

Question 1: Do you agree with our assessment of the current arrangements?

No. The key risk appears to be whether there will be sufficient investment in low carbon power generation assets by 2020. Any risks associated with investment in natural gas appear to be secondary and any significant focus in this area risks blurring what may be necessary and timely regulatory proposals relating to electricity.

We welcome Ofgem's recognition that for natural gas at least the current arrangements have to date delivered large scale investment. It is encouraging to see that nearly 30% of current gas supplies have been developed as recently as 2006. Such investment has allowed firm supplies to continue at record levels on two consecutive days this winter – clear demonstration of the ability of natural gas to meet security of energy supply. We are particularly encouraged by the recent Energy Market Assessment from HM Treasury and DECC that states "...that the risks of the gas market being unable to meet demand are very low, even in extreme scenarios and that there are no scenarios where there are any involuntary interruptions to supplies..."

Ofgem do not appear to comprehend how the international natural gas scene has changed. For example, gas from unconventional reservoirs in the US has become technically and economically feasible to the extent that such gas now makes up to 50% of production. U.S. reserves are up 29% in just five years. Gas prices are down. And it is now anticipated that a 100-year supply is available.

The implications of this are significant. The world uses 3 trillion cubic meters of gas a year. Its proven reserves are 185 TCM – a 60-year supply at current usage. Undeveloped conventional resources are estimated at another 217 TCM. However when we add unconventional resources – like shale gas – the recoverable potential jumps to well over a thousand TCM, and that does not include the methane hydrates under the ocean floor and in the Arctic.

Meanwhile, Europe's unconventional gas is only beginning to be assessed. Shale gas exploration is under way in Poland and in Sweden, France, Germany and Austria. Coalbed methane is being explored in France, the U.K. and Germany. And tight gas is being tested in Hungary and the Ukraine. On a smaller scale and closer to home we are also beginning to see the emergence of biogas.

Gas should no longer be viewed just as a bridge to a low carbon future but rather as part of the long term solution.

Thanks to growing LNG transportation capabilities and improved economics, gas found almost anywhere can potentially benefit Europe through direct import, or by easing the world market. We are seeing the evolution of a globally inter-dependent gas market, just as with oil, which has functioned successfully for decades.

We question Ofgem's comments regarding the availability and transportation of LNG cargoes and would recommend that Ofgem carry out a study on global natural gas supplies including LNG liquefaction and regasification projects. The advent of a growing international LNG industry means that increased supply (or demand) in one region of the world will have an impact in another.

Developers' plans for LNG import terminals in the US now appear to be on hold and as such LNG cargos will now be free for delivery to other markets including Europe. Ofgem comments on "... a short term glut of LNG..." but without any supporting analysis it is difficult to assess whether this is fact or just an assertion.

Ofgem comments that investing in CCGTs will exacerbate import dependency but we would point to recent studies such as that from the University of Sussex¹ which concludes that imported gas is not inherently insecure. A recommendation is that policy needs to ensure that the overall resilience of the UK energy system is high enough to withstand disruptions at home and abroad as the low carbon transition is implemented. The same applies to the continent where the UK has interdependency. Ofgem is silent on emerging legislation in this area, namely the draft security of supply regulation and it would be useful to include this in future studies on security of supply.

In relation to system resilience and particularly imports through the IUK, we welcome Ofgem's comments on the current restricted UK gas specification, the risk of protracted higher prices/demand curtailment and the challenges of investing in gas ballasting to resolve this issue. We request Ofgem to urgently develop a regulatory regime that facilitates such investment in what is a key infrastructure link.

Ofgem also raises the issues of CCGTs leading effectively to carbon lock in but this discounts the possibility of CCS and indeed any new combustion power stations in the UK over 300MW need to be 'carbon capture ready'. Furthermore we note that the current Energy Bill allows future decisions to support CCS to include natural gas-fired power stations. As such we should not regard investment in new gas-fired power generation as leading to a high carbon future. Furthermore natural gas can bring the flexibility necessary when combined with base load coal-fed power generation with carbon capture and storage (also see response to Question 4).

Ofgem's analysis of the 'cost and availability of finance' related to the one relatively new issue facing investors - the financial crisis – appears cursory. We would advocate a thorough review, potentially with financiers, to better understand and quantify this issue.

