BG GROUP

BG Group's response to DECC's Electricity Market Reform consultation (December 2010, Cm 7983)

Question 1 **Do you agree with the Government's assessment of the ability of the current market to support the investment in low carbon generation needed to meet environmental targets?**

We agree that the current market arrangements are unlikely to attract the level of investment required to meet the UK's emissions targets and keep prices within affordable levels.

Question 2 **Do you agree with the Government's assessment of the future risks to the UK's security of electricity supplies?**

We agree that the current market arrangements are unlikely to maintain secure supplies of electricity at affordable prices. In discussions with DECC officials last year, we outlined our view that it was critically important that natural gas play a central role in the energy-mix to 2020 and beyond. We also explained our view that it is essential that any new UK energy policy framework encourage investment in a new fleet of CCGTs. Without that new fleet, we fear that the UK risks vulnerability to a security of power supply gap between now and 2020, as existing nuclear and coal generation capacity is decommissioned. We also risk failing to respond to the challenge of intermittency in the event of significant, new offshore wind power coming onstream and forming an increasingly large share of UK baseload generation.[1]

Q's 3-11 We do not invest in renewable generation projects, so we will not comment on the pros and cons of each feed-in-tariff model with respect to renewable energy projects and nuclear. However, although the consultation primarily links feed-in-tariffs (FIT) with support for non-fossil generation, we believe that the premium FIT model could, in the future, be the basis for support of carbon capture and storage (CCS). The two other proposed FITs (CfD and Fixed) would expose CCS operators to movements in fuel costs without any compensating movement in their revenues from selling power. With a "premium" FIT, on the other hand, movements in fuel prices would be expected to feed through into changes in power prices. The FIT premium could then be expected to cover the fixed costs of building the capture plant. However, if power prices are set by unabated fossil generation, the resultant movements in power prices will not fully compensate for the changes in fuel cost, owing to the CCS plant need to take power to run the capture plant and to compress and pump the CO_2. Therefore investors in CCS would only be partially exposed to movements in fossil prices and, in time, a premium fit could represent a suitable basis for support for CCS.

[1] See BG Group Powerpoint presentation attached, which was shared with DECC in October 2010

Question 12 **Do you agree with the Government's assessment of the impact of an emission performance standard on the decarbonisation of the electricity sector and security of supply risk?**

We agree that the EPS, as currently proposed, would prevent the commissioning of new, heavily polluting generating technologies.

Question 13 **Which option do you consider most appropriate for the level of the EPS? What considerations should the Government take into account in designing derogations for projects forming part of the UK or EU demonstration programmes?**

We favour setting a stringent target, set at 450g CO_2/kWhe, and providing specific derogations for CCS demonstrations, rather than a weaker 600g CO_2/kWhe target. This tougher target would set the UK on a higher decarbonisation trajectory and signal the UK" s ambitions to the wider
international audience.

Question 14 **Do you agree that that EPS should be aimed at new plant, and 'grandfathered' at the point of consent? How should the Government determine the economic life of a plant for the purposes of grandfathering?**

We agree that the EPS should be aimed at new plant. „ Economic life" should
be agreed at the time of consent, as this will inform developers" investment
decisions. BG Group does not have a view as to how this might be determined; only that, once set, it should not be changed unilaterally.

Question 15 **Do you agree that the EPS should be extended to cover existing plant in the event that they undergo sufficient life extensions or upgrades? How might the Government implement such a programme in practice?**

We agree in principle. However, it may prove difficult to define an upgrade sufficiently tightly for such an approach to be workable in practice. Linking the definition to the replacement of the prime mover, such as a gas turbine or combustion chamber, might forestall any gaming.

Question 16 **Do you agree with the proposed review of the EPS incorporated into the progress reports required under the Energy Act 2010?**

We agree that this review will provide greater transparency to market participants.

Question 18 **Do you agree with the principle of exceptions to the EPS in the event of long-term or short-term energy shortfalls?**

We agree that setting the EPS on an annual basis would, as the consultation document suggests, enable unconstrained operation in times of unanticipated

system stress. However, this should be tightly controlled; otherwise carbon

emissions could become unconstrained. Instead, we would propose setting the EPS on a quarterly basis.

