

Gas Security of Supply: Significant Code Review – Proposed Final Decision

A Response by Centrica

Executive Summary

We have assessed the information contained in Ofgem’s Proposed Final Decision (PFD) and Impact Assessment (IA) documents of 31 July 2012. In discussing the merits of its proposal, Ofgem states that:

“this small impact on bills [just 11 pence per retail customer per year] is more than outweighed by the security of supply benefits for consumers that... our proposed reforms will deliver.”

We conclude that the costs to retail customers of Ofgem’s proposed emergency cash out solution are far higher than those presented by Ofgem. As a result, the basis on which Ofgem presents this proposal is flawed and its conclusions are therefore not adequately supported¹. A more accurate assessment of the costs and benefits would demonstrate that Ofgem’s proposal represents very poor value for customers with high costs (at least £4.40² on the annual bill of a gas customer, equivalent to about £130m in annual costs to customers) in exchange for a trivial – and also dubious – improvement in security of supply. The net consumer welfare impact – assessed by Ofgem as a small benefit of £65m NPV – becomes in our analysis a very large detriment of the order of £1.6 bn.

If Ofgem were to proceed with this proposal, it would be failing *inter alia* in its primary statutory duty to protect gas customers³ and its duty to have regard to the principle that regulatory activities should be proportionate⁴. With the support of an economic consultant, NERA, we have identified a number of significant flaws in Ofgem’s IA including material cost impacts which are unaccounted for and show that Ofgem’s conclusions are not supported by a robust analysis, in line with best regulatory practice⁵. Our assessment of the costs and benefits forms material new evidence which should be considered by Ofgem ahead of its final decision.

¹ E.ON’s successful appeal in *E.ON UK plc v. Gas and Electricity Markets Authority (CC02/07)* was permitted *inter alia* on the basis that “the Decision did not present an adequate basis for the conclusion that the costs of reform to industry parties and to consumers will be outweighed by the benefits to consumers” (para 7.12).

² See Section 9, para. 9.5 and Table 6 for the calculation.

³ Gas Act 1986 (“GA86”), Section 4AA(1), here in relation to the prices they pay for gas

⁴ GA86, Section 4AA(5A)(a)

⁵ Under Section 4AA(5A)(b) GA86, Ofgem must have regard to the principle of following best regulatory practice.

Key customer impacts

We set out in our response an alternative (and more accurate) presentation of the Ofgem Impact Assessment, as follows:

	Ofgem ⁶	Centrica
Impact on wholesale gas costs	−£1.8m/a	+£64m/a
Shippers' risk mitigation costs	+£4m/a (DSR only)	+c.£70m/a
Retail bill impact	+11p/a	+£4.40/a
Consumer welfare impact	+£65m	−£1.6bn

Our principal concerns with Ofgem's assessment are that:

- **Ofgem's IA omits the impact on wholesale gas prices from a rise in potential future cash-out prices (and therefore expected spot prices):** The intention behind Ofgem's proposal is to set a default emergency cash-out price (of £20/therm) which is far higher than the level at which cash-out may be frozen in a Gas Deficit Emergency (GDE) under current arrangements. Raising the cash-out price that applies in a GDE in this way will have the effect of increasing the expected value (and price) of any firm forward contract. It will increase market players' exposure to major unforeseen outages of infrastructure or supply and will encourage parties to re-price the risk of force majeure in their gas contracts. This re-pricing will feed into higher NBP prices whether or not there is a GDE. This impact is not reflected in the CBA or qualitative assessment of the proposals and on the basis of our own commercial experience we estimate this to cost at least 0.25p/therm, or £64m/annum on average over the period to 2030.
- **Ofgem does not properly quantify the impact on wholesale prices in very tight markets outside a GDE:** a £20/therm emergency cash-out price will influence market expectations, the forward wholesale price curve and market behaviour when gas markets are very tight, even if there is no actual supply failure. Ofgem seem to accept this logic – since prices of £3-7/therm are needed to trigger voluntary Demand Side Response (DSR) in their analysis – but do not appear to have taken it into proper account in their assessment of wholesale gas costs.
- **The cost of supplier/shipper risk mitigation is seriously understated:** Ofgem's proposals are intended to increase the exposure of shippers to gas supply failure and Ofgem focuses principally on cash-out liabilities and DSR. There are major flaws or omissions in this part of the IA:

⁶ Average annual amounts calculated are calculated from 2012 NPV divided by 13.2, reflecting the 3.5% real discount rate used by Ofgem.

- First, it looks at cash-out exposure but does not factor in the significant exposure faced by ‘downstream’ shippers to wholesale price increases in or near a GDE under Ofgem’s proposals. Even if a shipper has physically covered its position, it is likely that some of that cover will be subject to indexation (for instance, the purchased gas may be priced off the day-ahead index). Therefore shippers will in any reasonable scenario be exposed to very high short term prices in a GDE. On the illustrative assumption that retail supply portfolios have hedged 80% of their price exposure going into a GDE, we estimate the collective wholesale price exposure at almost £4bn. Responsible shippers would need to mitigate this risk exposure, but it is never possible to achieve a perfect hedge, particularly against very rare occurrences like a GDE.
- The draft decision contains a significant underestimate of the cost of securing DSR volumes which we demonstrate is likely to be at least three times higher than Ofgem’s estimate. Moreover, Daily Metered (DM) customer DSR will not by itself provide sufficient volume to fully hedge retail cash-out and price exposures. The relevance of this is that other risk mitigation measures would also be required, for which the cost to retail gas customers is not included in the Ofgem IA.
- We have looked at various other possible mitigation measures which are likely to cost at least £3 per retail customer per annum, equivalent to c. £70m per annum across the industry. This one item alone far exceeds the headline total annual cost to retail gas customers of just 11p/customer in Ofgem’s IA.

These illustrative changes result in the stated £65m net consumer welfare benefit of these proposals becoming negative to the tune of more than £1.6bn NPV. At the same time, the annual impact on retail gas bills rises from just 11p per customer to around £4.40. This represents a burden on gas consumers of over £130m per annum, in return for little or no improvement in supply security. While our estimates are illustrative and subject to some uncertainty, our evidence demonstrates that Ofgem’s proposal is overwhelmingly negative for the customers whose interests Ofgem are under a primary duty to protect⁷.

Supply security impact

- The stated improvement in gas supply security for retail gas customers is trivial⁸ (and dubious) and the “domestic customer supply security standards” as defined in the relevant objectives of the UNC are already comfortably exceeded. In these circumstances it is reasonable to suggest that the regulatory action proposed by Ofgem is disproportionate, contrary to Ofgem’s relevant duty.⁹

⁷ GA86, Section 4AA(1)

⁸ Equivalent to just 104,00 therms/a, on average – less than 0.001% of annual Non-Daily Metered (NDM) gas demand

⁹ GA86, Section 4AA(5A)(a)

- The substantial improvement in supply security reported for larger industrial daily metered (DM) customers is more apparent than real. The Ofgem proposals effectively convert involuntary disconnection of many such customers into voluntary self-disconnection, with the latter ceasing to be accounted for as a supply failure - but less gas is supplied to this sector under Ofgem’s proposals than under current arrangements.
- The stated electricity supply security benefit is not reasonably attributable to Ofgem’s proposals. Ofgem reports a material improvement in supply security for firm electricity customers due to an assumed change in the order of load disconnection during a GDE, as between (1) large industrial gas customers and (2) higher value gas supplies into power plants that are needed “to keep the lights on”. An appropriate and proportionate response to the perceived problem would be a common sense clarification of emergency disconnection procedures – and not a £20/therm emergency cash-out burden on customers.
- Ofgem recognises the very substantial cash-out exposures that shippers could face under these proposals, but does not consider the impact which this could have on supply security through the reduction in market liquidity from large and unknown counterparty exposures. Shippers and suppliers cannot arrange a perfect hedge against such infrequent risks as a GDE, so before and during a GDE they will be exposed to a high cost of buying gas to serve their customers. This high cost risks bankrupting some suppliers, which will harm market liquidity and act as a barrier to entry for new suppliers. This liquidity impact will negatively impact competition and promote inefficiency¹⁰.
- We present data which shows that Ofgem has under-estimated the amount of I&C DSR available under current arrangements (at zero) and over-estimated the volume of I&C DSR that will be available under its proposals. Thus the draft decision overestimates the likely incremental DSR and the associated benefits resulting from this proposal. These errors of fact undermine the evidence underpinning Ofgem’s analysis.

Other IA deficiencies

- **Impact on electricity prices:** NBP gas prices at or approaching £20/therm will affect wholesale and retail power prices and this impact is not considered within the IA, again undermining Ofgem’s conclusions. Under current arrangements, we understand that Redpoint’s modelling indicates that cash-out prices in a GDE would typically be frozen at around £2/therm. On this basis, the £18/therm impact of Ofgem’s proposals on wholesale gas prices in a GDE represents an increase in wholesale electricity prices of more than £1200/MWh, as against a more normal winter electricity price level of £50-60/MWh. The Redpoint model and Ofgem’s assessment of the impact on energy consumers omit this effect entirely.
- **Value of Lost Load (VOLL):** the proposed figure of £20/therm selected by Ofgem from the London Economics (LE) report is based on a number of errors, taking into account both the

¹⁰ Under GA86, Section 4AA(5), Ofgem must carry out its functions in the manner best calculated to promote efficiency and economy on the part of *inter alia* shippers and suppliers.

LE conclusions and the high level of NDM supply security as assessed by Redpoint in the revised July 2012 analysis:

- LE's estimates of VOLL are specific to a given level of security of supply. The NDM VOLL of £20/therm corresponds to a supply security level of 1-in-20 years, but existing supply security is already much higher than that (at worst 1-in-167 years) so the household VOLL selected from LE's analysis should have been below £11/therm.
 - Second, LE converted their VOLLs into £/therm at average daily consumption rates. Given their proposed use in a GDE, LE should have used peak winter consumption rates and the resulting VOLLs would then have been less than half those reported.
 - Third, the NDM sector comprises a mixture of households, SMEs and other retail customers. LE reports a much lower VOLL for SMEs (below £1/therm) and this ought to have been reflected by Ofgem in the overall weighted-average VOLL assigned to NDM gas customers.
- **DM customer compensation:** The proposal to compensate involuntarily disconnected DM customers at £20/therm (in many cases far above the value those customers place on continued gas supply) imposes costs on NDM customers without any proper justification. Contrary to Ofgem's duties¹¹, it will promote inefficiency through distorting DM customers' behaviour when they are considering interruptible contracts, thus increasing the cost of securing DSR contracts. This means that Ofgem's proposals would not in fact deliver the predicted amounts of voluntary DSR at the gas price levels Ofgem assume.
 - **Competition and market efficiency:** Ofgem's proposals introduce an administrative price rather than a market based solution¹². This becomes a high target price which affects the credit worthiness of counterparties, thereby undermining market liquidity, and increases the risks of large smeared charges to cover exposures from shippers that have not taken sufficient mitigating actions. Both of these impacts are likely to impair the efficiency of the competitive market in the EU, which Ofgem is under a duty to promote¹³.

Qualitative assessment

We consider that it is inappropriate to rely on qualitative factors to justify the implementation of a proposal which is clearly deficient. Ofgem identified four key assessment criteria: supply security, payment for involuntary DSR services, consumer prices and competition and market efficiency. We show that the supply security benefit of Ofgem's proposals is highly uncertain and at best trivial, whilst the impact of these proposals is moderately to severely adverse on the other three criteria.

¹¹ In particular, GA86, Section 4AA(5),

¹² Ofgem's power under Section 36C of the GA86 may be exercised where Ofgem considers that a modification which is market-based decreases the likelihood of a Gas Security Emergency occurring or it may decrease the duration or severity of such an emergency.

¹³ Under S4AA(1A)(c) of the GA86, the interest of consumers include the interests in the fulfilment by Ofgem of the objectives in Article 40 of the Third Gas Directive, notably Article 40(a)

Conclusion

Our conclusion is that Ofgem would be failing in its primary statutory duty to protect customers' interests and so other relevant statutory duties and obligations if it were to implement these SCR proposals (see section 11). In addition, implementation of these proposals would not better serve the Relevant Objectives of the UNC, as compared to the current arrangements.

Content of this response

1. Introduction and outline of the response
2. Impact on supply security
3. Impact on the cost of gas
4. Impact on power prices
5. Value of Lost Load (VOLL)
6. Availability of Demand Side Response (DSR)
7. Cost of securing DSR
8. Supplier/shipper risk mitigation
9. Ofgem cost benefit analysis
10. Ofgem's Qualitative Assessment
11. Legal conclusions

Annex 1 – Confidential Annex sent under separate cover (Ofgem correspondence)

Annex 2 - Confidential Annex sent under separate cover (DSR cost example)

1. Introduction and outline of the response

- 1.1 This response provides a detailed assessment of the information contained in Ofgem's Proposed Final Decision (PFD) and Impact Assessment (IA) documents of 31 July 2012. We have added additional evidence to test the logic and fundamental basis for the outcomes which Ofgem relies upon for its conclusions.
- 1.2 We have engaged an economic consultant, NERA, and it has helped to identify a number of significant flaws in Ofgem's IA, including material cost impacts which are unaccounted for.
- 1.3 We conclude that the costs of Ofgem's proposed emergency cash out solution are far higher than those presented by Ofgem. As a result, the basis on which Ofgem presents this proposal is flawed. A more accurate assessment of the costs and benefits would demonstrate that Ofgem's proposal represents very poor value for customers, with high costs (at least £4.40 on the annual bill of a gas customer) in exchange for a trivial (and dubious) improvement in security of supply. If Ofgem were to proceed with this proposal, it would be failing in its primary statutory duty to protect customers.
- 1.4 This response focuses on an assessment of the expected costs of Ofgem's approach:
 - Impact on supply security – which we consider to be highly marginal;
 - Impact on the cost of gas – which we consider to be severely underestimated through the omission of market dynamics and modelling error;
 - Impact on power prices – which is not properly considered given the expected and acknowledged increase in gas prices during a GDE;
 - Value of Lost Load – where the analysis is insufficient and there is an inappropriate use of published values;
 - Availability and cost of DSR – where we note the inconsistencies in the pre and post proposal calculation of available DSR, and our assessment of the significantly higher cost of this service than that assumed by Ofgem; and
 - Supplier/shipper risk mitigation – where we investigate the potential mitigation tools and the indicative costs.
- 1.5 The analysis and evidence is then used to reassess Ofgem's IA which results in a significant shift in the net consumer welfare benefits of the proposal. We also make note of Ofgem's qualitative assessment.
- 1.6 We have also sought external legal views on the proposals in terms of how they relate to Ofgem's statutory duties and wider European requirements, and NERA have provided an independent economic review, focussing on the expected market behaviour in and around a GDE

1.7 Our conclusion is that Ofgem would be failing in its primary statutory duty to protect customers' interests if it were to implement these SCR proposals. In addition, implementation of these proposals would not better serve the Relevant Objectives of the UNC, as compared to the current arrangements.

