14 ASSOCIATED WORKS - ELECTRICAL POWER TRANSMISSION

14.1 INTRODUCTION

There is a need for new power lines to cope with the additional power generated by the Abernedd CCGT power plant. To construct any new overhead line in either England or Wales, National Grid or any distribution company (in the case of South Wales, Western Power Distribution) requires formal consent under Section 37 of the Electricity Act 1989.

It is not a regulatory requirement that these issues be addressed within the Section 36 submission; however it was considered best practice for a chapter to be included within this ES, giving a brief overview of these works and any potential impacts that might be expected with the introduction of new power lines as a consequence of this proposed project. The potential impacts will be addressed in detail separately by each of National Grid and WPD as part of a future Section 37 application in around 2010.

NG and WPD are at early stages of design proposals for transmission connections and so nothing in this chapter should prejudice the development work and any later Section 37 applications which are the responsibilities of the two companies.

This ES (for the Abernedd power plant) forms part of the Section 36 submission, and this application is separate from any associated transmission works. Discussions between the generator, the national transmission grid operator and the local distribution grid operator normally take place at an early stage in the Section 36 process to understand the likely requirement for a Section 37 application. It is encouraged that generators consult in advance of the consent process so that transmission and consent implications of the project can be fully considered.

This chapter stands to support the EIA for the Abernedd power plant, as an initial desk based assessment of the likely transmission works. This assessment has been undertaken in order to provide an indication of the likely significant environmental impacts of these associated works, as described in the remainder of this chapter. This study will enable the decision maker to determine the application for the Abernedd power plant in the context of the associated works. It will also enable the developer and stakeholders to address the key issues from the outset and allows early recognition of these issues in the design and evolution of the scheme.
14.2  LEGISLATION AND SECTION 37

14.2.1  Section 36 and 37

There is no statutory obligation to carry out this part of study as part of the Section 36 application. This additional section to the study has been carried out to:

- better understand the likely scope of works required under the Section 37;
- understand the likely significant environmental impacts associated with the Section 37 application.

The Section 37 process is entirely separate to this Section 36 application and any Section 37 process should take account of works that are dedicated to this project and also to shared works that will be required for this power project as well as others in the vicinity or the region as a whole. Objections or conditions based on the Section 37 application should be made during the Section 37 process to the party submitting such Section 37 application (in this case NGET and Western Power Distribution). Decisions on the mitigation of such overhead line works are within the remit of these companies and not Abernedd Power Company Ltd.

14.2.2  Section 37 Overview

To construct a new overhead line in Wales, National Grid or Western Power Distribution require formal consent, under Section 37 of the Electricity Act 1989, from the Secretary of State for Business, Enterprise and Regulatory Reform, unless the new line is across land owned and occupied by the company. The Electricity Act 1989 contains a formal procedure for consultation with local planning authorities within whose areas the new line is proposed. If they maintain an objection to an application for Section 37 consent then the Secretary of State is required to convene a public inquiry. When granting Section 37 consents, the Secretary of State will usually direct that planning permission for the development will be deemed to be granted under the Town and Country Planning Act 1990.

National Grid has a statutory obligation to consult with statutory consultees through the Section 37 application. These include, CCW, EAW and CADW, all of which can formally object to the application.

The Section 37 application will be subject to those planning policy documents, outlined in Chapter 2, focussing on policy at national, regional and local levels.

National Grid & Western Power Distribution will consider if the Section 37 application should be subject to an EIA as part of the pre-application screening process.
A specific policy and legislative review for the specialist areas of the EIA will not be carried out as part of this Section 36 application, but instead will be carried out as part of the, later, Section 37 application by the appropriate party.

14.3 Alternatives

There are generally two potential options for additional power lines, buried power cables and overhead lines (OHL). For the purpose of this study we are assuming overhead lines will be the chosen method for exporting the additional power generated for the majority of the off-site route as this is usually the preferred option of National Grid (further details are highlighted in Section 14.5 of this chapter).

