

Wrexham Power Limited ♦ Proposed Wrexham CCGT power station

Sustainability

1. INTRODUCTION

- 1.1. As a part of its application to the Planning Inspectorate for a Development Consent Order for the proposed power station, Wrexham Power Limited (WPL) will submit a sustainability appraisal of the proposals.
- 1.2. This section describes the approach that WPL proposes to take to ensure that the proposed power station represents a sustainable form of development. It begins with a summary of the general policy requirements, and proceeds to explain how the sustainability of the project will be addressed.

2. GENERAL REQUIREMENTS

- 2.1. The goal of sustainable development is to *‘enable all people throughout the world to satisfy their basic needs and enjoy a better quality of life without compromising the quality of life of future generations’*¹. Sustainability lies at the heart of national policy frameworks for both energy and planning, as confirmed by the following statements on the Department of Energy and Climate Change’s Overarching National Policy Statement for Energy (EN-1)²:

Para. 1.7.1 All the energy NPSs have been subject to an Appraisal of Sustainability (AoS), as required by the Planning Act 2008.

Para. 2.2.19 . . . The Government believes that the NPSs set out planning policies which both respect the principles of sustainable development and are capable of facilitating, for the foreseeable future, the consenting of energy infrastructure on the scale and of the kinds necessary to help us maintain safe, secure, affordable and increasingly low carbon supplies of energy.

Para. 2.2.27 . . . Sustainable development is relevant not just in terms of addressing climate change, but because the way energy infrastructure is deployed affects the well-being of society and the economy. For example, the availability of appropriate

¹ From *One future - different paths: The UK’s shared framework for sustainable development*, HM Government, Scottish Executive, Welsh Assembly Government, Northern Ireland office, 2005; cited in para. 4.1.1. of *Planning Policy Wales* edition 4, February 2011.

² Presented to the UK Parliament in July 2011 pursuant to section 5(9) of the Planning Act 2008.

infrastructure supports the efficient working of the market so as to ensure competitive prices for consumers . . .

Para. 2.2.28 The planning framework set out in this NPS and the suite of energy NPSs takes full account of the objective of contributing to the achievement of sustainable development and this has been tested through the AoS. The AoS has examined whether the NPS framework for the development of new energy infrastructure projects is consistent with the objectives for sustainable development, including consideration of other Government policies such as those for the environment, economic development, health and transport.

2.2. The Welsh Assembly Government has specific duties regarding sustainable development under the Government of Wales Act 2006. Section 79 sets out the Welsh Ministers' duty to ensure that in the exercise of their functions they should promote sustainable development. This obligation is reflected in Planning Policy Wales (fourth edition, February 2011), which advises that:

Para. 3.1.1 The planning system is intended to help protect the amenity and environment of towns, cities and the countryside in the public interest while encouraging and promoting high quality, sustainable development ...

Para. 4.1.2 Sustainable development in Wales means enhancing the economic, social and environmental well-being of people and communities, achieving a better quality of life for our own and future generations in ways which:

- promote social justice and equality of opportunity; and*
- enhance the natural and cultural environment and respect its limits - using only our fair share of the earth's resources and sustaining our cultural legacy.*

Para. 4.4.2 Planning policies and proposals should . . .

- Play an appropriate role in securing the provision of infrastructure to form the physical basis for sustainable communities (including water supplies, sewerage and associated waste water treatment facilities, waste management facilities, energy supplies and distribution networks and telecommunications), while ensuring proper assessment of their sustainability impacts . . .*
- Maximise the use of renewable resources, including sustainable materials (recycled and renewable materials and those with a lower embodied energy). Where it is judged necessary to use non-renewable resources they should be used as efficiently as possible. The use of*

renewable resources and of sustainably produced materials from local sources should be encouraged and recycling and re-use levels arising from demolition and construction maximised and waste minimised . . .

2.3. In response, WPL proposes to adopt a broadly-based approach to ensuring that its project can meet applicable sustainability criteria. This is summarised below under the following headings:

- energy sustainability
- site selection
- building design
- gas and electricity grid connections
- transport
- construction management.

3. ENERGY SUSTAINABILITY

3.1. Natural gas is a fossil fuel and a finite resource. WPL will explain how the use of natural gas for electricity generation represents an appropriate use of this resource, both as a part of the UK's energy mix and in terms of the government's strategy to reduce greenhouse gas emissions in the energy sector of the economy.