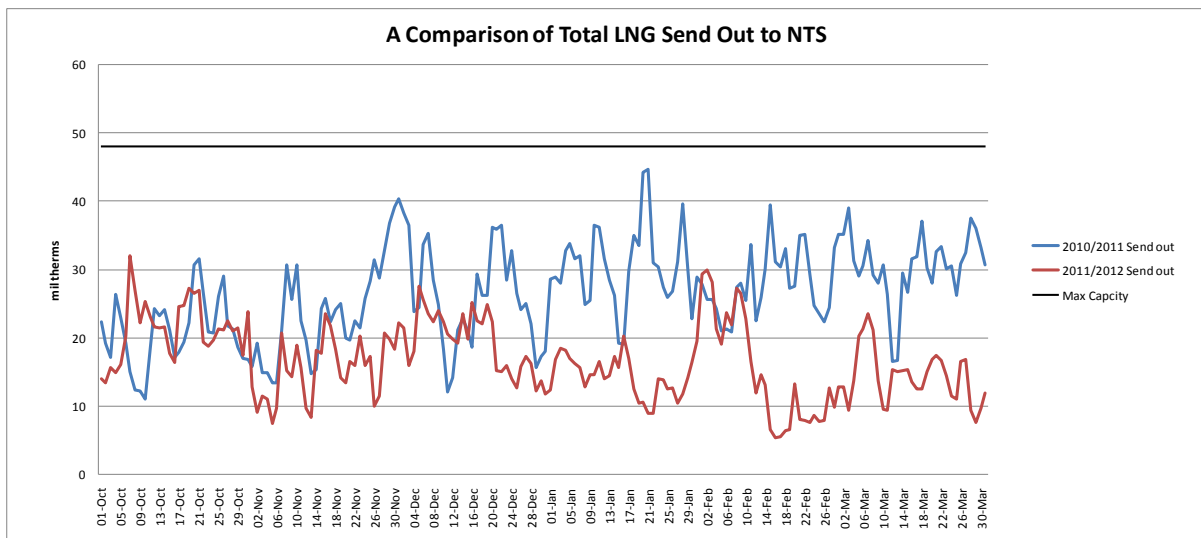
2 Impact on supply security

- 2.1 We set out below how the supply security benefits of Ofgem’s SCR proposals have been greatly exaggerated. Indeed, we believe that the likely attributable benefits are both highly uncertain, and small.
- 2.2 According to Ofgem’s analysis, the stated improvement in gas supply security for retail gas customers is extremely small and in fact the “domestic customer supply security standards” as defined in the relevant objectives of the UNC are already comfortably exceeded. The headline probability of at least one NDM sector outage (IA, page 16, table 3) remains unchanged at 1-in-167 years, whilst the forecast amount of unserved NDM energy in a GDE falls somewhat, according to Redpoint’s modelling, from c. 116 to c. 101 m therms (IA, page 17, Table 4). On an annual average basis, this is equivalent to just 104,000 therms¹⁴ p.a. – less than 0.001% of annual NDM gas demand¹⁵. We therefore question whether this trivial improvement in supply security for retail customers, of 15 m therms/a with a 1-in-167 year probability, justifies the very real costs which we estimate are attributable to Ofgem’s proposals. We will show in a later section that, by a very considerable margin, this minor benefit does not justify the substantial costs of the proposal.
- 2.3 We raised a number of concerns in response to the Ofgem consultation of 8 November 2011, around the overly pessimistic assumptions which had been used to assess the level of gas supply security under current arrangements. While some of those assumptions have now been amended, Redpoint’s updated assessment of gas supply security is still flawed. For example, we note that no account has been taken of the potential for gas held as LNG in tank at GB’s regasification terminals to contribute to total GB supply flexibility. As shown in Figure 1 below, these LNG terminals could typically deliver up to 20 m therms/day of turn-up daily gas supply flexibility in winter 2010-11, and much more in winter 2011-12. Maximum send out capacity for all three terminals is 48 m therms/day and up to 40 m therms/day have been sent out on many occasions. Significant flexibility will continue to be available as long as LNG throughput is neither very low (such that little LNG is held in tank) nor very high (near-maximum regas utilisation requiring tank stocks to be emptied on a consistent, regular basis.) As far as one can tell from the Redpoint report, neither of these scenarios is expected to pertain in future. Redpoint is wrong to disregard this significant element of supply flexibility, and in doing so has understated the current level of gas supply security. If this LNG supply flexibility is properly considered, we can conclude that the current security level is already higher than stated by Redpoint in the SCR supporting analysis.

¹⁴ Derived from the Ofgem Impact Assessment, page 16, table 2: 722,000 therms minus 618,000 therms p.a.

¹⁵ Based on 23m customers and the annual consumption figure quoted by Redpoint (page 50, footnote 47) of 16,500 MWh or 563 therms per annum

Figure 1: LNG send-out from LNG re-gasification terminals in winters 2010/11 and 2012/13



2.4 The £20/therm cash-out price proposal is not a gas supply security panacea. We refer, for example, to Figure 11 on page 45 of the Redpoint report. This is the only example we are shown of Redpoint’s modelling output. It illustrates a scenario in which a GDE is not avoided despite the £20/therm emergency cash-out price coming into effect. What is striking about this example is the fact that wholesale prices do not rise sufficiently to trigger voluntary DSR ahead of the emergency in late December 2030 – the reason being that Redpoint’s model does not allow traders to anticipate any future shortages, but only to react to past conditions¹⁶. Such modelling is bound to underestimate the ability of the market to deal with shortages under current arrangements, since it does not credit traders with any foresight. It is therefore not surprising that the only solution that Ofgem considers is to raise cash-out prices dramatically once a GDE has begun, in order to prompt some kind of response from traders. In fact, traders are highly responsive to market conditions expected in the near future, but Redpoint’s modelling – and Ofgem’s proposed solution - discounts such responses entirely.

2.5 The domestic customer supply security standards referred to in the “relevant objectives” of the UNC (Gas Transporter Licence Standard Special Condition A.11) are already comfortably exceeded, according to Ofgem’s own analysis. These standards refer to a 1-in-20 year peak day demand and a 1-in-50 peak winter. In Ofgem’s analysis of current arrangements, we note that 116m therms of unserved NDM energy over 14 days once in 167 years is equivalent to roughly 2m NDM customers being unserved¹⁷, so in fact over 90% of NDM customers would continue to be supplied in that event. If 9% of NDM customers are interrupted once every 167 years, and if interruptions are targeted randomly or in rotation,

¹⁶ The scenario (Redpoint report, page 45) exhibits a short price spike above £6/therm in early January 2031 (after the GDE), which prompts a beneficial reaction from DSR, but which comes too late to help avoid the late December GDE.

¹⁷ Assuming a cold winter daily consumption rate of 4 therms/customer, 116m therms over 14 days is around 8.3 m therms/day, equivalent to the daily gas consumption of 2.1m households

the security standard for any individual NDM customer is actually about 1-in-1850 years. In other words, the average supply security standard for NDM customers as a whole is, according to Ofgem's analysis, already far better than 1-in-167 years. This also goes to the wording of the "relevant objective" which refers to placing "reasonable economic incentives" on relevant suppliers. If the relevant standards are already far more than achieved and if (as we shall show) the cost of Ofgem's proposals is far higher than Ofgem states, there can be no case for presenting the economic incentive implied by the proposed £20/therm emergency cash-out price as reasonable, or necessary to achieve the domestic supply security standard.

2.6 A more substantial improvement in supply security is reported for larger industrial (Firm Daily Metered, or DM) customers – from a 1-in-55 year failure rate to 1-in-128 years (IA, page 16, table 3) – but this improvement is more apparent than real. The Ofgem proposals effectively convert involuntary disconnection of Firm DM customers into voluntary self-disconnection, and then cease to count the latter as a supply failure. This change of status applies to tranches 1 and 2 of Firm DM demand (Redpoint report, page 30); customers who together account for almost 75% of total Firm DM demand. Such customers are counted as "firm" under current arrangements but "interruptible" under Ofgem's proposals, so that when they choose to go without a gas supply they can no longer afford, the interruption of their supply is no longer counted as a supply failure or as an amount of unserved energy. However, whether involuntarily disconnected in a GDE, or voluntarily "self disconnected" in advance of one, the relevant customers would still go without gas. In fact, the frequency of voluntary DSR under Ofgem's proposals (understood to be around 1.8% p.a. probable for tranche 1 Firm DM customers at present, rising to 5.8% by 2030)¹⁸ rises over time and comes to exceed the probability of unserved Firm DM demand under current arrangements (1-in-55 years or 1.8% probable p.a. according to the updated Redpoint modelling). Thus the amount of gas actually supplied to DM customers under Ofgem's proposals would fall. Ofgem cannot therefore claim another unquantified (i.e. qualitative) benefit elsewhere in its justification case. Redpoint's modelling already treats any such a reduction in gas supplied as a saving in the cost of gas, so it would be wrong to assign to it a second benefit, as some kind of improvement in security of supply.

2.7 Ofgem reports a material improvement in supply security for firm electricity customers and an important part of the Ofgem benefit case for these proposals (£54m NPV as against a net consumer benefit of £65m) relates to improved electricity supply security. The stated rate of involuntary disconnection of gas-fired power generators falls from 1-in-34 years under current arrangements to 1-in-75 years under Ofgem's proposals. However, this improvement in electricity supply security cannot properly be attributed to the imposition of a cash-out price of £20/therm. If there is a perceived deficiency in the current order of load disconnection during a GDE, so that very high value gas supplies to power plants needed "to keep the lights on" would be interrupted before large industrial customers, then this is better addressed at lower cost by other administrative measures.

¹⁸ Ofgem e-mail of 17 October 2012, confirming Redpoint's analysis of voluntary DSR

2.8 We agree with Ofgem/Redpoint that gas supplies for power generators needed to maintain firm electricity supplies are even more valuable than gas supplied to industrial DM gas customers. The assumed electricity VOLLs for firm customers (Redpoint, page 30) are in the range £4-5/kWh of electricity supplied, which is in effect the value of “keeping the lights on”. This VOLL for electricity is equivalent to roughly £57-72/therm of gas supplied into a CCGT. In other words, electricity supply security is so highly valued by consumers that, when CCGTs are needed to maintain it, the VOLL for gas supplies into power stations is significantly higher than the VOLL for any other major use of gas – including supply to NDM gas customers such as households.

2.9 However, Ofgem/Redpoint go on to assume that, under current GDE arrangements, large power station loads would be disconnected ahead of smaller DM gas customers with a much lower VOLL. These rules have never been tested in practice, but it is questionable whether the SCR proposal can be justified on the basis of resolving a deficient emergency disconnection process. We note that the Secretary of State retains certain reserve powers to intervene in emergency circumstances (e.g. under the Fuel Security Code). Since a decision to cut off “pivotal” CCGTs (with a VOLL of £57-72/therm) ahead of I&C gas customers (with much lower VOLLs) would, according to Redpoint’s assumptions, be both economically irrational and seriously prejudicial to the national interest, we consider that the Secretary of State would be likely to intervene under those exceptional circumstances. It is inappropriate to utilise a UNC proposal which establishes a cash-out price of £20/therm to address a perceived issue with the order of gas disconnection in an emergency situation. Any other outcome must be justified by reference to other factors, which remain unstated and which therefore suggest that Redpoint’s analysis is incomplete. In any event, the Ofgem emergency cash-out price proposal of £20/therm is an incorrect and disproportionate regulatory response if the underlying issue is perceived to be a deficient set of emergency disconnection procedures. Whether or not Ofgem has correctly characterised the current disconnection arrangements in this respect, we can summarise by concluding that the stated benefit cannot properly be attributed to the proposed £20/therm emergency cash-out price.

2.10 Ofgem (IA, page 28, figure 2) also recognises the very substantial cash-out exposures that shippers could face under these proposals, but do not consider the impact which this could have on supply security. In total, we note that these shippers’ liabilities amount to as much as £1.0-1.5 bn in some of the model runs reported by Ofgem. We do not consider this estimate unrealistic or exaggerated. In fact the situation is likely to be much worse, as shippers would face not only cash-out liabilities but (potentially much more significant) exposure to elevated market prices on unhedged volumes, as set out in section 3 below. This risk arises because it will be very expensive to hedge the combined price risk of very cold winter weather and a major supply/infrastructure outage – yet these are precisely the circumstances which could create a material risk of a GDE. Some shippers may choose to hedge their exposures nonetheless, but others may not do so.

2.11 During 2008-9, a material cause of the slump in inter-bank lending was the inability of banks to gauge the creditworthiness of potential counterparties faced with massive but unknown liabilities deriving from “sub-prime” lending and its derivatives. Similarly, we can

envisage a situation under Ofgem’s proposals in which bilateral gas trading liquidity could “dry up” at the critical moment, either just before or during a GDE, because the counterparty exposures to £20/therm are potentially huge but unknown. By pushing gas prices up before a GDE, the £20/therm emergency cash-out price could increase the risk of a GDE when a stressed gas market is struggling to cope with a near-emergency situation (See Section three for the impact on gas prices from the proposal). Ofgem fails to consider these impacts and appears dismissive of the difficulties in finding solutions.

