

**dti**

*GOVERNMENT RESPONSE TO THE  
CONSULTATION ON THE  
EFFECTIVENESS OF CURRENT  
GAS SECURITY OF SUPPLY  
ARRANGEMENTS*

MAY 2007

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## *Executive Summary*

- i. The DTI issued a consultation document in October 2006 in which it sought views on:
  - the effectiveness of current gas security of supply arrangements;
  - their robustness as we move to higher dependence on gas imports over the next 10 -15 years;
  - whether new measures are needed to strengthen them.
- ii. As the UK's indigenous gas supplies decline, gas into the UK will be sourced from further afield, giving rise to different types of risks and consequently challenges to the gas market. In light of these challenges, Government needs to ensure that the current market and regulatory framework can continue to address security of supply risks effectively.
- iii. 37 responses were received to the consultation, from a large variety of interested parties including upstream producers, downstream suppliers, gas storage operators, academics, consumer organisations and other public bodies. In addition to the consultation, DTI also commissioned Oxera Consulting Ltd to provide additional cost-benefit analysis of the seven policy options considered in the consultation in order to determine whether their implementation could improve security of supply in a cost-effective manner.
- iv. Virtually all respondents expressly welcomed the publication of the consultation document and thought that considering the effectiveness of gas security of supply arrangements was a timely and necessary exercise. Respondents' views on the robustness of current arrangements were mixed, with producers, suppliers, infrastructure operators and Ofgem believing that current arrangements were robust and consumers believing further action to strengthen the arrangements had merit. However, while accepting these risks, both the consultation responses and analysis highlighted that the benefits from the supply-side options considered in the consultation are uncertain, that none of the options is without downside and that they could potentially hinder rather than improve the provision of security of supply.
- i. Following consideration of responses to the consultation and the supporting analytical work carried out by Oxera, the Government, as announced in the 2007 Energy White Paper 'Meeting the Energy Challenge', intends to encourage energy efficiency, improve information arrangements and industry engagement through the new annual Energy Markets Outlook (EMO) report,

promote open and competitive markets internationally, improve the planning and licensing regime for gas infrastructure projects and improve emergency planning arrangements. These actions will ensure the current commercial and regulatory framework can effectively manage the potential future risks to security of supply.

# THE EFFECTIVENESS OF CURRENT GAS SECURITY OF SUPPLY ARRANGEMENTS

## GOVERNMENT RESPONSE TO PUBLIC CONSULTATION

### 1. Introduction

1.1 Following up a commitment in the Energy Review Report<sup>1</sup> published in July 2006, the DTI issued a consultation paper in October 2006<sup>2</sup> on the effectiveness of current gas security of supply arrangements. This consultation also considered seven policy options that could potentially improve gas security of supply.

1.2 By the closing date of 12<sup>th</sup> January 2007 a total of 37 responses were received.

1.3 A list of all respondents is attached at Annex A. Copies of all original, non-confidential responses are available on the DTI website at: <http://www.dti.gov.uk/energy/review/implementation/gas-supply/cons-responses/>.

1.4 The breakdown of the 37 responses received is as follows:

Upstream producers	7
Downstream suppliers	9
Infrastructure operators	5
Consumer organisations	8
Other	8

1.5 The Full Regulatory Impact Assessment which updates the Partial Regulatory Impact Assessment published with the consultation document is included in Annex B.

1.6 The DTI is grateful to respondents for their time and careful consideration of the questions set out. Views expressed have been analysed carefully and this document seeks to reflect them. This document also considers the supporting analysis the DTI commissioned from Oxera Consulting Ltd to provide additional

<sup>1</sup> Department of Trade and Industry. *The energy challenge - An Energy Review Report*. July 2006. <http://www.dti.gov.uk/files/file31890.pdf>

<sup>2</sup> <http://www.dti.gov.uk/energy/review/implementation/gas-supply/page34654.html>

evidence to some of the questions posed in the consultation.<sup>3</sup> This document sets out the Government's response to those questions.

## 2. Background

2.1 The Energy Review Report published in July 2006 considered the changing nature of the UK gas market, future trends in supply and demand and the potential future sources of gas and recognised that increasing dependence on imports from or through markets that are further afield and which are not always open and competitive could increase the risk of price volatility and reduce supply reliability. In addition, there is a risk that any new infrastructure required after the successful delivery of the current wave of investment might not be added in a timely manner, which risks creating imbalances between supply and demand.

2.2 The Energy Review Report recognised current market arrangements have been successful in providing diverse, reliable and flexible sources of supply that can be used to manage any potential risks to security of supply. However, given the changing nature of the UK gas market, it was believed to be important to further investigate the robustness of the current security of supply framework by issuing the consultation.

2.3 Hence, the consultation considered several issues relating to security of supply in the UK gas market such as the ways in which security of supply can be measured, the robustness of the current framework in facing future challenges, what further action Government could undertake to mitigate these risks and the advantages and disadvantages of seven policy options:

- Increasing supplier obligations to cover industrial and commercial (I&C) users as well as domestic users.
- Sharpen incentives provided by cash-out arrangements.
- Regulate the use of gas storage for security of supply.
- Capacity mechanisms in the gas market.
- Measures to encourage demand-side response from I&C customers
- Encouraging the installation of fuel back-up capabilities at new combined-cycle gas-turbine (CCGT) power stations.
- Smart gas metering and increased efforts on fuel efficiency.

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<sup>3</sup> Oxera Consulting Ltd. *An assessment of the potential measures to improve gas security of supply.*

### 3. Summary of responses by theme

#### a. Measuring and valuing gas security of supply

- Q1. What factors should be taken into account in assessing the level of gas security of supply?**
- Q2. Which quantitative indicators or metrics should be used to measure security of supply?**
- Q3. How should cost-benefit analysis of security of supply policies be quantified?**
- Q4. How can qualitative aspects be taken into account?**

3.1 The consultation document put forward four main factors influencing the level of security of supply experienced by the UK gas market. These are sufficient production and transportation capacity, reliability, diversity of supply sources and effective price signals. Most respondents to the consultation agreed that these were the key factors but highlighted several others (some of which form subsets of the four listed above) which could also be considered when analysing security of supply. These factors are:

- the liquidity of markets;
- the extent and flexibility of demand side response;
- the interaction with the electricity sector;
- the EU context in terms of gas quality and the co-operation between the transmission system operators (TSOs);
- the interactions with EU emergency arrangements;
- the level of a country's dependency on imported gas; and
- geopolitical risks.

3.2 Using these factors, different indicators could be designed to illustrate different levels of security of supply. The consultation document discussed some of these indicators and elaborated on the concept of "expected energy unserved". Although some respondents expressed support for the use of expected energy

unserved, most respondents indicated that it was not a very transparent indicator in terms of the assumptions that were used in its determination. Combining numerous assumptions into one indicator could also compound any errors associated in modelling the complexity of security of supply. In addition, there was also uncertainty within the responses as to whether expected energy unserved took account of all the relevant factors such as the costs associated with the different sources of supply, available volumes of demand side response and the costs associated with a supply shortfall.

3.3 Hence, most responses considered that a number of indicators need to be used that would encompass the interests of different stakeholders, rather than using one main indicator that would not capture all the main drivers of security of supply in a transparent manner. The types of indicators mentioned in the responses included, among others:

- determining whether the 1 in 20 and 1 in 50 licence criteria were being met;
- annual UK gas demand and potential supply;
- daily gas deliverability versus gas demand in a 1 in 50 winter and on a peak day;
- load duration curves;
- concentration and reliance on individual sources/infrastructure assets; and
- how long can average demand be met without imports.

3.4 Given the variety of indicators and assumptions that can be used in the analysis of security of supply, a number of respondents favoured the use of scenarios that use different indicators and assumptions transparently.

3.5 A number of respondents highlighted the need to ensure that quantifying security of supply does not lead to the development of mechanistic triggers for intervening in the market, as this would inevitably have consequences on the commercial decisions of market participants.

3.6 Respondents highlighted that, in order to assess policies that could potentially impact on gas security of supply, the appropriate approach was to measure the incremental costs and benefits of different policy options compared to the status quo. Many respondents highlighted the complexity of valuing the economic costs of gas supply shortfalls by using a value of lost load (VOLL). One of the reasons given was that the value of lost load needs to encompass a number of different costs that are not easily captured such as the costs of re-supplying low-pressure networks (where appropriate), health and safety for vulnerable customers,

commercial and industrial revenue loss, restoration cost and the impact on the attractiveness of the UK for investors. In addition, VOLL varies by consumer group and by time period.

*These views corresponded closely with the Government's view, and will be reflected in the forthcoming Energy Markets Outlook (EMO) report, announced in the 2007 Energy White Paper<sup>4</sup>, which is aimed at increasing the security of supply information available. EMO will look at a range of indicators to analyse the longer-term level of security of supply in the UK gas market. It will also use scenario analysis to illustrate the wide range of plausible assumptions and possible outcomes associated with future supply and demand positions. More detail on EMO can be found in the 2007 Energy White Paper. EMO will be a joint DTI and Ofgem initiative of which a key element will also be engaging with industry on continually improving the information provided.*

#### *b. Current market arrangements and performance*

**Q5. Do the current arrangements offer adequate and cost-effective levels of security of supply to gas customers?**

**Q6. If not, for which types of customers do you feel the arrangements should be improved and how?**

3.7 The views of respondents on whether the current market and regulatory framework were providing appropriate levels of security of supply vary and broadly fall into two categories:

- Producers, suppliers and Ofgem believe the market does and will continue to provide security of supply as it is reacting to the decline in United Kingdom Continental Shelf (UKCS) production by providing more infrastructure; domestic customers are protected and larger consumers who can manage price and supply risks do so cost-effectively; and there have been no involuntary interruptions, even during winter 2005/06 when the supply-demand balance was tight.
- Consumers believe the market does not provide appropriate levels of security as it relies on demand-side response from the industrial sector to protect domestic

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<sup>4</sup> Department of Trade and Industry. *Meeting the Energy Challenge' – an Energy White Paper*. May 2007. [www.dti.gov.uk/energy/whitepaper](http://www.dti.gov.uk/energy/whitepaper)

consumers, the current levels of storage are low relative to other gas importing countries and the ability of energy intensive industries to manage price risks is limited when prices are high and volatile.

