

CHAPTER 17 - GRID CONNECTION

Introduction

- 17.1 The Mynydd y Gwynt Wind Farm will be connected to the UK electricity network via a 132kV line from the onsite substation at SN 283088 285005 to a new Scottish Power Manweb PLC (“SPM”) Substation located near to Cefn Coch; a distance of between 32km and 45km depending on the route chosen. The application for the grid connection does not form part of this application as it will be promoted by SPM as a standalone NSIP project. However, the purpose of this chapter is to illustrate that there are no major environmental constraints which may compromise the route, and there is no obvious reason why a grid connection would not be possible.

National Policy

- 17.2 The Overarching National Policy Statement for Energy (EN-1) states in section 4.9:

“The connection of a proposed electricity generation plant to the electricity network is an important consideration for applicants wanting to construct or extend generation plant. In the market system, it is for the applicant to ensure that there will be necessary infrastructure and capacity within an existing or planned transmission or distribution network to accommodate the electricity generated. The applicant will liaise with National Grid who own and manage the transmission network in England and Wales or the relevant regional Distribution Network Operator (DNO) to secure a grid connection. It may be the case that the applicant has not received or accepted a formal offer of a grid connection from the relevant network operator at the time of the application, although it is likely to have applied for one and discussed it with them. This is a commercial risk the applicant may wish to take for a variety of reasons, although the IPC will want to be satisfied that there is no obvious reason why a grid connection would not be possible”.

- 17.3 During the development life of the Mynydd y Gwynt wind farm there have been several rounds of discussions with SPM, particularly at appropriate times: when the size of the expected wind farm has changed; or other developments have been announced concerning the Mid Wales connection project. Over the life of the project it has received four grid connection offers reflecting these discussions. In January 2008 the first offer was received for 72MW with a connection date of October 2014. In August 2010 a revised offer for 69MW was received with a connection date of October 2015. In December 2011 an offer for 81MW was received with a revised connection date of October 2016, the changes in connection dates reflecting the delays to the mid Wales connection project. Another offer was made in February 2013 with the connection date further delayed to October 2017. A final grid connection application for an 81-89.1MW connection has been submitted in mid-May 2014 following lengthy discussions with SPM. SPM now has a statutory duty to produce a grid connection offer within 90 days. According to information released by SPM and NGET the connection date is now predicted to be 2019.
- 17.4 SPM has outlined some principal corridors for connecting the Strategic Search Areas (“SSAs”) B and C to the new substation at Cefn Coch. Although they have refined their proposals and indicated a preference, no decision has been made about where the final corridors will go. In each of the previous offers to Mynydd y Gwynt the length of the estimated grid connection has varied, reflecting the varying possibilities for the connection

route. During discussions in 2011, SPM indicated that the route of the grid connection from Mynydd y Gwynt was likely to run from the site substation along the main access track on wooden poles to the A44. It was then to follow the A44 / A470 corridor on wooden poles until it connected into the line from SSA C to Cefn Coch somewhere in the vicinity of Caersws. This was the preferred grid route option given with the December 2011 offer. This route corridor is therefore referred to as Mynydd y Gwynt 'Option 1'. From here the combined connection was to continue to a new Mid-Wales West grid supply point, at Cefn Coch, a further 15km to the North. This route is shown as CC1 on SPM's consultation documents: <http://www.spmidwalesconnections.info/english/>.

- 17.5 The February 2013 offer was silent on the route corridor so the draft submission documents addressed the previously assessed and practicable route along the A44 corridor was submitted.
- 17.6 However, during the S42 consultation process (which took place in May - July 2013) SPM indicated that their preferences for a likely route corridor had changed. SPM now suggest that their preferred option is a more direct route heading in a north/north easterly direction from the site towards the existing substation serving the Carno Wind Farms. This more direct route would join up with the Carno III project at the existing substation to the south west of the Carno wind farms. Recent communications with SPM suggest this latest route corridor remains the preferred route.
- 17.7 The combined capacities of the two projects (81-89.1MW and 48MW for Carno III) would both be able to be accommodated by a single 132kV wooden pole overhead line circuit. The typical capacity of such a line is in excess of 160MW. The Carno III planning application was submitted in July 2010 and the promoter is contracted to SPM for a grid connection. As such, this route is shown as the BSC line on SPM's consultation documents.
- 17.8 This, more direct, route option from Mynydd y Gwynt via Carno to Cefn Coch is referred to as Mynydd y Gwynt 'Option 2'. See **Figure 17.11** for both route options.
- 17.9 Feasibility studies have been completed by SPM and National Grid Electricity Transmission ("NGET") to determine the route and locations of the major elements in the new network, which will be the subject of a separate planning application. Several rounds of public and stakeholder consultations have been ongoing for some years. The current anticipated completion date for the connection point is in 2019.

