

## DEBATE SUMMARY

### The Future of the Energy Sector in Scotland

Held at The Royal Society of Edinburgh on 22<sup>nd</sup> October, 2015.

The Foundation is grateful to Aberdeen Asset Management, the Babcock International Group, The BRE Group and The Royal Society of Edinburgh for supporting this debate.

The hash tag for this debate is #fstenergyscotland .  
Audio files of the speeches are on [www.foundation.org.uk](http://www.foundation.org.uk) .

- Chair:** **Dame Jocelyn Bell Burnell DBE FRS PRSE FRAS FInstP**  
President, The Royal Society of Edinburgh
- Speakers:** **Phil Boswell MP**  
MP for Coatbridge, Chryston & Bellshill  
**Iain Conn FREng FRSE**  
Chief Executive, Centrica plc  
**Gary Haywood**  
Chief Executive Officer, INEOS Shale  
**Professor Rebecca Lunn FRSE FREng**  
Head of Department, Civil and Environmental Engineering, Professor of Engineering Geosciences, University of Strathclyde
- Panellist:** **Ben Ritchie**  
Senior Investment Manager, Pan-European Equities, Aberdeen Asset Management

PHIL BOSWELL said that energy was a crucial factor in Scotland's economy. The Scottish National Party saw the priorities for its future as being to increase energy efficiency; meeting climate change targets through renewable generation, and ending fuel poverty. He strongly criticized the UK government's policies which ended Green Deals, decreased the support for solar, moves to privatise the Green Investment Bank, which the Government claims to be in hard working taxpayers' interests. These policies led to job losses, disruption of supply chains and loss of work for SMEs. Subsidies were essential to fund start-up companies; without them innovative techniques would not develop and competition will stall. Cuts in subsidies such as those for solar panels decimated the renewables industry and had led to long term loss for a short term gain. Privatisation of the Green Investment Bank could lead to job losses in Edinburgh and could damage the future of the city as a major financial centre.

Growth of the renewables sector would create competition and end the dominance of the big energy companies in the market. Thus fuel poverty, which had such dire effects of families living in poor housing, would be reduced. It would create a new export market for Scotland. He supported the moratorium on unconventional gas. Companies must show that they would be able, and willing, to meet stringent regulatory

requirements. The possibility of compromising drinking water supplies must not be risked.

IAIN CONN outlined major factors in the global energy market - its importance (10% of global GDP is spent on energy), the impact of climate change, the instability of many producing countries and Saudi Arabia's determination to keep market share, whatever the price. For the UK and Scotland there were particular problems - the impact on competitiveness of low labour costs in the Far East and low energy costs in the US; the declining productivity and investment in the North Sea. So we must think about security of supply, response to climate change, affordability, and understand that circumstances might change rapidly. Fortunately, for Scotland, security of supply should not be an issue because of its indigenous resources. It should be able to meet climate change carbon reduction targets as one third of electricity generation came from renewables, and one third from nuclear.

The real problem was affordability - electricity prices in the US were 8p per kWh compared to 16p per kWh in the UK, 16.5p per kWh in Scotland, partly due to distribution costs and levies to support renewables. US gas prices were 2.4p per kWh, 5.1 p per kWh for the UK and 5p per kWh for Scotland. Oil prices would continue to decline while Saudi Arabia sought to maintain

market share and Chinese demand slowed down. Because of the high cost of production in the North Sea, oil and gas output would decline and more imports would be needed. A major challenge was driving down offshore production costs so that oil fields could become cash positive. 50% of fields were struggling at \$55/bbl. It was vital to know whether there were commercially exploitable new onshore gas resources in Scotland – exploitable by hydraulic fracturing of shale formations.

Meanwhile demand could be reduced if householders and businesses had more information about their energy costs and adjusted their demand in relation to price and volume. Distributed energy systems in which communities or individuals could generate their own supplies would then be seen to be of real value - in time becoming so important the role of the National Grid might become a back-up supply. Changing behaviour was the key. Centrica were rolling out intelligent thermostats and smart meters to provide much more information to consumers about how they used gas and electricity.

GARY HAYWOOD said a good and continuing supply of gas was crucial for Scotland - 80% of UK households were heated by gas and it was a vital feedstock for industry. Any significant replacement of gas sources by renewables would take time. We should be seeking to replace coal by gas (which has half its carbon density) and acknowledge that gas production from the North Sea is declining, although with proper management the decline could be slowed. We already import 50% of our gas. Thus the importance for living standards and industry in Scotland and North East England could be jeopardized unless all opportunities were seized for expanding gas production, to cover the gap before renewables could possibly generate sufficient power to substitute for gas fired power station supply - at least 20 years. This meant use of hydraulic fracturing of shale. Even if sufficient shale gas reserves were discovered the industry would not expand at the US rate (9 BCF/day shale gas production in 2009 to 26 BCF/day in 2012) but it could be a vital new supply.

INEOS had licences to explore 731 km<sup>2</sup> of potential scale gas formations in Scotland, but whether they could be exploited depended upon (a) the recoverable reserves, (b) access to skilled people to develop the fields, (c) a cost-effective supply chain and (d) agreement from local communities that developments should be permitted. The last was the most important; only if society were persuaded of the value of the gas to the community would permission be given to exploit the gas reserves. But such permission would be granted only if people had been engaged in a dialogue about the need for more gas, and that scientific evidence and experience showed that hydraulic fracturing of shale was, if properly regulated, safe and not environmentally damaging. Only by a steady programme of

dialogue would the emotional reaction that most felt about the prospect of hydraulic fracturing be replaced by rational analysis of the risks. He supported the moratorium as a period in which companies could work to develop this societal permission, but thought the period of suspension of exploration up to 2017 to be too long.

