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**Response to: Welsh Government Consultation Document, Achieving our low carbon pathway to 2030**
3rd October 2018

**Uniper**

Uniper is an international energy company with around 12,000 employees and operations in 40 countries. In the UK, Uniper operates a flexible and diverse generation portfolio, sufficient to power around six million homes. With our seven-strong fleet of power stations and our flexible, fast-cycle gas storage facility, we support the energy transition and make a tangible contribution to Britain's energy supply security.

Uniper also offers a broad range of commercial activities through its Engineering Services division, while the well-established Uniper Engineering Academy delivers high-quality technical training and government-accredited apprenticeship programmes for the utility, manufacturing and heavy industry sectors, at its purpose-built facilities near Nottingham.

**As the owner of Connah's Quay power station in Flintshire, North Wales, we are pleased to respond to this consultation. Our views are focussed on the section related to emissions from the power sector, and in summary are:**

- Gas fired power stations support and enable the energy transition to a low carbon future. They are flexible and able to operate for extended periods. This means that they can quickly change electrical output to respond to within day changes in renewable electricity production, as well as operate for weeks at a time, to support security of supply.

- Effective carbon emissions reduction policies targeted at the power sector are already in place in the form of the EU Emissions Trading System (ETS) and Carbon Price Support (CPS) tax.

- The electricity market operates across Great Britain. Increasing costs for gas fired power stations located in Wales would affect their competitiveness.

- The Connah's Quay site makes a meaningful contribution to the Welsh economy and supports security of supply in Wales, as well as having the potential to become a low carbon energy system hub in the future.

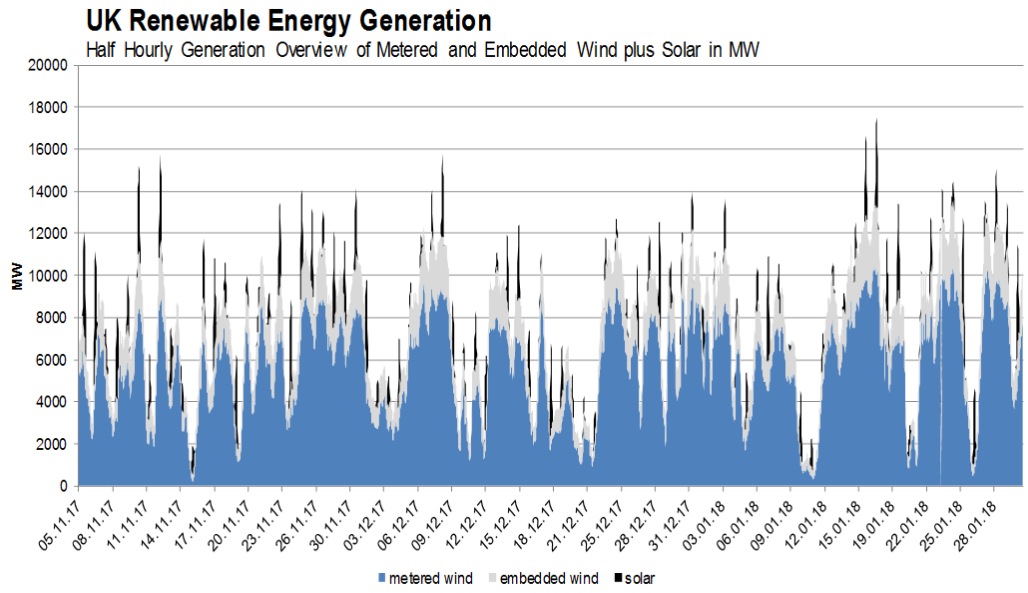
**The Role of Gas Fired Power Stations**

We recognise that Wales needs to consider how it achieves its decarbonisation goals and in particular developing its position towards the use of fossil fuels for electricity generation.

In assessing which sectors to prioritise, the role of gas fired power stations in enabling the energy transition needs to be considered. We all take for granted the ability to turn on a light or power a device at the flick of a switch. As the power sector decarbonises it is becoming more complex and challenging for the system and market across Great Britain to deliver on a day to day basis. Social acceptance of the energy transition is maintained as long as the electricity supply is maintained. This is where gas fired power stations come in.

