

# **Written Response**

to OFGEM's

***"Project Discovery Energy Markets Scenarios"***

**Consultation**

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## 1. Introduction and Summary

- 1.1 INEOS ChlorVinyls is a major chemical company operating throughout Europe. We produce 80 percent of the UK's chlorine and caustic soda – vital building blocks in the production of most chemicals made in the UK. Chlorine is used to purify 98 percent of our national water consumption and is a major raw material for the production of plastics. Caustic is used in every major chemical production process and is essential to a wide variety of everyday products.
- 1.2 The manufacture of chlorine is energy intensive. We are major users of both natural gas and electricity. Electricity is an essential raw material in the production of chlorine through the electrolysis of brine. We are one of the largest industrial consumers of both electricity and gas in the UK outside of the power generation sector.
- 1.3 The availability of secure and competitively priced gas and electricity supplies is absolutely essential to the success and sustainability of energy intensive manufacturing operations. Without these we cannot expect such industries to thrive in the UK.
- 1.4 We welcome and support the work OFGEM has undertaken on Project Discovery. We think this was a necessary exercise although perhaps it should have been undertaken earlier. The report brings into stark relief the problems that the UK now faces in the medium term.
- 1.5 It is very clear that energy infrastructure projects have lead times of many years. The reliance on markets to provide suitable investment signals within the timeframe required can lead to “too little, too late”. This can be evidenced by events within the UK when the decline of offshore gas production was not replaced by new import infrastructure in time. We are concerned that we are moving towards a similar situation but on a much larger scale.
- 1.6 The report re-affirms many of the key messages and concerns that we (and trade associations including the Energy Intensive Users Group and Chemical Industries Association) have repeatedly highlighted over a number of years. In Sections 2 to 4 we have made some more specific remarks on natural gas, electricity and demand response.
- 1.7 We also note that many of the issues highlighted are supported by other studies – for example recent work by National Grid in their ten year outlook statement. It is very clear that the UK faces very serious challenges with regard to energy.

- 1.8 The report, however, does not give any indication of how a diverse energy infrastructure can or will be delivered. Successive governments have relied on market forces to deliver energy policy. The evidence of the “dash for gas” and the failure to provide new gas infrastructure (gas storage) in a sufficiently timely manner gives little comfort that the market is capable of delivering – particularly for much longer-term projects such as new nuclear and coal power stations. OFGEM must also recognise that a total faith in the creation of markets to implement policy does not always deliver the expected and intended outcome.
- 1.9 Many industry players appear to share these concerns. The lack of certainty (for example with carbon costs) make it far from clear that the significant levels of investment required will be available. This combined with financing issues as a result of the economic down-turn are a serious concern.
- 1.10 Demand response seems to be seen as an answer to the issue of intermittency and lack of supply certainty. Whilst we believe the demand side can play a role, we consider that DECC (and possibly OFGEM) are seriously under-estimating the fundamental difficulties that will be created by an over-reliance on the use of the demand side to balance supply and demand. What industry will thrive (and be prepared to invest) in a country where the “lights go out” regularly. We also consider that the amount of demand response being muted would require a fundamental change in the consumption behaviour of all consumers – for which they are not prepared. It would be unforgivable if the “demand response” is industry leaving the UK as a manufacturing base.
- 1.11 Project Discovery has sensibly developed stress tests for the scenario analysis. We applaud this approach, but are concerned that the range of scenarios may not adequately reflect the most reasonable risks. As an example we note that over the last few years we have seen a number of events which have significantly impacted the UK supply situation for prolonged periods – most notable the fire on the Rough Storage gas platform which took away the UK's only source of Seasonal storage for many weeks. A single event outage such as this seems more credible than disrupted LNG supplies which are inherently more diverse.
- 1.12 The conclusions are clear and we agree with the themes. The UK faces a serious medium term energy challenge and much effort will be required to ensure we can access secure and competitive energy supplies.

- 1.13 The UK needs to deliver an energy infrastructure and market arrangements that allows the energy intensive products that society needs to be produced within a low carbon energy environment. We are concerned that if simply “left to the markets”, the markets will decide that high carbon and cheap energy economies are the place to make energy intensive products. This will be a catastrophic failure of policy for the UK and for the climate.
- 1.14 We would go further. Energy intensive industry can help to deliver the solution. The creation of partnerships, for example between low carbon baseload supply, and baseload demand could provide the climate for both to thrive, underpin the energy diversity and security issues, and prevent “carbon leakage” to other economies. Consideration must be given to support the creation of partnerships between energy producers and consumers – such as we now see in France with the Exeltium project.