Route Corridor Mynydd y Gwynt Option 1

- 17.10 An archaeology and ecology desk study has been completed by ADAS for a section of the route to identify any archaeological and ecological constraints within and adjacent to the proposed grid connection route (see **Appendix 17.1** and **17.2**). SPM has produced a landscape sensitivity report, cultural heritage report and strategic ecological report outlining further areas that the grid connection route could affect. Both sources of information have been used for this assessment.

Assessment Method Mynydd y Gwynt Option 1

- 17.11 The proposed route of the grid connection was assessed to determine if there are any ecology, archaeology and landscape constraints in the vicinity of the route. No field based surveys were carried out; all the information gathered is desk based.
- 17.12 As the exact route and connection point had not been decided at the point when desk studies were carried out, the archaeology and ecology reports cover the route up to the point just east of Llanidloes (archaeology and ecology data and maps in **Appendix 17.1** and **17.2** were based up to a point to the east of Newtown as a worst case scenario in the event the CA2 corridor was chosen). From there the route will go north to a substation at Cefn Coch following the CC1 corridor as in the SPM report: "Routeing Methodology and Route Corridors Appraisal-Phase 2 report. March 2012". SPEN reports were used to further assess the impacts on the chosen corridor route from Llanidloes to Cefn Coch.

Landscape Mynydd y Gwynt Option 1

- 17.13 A desk based theoretical landscape sensitivity study was undertaken by SPM, followed by a detailed field based study. The methodology for judging landscape sensitivity and the results of the field-based assessment of sensitivity are set out in the report "Field-Based Landscape Sensitivity in Relation to Overhead Lines" (Land Use Consultants ("LUC") in association with Gillespies, November 2011). The chosen route corridor, route CC1 is not located within a nationally designated landscape such as a National Park or Area of Outstanding Natural Beauty and does not pass through any areas of high landscape sensitivity. This route would involve the least landscape and visual impact, with most of the route falling within forested areas, with little or no need for felling, or along roads, meaning the minimal physical changes to the landscape, and minimal visual impact in the more sensitive locations in this landscape.

Ecology Mynydd y Gwynt Option 1

Mynydd y Gwynt Substation to Corridor CC1 east of Llanidloes

- 17.14 This study was desk based and information on statutory and non-statutory wildlife sites was obtained from the Multi-Agency Geographic information for the Countryside ("MAGIC"), Natural Resources Wales ("NRW") and Powys Biological Information Services ("BIS"). Local sites within 2km and protected and priority species within a 1km buffer of the proposed route were highlighted. The area under study ran from the proposed substation at SN 283088 285005 to the point of connection with corridor CC1, just east of Llanidloes.
- 17.15 Several sites with statutory designations were identified within the 10km search area of the chosen route. These are unlikely to be affected by the localised proposed works. The sites that are in close proximity to the line are listed in **Table 17.1** below. These sites should be considered carefully as to whether the works will impact upon them and associated species.

Table 17.1: Statutory Designations		
Site Name	Site Designation	Distance from Route
Elenydd Mallaen	Special Protection Area	3km
Afon Gwy (River Wye)	Special Area of Conservation	Adjacent to route
Upper Wye Tributaries	Site of Special Scientific Interest	Adjacent to route
Coed Mawr	Site of Special Scientific Interest	300m from route
Gwaun Bwlch Hafod-Y-Gog	Site of Special Scientific Interest	Adjacent to route