3.8 The Oxera analysis illustrated that, under the status quo, the risks of an involuntary supply interruption fall significantly over the next few years, but start increasing towards the middle of the next decade. The analysis illustrated that, in addition to the infrastructure already being constructed, the economic incentives are sufficient to bring on £5.4 billion of investment in storage and import projects over the period to 2020/21. Hence, despite the increased risk, the average size of an interruption is small and significantly less than 1% of annual demand in any given year.

*Government acknowledges the experience of winter 2005/06 was uncomfortable for many industrial consumers and this is reflected in their responses to this consultation. It has been argued that the market tightness experienced during that period would have been greatly alleviated had the additional infrastructure, that became operational in time for winter 2006/07, been available a year earlier. Although the risk of mistiming investment in new infrastructure can not be eliminated, in future the additional information provided by the Energy Markets Outlook report should facilitate the better timing of new investment by highlighting the time periods when new capacity might be needed.*

*In addition, it is the Government's view that there is evidence, in the form of additional investment coming forward and the analytical work carried out by Oxera, to suggest that the current market and regulatory framework is providing the correct signals and incentives for the market to achieve an appropriate level of security of supply, given that the risk of a supply shortfall can never be completely eliminated. The analytical work carried out by Oxera also indicates that under the 'base case' the economic incentives do exist for the market to provide substantial additional new investment (£5.4 billion), over and above the capacity now being constructed, in the period up to 2020/21, generating a low risk that there are material supply shortfalls.*

#### *c. Ongoing efforts to strengthen the current framework*

***Q7. In addition to the efforts outlined above, what further action should the Government take to facilitate the functioning of the market?***

3.9 There are a number of actions that Government and the Regulator are taking forward in order to strengthen the current framework and facilitate the investment that will deliver security of supply in the future. The consultation discussed the actions Government is taking in the areas of planning, European energy market liberalisation, emergency cash-out arrangements, safety monitors, improved information provision in the form of the Energy Markets Outlook report, the emergency arrangements and measures to promote energy efficiency and new technologies. The Government also has a clear international energy strategy to promote open and competitive energy markets that provide fair access to energy supplies, foster investment throughout the energy supply chain and deliver diverse, reliable supplies at competitive prices while moving towards a low carbon economy.

3.10 There was general consensus in the responses that the main areas on which Government should be focusing were:

- improving the planning system so that any potential barriers to investment in gas delivery infrastructure and storage were removed;
- working towards ensuring the full and proper functioning of the internal European energy market. Responses also highlighted the need for better information on the European gas market; and
- ensuring that the UK regulatory and commercial framework is adequate for managing any potential issues that could arise around different gas specifications of imported gas (gas quality).

3.11 A number of responses also highlighted that one of Government's key roles in gas security of supply was to provide a stable, long-term regulatory and fiscal framework that creates a predictable environment for investment.

3.12 Respondents also highlighted a number of further actions that they considered would help improve security of supply. These were:

- To provide information on the volume of demand-side response available to the market and the amount that suppliers may have contracted for.
- To address the potential disincentives around the use of distillate back-up at gas fired power stations due to the risk of being exposed to cash-out costs in the

electricity market should there be operational difficulties with the change-over to distillate.

- To create tax incentives for investment in gas storage.
- To review upstream tax and regulation to encourage the maximisation of the recovery of UKCS resources.
- To remove force-majeure provisions so that consumers get compensated when there is a supply shortfall.
- To create a new mechanism that allows National Grid to tender for more gas storage capacity when projections show that the supply-demand balance might get tight.
- To compensate industrial consumers when they are interrupted as they provide the protection for the domestic sector.
- To put in place a procedure that would allow National Grid to contract for gas reserve via a tender process, enhancing the volume of interruptible gas available.

*Government also acknowledges the priorities for action identified by the majority of respondents. As set out in the Energy White Paper the Government will take the following steps to address these:*

- *Encourage energy efficiency and demand-side flexibility.*
- *Introduce in Autumn 2007 the Energy Markets Outlook (EMO) report, which is a new security of supply information and analysis service helping to provide the information about supply and demand trends that market participants need to take decisions, including on new investments.*
- *Support the European Commission's efforts to secure effective liberalisation of, and competition in, EU energy markets and work to secure more open and transparent energy markets elsewhere.*
- *Government will set out a comprehensive package of measures to improve the onshore Energy Planning System swiftly and, following the consultation on the Planning White Paper, will establish a new consenting regime for all major energy infrastructure.*
- *Legislate to modernise the regulatory framework so that we have a fit for purpose planning consents regime for offshore gas storage and unloading of Liquefied Natural Gas (LNG).*

- *The Government undertook a public consultation on Great Britain's future gas quality specification, to which it will soon publish a response. Meanwhile Ofgem is leading an exercise to assess the potential impact of gas quality constraints on the supply of gas to the GB market in the short-to-medium term.*

*The actions described above will enable participants in the market to manage the risks to security of supply effectively, by removing barriers and allowing market signals to dictate the quantity, types and timing of investment. The Government does not however, agree with the additional actions identified by particular stakeholders as their costs and benefits have not been analysed, and hence their impact on gas security of supply is uncertain. Some of the actions proposed by respondents risk creating uncertainty for investors in the gas market and/or may impact on the incentives of customers to procure and manage their energy flexibly and efficiently.*

#### *d. Potential additional measures*

##### Measure 1: Increase supplier obligations to cover industrial and commercial users as well as domestic users

- Q8. Are the current supplier obligations an effective mechanism for enhancing or ensuring security of supply?*
- Q9. If extended, what costs, benefits, risks or consequences might materialise, additional to those identified above?*
- Q10. How could such obligations be enforced more efficiently and effectively, to ensure they deliver the desired outcome?*
- Q11. How can the benefits and costs of the potential measure be quantified, and would this support considering it further?*
- Q12. On balance, should the Government investigate and consider this measure further?*

3.13 The views of respondents on whether the current supplier obligation was effective were mixed. Under current licence conditions suppliers meet the domestic security standards through contracting with shippers who have signed up to the network codes. These codes then place the necessary economic incentives on signatories to provide for the domestic security standards. Some respondents believed that these current arrangements were effective in ensuring the necessary level of safety to domestic customers. However, other respondents thought that the current supplier obligations needed clarifying and better monitoring and enforcement to be effective. Some responses indicated that it was worth Government considering this option further.

3.14 Although views on this measure were mixed, the majority of respondents considered that it would not be beneficial to extend the current domestic standards to cover all gas consumers. The reasons given were that a 1 in 50 winter and 1 in 20 peak day level of security of supply was not appropriate for the entire gas market as it would lead to excessive costs in increased supply capability that would be used very infrequently. In addition, such an extended obligation would reduce the incentives for industrial and commercial consumers to provide demand side response which would push up the costs of balancing the gas market. In the longer-term, this reduced flexibility could potentially lead to a lower level of security of supply.

3.15 The cost-benefit analysis Oxera carried out suggested that, if an obligation equivalent to a security of supply level of a 1 in 30 winter was applied across the market, i.e. to industrial, commercial and domestic consumers and the power sector,<sup>5</sup> there would be a cumulative (discounted) net cost to society of £177 million over the period 2007-2020. This net cost arises due to the fact that, although there would be a benefit in terms of avoided supply interruptions and demand-side response costs of £478 million over that period, the measure would also lead to a decrease in welfare of £655 million due to the increase in prices required to remunerate the additional investment. In addition, Oxera did not account for the implementation costs of this measure, which could potentially be significant given the monitoring and enforcement required to ensure its effectiveness, which would further add to the net cost of £177 million.

*Given the Oxera analysis indicated that there would potentially be a net cost imposed on the UK economy and the potential unintended consequences identified by respondents and the Oxera analysis, it is the Government's view that extending the current domestic security standards to cover a broader range of consumers would not be an appropriate policy to implement to improve security of supply, and we will therefore not further investigate this policy option.*

#### Measure 2: Sharpen incentives provided by cash-out arrangements

*Q13. Do the existing cash-out arrangements already provide sufficient incentives for the market to provide appropriate security of supply?*

*Q14. If not, in what ways do the expected cash-out prices or other commercial incentives not reflect the full value of security of supply?*

*Q15. How can the benefits and costs of the potential policy be quantified, and would this support considering it further?*

*Q16. On balance, should the Government investigate and consider this measure further?*

3.16 Only two respondents indicated that Government should consider making further changes to cash-out arrangements in order to improve the future level of gas security of supply. Centrica Storage indicated that the cash-out arrangements limit the response to imbalance risk and hence did not provide the marginal incentive to

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<sup>5</sup> This is comparable to the volumes of gas that would represent a 1-in-50 cold winter conditions for domestic, industrial and commercial customers and average conditions for power generation customers.

suppliers to balance their positions. In addition, Stag Energy suggested that balancing rules and cash-out arrangements should be progressively tightened, while monitoring the market response, as the current arrangements did not generate prices that were sufficiently high to attract investment in storage.

3.17 The vast majority of respondents indicated that cash-out arrangements were effective at providing the incentives to suppliers to balance their positions and that any further increases would impose unnecessary costs onto the market.

3.18 The analysis carried out by Oxera supported this conclusion as it showed that a significant increase in expected cash-out prices could lead to a significant increase in gas prices and a welfare loss to the UK economy of £4.4 billion over the period 2007-2020.