“We note that the risk of shippers defaulting is with the industry as a whole (through the neutrality mechanism). If industry does not think that the current credit arrangements are fit for purpose (e.g. to discourage the creation of shell companies), then industry can use existing processes that allow participants to suggest changes and Ofgem will consider these if raised. We believe that the industry is better placed to review and potentially propose changes to these arrangements.” (Ofgem IA para. 3.56)

2.12 Significant market events will have an impact on the credit and cash flow management within a business; however, Ofgem’s proposal will add more costs to this. Credit and cash implications may flow both ways depending on the net position of the shipper but would include:

- Collateral movements against margin counterparties;
- Funding of additional gas costs
- Costs of additional capital to manage changes in hedging strategies
- A potential increase in the cost of credit instruments should the overall risk of default rise

If a shipper is not able to arrange timely additional credit cover, it will be forced to cease trading with a consequential impact on the remaining shippers – and potential for a domino effect - . as it will be unclear to other shippers and traders where the various losses will fall (being (i) smearing of the emergency cash-out owed by the defaulting shipper (ii) credit losses relating to contracts between the defaulting shipper and the rest of the market and (iii) indirect losses falling on those shippers who were net purchasers from the defaulting shipper and who are thus exposed to further emergency cash-out and/or imbalance charges).

2.13 We question whether consideration has been given to the effects that these revised emergency cash-out arrangements may have on neighbouring gas markets, or indeed whether the implementation of these proposals could cause stakeholders in other markets to similarly revise their own domestic arrangements. We note in particular concerns expressed by Ofgem in November 2005, at the decision by the Spanish sectoral regulator to set cash-out prices in Spain at 150% of the higher of US and GB hub prices. This prompted Ofgem to write to the European Commission¹⁹ raising a concern that the Spanish

¹⁹ Open letter dated 25 November 2005 from Sir John Mogg to Philip Lowe, the then Director General of DG Competition

intervention might constitute a breach of EU Treaty rules. There are two primary questions which have not been adequately addressed in relation to the current SCR decision: first, whether this proposal may also infringe EU rules, and second, whether these proposals could encourage revisions to arrangement in other markets which, overall, could be harmful to GB supply security interests? The potential adverse impact of provoking such “regulatory retaliation” in other markets does not appear to have been considered by Ofgem.

- 2.14 Finally, Ofgem’s refusal to adopt measures to cap the extent to which liabilities could be socialised amongst shippers who have behaved as a reasonable and prudent operator, introduces adverse selection and moral hazard risks into the market. Larger more established operators are likely to be in a stronger position to assess the scale of risks, the probability with which they might occur, and have greater access to risk management tools than smaller or less established players. The position of these larger players within the fabric of “GB plc” and the degree of regulatory and political scrutiny they face also suggests that these same players are more likely to take action to mitigate their direct exposure to financial loss.
- 2.15 Shippers who underestimate the risk of a GDE and who take no steps to mitigate it (and therefore detract from supply security) will be able to offer lower prices to customers. Far from being beneficial, these low price offers will distort competition, because high cash-out liabilities may drive these suppliers into bankruptcy when a GDE occurs, leaving other shippers to pick up the true cost of serving their customers (through the “socialisation” of the resulting liabilities). Thus, the proposals will set up the market in a way that ensures it will fail. Inefficient choices dominate the market, because consumers are fooled into choosing those suppliers who under-price risk.²⁰
- 2.16 Indeed, moral hazard risks emerge where rather than incurring a high cost to mitigate GDEs, shippers may even accept the risk of bankruptcy due to the £20/therm charge for gas supplies in excess of contractual commitments during a GDE - although we do not believe that this strategy would be available to large companies with reputations to preserve in other, related businesses.
- 2.17 Overall, we do not consider that the supply security benefits from the proposal are significant. Further, other impacts including credit, market liquidity and the behaviour of some shippers may act against efficient market outcomes to the detriment of supply security.

²⁰ This assumes that consumers cannot foresee the bankruptcy or do not anticipate suffering when it arises. Such consumer perceptions are quite feasible. The recent banking crisis exposed some cases in which customers accepted higher interest rates without considering the risks (e.g. Icelandic banks). Banks also seem to have underpriced risks (as they did with default risk part of subprime mortgages), so that they were able to take business from insurance companies. The subsequent bail-outs will have created a perception that the UK government will intervene to spread (“socialise”) the impact of major risks and that consumers have little or nothing to lose from selecting the cheapest offer. That problem is also present in the socialisation of liabilities in the event of a gas supplier going bankrupt.

3. Impact on the cost of gas

3.1 The Ofgem/Redpoint analysis of wholesale gas price impacts likely to result from Ofgem's SCR proposals reaches the conclusion that, when the emergency cash-out price is raised to the very high level of £20/therm, the total cost of gas to the GB market falls – albeit by the very modest amount of £23m NPV or around £2m/a (undiscounted) over the period to 2030. As we show below, this conclusion is not only highly counter-intuitive; it is also wrong. The underlying gas market analysis is flawed or deficient in several important respects:

- First, it fails to appreciate that the £20/therm cash-out price in a GDE will influence prices on the whole of *the NBP prompt market during a GDE* – and not just the price of a relatively small volume of incremental gas supplies attracted into the GB market by that exceptional high price level.
- Second, it fails to take into account the fact – inherent in the logic of Ofgem's proposals and acknowledged by them in correspondence earlier this year - that "FM" (physical supply failure) risk would be re-priced by the market if the emergency cash-out price were £20/therm. In turn, the higher cost of losing a physical source would be passed through into the general level of *NBP forward contract prices*.
- Third, it does not appear to factor in sufficiently the impact of a £20/therm emergency cash-out prices on the *NBP prompt market at times outside a GDE*, but sufficiently close to it that the risk of a GDE is perceived to be materially greater than zero. Ofgem recognise the effect in its IA – but without considering the costs.

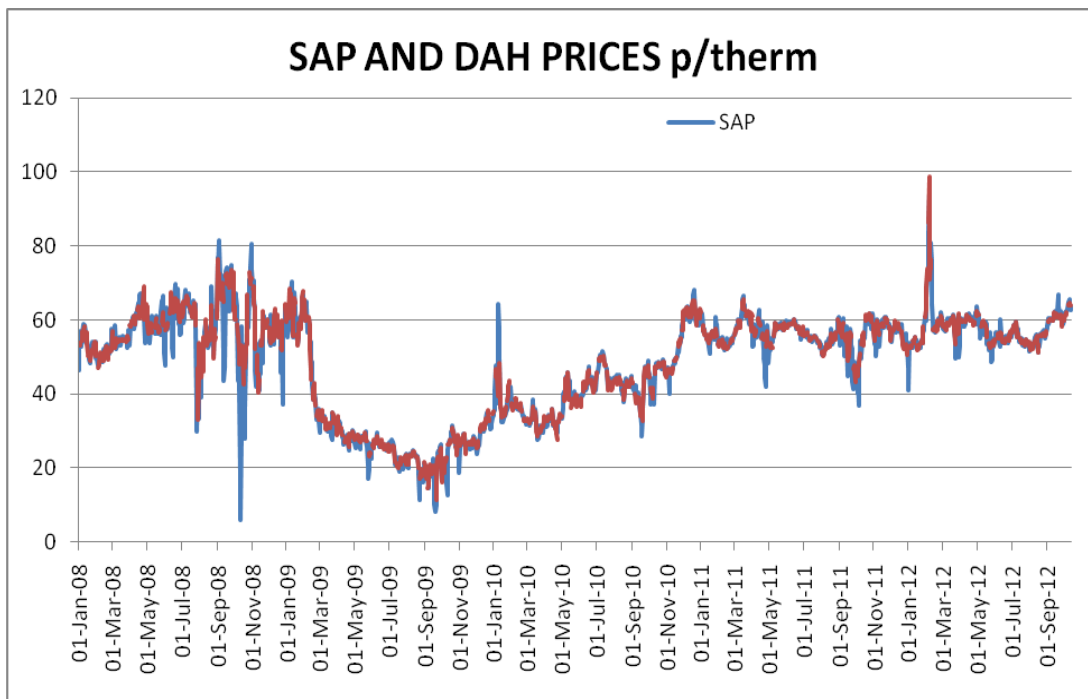
"In reality, we expect cash-out reform to be more effective at reducing the likelihood and impact of emergencies than predicted by the modelling, as the model does not account for expectations of rising gas prices. We would expect prices to rise to higher levels under cash-out reform compared to current arrangements before any firm customers are interrupted. This is because there would be an expectation that prices would potentially rise to VoLL; in particular in slowly developing emergencies. We anticipate that this would attract additional available supplies of gas into GB which could be sufficient to allow supplies to firm customers to be maintained" (Ofgem IA, para 3.14)

3.2 **Price impact within a GDE:** The first of these three flaws arises from the statement (Redpoint report, page 49) that: "...in periods when the cash-out price is allowed to rise to VoLL and extra gas is imported into GB as a result, the costs of the *extra imported gas* is reflected in the total cost of gas line as the *quantity of extra gas imported* times the cash-out price" [*our emphasis*]. In fact, this effect is only a small part of the total impact of allowing the cash-out price (and with it the wholesale gas price for prompt trades at the NBP) to rise to £20/therm – a point acknowledged by Ofgem:

"we consider that long shippers in particular should benefit greatly from the reforms by potentially being able to sell excess gas at a price close to £20 per therm and therefore we would expect cash-out reform to greatly incentivise increasing supplies." (Ofgem IA para 3.66)

3.3 We have calculated the statistical correlation on weekdays between daily SAP (a proxy for balancing market prices) and day-ahead (DAH) wholesale gas market prices over the whole period since January 2008 and unsurprisingly it is extremely high, at 98%. This is also shown in the Figure 2, below. In short, when emergency cash-out prices are set to £20/therm under Ofgem’s proposals, it is extremely likely that prompt wholesale gas prices will also be at or around £20/therm, throughout the duration of the GDE. Thus Ofgem’s Impact Assessment should also have included the effect of a £20/therm wholesale gas price on the cost of all unhedged gas supplies during the period of the relevant GDEs.

Figure 2: Correlation between SAP and day ahead prices



3.4 A straightforward numerical example based on a 14 day NDM outage under Ofgem’s SCR proposals (option 2) serves to illustrate this important point. As a GDE is much more likely during peak winter we assume that NDM demand is 140% of seasonal normal demand. We have simply added back in the extra cost of existing gas supplies at £20/therm, assuming that a supplier would hedge his seasonal normal demand ahead of delivery and could purchase a further 50% of the peak demand ahead of a GDE being priced into the market, leaving 20% of demand, to be price exposed ^[2] as shown in the table below:

^[2] We assume here that 80% of gas supplies in a GDE would be covered by prior arrangements that prevent their price from rising. This cannot be true in the long run, of course, as all expiring contracts will be replaced by new contracts that take into consideration the higher value of firm gas. The results in this table therefore show the lower end of the potential impact over the period to 2030.

Table 1: Calculation of gas costs in a GDE under Ofgem’s SCR proposal

Impact of 14 day NDM outage (based on Redpoint)	
[1] Normal peak winter NDM demand (estimated as 23m NDM customers at 4 therms/day over 14 days)	1288 m therms
[2] Unserved NDM energy over 14 days (from Ofgem IA, Table 3)	c.0.618m x 167 = 101 m therms
[3] Energy supplied to other NDM customers (= [1]-[2])	1187 m therms
[4] Additional gas imports included in Redpoint analysis (estimate)	90 m therms
[5] Other gas supplied to NDM customers (= [3]-[4])	1097 m therms
Wholesale gas cost impact of SCR proposals in the event of a 14 day GDE	
	Impact (£m)
[6] Extra cost of existing retail gas supplies (before considering hedging) = [5] x £18/th	+ 19,746
[7] Extra cost of existing retail gas supplies (assuming that 80% is hedged) (= [6]*0.2)	+ 3,949

3.5 Redpoint’s detailed assumptions are not stated, but we believe that extra gas supplies during a GDE of c. 90 m therms would be broadly consistent with its analysis, i.e. just over 6.4 m therms per day of extra gas, at £20/therm, over the 14 day duration of the outage. The impact of Ofgem’s proposals on the (unhedged) wholesale cost of gas in a GDE is thus understated by £19.7 bn, calculated from the volume of 1,097 m therms (1,187 m minus 90 m) multiplied by £18/therm, i.e. the cash-out price of £20/therm minus a price of £2/therm, which we understand reflects the modelled price at which cash-out would typically be frozen under current arrangements.

3.6 At the time of a GDE, much of the gas supplied to retail customers will have been hedged (bought at fixed prices) before the £20/therm began to influence the NBP market. However, ‘downstream’ shippers would not typically fully hedge the extreme combination of very cold weather and a major gas supply/infrastructure outage which would give rise to a GDE. This is largely because if such combination of events did not arise, they would be considerably “over-hedged”

against normal demand levels – and thus face a consistent loss from selling fixed price gas into a prompt market which is generally priced below the cost of the hedge. We therefore assume, for illustrative purposes in the table above, that retail gas supplies are 80% price hedged going into the GDE. Once we allow for a plausible unhedged supply element of 20%, this would require the pass through into retail prices of almost £4 bn at the time of a GDE. In addition the increase in prompt wholesale gas prices would most likely drive up the forward curve and thus also the cost of gas for delivery to end consumers in subsequent periods.

3.7 The impact of correcting for this critically important error in the Ofgem IA is highly significant. It demonstrates clearly that there is not only a cash-out exposure from Ofgem’s proposals, but also a very major price exposure which Ofgem does not consider. In section 8 below, we therefore consider a scenario in which downstream shippers hedge these exposures through a combination of DSR and other mitigation measures. Such measures will carry a material cost. The key point is this: whether exposures are in fact fully or only partly hedged, there will be a significant extra cost passed through to end customers as a result of the SCR proposals which is not factored into the Ofgem IA.