Both options for power connection give rise to potential impacts; however overhead lines are the preferred option of the infrastructure owners for the majority of the route as they are considerably less expensive to install (and hence have less of an impact on domestic electricity bills) and have operational advantages such as reduced fault repair times when compared to buried cables, thus reducing the disruption time to customers.

14.3.1 Electrical Power Transmission

National Grid (hereafter “NG”) is the responsible transmission grid operator for the UK and Wales whilst Western Power Distribution (hereafter called “WPD”) is the responsible local distribution grid operator. WPD is the electricity distribution company for South West England and South and West Wales. WPD deliver electricity to 2.5 million customers over a 26,000 sq kms service area. NG owns and maintains the high-voltage electricity transmission system in England and Wales, together with operating the system across Great Britain.

For the purpose of this study we are only considering works in the local area from Swansea North substation to Pyle substation.

NG owns a 275 kV circuit from Swansea North substation to Pyle substation (known as the “VE Route”) and WPD uses the same pylons but owns the 132 kV circuit suspended on the other side of the these same pylons. For the introduction of the Abernedd CCGT power plant, WPD have been requested to release its 132 kV circuit to NG for refurbishment from 132 kV to 275 kV (addressed in Section 14.5 of this chapter). As a result of this, WPD will need to modify the remainder of its own distribution assets to compensate for this loss of this circuit to NG.

14.3.2 Pylons, Substations and VE configuration

The existing pylon configuration on the VE route between Swansea North substation and Pyle is shown on Figure 14.2. The pylons carry the 132 kV
distribution circuit operated by WPD and the 275 kV transmission circuit operated by NG.

The existing pylons stand approximately 250 metres apart and each pylon base covers less than 50 m². The pylon foundations usually consist of a buried raft of concrete or separate piles for each leg. There are two different types of pylons involved in this study; the 275kV ones similar to those carrying the existing 275 kV NG circuits; and the smaller pylons for 132kV overhead lines belonging to WPD. A example of typical pylons can be seen in Figure 14.1 below.

There are existing buried cables and these, together with the overhead lines, feed into various existing substations. The substations that are involved with the works will include Baglan Bay substation and Britton Ferry substation. Only Baglan Bay and Pyle substations will undergo physical expansion works and any resulting impacts will be minor. Due to constraints on space there is a possibility that a new WPD switchyard will be required in the vicinity of the existing Baglan Bay substation but within the Baglan site.

Figure 14.1 Examples of Pylons – Typical Only

14.4 THE PROPOSED WORKS

14.4.1 Overview

The connection work will involve physical alteration of the local transmission network and local distribution network. The Abernedd power plant will be connected into the existing 275 kV National Grid substation on the Baglan site.
Some 1-2 km of new overhead lines (of the larger variety mentioned) will be built. This will be owned by NG and will carry a new 275kV double circuit to provide sufficient export capability in the system.

A new section of some 3km of overhead line (of the smaller variety) will be required to replace the (“VE route”) circuits transferred to NG (see previous section). There is potential for buried cable to be used for some of this route instead of OHL. These will be owned by WPD and will carry a 132 kV double circuit.

14.4.2 Summary

The new overhead lines and underground cables and substation works are summarised below and described in further detail in the following section.

- installation of a new National Grid set of OHL parallel to the existing OHL between Baglan substation and pylon 4; (subject to a Section 37 application);

- a new section of OHL (some may be buried cables) from Baglan Bay substation across the M4 to existing pylon U167 parallel to existing pylons (approximately 3km);

- two new sections of WPD buried cable from Baglan Bay substation to Briton Ferry substation (approximately 1.2km);

- new set of buried cables from pylon 4, and across the M4 for approximately 650m; and

- extension of NG’s Baglan Bay substation by four bays.

