

## 2. Executive Summary

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- 2.1 This second Energy Markets Outlook provides a detailed discussion of the risks and drivers associated with future security of energy supply, including scenarios for future security of supply of electricity and gas and the full range of other fuels, and provides a narrative on these scenarios. It builds on the first Energy Markets Outlook published in October 2007, and takes account of feedback and inputs provided through stakeholder engagement. It draws on technical modelling and other expert work and knowledge. It is not a statement of policy, and it does not make guesses about future prices.
- 2.2 The first result of problems with supply, however caused, is likely to be a jump in the price as the market responds, rather than physical interruptions to supply. Such price increases are costly for consumers, but actual supply interruptions have greater costs – forcing 10% of gas demand off the system involuntarily could cost the economy £300m a day.
- 2.3 The Government has ultimate responsibility for security of supply, but looks to the market to deliver the necessary infrastructure and diversity of competitive sources of energy. The Government seeks to facilitate this through a supportive regulatory framework, which is then administered by (in Great Britain) Ofgem and (in Northern Ireland) the Northern Ireland Authority for Utility Regulation (NIAUR), the independent energy Regulators.<sup>7</sup> Under this policy framework, energy companies invest to maintain secure and reliable supplies in response to price signals emerging from energy markets.
- 2.4 While future security of supply will be principally determined by market-based drivers, Government policy and action are also important. In this context, Government's role is to provide a stable regulatory framework. Where appropriate, Government may also provide incentives (for example for deployment of renewable technologies) and has a key role in removing barriers to ensure the widest possible range of options are available to the market. The Government and Ofgem also have a role in ensuring that the market has credible and timely information to help

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<sup>7</sup> <http://www.ofgem.gov.uk/>  
<http://www.niaur.gov.uk>

inform its investment and other strategic planning decisions.

- 2.5 In terms of maintaining continuity of supply for customers, private companies in the market work with National Grid to meet consumers' demand. Ofgem oversees the market rules to make sure that energy suppliers face the full economic costs of any failure to match their supplies to their customers' demands. This enables them to make trade-offs between the costs and benefits of additional investments to reduce the risk of imbalances.
- 2.6 While discussion about security of supply often focuses on the risks arising from import dependency, or the margin of electricity generating capacity above peak electricity demand, shortcomings in these areas have not historically been the main causes of interruptions to energy supply. Other risks include:
- unplanned outages of transmission and distribution networks;
  - accidents, such as the fires at the Rough gas storage facilities and at the Coryton and Pembroke oil refineries;
  - extreme weather, such as the floods that affected much of the West of England in 2007 or the hurricanes that threaten oil supply in the Gulf of Mexico;
  - industrial action, such as the dispute at Grangemouth which affected petroleum deliveries and the operation of the Forties pipeline.
- 2.7 There are also other, lower probability risks, such as terrorism or pandemics – and climate change is a risk too, partly through its effects on extreme weather.
- 2.8 Over the next few years, Britain faces additional challenges. As plants start to close, the electricity generating industry faces a substantial challenge in ensuring delivery of the new generating capacity that will be needed if Britain is to maintain security of supply at similar levels to those so far enjoyed. In particular, as coal-fired plant closes by 2016 under the Large Combustion Plants Directive, there will be a requirement for replacement capacity. In the longer term, the move to a low-carbon economy will require substantial investment in renewables, and appropriate back-up capacity to deal with intermittency. The Government has also signalled the need for new nuclear plant in the mix, and the role for Carbon Capture and Storage in the context of fossil

fuel generation. The delivery of new generation plant, and potential upside to electricity demand, will also lead to a need for expansion and strengthening of the transmission network.