3.2. One of gas's advantages is that it can be used at very high rates of efficiency in a combined-cycle gas turbine (CCGT) power station of the type that WPL proposes. Whereas a coal-fired power station would operate typically at 30-35% efficiency, upto 60% efficiency is attainable in a CCGT gas-fired power station.

3.3. Another advantage of CCGTs is their ability to operate flexibly in response to supply and demand. They can be turned off, or run efficiently at part load, when demand is low or if there is a high level of generation from renewable sources including wind. This flexibility reduces the amount of CO₂ produced across all generation in the UK, but also ensures that the country has sufficient controllable generation to meet the daily needs of households and businesses.

3.4. The role of fossil fuel generation in the UK is explained in paras. 3.6.1 to 3.6.3 of National Policy Statement EN-1, as follows.

3.6.1 Fossil fuel power stations play a vital role in providing reliable electricity supplies: they can be operated flexibly in response to changes in supply and demand, and provide diversity in our energy mix. They will continue to play an important role in our energy mix as the UK makes the transition to a low carbon economy, and Government policy is that they must be constructed, and operate, in line with increasingly demanding climate change goals.

3.6.2 *Fossil fuel generating stations contribute to security of energy supply by using fuel from a variety of suppliers and operating flexibly. Gas will continue to play an important role in the electricity sector – providing vital flexibility to support an increasing amount of low-carbon generation and to maintain security of supply. The UK gas market has diversified its sources of supply of gas in recent years, so that as the UK becomes more import dependent, companies supplying the market are not reliant on one source of supply. This protects the UK market from disruptions to supply. UK natural gas supplies come from the producing fields on the UK Continental Shelf, by pipeline direct from Norway, and from continental Europe through links to Belgium and the Netherlands. Liquefied natural gas (LNG) is imported by tanker, supported by ongoing investment in LNG facilities such as those on the Isle of Grain and at Milford Haven. ... This ability to source fuel from alternative suppliers helps to give stability to the UK's generating capacity. In addition, unlike some renewable energy sources such as wind power, fossil fuels may be stockpiled in anticipation of future energy demands.*

3.6.3 *Some of the new conventional generating capacity needed is likely to come from new fossil fuel generating capacity in order to maintain security of supply, and to provide flexible back-up for intermittent renewable energy from wind. The use of fossil fuels to generate electricity produces atmospheric emissions of carbon dioxide. The amount of carbon dioxide produced depends, amongst other things, on the type of fuel and the design and age of the power station. At present coal typically produces about twice as much carbon dioxide as gas, per unit of electricity generated. However, as explained further below, new technology offers the prospect of reducing the carbon dioxide emissions of both fuels to a level where, whilst retaining many of their existing advantages, they also can be regarded as low carbon energy sources.*

3.5. In keeping with this approach, WPL will make provision for the future installation of carbon capture and storage facilities (CCS) on land beside its proposed power station. This approach will fulfil the requirements for new combustion plant with a generation capacity at or over 300 megawatts (MW) to be 'carbon capture ready' before any consent is forthcoming. In keeping with guidance on carbon capture readiness published by the Department for Energy and Climate Change in November 2009, WPL will demonstrate:

- that sufficient space is available on or near the site to accommodate carbon capture equipment in the future;
- the technical feasibility of retrofitting its chosen carbon capture technology;
- that a suitable area of deep geological storage offshore exists for the storage of captured CO₂ from the proposed combustion station;
- the technical feasibility of transporting the captured CO₂ to the proposed storage area; and
- the economic feasibility within the power station's lifetime of the full CCS chain, covering retrofitting, transport and storage.

4. THE SITE

4.1. WPL will provide an explanation of why the preferred location on Wrexham Industrial Estate is considered to be a sustainable site for a CCGT gas-fired power station, in comparison with the alternatives. This analysis will embrace the following considerations.