*The Government agrees with the responses and analysis that indicate that any further changes to cash-out arrangements are more likely to lead to a negative impact on the UK economy as a whole and will therefore not further investigate this policy option.*

#### Measure 3: Regulate the use of gas storage for security of supply

*Q17. Are existing market mechanisms (e.g., price signals) effective in ensuring optimal use of existing gas storage capacity?*

*Q18. Are there regulatory barriers that prevent or hinder the 'optimal' use of storage capacity in the UK market?*

*Q19. How can the benefits and costs of the potential policy be quantified, and would this support considering it further?*

*Q20. On balance, should the Government investigate and consider this measure further?*

3.19 Most responses indicated that regulating the use of storage would have an adverse impact on the incentives to invest in commercial storage and would most likely lead to a worsening of security of supply. Responses indicated that last winter provided evidence that the use of commercial storage was optimised, given the amount of recycling experienced. In addition, participants in the market would be better placed to optimise the use of storage rather than Government given their informational advantages.

3.20 GDF did put forward a different approach for regulating storage that required suppliers of domestic customers to hold a certain proportion of their sales in storage, and to maintain a minimum level of storage throughout the winter. In addition, the Institute of Mechanical Engineers suggested that strategic storage should be reconsidered.

3.21 The analysis carried out by Oxera illustrated that, although regulating the use of storage could have a potentially beneficial impact on reducing the risk of involuntary interruptions in the short term, it could significantly depress the revenue storage facilities can earn and thus lead to less investment in storage in the longer-term.

*Given that the majority of responses and the analysis indicated that regulating the use of storage in the manner described in the consultation would significantly impact on the profitability of storage operators and hence the incentives to provide more storage capacity, this measure is unlikely to benefit security of supply. Government therefore does not propose to consider this measure any further.*

#### Measure 4: Capacity mechanisms in the gas market

*Q21. In the absence of such a policy, why would the market not deliver an appropriate level of security of supply?*

*Q22. If the policy was implemented, what costs, benefits, risks or consequences might materialise, additional to those identified above?*

*Q23. How can the benefits and costs of the potential measure be quantified, and would this support considering it further?*

*Q24. On balance, should the Government investigate and consider this measure further?*

3.22 A number of responses indicated that some form of capacity mechanism, particularly the reliability option, required further consideration as they could encourage further investment by decreasing the uncertainty on the returns to investments.

3.23 However, several other respondents commented that some form of capacity mechanism in the gas market would increase uncertainty for investors and could potentially lead to the responsible body paying market participants for investment they would have undertaken anyway, incurring inefficient costs to consumers. In

addition, respondents also indicated that in markets where capacity mechanisms have been used in the past, for example in electricity, they have been discredited as being distortive and subject to abuse and, although they may increase the spare capacity on the gas system, they are unlikely to be effective in stimulating an overall increase in availability of gas to the UK.

3.24 The analytical work carried out by Oxera illustrated that the introduction of a capacity mechanism that would provide enough capacity to meet demand in a 1 in 50 winter severity across the whole market (domestic, industrial and power sector consumers) would significantly reduce the risks of outages over the period to 2020. However, the costs of this additional capacity in the form of higher prices faced by consumers had a negative welfare impact that more than outweighed the benefit of the reduced outage risk. Hence, the analysis indicated that the measure would potentially impose a net cost to the UK economy.

*Given the potential for significant unintended consequences, as highlighted by respondents, and the above analytical evidence from Oxera, it is the Government's view that the costs of introducing some form of capacity mechanism are high while its benefits are very uncertain and its introduction could create uncertainty for investors, depressing the level of investment they undertake. Hence, the Government does not propose to pursue the implementation of this policy option any further.*

#### Measure 5: Measures to encourage demand-side response from industrial and commercial customers

***Q25. In addition to actions already in place, what additional measures should the Government consider to enhance demand-side response?***

3.25 There was strong support across all respondents for Government action to encourage demand-side response (that is the voluntary curtailment of gas consumption in response to higher prices) and encourage greater energy efficiency in the industrial and commercial sectors. Questions were raised on whether there were significant levels of additional demand-side response that had not already been tapped into during winter 2005/06 and the extent to which demand-side response from this section of the gas market would benefit security of supply. Some responses from consumers also expressed concern about the reliance on demand-side response from the industrial and commercial sector to balance the gas market, due to the economic implications for the firms providing it.

3.26 Those respondents strongly in favour of further measures to encourage demand-side response and energy efficiency recommended a number of actions Government could pursue to this effect such as:

- Increasing information.
- Relaxing environmental controls when the use of back-up fuels becomes necessary.
- Compensating consumers in the industrial and commercial sector for providing demand-side response.
- Providing financial help with the costs of equipment and personnel required to increase the flexibility in gas consumption.
- Government to consider its own gas procurement arrangements to determine whether there could be more scope for demand-side response from the public sector.
- Establishing a consultancy service to advise non-domestic consumers of demand-side response opportunities.

3.27 There were also calls to focus these efforts on promoting demand-side flexibility and energy efficiency in the commercial sector where there was potentially less awareness of the opportunity to source gas more flexibly and be more responsive to market prices.

3.28 The analytical work illustrated that increasing the potential demand-side response (DSR) available, particularly in the industrial sector, could be a cost-effective way of providing additional security of supply, as the costs of additional infrastructure are potentially greater than the costs of providing DSR, yielding a potential net benefit of £1.3 billion over the period 2007–2020. The Oxera analysis, however, did highlight that there were a number of factors such as the costs of providing DSR, the feasibility of prolonged periods of DSR and the effectiveness of action taken to increase DSR that had not been investigated and could impact on the assessment of this measure.

*The Government has developed a package of measures, announced in the 2007 Energy White Paper, to encourage further demand-side response and energy efficiency that could make firms more responsive to price signals in the commercial sector in particular. These measures include introducing the Carbon Reduction Commitment for the non-energy intensive sector, improving the information to energy consumers in businesses through improvements to energy metering and*

*billing and publishing public sector procurement criteria for energy efficiency and energy savings.*

Measure 6: Encouraging the installation of fuel back-up capabilities at new CCGT power stations

*Q26. Are there reasons why investors might not install distillate back-up in CCGTs anyway, given the risks identified for gas supplies?*

*Q27. If this policy was implemented, what costs, benefits, risks or consequences might materialise, additional to those identified above?*

*Q28. How can the benefits and costs of the potential measure be quantified, and would this support considering it further?*

*Q29. On balance, should the Government investigate and consider this measure further?*

3.29 There were a number of responses in support of further investigating this measure. In addition, the analytical work illustrated that further demand-side response from the power generation sector could be a cost-effective way of reducing the risk of involuntary outages and could generate a net benefit to the UK economy of the order of £1.7–£1.8 billion over the period 2007–2020.

3.30 However, both respondents and the analytical report questioned the feasibility of sustained high levels of distillate usage at power stations due to the constraints around filling up the distillate tanks, environmental constraints and future changes in the electricity generation mix, which could limit the extent to which gas-fired power stations might play a role in providing gas market flexibility.

3.31 The analysis and responses expressed concern about mandating the introduction of distillate back-up at new CCGTs due to the potential unintended consequences for the generation sector and for electricity prices and the potential for displacing investment in gas supply infrastructure, including gas storage. In addition, there is evidence that the commercial incentives to encourage the construction of back-up capabilities at CCGTs already exist.

*Given the concerns raised on mandating the use of distillate back-up at CCGTs and the potential for the market to provide this flexibility independently in a more cost-effective way, Government does not propose to investigate this measure further.*

## Measure 7: Smart gas metering and increased efforts on fuel efficiency

*Q30. In addition to actions already in place, are there areas in smart gas metering that require further Government attention and are not currently being taken forward?*

3.32 There was strong support among respondents for Government action to encourage the use of smart gas meters, although some respondents did question the extent to which smart gas meters could significantly increase security of supply.

3.33 The Oxera analysis indicated that smart gas meters were not a cost-effective way of reducing the risk of involuntary interruptions, given the high costs of installing them. However, the analytical work did not consider the additional environmental benefits of smart meters in reducing carbon emissions, which would significantly alter the cost-benefit analysis results.

*Given the wide ranging support for smart metering and the environmental benefits associated with their wide-spread introduction, the Government, working with suppliers, Ofgem and other interested parties, will encourage the roll-out of smart gas meters. In addition, following the Government consultation on billing and metering, Government intends to roll forward a package of measures that will change the way in which energy use is communicated to customers, to help them reduce their energy use.*

## 4. *Next Steps*

4.1 Government has set out the steps it proposes to take to ensure that the current commercial and regulatory framework effectively manages the risks to gas security of supply in the 2007 Energy White Paper. These are to:

- Encourage energy efficiency and energy savings in order to reduce the use of fossil fuels and encourage energy market flexibility through the promotion of energy efficiency measures, such as the rollout of smart gas meters and the introduction of the Carbon Reduction Commitment to the non-energy intensive sector.
- Introduce Energy Markets Outlook (EMO) in autumn 2007, which is a new security of supply information and analysis service helping to provide the information about supply and demand trends that help market participants to take decisions, including on new investments.
- Promote open, competitive energy markets, through our international strategy, which provide fair access to energy supplies, foster investment throughout the energy supply chain and deliver diverse, reliable supplies at competitive prices.
- Support the European Commission's efforts to secure effective liberalisation of, and competition in, EU energy markets and work to secure more open and transparent energy markets elsewhere.
- Set out a comprehensive package of measures to improve the onshore Energy Planning System swiftly and, following the consultation on the Planning White Paper, establish a new consenting regime for all major energy infrastructure.
- Legislate to modernise the regulatory framework so that we have a fit for purpose planning consents regime for offshore gas storage and unloading of Liquefied Natural Gas (LNG).
- Improve the UK economy's resilience in the face of shocks to energy supplies by improving our emergency planning arrangements.