## 2. Gas Issues

- 2.1 The operation of the UK gas market has become a growing concern over the last few years as gas import dependency has increased. The UK gas market is now one of the most volatile energy markets in the world. Periods of high and uncompetitive prices (initially due to delays with new projects and then an increasing reliance on short term LNG contracts) have been followed by low prices as a result of the economic downturn. This volatile environment will not deliver confidence in users or producers.
- 2.2 While current prices are low, we agree with the conclusion of Project Discovery that in all likely scenarios the UK's gas import dependency will increase. We believe this increase is likely to be significant.
- 2.3 There are evident risks in what new electricity generation plant will actually be built in the UK. With volatile markets, we fear the answer for most investors will be new CCGT build creating an increasing level of gas dependency.
- 2.4 A competitive gas market will be critically important to deliver competitive energy for the UK. We believe the key to delivering this is the removal of a number of significant barriers:-

### 2.4.1 Gas Storage

The UK has inadequate levels of gas storage – way below the comparable levels in other countries. A number of projects are now under construction but it is apparent that this is only a small proportion of the schemes that have been proposed (and an even smaller proportion of the volume largely considered to be needed).

Importantly, the schemes under construction are all Medium Range facilities and it is far from certain that new Long Range Storage assets will be built. We see this as potentially one of the significant “stress test” risks as one event can potentially shut-down all the Long Range Storage supplies from the UK market.

There is a clear need for more gas storage and for this to be funded through the domestic sector. The domestic sector creates the vast majority of demand swing and so should bear the costs of this.

The issue of inadequate levels of gas storage is further emphasized by the increasing reliance on LNG imports and gas for power generation. Additional levels of Long Range storage will be required to both better

match seasonal demand swings, but also to capture market opportunities – or to hold reserves should LNG supplies be disrupted.

Increasing reliance on electricity generation from gas will also put additional short term demand pressure on gas networks. In order to ensure short term demand peaks can be met, increased levels of short and medium term storage will be required. The recent closure of the Dynevor Short Range Storage facility shows just how short term markets can be. Is this a closure that will be regretted in a few years?

#### 2.4.2 LNG Supplies

Coincident with the opening of major new import terminals we are seeing regular and significant increases in LNG imports to the UK. However, the impact and reliability of LNG imports in the medium and longer term remains a major uncertainty.

Before 2009 LNG imports were extremely low, despite UK gas prices being the highest in the world. It is very far from clear that firm contracts are or will be in place to ensure that secure gas imports will continue to flow when global recovery comes and demand for LNG grows particularly in the Chinese and Indian markets. Can secure supplies of such a key resource be left simply to short term markets?

#### 2.4.3 European Market Liberalisation

The UK is currently the “swing” market in Europe – and as a result prices are very volatile.

We recognise the efforts from the UK government and regulators to push for wider Europe gas market liberalisation and these efforts do need to continue.

### **3. Electricity Issues**

- 3.1 The report highlights the impact on prices of proposals to decarbonise electricity supplies. These proposals will make energy costs more expensive, less secure and crucially less competitive than in other countries. This leads to the significant risk of carbon leakage if manufacturing relocates to cheaper but more carbon intensive locations.
- 3.2 There is a need for a massive investment in new generation assets – which in the case of coal and nuclear power stations will take at least ten years to develop and construct. The impact of the recession and the lack of certainty in emissions markets make it far from certain that new nuclear and clean coal plants will come to market in a timely manner (if at all). As a result new gas power stations will be the plant of choice reducing the diversity of UK electricity supplies.
- 3.3 Little recognition appears to have been given to the need for stand-by generation plant. The expected increase in wind assets must be a massive concern for supply reliability. The assumed load factors for wind generation seem optimistic. The co-occurrence of peak power demand (when it is very cold) and low wind generation as a result of high pressure weather systems across the whole of the UK is well understood.
- 3.4 The current market does not provide the necessary signals to ensure that this stand-by plant will be constructed. We question why any investor will construct plant today that may be only required to operate for a very limited number of hours per year with no guarantee of payback.



## 4. Demand Side Response

- 4.1 Project Discovery highlights the apparent increasing need for demand side response – and the belief that demand response is an acceptable outcome of policy. Any such view, we think, is irresponsible and completely underestimates the fundamental difficulties that demand response creates.
- 4.2 Over the last few years demand response has been a euphemism for demand destruction. We have seen significant levels of demand destruction as a result of uncompetitive energy prices.
- 4.3 We would highlight and support the House of Commons Business and Enterprise Committee who wrote in 2008 *“We cannot form public policy in a world of energy shortages and sharply rising prices on the complacent assumption of a demand side response. The gas price spikes of winter 2005/06 were cited as a key factor by the industrial energy user groups in the loss of around 100,000 manufacturing jobs in the months that followed”*.
- 4.4 It is apparent that the levels of demand response has not been demonstrated and properly studied. We have seen expectations of demand response levels of between 4 and 6 GWatts. This is way beyond anything that has been seen or delivered before.
- 4.5 We consider there are also considerable misconceptions about the potential for gas interruptions. Over the last few years there has been a move to universal firm supplies and we are surprised at the assumed levels of interruptible gas supply contracts.
- 4.6 Most large and inherently flexible operations currently offer demand response – to get to the required levels there will be a need to interrupt increasingly less flexible operations. There is an inherent danger in relying upon a response from a demand side which sees this as a non-core activity and may be infrequently used.
- 4.7 Manufacturing processes are set-up to produce products – and not to provide demand response. In order to continue to invest there is a need for reasonable certainty of secure and competitive supplies. Just as there is no long-term market signals to enable investment in stand-by generation (through for example capacity payments) then there is no long-term signal that can reward investment in inherently flexible production. This needs to be considered. Will purchasing or manufacturing managers “sign up” for significant interruption and business shutdown in order to secure the UK’s aspirations for interruptible wind generation?