PROFESSOR LUNN said that she had wished in her report for The Royal Society of Edinburgh<sup>1</sup> (*Options for Scotland's Gas Future*, 2015) to provide a perspective of the wider energy scene. Electricity generation in Scotland was 10% from gas; 35% from nuclear; 20% from coal; and 33% from renewables. If Scottish government policy is to phase out nuclear and coal by 2023, these sources would have to be replaced by gas. It would not be feasible to increase sufficient renewables output in that time frame. In any case many renewables are intermittent - subject to weather conditions - and there will have to be a backup supply. Gas is a low carbon option compared to coal. Household consumption of energy was not just through electricity. Gas heating was an important part of the equation. Final energy consumption in Scotland in 2012 was 55% for heat, 21% for electricity and 24% for transport.

Possible options for meeting the supply crunch were reducing demand, increasing imports, technological advances, or more indigenous gas production. All presented difficult choices, with different problems. Household demand for gas could be reduced through better insulation etc., but only if it did not increase demand for electricity. But it is unlikely the demand for gas feedstock for industry could be reduced, without job losses and plant closures. Importing gas did nothing to help reducing Greenhouse gas emissions, and raised issue about health and safety and security of supply; the most likely technological advance to cut emission was widespread use of CCS (carbon capture and storage) but no one had shown yet that CCS projects were commercially feasible. The remaining option was increasing internal production - this meant using unconventionally sourced gas - through hydraulic fracturing of shale to release gas. There were no safety issues with this, provided that wells were drilled and managed within a proper regulatory structure. Environmental protection could be managed so as not to cause damage to the surface or underground resources, such as water. The problem was public understanding of the whole energy scene and why increasing domestic gas production was vital. The government should launch a well-funded campaign, in conjunction with private firms, to engage in a two way dialogue with public about all the issues of concern about unconventional gas developments.

BEN RITCHIE opened the discussion. There were three elements to consider - politics, policies, and

<sup>1</sup> [www.royalsoced.org.uk/cms/files/BriefingPaper15-01.pdf](http://www.royalsoced.org.uk/cms/files/BriefingPaper15-01.pdf)

market forces. They can only be aligned through leadership by those who understand the politics, can devise long-term policies which respect market forces. At present policy is being driven by political forces. Scientific evidence and global market trends are being ignored.

Participants accepted that reducing household demand for energy was desirable, but saw difficulties in achieving reductions in the use of gas for heating, and saw different priorities for action. Some saw helping the fuel poor as the priority, which could be achieved by ensuring that excessive profits from suppliers were directed to lessening their bills. This meant growth of the renewables sector leading to competition. Others saw the priority as being changing household behaviour. Priority should be given to ensuring that householders had full information of their fuel costs, and were then able, through distributed generation means (e.g. solar panels) to manage their own supplies. But would distributed generation systems spread as quickly as had been hoped, now that subsidies were being reduced? They would always need backup from the grid. Others favoured a drive for the use of particular technologies, such as heat pumps. But none of these measures would be effective in reducing the price of fuels unless the cost of developing and improving the energy network was borne by the taxpayer, not the consumer. Without this change energy costs for the consumer would continue to rise, and fuel poverty increase.

Participants endorsed the speakers' concern about the 20 year gap that would occur before renewables could replace coal and nuclear, with a danger of a supply crisis. While much could be done to promote distributed systems, reduce demand and encourage start-ups and innovation, efforts would fail unless there was, first, a long term consistency in government policies on taxation, subsidy and regulation, and, second, fundamental analysis of why problems existed and what measures would best deal with them. The Green Deal had failed as it was not underpinned

by analysis and it was doubtful if the Green investment Bank was targeting the best investment.

Participants urged the Scottish and UK government to recognize the importance of maintaining investment in the North Sea which, employed 100,000 people and was struggling to reduce costs. Action should be taken now to protect offshore fields. There is a strong case for abating the Petroleum Revenue Tax. The electricity market was unbalanced. Scotland overproduced electricity, and exported to England, but if it became ever more dependent on renewables, whose productivity was unstable, it could see a shortfall in supply. Certainly we should not look to replace gas by electricity, but much more effort should be given to research on ways of counteracting the instability of renewables - for example novel technologies for the storage of electricity. While more research in all energy areas was essential, there was still a gap between what was promoted by government and academics and what impact the results of that research would have on business. The saga of CCS demonstrated this. All agreed it was a feasible technique, which only needed further subsidies to be implemented. But, in fact, there had never been a business case for it.

Principal points arising from the discussion were the dangers of assuming that further indigenous gas resources were not needed in the next 20 years; that these could only be successfully found and utilized after determined leadership which would engage the public on the wider energy scene and the safety and environmental acceptability of hydraulic fracturing of shale to release gas. At present political leadership was directed towards specific issues - nuclear and fuel poverty - and was failing to reach the public on essential facts. Professor Lunn's report was a valuable background for politicians, academics and community leaders to engage in a two-way dialogue.

Sir Geoffrey Chipperfield KCB

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Reports:

*Options for Scotland's Gas Future*, RSE Report 15-01  
[www.royalsoced.org.uk/cms/files/BriefingPaper15-01.pdf](http://www.royalsoced.org.uk/cms/files/BriefingPaper15-01.pdf)

*Shale gas extraction in the UK: a review of hydraulic fracturing*, Royal Society/Royal Academy of Engineering Report, 2012  
[www.royalsociety.org/~media/policy/projects/shale-gas-extraction/2012-06-28-shale-gas.pdf](http://www.royalsociety.org/~media/policy/projects/shale-gas-extraction/2012-06-28-shale-gas.pdf)

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