4.2 The DTI looks forward to continued close co-operation with those who responded to this consultation and would welcome any further contact with stakeholders on this issue.

## *Annex A: List of respondents to the consultation*

Amicus  
Association of Electricity Producers (AEP)  
BG Group  
BP  
Centrica  
Centrica Storage Limited  
Chemicals Industries Association (CIA)  
Confederation of British Industry (CBI)  
Confederation of Paper Industries (CPI)  
Confederation of UK Coal Producers (CoalPro)  
EDF Energy  
Energy Information Centre (EIC)  
Energy Intensive Users Group (EIUG)  
energywatch  
E.ON UK  
Exxon Mobil International Ltd  
Gas Storage Operators Group (SBGI)  
Gaz de France  
INEOS ChlorVinyls  
Institution of Mechanical Engineers (IMechE)  
Interconnector (UK) Ltd  
Kemp, Prof. A.G.  
Marathon Oil UK Ltd  
Merrill Lynch Commodities  
National Grid  
Ofgem  
RWE npower  
Scottish and Southern Energy (SSE)  
ScottishPower  
Shell Gas Direct Limited  
StagEnergy  
Statoil (UK) Ltd  
Stern, Prof. J.P.  
Terra Nitrogen UK Limited  
UK Business Council for Sustainable Energy (UKBCSE)  
UK Offshore Operators Association (UKOOA)  
Wales and West Utilities

## *Annex B: Full Regulatory Impact Assessment*

- 1.1 This Full Regulatory Impact Assessment (RIA) updates the Partial (RIA) published in October 2006 as Annex B to the consultation on the effectiveness of current gas security of supply arrangements. It summarises the responses received to the consultation, the supporting analytical work carried out by Oxera Consulting Ltd and sets out Government's response to the questions raised.
- 1.2 Following consideration of responses to the consultation and the supporting analytical work carried out by Oxera, the Government, as announced in the 2007 Energy White Paper 'Meeting the Energy Challenge', intends to encourage energy efficiency, improve information arrangements and industry engagement through the new annual Energy Markets Outlook (EMO) report, promote open and competitive markets internationally, improve the planning and licensing regime for gas infrastructure projects and improve emergency planning arrangements. These actions will ensure the current commercial and regulatory framework can effectively manage the potential future risks to security of supply.

### *Title of proposal*

- 1.3 The consultation document, which the Partial Regulatory Impact Assessment (RIA) accompanied, sought views on the effectiveness and robustness of current gas security of supply arrangements. Views were also sought on whether new measures are required to strengthen current arrangements and if so, if the measures considered in that document were appropriate. The partial RIA investigated the potential effects of the measures considered in the consultation. This Full Regulatory Impact Assessment updates that document.

## *2. Purpose and intended effect*

### *a. Objective*

- 2.2 The objective of the consultation is to assess the effectiveness of current arrangements for gas security of supply and assess the impact and cost-effectiveness of the measures/policies considered in the consultation document.

## *b. Background*

- 2.3 The Government believes that well-functioning markets are the most efficient and reliable mechanism to ensure that supply meets demand. The UK gas market has to date been effective in providing a high level of security as evidenced by the lack of involuntary interruptions and the large scale investment in infrastructure. In order to further strengthen the domestic gas market, the Government is examining the planning process for all large infrastructure projects, continuing to promote further liberalisation of European gas markets, consulting on arrangements for priority users, improving cash-out and safety monitor arrangements, and promoting energy efficiency and new technologies.
- 2.4 However, the nature of the UK gas market is rapidly changing. The UK has become a net gas importer and will become increasingly dependent on imports as the production capability of the UK Continental Shelf declines. Modelling work included in the 2006 Energy Review Report and produced by Ilex Consulting<sup>6</sup> indicated that, after 2015, it is possible that the level of spare gas supply capacity could again become tight in the UK market. While the probability of this leading to involuntary interruptions of gas supplies is likely to remain very small, the costs of any shortfall to British industry and economy as a whole could be substantial, since the loss of gas supplies to an energy intensive industry has both direct effects on the industry itself and also indirect effects on suppliers and customers of the affected business.
- 2.5 The Energy Review Report published in July 2006 concluded that, given these risks, the Government should carefully consider means of increasing the resilience of the UK gas market to potential supply shortfalls, while ensuring that any regulatory adjustment leads to genuinely additional security and does not simply displace private investment.

## *c. Rationale for Government intervention*

- 2.6 The Energy Review Report considered the changing nature of the UK gas market, the future trends in supply and demand and the potential sources of gas and recognised that increasing dependence on imports from or through markets that are further afield and which are not always open and competitive could increase the risk of price volatility and reduce supply reliability. In addition, there is a risk that any new infrastructure required after the successful delivery of the current wave of investment might not be added

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<sup>6</sup> Ilex Energy Consulting Ltd. *Strategic storage and other options to ensure long-term gas security*. July 2006. <http://www.dti.gov.uk/files/file31788.pdf>

in a timely manner, which risks creating imbalances between supply and demand. Any potential or unforeseen involuntary interruptions could impose significant costs on the economy.

- 2.7 The Energy Review Report recognised current market arrangements have been successful in providing diverse, reliable and flexible sources of supply that can be used to manage any potential risks to security of supply. However, given the changing nature of the UK gas market, it was believed to be important to further investigate the robustness of the current security of supply framework by issuing the consultation.

### **3. Consultation**

#### **a. Government consultation**

- 3.1 There has been cross-Whitehall consultation on the measures presented in this full RIA. Ofgem and National Grid also commented extensively during the development of these measures.

#### **b. Public consultation**

- 3.2 This full RIA will be published alongside the Government response to the public consultation. The consultation allowed the fullest discussion of the current regulatory framework and the options considered to potentially strengthen it. The consultation occurred over a period of twelve weeks from October 2006 till January 2007. The views of gas shippers, suppliers, Ofgem, National Grid, industrial and commercial customers, and consumer organizations were sought.
- 3.3 Respondents' views on whether the current market arrangements are providing adequate levels of security of supply and their views on the different options are outlined in the 'base case' option and the measures section respectively.

### **4. Options**

- 4.1 In addition to the 'base case', the consultation document considered seven possible measures:
- Increase supplier obligations to cover Industrial and Commercial (I&C) users.

- Sharpen incentives provided by cash-out.
- Regulate the use of gas storage.
- Capacity mechanisms in the gas market.
- Encourage demand-side response from I&C customers.
- Encourage the installation of back-up at new CCGT power stations.
- Smart gas metering and increased efforts on fuel efficiency.

### *Costs and Benefits, risks, and impacts on competition and small firms*

4.2 The costs and benefits of each measure considered in the consultation were investigated by Oxera and their results are set out in Table 1. A qualitative discussion of the costs and benefits, unintended consequences/risks, respondents' views, enforcement and monitoring, and the impacts on competition and small firms is then included for each of the measures individually.

### *The Base Case*

4.3 The nature of the UK gas market is rapidly changing. As the production capability of the UK Continental Shelf declines, so too does our ability to rely on additional, flexible supply of gas from it during periods of high demand (e.g. winter). UK production of gas is declining and, by 2010, net imports could be meeting a third of the UK's total gas demand, rising to 80% or more by 2020.<sup>7</sup>

4.4 Norway is likely to remain a significant supplier of gas to the UK in the medium term. Our increasing LNG import capacity will also allow us to obtain gas from a number of sources such as Algeria, Qatar, Egypt, Nigeria, Equatorial Guinea and Oman. Other potential suppliers are Russia and the Caspian states, Libya and Iran. Although investment in LNG is increasing, in the meantime our gas supplies could still be constrained by access to pipelines.

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<sup>7</sup> Production from the North Sea was 85.7bcm in 2005 and is expected to fall to around 65bcm by 2015, 40 bcm in 2015, and 25 bcm in 2020.

- 4.5 Recent market developments illustrate that the market is responding to the changing pattern of supply. There is actual and planned investment in gas import infrastructure, storage and related transportation of some £10 billion, which could deliver approximately 100 billion cubic metres or more by 2015, assuming that all projects are completed.
- 4.6 There is also the risk that – while currently investing heavily into new import infrastructure and storage – the market may not correctly anticipate the need for the ‘next wave’ of investment, perhaps around 2015, and may not bring this extra capacity on-stream sufficiently in line with demand. This could lead to a higher risk of supply interruptions, and periods of high/volatile prices when the market is “tight” as observed in winter 2005/06; in either event, there could be significant economic impacts. Estimates from work carried out by Ilex<sup>8</sup> for the DTI indicate that the cost to industry of a one day interruption could be £188 million and the costs of a 6-week interruption to gas supplies could be of the order of 1% of GDP<sup>9</sup>, if the impacts on the industries directly upstream and downstream are also included.
- 4.7 However, the benefits of reducing these risks need to be weighed up against the costs of any actions to strengthen the current gas security of supply arrangements.
- 4.8 The views of respondents on whether the current market and regulatory framework were providing appropriate levels of security of supply vary and broadly fall into two categories:
- Producers, suppliers and Ofgem believe the market does and will continue to provide security of supply as it is reacting to the decline in UKCS production by providing more infrastructure; domestic customers are protected and larger consumers who can manage price and supply risks do so cost-effectively; and there have been no involuntary interruptions, even during winter 2005/06 when the supply-demand balance was tight.
  - Consumers believe the market does not provide appropriate levels of security as it relies on demand-side response from the industrial sector to protect

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<sup>8</sup> Ilex Energy Consulting Ltd. *Economic implications of a gas supply interruption to UK industry*. 2006. <http://www.dti.gov.uk/files/file28936.pdf>

<sup>9</sup> The Gross Value Added (GVA) at basic prices has been used in order to quantify the economic impacts on the industries affected, where GVA is defined as the value of goods and services less value of the products used to make them. The costs of interruption would depend on the size of the interruption and on the sectors that are actually interrupted. It is assumed that sectors within the energy intensive industry are disconnected in case of an interruption according to a ranking order based on gas use.

domestic consumers, the current levels of storage are low relative to other gas importing countries and the ability of energy intensive industries to manage price risks is limited when prices are high and volatile.