As more and more low carbon renewable generation comes on to the system, for example the offshore windfarms connected in North Wales, the production of electricity becomes more dependent on weather conditions. The output from weather dependent generation can vary significantly; from high sun days in the peak of summer, often accompanied with low wind, to darker, potentially windier, winter days or, as can happen, grey windless days. This is illustrated in the chart below showing half hour renewable generation output between November 2017 and January 2018. The chart shows output swings from below 2 GigaWatts (2GW) up to 16GW. Over the same period, national demand varied, depending on the time of day, between approximately 18GW and 46GW.

Nov 17 – Jan 2018: Half-hourly data




Gas fired power stations are both flexible and able to operate efficiently for extended periods. This means that they can quickly change electrical output to respond to within day changes in renewable electricity production and demand, as well as operate for weeks at a time when there may be an occurrence of low renewable output during the winter. The capability of gas fired power stations to do this means that they support operation of the electricity system by helping to balance supply and demand and are instrumental in delivering security of supply.

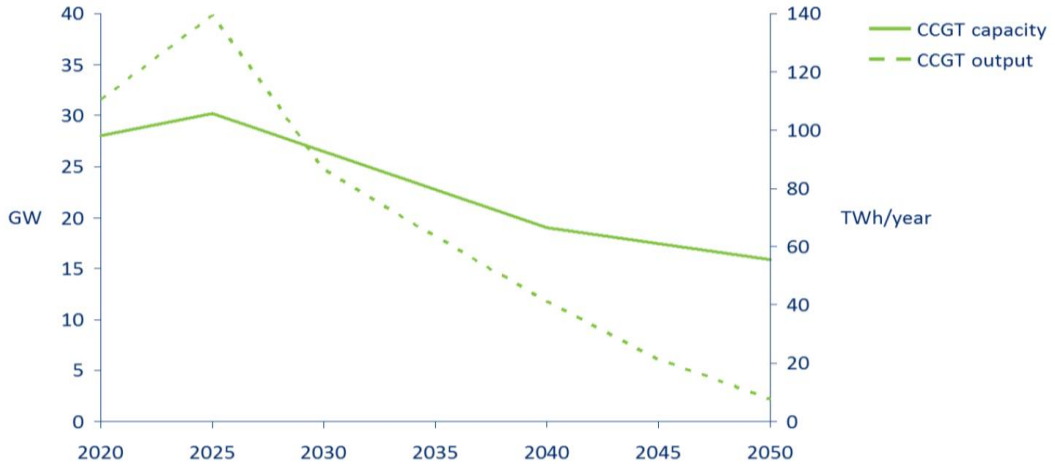
Renewable generation and gas fired power stations are competing in the Great Britain energy market. The energy market is comprised of three main markets: the energy wholesale market,

which provides a price for the electricity produced; the ancillary services and balancing market, which National Grid uses to support the functioning of their network, as well as balance supply and demand second by second; and the Capacity Market. This last market was introduced as a direct consequence of the energy transition to ensure continued security of supply.

Up until about 10 years ago, much of Britain's electricity was produced by coal, gas and nuclear power stations. As more and more zero marginal cost generation, like wind, comes on to the system it displaces generation that has a fuel cost. This has meant that the ability for gas fired power stations to run and earn money in the energy wholesale and ancillary services markets has reduced.

This was to the point that there was a risk of large scale closures of large power stations, which the UK Government deemed to be a significant risk to security of supply. The Electricity Market Reform policy introduced the Capacity Market to cost effectively procure capacity by competitive auction to provide a revenue stream to plant like gas fired power stations. This was so that they could continue to be available to support operation of the network and supplement output from renewable generators.

Expert opinion continues to argue that gas fired power stations will continue to be needed through to 2030 and beyond, albeit that the amount of electricity produced over the course of a year, their load factor, will continue to decline through to 2050. The chart below was produced by the Carbon Trust and Imperial College as part of a study in support of UK Government's Smart, Flexible Energy System policy [1], which shows that the required level of installed gas fired generation capacity will only decrease by a small amount, albeit the load factors will drop off considerably towards 2050. The Committee on Climate Change in its latest report[2] to Westminster Parliament contained new central power scenarios that show that approximately 96TWh of gas fired generation will be needed in 2030, to serve between 24-29% of GB's generation. This compares with 133TWh in 2017, approximately 40% of GB's generation[3].




