

The Rt Hon Edward Davey MP
Secretary of State, Department of Energy & Climate Change
3 Whitehall Place, London SW1A 2AW

13th September 2012

Dear Edward

The need for a carbon intensity target in the power sector

We are writing to express the great concern of the Committee on Climate Change about the recent Government statement “that it sees gas as continuing to play an important role in the energy mix well into and beyond 2030...[not] restricted to providing back up to renewables”.

Extensive use of unabated gas-fired capacity (i.e. without carbon capture and storage technology (CCS)) in 2030 and beyond would be incompatible with meeting legislated carbon budgets. These are, of course, designed to balance the costs and risks of meeting long-term objectives and they require significant investment in low-carbon power generation over the next two decades (see Attachment). Unabated gas-fired generation could therefore not form the basis for Government policy, given the need under the Climate Change Act to set policies to meet carbon budgets and the 2050 target. This does not deny the important medium-term role of gas in meeting our energy needs which is already factored into the budgets (i.e. predominantly for heat in buildings and industry), nor does it prohibit the use of our own gas resources for this purpose, if environmental concerns can be addressed.

However, the apparently ambivalent position of the Government about whether it is trying to build a low-carbon or a gas-based power system weakens the signal provided by carbon budgets to investors. It makes more pronounced the perceived risk that the Electricity Market Reform (EMR) will perpetuate the current stop-start approach to investment in low-carbon technologies. As a result, the cases for low-carbon business development, capital allocation, innovation and supply chain investment are undermined, damaging prospects for required low-carbon investments. This has been made clear to us in our extensive discussions with the energy and supply chain companies who it is hoped will fund the very significant investments needed in power generation over the next two decades, and who have suggested to us that the sector investment climate is currently very poor.

To address this risk, and to buttress the signal provided by carbon budgets, an appropriate approach would be to set a clear carbon objective for the EMR in secondary legislation (to reduce carbon intensity of power generation to around 50 gCO₂ / kWh by 2030), as recommended by the Energy and Climate Change Select Committee.

This would provide more confidence about the direction of travel for the power system through clarifying and getting agreement on specific implications and underpinning assumptions of carbon budgets, and guiding EMR implementation through the Delivery Plan, therefore bringing forward low-carbon investments required to meet carbon budgets at least cost to the consumers.

It would also allow flexibility for periodic review (e.g. prior to drafting a Delivery Plan) and possible modification based on new information about technology costs, gas prices, carbon prices and feasible build rates.


It could be designed in a way to provide incentives for innovation and cost reduction, for example, through conditioning the level of ambition in the target / support for low-carbon technology on cost reductions being achieved.

We therefore strongly urge that you accept the recommendation of the Select Committee and address investor concerns by setting a 2030 carbon intensity target in secondary legislation with a reference to this in the next draft of the Energy Bill.