- 4.9 During the consultation period DTI commissioned Oxera Consulting Ltd to assess the level of security of supply that the current market framework will deliver and carry out a cost-benefit analysis of the seven measures discussed in the consultation<sup>10</sup>. Full details of their methodology are included in their report, which has been published alongside the 2007 Energy White Paper. The Oxera analysis illustrated that under the base case (or status quo) the risks of an involuntary supply interruption fall significantly over the next few years, but start increasing towards the middle of the next decade. The analysis illustrated that, in addition to the infrastructure already being constructed, the economic incentives are sufficient to bring on £5.4 billion of investment in storage and import projects over the period to 2020/21. Hence, despite the increased risk, the average size of an interruption is small and significantly less than 1% of annual demand in any given year.
- 4.10 In addition, under the base case, there are a number of actions that Government and the Regulator are currently taking forward in order to strengthen the current framework and facilitate the investment that will deliver security of supply in the future. The consultation discussed the actions Government is taking in the areas of planning, European energy market liberalisation, emergency cash-out arrangements, safety monitors, improved information provision in the form of the Energy Markets Outlook report, the emergency arrangements and measures to promote energy efficiency and new technologies. The Government also has a clear international energy strategy to promote open and competitive energy markets that provide fair access to energy supplies, foster investment throughout the energy supply chain and deliver diverse, reliable supplies at competitive prices.
- 4.11 The actions described above will enable participants in the market to effectively manage the risks to security of supply, by removing barriers and allowing the correct market signals to dictate the quantity and types of investment.

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<sup>10</sup> Oxera Consulting Ltd. *An assessment of the potential measures to improve gas security of supply*. May 2007.

**Table 1:** Costs and benefits of the measures considered in the consultation<sup>11</sup>

	Reduced interruption costs (NPV over 15 years)	Increase in welfare (NPV over 15 years)	Implementation costs (where known)	Reduced demand-side response cost (NPV over 15 years)	Net benefit
Measure 1 (supplier obligation)	£454m	-£655m	Licence amendment plus monitoring	£24m	-£177m
Measure 2 (cash-out pricing)	-£176m	-£4,244m	Changes to Code Contract renegotiations?	£48m	-£4,372m
Measure 4 (capacity mechanism)	£1,005m	-£3,145m		£86m	-£2,054m
Measure 5 (industrial DSR)	£673m	£661m		-£19m	£1,315m
Measure 6 (CCGT response)	£1,107m	£832m	£124m to £147m	-£1m	£1,814m to £1,791m
Measure 7 (smart metering) <sup>12</sup>	£777m	£782m	£2.5 billion to £4 billion	£20m	-£2,421m to -£921m

Source: Oxera.

### *Measure 1: Increase suppliers' obligations to cover I&C users*

#### *Background*

4.12 Under current licence conditions suppliers meet the domestic security standards through contracting with shippers who have signed up to the network code. These codes then place the necessary economic incentives on signatories to provide for the domestic security standards, which require that supplies are secured to domestic customers even in the event of severe weather conditions (i.e. conditions which may be expected to be exceeded in only 1 year out of 50). These licence conditions do not currently extend to industrial and commercial (I&C) users. In practice, all consumers with an annual consumption of less than 25,000 therms are protected in 1 in 20 and 1

<sup>11</sup> Measure 3 (regulating gas storage) was treated differently in the Oxera analysis as it was not feasible to operationalise the constraints on usage. An alternative approach was applied, focussing on the revenue implications for storage operators.

in 50 conditions (therefore small and medium enterprises are generally protected); whereas energy-intensive users potentially face supply restrictions.

- 4.13 However, in order to ensure secure gas supplies to I&C users (as well as domestic users), a licence condition could be developed that would require suppliers to have enough available gas to cover their industrial and commercial customers with firm contracts in the event of a 1 in 20 or a 1 in 50 winter. The mechanism for ensuring compliance with the expanded obligation would be left to the market. However, the most likely way that this obligation would be met, assuming that it was actively enforced, is through additional gas storage, although there would also be scope for contracting demand side response.

### *Benefits*

- 4.14 The probability of involuntary interruption to consumers supplied by gas suppliers (as opposed to those who purchase on their own behalf directly from the wholesale market) is likely to be reduced through greater over-provision on the supply side. Placing a forward-looking obligation or licence condition on suppliers to secure gas for their potential future customers might induce them to put in place long-term arrangements (investments, contracts) to ensure sufficient capacity and molecules in the UK in the longer run. The significant economic costs associated with an interruption (as described in the base case) could therefore potentially be avoided.

### *Costs*

- 4.15 If the obligation is met through increased contracted storage then the costs of increasing storage capacity will be incurred. Gas prices will be higher in summer as more (and on average excessive) gas is injected into storage. The extra costs, in terms of working capital, opportunity costs, and possible capital cost investment in new storage sites, will all be likely to be passed on to end-users.
- 4.16 In addition, large industrial users have overall access to lower per unit prices than the domestic market (through for example the participation in the wholesale market). Implementing the licence described above could potentially remove this flexibility and increase the overall level of costs of the intensive gas users.

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<sup>12</sup> The costs and benefits presented for Measure 7 (smart metering) are derived from Oxera methodology and do not necessarily correspond with latest DTI views.

4.17 National Grid may also need to upgrade its network to cope with increased levels of demand on the network in 1-in-50 conditions, leading to higher transportation costs.

### *Risks/Unintended consequences*

4.18 The obligation would have to be carefully constructed to ensure that gas was released when it was needed, not necessarily when it was announced that it was a 1-in-50 winter. If there was a very cold period in December the obligation would have to be flexible to allow the release of gas at this time, whilst leaving gas in storage for the remainder of the winter.

4.19 In addition, the insurance of the obligation may lead to moral hazard issues with business less prone to enacting demand-side response policies or limiting gas consumption in periods of tight supply. It would also presumably remove a lot of gas in commercial storage facilities from the market if parties had to meet these specific obligations.

4.20 Ultimately the obligation could result in inefficiently high levels of security of supply – the costs of the additional security would outweigh the value placed on it by consumers.

### *Views from respondents*

4.21 The views of respondents on whether the current supplier obligation was effective were mixed. Some respondents believed that these current arrangements were effective at ensuring the necessary level of safety to domestic customers. However, other respondents thought that the current arrangements needed clarifying and better monitoring and enforcement to be effective. Some responses indicated that it was worth Government considering this option further.

4.22 Although views on this measure were mixed, the majority of respondents considered that it would not be beneficial to extend the current domestic standards to cover all gas consumers. The reasons given were that a 1 in 50 winter and 1 in 20 peak day level of security of supply was not appropriate for the entire gas market as it would lead to excessive costs in increased supply capability that would be used very infrequently. In addition, such an extended obligation would reduce the incentives for industrial and commercial consumers to provide demand side response which would push up the costs of balancing the gas market.

### *Implementation and enforcement*

4.23 This would be a fundamental change to the arrangements. In fact, a suitable enforcement regime would have to be enacted. If the method for fulfilling the obligation were left to the market, then the burden on Ofgem to interrogate contractual arrangements, and disentangle physical from financial arrangements, would be onerous. Monitoring and enforcement would require daily information regarding supplier positions to ensure that the security standards were being met at all times.

### *Impact on competition*

4.24 The costs of the additional supply capacity needed to meet the extended obligation could be prohibitive to new entrants in the supplier market. This would have a negative effect on competition.

### *Impact on small firms*

4.25 Whilst not explicitly protected under the current security of supply obligation, the majority of small businesses are covered under the emergency arrangements currently in force. The extension of this obligation would complete the coverage of the SME sector, but would raise the price of gas for all businesses and for domestic customers.

### *Conclusion*

4.26 Given the Oxera analysis indicated that there would potentially be a net cost imposed on the UK economy and the potential unintended consequences identified by respondents and the Oxera analysis, it is the Government's view that extending the current domestic security standards to cover a broader range of consumers would not be an appropriate policy to implement to improve security of supply, and we will therefore not further investigate this policy option.

## *Measure 2: Sharpen incentives through cash-out arrangements*

### *Background*

4.27 Present gas balancing arrangements are designed to provide shippers with commercial incentives to balance their inputs to, and offtakes from the National Transmission System (NTS) by the end of each gas day. Cash out

prices are therefore designed to reflect the costs that National Grid incurs in buying and/or selling gas to balance the system each day.

- 4.28 One way to sharpen the incentives on gas shippers still further – to reduce the possibility that the system as a whole may be short of gas – might be to further amend the cash out arrangements so that parties that are not balancing their positions are exposed to even sharper prices when short.

### *Benefits*

- 4.29 The arrangement would focus on avoiding a shortage caused by parties who failed to have contracts fulfilled or who deliberately chose to go short, but currently do not bear the full cost of an emergency. The imperative to minimise any risk of gas shortage would thus fall on those who are best placed to manage the risk; i.e. gas shippers who would be best placed to take whatever action would be most economical to ensure that they were able to keep the system supplied.

### *Costs*

- 4.30 If cash-out prices were significantly increased, shippers might incur costs if they need to take additional (potentially unnecessary) measures above and beyond those they already have in place to ensure that they remain in balance; and these costs would be likely reflected in gas prices. However, this measure would enable shippers to decide for themselves, which would be the most economical way to ensure balance, so this approach might be less costly than a more prescriptive requirement. Ultimately, the costs of sharper cash-out prices would be passed onto consumers. In the extreme, very high costs could force parties that were short to exit the market.