In addition there may be some other works consisting of refurbishment and infrastructure upgrading which is not necessarily required for this project alone and is affected by other projects, assets reviews and general maintenance etc. These may include:

- refurbishment of the existing ‘VE’ OHL route between Margam and Swansea North;

- refurbish and upgrade WPD’s 132 kV circuit between Swansea North substation and Pyle substation;
14.4.3 Construction Program

Overview

New works associated with the connection of the Abernedd CCGT power station to the National Transmission Grid are split into two types associated with either NG or WPD.

Works Associated with National Grid - Pre 2014

Initial NG works will involve the refurbishment (like for like replacement) of NG’s 275kV “VE route” between Margam and Pyle, Baglan Bay and Margam and Baglan Bay and Swansea North substation. The new OHLs will be of a similar design to those which exist at present.

From pylon 4 (Figure 14.4) there will be a new set of buried cables to accompany the existing buried cables that run from pylon “VEA4” (refer Figures 14.4 and 14.6) along and crossing the M4 motorway corridor for approximately 650 metres. Existing cables are indicated in yellow on Figure 14.2 below and proposed cables are indicated in blue. Once complete, these works will not be visible and no significant impacts of any nature are predicted.

Figure 14.2 New and Existing Buried Cables
Works Associated with National Grid and Western Power Distribution - Post 2014

The next set of works required by NG is likely to be the extension of National Grid’s Baglan Bay 275 kV GIS substation by four bays (refer to Figure 14.3). This substation falls within the redline planning study boundary for the Section 36 application therefore possible impacts resulting from these works have already been addressed within this ES as part of the Section 36 application. The works to the existing enclosed substation will be minimal. It is envisaged that extensions to the size of the substation building will be required.

There are existing overhead lines and supporting pylons that run from Baglan substation to pylon VEA 4. The position of these pylons is indicated on Figure 14.4. The existing pylons stand more or less 250 metres apart. It is proposed that a complete new line will be built to carry a new 275 kV set of circuits. The proposed overhead lines are shown on Figure 14.5. It is assumed at this stage that the new pylons will run adjacent to the existing pylons however this will be confirmed as studies progress.

WorksAssociated with Western Power Distribution - Post 2014

Given that WPD will have relinquished their 132 kV inter-connector (on the “VE route”), they will require a certain amount of distribution grid reinforcement. This will involve two new sections of 132 kV buried cable (approximately 1.2 km) from Baglan Bay substation to Briton Ferry substation. It is assumed at this stage that the new buried cables will run adjacent to the existing pylons, however this will be confirmed as studies progress. Once construction has been completed these works will not be visible.

WPD will also require a new section of 132 kV OHL from Baglan Bay substation across the M4 and up the Baglan Escarpment to pylon U167 (see Figure 14.6). It is assumed at this stage that the new pylons (smaller type) will run adjacent to existing pylons for the majority of the route, however this will be confirmed as studies progress. These pylons will stand approximately 250 metres apart and will be a similar height to those existing. Buried cables may be used for some of this route rather than OHL, in particular to cross under the M4 motorway. The total length of works will be approximately 3 km, and the split between OHL and buried cables will be confirmed by WPD as part of the Section 37 process.
Figure 14.3  Works to Baglan Bay Substation (Extension of Existing Building)

Figure 14.4  Positions of Existing Pylons “VEA1”, “VEA2”, “VEA3” and “VEA4”
**Figure 14.5**  Proposed New 1km OHL Route between Baglan Bay and Britton Ferry Substation (Shown in Blue)

**Figure 14.6**  WPD’s Proposed New Overhead Lines (Shown in Red)

[nb – the orange, blue and purple circuits shown here are buried underground cables and will not be visible]
14.5 *ASSessment SCoPe & MeThOdology*

The objective of this (Section 36) study is to carry out a high level assessment to provide context to the decision makers of the key environmental issues associated with the transmission works. Further detailed studies will be carried out by NG and WPD in 2009 and / or 2010.