3.8 **Re-pricing of “force majeure risk”:** One of the principal intentions behind Ofgem’s £20/therm emergency cash-out proposal is to increase, very substantially, the risk to shippers of being “short gas” in the balancing market when a GDE is declared, or when one is perceived to be imminent. Ofgem acknowledge the risk in its IA, but do not include the costs noting:

“We believe that the market can price in any transferred risks created by the Gas SCR. If the risk of being out of balance is with the buyer of gas in the case of physical contracting but with the seller in the case of NBP trade agreements, then economic rationale would suggest that the cost of buying at the NBP should rise relative to the cost of buying gas through physical contracts. This is because sellers at the NBP would want to receive a “risk premium” and buyers should be willing to pay a premium because they shift the risks to the seller.” (Ofgem IA para. 3.70)

In Redpoint modelling terms, we understand that (as mentioned above) the cash-out price under current arrangements is expected to be frozen at about £2/therm, so on that basis short shippers would be cashed out under Ofgem’s proposals at around ten times the emergency cash-out price under current arrangements.

3.9 We believe that this may somewhat over-state the likely price difference, but in any event it is common ground that the market would not have expected cash-out prices to rise to £20/therm, or anything like it, under current arrangements. In winter 2005/6, probably the only recent occasion when the probability of involuntary DM customer disconnection was materially above zero, the highest level of OCM wholesale gas prices was £2.59/therm within-day on 13 March 2006, the date of the first ever Gas Balancing Alert (GBA). On the day ahead market, NBP prices have never exceeded c. £1.80/therm, which also helps to put the £20/therm proposal in perspective. (Based on the CPI, these March 2006 out-turn prices of £2.59 and £1.80 are equivalent to around £3.15 and £2.20 respectively, at July 2012 prices.) One could conclude from this that, if continued cold weather in March 2006 had led to a GDE and involuntary disconnections, the cash-out price would

have been frozen at a price above £3/therm – higher than Redpoint’s modelling suggests, but still well below £20/therm.

3.10 Under Ofgem’s £20/therm default cash-out proposals, short shippers would be forced to cash out at much more “punitive” price level than before. This additional exposure will lead market players to re-price the risk of “FM” interruptions of physical gas supply. Contracting parties who take such risks (often producers, but sometimes also buyers like Centrica under longer term gas contracts) will logically re-price this risk in the light of Ofgem’s proposals. As Ofgem have recognised in correspondence earlier this year (see Confidential Annex 1), this increased “FM” risk premium would feed through into somewhat higher NBP prices, whether or not there is actually any GDE. This is one of the important points which we and others have previously drawn to Ofgem’s attention, but which is not reflected in their CBA or qualitative assessment of their proposals.

3.11 We have significant experience of contracting bilaterally to purchase wholesale gas, whether delivered to the NBP, the Beach, upstream in the North Sea or LNG delivered ex-ship. As a result, we appreciate that the more latitude around firm physical delivery that we provide to the seller, the more discount we can typically expect to receive on the delivered price. Similarly, the “firmer” the supply arrangements are, the less discount we expect to receive. Under some supply contracts, the seller will insist on having the contractual right not to physically deliver gas as a result of an FM event. Therefore, under these contracts we as the buyer take the risk of non-delivery where the seller claims FM – in other words we will need to make up the resulting gas shortage ourselves, at our own cost. However, other contracts may not contain any relief for the seller. Such contracts would be fully firm, and where the seller was unable to deliver the physical gas as contracted, they would have to keep the contractual obligation whole by buying the equivalent volume from elsewhere and passing the title to that gas, to us. We would expect to pay more for gas contracted under these arrangements. Gas sold at the National Balancing Point (NBP) under standard NBP 97 terms and conditions is fully firm i.e. the seller cannot claim FM under any circumstances.

3.12 Based on our experience of contracts under the existing regime where Seller’s operational FM risk is passed to the Buyer, we might expect that a proper analysis would price the risk in excess of 1p/therm. Even if using a conservative estimate of 0.25p / therm on NBP prices is equivalent to an impact of around £64 million per annum across the UK gas market as a whole (based on average annual GB gas demand in a “Gone Green” scenario of a little under 26 bn therms). The important point here is that this re-pricing of “FM” risk, based on market parties’ expectations of their possible outage exposures, will feed through into the prices of forward contracts for wholesale gas under Ofgem’s proposals, irrespective of whether or not a GDE actually arises.

3.13 **Impact on forward prices outside a GDE:** Ofgem and Redpoint recognise that, where firm customers are involuntarily disconnected, wholesale gas prices at the NBP will rise to the default cash-out price level of £20/therm. Indeed, this is an important part of the benefit case. It is assumed (Redpoint report, page 30) that 27 mcm/d of DSR is available from DM I&C customers in two tranches, with VOLLs of £3.18/therm and £6.68/therm respectively. Under Ofgem’s proposals (and as noted in its IA), it is simply a matter of logic that wholesale gas prices would need to rise to those levels in order to bring forward voluntary DSR from those customer groups.

“We have argued above that we would expect prices to rise to higher levels under cash-out reform compared to current arrangements before any firm customers are interrupted. Cash-out reform is likely to have a greater impact in such circumstances in particular if this helps to attract additional available supplies of gas into GB which could be sufficient to allow supplies to firm customers to be maintained. However, it should be noted that this would also come with higher costs of gas for consumers.” (Ofgem IA, para.3.43

3.14 By definition, therefore, voluntary DSR must arise before a gas deficit emergency (GDE); it is therefore clear that wholesale gas prices of at least £3.18/therm and potentially above £6.68/therm must arise outside a GDE under the Redpoint analysis of Ofgem’s proposals. An example of this can be seen in Redpoint’s Figure 11 (page 45 of their report), which shows a short-lived price spike of over £6/therm at 2012 prices in winter 2030/31, a wholesale gas price level which has not actually been tested in practice. In that scenario, the wholesale price spike helps to trigger significant DSR and avert a GDE which might otherwise have occurred in early January 2031.

3.15 However, Redpoint’s cost benefit analysis and Ofgem’s Impact Assessment take no account of the rising cost of gas supplied, through the effect on spot prices outside an emergency. This is partly because the Redpoint model does not incorporate any forward looking expectations or market-clearing arbitrage via storage. The critical factor which is ignored by Ofgem/Redpoint when reaching this conclusion is that very tight wholesale gas markets will factor in the value of VOLL, adjusted for the Loss of Load Probability (LoLP) as demonstrated below.

3.16 Suppose that, shortly before a GDE is actually declared, the perceived LoLP is 50%. Hence market players perceive a significant risk, but not yet a certainty, that a supply failure is imminent. In such circumstances, any player which has the ability to deliver additional gas to the UK market but has discretion over when to deliver it is clearly going to weigh up the possibility of earning £20/therm once involuntary disconnection kicks in against the certainty of earning a lower amount from immediate delivery of that gas. Unless today’s spot price is worth as much (probability-weighted) as tomorrow’s GDE cash-out price, traders in a competitive market will hold back their gas and today’s spot price will rise. If the perceived LoLP is 50% and VOLL is £20/therm, then it follows that the competitive, market-clearing spot price on the NBP is likely to rise to around £10/therm on that day. The same logic will apply in previous periods, as soon as the perceived LoLP is materially above zero – so a perceived LoLP of 15% would lead to an NBP price of around £3/therm and so on. Redpoint’s model does not permit this forward-looking pricing of gas, so it does not allow for prices to rise before a potential GDE. As a result, in the period before a potential GDE, the model forecasts too little DSR, overstates demand, and exaggerates the potential for a shortage to occur in the days that follow. It is no wonder that Redpoint – and Ofgem – then put so much emphasis on the beneficial effect of raising prices *during a GDE*, as in the model that is the only price signal to which traders react, unlike in reality

3.17 Using our own in-house economic model of the UK gas market (*“Centrica UK Gas Market Model”*), we have sought to quantify this wholesale price impact in a more systematic manner, based on an illustrative but plausible scenario of market stress which assumes a 5-day full outage of the Kollsnes gas processing facility in Norway during the course of a December which is 1-in-20 cold. Our economic model is a Monte Carlo simulation platform that considers UK gas demand and supply

in a stochastic manner. This allows us to quantify the probability of events where supply cannot meet demand, i.e. the probability of system failure (“PrF”).

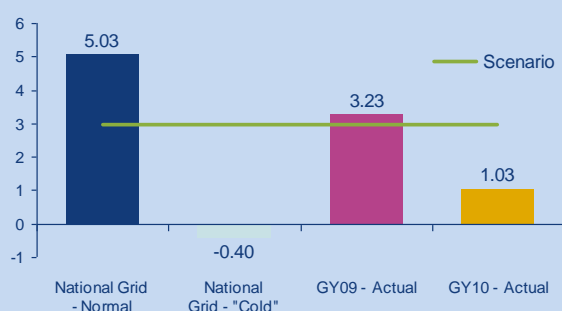
3.18 Under normal conditions the PrF in the UK market is vanishingly small. However, the PrF is not stable across a given year and will change depending on various factors, particularly weather and infrastructure reliability. When the PrF increases (even to levels that are still relatively small), the risk premium can increase significantly in absolute terms, depending on the cost of load loss perceived by market players. This is what we tried to quantify with our in-house model. *Box 1* and *Box 2* below describe the exercise in detail.

Box 1: A plausible tight gas market scenario where probability of system failure is higher than normal but still low

- A 1 in 20 cold average December increases end-user demand by c. 28 Mcm/d vs seasonal normal
 - Volume impact is 33 Mcm/d below the National Grid “Cold” forecast for Dec-11*
 - On average temperatures are 2°C above those observed in Dec-10 (and similar to those seen in Dec-09)
- Cold weather assumed to be correlated across NW Europe, limiting IUK import capacity (c.30 Mcm/d capacity lost). As evidenced in Feb-12, correlated cold weather can restrict gas supply via the IUK/BBL and localised supply constraints in Continental Europe come into play
- Furthermore, a 5-day unplanned outage to Kollsnes is also considered. This particular facility is selected as it has frequently failed in winter months:
 - Between Jan 1 2011 and May 22 2012, Kollsnes unexpectedly failed 12 times
 - This puts its failure incidence at 12/508 days = 2.4%
 - However, if we focus on months of Dec and Jan, this rate increases to 10/93 days = 10.8% in a December or January month
- Correlated sequence of events described above would limit the ability of LNG to respond promptly to price signals
- In this scenario our stochastic market model still estimates a very low likelihood (c15%) of failure where demand for gas is not met

Box 2: Further Details on our tight gas market scenario

Average December Temperatures (CWV °C)*



Examples of Kollsnes failures in 2011**

Start Date	Duration (Days)	Incident Description	Volume impact (Mcm, est.)
20 th Jan 2011	4	Power failure	188
25 th Oct 2011	1	Unspecified	28
1 st Dec 2011	1	Power supply issue	32
8 th Dec 2011	1	Unspecified	45
12 th Dec 2011	1	Unspecified	31
25 th Dec 2011	2	Weather (storm)	73

*Source: National Grid. National Grid cold/warm curves are 1 in 20 weekly values. Published July 2011

**Source: Estimated from various news sources & Gassco announcements

3.19 After establishing these fundamental assumptions we then tested the market prices under a gas cash-out price of £20/th vs £3/th. The latter is a proxy for what market may perceive as the likely price level in extremely tight market conditions, under current arrangements. (This is a somewhat higher, and in our view somewhat more realistic, than the £2/therm indicated by Redpoint's modelling.) We have derived this proxy by rounding the highest ever observed OCM within-day wholesale price of £2.55/th on 13 March 2006, reported by Platts and Heren, to the next higher integer value of 3. Following the economic logic outlined in the section above, we would expect the stochastic model to calculate the probability weighted cost of these price levels and reflect it within the average (mean) market price level. The following charts show the results of this impact on both daily and monthly prices.

Figure 3: Illustrative impact of a £20/therm default emergency cash-out on NBP monthly prices (p/therm) in tight gas markets outside a GDE

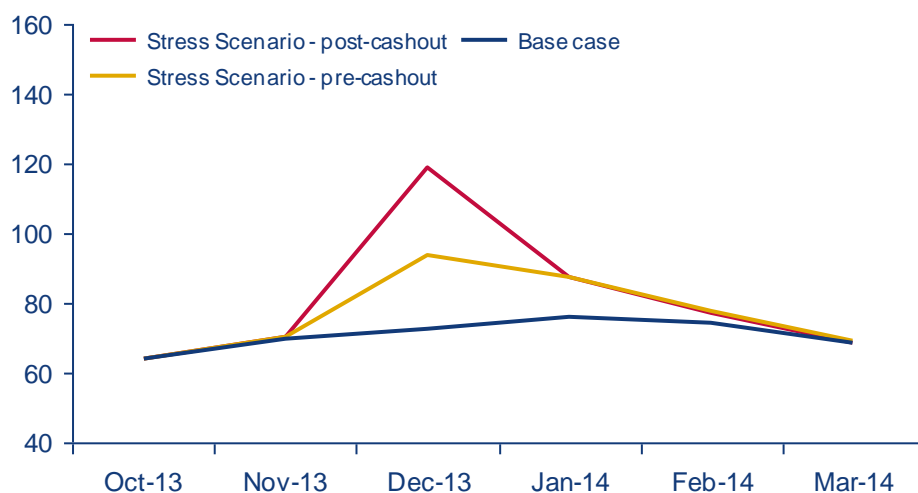
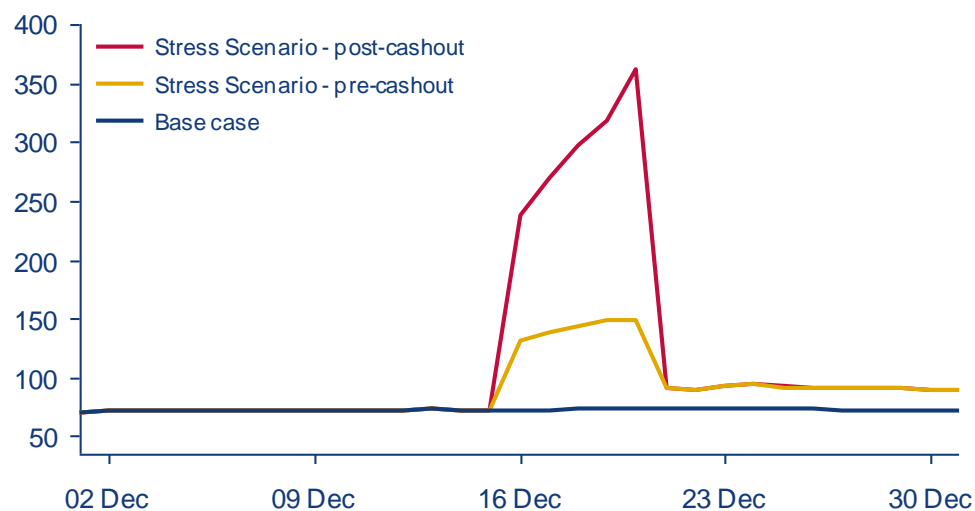


Figure 4: Illustrative impact of a £20/therm default emergency cash-out on NBP daily prices (p/therm) in tight gas markets outside a GDE



3.20 As this analysis illustrates, the £20/therm default emergency cash-out – which is considerably in excess of an economically efficient level of cash-out prices which market players may otherwise have expected – will lead to significantly higher wholesale gas prices in the NBP spot market, even if there is in fact no GDE and the likelihood of reaching a GDE-like situation remains moderate.