- 2.9 There is expected to be increasing diversity of the potential sources of gas supply to the UK, though there are widely differing views on the future sources of gas. For the medium and longer term, further investment in additional import and storage capacity is likely to be required. In particular, the need is recognised for additional gas storage in the UK over the coming years as UKCS supplies continue to decline and the UK becomes increasingly dependent on imports. Maximising the diversity of sources of supply and additional investment in import capacity are important in the medium term if the UK is to be able to maintain the position of being able to meet demand in the event of interruption to another supply route.
- 2.10 The downstream oil industry has the flexibility to respond to short-lived disruption of UK oil supply and the UK has well-established procedures in place to deal with supply emergencies, including through membership of international institutions. However, there are significant uncertainties as to how far and when the necessary new investment in upstream and downstream oil supply capability will be forthcoming. Continuing demand pressure on the one hand and a continuing slow supply and investment response on the other are reducing spare capacity and increasing pressure on inventories. The UK is obligated by its membership of the International Energy Agency and the EU to maintain extensive reserves of petroleum products and the level of stocks to be maintained is due to increase over coming years.
- 2.11 It is perhaps too soon to assess the effect of the economic downturn and financial market turmoil on investment in energy infrastructure due to difficulties in accessing, and higher cost of, finance. Equally we can expect to see some reduction in demand, both domestically and globally. The extent and duration of these effects will need to be monitored carefully.
- 2.12 There is a wide range of possible out-turns around future levels of electricity demand and new electricity build, as well as for the exact timing and sequence of plant closures. In any case, improvements in energy efficiency and demand-side responsiveness could also help to underpin

continued security, as well as limiting the need to invest in new generating capacity. In the longer term, the possibility of currently unforeseen technological advances in generation, transmission and distribution and demand side management enters into the equation. There are indications that the industry is already addressing these challenges. However, this is an area which the Energy Markets Outlook will continue to monitor closely.

- 2.13 More gas storage capacity and the maintenance of a broad diversity of import options should help to mitigate the risks of gas import dependency, but it is inevitable that the UK's security of gas supply will increasingly depend on EU and global gas market conditions. Further progress on EU market liberalisation will be important. Regional gas markets are on their way to globalisation, encouraged by more producing and consuming countries, Europe's growing dependence on external imports, tighter balances, increasing volumes of spot and short-term Liquefied Natural Gas (LNG) and higher prices. Spot and short-term LNG is beginning to play a greater role in inter-regional market balancing and price alignment. If this leads to more transparency on prices and flows and more competitive internal markets, interregional competition should improve global gas security in the long term.
- 2.14 A range of scenarios can be postulated for demand for coal in the UK over the next decades, driven primarily by assumptions about levels of coal fired power generation, which in turn depend on assumptions about the regulatory climate and the drive towards low carbon generation. Future demand for coal will provide an opportunity for indigenous production of coal, although issues such as planning consents, in particular for surface mines and rail infrastructure would also need to be considered. In all reasonable scenarios, however, there will continue to be a requirement for imports. Given the abundance of proven reserves of coal globally, the future use of coal is unlikely to be limited by resource availability, although there are a number of international issues and risks that could affect future prices.
- 2.15 Although the UK only recently became a net oil importer, we already have in place infrastructure, contractual arrangements and commercial relationships which should help ensure continuity and security of oil supplies for the UK from external sources, though the degree of resilience which these bring obviously depends on the size of any

supply problem. The UK also has a long-established refinery sector to process crude oil, even though it is unlikely that domestic production will ever fully match consumption of the different oil products.