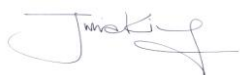
Yours sincerely



Lord Deben, Chairman



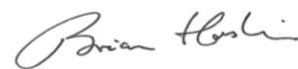
David Kennedy, Chief Executive



Professor Dame Julia King



Professor Samuel Fankhauser



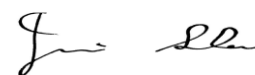
Professor Brian Hoskins



Lord Krebs



Lord May



Professor Jim Skea

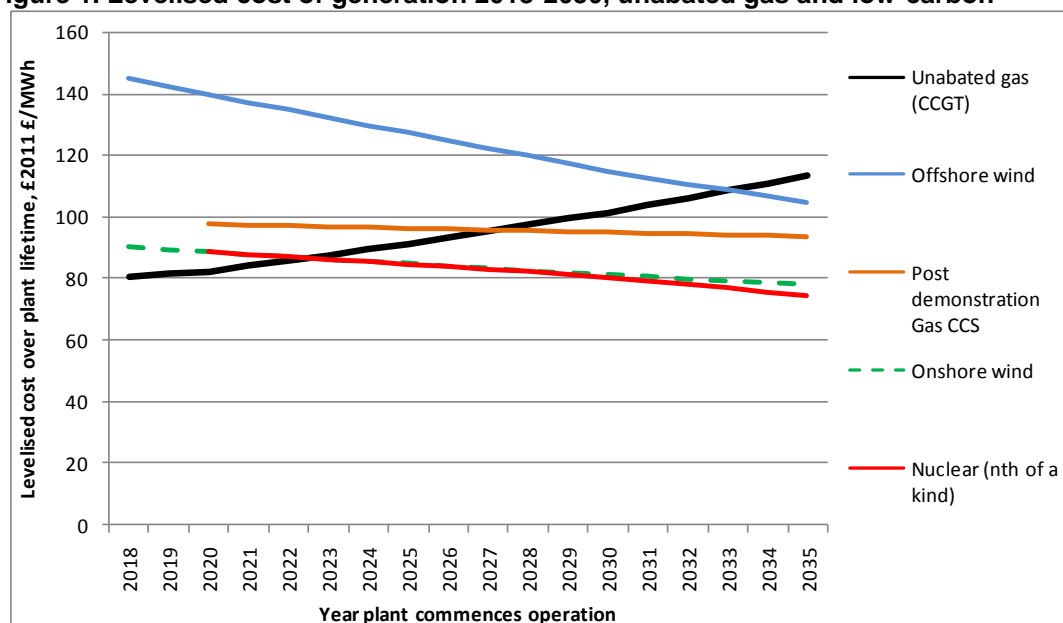
cc Prime Minister, The Rt Hon David Cameron
Deputy Prime Minister, The Rt Hon Nick Clegg
Chancellor of the Exchequer, The Rt Hon George Osborne
Secretary of State for Business, Innovation and Skills, The Rt Hon Dr Vincent Cable MP
Minister of State at the Cabinet Office, The Rt Hon Oliver Letwin

Attachment: the need for early power sector decarbonisation to meet carbon budgets and the 2050 target

Early power sector decarbonisation is required to meet the 2050 target in the Climate Change Act.

- The power sector currently accounts for around 25% of UK greenhouse gas emissions.
- There is a set of low-carbon technologies available for power sector decarbonisation. These are either broadly cost-effective compared to gas-fired generation with a rising carbon price (e.g. onshore wind, nuclear), or – for less mature technologies (e.g. offshore wind, CCS) - likely to become cost-effective over time (Figure 1).
- Our analysis, together with that of the Government and of other organisations, suggests that deep cuts in power sector emissions will be required to meet the 2050 target.
 - Without significant cuts, power sector emissions would account for almost all of the allowed emissions under the 2050 target (i.e. 150 MtCO₂ of the 160 MtCO₂e available).
 - Power sector decarbonisation and electrification is key to cutting emissions in surface transport, heat in buildings, and possibly heat in industry; together emissions from these sectors account for just over half of UK greenhouse gas emissions.
- Early investment in low-carbon technologies is required to achieve longer term objectives given build rate constraints (e.g. it would not be feasible to add low-carbon capacity required in 2050 entirely in the period from 2030), and the need to develop less mature technologies for subsequent deployment.
- There is the opportunity for early investment given significant capital stock turnover in the next two decades (i.e. around 50-60 GW of new baseload capacity is required between now and 2030, much of which will still be on the system in 2050).

Figure 1. Levelised cost of generation 2018-2030, unabated gas and low-carbon



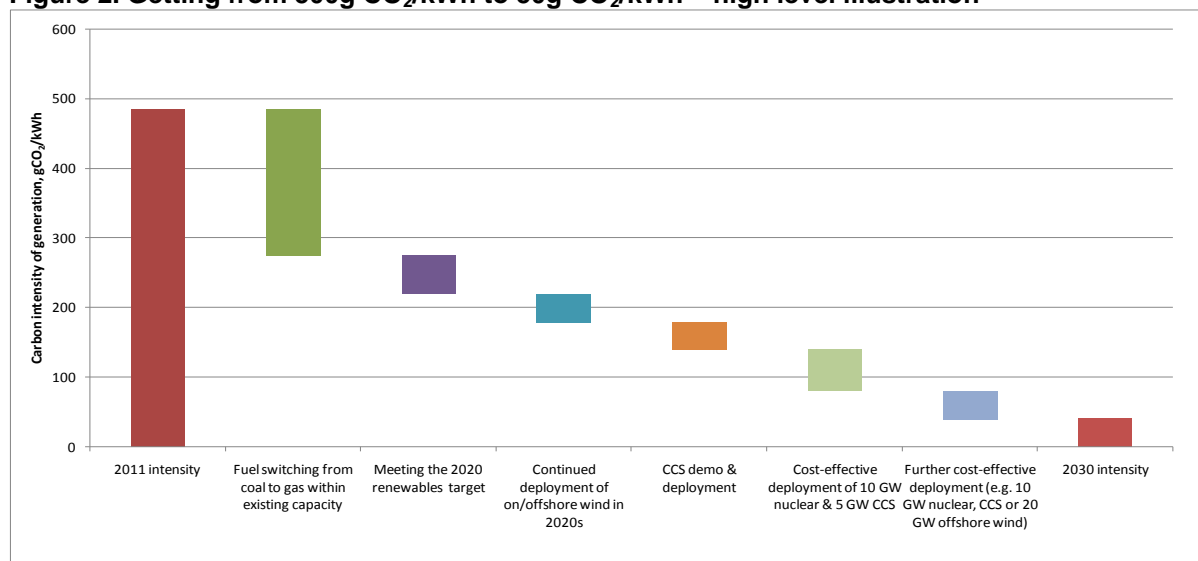
Source: CCC calculations, based on Mott MacDonald (2011) and Parsons Brinckerhoff (2011).