4.8 There is a clear need for further rigorous work to assess the real potential for demand response. We believe this will highlight that there is extremely limited additional demand response available and that in future new providers will need to be found and properly incentivised. A fundamental change to consumer behaviour will be required and urgent action is required to start to develop this.

Appendix 1 – Comments on specific questions. We have made some further comments in response to the questions posed in support of our more general remarks.

## Chapter 2

**Question 1:** Please provide comments on our approach of using scenarios and stress tests to explore future uncertainty, and as a basis for evaluating policy responses.

The scenarios selected have the advantage of being manageable in number. However, some key assumptions in the Green Stimulus/Transition scenarios on the penetration of green technologies seem ambitious.

It is counter-intuitive that scenarios requiring double the investment have no major impact on customers' bills.

**Question 2:** Are there other techniques for analysing uncertainty that we should consider?

We have no specific comment.

**Question 3:** Do you agree with how we measure the impacts of our scenarios and stress tests?

It is not clear that the scenarios properly assess interactions of other parts of the system in the event of extended infrastructure problems. For example we have seen strong evidence of "irrational" market behaviour – for example periods where continental gas did not flow to the UK despite prices being incredibly high.

We would also observe that the economic impact on consumers is not fully addressed. Industrial consumers are expected to play a major role in the provision of demand response but the economic impact is not assessed in any detail.

**Question 4:** Do you agree with our key scenario drivers and choice of scenarios?

No further comment.

**Question 5:** Do you believe our scenarios sufficiently cover the range of uncertainty facing the market, and hence cover the areas where future policy responses may be required?

No. We consider industrial consumers have not been properly considered. Given scenarios where unreliable and unpredictable renewables have a large nominal share of capacity, and industrial consumers are assumed to provide much of the balancing of the system through demand side response, the impact on the "insurance premium" in forward market prices needs to be more thoroughly researched.

**Question 6:** Do you have any specific comments on scenario assumptions, and their internal consistency?

The assumptions appear to be determined by arbitrary political targets rather than reasonably probable outcomes. The assumption (in the Green Scenario) that little additional investment is required beyond renewables, CCS and nuclear" is not realistic. Neither CCS nor nuclear are likely to make a significant impact before well into the 2020s, while the renewables need back-up of almost 1:1 in conventional nominal capacity in order to provide adequate security.

**Question 7:** Do you agree with our methodology for modelling gas and electricity supply/demand balances?

No. We are concerned that there is a fundamental lack of understanding of the potential for demand response – or the economic impact this has on consumers. More work is required in this area.

**Question 8:** Do you agree that LNG is the likely medium-long term source of "swing gas" for the European market?

Yes.

Chapter 3

**Question 1:** Do you have any observations or comments on the scenario results?

As we have already noted, we are concerned that policy outcomes will lead to an increasing reliance on gas fired power stations (and gas as a primary fuel).

**Question 2:** Do you agree with our assessment of what the key messages of the scenario analysis are?

No further comment.

**Question 3:** Are there other issues relating to secure and sustainable energy supplies that our scenarios are not showing?

As already noted, we think the impact on industrial consumers is inadequately considered.

**Question 4:** To what extent do you believe that innovations on the demand side could increase the scope for voluntary demand side response in the future?

We are far from clear on this. We consider that consumers with inherent flexibility will generally already offer demand response (through for example Short Term Operating Reserves). It will be a challenge to bring significantly more demand response "to market" and we think this is an area that has not been properly assessed.

Chapter 4

**Question 1:** Do you agree that our stress tests are representative of the types of risks facing the GB energy sector over the next decade?

Generally yes, although we have in recent years seen some significant events (Rough Storage) that have had significant and sustained impact on gas supplies.

**Question 2:** Are there further stress tests that you think should be considered?

No further comment.

**Question 3:** Do you agree with the assumptions behind our stress tests?

No further comment.

**Question 4:** Do you have any views on the probabilities of these stress tests occurring?

Recent experience suggests that significant supply disruption could be quite frequent. With this in mind, and looking at the ways that supply disruption will have to be managed, it is very clear that the UK requires significantly more storage than is available or is being constructed.

On electricity, it seems likely, that at times of peak demand, wind generation is very likely to be low as cold frosty conditions are generally coincident with little wind.

**Question 5:** Do you agree with how we have modelled demand curtailment in response to constrained supply?

We think there is a lack of proper analysis of this.

We do not think that the economic impact of demand response has been properly assessed.

Further, we are concerned there may be a lack of understanding about the amount of response that is available. Recent moves to universally Firm gas supply arrangements seem counter-intuitive to the figures quoted for the amount of gas interruption that is commercially available.

**Question 6:** Do you have any other comments on our stress tests?

None.