For the purpose of this study, the following environmental aspects have been scoped out as the environmental impacts are likely to be negligible:

- socio-economics;
- contaminated land;
- waste;
- traffic and transport
- water; and
- air quality.

The environmental aspects that have been considered for this study as they are deemed to have more potential for significant environmental impact are:

- landscape and visual;
- ecology;
- land use and land take;
- noise and vibration; and
- cultural heritage; .

For the purpose of this study, the above aspects have been assessed in order to predict any potential likely residual impacts. In order to assess the impacts, desk based qualitative assessments of potential impacts have been undertaken. These will be confirmed by any later studies undertaken by NG and WPD.

There is no statutory definition of significance and therefore, for the purposes of the assessment the following definition of significance has been adopted.

*An impact is significant if, in isolation or in combination with other impacts, it should, in the judgement of the EIA team, be taken into account in the decision-making process, including the identification of mitigation measures and consenting conditions.*

14.6 *Baseline Conditions*

Detailed baseline descriptions are provided for the Baglan Bay site and the surrounding area within the relevant chapters of this ES.
14.7 Potential Impacts

14.7.1 Landscape and Visual

Works Associated with National Grid and Western Power Distribution - Post 2014

The site where the new ‘NG’ pylons may be erected is in a visually highly exposed location and will as a result be visible from many locations. The Brecon foothills are expected to shield views from the north of the pylons but views from the south-east and west will be largely unrestricted.

Nonetheless, industry and industrial skylines are an inherent part of the South Wales landscape and reflect an important cultural identity of the area. BP’s large chemical works had been a feature of the site for 40 years until its demolition in 2003. Moreover, the existence of the similar pylons adjacent to the proposed new NG pylons will moderate the extent of visual change.

The main visual impact is expected to come from the M4 carriageway as any new pylons will be fully visible to commuters and tourists using the M4 corridor as well as the residents of Baglan. Refer to Figure 14.7 for views of the existing pylons. At this stage there are no photomontages available of the proposed pylons, however the new pylons will likely be placed next to the existing pylons and will be similar in appearance.

Chapter 7 of the ES recommends mitigation measures for the screening of views from the east of the site (Sandfields and Baglan Moors) of the Abernedd Power Plant (along the edge of the site and/or along peripheral roads including Endeavour Close and Seaway Parade). With this mitigation in place, views of the new pylons will be reduced. Screening will become more effective as it matures over time.

It is likely that there will be visual impacts from the proposed WPD pylons to be erected between Baglan Bay and existing pylon U167 (the scale of significance will depend upon the mix between overhead lines and buried cables for this route). The path will follow more or less the existing pylon route, which is shown on Figure 14.4. The majority of the pylons are not currently screened and can be viewed from the M4 corridor and as such would result in residual impacts. However, it is understood that the M4 crossing may be by underground cable and hence this impact may be removed or at least greatly mitigated. The significance of these impacts will be confirmed during the later studies.

Views from sensitive receptors of this 3km strip of new WPD pylons include Baglan and Briton Ferry. The first pylon will cause the most visual intrusion from Baglan and Briton Ferry.

A more extensive site walk over will be carried out as part of the later studies process in order to identify the visual receptors in and around Baglan and Briton Ferry.
It should be noted that the most effective form of mitigation would be to use underground cables instead of overhead lines which would remove the visual impact almost entirely. However NGET usually oppose such an option except as a measure of last resort as these cables are typically 10-15 times more expensive than overhead lines and require a significant amount of land.

