2050 Pathways Call for Evidence Coordinator
Department of Energy and Climate Change
3 Whitehall Place
London SW1A 2AW

2050pathways@decc.gsi.gov.uk

5th October 2010

Response to the 2050 Pathways Call for Evidence

Statoil welcomes the opportunity to comment on the 2050 Pathways Call for Evidence. The UK energy market is important for Statoil in a number of ways. Statoil is the largest importer of natural gas to the UK and an investor in offshore renewable projects in the UK.

As requested in the Call for Evidence, in this document we clearly labelled all responses with the relevant numbers of the questions which we aimed to address. However, we would like to make a few general remarks about the methodology adopted in building the 2050 Pathways model. In our view, assumptions about the costs and technology risks, that are inherent to the development of any facility or infrastructure and vary among sources of energy, are too important to be left out while developing a scenario model with such a long-term scope as this one. The lack of cost and risk assumptions (even though costs are mentioned in the Call for Evidence) makes it difficult to differentiate between energy sources, while the relative costs of implementation of different solutions will, to a large extent, drive the actual path. Moreover, the model does not take into consideration the effects of legislation already in place in the UK (e.g. the Large Combustion Plant Directive) and approved at European level and soon to be transposed into UK law (e.g. the Industrial Emissions Directive), which is going to modify the rules for some energy sources and, in particular, have the potential to dramatically change the relative share of coal to natural gas in the overall fuel mix.

Please find below our more specific comments to the questions posed in the Call for Evidence.

1. Scope of model

(a) Are there any low carbon technologies or processes or major demand-side options which are not currently included within the scope of the model but that you consider should be in future?

The UK economy relies on natural gas for more than one fifth of primary supply, due to extensive building of Combined Cycle Gas Turbine (CCGT) power stations in the 1990s which substituted part of the then overwhelming share of the energy mix supplied by coal with this much cleaner fuel. This choice is still key to the decarbonisation of the UK economy today and for the foreseeable future. This is an important message which is not reflected in the 2050 Pathways Analysis.

Natural gas represents a carbon efficient alternative to coal and it would provide the flexibility needed in a generation mix with a large share of renewables.

Moreover, although it is true that a higher degree of electrification of the economy is necessary for delivering the 2050 targets, a link must be drawn between the successful deployment of large generation capacity from renewables and the build of a commensurate amount of back-up capacity, on security of supply grounds. Currently, back-up capacity in the amounts needed to secure the 25% wind power target for 2020 can only come in the form of gas-fired generation. Far from being undesirable, this development of gas generation capacity would address key concerns in two of the three corners of the energy policy triangle:

- it would increase security of supply, in the form of a storable commodity, whilst maintaining the focus on indigenous renewable production with a low-carbon back-up;
- it would improve market functioning by supplying peak capacity and therefore increase the overall liquidity of the electricity market.

2. Scope of sectors

(a) Does the range of alternative levels of ambition presented for each sector cover the full range of credible futures? If not, what evidence suggests that the range of scenarios should be broader than those presented?

We believe that one key scenario is missing: namely, the one which foresees a transition to a low carbon economy through the most efficient and commercially proven path, that is, exploiting the potential of natural gas as a stepping stone towards a future and as part of the long term future of the UK as a flexible energy supply. The efficiency of natural gas would ease the way towards the ambitious target of an 80% reduction in carbon emissions by 2050, relative to 1990 levels, and it is presently the only source which could deliver this result with no implications in terms of security of supply. Our aim is to present DECC with a scenario study, based on the 2050 Pathways Analysis assumptions, in which natural gas is given a central role in delivering the UK's transition to a low carbon economy and achievement of its carbon reduction goals to 2020 and 2050.

Developing such a scenario would make it possible to integrate the policy aspirations in the 2050 Pathways model. We have evaluated a scenario where all levels are set to 2, which is likely to be viewed as ambitious but unreasonable by most or all experts, and focused on the 2020 time framework. The 2050 Pathways model then produces these results:

- a 27% reduction compared to 1990 by 2020, while the target is 34%;
- the penetration of renewables in the power sector would amount to 25% in 2020;
- unabated coal consumption would be 285 TWh, and gas consumption 697 TWh in 2020, while the 2007 level is 400 and 1000 TWh respectively.

It would seem illogical that in an ambitious effort (level 2) made in all areas, coal is still not being replaced with gas, which would be the cheapest abatement option. The reason for this lies in the 2050 Pathways assumption that the split between coal and gas remains constant in fossil fuel use (the unabated use). In doing that, the advantage of gas relative to coal is being neglected.