### *Risks/Unintended consequences*

- 4.31 It is likely that increasing the pressure on shippers to ensure that they are very well supplied with physical gas, or that they are actively contracting with the demand side for load management/sell back contracts, would reduce liquidity in the market (both the spot and forward markets) as few, if any, market participants would be prepared to run the risk of going short. This would be likely both to raise the price of gas and to reduce competition and choice.

### *Views from respondents*

- 4.32 Only two respondents indicated that Government should consider making further changes to cash-out arrangements in order to improve the future level of gas security of supply. Centrica Storage indicated that the cash-out arrangements limit the response to imbalance risk and hence did not provide the marginal incentive to suppliers to balance their positions. In addition, Stag Energy suggested that balancing rules and cash-out arrangements should be progressively tightened, while monitoring the market response, as the current arrangements did not generate prices that were sufficiently high to attract investment in storage.
- 4.33 The vast majority of respondents indicated that, following Ofgem's review, cash-out arrangements were effective at providing the incentives to suppliers to balance their positions and that any further increases would impose unnecessary costs onto the market.

### *Implementation and enforcement*

- 4.34 The cash out arrangements have already been the subject of intensive discussion in a cash-out review working group convened by Ofgem. This resulted in a modification to the Uniform Network Code (UNC modification proposal 044) in 2005, increasing the costs payable by shippers who are short during a gas supply emergency, as well as new arrangements to ensure that such shippers do not benefit by waiting for NGG to correct the market imbalance and hence cancel the shortfall. The new arrangements were in place for winter 2005/06.
- 4.35 Further changes to the current pre-emergency cash-out arrangements would similarly require a modification to the UNC.

### *Impact on competition*

- 4.36 Those directly affected are shippers. There are over 80 licensed shippers, though not all actively trade. Shippers include major oil and gas producers such as BP, Shell, Statoil and Total and retail suppliers such as EdF, Powergen and GdF. Some industrial consumers and banks also have shipper licences.
- 4.37 When Ofgem made the decision in respect of UNC modification proposal 044 it noted that the then emergency cash out arrangements represented a form of "collective insurance" in that shippers that were short of gas paid a price for the shortfall which was lower than the true market value of the gas, and

conversely, shippers that were surplus of gas received a price below the true market value. The arrangements therefore acted to insure the shippers that are short of gas at a cost to the shippers who are long gas, which in turn was likely to distort competition.

- 4.38 Therefore, any cash out prices which better reflect the market value of gas on the GB system immediately prior to an emergency would remove any element of collective insurance and would ensure that costs were appropriately targeted to prevent distortion of competition between relevant shippers and suppliers.

### *Impact on small firms*

- 4.39 As discussed in the competition section gas suppliers are usually large companies. The only potential impact on small businesses is through having to spend more on gas, as the Oxera analysis indicated that this measure is likely to lead to a general increase in gas prices.

### *Conclusion*

- 4.40 The Government agrees with the responses and Oxera analysis that indicate that any further changes to cash-out arrangements are more likely to lead to a negative impact on the UK economy as a whole and will therefore not further investigate this policy option.

## *Measure 3: Regulate the use of gas storage for security of supply*

### *Background*

- 4.41 The proposal would be to regulate to ensure that levels of gas in storage were kept at their highest possible levels going into, and during the early part of winter; and that gas from storage was not used to supply the market in preference to other sources of supply. The imposition of such restrictions would require closer supervision of exactly how each market participant was sourcing gas. Enforcement could take the form of an ex ante refusal to allow the supplier to withdraw gas or an ex post penalty for withdrawing gas inappropriately.

### *Benefits*

- 4.42 Gas in storage today provides greater certainty of ability to meet demand later than do gas imports or UKCS production because of the additional (close

to market) delivery capacity which storage offers alongside these other sources.

### *Costs*

- 4.43 Price signals should anyway encourage the market to buy gas and place it in storage when it is available over and above current demand, for later use when supply is less abundant. At such times the spot price (reflecting today's supply-demand balance) would be lower than the forward price (reflecting the market view of the future supply-demand balance). This signals that buying gas today and keeping it for sale at a later date is likely to be profitable.
- 4.44 This is why the summer months consistently see steady injections into storage so that storage facilities are full going into winter. Within winter also, we have seen a good correlation between the direction of storage flows and the relationship between the spot price and the forward price.
- 4.45 For the most part, then, such a requirement would simply reinforce existing price signals and the only costs would be associated with information provision by firms and the administrative effort of monitoring and assessing market participants' decisions and choices.
- 4.46 The proposal would also be likely to lead to higher gas prices if shippers were prevented from supplying gas out of storage when stored gas is cheaper than imported gas. It would also reduce the attractiveness of putting gas into storage in the first place and thus make it less attractive to invest in storage capacity, hence possibly leading to less capacity being made available than would otherwise be the case.

### *Risks/Unintended consequences*

- 4.47 It is possible that restrictions on market participants' freedom to choose in response to price signals how they source gas and the use they make of import and storage capacity which they have paid for, would discourage participation in the GB market.

### *Views from respondents*

- 4.48 Most responses indicated that regulating the use of storage would have an adverse impact on the incentives to invest in commercial storage and would most likely lead to a worsening of security of supply. Responses indicated that last winter provided evidence that the use of commercial storage was optimised, given the amount of recycling experienced. In addition,

participants in the market would be better placed to optimise the use of storage rather than Government given their informational advantages.

#### *Implementation and enforcement*

4.49 There are at present no restrictions on the usage of storage capacity or import capacity by the owners. The imposition of such restrictions would require closer supervision of exactly how each market participant was sourcing gas, implying more burdensome and detailed reporting requirements for market participants and the administrative cost and difficulty for enforcers of assessing market participants' decisions and choices.

#### *Impact on competition*

4.50 The restrictions on market participants' freedom to choose how they source gas in response to market signals, could discourage participation in the GB market and deter new entrants' investment.

#### *Impact on small firms*

4.51 The only potential impact on small firms identified is the increase in gas costs should the general level of gas prices increase as a result of this measure.

#### *Conclusion*

4.52 Given that the majority of responses and the analysis indicated that regulating the use of storage in the manner described in the consultation would significantly impact on the profitability of storage operators and hence the incentives to provide more storage capacity, this measure is unlikely to benefit security of supply. Government therefore does not propose to consider this measure any further.

### *Measure 4: Capacity mechanisms in the gas market*

#### *Background*

4.53 One way of actively incentivising the provision of spare capacity in the UK gas market and reduce the risk of interruptions is for a dedicated body (either National Grid, Ofgem, or an independent agency) to specify the level of capacity required, and put in place arrangements to provide it. This additional capacity could be in the form of demand-side response, storage or imports.

We describe below four different ways in which this body could ensure this additional capacity is provided.

### *Tendering for additional capacity*

- 4.54 Under this mechanism, the responsible body would determine, a few years ahead of time, the amount of extra capacity required to meet future security of supply needs. Private sector companies would then bid to provide this additional capacity, and this body would cover the capital costs of the reserve capacity thus created. The costs could be recouped through higher gas transportation charges.

### *Capacity payments*

- 4.55 A second mechanism would involve National Grid or another body contracting for reserve capacity and paying those who provide it a monthly/annual fee for making it available. The additional profits suppliers receive from this arrangement would incentivise them to add more capacity onto the system. There would be significant penalties if this reserve was not available when called upon.

### *Reliability option*

- 4.56 A third variant to ensure there is increased capacity on the system is for the dedicated body to contract for the option to use gas supplies, when it considers necessary to do so. Under this option, this body would enter into a contract with private sector companies under which it would pay them a monthly/annual fee to ensure that it has access to a certain amount of gas when it needs it. At the point when the option got called upon to be used, the contract counterparties would provide the body with the gas instead of directly providing the market. The body holding the option would recoup the cost of the option contract by selling the gas back to the market. The option would only be called on if the supply-demand balance was tight, hence the price the option-holder would receive for the gas it supplies would in all likelihood be very high.

### *Capacity Obligation*

- 4.57 A fourth way of ensuring that there are sufficient levels of capacity on the system to supply enough gas to meet demand, would be to impose a capacity obligation on suppliers. Under this obligation, suppliers would be legally required to demonstrate that they have contracted for enough capacity to meet a certain percentage of their customers' demand. If suppliers failed

to meet this obligation they would have to face significant penalties. Again, the body responsible for implementing the mechanism would define the requirement.

### *Benefits*

4.58 The additional capacity on the system would reduce the risk of an involuntary interruption, or decrease the size of any interruption that did occur, and avoid the associated economic costs. By allowing the market to provide different forms of reserve, the most efficient ways of providing additional capacity will be used, limiting the costs of this additional capacity. Depending on the mechanism, this option could also reduce price volatility or cyclicalities by providing an incentive for a steady stream of investment 'ahead of need', hence ensuring that the market supply-demand balance never got very tight.

### *Costs*

4.59 The costs involved in all four variants above include the additional resource costs for providing the additional storage, demand-side response and/or import infrastructure that would make up the additional capacity. This body would recoup its costs through increased transportation charges, which will ultimately be passed onto consumers in the form of higher gas prices. In the case of a capacity obligation, suppliers would face the costs in the first instance, but would be likely to pass them on to end customers.

### *Risks/Unintended consequences*

4.60 By allowing a body to set the optimal level of reserve margin, it is not at all certain that we would achieve the most efficient level of capacity, resulting in unnecessary costs to consumers. The additional reserve capacity created in all three options would likely displace some or any private investment in further capacity. Hence, the market might not achieve this additional capacity until the dedicated body also tendered for all the displaced investment. This could substantially increase the costs to consumers.

4.61 In addition, knowing that the agency has excess capacity it can call on when supply-demand is tight would reduce the incentives of market participants to balance their positions. The excess capacity in the market would reduce price volatility, making it difficult for existing commercial operators to recoup the costs of their existing investment. Similarly, new entrants could be deterred, as new investments in flexibility would not appear as profitable. Ultimately, all new capacity might have to be provided by the mechanism.