Figure 14.7  Views of Existing Pylons Crossing the M4 Corridor from the Old Briton Ferry Road
Figure 14.8  WPD Existing Pylons (Pylon 1)
14.7.2 Ecology

New Works Associated with NG and Western Power Distribution - Post 2014

The assumed overhead lines and cable route within the BP industrial park passes through a number of habitats, including areas of ephemeral/short perennial habitat, amenity and semi-improved neutral grassland, scrub and bare ground (see Chapter 9, Figure 9.3). The cable route in this area runs close to two notable plant species, the nationally endangered *Dianthus armeria* (Deptford pink) and the near-threatened *Filago vulgaris* (common cudweed), identified during the Extended Phase 1 Habitats Survey carried out by ERM in April, May and June 2007 for the purposes of the ecological assessment. In addition, the cable route crosses the Baglan Brook, approximately 500 m south of Warren Hill. Although this channel is considered to be of low ecological interest, signs of otter have been recorded along this channel in the recent past (Pryce Consultant Ecologists, June 2006) (1). At this stage it is considered that with appropriate mitigation there will not be any significant long term ecological impact, however further investigation will be carried out during the later studies undertaken by NG and WPD.

The proposed ‘WPD’ 3km stretch does not pass through any designated sites for nature conservation. However, a number of statutory designated sites occur within close proximity to the cable route, including three European designated sites, comprising two Special Areas of Conservation (SACs) (2) and one Ramsar Site (3), and 12 sites of national importance, comprising ten Sites of Special Scientific Interest (SSSIs) (4) and two National Nature Reserves (NNRs) (5). These sites are listed below, with approximate distances from the proposed cable route. The details of these sites including reasons for their designations are contained in Chapter 9, Ecology and Nature Conservation, Table 9.1.

Because these designated sites are situated at some distance from the proposed works, no residual impacts are predicted.

Aerial photographs suggest the remainder of the proposed cable route to the east passes through areas of grassland, woodland, scrub, dense stands of *Pteridium aquilinum* (bracken) and heathland.

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(1) Baglan Energy Park, Phase 2, Plot 6 Ecological Assessment. Pryce Consultant Ecologists, June 2006
(2) Special Area of Conservation (SAC) is designated under the European Directive on the Conservation of Natural Habitats and Wild Flora and Fauna (92/43/EEC) (known as the Habitats Directive) to protect sites that are considered rare because of their habitats or the species contained within them. Enacted in the UK through the Conservation (Natural Habitats &c) (Amendment) Regulations, 2007.
(3) A Ramsar site is a site that has been designated under the Convention on Wetlands of International Importance Especially as Waterfowl Habitat (known as the Ramsar Convention) to protect internationally important wetlands.
(4) Site of Special Scientific Interest (SSSI) is a site notified by CCW, under the provisions of the WCA as of national nature conservation or geological importance.
(5) A National Nature Reserve (NNR) is a site designated under the Wildlife and Countryside Act, 1981 and subsequent amendments or the National Parks and Access to the Countryside Act, 1949 and are notified as SSSI.
There is insufficient ecological baseline information available currently to provide conclusions on the likely significant ecological impacts. These will be confirmed during the later studies.

### 14.7.3 Land Use

**Works Associated with WPD - Pre 2014**

The laying of the WPD’s buried cables pre 2014 is not expected to give rise to any land use issues as the land take where the cables are going to be buried is considered of low ecological value with no other current land uses other than derelict land. The cables will have to be buried under a section of road, however this road is unsurfaced and only serves one shipping depot. It is likely, therefore, that the development will only give rise to minor significant impacts.

**Works Associated with NG and Western Power Distribution - All post 2014**

The temporary land take associated with the erection of the new pylons is estimated to be 50m by 50m during erection, the permanent footprint is about 20 m by 20m per pylon. Considering that the pylons will be erected on a large industrial area, it is considered that the pylons will not have a significant impact on the land use of the area.

The development will use the Baglan Bay substation, which will be expanded for the purpose. Overall, the development is considered to have a minor significant impact as the extension is located within existing industrial land use.

The land take associated with the 3km stretch of WPD’s pylons / buried cable is expected to give rise to potential residual impacts. The route is to be confirmed by WPD later in the program.