- 17.16 Key features that should be taken into consideration from the Special Protection Area are breeding Red Kite (*Milvus milvus*), Merlin (*Falco columbarius*) and Peregrine (*Falco peregrinus*).
- 17.17 If the proposed route is likely to directly affect a statutory site, the route should be redesigned to avoid any negative impacts on protected areas.
- 17.18 A total of five non-statutory wildlife sites were identified within 2km of the proposed grid route. Llandinam Gravels is a Montgomeryshire Wildlife Trust reserve that runs adjacent to the route for approximately 1.5km. The Pwll Penarth Wildlife Trust reserve also lies in near proximity to the proposed route. A Montgomeryshire wildlife site also lies adjacent to the route. There are also two regionally important geodiversity sites within 2km.
- 17.19 A number of protected species records were identified during the desk study, however many of these do not lie in close proximity to the proposed route, and some of these records are dated.
- 17.20 The results of the desk study indicate that the ecological resource along the section of route from the on-site substation to the point of connection with CC1 is not likely to present an impediment to development of the line. The full desk study is provided in **Appendix 17.1**.

Route CC1: Llanidloes to Cefn Coch

- 17.21 LUC was appointed by SPM to complete a strategic ecological appraisal of the areas within which the corridor options are located. Data relating to national and international designated sites was collated across the study area, and analysed with the use of geographic information system ("GIS").
- 17.22 The main issues concerning the chosen route, corridor CC1, were regarding ornithology as the route passes over an area used by waterfowl including Whooper Swans (*Cygnus cygnus*) and Curlew (*Numenius arquata*). A further site with raptor sensitivities enters the western edge of CC1 immediately south of Llanidloes. However, when considering the potential impacts of using other corridors, CC1 was considered to be the one with least environmental effect.

Archaeology Mynydd y Gwynt Option 1

Mynydd y Gwynt Substation to corridor CC1 east of Llanidloes

- 17.23 To determine the impact of the proposed development on the cultural heritage of the area, a desk based Archaeocheck study was carried out.
- 17.24 The proposed route is located in an area of low to low moderate archaeological potential. The proposed route will not directly affect any designated heritage assets, but sections of the route have the potential to affect the settings of certain designated heritage assets if overhead lines are chosen. The assessment established that archaeology and cultural heritage should not, at this stage, be seen as an over-riding constraint.
- 17.25 The full desk study is provided in **Appendix 17.2**.

Route CC1: Llanidloes to Cefn Coch

- 17.26 The Field Services Section of the Clwyd-Powys Archaeological Trust (“CPAT”) was commissioned by SPM to undertake an initial assessment of the cultural heritage implications of the potential route corridors. CPAT identified designated, registered and undesignated cultural heritage assets within each corridor. The appraisal involved GIS based identification of the location and type of the cultural heritage asset including its setting where relevant.
- 17.27 Corridor CC1 contains numbers of both Scheduled Ancient Monuments and Listed Buildings. It also runs close to the boundaries of two registered Historic Landscapes. Further consideration will be given to the Historic Landscapes at the detailed routeing and subsequent environmental impact assessment stage.

Conclusion Route Corridor Mynydd y Gwynt Option 1

- 17.28 The results of the desk studies have indicated that the value of the ecological and archaeological resource from the on-site substation to the junction with CC1 is such that these interests should not be seen as a constraint to development provided the design is sensitive to local conditions.
- 17.29 The strategic report by LUC for the connection routes from SSA C to Cefn Coch indicated in para. 6.1 of the Strategic Ecology report that there were few ecological receptors to constrain the selection of the route corridor.
- 17.30 The preferred route corridor, route CC1, is not located within a nationally designated landscape such as a National Park or Area of Outstanding Natural Beauty and does not pass through any areas of high landscape sensitivity.
- 17.31 In the absence of any significant environmental constraint, it is considered that there is no overriding reason why a connection with the substation at Cefn Coch could not be constructed.

Mynydd y Gwynt Route Corridor Mynydd y Gwynt Option 2

- 17.32 A further route options study, archaeology study, and ecology study with landscape desk study has been completed by Magna Project Services, ADAS and Anne Priscott

Associates (November 2013) for a section of the route to identify any archaeological and ecological constraints within and adjacent to the revised grid connection route (see **Appendix 17.3, 17.4 and 17.5**). Site visits were also undertaken by Magna Project Services. Powys BIS, MAGIC and NRW were used as ecology sources of information for this assessment. CPAT Historic Environment Record (“HER”), Cadw datasets for Scheduled Monuments, Listed Buildings, Registered Parks and Gardens, registered Battlefields and World Heritage Sites as well as cartographic and other documentary sources listed in the Appendices were used for the desk study.