### *Views of respondents*

- 4.62 A number of responses indicated that some form of capacity mechanism, particularly the reliability option, required further consideration as they could encourage further investment by decreasing the uncertainty on the returns.
- 4.63 However, several other respondents commented that some form of capacity mechanism in the gas market would increase uncertainty for investors and could potentially lead to the responsible body paying market participants for investment they would have undertaken anyway, incurring inefficient costs to consumers. In addition, respondents also indicated that in markets where capacity mechanisms have been used in the past, for example in electricity, they have been discredited as being distortive and subject to abuse and, although they may increase the spare capacity on the gas system they are unlikely to be effective in stimulating an overall increase in the availability of gas to the UK.

### *Implementation and enforcement*

- 4.64 Details for the four different ways to implement a capacity mechanism have not been further investigated given the responses and analytical results received, indicating that the benefits of this measure are very uncertain.

### *Impact on competition*

- 4.65 As the experience with other capacity mechanisms has shown, these are potentially subject to 'gaming' by the participants. The means for gaming is typically to withhold capacity in order to drive up the capacity price. Scope for incentives to behave in this way occurs when there is market power (i.e. when a small number of large shipper/supplier companies dominate the market).
- 4.66 Additionally, new entrants could be deterred, as new investments in flexibility would not appear as profitable.

### *Small firms impact assessment*

- 4.67 The analysis indicated that implementing this measure could have an impact on small firms' costs of procuring gas, as it is likely to lead to an overall increase in gas prices.

## Conclusion

4.68 Given the potential for significant unintended consequences, as highlighted by respondents, and the analytical evidence from Oxera, it is Government's view that the costs of introducing some form of capacity mechanism are high while its benefits are very uncertain, and its introduction could create uncertainty for investors depressing the level of investment they undertake. Hence Government does not propose to pursue the implementation of this policy option any further.

## Measure 5: Encourage demand-side response from I&C customers

### Background

4.69 Energy intensive industries are those that consume large volumes of gas and electricity, such that the costs of procuring energy make up a large proportion of their overall production costs. These industries include, the paper, steel, aluminium, chemicals, petrol refining, glass and heavy food industries. Together these industries consume around 5-6% of national gas demand and 14% of electricity demand at the peak time on a peak day.<sup>13</sup>

4.70 While it could be assumed that increasing numbers of large energy consumers start devoting more attention to ways in which they can alleviate the impact of recent high-energy prices, there are constraints that limit the ability of industrial gas consumers to respond to high prices. These include technical constraints, customer commitments, lack of resources within firms to increase flexibility of their production processes and lack of knowledge of contracts and financial products that increase flexibility of energy procurement.

4.71 Ofgem already have initiatives in place to encourage greater participation of the demand side in the market. However, there may be further actions that Government or Ofgem could undertake to facilitate demand-side response from industry. These measures include:

- Increasing the amount of information available to large consumers on the different types of contracts and financial products available;
- Improving arrangements for data flow to consumers so that they can make informed decisions regarding their purchasing strategies and production

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<sup>13</sup> Global Insight Ltd. *Estimation of industrial buyers' potential demand response to short periods of high gas and electricity prices*. 2005. [http://www.dti.gov.uk/files/file\\_33152.pdf](http://www.dti.gov.uk/files/file_33152.pdf)

decisions;

- Communicating to firms the commercial opportunities open to them when gas prices are particularly high in terms of being able to rapidly reduce production, where it is technically feasible, and having the management and administrative processes in place to do so;
- Similarly, highlighting the commercial opportunities open to firms by re-examining aspects of their production process such as: changing their production profile and producing more at times of low gas demand such as the summer; introducing more delivery flexibility in the contracts with their customers or; holding more stocks of their product which could replace foregone production; and
- Encouraging the supply side to offer better and more flexible energy services and contract forms.

### *Benefits*

- 4.72 Global Insight (2005) have estimated that the maximum amount of demand-side response available from this sector varies between 30% and 50% of their gas demand depending on whether there are fixed contracts affecting firms incentives to reduce their demand or not. These figures represent between 2% and 3% of national demand, which at periods of high gas demand, may provide that necessary additional flexibility. During winter 2005/06, National Grid estimated that at times of the highest gas prices around 7mcm/day of demand-side response from daily-metered industrial customers was observed. These industries reduced their gas consumption by using back-up fuel, and by reducing their production. In addition, by reducing their production or by switching to on-site back-up diesel generators, they also reduced their electricity consumption, freeing up more gas at CCGT stations. Consequently, the risks that industry will have its gas supplies forcibly interrupted will be reduced, and the costs to the economy (described in the base-case) avoided.
- 4.73 In addition, firms that have the ability to procure their gas more flexibly and efficiently will benefit from reducing their energy costs and, in the circumstances when they can sell their gas back to the system, make a profit due to the higher gas prices. Similarly, by increasing awareness, firms will benefit from taking advantage of the different types of contract and different types of financial products that could further reduce their energy costs and create opportunities to profit.

4.74 Highlighting the opportunities available by decreasing gas demand may also lead to fuel efficiency improvements and associated reductions in CO2 emissions.

### *Costs*

4.75 The costs involved in employing these methods of demand-side response are:

- The administrative cost to Government of providing the necessary information and promoting industrial responsiveness;
- The costs of any equipment that firms need to introduce to increase the flexibility of their production processes;
- The additional costs that firms may require to improve their gas procurement methods, i.e. the increased man-hours required to investigate various contractual and financial products;
- The additional costs of storing excess product on site (both capital and maintenance costs);
- The administrative costs, incurred by both suppliers and customers, involved with renegotiating contracts with other firms in the supply chain; and
- The additional costs to shippers and/or suppliers of developing more flexible supply products and marketing them.

### *Risk/Unintended consequences*

4.76 There is a risk that firms invest in improving their flexibility and responsiveness but that future prices are not high enough to reward this additional flexibility. Hence, there is a real opportunity cost to these investments, although these may meet wider energy efficiency or energy reduction goals.

### *Views of respondents*

4.77 There was strong support across all respondents for Government action to encourage demand-side response (that is the voluntary curtailment of gas consumption in response to higher prices) and encourage greater energy efficiency in the industrial and commercial sectors. Questions were raised on whether there were significant levels of additional demand-side response that had not already been tapped into during winter 2005/06 and the extent to

which demand-side response from this section of the gas market would benefit security of supply. Some responses from consumers also expressed concern about the reliance on demand-side response from the industrial and commercial sector to balance the gas market, due to the economic implications for the firms providing it.

### *Implementation and enforcement*

4.78 Government could increase awareness through stakeholder meetings and better dissemination of information (through websites, publications etc). OFGEM could continue with the series of seminars it has been holding in order to ensure that these messages are reaching as wide a stakeholder group as possible.

### *Impact on competition*

4.79 There are no negative impacts on competition.

### *Impact on small firms*

4.80 Small firms that also invest in more flexible production processes and energy efficiency measures would benefit by potentially reducing their gas costs.

### *Conclusion*

4.81 The Government has developed a package of measures, announced in the 2007 Energy White Paper, to encourage further demand-side response and energy efficiency that could make firms more responsive to price signals in the commercial sector in particular. These measures include introducing the Carbon Reduction Commitment for the non-energy intensive sector, improving the information to energy consumers in businesses through improvements to energy metering and billing and publishing public sector procurement criteria for energy efficiency and energy savings.

## *Measure 6: Encourage the installation of distillate back-up capability at new CCGT power stations*

### *Background*

4.82 Some combined-cycle gas-turbine (CCGT) power stations, as well as operating with gas, are also capable of operating with back-up fuel in the form of distillate oil. Currently around 5.7GW of the existing 25GW total CCGT

capacity, or around 23%, has oil back-up and storage capability. This back-up capability is predominantly used when gas prices are very high and it is economical to use distillate, with the effect of freeing up gas to be used elsewhere in the market.

- 4.83 At times of high gas prices, even CCGTs without back-up facilities already reduce generation, as more economical forms of generation such as coal increase their output. However, at times of high electricity demand some gas generation is still necessary regardless of the price. More distillate back-up would allow for further gas savings even in times of high electricity demand, which tend to coincide with high gas demand days as they are typically a consequence of cold weather. Hence, this measure would allow for incremental amounts of demand-side response from electricity generators.
- 4.84 Direct regulation (e.g. through planning consents) or financial incentives could be implemented to ensure that new CCGTs have a certain volume of back-up fuel. This measure could then result in an increase in the volume of back-up fuel kept at CCGTs and an increase in the number and proportion of CCGTs with back-up capabilities.
- 4.85 Similar measures could be implemented at industrial sites that are large consumers of gas. However, regulative measures to require energy intensive industries to have back-up facilities, would impact on their international competitiveness. For this reason this measure focuses on developing back-up facilities at CCGTs.

### *Benefits*

- 4.86 National Grid has estimated that when prices were at their highest in winter 2005/06 there was approximately 40 mcm/day of demand side response from CCGTs. Higher levels of fuel back-up would have freed up further demand-side response in the power generating sector, possibly exceeding 40 mcm/day of demand reduction on days of particularly high demand. This additional flexibility could help prevent involuntary interruptions in other sectors, such as the industrial and commercial sector, where it is potentially less economical to install back-up facilities. In addition, this measure would reduce the risk of an interruption of electricity supplies due to unavailable gas supplies.

