

## **DECC – A Call for Evidence on the Role of Gas in the Electricity Markets – June 2012**

### **BP Submission**

#### **Summary**

- Greater use of gas will result in far cheaper carbon abatement, whilst aiding UK competitiveness.
- The UK has a diverse supply infrastructure, which enables gas to enter the country from a number of different supply sources.
- Cheap gas is providing the US with a competitive advantage.

#### **Introduction**

1. While BP plays a major role in the UK as a producer of gas, our role in the mid and downstream is restricted to trading activities. Therefore we will limit our comments to areas where we feel we have expertise, namely global market trends and the global supply/demand picture. Given our global perspective, it may be most helpful if present our overall view of the gas market in the UK and globally without specific reference to each question. Our main argument is that, when considering the three most important requirements of UK Energy policy – carbon abatement, supply security, and competitiveness – Gas is unique in being able to contribute to all three requirements simultaneously.

#### **The qualities of gas**

2. Gas is naturally the cleanest burning fossil fuel, producing 55% less CO<sub>2</sub> emissions than coal when burned for power generation, whilst also producing relatively little nitrogen oxide, sulphur dioxide or particulates. It also has a higher conversion efficiency, which means it loses less energy than other fossil fuels when producing electricity or heat. The reliability and flexibility of gas also make it an essential backup to intermittent low carbon sources of generation such as wind and solar.
3. Natural gas also has the advantage of being competitively priced, and as a mature technology requires no subsidies to guarantee its future availability. As well as its competitive market price, new gas Combined Cycle Gas Turbines (CCGT) also benefit from having a low capital cost and take as little as three years to build. These qualities of gas support the assertion in the previous paragraph.

#### **A role in decarbonisation**

4. Greater use of gas will result in far cheaper carbon abatement than relying on renewable generation exclusively. BP's estimates for Levelised Cost of Electricity (LCOE) show that unabated gas produced by a new build CCGT costs £50 per megawatt hour. This compares favourably to other renewable and low carbon technologies, especially offshore wind and nuclear which equate to £155 and £90 per megawatt hour respectively.
5. The intermittent nature of renewables requires some complementary form of load management to match supply and demand when generation is not available. Over time, the roll out of smart grids, smart meters and smart appliances is expected to contribute via the demand side, but the lead times necessary to replace the appliance stock are likely to be

extensive and its effects are as yet uncertain. It is, therefore, unlikely to be sufficient to bridge the gap in the medium term, requiring some additional load-following generation at scale within this time period to provide a balance. Correlation between peak demand and low wind generation at times of low temperatures will also mean that such generation must also be guaranteed to be able to run at peak. It is likely that a substantial proportion of this capacity will be provided by new CCGT facilities.

6. Emphasising gas in the short to medium term also creates time and opportunity to focus on developing and demonstrating the options that will ultimately be needed – not just Carbon Capture and Storage (CCS) but also wind and nuclear. The risk of pushing the power sector to deploy these options too widely too early is that investments are made in the wrong technologies or in “first of a kind” technologies that become obsolete before anyone else’s. For example, the US nuclear fleet (built 70s and 80s) is now expected to operate for 20 years beyond its original 40 year design lifetime; the UK’s (built from the 60s and 70s onwards – and the only country to use Magnox technology) is not.
7. There has been concern that a heavy gas future will necessitate the development of further unconventional gas sources, which critics have claimed presents its own environmental issues. However the latest IEA report “Golden Rules for a Golden Age of? Gas” shows that a reduction in unconventional gas development actually increases energy related CO<sub>2</sub> emissions by 1.3% by 2030. If the aims of policy makers is to limit the emissions of CO<sub>2</sub> then unconventional gas is the cheapest and most secure way of achieving this goal. The report also proposes certain rules, which while raising costs marginally, would further alleviate the concerns that have been expressed over potential environmental impacts associate with unconventional gas production.

### **Secure Supply**

8. The increasing role of unconventional gas which, at least in the United States, appears to be a ‘game changer’ has important implications for UK energy security. This is not just important for the US but has significant implications for the global market as well, including UK energy security.
9. This ‘revolution’ in developing new supplies of gas in North America has occurred in relative obscurity, but is no less significant for that. As little as four or five years ago, the United States of America was expecting to become a major net gas importer merely to satisfy its own existing needs. But technological advances in hydraulic fracturing and horizontal drilling are now being used to access unconventional gas deposits in tight/shale gas formations, as well as coal bed methane. The result is that, while estimates vary, the United States can now confidently assume the existence of between 50 and 100 years’ worth of recoverable natural gas. No amount of energy planning or energy policy initiatives could have forecast this development, and indicates the danger of government intervention in ‘picking winners’.
10. The shale gas revolution in the United States has one direct consequence for countries such as the UK – namely, that vastly increased US production of unconventional gas will in turn free-up Liquefied Natural Gas (LNG) cargoes for the rest of the world. The expected increase in unconstructed LNG cargoes will be free to go to wherever the price mechanism signals

the greatest need. This is especially important for Europe, because it addresses the misconception that increased use of natural gas involves greater dependence on a narrow range of gas suppliers. In fact, the opposite is becoming true. The UK is particularly well placed in this connection because the investment which has already been made in UK LNG infrastructure allows us to cope with increased LNG imports.