It is difficult at this stage without detailed assessment to fully understand the extent of these impacts, but based upon previous experience the following impacts may arise:

- permanent impacts arising from the occupation of land by the pylons;
- temporary impacts on land take arising from construction activity; or
- indirect impacts on land in the surrounding area.

### 14.7.4 Noise

**Works Associated with National Grid and Western Power Distribution - Post 2014**

NG’s pylons on the Baglan Bay Energy Park will be constructed over a short duration. As such, the noise impacts during construction will be minimal.
There will be a potential impact on residential properties resulting from erection of the first WPD Pylon (refer to Figure 14.9 for the noise sensitive receptor situated on Old Road). This will, however, be a very short term impact. This short term residual impact can be managed through the setting of limiting noise criteria and the implementation of mitigation methods (e.g., use of Code of Construction Practice). There is not expected to be residual noise impacts from the erection of the other WPD pylons.

Figure 14.9  Potential Noise Sensitive Receptor

14.7.5  Cultural Heritage

Works Associated with NG and Western Power Distribution - Post 2014

The new ‘NG’ pylons are not expected to have any impact as the land has no cultural heritage value as its prior uses have been purely industrial.

There is a site of cultural heritage value, Mynydd Y Gaer, an Iron Age fort situated approximately 500 m from WPD’s proposed pylon furthest from the Energy Park. The site is a pre-historic hillfort from the Iron Age and is a broad class defence fort that is under Neath and Port Talbot Unitary Authority (its approximate location can be viewed as U167 on Figure 14.10).

If a new pylon is required within the vicinity of this site, there may be a significant impact on the setting of the site. However, it may be possible to use the existing pylon U167 which would mitigate or minimise the impact. The exact extent of the significance of this potential impact can only be determined through further investigations during the later studies.
14.8 CONCLUSIONS AND SUMMARY OF RESIDUAL IMPACTS

14.8.1 Overview

As detailed in Section 14.2, this chapter provides an initial desk based assessment of the likely impacts of the transmission works. This assessment has been undertaken in order to provide an indication of the likely significant environmental impacts of these associated electrical power transmission works, as described in the remainder of this chapter.

In summary it is likely that the following significant impacts will occur as a result of these works, however detailed assessments will be completed as part of the Section 37 and / or later studies that may be performed by National Grid or WPD.

14.8.2 Landscape and Visual

Visual impacts are expected from the construction of the NG pylons. Visual impacts are also expected from the construction of the new WPD overhead lines from the Baglan Bay substation across the M4 and up the Baglan escarpment which will be viewed from the M4 corridor and from Baglan and Briton Ferry.

14.8.3 Land use and Land Take

Potential residual land use and land take impacts might arise from the development of the WPD pylon route including:
• temporary impacts on land take arising from construction activity;
• permanent impacts arising from the occupation of land by the pylons; or
• indirect impacts on land in the surrounding area.

14.8.4 Noise and Vibration

There will be a potential noise impact on residential properties resulting from the erection of the first WPD pylon. However, this will be a very short term impact for the construction of this pylon. This short term residual impact can be managed through the setting of limiting noise criteria and the implementation of mitigation methods (e.g. use of Code of Construction Practice).

14.8.5 Cultural Heritage

If a new pylon is required within the vicinity of the Mynydd Y Gaer cultural heritage site, there may be a significant impact on the setting of this site. However, it may be possible to use the existing pylon U167 which would mitigate or minimise the impact. The exact extent of the significance of this potential impact can only be determined through further investigations during the Section 37 process.

14.8.6 Ecology

Insufficient baseline information is currently available to determine the potential impacts of the WPD overhead line works on the Baglan escarpment. However, following further detailed assessments as part of the later studies and any Section 37 process, it is possible that there will be significant ecological impacts as a result of disturbance to habitats. It may be possible to reduce or minimise these impacts through mitigation measures, but this will be determined as part of the later assessments.