### *Costs*

- 4.87 The fixed costs associated with providing distillate back-up at CCGT stations are:

- The costs of the equipment required for dual-firing burners, such as special nozzles and pumps, storing the distillate in tanks and supplying the generators.
  - The costs of the storage tanks and fuel transport equipment.
- 4.88 In addition to these fixed costs there are additional operating costs associated with distillate back-up. These are:
- The cost of procuring the distillate oil to fill the tanks and keep them full.
  - Increased maintenance costs as maintenance will be required more frequently if the plant is run on distillate.
  - The cost of water that may be required for controlling NOx emissions.
  - The costs of the additional carbon allowances required, as there are more emissions generated when CCGTs run on distillate rather than gas.
- 4.89 In addition to the financial costs described above, there are incremental environmental costs associated with using distillate such as increased NOx and CO2 emissions.
- 4.90 The Oxera analysis indicated that the volume of incremental CCGT response equates to around 19GW of additional gas-fired plant by 2020/21. The estimated capital cost of installing back-up fuel capability is estimated at £3.23-£3.85 million for a 390MW unit. Hence, the costs of implementing this measure are £124 - £147 million. The costs of providing this back-up facility will initially fall on the generators but are likely to get passed onto consumers in the form of higher electricity prices.

### *Risks/Unintended consequences*

- 4.91 If new CCGTs are required to have distillate back-up capability, the costs faced by investors for the development of a CCGT station will increase. It is therefore likely that the margins in the electricity wholesale sector will have to increase to make CCGTs with back-up capabilities a viable investment. This may delay investment in CCGTs, potentially impacting on electricity security of supply. Also there might be issues of whether the increased demand for, and tankering of distillate can be met.
- 4.92 There are also possible risks to CCGTs of either tripping or failing to meet their intended load level following a decision to switch from gas to distillate or vice versa. There might also be issues associated with site suitability and

obtaining the necessary planning permission for the back-up storage and transportation.

- 4.93 Finally, knowing that at a certain price most CCGTs were able to switch to distillate, it would reduce the incentives of other market participants to invest in flexibility. If it was expected that, as soon as prices rose above a certain level, gas demand would be reduced and prices essentially capped, the expected returns from investment in gas storage or over-sized import infrastructure could be severely reduced. It is therefore possible that imposing an administered solution onto the market would increase costs but not actually increase overall security of supply.

### *Views of respondents*

- 4.94 There were a number of responses in support of further investigating this measure. However, both respondents and the analytical report questioned the feasibility of sustained high levels of distillate usage at power stations due to the constraints around filling up the distillate tanks, the environmental constraints and future changes in the electricity generation mix, which could limit the extent to which gas-fired power stations might play a role in providing gas market flexibility.
- 4.95 The analysis and responses expressed concern about mandating the introduction of distillate back-up at new CCGTs due to the potential unintended consequences for the generation sector, electricity prices and the potential for displacing investment in gas supply infrastructure, including gas storage. In addition, there is evidence that the commercial incentives exist to encourage the construction of back-up capabilities.

### *Implementation and enforcement*

- 4.96 To ensure all CCGTs have back-up capabilities installed, it could be made a necessary condition for obtaining planning permission to build a new CCGT station. Alternatively, financial incentives could be provided to firms building new CCGTs if they meet certain conditions relating to back-up fuel capabilities. The level of back-up could also be specified in these conditions. Ongoing monitoring may be required to ensure the distillate tanks are kept full when not used.

### *Impacts on competition*

- 4.97 If CCGTs have to maintain a certain amount of back-up capability, it will increase the construction and operating costs of CCGT stations, potentially

making it more economical to invest in other forms of generation, such as coal. However, this is unlikely to favour any particular firm. Similarly, this measure would not change the market structure or degree of market concentration. However, the additional costs faced by new CCGTs would lead to higher set-up costs for new entrants and potentially deter new entry.

### *Impact on small firms*

4.98 No impacts on small firms have yet been identified.

### *Conclusion*

4.99 Given the concerns raised on mandating the use of distillate back-up at CCGTs and the potential for the market to provide this flexibility independently in a more cost-effective way, Government does not propose to investigate this measure further.

## *Measure 7: Smart gas metering and increased efforts on fuel efficiency*

### *Background*

4.100 An additional way to enhance security of supply would be to effectively extend the range of consumers participating in demand-side response.

4.101 There are a number of ways of doing this. One is to look to introduce smarter, more innovative energy metering which could help both residential and commercial customers understand better their gas use and reduce how much they use or shift their consumption patterns in response to price signals, and consequently help security of supply. The improved quality of the data and the ability to see how much energy is consumed instantaneously, should lead to greater awareness and enthusiasm from the customer and encourage them to take an active role in reducing demand for gas.

### *Benefits*

4.102 No clear estimates of the potential savings that could be achieved by smart gas meters have been made – the trial currently being carried out by Ofgem<sup>14</sup> is intended to help do so. There is however a clear benefit to security of supply if smart gas meters could help consumers reduce consumption

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<sup>14</sup> <http://www.ofgem.gov.uk/Markets/RetMkts/Metrng/Smart/Documents1/12813-2006.pdf>

voluntarily in times of tight supply/demand balance and high prices. All other things equal, this should reduce the risks of involuntary interruptions.

4.103 There is also an argument to suggest that by making clear that lower costs can be achieved through reduced peak consumption, there would be a consequential reduced need for new network investment.

4.104 There are a number of key stakeholders who could benefit from the wider use of smart gas meters:

- Suppliers – avoided manual meter reading costs, elimination of estimated bills reducing call centre costs, lower costs from shifting peak loads, reduced fraud;
- Network operators – avoided costs of infrastructure investment from shifting in peak load; and
- Households – benefit by receiving better information (in bills or real time data) encouraging them to conserve more gas. Hence, better information leads to lower bills which help fuel poverty, reduced overpayments of estimated bills and easier switching between suppliers.

4.105 Energy efficiency measures contribute towards meeting Government policy objectives on reductions in carbon dioxide emissions by reducing demand for gas and help fuel poverty by enabling domestic customers to understand more about how the costs of the gas they use. Smart meters, in conjunction with the provision of energy efficiency advice, may encourage consumers to invest in further energy efficiency measures.

### *Costs*

4.106 There are significant costs in terms of the hardware and supporting communications that would fall initially on energy suppliers but which would be likely to be passed on to consumers. At present most forms of gas smart meters are expensive to both supply and operate. The more sophisticated the meter, the more expensive, although technology does exist that could meter gas use on an appliance basis.

4.107 The level of these costs and the relative benefits of different energy efficiency measures will be assessed as part of the Ofgem 18-month trial. Oxera's analysis indicated that the costs of introducing smart gas metres in the domestic sector were £2.5 to £4 billion.

### *Risks/Unintended consequences*

4.108 The extent of the benefits (in terms of reductions in gas demand) of gas smart metering is still unclear. This is one of the questions the Ofgem trial is seeking to address.

### *Views of respondents*

4.109 There was strong support among respondents for Government action to encourage the use of smart gas meters, although some respondents did question the extent to which smart gas meters could significantly increase security of supply.

### *Implementation and enforcement*

4.110 Any new measures to encourage smart gas metering should be carried out in conjunction with existing schemes and programmes encouraging similar moves.

### *Impact on competition*

4.111 If properly implemented, there is no reason to assume that the widespread use of smart gas meters would in any way distort competition. If anything, making additional information available to consumers could enhance competition.

### *Impact on small firms*

4.112 It is likely that improved energy efficiency measures and smart gas metering would have a beneficial effect on small firms, though reducing their energy procurement costs.

### *Conclusion*

4.113 Given the wide ranging support for smart metering and the environmental benefits associated with their wide-spread introduction Government will encourage the roll-out of smart gas meters by removing any potential barriers and working with suppliers, Ofgem and other interested parties in the development of this policy. In addition, following the Government consultation on billing and metering, Government intends to roll forward a package of measures that will change the way in which energy use is communicated to customers, to help them reduce their energy use.

## 5. *Overall conclusions and next steps*

- 5.1 Respondents' views on the robustness of current arrangements were mixed, with producers, suppliers, infrastructure operators and Ofgem believing that current arrangements were robust and consumers believing further action to strengthen the arrangements had merit. However, while accepting these risks, both the consultation responses and Oxera analysis highlighted that the benefits from the options considered in the consultation are uncertain, that none of the supply-side options is without downside and that they could potentially hinder rather than improve the provision of security of supply.
- 5.2 In addition, there is strong evidence, in the form of additional investment coming forward and the analytical work carried out by Oxera, to suggest that the current market and regulatory framework is providing the correct signals and incentives for the market to achieve an appropriate level of security of supply, given that the risk of a supply shortfall can never be completely eliminated. The analytical work carried out by Oxera also indicates that under the 'base case' the economic incentives do exist for the market to provide substantial additional new investment (£5.4 billion) over and above the capacity now being constructed, in the period up to 2020/21, generating a low risk that there are material supply shortfalls.
- 5.3 However, as identified by respondents, there are still actions Government can take to ensure that the current commercial and regulatory framework effectively manages the risks to gas security of supply. These actions are outlined in the 2007 Energy White Paper, and are to:
- Encourage energy efficiency and energy savings in order to reduce the use of fossil fuels and encourage energy market flexibility through the promotion of energy efficiency measures, such as the rollout of smart gas meters and the introduction of the Carbon Reduction Commitment to the non-energy intensive sector.
  - Introduce Energy Markets Outlook (EMO) in autumn 2007, which is a new security of supply information and analysis service helping to provide the information about supply and demand trends that help market participants to take decisions, including on new investments.
  - Promote open, competitive energy markets, through our international strategy, which provide fair access to energy supplies, foster investment throughout the energy supply chain and deliver diverse, reliable supplies at competitive prices.

- Support the European Commission's efforts to secure effective liberalisation of, and competition in, EU energy markets and work to secure more open and transparent energy markets elsewhere.
- Set out a comprehensive package of measures to improve the onshore Energy Planning System swiftly and, following the consultation on the Planning White Paper, establish a new consenting regime for all major energy infrastructure.
- Legislate to modernise the regulatory framework so that we have a fit for purpose planning consents regime for offshore gas storage and unloading of Liquefied Natural Gas (LNG).
- Improve the UK economy's resilience in the face of shocks to energy supplies by improving our emergency planning arrangements.

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