- 2.16 While future security of supply will depend on investment by private companies, Government policy and action will define the choices that are made.
- 2.17 The Energy White Paper 2007 set out the Government's strategy to address the long term challenges faced by the UK of tackling climate change by reducing greenhouse gas emissions and ensuring the UK has secure, clean and affordable energy. The Government believes that independently regulated, competitive energy markets with an appropriate cost of carbon and support for emerging low carbon technologies are essential to delivering the twin goals of both secure energy supplies and lower emissions. The Government also considers that the best way to deal with future uncertainties is to ensure the market has access to all the technologies and options available, encouraging a diverse and increasingly low-carbon energy mix. A diverse range of low carbon energy sources are also helping to limit our future dependence on imported fossil fuels with all the uncertainties they entail. The Government is also promoting energy efficiency, as a means of reducing overall energy demand, and has announced other measures to encourage localised generation.
- 2.18 Dynamic markets and private investment are at the heart of the Government's energy policy, while there is also a role for Government in taking strategic action to shape the medium term framework and to ensure that the market delivers. Strategic Government action includes setting targets for deployment of renewables to implement the EU's target for meeting 20% of EU energy demand from renewable sources by 2020, promoting development of Carbon Capture and Storage Technology, and driving energy efficiency. The Government is also working to ensure that unnecessary barriers to the market working effectively are removed. Legislative changes to reform the planning system have been agreed in the Planning Act 2008, where the intention is to streamline the process for obtaining planning permission, removing avoidable uncertainty and delay from the process, while protecting environmental interests. As set out in the Planning White Paper, the Government has already introduced streamlined inquiry rules for major electricity projects.

- 2.19 The Energy Act 2008 will enable a fit for purpose regime for certain types of offshore gas infrastructure such as offshore gas storage. The Energy Act has also updated the legislative framework to reflect the availability of new technologies, such as carbon capture and storage, which would enable coal fired generation to be deployed in a way consistent with the transition to a low carbon economy, and emerging renewable technologies.
- 2.20 The Government is also ensuring there are no unnecessary barriers to the deployment of new nuclear power, and that the appropriate regulatory frameworks are in place for nuclear new build. In January 2008, the Government published a White Paper on nuclear power development. The White Paper also set out the timetable of facilitative actions necessary to enable energy companies to begin construction of the first new nuclear power stations in 2013-2014 to start operation in 2017-2020.
- 2.21 As mentioned in paragraph 2.17, the second half of the Government's approach is to ensure an appropriate cost of carbon and to provide support for emerging low carbon technologies within the context of competitive energy markets. The Government has set aggressive targets for the deployment of renewables, to implement the EU's target of delivering 20% of energy demand from renewable sources by 2020, and reductions in emissions, as set out in the Climate Change Act 2008. Its 2008 consultation sought views on how to achieve the level of deployment of renewable energy in the UK at the speed and scale required. This will help to shape the UK's Renewable Energy Strategy which will be published in first half of 2009. The Government has already been providing support for the development and deployment of renewable electricity and has recently taken powers in the Energy Act 2008 to introduce a Renewable Heat Incentive and a Feed in Tariff for small-scale renewable electricity generation.
- 2.22 The reform of the EU Emissions Trading Scheme and business confidence in there continuing to be a meaningful carbon price are key to future investment decisions. The current proposals for reforming the EU ETS go some way towards providing a longer-term carbon price signal and increased certainty for investors. They point to increasing scarcity in the carbon market (due to reduced supply) as the EU moves towards its 2020 emissions reduction target. This should support the carbon price, thus encouraging research, development and investment into innovative low-

carbon energy technologies to take an increasingly large place in the UK's overall energy supply mix.

- 2.23 Energy efficiency is an important strand to the Government's approach, offering the possibility of reduced emissions through reduced fuel consumption and a reduced need for new generation and gas supply infrastructure in the future.
- 2.24 The Government has promoted household energy efficiency through a combination of regulation, awareness-raising and incentives. Building regulations have increased the energy performance of new homes as well as that of replacement windows and boilers. The main policy in existing homes is the energy supplier obligation, which sets suppliers a target to deliver carbon-saving measures to households in Great Britain. The Carbon Emissions Reduction Target, which commenced in April 2008, represents a doubling of the target under the previous programme. A further 20% increase was announced in September 2008, as well as the introduction of a new Community Energy Saving Programme. Government announced in October its intention to move to a 10-year roll-out of smart meters to domestic households, which will help householders better manage their energy use. The Government is working closely with other European Countries on ambitious mandatory minimum appliance standards and labelling for the energy efficiency of new products sold within the EU.