3.21 When first looking at monthly modelled prices, we observe for the mean price post-£20/th cash-out scenario increases from c.70p/therm in November 2013 to 119p/therm in December, an uplift of 48p/therm over the monthly prices. The post-cashout scenario then aligns back to Base Case prices three months later, March 2014, to c.69p/therm. This compares to an increase from c.70p/th in November 2013 to c94p/th in December under the Stress Scenario without a £20/th

cash-out price. Importantly, we see a slow progression back to the Base Case prices as a result of spillover effects due to various factors including *inter alia* contract pricing linkages to hub prices with lags, storage utilisation and fill/refill dynamics, which we model.

3.22 When drilling down to when the market may actually move towards failure and examining the daily modelled prices, we observe that without a £20/therm cash-out price, daily prices could be expected to reach c.141p/therm. When introducing the £20/therm cash-out price, the highest daily observed price is 362p/therm. So a £20/therm cash-out price has added a wholesale price premium of the order of £2/therm from the pre-cash-out scenario.

3.23 Besides the gas price increase, the impact of a £20/therm emergency cash-out price would also feed into power prices which we modelled separately using our in-house UK Power Market Model. Our modelling results show that without a £20/therm cash-out price Dec-13 power would rise by c.£14/MWh, but with a £20/th cash-out price this increase is doubled to c.£28/MWh.

3.24 Finally, it is important to note that what we may actually observe if such a scenario was to occur is that market participants may seek to cover their exposure to cash-out, by holding gas back for longer in times of system tightness, which could worsen supply security and ratchet prices up even more dramatically.

3.25 We also understand that the use of voluntary I&C DSR within the Redpoint model is triggered on an increasing scale over time, between 2012 and 2030. This is perhaps not surprising, in view of (inter alia) the considerable further decline in UKCS gas supplies over the same period. We are grateful to them and Ofgem for providing the information that:

- Tranche 1 DSR (with an assumed VOLL of £3.18/therm) is called upon with a probability that rises from 1.8% to 5.3% (equivalent to more than 1-in-20 years by the end of the period); and
- Tranche 2 (with VOLL of £6.68/therm) is used less frequently, from 1.4% of runs in the earlier years to 2.2% at the end of the period.

3.26 This is a useful indicator of the extent to which wholesale prices are likely to be pulled upwards by the £20/therm emergency cash-out price since, at the point when tranche 2 DSR is triggered, the probability of a GDE in the near future would presumably be materially greater than zero but no additional DSR would be available above this price.

3.27 Our overall analysis of the likely adverse impact which an extreme default cash-out price would have on wholesale gas prices is by no means unprecedented. A similar conclusion was reached by Oxera on behalf of DTI in May 2007 (“An assessment of the potential measures to improve gas security of supply”).²¹ Oxera considered an illustrative increase in cash-out prices from £5/therm to £30/therm and concluded (on summary page x of their report) that this would impose an aggregate NPV welfare burden on the GB economy of over £4 bn, with much of this accounted for by additional producer revenue going overseas as higher payments for gas imports. In contrast, we

²¹ www.berr.gov.uk/files/file38980.pdf

understand, Redpoint's modelling assumes explicitly that the current proposals will not change the cost of gas imports. We consider it surprising (to say the least) that Redpoint should adopt such an assumption – and that Ofgem could come to such very different conclusions from Oxera. Ofgem does not appear to have reviewed or considered this analysis, which was carried out for Government just 5 years ago.

3.28 In summary, we believe that there are serious flaws in Ofgem's assessment of the likely impact of its proposals on wholesale gas prices, to which all consumers are ultimately exposed. Once these costs are modelled and factored in to the IA, as we have attempted to do, the overall outcome is heavily negative for consumers. Implementing this proposal, therefore, would amount to a failure by Ofgem to meet its statutory duties to protect consumers' interests.

4. Impact on power prices

4.1 In the previous section, we pointed out that a default emergency cash-out price of £20/therm during a GDE will feed through into the entire wholesale gas market at the NBP. In turn, this will have a significant knock-on effect on wholesale and retail electricity prices which Ofgem's IA does not even consider.

4.2 We understand that Redpoint's modelling indicates that cash-out prices in a GDE would typically be frozen at around £2/therm under current arrangements. On this basis, the £18/therm impact of Ofgem's proposals on wholesale gas prices in a GDE represents an increase in wholesale electricity prices of more than £1200/MWh, as against a more normal winter electricity price level of £50-60/MWh. Even if the Redpoint figure of £2/therm is an under-estimate, as we believe it may be, this highlights a major impact of Ofgem's proposals on consumer welfare which the IA does not even consider. (We note that firm electricity demand would be essentially unchanged in the face of this exceptional price spike, as the electricity VOLL for the relevant consumers is even higher, at £4,000-5,000/MWh)²².

4.3 Even if a large part of this wholesale power price increase were, in the short term, hedged by retail electricity suppliers, it would feed through to larger electricity users facing wholesale market prices directly. There would also most likely be an impact on the wholesale electricity forward curve, for trades in future periods, so that sooner or later retail electricity customers would feel the adverse effects of this massive (potential) spike in wholesale power prices.

4.4 Since the improvement in electricity supply security as stated in Ofgem's IA could be achieved at much lower cost just by reordering disconnections and without a £20/therm emergency cash-out price (see section 2 above), we can only conclude that Ofgem's proposals would represent a very raw deal for electricity customers, as well as for gas customers.

²² Page 30 of the Redpoint document: *Gas security of supply Significant Code Review: Economic modelling for Ofgem's proposed final decision*.

5. Value of Lost Load (VOLL)

5.1 Ofgem have adopted the incorrect Value of Lost Load for NDM customers (based on the analysis of their own consultants, London Economics) and have applied it in the wrong way in its proposals.

5.2 The London Economics (LE) analysis²³ (e.g. table 12 on page 27 of their report) clearly shows that the NDM customer VOLL varies in relation to current supply security – in other words, the reported household customer VOLL is much lower when the probability of failure is 1-in-50 years, rather than 1-in-20 or 1-in-5. As table 1 on page vi of the LE report makes clear, the £20/therm estimate from their preferred WTA (“willingness-to-accept”) methodology corresponds to an expected failure rate of 1-in-20 years. However, Redpoint’s latest estimated risk of failure for NDM customers under current arrangements is actually far better than 1-in-167 years on average and on this basis one can infer from LE’s analysis (table 12) that the relevant household VOLL must lie well below £11/therm. The current proposals are therefore based on selective use of consultants’ reports which creates a mis-match between (1) the security standards that Ofgem used to derive VOLL and (2) the security standards that Ofgem expects to apply.

5.3 We note that LE have converted the respondents’ WTA into £/therm using average daily consumption rates. Given that the VOLLs are used to derive an emergency cash-out price (and that a GDE is most likely to arise in a period of severe cold winter gas demands, LE should in fact have used peak daily consumption rates and the resulting VOLLs in £/therm should this have been less than half those set out in their report

5.4 Estimates of VoLL have been produced for a number of markets in a number of countries around the world, and inevitably uncover contradictory values. We would however, highlight a Centre for European Policy Studies (CEPS) report²⁴ which concludes that UK domestic consumers would consider a three day sudden loss of supply at £22/*annum* – equivalent to a little less than £2/therm at peak winter consumption rates.²⁵

5.5 Redpoint state on page 30 of their report: “These categories [households and SMEs] are amalgamated as it is likely to be impossible to distinguish between them for the purposes of cutting off tranches of demand.” In fact, SMEs account for a significant proportion of total NDM gas consumption and cannot be distinguished from households when interrupting NDM load. The cost of interrupting NDM load is therefore a (weighted) average of the VOLL for households and the VOLL for SMEs. LE (table 1, page vi) estimate the VOLL for SME customers at less than £1/therm, so the average cost of NDM interruptions is considerably lower than the VOLL for households (which is itself lower than £10/therm – see above). Ofgem has ignored Redpoint’s observation, the nature of NDM interruptions and the VOLLs estimated by LE for SME customers, when proposing a default emergency cash-out price of £20/therm.

²³ <http://www.ofgem.gov.uk/Pages/MoreInformation.aspx?docid=46&refer=Markets/WhlMkts/CompanEff/GasSCR>

²⁴ <http://www.ceps.eu/book/consumer-valuation-energy-supply-security-analysis-survey-results-three-eu-countries>

²⁵ £22/*annum* divided by annual outages of 3 days x 4 therms/peak day.

5.6 Not only has Ofgem selected the wrong default cash-out price on the basis of LE's analysis, but it proposes to apply this in a way that lacks economic logic or coherence. This is because the proposal ignores any concept of the Loss of Load Probability (LoLP), a well recognised concept in energy sector analysis. At the point at which the first DM customer is interrupted in a GDE, the probability of an NDM customer suffering a loss of load would generally be well below 1. It is therefore quite wrong – and economically inefficient – for Ofgem to propose that the default cash-out price should be set immediately at the level of VOLL for an NDM consumer, which fails to take that LoLP into account. The efficient price in these conditions would be the VOLL of a DM customer *or* the VOLL of an NDM customer scaled down by an estimate of LoLP. Setting the cash-out price higher than this level will encourage inefficient interruption of customers who value gas more highly than the DM VOLL, but lower than the NDM VOLL. By inducing these customers to give up valuable opportunities to use gas unnecessarily, Ofgem's proposal will reduce social welfare and harm consumer interests.

5.7 For illustrative purposes, an overall NDM VOLL of (say) £5/therm combined with a NDM LoLP of 50% would indicate an economically efficient cash-out price of £2.50/therm at the point the first DM customer is disconnected. Ofgem has not sought to make such an assessment of the appropriate cash-out price for different circumstances. Instead, the draft decision argues – without supporting evidence – that most DM customer load will never be shed involuntarily, because the relevant DM customers (in Redpoint's tranche 1 or tranche 2) will negotiate DSR contracts and be voluntarily interrupted instead. As we discuss in section 6 below, such an assumption is unwarranted.

5.8 Redpoint concludes that a £20/therm default cash-out price is more beneficial than a default cash-out price of £280/therm²⁶. By the same token, Ofgem's statutory duty to protect consumers' interests requires that it considers whether a lower, economically more efficient cash-out price, among other options, would have a higher welfare benefit than the selected figure of £20/therm. If, as Redpoint assumes, the last tranche of available non-power DSR is triggered at a price below £7/therm, it seems highly likely that the same or similar supply security benefits could be achieved at a much lower cost to consumers and a much lower risk to gas shippers. No thinking appears to have been devoted to this possibility, which appears to us to be inconsistent with Ofgem's duties, as set out in at Section 4AA of the GA 1986. Primarily, we believe that the interests of existing and future consumers would be better protected if consideration had been given to proposals which might deliver a higher security standard at a lower overall cost to consumers.

5.9 We set out elsewhere in this response the ways in which Ofgem statutory Regulatory Impact Assessment / CBA is deficient in this respect – most notably how it recognises that costs will be created but then makes no attempt to quantify them or to include them in the quantitative assessment.

²⁶As set out by Redpoint in Table 12 on page 30 of the document: "*Gas security of supply Significant Code Review: Economic modelling for Ofgem's proposed final decision*".

6. Availability of Demand Side Response (DSR)

6.1 Ofgem has under-estimated the potential for I&C sector demand side response (DSR) under current arrangements and over-estimated the amount of DSR which is likely to be available under their proposals. As a result, the IA and the draft decision exaggerate significantly the benefit of the proposed SCR in terms of encouraging new DSR and improving gas supply security, and create an unjustified reason for adopting a household VOLL as the only default cash-out price.

6.2 Dealing first with the current situation, Ofgem and Redpoint effectively assume that no I&C sector DSR will be available at any price. There is no evidence to support this assumption and much to suggest that it is wrong.

6.3 There are two readily available data sets which can be used to sense check the Ofgem/Redpoint assumptions as regards non-power DSR. These are:

- first, the actual experience of DSR in winter 2005/6; and
- second, the set of forward-looking assumptions which Poyry made in their March 2010 report to DECC on gas supply security.

6.4 The most recent substantial evidence of actual gas sector DSR comes from winter 2005/6, which saw supply disruption caused by a fire and subsequent cessation of gas send-out from the major Rough gas storage facility. Although this is now some years ago and the UK gas supply mix has changed significantly in the intervening period, it remains the case that this was the last time that NBP prices reached levels sufficient to trigger a material amount of non-power DSR. If the second half of March 2006 had been as cold as the first, there would very probably have been a GDE. This period therefore provides a useful case study for market and system operation at times of considerable system stress.