[1] Chart 6, An Analysis of Electricity System Flexibility for Great Britain, Carbon Trust and Imperial College London, November 2016
[2] Figure 2.7, Reducing UK Emissions, Progress Report to Parliament, Committee on Climate Change, June 2018
[3] BEIS Energy Trends, March 2018

In a scenario where decarbonisation is achieved through greater electrification of industry, heat and transport, electricity demand in Wales potentially increases. In such a higher electricity demand scenario, the current electricity production surplus in Wales may decline.

Any increase in costs to power stations in Wales will skew the GB electricity market and undermine the overall aim of delivering the most cost-effective energy transition. Skewing the GB electricity market increases the cost of electricity for industry. Due to the extent of heavy industry with high power demand located in Wales cost increases could disproportionately impact the Welsh economy. It could also be counterproductive by increasing carbon emissions from less efficient gas fired power stations located elsewhere or increase output from smaller scale alternatives, such as reciprocating engines that are approximately 20% more carbon intensive.

Whilst battery storage may have a role to play in the future in smoothing out renewable electricity production, it is not currently cost competitive. The cost of electricity from a Combined Cycle Gas Turbine (CCGT) power station is approximately £60/MWh[4]. Battery technology is currently approximately £200/MWh[5]. We know that costs can fall quickly, as offshore wind generation has shown, but a similar effect in batteries is probably going to take many years yet.

**Carbon Emissions Reduction Policies in the Power Sector**

As well as the reduction in carbon emissions due to reduced load factors as the amount of renewables on the system increases, there are effective policies targeting the power sector already in place at a UK level. These are the EU ETS and the UK CPS tax, which put a price on carbon emissions from the power sector with the intention of driving down carbon emissions from this sector. The CPS, in particular, has already had a significant role in reducing the output from coal fired generation and increases the cost of gas fired electricity production.

**Connah's Quay Power Station Contribution to the Welsh Economy**

We are proud to be the owner and operator of Connah's Quay power station. 98 people are employed at the site. During site outages the number of people working at the power station can exceed 400 people. The power station supports employment in the wider area through sourcing goods and services from many local providers. Consequently, including taxation, we estimate the contribution to the local economy to be in the region of £10m annually.

Connah's Quay power station benefits from existing infrastructure in terms of connections to the gas and electricity networks and civil engineering at the site. Reusing this infrastructure is likely to be more cost effective than new build replacements in either Wales or England. We are in discussion with local policy makers and regulatory authorities regarding potential future development at Connah's Quay.

In addition to the role of the power station in supporting security of electricity supply, there is an extensive gas reprocessing plant on the site to take gas from gas fields in Morecambe Bay. This is injected in to National Grid's gas transmission system at Burton Point and makes a contribution to Wales' and GB's gas security for industrial processes and for heating homes.

This gas infrastructure could have a significant role in the future should Carbon Capture and Storage become economically viable to support the continued use of gas fired generation or Carbon Capture and Use processes at Connah's Quay. Preliminary studies, such as those by

[4] BEIS, Levelised Cost of Electricity, Nov 2016
[5] Lazards, Levelised Cost of Storage, Nov 2017

the Energy Technologies Institute, illustrate the strategic potential of the Connah's Quay site and gas infrastructure to realising a low-carbon future for the UK[6].

Any devolved Government intervention that increases costs to the power station site would impact the competitiveness and viability of the location, and this would impact on the potential for the Connah's Quay site to become a low carbon energy system hub in the future. We expect consideration to be given to the advantages of keeping the existing and potential future economic benefit in Wales.

**A Hydrogen economy**

A potential future use of Connah's Quay could be in the production and storage of Hydrogen. It may be possible in the future for gas fired power stations, with carbon capture, to produce electricity to be used for conversion to Hydrogen by electrolysis. Innovation in power-to-gas technology could be used to support decarbonisation by producing Hydrogen for use in heat, transport and for storage. There are a number of examples of Hydrogen fuelled gas turbines in operation or planned around the world.

[6] Taking stock of $CO_2$, An ETI Insights report, Figures 1 and 6, https://d2umxnkyjne36n.cloudfront.net/insightReports/Taking-stock-of-UK-CO2-storage.pdf