A Call for Evidence by DECC on the Role of Gas in the Electricity Market, May 2012

Response by Oil & Gas UK

Introduction

Oil & Gas UK is the principal trade association representing the offshore oil and gas exploration and production (E&P) industry in this country. It has some 250 members from the largest, integrated oil and gas companies, through the independent explorers and producers, utilities with E&P subsidiaries and exploration-only companies to a wide variety of businesses in the supply chain.

This sector has been the largest industrial investor in the UK for the past 30-40 years with roundly £300 billion (in 2010 money) invested by the sector in the four decades to the end of 2010; it remains so, with £8.5 billion of capital invested in 2011 and a forecast of £11.5 billion investment in 2012. Corporate taxes paid on the production of oil and gas amounted to £11.2 billion in the last financial year, almost 25% of all corporation tax receits by the Exchequer, with another £6 billion contributed by the supply chain in payroll and corporate taxes. The industry supports some 450,000 jobs throughout the economy, many of them highly skilled and well paid. Exports of oil and gas field goods and services were in excess of £6 billion in 2011.

Power Generation: current outlook

We are pleased that DECC has sought evidence on the role of gas in the electricity market. This is timely. Gas is not only the largest source from which electricity is generated[1], it is also the largest source of primary energy in the UK and has been for a considerable number of years. It is, of course, as DECC's own heat strategy recently demonstrated, by far our largest source of heat, with some 80% of homes and much of industry and commerce being heated by it.

As is widely known, there are large amounts of power generation capacity to be closed in the coming years on account of emissions' restrictions and old age. What is less well appreciated is the full extent of these closures, particularly if the time horizon is moved from the oft-quoted 2020 to 2025. To the best of our knowledge, this is the full picture, albeit in broad terms:

- 12 GW of oil and coal fired power by end of 2015 – LCPD induced
- 9.5 GW of nuclear power by 2023-5 – resulting from old age
- ≤18.5 GW of coal fired power by 2023 – IED induced plus old age*
- ≤18 GW of pre-2002 gas fired power by 2023 – IED induced†

(* = all coal plant except Drax B will be 50 years old or more by 2024)
(† = extent of ability/willingness to invest to comply with IED is not known)

This should be set in the context of total generating capacity in GB of about 80 GW and peak winter demand of some 60 GW. The scale of the forthcoming closures is unprecedented.

By the end of this year, some 10 GW of new CCGT generating capacity will have been commissioned since mid-2009; another 8 GW have been consented for completion during 2013-16, according to National Grid's 7 Year Statement for 2011, but the economics of gas fired power are not good in the near term owing to the low prices of coal and CO_2 allowances. Therefore, how much of these 8 GW

[1] DECC states on page 2 that "around 34%" of electricity in 2011 was generated from gas. This is incorrect according to DECC's published figures: see "UK Energy Statistics" of 29th March 2012 where the figure is given as 40%.

will be built and when is far from clear. No new coal fired power will be built without CCS which, we assume, is most unlikely to be available by 2025 at commercial scale.

As far as new nuclear power is concerned, our sense is that only Hinkley Point C (3.2 GW) is likely to be built within this timeframe. Current wind power capacity is ~4.5 GW and, even if the UK were to have installed 25-30 GW by 2025 (also most unlikely, in our opinion, owing to financial and supply chain constraints), there will still be a substantial gap between supply and demand even for baseload power, never mind peak power (~60 GW), both of which are expected to increase with time as the economy becomes more electrified.

It therefore seems inevitable to Oil & Gas UK that gas fired generation is going to be required on a substantial scale in order to provide both baseload power and back-up for intermittent renewable generation. This is likely to be mainly CCGTs, but may include some OCGTs for peak purposes (a number of the big coal fired plants referred to in the list above were equipped with OCGTs for peak power when they were built). However, OCGTs which are more responsive than CCGTs are unlikely to meet the proposed Emissions Performance Standard.

The main unknown in all this is the full extent of the requirement for new gas fired power and what this might mean in terms of the overall demand for gas.

Questions Posed by DECC

a) *What are the main strengths and weaknesses of gas generation in helping deliver a secure, affordable route to decarbonisation through to 2020 and then by 2050?*

The main benefits of gas fired power are:

i) Low capital cost and, therefore, easier to finance than other more capital intense means of generation, such as nuclear and renewables
ii) Proven technology which can be built quickly at the required scale, providing reliable generation with high load factors
iii) Very flexible
iv) Can be located near demand and can use former coal or oil fired station sites with the grid connections that already exist; smaller footprint than the ones they replace
v) Large reduction in emissions (CO_2, NOx, SOx, heavy metals and particulates) relative to coal and oil fired stations replaced
vi) Suitable for CCS if and when this becomes proven at commercial scale

b) *What role can gas fired generation play in the future and what level of gas generation capacity is desirable?*

There are several main roles for gas fired generation in future:

i) Baseload power during at least this decade and next and, with CCS, for even longer, but depending on relative costs
ii) Back-up for intermittent renewable generation
iii) Grid stability generation

However, predicting future capacity requirements is fraught with difficulty. On the face of it, there will be a very large requirement until at least 2030. Much will depend, though, on the future trend in electricity demand which is expected to rise, but by how much is not known.