6.5 Power sector DSR was particularly substantial during winter 2005/6, as gas generation had been running ahead of coal in the merit order before the November 2005 hike in wholesale gas prices. Over the winter as a whole, Ofgem estimated that 83% of the total NTS DSR derived from the power sector, but that 17% came from the industrial sector. This belies Redpoint's baseline assumption²⁷ that there is no voluntary DSR currently available in this sector.

6.6 Detailed National Grid data is available for Q4 2005²⁸, which suggests a total of around 12 mcm/day of industrial DSR (3 from NTS connected loads, 1 from firm LDZ and around 8 from interruptible LDZ customers). In Q1 2006, even higher wholesale gas prices were observed at times

²⁷ Page 31 of the document: Gas security of supply Significant Code Review: Economic modelling for Ofgem's proposed final decision.

²⁸ http://www.ofgem.gov.uk/Pages/MoreInformation.aspx?file=13436-winterseminarfapril_final.pdf&refer=Markets/WhlMkts/CustandIndustry/WinterOutlook

– most notably around mid-March 2006, during a spell of cold weather which followed the Rough fire outage – and at peak the amount of DSR was commensurately higher than in Q4 2005.

6.7 During this period (according to Ofgem, 22 March 2006)²⁹ there were quite a lot of days on which NTS DSR amounted to more than 40 mcm/day and one day in mid-March 2006 on which it exceeded 60 mcm/day. Based on this data, plus our own analysis of power sector DSR in Q1 2006, the I&C sector may have provided around 15-20 mcm/day of DSR on occasions in periods of especially high wholesale gas prices³⁰.

6.8 It is also useful to review the DSR assumptions made by Poyry on behalf of DECC in March 2010 (“GB Gas Security of Supply and Options for Improvement”)³¹. Poyry reported that the amount of interruptible I&C gas sales in 2007 was 2935 m therms/annum, equivalent to 36 mcm/day assuming a typical 60% annual load factor. (This was around one-third below the level reported by Ofgas in 1997.) Poyry estimated that around 70% of the then existing I&C back-up fuel facilities would be demolished following the implementation of UNC Mod 90 (removal of interruptible transportation incentives) in 2011. Poyry therefore assumed that 10 mcm/day of interruptible I&C capacity would be available in future.

6.9 Poyry’s 2010 estimates of DSR capacity among firm I&C customers were 5 mcm/day at £12/therm and a further 15 mcm/day at £23/therm. Separately, Poyry estimated that 24 mcm/day of DSR capacity was available in the power sector, from distillate back-up at CCGTs. This was expected to decline over time as older CCGTs are closed, since fewer modern plants are equipped with an oil fuel reserve.

6.10 Bringing these various estimates together and comparing them with Redpoint’s assumptions on behalf of Ofgem, we obtain the indicative comparison set out in the table below (in mcm/day). The category of I&C load labelled “interruptible” was historically served under interruptible supply contracts; in the current market, these can be better thought of as gas customers who could readily switch to an alternative form of energy (e.g. by using back-up oil fuel, or grid electricity instead of on-site auto-generation).

²⁹ http://www.ofgem.gov.uk/Pages/MoreInformation.aspx?file=13436-winterseminarfapril_final.pdf&refer=Markets/WhlMkts/CustandIndustry/WinterOutlook

³⁰ A “normal” level of I&C gas demand in March 2006 was around 27-32 mcmd, and there were several days where demand dipped to about 12-13 mcmd, broadly backing up the quoted 15-20 mcmd DSR figure in the response

³¹

<http://www.decc.gov.uk/publications/AdvancedSearch.aspx?term=security&tags=96&urn=&fromDate=12/07/2010&toDate=12/07/2010&alpha=>

Table 2: Assumed availability of voluntary I&C sector interruption

	Maximum, W 2005/6	Poyry	Redpoint – current arrangements	Redpoint – Ofgem SCR proposals
Interruptible I&C*	8-10	10	None	27
Firm I&C	7-10	5**	None	None
Total I&C	15-20	15	None	27
Power	c. 25	24	Not stated	Not stated
Total DSR	> 40***	39	-	-

* Historically classified as interruptible, but assumed to still retain back-up fuel capability. In our view likely to include auto-generation

** £12/therm tranche only; the £23/therm tranche is ignored for comparability with Redpoint and as the trigger price exceeds the proposed £20/therm default cash-out price

*** As mentioned above, there was a single day in March 2006 on which total DSR appears to have reached around 60 mcm

6.11 The most striking features of these comparisons are (i) Redpoint’s assumption of zero I&C DSR under current arrangements and (ii) their assumption, under Ofgem’s SCR proposals, of far more I&C DSR (available at prices of £3-7/therm) than either Poyry’s estimate or the historical experience of winter 2005-06 would suggest.

6.12 In fact, there is some industrial gas demand which – even if supplied under contracts which are formally “firm” - could still be interrupted under current arrangements if NBP prices rose sufficiently to warrant it. Many very large industrial customers are likely to be supplied on a day-head (DAH) gas index price basis, rather than month-ahead (MAH) or on a fixed price contract, so they could be highly responsive to a major NBP price shift.

6.13 This category of large industrial customers is likely to include the auto-generators. As LE (table 32 on page 70) have recognised, a significant part of I&C sector gas consumption is used for the on-site auto-generation of electricity. According to data published by DECC (DUKES, 2011), 14.1 TWh of electricity was generated in this way in 2011 using 31.7 TWh of gas supplied. This gas volume is equivalent to c. 3 bcm/annum or probably around 10-11 mcm/day, assuming a 75-80% utilisation rate. If wholesale gas prices rise sharply relative to wholesale power prices (squeezing clean spark spreads below a profitable level), a number of industrial firms are likely to stop using this plant and buy electricity from the grid instead. Against total 2012 Firm DM gas consumption of just under 37 mcm/day (Redpoint, page 30), this is a significant source of I&C sector DSR which was rightly identified by LE but then apparently ignored by Ofgem and Redpoint.

6.14 We have also reviewed National Grid’s recent winter outlook presentation for this coming (2012/13) winter. This has to be seen against expected NBP price levels which are well below those arising in winter 2005/6. National Grid assume total DSR of up to 30 mcm/d at peak in winter

2012/13, of which we understand that one-third (i.e. 10 mcm/d) is accounted for by the industrial sector. Even at relatively moderate wholesale gas prices, National Grid clearly considers that the potential for I&C sector DSR is well above zero, under current arrangements.

6.14 This evidence is indicative rather than precise, but it does strongly suggest two key conclusions:

- First, the amount of non-power-sector DSR currently available is certainly far from zero. However, much of it is likely to be triggered at higher gas prices than those generally experienced since winter 2005/6 – so it may not have been much observed in the intervening period.
- Second, it is highly unlikely that 27 mcm/d of I&C DSR capacity will be available consistently at gas prices of below £7/therm from now until 2030, as Redpoint assume. Neither the 2005/6 data nor the Poyry modelling assumptions from 2010 would suggest that 27 mcm/d is potentially available today. Moreover, the process of structural change in energy-intensive UK manufacturing is such that existing amount of I&C sector DSR potential will almost certainly decline further between now and 2030.

6.15 Ofgem's analysis is inconsistent with both these conclusions. As a result, the volume of DSR available under current arrangements is under-estimated. Similarly, the volume of incremental DSR likely to be available under their proposals is over-stated. The effect of these errors when taken together is to substantially over-state the supply security benefits of the SCR. This is a crucial deficiency as it affects the balance of the CBA. In particular, it ascribes a greater benefit to customers than the proposal will actually deliver.

7. Cost of Securing DSR

7.1 Ofgem has focused heavily on the supposed "free option to disconnect", as regards NDM customers. The logical implication of this argument is that currently shippers are not properly incentivised and are therefore not willing to pay enough for DSR in the DM sector, or other supply security measures. However, Ofgem's proposals assume that DSR from the DM sector will be available much more cheaply than at present. This is both inconsistent with the other aspects of the proposals and inaccurate.

7.2 Ofgem (IA, page 39, table 9) assume that 27 mcm/d (c. 10 m peak day therms) of DSR capacity can be secured from I&C customers throughout the period from 2013-30 for a cost of just £51m NPV. Based on a real social discount rate of 3.5 percent p.a. this is equivalent to less than £4m per annum (undiscounted), or in other words less than £0.40 per peak day therm (= £4m ÷ 10 m peak day therms). We have reviewed various different examples of actual demand side flexibility provided in the GB gas market and find all of them to be materially more expensive than this figure suggests – and this will have important adverse consequences for retail customer bills.

7.3 The basis for the findings of Ofgem/Redpoint is an assumption (with no supporting evidence or analysis of real world examples) that DSR will be forthcoming at a cost equal to the VOLLs estimated by London Economics. This assumption is unwarranted and places far more reliance on these reasonably preliminary analytical estimates than LE itself (page 76 of its report) considers appropriate:

*"While we have made our best efforts to estimate VoLLs by I&C sector that adjust for factors such as gas critical production, storability, and capacity, it should be noted that these estimates are reasonably preliminary, and more robust estimates would require additional work and resources. More robust estimates would most likely require cooperating directly with industry. In conclusion, **we would recommend that Ofgem should work closely with industry to obtain a deeper understanding of how gas is actually used in and across each industrial sector**, such that VoLL estimates could be adjusted with greater confidence and precision."* [Our emphasis].

7.4 There is no sign that Ofgem has worked with the industry to develop more robust estimates. Although the whole proposal revolves around the laudable desire to encourage maximum DSR from DM I&C customers on commercial terms, Ofgem's fact-base on the potential providers of this DSR is highly subjective and ultimately unreliable. We believe that more objective and reliable data is available from other sources.

7.5 The figures used as a cost basis for securing voluntary interruption are based upon the study³² undertaken by LE on behalf of Ofgem, and first published by Ofgem on 8 November 2011. That study established low and high Values of Lost Load (VoLLs) in 16 industry sectors with two VoLLs being quoted for the electricity sector based upon two different interruption durations (1 hour and 24 hours). The range of the VoLLs across all sectors, further subdivided by low range and high

³² *Estimating Value of Lost Load,*

<http://www.ofgem.gov.uk/Pages/MoreInformation.aspx?docid=46&refer=Markets/WhIMkts/CompanEff/GasSCR>

range according to prevailing operating conditions, as established by that study is 0p/therm (low case for construction) to just under £24/therm (high case for “other Industries”).

7.6 Ofgem’s IA assumes that I&C sector DSR will be available when the gas price reaches the relevant customer VOLL, without any profit margin or “option fee” (to phrase it another way). This seems implausible, from the viewpoint of commercial logic. Given all the uncertainties attached to pricing what is, in effect, an out-of-the-money call option for the buyer of DSR, it seems most unlikely that an industrial gas customer would be willing to sell such an option “at cost”. Moreover, all the evidence we have gathered regarding the actual cost of DSR services suggests that this assumption is incorrect. We set out below a number of different “real world” examples which we have reviewed and compare the actual cost of DSR with that assumed in the IA.

7.7 We have analysed the results of the Operating Margins tender process³³ conducted by National Grid each year for the last three years (Table 3, below). This process invites, but does not oblige, large daily metered consumers and gas delivery providers (e.g. storage) to tender for turn down and turn up services respectively. This process enables those tendering to indicate their actual VoLLs. Taking the average result of the last three auctions, for 2010/11 to 2012/13, the cost of accepted OM bids was equivalent to over £11m for just one day’s supply at 10m therms/day (the level of DSR assumed by Ofgem) as referenced in table 3, below. If OM gas had been required for longer periods, the implied cost of the accepted bids would have been considerably higher. Compared with the £4m annual cost assumed by Ofgem/Redpoint for multiple days of DSR (see above), this evidence suggests that the true cost of demand side flexibility will be at least 3 times higher than Ofgem’s estimate.

Table 3: Analysis showing cost per customer of procuring Operating Margins DSR Services

Item	Unit	2012/13	2011/12	2010/11
Weighted Average Price				
- Deliverability	p/pk-d-kWh	2.52	1.9	2.2
- OM Gas	p/kWh	1.76	1.4	1.8
Total Price for 1 Day Interruption	p/pk-d-kWh	4.28	3.30	4.00
Equivalent price for 1 day at 10 m th/d	£ m	12.5	9.7	11.7

7.8 Looking at a specific example of an accepted OM bid based on power sector DSR (see confidential Annex 2), we conclude that the equivalent cost of 27 mcm/d (10 m therms/day) of DSR would be of the order £8-15m per annum, which is roughly 2-4 times the annual cost of I&C DSR assumed by Ofgem/Redpoint. We consider that I&C sector DSR would typically be more expensive than this (as one would expect from the LE analysis of their respective VoLLs).

7.9 We have also looked at the discounts typically applied historically, when gas transportation charging arrangements allowed interruptible gas customers to avoid system exit capacity charges.

³³ <http://www.nationalgrid.com/uk/Gas/OperationalInfo/GasOperatingMargins/>

We understand from our own experience and from talking to customers that the discount to the cost of gas delivered would typically have been of the order of 1p-2p/therm. By contrast, we note that the Ofgem/Redpoint assumption of an annual cost of £0.40/peak day therm for the cost of DSR is equivalent to a discount of just 0.2 p/therm, for an industrial customer using gas on a typical annual load factor of 60% (at which a peak day therm translates into annual consumption of $365 \times 0.6 = 219$ therms). In other words, evidence in the form of real examples suggests that the true cost is likely to be around 5-10 times higher than that assumed in Ofgem's analysis.