- **Proximity to gas and electricity grid connections** - Wrexham is in one of comparatively few areas of Wales which has gas and electricity networks with the capacity to supply gas and accept the electricity generated from a new power station in close proximity.
- **Potential for gas and electricity grid connections and water supply** – undeveloped corridors of land have been identified between the potential power station site and feasible connection points on the gas and electricity networks, through which the required connections could pass. Route options will be the subject of detailed landscape, archaeology, ecology and residential amenity assessment. Water supply is available from the water mains supplying the industrial estate.
- **Site characteristics** – the site is situated on Wrexham Industrial Estate and comprises a combination of brownfield and urban fringe greenfield land, the former being the former site of a fibre-glass factory, now demolished. The location is generally level and free from flood risk. The site is comfortably capable of accommodating a CCGT gas-fired power station of the scale envisaged, along with future requirements for carbon capture and comprehensive provision for boundary landscape works and habitat creation.
- **Environmental designations** - there are no listed buildings or scheduled ancient monuments on the site, and the site is not designated as a conservation area or historic park or garden. The closest listed building is 0.8 km away, and the nearest scheduled ancient monument is 1.9 km distant. The site is not subject to nature conservation designations. The closest designated *Natura 2000* habitat and Site of Special Scientific Interest lie along the corridor of the River Dee, 2.2 km away.
- **Biodiversity** - ecological assessment undertaken in conjunction with earlier development proposals for the site, and verified by WPL's own site assessment, indicates that most of site's ecological interest is found in field boundary features and water courses and ponds. In common with previous development proposals for the site, ponds could be relocated in an integrated ecology and landscape strategy for the site. Where feasible, field boundary vegetation would be retained and reinforced. The water courses on the northern and western edges of the site could be retained on their existing routes.

- **The local landscape** - a power station in this location would be viewed against the backdrop of existing industrial buildings. The rural landscape to the north and east features level farmland with mature field boundaries of trees and shrubs that would help to contain views of the power station and electricity transmission lines.
 - **Economic considerations** – Wrexham Industrial Estate is one of the largest industrial concentrations in North Wales, providing opportunities for WPL to supply heat to large heat users on the estate. This will further boost the energy efficiency of the project. Existing industrial estate occupiers would also benefit from the replacement of the existing single circuit electricity grid supply to the estate, which is aged and of limited capacity.
 - **Health and social considerations** – the power station proposals and associated grid connections will be accompanied by a health impact assessment. The location of the development will help to ensure no adverse effects in these terms. With respect to the protection of residential amenity, it is helpful that the site being investigated is relatively remote from residential neighbourhoods.
 - **Transport** - Wrexham Industrial Estate has road access capable of accommodating construction traffic for a power station. It also has public transport connections. Once constructed the amount of traffic generated from the use is minimal. There are likely to be approximately 50 employees working across a 24 hour period. The majority of traffic generated by these users will be cars and light commercial vehicles rather than HGVs.
 - **Planning context** – the adopted Wrexham Unitary Development Plan 2005 allocates land on the north-eastern edge of the Wrexham Industrial Estate for a large employment user (policy E3). Outline planning permission has been granted for a 500,000 sq ft factory or distribution warehouse (use classes B2 and B8) on the site.
- 4.2. On the basis of these considerations, WPL considers that the site is considered to be a sustainable development location. The company aims to develop proposals for a CCGT gas-fired power station that reflects a detailed understanding of the interplay of these site considerations, with the aim of delivering a project that fits comfortably on the site and supports relevant environmental, social and economic sustainability objectives. Similarly, WPL aims to achieve the gas and electricity grid connections in a sensitive manner, where possible by adapting or replacing existing infrastructure.

5. THE POWER STATION BUILDINGS

5.1. According to paras. 4.5.1 to 4.5.2 of National Policy Statement EN-1:

4.5.1 The visual appearance of a building is sometimes considered to be the most important factor in good design. But high quality and inclusive design goes far beyond aesthetic considerations. The functionality of an object — be it a building or other type of infrastructure — including fitness for purpose and sustainability, is equally important. Applying ‘good design’ to energy projects should produce sustainable infrastructure sensitive to place, efficient in the use of natural resources and energy used in their construction and operation, matched by an appearance that demonstrates good aesthetic as far as possible. It is acknowledged, however that the nature of much energy infrastructure development will often limit the extent to which it can contribute to the enhancement of the quality of the area.

4.5.2 Good design is also a means by which many policy objectives in the NPS can be met, for example the impact sections show how good design, in terms of siting and use of appropriate technologies can help mitigate adverse impacts such as noise.

5.2. Section 4.10 of Planning Policy Wales (4th edition, 2011) highlights the importance of good design to sustainability. In the light of this, and given the importance that the Planning Act 2008 places on good design and sustainability, WPL intends to demonstrate that its proposals are sustainable and, having regard to regulatory and other constraints, are as attractive, durable and adaptable as can feasibly be achieved. To this end, the design process will take into account both functionality and aesthetics. WPL will also demonstrate a responsive design approach in terms of siting relative to existing landscape character, landform and vegetation. These principles will apply both to the power station and the electricity grid connection.