Assessment Method Mynydd y Gwynt Option 2

- 17.33 The proposed route of the grid connection was assessed to determine if there are any ecological, archaeological and landscape constraints in the vicinity of the route. No field based surveys were carried out, although site visits were made by Magna Project Services; all the information gathered is desk based.
- 17.34 As SPM suggest the line will connect with the Carno III line at the Carno substation, and continue as one 132kV overhead line towards the proposed mid Wales substation near Cefn Coch, the archaeology and ecology reports cover the route up to the Carno substation. From there the route will go north easterly to a substation at Cefn Coch following the BSC corridor as in the SPM report: “Stage Three Consultation Summary October - December 2013”.
- 17.35 The SPM “Stage Three Consultation report” notes that the Carno III project is contracted for a grid connection and the line from the substation to the hub will be a 132kV single circuit wood pole construction. It is also noted that a large section of this line north of the A470 designated the “Tirgwynt Route” is already planning consented for a 132kV wood pole line.

Landscape Mynydd y Gwynt Option 2

- 17.36 From the site the route would run on wooden poles through the Hafren Forest, following forest tracks meaning reduced need for felling. It would then run alongside minor roads, still on wooden poles, around the northern end of the Llyn Clywedog reservoir. Wires on poles are a common feature running alongside roads, especially in rural areas, and not an unexpected or alien feature, and would therefore be seen as part of the general rural scene, not impacting on the enjoyment of the route. It would then pass across enclosed farmland to Carno. Wooden poles carrying electricity lines are a common feature of farmland, and again would not look out-of-place in this rural environment, having a minimal landscape or visual effect on people’s perception of the landscape.
- 17.37 Therefore, this route would involve the least landscape and visual impact, with most of the route falling within forested areas, or along roads, meaning the minimal physical changes to the landscape, and minimal visual impact in the more sensitive locations in this landscape.

Ecology Mynydd y Gwynt Option 2

Mynydd y Gwynt Substation to Carno III Substation

- 17.38 This study was desk based and information on statutory and non-statutory wildlife sites was obtained from MAGIC, NRW and Powys Biological Information Services. Local sites within 2km and protected and priority species within a 1km buffer of the proposed route were highlighted. The area under study ran from the proposed substation at SN 283088 285005 to the point of connection with Carno III substation at SN 292900 295800.
- 17.39 Several sites with statutory designations were identified within the 10km search area of the chosen route. These are unlikely to be affected by the localised proposed works. The sites that are in close proximity to the line are listed in **Table 17.2** below. These sites should be considered carefully as to whether the works will impact upon them and their associated species.

Site Name	Site Designation	Distance from Route
Elenydd Mallaen	Special Protection Area	4km
Coedydd Llaur-y-glyn	Special Area of Conservation	250m
Afon Gwy (River Wye)	Special Area of Conservation	2.5km
Mwyngloddfa Nantiago	Site of Special Scientific Interest	Adjacent to route
Pumlumon (Plynlimon)	Site of Special Scientific Interest	60m
Coedydd Llaur-y-glyn	Site of Special Scientific Interest	250m
Upper Wye Tributaries	Site of Special Scientific Interest	280m

- 17.40 Key features that should be taken into consideration from the Special Protection Area are breeding Red Kite (*Milvus milvus*), Merlin (*Falco columbarius*) and Peregrine (*Falco peregrinus*). The upland bird assemblage of Pumlumon (Plynlimon) Site of Special Scientific Interest, which forms one of its qualifying features, should also be taken into consideration.
- 17.41 If the proposed route is likely to directly affect a statutory site, the route should be redesigned to avoid any negative impacts on protected areas.
- 17.42 Four non-statutory sites were identified within 2km, including one non-statutory wildlife site, approximately 1.5km from the proposed grid route, a road verge nature reserve adjacent to the grid route at Cwmbiga and two regionally important geodiversity sites, Carno and Nantyreira Mine.
- 17.43 A number of protected species records have been identified during the desk study, however many of these are not in close proximity to the proposed route, and some of these records are old. Further surveys may be required once the route is finalised.

- 17.44 The results of the desk study indicate that the ecological resource along the section of route from the on-site substation to Carno substation is not likely to present an impediment to the development of the line. The full ecology desk study is provided in **Appendix 17.3**.