To account for this, we looked at the level 2 scenario in combination with replacing all the coal with gas. The results for 2020 would then be:

- the 285 TWh unabated coal consumption is replaced with gas, and this reduces emissions by 65 Mt/year;
- a 36% reduction is achieved compared to 1990 levels, thus exceeding the 34% target;
- the penetration of renewables in the power sector remains 25%;
- no unabated coal consumption would remain in place;
- gas consumption amounts to 880 TWh (80 bcm), as compared to 1000 TWh (90 bcm) in 2007.

The main benefits of such scenario would be:

- A broad approach, with all levels set to 2, is relatively technology neutral and therefore reduces risk, as policy needs not be committed to a specific (uncertain) technology. Choices of specific technology can thus be delayed to 2020, when commercial viability of CCS will be more certain.
- The cheapest abatement option, i.e. switching coal to gas, can be achieved first. This is also the option that has the most proven technology, and it can be implemented quickly.

Such an approach provides a path towards reaching the 2020 target and reduces the "first mover" risk for the other technologies. Of course, in order to reach the 2050 target further efforts will have to be made after 2020. In a longer time framework, for example, it is likely that CCS for gas plants will become commercially viable through retro-fitting at a later point in time with post-combustion capture.

(b) Do the intermediate levels of ambition (levels 2 and 3) provided for each sector illustrate a useful set of choices, or should they be moved up or down?

We will illustrate our views on this point in the forthcoming scenario study mentioned in question 2.a.

3. Input assumptions and methodologies

(a) For each sector, are the input assumptions and the methodologies applied to those input assumptions reasonable?

We will illustrate our views on this point in the forthcoming scenario study mentioned in question 2.a.

(g) Could the relative roles of coal and gas out to 2050 vary from the assumptions shown in this work, and if so, how?

The main shortcoming of the document is that no distinction is made between fossil fuels, most notably between coal and gas, which are treated together under the label of either "fossil fuel" (in supply forecasts) or "unabated thermal generation" (in generation forecasts). On the contrary, coal

and gas have very different roles in the UK energy picture going forward: gas is essential in terms of security of supply, and it will need to be readily available as a back-up fuel in order for the government's ambitious wind energy plans to be effective.

Part of the reason for the lack of acknowledgement of the role of natural gas is the widespread practice of placing all fossil fuels in one single pot. The strategic role and technological features of gas and coal are dramatically different, and this is an important shortcoming of the 2050 Pathways Analysis. Fossil fuels are just as diverse a group as renewables are. We would like to see a "Pathway Alpha" in which the fossil fuel value of the primary supply is broken down into coal, oil and gas – and reduction targets to be set accordingly. Given the abundant supply situation going forward there is a strong incentive to utilise gas to a greater extent and earlier in the transition in order to make efficient reductions in emissions.

4. Common implications and uncertainties

(a) The introduction to the report sets out some of the implications and uncertainties common to the illustrative pathways. Does this list cover the key commonalities? If not, please identify other common implications and uncertainties and provide evidence as to why these are key conclusions from the analysis.

One key uncertainty is the timing by which CCS is going to achieve commercial viability, especially on the gas side, and such uncertainty is not fully reflected in the 2050 Pathways Analysis. The flexibility and ability to respond quickly to demand peaks is one major characteristic of gas-fired power plants. This characteristic is of major importance in electricity markets with a large share of renewable production, such as wind power. The increase in investment costs of CCS are likely to limit the construction of gas-fired power plants. If they were built these costs would require baseload operation which would not fit the supply pattern required with high levels of renewable energy. This would have negative impact on the security of supply in the UK electricity market with a growing share of renewable production and reduced ability to meet peak demand.

5. Impact of pathways

(a) What criteria should be taken into account in understanding the impact and relative attractiveness of pathways?

We will illustrate our views on this point in the forthcoming scenario study mentioned in question 2.a.

6. Cost analysis

(a) Can you suggest a methodology by which the wider cost implications of choosing one pathway over another could be accurately reflected, and any relevant findings from such an approach?

Cost implications are key to any transition strategy, yet they have not been tackled in depth in the 2050 Pathways Analysis. This might have been due to the fact that it would have been too difficult

to integrate cost considerations in an already very complex model. However, knowing how much it will exactly cost to implement each of the ambitious targets is important for consumers, who will have to pay some of these costs through their bills, as well as for industry players who will have to align their investment choices with the increased costs of compliance in the coming years.

7. Future improvements to model

(a) Do you have any further suggestions for refining the 2050 Pathways Calculator?

The promotion of micro-generation technologies such as CHP would help alleviate the use of the electricity system, improve energy efficiency and ensure the exploitation of the already existing extensive gas network. The adaptation of HGV transportation to compressed natural gas should deserve consideration.

Statoil appreciates the opportunity to communicate our opinion in this regard and we remain available for any further discussions on this matter.

Yours faithfully,

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Head of NG SA EU & Regulatory Affairs