A UK ‘dash’ for *smart* gas

Samuela Bassi[*], James Rydge[‡], Cheng Seor Khor[†], Sam Fankhauser[*], Neil Hirst[†] and Bob Ward[*]
[*]Grantham Research Institute (LSE), [‡]New Climate Economy, [†]Grantham Institute (Imperial College)

Introduction

Shifting from coal to natural gas for electricity generation can help the UK power sector to decarbonise in the near term.

This, coupled with the suggestion that shale gas could make future supplies cheap and plentiful, has generated enthusiasm for natural gas to play a much bigger role in electricity generation.

However, without significant advances in Carbon Capture and Storage (CCS) technology, extensive use of natural gas for power generation in the UK beyond 2030 threatens the UK’s ability to meet its carbon targets at least cost.

The approach

This policy brief explores the potential role for conventional and unconventional natural gas in the UK, and their possible impact on energy security, prices and on the environment.

The analysis is based on a review of the most recent and robust evidence about the opportunities and challenges of an increasing role for conventional gas sources and shale gas.

It takes into account UK and European carbon constraints, gas market dynamics, environmental impacts and technological progress.

Results

A dash for gas power generation?

Energy security

Natural gas is expected to continue playing a significant role in the UK energy mix over the coming decades, for both heating and electricity generation.

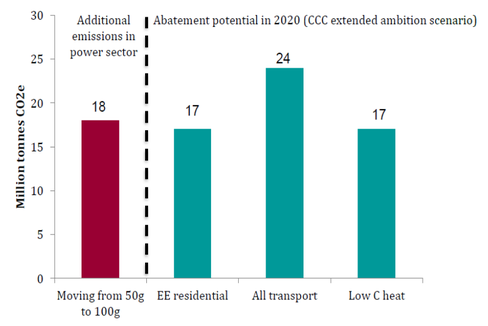
Energy cost

There are large uncertainties around future gas price forecasts. Several estimates, including by the International Energy Agency (2012), indicate that gas prices in the UK and European Union are unlikely to fall over the next two decades.

Environment and climate change

Investment in gas power generation should be consistent with UK emissions targets. The Committee on Climate Change (2010) advises that the power sector should emit no more than 50g CO_2/kWh by 2030. Should it decarbonise only up to 100g CO_2/kWh, for instance, this would require doubling the effort on other key climate change measures, such as on transport or energy efficiency, in order to remain consistent with the UK carbon budgets – see Fig.1. This can be more expensive.

Figure 1. Policy implications of a less ambitious decarbonisation target for the power sector



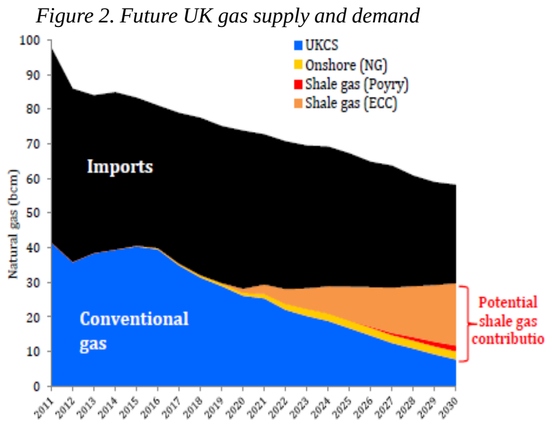
Source: Bassi et al. (2013) based on CCC (2010)

A dash for shale gas?

Energy security

There is great uncertainty around the size of UK shale gas reserves that can be commercially extracted. Current estimates suggest shale gas will not make the UK free from the need to import natural gas. At best, shale gas may compensate for the decrease in domestic production of conventional gas - see Fig.2.

Figure 2. Future UK gas supply and demand



Source: Bassi et al. (2013) based on National Grid (2012), Pöyry (2011) and ECC (2012)

Energy cost

Prices on the UK market are likely to remain largely driven by wholesale prices charged by foreign suppliers. The effect of UK shale gas on household and business electricity bills may therefore be limited.

Environment and climate change

Environmental impacts from fracking can be limited if the right technology and good practices are in place, but strong regulation will be paramount. This should be carefully designed to minimise local impacts (for example, on landscape and traffic) and ensure strict environmental and health and safety standards of future shale gas exploration.

Conclusions: a ‘dash’ for *smart* gas

Shifting from coal to natural gas for electricity generation can help the UK power sector to **decarbonise in the near term**.

In the long run, however, **extensive deployment of gas-fired power stations would not be consistent with the UK’s carbon targets**, unless it is accompanied by the widespread deployment of carbon capture and storage (CCS).

Furthermore, **the suggestion that shale gas could make supplies cheap and plentiful in the future appears unlikely**. Environmental concerns and large uncertainty about the future price and availability of natural gas give cause for caution.

A lower risk option is rather a ‘dash’ for *smart* gas, where **natural gas is used judiciously in those areas where it offers the greatest value in decarbonising the power sector**.

With good planning and investment, natural gas can support the development of a low-carbon power sector in the UK by providing essential **backup for intermittent supply from renewables**, and could play an even **bigger role if** gas-fired power stations are **fitted with CCS technology.**

Literature cited

Bassi, S., Rydge, J., Khor, C.S., Fankhauser, S., Hirst, N. and Ward, B. 2013. *A UK dash for ‘smart’ gas*. London: Grantham Research Institute for Climate Change and the Environment and CCCEP, LSE

Energy Contract Company (ECC), 2012. *UK Shale Gas – An Assessment of Production and Reserve Potential*. Twickenham (UK): ECC

Committee on Climate Change (CCC), 2010. *The fourth carbon budget – reducing emissions through the 2020s*. London: CCC

National Grid, 2012. *UK future energy scenarios*. London: National Grid.

International Energy Agency (IEA), 2012. *Golden rules for a golden age of gas, special report on unconventional gas, world energy outlook.* Paris: OECD/IEA.

Pöyry, 2011. *The impact of unconventional gas on Europe*. A report for Ofgem. London: Pöyry.

Further information

Contact: s.bassi@lse.ac.uk
Grantham Research Institute on Climate Change and the Environment, LSE
www.lse.ac.uk/GranthamInstitute

Full paper available at:
www.lse.ac.uk/GranthamInstitute/publication/a-uk-dash-for-smart-gas