We note that there is no discussion on the state of the wind power generation supply chain although Ofgem makes reference to its limitations. Analysis is required to assess whether it can at least double the current deployment in response. There is also a question of whether it would respond significantly to any new measures such as a carbon price floor. For example Ofgem advise that "... the impact is likely to be relatively small since the wholesale electricity price typically contributes less than 50% to the revenues of renewables plant...". Recognising that Discovery's review period only covers the next 10-15 years it is important that any policy measures facilitate emerging technologies that can mitigate the challenge of intermittent power, such as dynamic demand management and energy storage.

Comments Ofgem make about 'ownership' of the industry codes in connection with issues of security of supply imply that Ofgem may wish to become more interventionist in this area. This would increase regulatory uncertainty and be

¹ UK Gas Security: Threats and Mitigation Strategies. Dr Jim Watson, Director Sussex Energy Group SPRU – Science and Technology Policy Research, University of Sussex. January 2010.

counterproductive. We would advocate alternatives be considered such as a framework that puts a value on security of supply.

Ofgem raises the important issue of electricity market structure and makes reference to a lack of liquidity. We note the Ofgem consultation issued on 22 February 2010 on this issue and will respond in due course. This consultation highlights that a lack of liquidity in the GB electricity market as one of the key barriers of entry. One of the main concerns we have as an independent generator is the limited level of trading in the short term forward markets to alleviate any imbalance exposure. If the cash out prices were to become more volatile this would leave small suppliers, independent generators and intermittent generation exposed. For vertically integrated firms, generation assets can provide a natural hedge against the volatile cash out prices, giving such firms an advantage.

We agree that the current electricity cash out rules are flawed, but any action to change them needs to be combined with reforms of the wholesale market to increase liquidity and provide the tools for parties to manage their imbalance.

Question 2: Are there other aspects of the current arrangements which could have a negative impact on secure and sustainable energy supplies, or costs to customers?

Yes. Ofgem should recognise that the tests for obtaining exemption to regulated third party access for developing infrastructure (Third Gas Directive) have significantly tightened at a time when the UK has record and increasing planned import infrastructure. This will not encourage investment in a market which has seen significant gas infrastructure development in the recent past.

Question 3: Do you agree that the five issues we have highlighted are the most important?

No. Ofgem should broaden the competitiveness issue to include the yet to be incurred costs of upcoming unilateral UK and EU regulation such as the RHI, CRC EES, CCS levy and EU ETS Phase III. Furthermore, we question Ofgem's statement that "interdependence with international markets exposes GB to a range of additional risks that may undermine GB security of supply" and look for supporting analysis. The UK is reliant for 2/3s of its coal supplies from overseas and has successfully traded in international oil and products markets for decades without hiccup. Why should natural gas be viewed any differently? (see also response to Question 1).

Question 4: Do you have any comments on our description of what might happen if no changes are made to the current arrangements?

Yes. Ofgem comments that installation of new CCGTs "... risks increasing the costs of future decarbonisation of the power sector as these plants may have to be written off well before the end of their useful working lives." This is one possible outcome but there are others such as the development of CCS that could prove important, if not prior to 2020 then perhaps not long afterwards. For example, operating facilities capturing CO₂ – including those manufacturing fuel for power generation as in

gasification technology - should be run base load for operational and economic reasons. Ramping operation up and down for a power station customer, operating as mid merit or swing to counter variable supplies from renewables, will be less efficient and more expensive given the very high capital costs, plus those in the related transport and storage chain.

Conversely, power stations running on a combination of hydrogen fuel from pre-combustion capture facilities, together with natural gas, can offer flexibility to the system. For example, if a CCGT with two (or more) gas turbine trains is firing 50% hydrogen and 50% natural gas in each train and pure hydrogen fuel can be fired in a single turbine, then one of the gas turbine trains could be shut down and natural gas displaced for use elsewhere. Meanwhile the gasification facility would continue to run base load producing hydrogen fuel. Furthermore, if the gas turbines needed to be briefly shut down it is possible that the hydrogen produced could be stored for a limited period and combusted at a later stage. In these respects such pre-combustion CCS schemes offer significant operational flexibility and security of supply to the UK's gas and power grids.