Question 19 **Do you agree with our assessment of the pros and cons of introducing a capacity mechanism?**

We agree that, with the anticipated increase in the contribution from non-dispatchable forms of generation, the current trading arrangements need to be changed. There should be a scheme to reward centrally instructed changes in generation and/or demand patterns at short notice

Q" s 20-25 We agree that, by allowing centralised purchases (ie: on behalf of the market as a whole) of capacity, security of supply will be ensured at a lower price to customers than through a series of bi-lateral contracts between generators and suppliers. However, we believe that there is a model for a capacity payments mechanism that can deliver security of electricity supply in a more efficient manner than that proposed in the consultation.

As mentioned above, BG Group agrees with DECC that the UK will need additional CCGT capacity. This is for three reasons: first, CCGTs will be required to fill the generation gap created by the decommissioning of coal and nuclear plant that is expected between now and around 2020; second, natural gas is central to the UK meeting its 2020 decarbonisation targets; and, third, in the event that significant wind generation capacity comes onto the system over the next decade or so – as the UK Government expects – we will need capacity that can be switched on at short notice to counter generation intermittency that occurs when the wind does not blow (as during the cold snap during Winter 2010-2011). On occasions, fast response generation may be required even when demand is not at peak. The greater the share of wind in our generation-mix, the more flexible capacity will be required to cope with intermittency.[2]

We believe that the capacity payments mechanism model that we are proposing, as an alternative to that outlined in the consultation document, would fill any potential generation gap that risks emerging over the next decade or so and meet the intermittency challenges that are likely occasionally to result from the Government" s proposed energy-mix going
forward.

At a time when the UK has taken a conscious decision to reshape its energy and generation mix, there is a temptation to conclude that there is a need to incentivise pure peaking capacity. Indeed, the mechanism outlined in the consultation proposes offering capacity payments only to suppliers of such capacity. However, a better solution would be to encourage flexible and responsive capacity, capable of reacting at all times of system stress. By its

[2] See attached Powerpoint referred to above, which outlines BG analysis of why new CCGT capacity is required

to meet security of supply and decarbonisation requirements.

nature, this kind of capacity would be able to help meet peak demand but it would also be available at short notice in the event of wind or other intermittent sources of power failing.

The introduction of a capacity payments mechanism seeking to incentivise only pure peaking plant would be likely to trigger the construction of new – or the reintroduction and upgrading of existing – distillate plant and/or Open Cycle Gas Turbine stations. By their very nature, power stations of this type would be operational only during periods of peak demand. Given their niche role, they are unlikely to be able to meet the generation gap created, when the wind stops blowing, once wind generates a significant percentage of our baseload supply.

By broadening the availability of capacity payments to plant that is also capable of operating as baseload or mid-merit, investors could choose to run their plant – which are likely in large part to be CCGTs – at below peak capacity, retaining the capacity to ramp up output at times of the highest demand. This is a function known as " spinning reserve" .

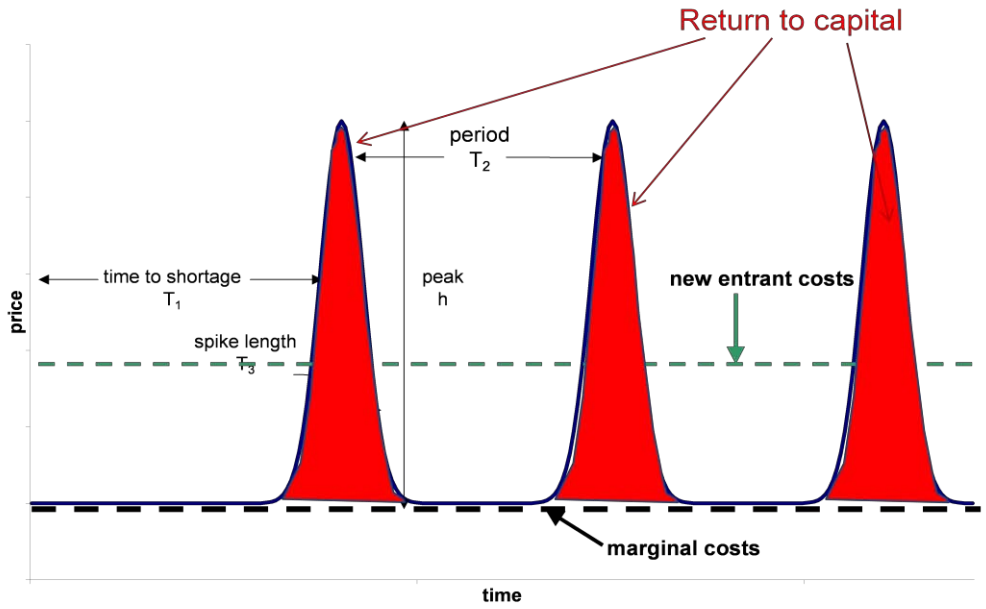
A system that incentivises peaking plant will not only be less efficient than a system that can deploy spinning reserve, because of its significant periods of „ down time" ; it is also likely to encourage investment in new or upgraded
distillate plant and OCGTs, which by definition will make achieving our decarbonisation goals harder than under our preferred alternative. The „ peaking plant only" option is also likely to be more costly because this
capacity will be operating only at limited times in any given year. Mid-merit or baseload plant may not be cheaper in the provision of power generated at peak but the overall system cost could be lower because of their ability to function for all or significant parts of the year.