7.10 Anecdotal evidence suggests that customers are overtly (a) unable to spare sufficient time to consider the potential savings versus the risks they might face under an interruptible contract; and or (b) assess a value of lost load – typically a guaranteed annual saving which more than covers the cost of installing and maintaining back-up fuel facilities – at significantly more cost than the optionality benefit which we as a shipper/supplier place on that supply. We consider that Ofgem's proposal will have the effect of increasing customers' expectations about the value of their interruption to their shipper/supplier, but will not actually increase the optionality benefit as assessed by the shipper/supplier. To this end, this proposal will simply increase the gap between customers' expectation and shippers'/suppliers' willingness to pay.

7.11 We have attempted to use Ofgem's/Redpoint's own figures to model the logical effects of DM customer compensation. We set out why Ofgem's proposals are not economically efficient, but instead are counter-productive in respect of encouraging voluntary DSR and enhancing gas supply security.

7.12 We have calculated how much a shipper would have to pay DM customers to make them exactly indifferent between (1) procuring a firm contract for gas and (2) agreeing to an interruptible contract. We have done this as set out below.

7.13 According to Redpoint's modelling, we assume that the probability of tranche 1 firm I&C disconnection in a GDE under current arrangements to be on average 1-in-55 years, over the period to 2030. We are not told the probability of tranche 2 I&C customers being interrupted under current arrangements, but we assume for illustrative purposes that it is less frequent, say 1-in-80 years.

7.14 Based on information provided by Ofgem and Redpoint, we assess the likelihood of voluntary self-disconnection by tranche 12 and tranche 2 I&C customers respectively at an average of around 1-in-35 and 1-in-60 years respectively. We then consider the impact of a £20/therm involuntary disconnection compensation payment on the price at which they would be willing to offer voluntary DSR.

7.15 Table 4 below show the logical process a customer would follow in order to derive their price for being interruptible under the SCR proposals which set the price of doing nothing at £20/th. This clearly shows that Ofgem's proposal to compensate DM customers for involuntary DSR at £20/therm is counter-productive, in the sense that it dramatically raises the "break-even" price at which I&C customers should be willing to offer voluntary DSR services. As a result of the £20/therm DM compensation proposal, therefore, the Ofgem proposals would not in fact deliver the predicted levels of voluntary DSR at the £3-7/therm price points Ofgem assume – even if the total amount of I&C DSR available were as high as 27 mcm/d.

Table 4: Impact of £20/therm DM compensation on the cost of DSR

	Frequency of Disconnection – current arrangements	Frequency of DSR – SCR arrangements	VOLL	Required DSR payment (with £20/therm payable as an alternative)
Tranche 1	1-in-55	1-in-35	£3.18	£13.88 ³⁴
Tranche 2	1-in-80	1-in-60	£6.68	£16.67

7.16 Finally, we have investigated the cost of “out of the money call options” with a number of major financial players, since these are equivalent to the service which Ofgem envisages would be obtained by shippers from I&C sector DSR. Such options would work on the basis that, for example, the seller agrees to provide x m therms per day of gas supply at a given price which is well above the current market level, on every day that the wholesale market price reaches or exceeds that level. The cost of such an option would depend on its precise definition (especially as to strike price and the maximum number of days on which it could be exercised), but the price indications we have received are typically of the order £2 per peak day therm, equivalent to £20m p.a. for 10m therms/day of calls. This is five times the costs of DSR assumed by Ofgem/Redpoint. These quotes are made under current market conditions and would be considerably more under Ofgem’s proposal.

7.17 Bringing together these different pieces of evidence, which all point in broadly the same direction, we can conclude with some confidence that Ofgem/Redpoint have under-estimated the likely true cost of DSR by a factor of 3-5.

³⁴ Thus $(1/55) * (20.00 - 3.18) = (1/35) * (13.88 - 3.18)$ and analogously for tranche 2

8. Supplier/shipper risk mitigation

8.1 Ofgem's intention, with its SCR proposals, is to pass a much greater financial risk of supply failure onto shippers noting in its IA "In particular, a more dynamic cash-out price will provide strong incentives to attract imports in an emergency and will strengthen shippers' incentives to take measures to enhance security of supply. This could take many forms including arranging interruptible contracts with consumers, diversifying supplies, investing in storage, and ensuring an appropriate mix of long-term and short-term contracts with producers." There are a number of significant flaws in Ofgem's reasoning on this point:

- First, Ofgem fails to appreciate the scale of the extra risk exposure its proposals would place on shippers, since these consist of price exposures (at or near a GDE) as well as cash-out liabilities in the event of a GDE
- Second, Ofgem does not appear to appreciate that DSR alone (even on the unprecedented scale it assumes would follow the introduction of the proposed measures) would not be anywhere near sufficient for retail gas suppliers to cover their risk exposure.
- Third, this means that 'downstream' shippers/suppliers would have to take additional steps to mitigate their risks and the substantial cost of these measures is not factored in to the Ofgem IA.

8.2 This means (a) that the potential impact on market players of Ofgem's proposals is much greater than it realises and (b) that the CBA has failed to capture the recognised risk mitigation costs which would be incurred and, as Ofgem recognises in its approach, passed through to retail gas customers.

"Further, options 1 and 2 might lead industry to invest in measures to mitigate against the risk of an emergency. This is likely to require more capital which could come at greater costs if the marginal cost of acquiring extra funding increases." (Ofgem IA para. 3.56)

8.3 Ofgem's CBA reports an additional cash-out liability to shippers, under these proposals, of around £27m NPV, which is equivalent to about £2m/a on average over the period to 2030, before discounting. This sounds very modest, until you consider the frequency with which a GDE is estimated to occur (no more often than 1-in-128 years, under Redpoint's analysis, with a "major" GDE involving NDM disconnections every 167 years). What this cash-out liability would actually mean, in years when a GDE occurs with gas fired power stations and firm DM customers interrupted, is typically a collective cash-out obligation on shippers of over £250m. This is by no means a worst case; Ofgem's IA document (table 4, page 28) shows many examples of much higher exposure, including several in the range of £1.0-1.5 bn for gas shippers as a whole.

8.4 In fact, under Ofgem's proposals, this additional cash-out exposure is only a part of the heavy risk burden faced by 'downstream' shippers who deliver gas for supply to retail customers. A GDE is more likely to occur when demand is very high and supply is constrained. As described in section 3.4 under such circumstances it would be reasonable to assume that a prudent supplier could be ~20% short of their peak demand position going into a GDE. As prices rise leading up to a

GDE, and then are set at £20/therm for the duration of a GDE, the costs for a short supplier will rapidly escalate. In section 3, we included an illustrative example on this basis which showed, in the event of a 14 day NDM customer outage, a collective price exposure for shippers of almost £4 bn. This would place the supplier and, due to the expectation that all costs are “passed onto consumers through a retail price increase”³⁵, consumers under a cost burden far greater than Ofgem’s IA indicates. Even major downstream shippers could not leave themselves exposed to combined cash-out and pricing exposures on this level. In other words, they would need to explore mitigation measures to cover their dramatically increased risk under Ofgem’s proposals.

8.5 We have considered a number of possible ways in which these exposures could be addressed, in order to better manage the exposures and costs passed through to potentially vulnerable residential consumers. Some of these are described in section 7 on the cost of DSR. Whether interruptible sales to DM customers of financial call options, these are likely to be much more expensive than Ofgem supposes. Moreover, the availability of these market instruments is unproven – so it is uncertain whether in fact a prudent shipper could cover its potential exposures by this means at all.

8.6 On p.14 of the Ofgem IA Ofgem suggest that:

“..Shippers have stronger incentives to take measures to enhance security of supply and to avoid being short during an emergency. This could include seeking storage provision, diversifying supplies, arranging interruptible contracts with customers and ensuring an appropriate mix of long-term and short-term contracts with producers.”

We have identified 2 broad categories of measures which could be used by suppliers to mitigate the costs which will ultimately be borne by consumers – financial mitigations which mitigate costs but have no benefit in terms of improving security of supply; and physical mitigations which seek to ensure that supplier demand is physically backed with gas at the NBP.

8.7 Financial Mitigations

- Accounting Provision: Given the challenges to source effective mitigations the exposure could be managed by “accruing” a cash provision to be released should a GDE and resulting financial impacts occur. This would not be effective at mitigating the risk of a GDE but would relieve consumers of the full financial impact of the GDE costs in one year.
 - If a provision of only £1.2bn was made across all suppliers then assuming a corporate cost of capital of ~7% **the cost for consumers would be £84m/yr or ~£3.65/household**
- Disaster Insurance: Our research indicates that some reinsurers might be willing to offer insurance that would provide compensation to suppliers in the event of a GDE. Such a

³⁵ Ofgem IA, P.38, section 3.108

product would need to be tied to clear criteria of physical events³⁶. This would necessarily not protect against all possible occurrences of a GDE as the possible causes are wide ranging. An indicative view from an insurance professional suggested that such risks could be insured for ~5%/yr; as such **the cost for consumers would be £60m/yr or ~£2.60/household**

- Commodity Options: Financial institutions are the primary sellers of options related to gas prices. These options could theoretically be used to mitigate price risk. However there are material constraints on liquidity and cost. The cost of call options “close to the money” is high relative to options that are further “out of the money” – by this we mean that the cost of the option is closely tied to the option exercise price and its proximity to the market price at the time the option is written. In practice options that are out of the money by a significant margin (>30p/therm) are not materially different in price to options that are £1/therm or £10/therms out of-the-money – this is because traders cannot effectively hedge such deeply out of the money products to manage the risks associated with selling them. In addition the market for options has very limited liquidity. Options with a daily, rather than monthly, exercise would be required to provide effective risk mitigation against a GDE as you can’t know when it will occur. Only 12 daily exercise gas options have been transacted in the brokered market in the last year and all on a horizon of less than 12 months prior to delivery. **For these reason we do not consider such options a viable mitigation strategy.**

8.8 Physical Mitigations

- Gas storage Capacity: Ofgem suggest that their reform does little or nothing to support the economics of new short range storage which could be effective at mitigating the risks Ofgem’s proposal will generate³⁷. However there is existing Third Party Access (TPA) storage in the UK - the Rough and Hornsea facilities.
 - Centrica Storage offers ~455m Standard Bundled Units (SBUs) of Storage Capacity each year for sale on a bilateral basis with market based pricing - this equates to daily gas supply of ~15.5m therms. In order to secure 50% of this capacity the Centrica Storage website is indicating an indicative price for 2013/14 of 25.9p/SBU or £59m/yr with prices in future years being 5 – 10% higher.
 - SSE Hornsea is able to deliver ~6.6m therms/day (18MCM/day)³⁸ with space that would allow delivery for about 18 days. We understand that Hornsea capacity is typically offered via auction with SBUs space typically selling at a premium to the

³⁶ E.g. failure of specific Norwegian gas transportation infrastructure coinciding with UK temperatures at [x] below SNT

³⁷ Ofgem, IA P.15, section 3.14

³⁸ http://www.sse.com/uploadedFiles/Controls/Lists/Reports_and_Results/SSE_AnnualReport2012.pdf

ts_and_Results/SSE_AnnualReport2012.pdf

differential between January and Summer forward prices. Costing Hornsea on this conservative basis³⁹ securing 50% of Hornsea capacity would cost ~£6.5m/yr

- If such a material proportion of both facilitates were effectively “reserved” to be used solely in a GDE it is very likely that NBP prices would be significantly higher in winter with these higher prices impacting consumers. Additionally such a reservation of flexible supply could result in a GDE occurring where storage supply would otherwise have prevented it happening would provide 11m therms/day of gas supply in a GDE; **the cost of this for consumers would be ~£65M/yr or £2.80/household**
 - “Going long”: It is possible for suppliers to contract on a forward basis for their peak rather than Seasonal Normal Temperature (SNT) demand level. Between 2006 and 2011 the average winter difference between the forward month ahead price and the day ahead price (by day ahead the actual level of demand and likelihood of a GDE would be known with a high level of confidence) was 3p/th. Where suppliers were to follow a pattern of “over procuring” and selling gas back day ahead to balance then this day ahead differential is likely to increase. However on this conservative basis for an SNT day the cost of this strategy would be ~£0.5m/day or £83m/yr for the peak winter months of November-March. **The resulting cost for consumers would be £83m/yr or ~£3.60/household.**
- 8.9 None of the measures outlined here are fully effective at mitigating the risks created by Ofgem’s proposals but these are the most realistic tools for residential suppliers. The individual options broadly amount to a cost of £3-4/household per year, this would mitigate the cost of a one-off consumer price rise of ~£160/yr. In practice some combination of mitigating strategies might be required to provide effective risk management – this would of course materially increase the mitigation costs. Even in isolation each of these options demonstrates that Ofgem’s judgment that the cost to consumers will be 11p/yr/account is incorrect by a factor of greater than 20.
- 8.10 These impacts are exacerbated by the fact that shippers who had behaved perfectly properly could well face the “smeared” liabilities of those who have not, but have gone out of business. This is not only unjust, but it may well create perverse incentives.

³⁹ Using ICE closing prices for Jan-14 and Summer 13for 23rd Oct, 20123.3

9. Ofgem’s Impact Analysis

9.1 As shown below, Ofgem/Redpoint have concluded that the emergency cash-out reform proposals would deliver a net benefit of £65m NPV and would result in just 11p being added, on average, to a retail customer’s annual gas bill.

Table 5: Summary of Ofgem’s Option 2⁴⁰ Impact Assessment findings

Option 2 CBA - real 2012 £m NPV	£m NPV
Cash-out liability	-26.7
Payments to interruptible customers	-51.3
Change in total cost of gas	23.1
Retail revenue	54.8
Net supplier welfare	0.0
Retail costs	-54.8
Payments for involuntary DSR services	26.7
Payments to interruptible customers	51.3
Load reduction to firm gas customers	39.2
Load reduction to firm electricity customers	54.1
Load reduction to interruptible customers	-51.3
Net consumer welfare	65.1

9.2 These proposals represent poor value for money to consumers, even on the basis of Ofgem’s own analysis. Ofgem⁴¹ show in their IA that unserved NDM energy demand would be reduced by 104,000 therms per annum under their proposals, at an annual cost to NDM gas consumers of over £2.5m.⁴² This represents a unit cost of over £24/therm of additional gas supply – but this exceeds Ofgem’s £20/therm estimate of the maximum value of gas to retail customers.