Notes: £2011. Assumes plant runs at full availability. Central cost ranges only (capex, opex and gas price), although there is considerable uncertainty, e.g. over offshore wind costs for which the full range for 2030 is £90-140/MWh. Gas CCGT and residual emissions from Gas CCS face a carbon price in line with the Government's carbon values, including the carbon price floor, rising to around £70/tCO₂ in 2030.

Analysis underpinning the fourth carbon budget assumes deep cuts in power sector emissions over the next two decades.

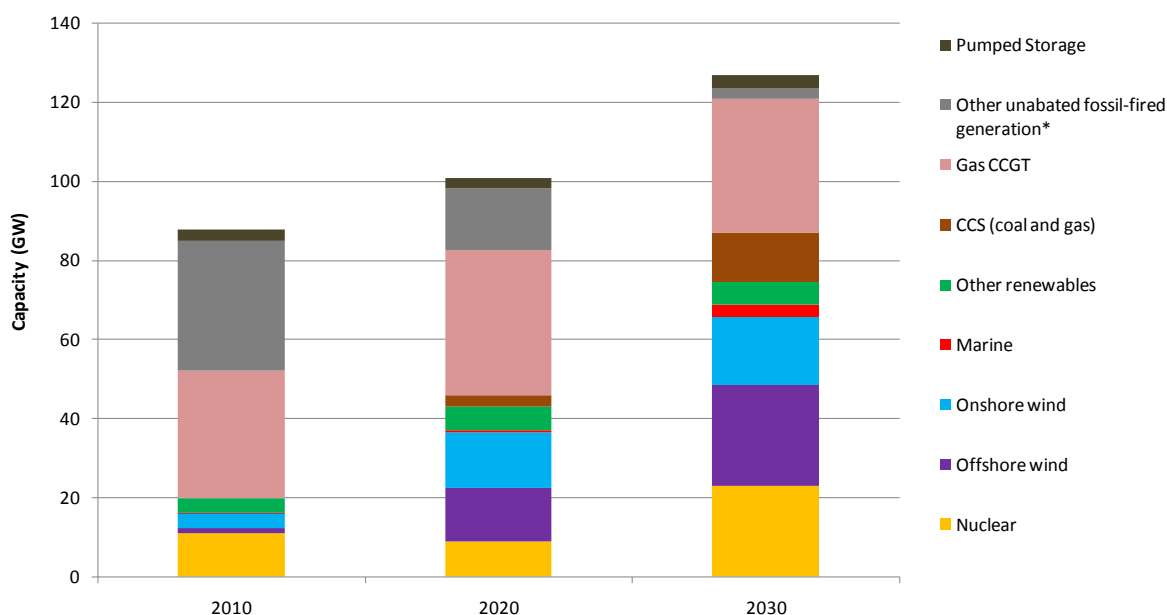
- The power sector scenario for the fourth carbon budget was designed to develop a portfolio of low-carbon technology options, and includes cost-effective investment in mature low-carbon technologies, together with investment in less mature technologies required to support learning and innovation.
- The scenario results in a carbon intensity reduction from around 500 gCO₂ / kWh today to around 50 gCO₂ / kWh in 2030 through retirement of coal plant, investment to meet the renewable energy target, demonstration of CCS prior to 2020, and further investment through the 2020s in nuclear, renewables and CCS (Figure 2).
- An indicative generation mix to achieve this intensity reduction in 2030 is 40% nuclear, 40% renewable, 15% CCS, and around 5% unabated gas-fired generation (Figure 3)

Figure 2. Getting from 500g CO₂/kWh to 50g CO₂/kWh – high level illustration



Source: CCC calculations.

