Shadow flicker
- Traffic and transport.

6.20. The specific policy requirements for each topic are described further in Chapters 7 to 17.

OTHER POLICY CONSIDERATIONS

6.21. Section 104 of the Planning Act 2008 states that the IPC Panel or Council must have regard to relevant NPSs but also any reports, documents or other matters that "are both important and relevant to [the] decision". As such other national policy and development plan policy may be material considerations in the decision making process (as detailed in EN-1). These are described further below.

National Planning Policy, Advice and Guidance

6.22. National planning policy, advice and guidance, which has informed the preparation of the NPSs, is also likely to inform the IPC's decision making process. Key planning policy, advice and guidance of greatest relevance to the Brechfa Forest West Wind Farm is described below:

- Securing the Future: The UK Government Sustainable Development Strategy (DEFRA, 2005);
- Planning Policy Wales (PPW) (WAG, 2011);
- One Wales: One Planet. The Sustainable Development Scheme of the Welsh Assembly Government (WAG, 2009);
- Technical Advice Note 5: Nature Conservation and Planning (WAG, 2009);
- Technical Advice Note 8: Planning for Renewable Energy (WAG, 2005);
- Technical Advice Note 12: Design (WAG, 2009);
- Technical Advice Note 16: Sport, Recreation and Open Space (WAG, 2009);
- Technical Advice Note 18: Transport (WAG, 2007).

UK Government Sustainable Development Strategy

6.23. The UK Government Sustainable Development Strategy (Defra, 2005) is a key document in relation to sustainable development in the UK. It takes account of developments since the previous 1999 strategy, both domestically and internationally including the changed structure of Government in the UK with devolution in Scotland, Wales and Northern Ireland, the greater emphasis on delivery at the regional level and the altered relationship between Government and Local Authorities.

6.24. The Strategy contains a set of shared UK principles that will be used to achieve sustainable development and that will form the basis for policy in the UK. These guiding principles set out an overarching approach for the UK Government and devolved administrations to work within. These are:

- living within environmental limits;
- ensuring a strong, healthy and just society;
- achieving a sustainable economy;
- promoting good governance;
- using sound science responsibly.

Planning Policy Wales

6.25. Planning Policy Wales (PPW) (WAG, 2011) sets out WAG's aims and objectives for infrastructure and services which includes promoting "the generation and use of energy from renewable and low carbon energy sources at all scales" (para 12.1.4). It also seeks to secure "an appropriate mix of energy provision for Wales whilst...minimising environmental...impacts", in part by "strengthening renewable energy production" (para.12.B.6). It states that "local planning authorities
6. Planning Policy Context

should facilitate the development of all forms of renewable and low carbon energy”, and should “make positive provision by…ensuring that development control decisions are consistent with national and international climate change obligations, including contributions to renewable energy targets and aspirations”. At the same time, local planning authorities must “ensure that international and national statutory obligations to protect designated areas, species and habitats and the historic environment are observed” and “that mitigation measures are required for potential detrimental effects on local communities, whilst ensuring that the potential impact on economic viability is given full consideration.” (para.12.8.10).

TAN8: Planning for Renewable Energy

6.26. Technical Advice Note 8 (TAN8): Planning for Renewable Energy (Welsh Assembly Government, 2005) provides technical advice relating to the delivery of Wales’ renewable energy and onshore wind energy targets. TAN8 recognises that the SSAs for onshore wind are of key importance to the achievement of energy policy targets (para. 5.4).

6.27. Annex C of TAN8 provides a description of wind energy including general policy advice on a range of issues such as noise, landscape, ecology and ornithology, archaeology, shadow flicker and aviation.

A Low Carbon Revolution: Wales’ Energy Policy Statement


The Development Plan

6.29. The site lies within Carmarthenshire, 10km northeast of Carmarthen. The development plan for the area is the Carmarthenshire Unitary Development Plan (UDP) (adopted July 2006). This contains policies in relation to the promotion of renewable energy and particularly wind energy; the protection of the natural environment, landscape features, recreation assets and the historic environment; and the protection of the amenity of local communities, in particular:

- Policy UT5 – Renewable Energy seeks to promote renewable energy proposals as long as they do not have adverse impacts on the quality of the local environment (natural and historic), and do not have adverse impacts in terms of noise, water or air pollution and traffic generation.

- Policy UT6 – Wind Energy sets out the criteria which proposals for wind energy (including ancillary works) will be expected to meet, including in relation to avoidance of adverse impacts on the natural and historic environment, landscape, highway safety, provision of public services, and various forms of amenity.

6.30. The Carmarthenshire Local Development Plan (LDP) will eventually replace the Unitary Development Plan, but is still in the early stages of development. The LDP Deposit Draft was published for public consultation in June 2011. The emerging Plan may also form a material consideration if deemed important and relevant by the IPC. The key policy set out in the LDP Deposit Draft is SP11: Renewable Energy & Energy Efficiency which seeks to support renewable energy developments “in areas where the technology can operate effectively and the environmental and cumulative impacts can be addressed satisfactorily. Such developments will not cause demonstrable harm to residential amenity and will be acceptable within the landscape. Large scale wind farms will only be permitted within refined Strategic Search Areas.”.

Carmarthenshire Supplementary Planning Guidance (SPG)

6.31. Carmarthenshire’s Supplementary Planning Guidance (SPG) for Major Wind Farm Development in the Brechfa Forest Area (Carmarthenshire County Council, 2008) was produced in response to the identification, by the WAG, of Brechfa Forest as an area suitable for major wind farm development. The purpose of the SPG is to provide information on the character of the Brechfa Forest Area; encourage developers to design proposals with maximum sympathy for the local environment; and assist in the determination of applications for major wind farm development. The SPG advises on the interpretation and application of policies contained in the UDP and is not in itself, a separate plan16.

6.32. The SPG notes that it does not refine the Strategic Search Area boundaries identified in TAN8. CCC considers that the SPG, read in conjunction with the UDP and TAN8, contains sufficient guidance to assist a potential developer without further refinement of the Strategic Search Area (para. 7.8.8).

6.33. Given the specific spatial and thematic focus of the SPG it is very likely that the IPC will take account of the SPG when determining the planning application for Brechfa Forest West Wind Farm.

REFERENCES


16 Carmarthenshire Wind Farm SPG, para.3.1.