The flexibility provided by offering capacity payment options to mid-merit or baseload plant is considerable. CCGTs are capable of making up the shortfall caused by variations in wind output that change on timescales of around one hour but part-loaded CCGTs on spinning reserve have even faster response times.

A further consideration lies in environmental performance. The UK" s decarbonisation target to 2020 already represents a considerable challenge. By encouraging distillate and OCGT construction or refurbishment, we make that target still harder to achieve than by adopting the alternative we propose, with its emphasis on cleaner, more efficient CCGT capacity.

It is also important to understand how the proposed capacity payments mechanism could undermine investor confidence in new CCGT plant.

The chart below shows the typical cycle of investment in new generating capacity:



In a fragmented, competitive, wholesale generation market, such as exists in Britain, prices of power should, and do, match the marginal costs of generation - currently gas - for most of the time. This means that profitability is close to zero most of the time and it is only when demand approaches the amount of generating capacity available that prices tend to rise. As such, generators only enjoy a return on capital when generation is scarce. This is depicted as the red areas in the chart above.

This kind of „ spikey" price behaviour is common in commodity markets with many sources of production under fragmented ownership. A potential generator would want to invest when the time before the next shortage (T_1) is short. T_2, the time in-between spikes will depend on the rate of growth in the market and the size of incremental generation. The spike" s duration (T_3) will
be determined by the rate of new capacity commissioning. The height of the peak is a function of customers" propensity to reduce demand.

The risk of a capacity payments mechanism that rewards only peaking plant is that it would be likely to flatten the peaks and disincentivise investment in new, non-peaking plant. As we have outlined above and in our analysis attached, this could have serious consequences for security of electricity supply for the UK in forthcoming years.

BG Group does not believe that sufficient new CCGTs will be built in a timely fashion to meet demand, regardless of the policy framework. Chief Executive of E.ON UK, Paul Golby, warned in a recent FT Round Table on Energy Policy[3] that companies were " probably in a period of, relatively speaking,
sterilisation of investment" until the details of the Government" s proposals are

finalised.

[3] FT Online, 30/1/11

At the same event, Mark Hanafin, Managing Director of Centrica Energy, was even more explicit about the need for CCGT investment and for that investment to be underpinned by some kind of capacity market mechanism. He said: " I'm not sure any of us (generators or equity holders in power
generation) would be taking to the board a final investment decision for a gas-fired plant that will be entering service in a world or greater intermittency without a capacity market behind
it."

BG Group's proposed model for capacity payments would increase the attractions of investing in that much needed, new CCGT capacity – capacity which, of course, stands to benefit from the development of CCS for gas.

Q's 26-29 BG Group welcomes the introduction of the EPS, the Carbon Price Floor and the FIT by CfD. It has reservations over the operation of the capacity mechanism, as it believes that this could distort the market by just considering one particular mode of operation and lead to greater overall costs and higher emissions. Instead, the offering of central contracts should be extended to all forms of fossil generation. CCS is currently only supported by the Carbon Price Floor under the "preferred package". BG Group plc believes that there
may be a case for considering the use of a premium FIT for CCS, if the parasitic energy losses are low. If this is not the case, then the extension of central contracts to CCS should be considered.

Question 30 **What do you think are the main implementation risks for the Government's preferred package? Are these risks different for the other packages being considered?**

BG Group agrees that there are two major risks; the first, as recognized, is the potential inertia caused by the review process itself. This may be overstated. The second, as noted in our response to the "analysis of packages", is that
the coordinated targeted purchases of peaking capacity may discourage those who would otherwise have invested in plant destined for baseload/mid-merit operation. This may lead to higher costs and put the decarbonisation target at risk.