Ofgem comments that investment in CCGTs may not be forthcoming because of investor concern regarding the risk of future government intervention to address issues via the promotion of CCS and nuclear. Industry is already fully aware of such possibilities as evidenced for example by the current Energy Bill, which seeks to incentivise 4 CCS projects. What may cause industry more concern are sweeping policy proposals within Project Discovery that could potentially reverse the successful liberalisation of the UK energy markets. What is clear is that there needs to be reasonable regulatory certainty not least that the life of an asset will be realised otherwise investment is unlikely to be forthcoming.

Ofgem assert among a number of reasons that investment may be held back because of a "... short term glut of LNG..." and that future gas demand is uncertain. Both of these assertions are very significant and require support through detailed analysis before they can have significant weight attached to them.

Ofgem comments that if there is insufficient seasonal gas storage there would be a risk of protracted higher prices and of demand curtailment during periods of extreme weather or supply shocks. It could be argued that the market would react to such price signals e.g. through importation of LNG cargoes. In this respect the concept is akin to the improved price signals proposal under the Targeted Reforms policy package.

Ofgem also raises the concentrated structure of the [gas] industry as a reason holding back the pace of change in the market but again offers no analysis. In light of Ofgem's praise of the functioning of the gas market in parts of the consultation document and criticisms of the electricity market, it may be that it is the structure of the electricity market that warrants review. For example, Ofgem's recent document concerning liquidity in the GB wholesale electricity market states that "...the Big 6 account for over 99% of the market...".

Finally it is unclear whether Ofgem have incorporated the potential effects resulting from the Government's recently announced Household Energy Management Strategy and its soon to be published Roadmap to 2050.

Question 5: Do you believe that our policy packages cover a sufficient range of possible policy measures?

Yes. What would be useful however is an understanding of the Government's objectives for energy and the timing of their implementation. For example, is security of supply of highest importance against which trade offs should be measured.

The policy packages cover the range of measures that could be implemented. We question the inclusion of certain elements within the packages however. Our impression is that investors would prefer to see evolution over revolution and the inclusion of a minimum UK carbon price in the least significant of the options is still fairly radical. A key objective of any change at this stage, besides being evolutionary, should be that efficient longer term development of the energy markets is not sacrificed at the cost of meeting targets in the next 10 years.

Question 6: Do you have suggestions for variants to these policy packages?

Yes. A policy option that represents evolution rather than radical change should be considered.

For example, a minimum carbon price – a very significant policy option - could be removed from the targeted reforms option and considered in the more extreme packages.

ConocoPhillips has a preference for market prices to be discovered by the market rather than set artificially. If Ofgem's objective here is to stimulate investment it may well be better to use other policy levers such as direct investment grants or capital allowances to target assistance where it is required. For example, Ofgem advise that "... the impact is likely to be relatively small since the wholesale electricity price typically contributes less than 50% to the revenues of renewables plant...". In light of these comments the impression is that renewables are currently well supported and that other low carbon technologies, if they are deemed to require support, will need a much better targeted approach (is Ofgem thinking about nuclear here?).

Ofgem's objective for a minimum carbon price may be to counter short-term price volatility. However long term investment decisions are rarely made on the basis of short term prices. Respondents to project Discovery have complained of both price volatility and price level, so whilst setting a price floor addresses the price level, it would require a price ceiling to address the volatility issue.

Any unilateral application of a minimum carbon price across the UK electricity sector will have impacts on the competitiveness of UK industry and requires thorough analysis and very careful consideration. The UK, through the introduction of new and unilateral measures such as the CRC, RHI, and the CCS levy, already risks sending developers confusing and conflicting signals to respond to, especially when there are already measures in place such as the RTFO, ROCs, LECs and EU ETS.

Issues to consider in a minimum carbon price mechanism as advocated by Ofgem are whether such a scheme applies either to a company's weighted average cost of allowances or an independently determined benchmark. Adoption of a weighted

average approach, whereby an individual company's tax is calculated versus its actual average cost of carbon, would neutralise a company's expertise at doing better than the market average. As such it is potentially market-distortive. The benchmark approach is indifferent to a company's performance in acquiring EU ETS allowances and still drives normal market behaviour including the purchase of offsets. As such it is not distortive.