5.3. In accordance with advice given in para. 4.5.4 of EN-1, WPL will demonstrate in its application documents how the design process was conducted and how the proposed design evolved. Where a number of different designs are considered, WPL will set out the reasons why the favoured choice has been selected.

5.4. WPL’s proposals will also take into account.

- *construction standards* – including the energy performance of the built envelope and the potential to use locally-sourced construction materials;
- *energy use* – the efficient use of energy for heating, lighting and cooling within the power station, including the effective use of daylighting in the office buildings on the site;
- *waste minimisation and recycling* – including the avoidance of waste during construction and the ability to recycle building materials at the end of power station life.

6. GAS AND ELECTRICITY GRID CONNECTIONS

- 6.1. The National Policy Statement for Electricity Networks (EN-5)³ provides further guidance on the delivery of electricity transmission distribution systems of 132 kilovolts (kV) and over. EN-5 supplements the advice in EN-1. In section 2.2 it identifies some of the factors influencing site selection for transmission lines. In addition to the location of the infrastructure that the line would connect, these include land ownership and landscape and visual considerations. According to para. 2.2.6:

As well as having duties under section 9 of the Electricity Act 1989, (in relation to developing and maintaining an economical and efficient network), developers will be influenced by Schedule 9 to the Electricity Act 1989, which places a duty on all transmission and distribution licence holders, in formulating proposals for new electricity networks infrastructure, to “have regard to the desirability of preserving natural beauty, of conserving flora, fauna and geological or physiographical features of special interest and of protecting sites, buildings and objects of architectural, historic or archaeological interest; and ... do what [they] reasonably can to mitigate any effect which the proposals would have on the natural beauty of the countryside or on any such flora, fauna, features, sites, buildings or objects.” Depending on the location of the proposed development, statutory duties under section 85 of the Countryside and Rights of Way Act 2000 and section 11A of the National Parks and Access to the Countryside Act 1949 may be relevant.

- 6.2. EN-5 also identifies environmental effects particular to electricity transmission lines that require assessment. These are:

- *biodiversity and geological conservation* - including any effects of the proposals on areas used by wildlife for feeding, migration or breeding;
- *landscape and visual* – in respect of which, EN-5 advises the promoters of projects to apply the ‘Holford Rules’ for the sensitive routing of overhead lines;
- *noise and vibration* – including the need to avoid any audible crackle or humming sounds that can arise from overhead lines during wet weather;
- *electric and magnetic fields* – including the effects on public health and aviation.

- 6.3. Beyond these considerations, the sustainable development considerations that WPL will take into account in the routing and design of these grid connections will include:

³ Presented to the UK Parliament in July 2011 pursuant to section 5(9) of the Planning Act 2008.

- *the length of route options* – working on the principle that the shorter routes cause less environmental disturbance during construction and consume less physical resources;
- *environmental, economic, social and health effects* – avoiding significant harm to local interests;
- *construction* – the use of methods and materials that minimise waste and promote recycling at the end of operational life.

7. CONSTRUCTION MANAGEMENT

- 7.1. WPL will consider a range of measures to ensure that the delivery of the proposed power station and related infrastructure takes place in a sustainable manner. These will include the use of locally-sourced construction materials, where feasible and viable. This measure would help to retain wealth in the local economy and reduce the distance over which materials are transported. The contractor will be selected partly on the basis of its ability to employ local construction workers, again to retain wealth locally.
- 7.2. A Construction Traffic Management Plan will be submitted with the DCO application for the site. The contractor will also be required to achieve a ‘best practice’ score under the Considerate Contractors scheme to minimise construction effects. A community liaison group will be established to provide for an open and timely exchange of information during the construction phase of the project.
- 7.3. To ensure appropriate environmental protection during the construction stage, a construction environmental management plan will be implemented. This will incorporate provisions for effective environmental monitoring.

8. CONCLUSIONS

- 8.1. Though the various measures outlined, WPL proposes to take a comprehensive approach to sustainability that will embrace:
- i). the environmental, social and economic dimensions of sustainable development . . .
 - ii). as expressed at all levels of policy – local, national and international . . .
 - iii). at all stages of the project - siting, design, construction, grid connection, operation and ultimate decommissioning of the project, and . . .
 - iv). supported by appropriate community engagement.

- 8.2. WPL invites feedback on the adequacy of this approach and the means by which it can be implemented to best effect in the environmental, social and economic interests of Wrexham and surrounding communities.