

Addressing the risks to the longer term security of UK gas and electricity supplies: Ofgem's Project Discovery, and a related scoping study on biogas distributed via gas networks - SUMMARY

Over the next decade and beyond, the UK will face unprecedented change and uncertainty regarding its gas and electricity supplies. A large proportion of our old coal and oil-fired plants will need to be retired by 2016 to comply with EU environmental legislation, meaning that a growing proportion of our gas supplies will need to be imported.

Dr Robert Hawley CBE was our Chair, while John Wybrew, former BEA Chairman and a non-executive member of Ofgem's board, set the scene for the workshop. Ian Marlee, Director of Trading Arrangements at Ofgem, outlined for us the aims of Project Discovery, Ofgem's major scenario-based study. Janine Freeman, Head of Sustainable Gas Group, National Grid, presented the findings of their recent investigative study into the potential for renewable biogas.

Helping to shape the energy future for GB consumers: Ofgem's "Project Discovery"

Ian Marlee - Director of Trading Arrangements, Ofgem

Ian Marlee is leading Ofgem's **Project Discovery** study, which explores the implications for the longer term security of the UK's gas and electricity supplies, in consultation with a wide range of groups within the energy sector. Marlee began with a recent quote from Gary Dirks, President BP, Asia-Pacific:

"Big energy projects take 10 years. If we see a pause in investment today we will not see the impact for 10 years" (20th January 2009)

Bearing in mind that UK nuclear power stations are unlikely to be ready by 2017, this leaves the UK with an upcoming cliff-edge from 2016 onwards, when the EU's [Large Combustion Plant Directive](#) regarding coal and oil-fired generating plants comes into force. The Directive either limits the emissions of these plants (an opt-in which generally requires Flue Gas Desulphurisation or FGD investment) or restricts the operating life of a station (opt-out clause which limits operation to 20,000 hours or until 2015). In addition all plants must reduce nitrogen oxide (NOx) emissions from below 500mg/m³ to below 200mg/m³ by 2016. The Directive applies across Europe but in Marlee's opinion will probably affect the UK and Poland more than the rest of the EU.

Ofgem is conducting the study because it has responsibilities under the [2008 Energy Act](#) to act in the interest of "future consumers", not just consumers now. At present the credit crisis means that everyone is focusing on financing the short-term, but there should be concern about the medium-term too. The UK could be impacted by capital allocation and corporate priorities. Some companies are indicating that renewables & gas storage projects are at the bottom of their priority lists and will drop off in financially difficult times. There is a need to focus on the level of risks associated with such projects and establish the level of returns.

Looking at our future energy supplies, Project Discovery has 5 new factors to digest:

- the credit/financial crisis
- tougher environment targets
- EUETS uncertainty
- security of supply worries
- - all contributing to the likely 2016 cliff-face factor.

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The different factors are pushing in different directions. The financial crisis and subsequent dampening of energy demand may have given us a small amount of breathing space. However, in the long-term we need to look at international investments we have no control over. We are becoming more import dependent on gas, which is a cause for concern in light of the recent instabilities in the European and Russian/Ukraine market in particular. There is also uncertainty over the EU Emissions Trading System and what this means for the carbon market – carbon price is still relatively low, to what extent is carbon a real market? One of the next stages of the project is to research whether a voluntary reduction in demand could happen in the future, or if an involuntary one might occur.

We looked at a slide mapping the eight European projects needed to assure gas supply for 2015-2020. Project Discovery will need to stress test these forecasts for gas and pipe delivery schedules. Huge sums of money will need to be spent – a minimum of \$135bn. The extent to which Russia and Asia can deliver will be critical, with new pipes and gas fields needing development. Gazprom needs to deliver on giant fields; although they appear financially strong and sound, raising debt is a challenge.

Marlee ended by stressing the need for Ofgem to remain open-minded and impartial whilst carrying out Project Discovery. Ferocious debates are being held within Ofgem as future assumptions are explored. His instinct is that market regulations are generally right, but could do with improvement – there is no such thing as a 'perfect market'. Ofgem will provide an initial report on Project Discovery to GEMA in summer 2009 and liaise closely with DECC on their findings.

National Grid: Developing UK Biogas

Janine Freeman – Head of Sustainable Gas Group, National Grid

Janine Freeman began by giving a brief overview of the role of National Grid in making efficient networks investments, making it necessary for them to understand future energy supply and demand in order to plan ahead. The government are currently formulating their policy, with a Renewable Energy Strategy due for publication by DECC in July. The National Grid would like to see a government "Energy Masterplan" to help decide how to invest in network infrastructure. Janine's team have been working on a number of future scenarios and looking at the contribution the electricity, heat and transport sectors can make towards energy efficiency improvements.

Although until very recently the focus of political debate around energy and climate change was on decarbonising electricity, last year the government began considering how we might deal with heat. Proposed solutions include heat pumps, solar thermal technology, biomass boilers and district heating. These are all excellent ideas, but they do require consumer action and investment as well as network investment, which could involve disruptive work such as digging up roads.

Janine's team have been particularly looking at the potential for decarbonisation of gas, which could make a significant contribution to the EU's 2020 renewable energy target. Waste and energy crops can be used for anaerobic digestion and gasification, producing pipeline quality biomethane. Hydrogen Enriched Natural Gas (HENG), a process by which carbon is extracted from methane to leave hydrogen, which can be injected back into the gas stream, looks

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hopeful. Currently only very small quantities can be injected to meet pipeline gas specification, but over time it may be possible to increase this.

Up to 50% of residential gas demand could be met with renewable gas. Justine showed a slide giving figures for a pragmatic baseline scenario compared with a full-stretch one using all sources. Possible materials for renewable gas include sewage/waste water, manure, straw, food waste, biodegradable waste, wood waste and Miscanthus, an energy crop suitable for growing in the UK. The marginal cost of delivering the "stretch" scenario is estimated to be around £10bn, including costs such as cleaning the gas up and putting it in the grid.

There are some barriers to delivering and maximising the delivery of renewable gas. There needs to be a commercial incentive to level the playing field with electricity generation. At the moment there is big potential for renewable gas and the costs look supportable, but there is no commercial incentive to produce it. The government should also set waste policy to ensure maximum energy recovery from waste. A lot of waste is currently going to landfill, but some is being used to generate electricity. However, the rest needs to be captured. The government put legislation in the 2008 Energy Act to develop a heat incentive by 2011, which should help.

In conclusion, Janine summed up the many benefits of renewable gas: it uses renewable fuels to decarbonise our energy supply, is affordable, no significant consumer action or network investment is required, it improves security of supply, is an efficient solution for UK waste, a cleaner technology than incineration from an emissions perspective and provides the possibility of capturing CO₂.

John Wybrew – former BEA Chairman

John concluded the workshop by expressing his optimism in the extent to which consumers are being given management tools for the future. The advent of smart meters will greatly increase the scope for mobilising price-responsive demand-side management. There will be a myriad of possibilities for consumers, with technology such as electric cars, heat pumps and smart meters enabling us to manage our energy consumption rather than being passive consumers.