Other issues to consider include the price prediction for carbon. How will this be set and how often will it be changed ? Will investors place more trust in the Government to set this price (and to leave it alone) versus letting the market decide ? What happens if the wrong price is set ? Is the floor a sector-specific approach or wider ? What happens to the funds raised – will they be used to stimulate investment elsewhere in which case will this be market-distortive ?

Question 7: What other policy measures do you believe should be considered and why?

At EU level a view is emerging that new policy proposals should consider any impacts on security of supply. It would be appropriate that the UK also consider such an approach in the future.

Ofgem raises the important issue of electricity market structure and makes reference to a lack of liquidity. We believe that increasing imbalance risk will distort competition especially for non-portfolio players, by increasing the risks and costs they face. Increased imbalance costs are likely to drive parties to be longer than at present to avoid penal prices, which would diminish liquidity in the short-term forward markets. We look forward to new proposals to come from Ofgem's work on liquidity in the UK electricity market.

Question 8: Do you agree with the assessment criteria that we have used to evaluate the policy packages?

No. A further criteria should be added to assess the impact of any policy measures on the UK's competitiveness. As Ofgem highlights, there are already a significant number of specific UK policy measures yet to be implemented including the RHI, CRC EES and CCS levy, in addition to the tightening of EU ETS Phase III.

Question 9: Do you have any comments on our initial assessment of each of the packages?

Yes. Ofgem present a reasonable discussion of the pros and cons of the elements within the packages. However, there is no weighting of the assessment criteria nor quantitative measurement to guide the audience as to which package best achieves any particular outcome.

Ofgem have only presented cursory arguments to support their assessments. For example, there is no discussion of the effects that a minimum carbon price could have on industry e.g. leakage effect if UK-centric approach.

The concept of security of supply may require wider analysis than what appears to be a downstream view on gas or electricity supplies. For example, the supply chain for different low carbon energy technologies may require analysis for bottlenecks to assess the possibility that these could be overcome both by new support measures but also in the required timeframe. Similarly supplies for particular fuels should also be assessed. For example what impact would an increased UK consumption of a chosen fuel have on world markets, how diverse are the key supplies and what are the barriers for their increased production including planning, finance, cost and so on.

Question 10: Do you agree with our summary of the key benefits and key risks of each policy package?

No. The exposure of customers to risk in the 4th and 5th packages may well apply to some extent in all of the packages due to the far-reaching nature of policies in them all. Also see response to Question 9.

Question 11: Do you have a view on which package is preferable, or alternative policy measures or packages that you would advocate? We are particularly interested any analysis you may have to support your views.

No. At this stage of analysis it is too difficult to express a preference. However, as a general point we would advocate an evolutionary approach that continues to rely on market-based solutions rather than anything more radical.

Question 12: Do you agree with our assessment of the timing for important investment decisions?

Broadly yes although we would comment that Project Discovery in itself may cause delay to investment by raising the possibility of significant changes to the regulatory environment. Furthermore, when reviewing changes necessary to be effective for 2020, a two year policy implementation period represents a significant portion of the remaining time for the resulting changes to take place, especially if one considers that detailed project design and sanction need to occur before construction can begin.

Question 13: Do you believe that early actions should be considered?

Yes – both by Ofgem and DECC.

- The order of priority of the three main objectives of energy policy should be stated
- It should be made clear to market participants that destabilising fundamental change to the UK's energy markets is not on the agenda
- Improved physical interconnection with continental Europe should be encouraged including developing the regulatory regime that would allow investment in gas ballasting, such that the UK can continue to access the continent's wider specification gas

- Clarification is required surrounding the conditions around which investments can be made under the Third Gas Directive
- Alternative approaches are required to encourage the uptake of policy objectives. The extension of increasingly complicated obligations on energy companies that do not have energy retail businesses is inequitable.
- Proposals such as improving the ability for the demand side to respond and the development of price signals should be carried out first. Other options require more analysis and may ultimately need legislation. As such any further analysis and consultation should be carried out promptly.

Question 14: Do you think that the issues are such that policy measures should be considered as a package or should they be considered on a case by case basis?

Case by case basis. See response to Question 13.