Figure 3. Capacity mix in a scenario underpinning the fourth carbon budget advice (2010, 2020, 2030).



Source: DUKES (2011), Redpoint modelling for CCC 2012 Progress Report.

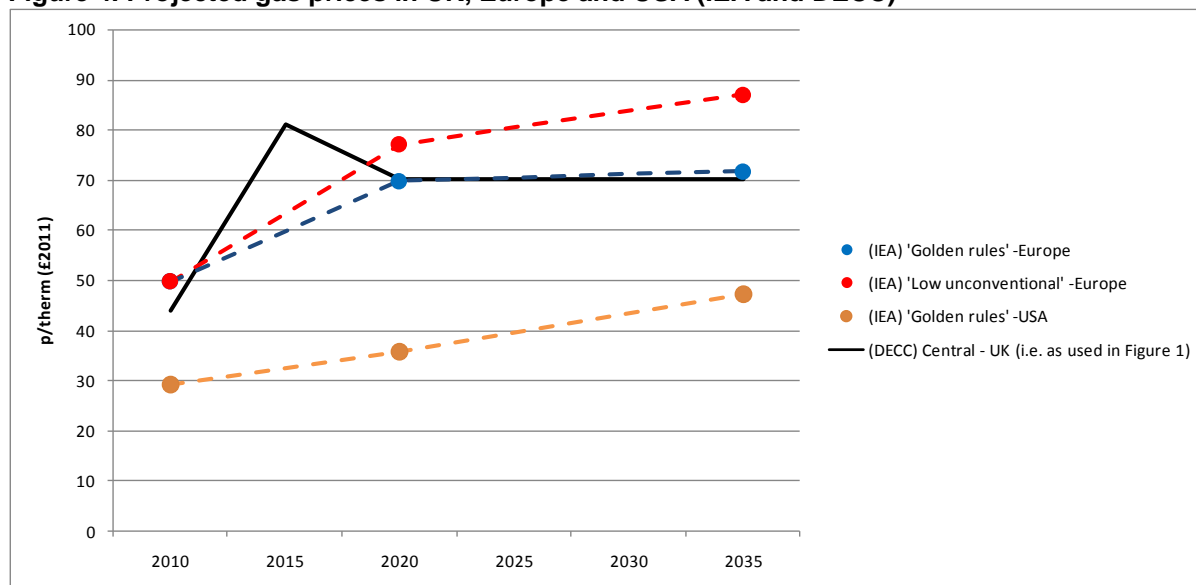
Notes: Capacity is shown on a nameplate basis (i.e. not adjusted for availability). In 2020 and 2030, the share of generation from renewables is around 35% and 40% respectively.

*Mainly coal. Other renewables includes biomass, hydro, solar.

The power sector scenario for the fourth carbon budget is robust to different assumptions about the gas price.

- The power sector scenario for the fourth carbon budget is based on the Government's central case gas price assumptions.
- The Government's central case projection is broadly consistent with gas price projections from the International Energy Agency (IEA). These envisage rising gas prices in the US and the EU over the next two decades, and a significantly higher gas price in the EU than the US, notwithstanding the potential impact of shale gas (Figure 4).
- Under this assumption, use of unabated gas-fired generation rather than cost-effective low-carbon generation would significantly increase system costs (e.g. by around £23 billion in NPV terms, see Figure 5).
- Even in an extremely unlikely case where the gas price in the EU falls to the level in the US (i.e. to around 40% below the lowest European price projected by the IEA), there is negligible benefit switching from cost-effective low-carbon generation to unabated gas-fired generation (Figure 5).