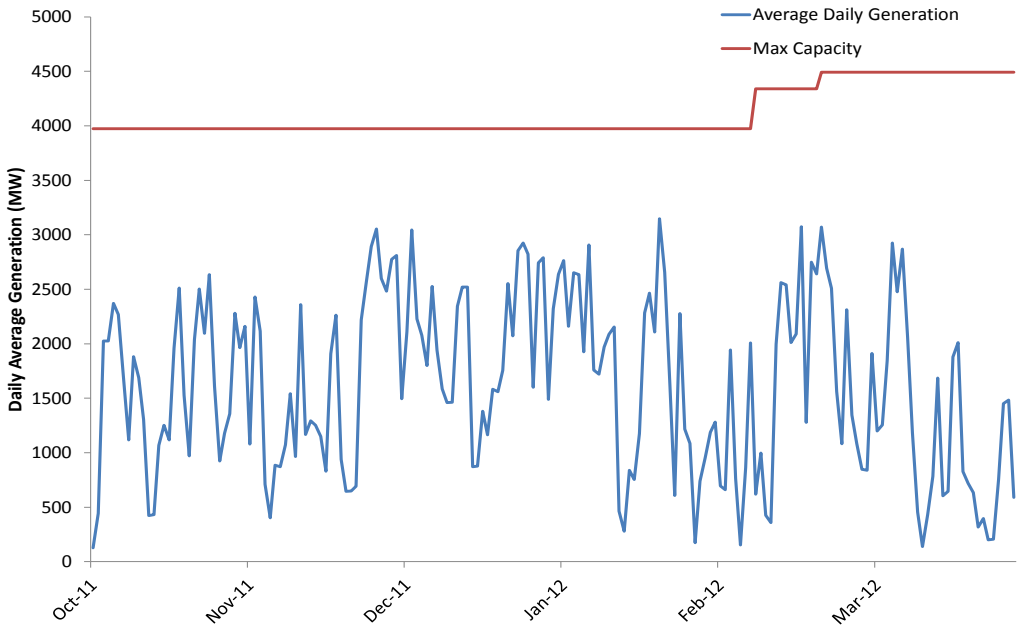
c) *What are the key factors driving the economics of investing in new gas fired power generation and how are these factors likely to change?*

We think that these are questions for the power generators to answer and not us.

d) *What barriers do investors face in building new gas generation plants in the UK? What are the key regulatory uncertainties that may prevent debt and equity investors making a final investment decision in gas generation and supply infrastructure?*

We also think that these questions are mainly for the power generators to answer, but we would like to comment on the final aspect regarding supply infrastructure.

The demands on the gas infrastructure, mainly the NTS, are going to change as gas demand responds to the variability in gas fired generation, itself caused by intermittent wind power. The graph shows the variability of grid connected wind generation during the six months from October 2011 to March 2012, a windier autumn and winter than for some years.



This means that the NTS will almost certainly need extra investment in order to be able to respond to these rapid variations. It also suggests that more fast cycling gas storage, such as salt cavities, will be required. What ever, the NTS will have to be more flexible.

e) *Are there any other policy issues that need to be addressed beyond the government's proposals for the capacity mechanism and the EPS?*

i) The potential for CCS to be applied to gas fired in future should not be overlooked. If it will work for coal, it will work for gas and probably at lower cost. This should be taken into consideration in DECC's review of the role of gas in power generation.

ii) Any future reductions in the EPS will have to be applied with care, so that they do not prevent the required investment in gas fired power plant in order to maintain security of electricity supplies.

iii) Also, it should not be forgotten that gas is mainly used as a source of heat in the economy and that gas demand for heating currently far exceeds that for electricity. Indeed, if all the heat satisfied by gas on cold winter's days, such as occurred in January and December 2010, were instead to be supplied by electricity, the electricity system would need to have four to five times its present capacity.

iv) Thus, what happens to gas demand overall is of crucial importance, if the UK is to ensure the security of future energy supplies. In recent years, the gas supply industry has responded on a very large scale with investment in new infrastructure, but it is far from clear how much further investment will be required in gas infrastructure to satisfy future requirements.

v) Liquidity in the gas market is likely to be affected by these changes as the system has to react to rapid fluctuations in demand, because gas and electricity are becoming more and more interconnected (ref our comments above about the NTS, as well). The consequences for gas market liquidity are not adequately reflected in the proposals for reforming the electricity market.

vi) It should not be forgotten that moving gas is considerably cheaper and more flexible than moving electricity. This factor is also not reflected in these proposals.

vii) The details in the new Network Codes being developed under the EU's third package of measures should not be allowed to interfere with current trading and balancing arrangements in GB's gas market which work well.

f) Given a continuing role for gas and the potential for increased volatility in gas demand, to what extent is gas supply and related infrastructure a barrier to investment in gas fired generation? What impact will unconventional gas have on the case for investing in gas generation and the supporting infrastructure?

Please refer to our comments in answer to (e) above regarding infrastructure. As far as unconventional gas is concerned, it is largely supplied at constant rates. It does not have the "swing" capability of traditional natural gas supplies. Therefore, its effects on generation and infrastructure will simply be as another source of supply, albeit steady supply.

Summary

The scale of the forthcoming changes in electricity generation is clearly very large, larger probably than many have realised. While it may have been understandable that most of the attention to date has been concentrated on reducing emissions in the electricity sector, security of supply and affordability, with which comes economic competitiveness, are the two other high level objectives which government (EU and UK) has; they are just as important.

Therefore, it seems inevitable that gas has a major role to play in power generation, both for baseload and back-up, as well as in the provision of heat, for some decades to come and, with CCS, for even longer.

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