11. However, it is not just that US unconventional gas relieves the pressure on LNG supplies. The new technologies currently being applied in the United States have only just begun to be extended to the rest of the world. Worldwide and in total, BP estimates that as yet undeveloped or unidentified unconventional gas could contribute a further 113 tcm to gas resources, adding another 60 per cent to proven gas reserves – a combined total of approximately one hundred years of consumption at current rates.
12. Security will be further enhanced with the development of the Southern Gas Corridor. The Shah Deniz full field development (FFD) is a giant project which is expected to add a further 16 billion cubic metres per year (bcma) of gas production to the existing 8 bcma from Shah Deniz Stage 1, opening up Azerbaijan as a major gas supplier to new gas markets. The project is designed to bring increased gas supply and energy diversity to European markets through a new Southern Corridor. BP plans to start Shah Deniz gas deliveries in 2017.
13. The UK is well placed to benefit from these of global supplies of gas. The UK's gas import capacity in 2015 will be well above the National Grid's prediction of gas imports for the foreseeable future. The combination of LNG regasification facilities and pipelines from Europe and Norway increases the diversity of supplier further.

#### **Gas and US Industrial Competitiveness**

14. What is becoming increasingly apparent is the impact that low gas prices are having on the US economy. Gas prices in the US have fallen dramatically over the last two years with prices now averaging around \$2.5 per MMBTU. While it is too early to say definitively, it appears to be leading to an industrial renaissance in the US, with the impact being particularly pronounced in the US chemical industry. According to the December 2011 IHS Cera report 'The Economics and Employment Contributions of Shale Gas in the United States' low and stable natural gas prices over 25 years will result in industrial production being 4.7% higher by 2035 than it would have been under a constrained unconventional gas scenario.
15. Chemical companies are once again increasing investment in the US reversing a trend of decline that had been apparent since 2001. Several companies have begun incremental expansion of existing assets and some have announced plans to invest in new assets especially new ethylene crackers. Yet low electricity prices don't just stand to benefit the chemicals industry. Increased competitiveness will expand production and create more jobs in the rest of the economy, including, but not limited to, the production of aluminium, fertilisers and iron ore. This is because there is a significant impact on the end electricity price when the price of fuel falls. The cost of fuel represents 40% of the total cost of producing and delivering electricity. Therefore a low natural gas price should mean cheaper energy costs for the US. As the IHS Cera report notes "the benefits from lower cost electricity are subtle but they have an extensive reach. Electricity is involved in every aspect of modern life, including the productive processes of an economy." IHS Cera does not expect this trend to be

reversed with gas prices remaining depressed in the US for the foreseeable future. This is evidenced by the expected investment in energy generation in the US. The IHS Cera report predicts that gas will account for 60% of new generation capacity by 2035, outstripping investment in renewables.

### **Lessons for the UK and EU**

16. It is clear that natural gas offers the UK an effective means to achieve energy security and help to meet our carbon reduction commitments. In the UK, its competitive cost, and wide supply base, coupled with cheap capital costs and quick build times for gas power stations, and an excellent infrastructure system, means that the use of Gas in our energy mix can only enhance our energy security.
17. Gas may not be the perfect solution to carbon abatement but it is currently the most practical and affordable solution. Far from closing options, as is sometimes alleged, it provides the breathing space to move from first to second generation renewable technologies which are likely to be essential in finally reaching the world's CO2 targets at a price which electorates and consumers are prepared to afford. While it is true that gas alone cannot meet the entirety of the UK's and EU's CO2 targets, there is a danger of the best being the enemy of the good – if gas isn't allowed to play its part and is merely seen as a threat to renewables, Europe may end up with an unreliable, uncompetitive supply of energy which fails to achieve the CO2 targets and which necessitates even more polluting fossil fuels in order to avoid a supply crisis.
18. All of this has implications for the UK's energy policy. In a bleak global economic climate, the US is seeing its industrial base gain competitive advantage versus companies in countries such as the UK due to their low gas prices. The development of gas generation can benefit the UK too, aiding competitiveness while allowing us to lower CO2 emissions.