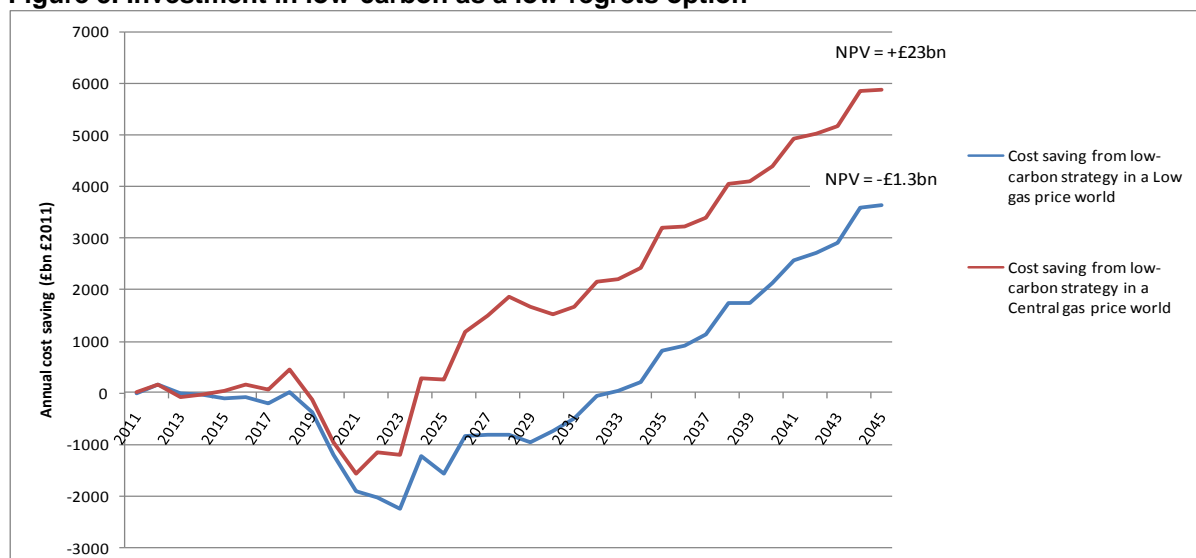
Figure 4. Projected gas prices in UK, Europe and USA (IEA and DECC)



Source: IEA (May 2012) *Golden Rules for a Golden Age of Gas*. DECC (October 2011) *Fossil Fuel Price Projections*.

Notes: IEA projections adjusted to £2011. £:\$ = 0.65. 'Golden Rules' scenario assumes 'a continued global expansion of gas supply from unconventional (i.e. shale) resources, with far reaching consequences for global energy markets'. The 'Low unconventional' case assumes 'only a small share of the unconventional resource base is accessible for development'. For 2035, DECC projections have been held flat at 2030 levels.

Figure 5. Investment in low-carbon as a low-regrets option



Source: Redpoint modelling for CCC 2012 Progress Report.

Notes: Low-carbon strategy decarbonises to around 40 gCO₂/kWh by 2030. Scenario with investment in predominantly gas achieves 130g CO₂/kWh by 2030. Both scenarios achieve at least 30% renewable generation by 2020 and assume technology policy continues to support minimum levels of offshore wind and CCS in the 2020s. Negative values imply a cost penalty from investing in low-carbon, while positive values imply a cost saving. NPV = Net Present Value, discounted at 3.5%. Low and Central gas price worlds as in DECC (October 2011) *Fossil Fuel Price Projections*.

Some but limited flexibility is desirable in the path for power sector decarbonisation over the next two decades.

- Flexibility is required, for example, given uncertainties over the feasible pace of investment in new nuclear capacity (i.e. a slower pace of nuclear investment than in our scenario could warrant increased use of unabated gas-fired generation).
- However, the degree of flexibility required is relatively minor, given limited opportunities elsewhere in the economy to meet the fourth carbon budget, and the relatively high cost of purchasing European Union Allowances or offset credits to meet the budget.
- Moreover, a significantly less ambitious pace of investment in low-carbon technologies over the next two decades would be incompatible with meeting longer term objectives. In particular, this would leave an insufficiently developed low-carbon technology portfolio, and prohibitively high build rates post 2030.

Hence a commitment to reduce carbon intensity to around 50 gCO₂ / kWh with some flexibility to review through a clear, transparent and evidence-based process is a low-regrets strategy. It is one that would help to improve the investment climate for low-carbon technologies, given

mixed messages from the Government about its intentions for the power sector, which signal a 2030 carbon intensity of anything from 50 to 200+ gCO₂ / kWh.