Archaeology Mynydd y Gwynt Option 2

Mynydd y Gwynt Substation to Carno III Substation

- 17.45 To determine the impact of the proposed development on the cultural heritage of the area, a historic environment desk based Archaeocheck study was carried out.
- 17.46 The proposed route passes through the Clywedog Valley Designated Landscape of Special Historic Interest and within close proximity to two Scheduled Monuments, the Barrow Group West of Staylitttle and the Cwmbiga Long Cairn. The proposed route passes through or close by 12 undesignated heritage assets and a number of heritage assets associated with the Nantiago Lead Mine Complex. Further assessments are recommended to assess the potential for direct impacts and setting impacts of designated and undesignated assets following confirmation of the final route corridor.
- 17.47 The assessment established that archaeology and cultural heritage should not, at this stage, be seen as an over-riding constraint, subject to additional assessments and mitigation measures being implemented. The full desk study is provided in **Appendix 17.4**.
- 17.48 The grid route options report summarised in this Chapter is also included in **Appendix 17.5**.

Grid Connection for Alternative Turbines

- 17.49 The proposed 132kV wooden pole grid line will have a nominal capacity of more than 160MW. In grid connection Option 1 Mynydd y Gwynt would have a dedicated line to the substation, in Option 2 the line would be shared with Carno III, at 48 MW. Therefore even if the selected turbines are 3.3 MW machines, increasing the total capacity from 81MW to 89.1MW, there will still be adequate capacity in the grid connection. The worst case will be 134.1MW under the Option 2 grid route, leaving more than 25 MW of spare capacity on the line.
- 17.50 The new 400kV National Grid Substation planned for Mid-Wales will have 1,800MW capacity. Currently SPM has 666MW contracted to connect. Until November 2013 NGET had another 160MW contracted direct with SSE for the proposed Nant y Moch wind farm. This contract has recently been cancelled. Several other wind farms and other renewable generation projects are also hoping to be successful in planning and connect to the proposed substation, although not presently contracted to SPM, as reflected in the following extract from the July 2012 update of National Grid's Strategic Options Report for the Connection of On-Shore Wind Farms in Mid Wales (via Shropshire):

“9.17 It should be noted that the transmission connection, of two circuits, could ultimately accommodate up to 1800 MW of generation....

9.18 The total contracted onshore wind generation projects described above is 826MW. It is recognised that information in the public domain suggests that there are other generators that may seek connection in the Mid Wales region. Publications in 2011 in the Powys County Council and Welsh Government

websites identify total onshore wind generation levels in Mid Wales within the region of 1,325 MW and 1,420 MW respectively”.

Conclusions

- 17.51 Although SPM currently prefers Mynydd y Gwynt Option 2 it is technically possible that the final route corridor could be switched back to Mynydd y Gwynt Option 1. Both are viable routes as set out above and the final choice will depend upon practical, commercial factors including for example which other schemes which might be served by the route corridors gain consent.
- 17.52 The National Policy Statement for Energy (EN-1) section 3.9 requires that the applicant to “*ensure that there will be necessary infrastructure and capacity within an existing or planned transmission or distribution network to accommodate the electricity generated*”.
- 17.53 The well publicised plans for the mid Wales Connection Project jointly promoted by SPM and NGET show that capacity will be available.
- 17.54 It is incumbent on the Planning Inspectorate to “*be satisfied that there is no obvious reason why a grid connection would not be possible*”. That this test is satisfied is demonstrated in the previous SPM Grid Connection Offers (most recently the February 2013 offer), supported by the publicly available data provided by NGET and SPM as part of the mid Wales Connection Project. Further Mynydd y Gwynt has shown that there at least two grid connection routes available for SPM as the Distribution Network Operator to utilise, to connect to the proposed sub-station at Cefn Coch, neither having significant environmental constraint.

References

SP Mid Wales Connections, (2012). Routeing Methodology and Route Corridors Appraisal-Phase 2 report. March 2012.

SP Mid Wales Connections, (2012). Cultural Heritage Report. March 2012.

SP Mid Wales Connections, (2012). Strategic Ecological Report. March 2012.

SP Mid Wales Connection, (2012). Field-Based landscape sensitivity in Relation to Overhead line. March 2012.

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LUC in association with Gillespies, (2011). Field-Based landscape Sensitivity in Relation to Overhead Lines. November 2011.