⁴⁰ Table 12 on page 50 of the Redpoint document: *Gas security of supply Significant Code Review: Economic modelling for Ofgem’s proposed final decision*.

⁴¹ Impact Assessment, page 16, table 2: 722,000 therms minus 618,000 therms p.a.

⁴² 11p/customer/a X 23m NDM customers

9.3 When a more realistic appraisal is made, the net consumer welfare impact of Ofgem's proposals can be seen to be much more adverse. Based on our own analysis, we would make three major criticisms of the Ofgem IA:

- first, it underestimates the likely cost of DSR services from I&C gas customers by a factor of 3-5 (see section 7 above) and neglects the cost of other necessary risk mitigation measures (section 8) ;
- second, it very materially under-estimates the impact of Ofgem's proposals on wholesale gas prices, both within and outside circumstances of a GDE (section 3); and
- third, the benefit claimed in terms of electricity supply security is not properly attributable to Ofgem's SCR proposals (see Section 2).

9.4 Consistent with this analysis, we show below an illustrative revised IA which assumes the following four changes in assumptions:

- First, we assume that the re-pricing of "FM" risk has the effect of increasing NBP gas prices by 0.25p/therm, on average (representing, in our view, the very low end of a plausible impact range as set out in section 3 of this response).
- Second, we postulate a realistic cost of I&C DSR which is three times the figure assumed by Ofgem, at the lower end of the range set out in section 7 above.
- Third, we assume that the total cost of 'downstream' shippers' risk mitigation (including DSR) is equivalent to £3 per retail customer p.a., at the lower end of our calculated £3-4 cost range set out in section 8 above.
- Fourth, we have set the stated electricity supply security benefit of £54m NPV to zero, as we do not consider that it can properly be attributed to Ofgem's proposals.

Our alternative consumer welfare impact assessment is set out below on that basis:

Table 6: Summary of Centrica’s Option 2 Impact Assessment findings

Option 2 CBA - real 2012 £m NPV	£m NPV
Cash-out liability [1]	-26.7
Payments to interruptible customers [2]	-153.9
Other risk mitigation [3]*	-729.5
Change in total cost of gas [4]**	-845.4
Retail revenue [5] = [1] + [2] + [3] + [4]	1755.5
Net supplier welfare [6]	0.0
Retail costs [7] = - [5]	-1755.5
Payments for involuntary DSR services [8] = - [1]	26.7
Payments to interruptible customers [9] = - [2]	153.9
Load reduction to firm gas customers [10]	39.2
Load reduction to firm electricity customers [11]	0.0
Load reduction to interruptible customers, at VOLL [12]	-51.3
Net consumer welfare [13] = [7] + [8] + [9] + [10] + [11] + [12]	-1587.0

* Note that [1] + [2] + [3] = £910m NPV = £69m p.a. = £3/retail customer p.a. based on 23m retail gas customers, consistent with the total cost of risk mitigation measures (including DSR) which was mentioned above

** This is 0.25p/therm applied to total GB gas demand (excluding exports to Ireland) under National Grid’s 2011 “Gone Green” scenario, for the period to 2030

9.5 As may clearly be seen, the slightly positive impact on net consumer welfare set out in the Ofgem IA becomes a very large negative, of the order £1.6 bn NPV. At the same time, the annual impact on average retail gas bills rises from just 11 p to something of the order £4.40⁴³. This represents a burden on gas consumers of over £130m⁴⁴, in return for little or no benefit in terms of supply security. The equivalent unit cost of marginally enhancing NDM supply security is thus over £970/therm of unserved NDM energy reduction – a wholly disproportionate burden on consumers.

⁴³ The “other risk mitigation” costs in our analysis are specific to temperature sensitive retail customers (c. 23m). The remainder of the estimated retail costs are spread across the whole of non-power demand, to be consistent with Redpoint’s approach – see Redpoint report, page 50, footnote 47.

⁴⁴ £1755.5m divided by 13.2 = £133m/a over the period to 2030.

This illustrative revised version of the Ofgem CBA only takes account of the four specific adjustments mentioned above, but one could make further changes based on our evidence and arguments (e.g. around the impact on wholesale and retail electricity prices) would show an even more deleterious welfare impact.

9.6 We do not assert that the £1.6 bn adverse NPV impact on consumer welfare is “precisely correct”, any more than Ofgem believe that the net consumer welfare benefit is precisely £65m. Nevertheless, the compelling evidence presented in our response clearly demonstrates that the impact of Ofgem’s proposals is not “a small positive” (as per Ofgem’s IA) but rather a “very large negative”. Moreover, the scale of the consumer welfare burden can leave no room for doubt.

9.7 On this basis, we conclude that these proposals do not better serve the Relevant Objectives than the current arrangements and that they are inconsistent with Ofgem’s primary statutory duty “to protect the interests of consumers”.

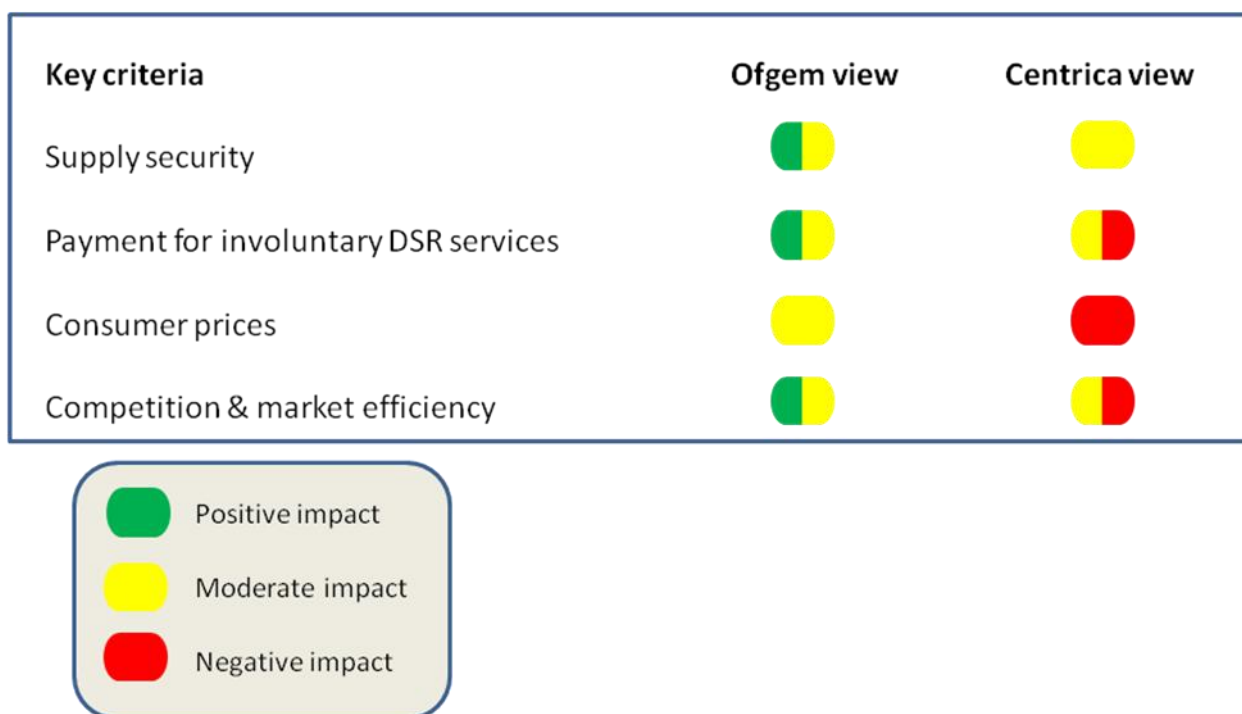
10. Ofgem’s Qualitative assessment

10.1 Ofgem’s overall IA for these proposals relies heavily on a qualitative assessment of their merits, alongside (or even over and above) the quantified cost-benefit analysis carried out by Redpoint on their behalf.

10.2 Whilst there may be some relevant factors which cannot readily be quantified precisely, it is in our view important for any qualitative assessment to be well supported by the evidence base and economic/commercial logic. If not, it may otherwise become a thinly veiled exercise in subjective pre-judgement of the issues.

10.3 From table 10 on page 41 of their IA document, we set out below the Ofgem assessment of their Option 2 proposals with a £20/therm default emergency cash-out price. Alongside this, we set out our own assessment based on the same key criteria and the evidence/evaluation set out in the remainder of this response.

Figure 5: Assessment of Cash-out reform – Option 2 versus current arrangements



10.4 We identified major flaws in the quantitative cost-benefit analysis, and also find that Ofgem has not properly assessed the qualitative factors bearing on this decision. Taking each of these points in turn:

- We have shown that the supply security benefit of Ofgem’s proposals is highly uncertain and at best marginal. The improvement in supply security for many firm I&C gas customers is more apparent than real, whilst the benefit to electricity supply security is not, in our view, attributable to Ofgem’s proposals

- We have shown that the proposed £20/therm compensation to DM customers for involuntary DSR services is without economic foundation and counter-productive, as regards eliciting DSR and enhancing gas supply security.
- We have demonstrated the severely adverse effect which Ofgem's proposals are likely to have on consumer prices.
- We have shown how these proposals are likely to distort fair and effective competition in the GB gas market.

10.5 Finally, we refer to a study by Eclipse Energy Group⁴⁵ which is being published around this time. The background to this study is consistent with Redpoint's findings, which suggest that physical gas supply security is already robust. Eclipse focus instead on a more important issue, which is the longer term vulnerability of the UK gas market to price shocks emanating from the global gas market. In their report, Eclipse show how increased gas storage capacity can contribute to reducing the incidence and scale of any such adverse price shocks. By contrast, Ofgem's SCR proposals are actually unhelpful when seen in this light. They might lead to a very marginal improvement in physical gas supply security, if they work as Ofgem intend, but (as we have clearly demonstrated) they would have the impact of putting up the price of gas to GB consumers – and not to reducing price risks as policy makers may intend.

⁴⁵ "Security of price, 2020-2026 – a study for Centrica", being published on 29 October 2012

11. Legal Conclusion

For the reasons outlined in this response, the PFD is wrong on a number of grounds and the principle of good regulation means, in our view, that Ofgem should reconsider and revisit some of its assumptions and allow the industry to develop alternatives as part of the normal governance process. In Centrica's view, the PFD is contrary to Ofgem's duties, fails to take account of the purposes of Special Standard Condition A11 of the Transporters' Licence and contains a number of errors of fact.

11.1 Failure to have regard to Ofgem's principal objectives and general duties⁴⁶

11.1.1 Under S4AA(1) of the **GA86**, Ofgem's principal objective is to protect the existing and future interest of consumers in relation to gas conveyed through pipes.

- (i) As outlined in more detail below, we consider that Ofgem's IA underestimates the impact the PFD will have on customer bills and shippers/suppliers where the improvement to security of supply is not sufficiently material to justify such impact.
- (ii) Consequently the PFD will increase prices to consumers for no material increase in their security of supply and it is therefore not in their interests.

11.1.2 Under S4AA(5A)(a), Ofgem must have regard to the principles that regulatory activities should be proportionate and targeted only at cases in which action is needed.

- (i) According to Ofgem's own analysis, the domestic customer supply security standards as defined in the relevant objectives of the UNC⁴⁷ are already comfortably exceeded (Section 2.5).
- (ii) While Centrica may generally support the objective of increasing security of gas supply in the UK, given the significant costs at which the PFD would deliver this, it would be disproportionate to implement the PFD as it currently stands.
- (iii) Redpoint's CBA suggests that the PFD results in neutral supplier welfare but provides modest consumer welfare (Redpoint analysis, para 8.2.2). In interpreting the results of the CBA, Ofgem's IA suggests that the annual consumer bill increase will be only 11p (IA, para 3.41).
- (iv) However, the modelled costs do not incorporate the measures required to be taken by shippers to mitigate their increased risk exposures (e.g. Section 8), nor Ofgem's own recognition of the higher wholesale cost of gas under its PFD (Section 3).
- (v) Centrica's own assessment of the impact to consumers at Section 9.4/9.5 points to an actual increase in the retail gas bill on average of £4.40 and an overall negative impact on net consumer welfare of the order of almost £1.6bn.

⁴⁶ S 175(2) Energy Act 2004 ("**EA04**").

⁴⁷ Standard Licence Conditions for Gas Transporters, Condition 9, 1A

(Section [9.4]). Ofgem should balance the appropriate qualitative benefits against the PFD's significant costs⁴⁸.

- (vi) The significant increase in retail bills cannot be justified in relation to the marginal increase in security of supply presented in Ofgem's PFD. Ofgem has therefore failed to give appropriate weight to the interests of consumers in not paying higher prices for the supply of gas than necessary or proportionate to meeting their interests or the need to secure that, so far as it is economical to meet them (and implicitly, only that far) all reasonable demands for gas are met.
- (vii) The industry has suggested an alternative proposal to enhance gas supply security. Under an SCR, the industry would be able to propose alternative proposals to those of Ofgem but by using the power under Section 36C of the GA86, Ofgem removes this possibility. This undermines the principle that regulatory activity must be targeted where action is needed: the fact that an alternative process has started under industry governance rules shows that regulatory action may not be needed.

11.1.3 Under S4AA(5), Ofgem must carry out its functions in the manner best calculated to promote efficiency and economy on the part of *inter alia* shippers and suppliers.

- (i) As outlined at Section 9, Centrica's analysis (conducted jointly with the economic consultancy NERA) suggests that Ofgem's IA is not adequately supported in certain material respects and will in fact result in a net decrease in consumer welfare of almost £1.6bn.
- (ii) In light of the evidence that the costs of the PFD will outweigh its supposed benefits, leading to a reduction in net consumer welfare, by imposing costs on shippers and suppliers without material or proportionate consumer benefits, the PFD is inconsistent with the Authority's duty to promote efficiency or economy on the part of shippers and suppliers.
- (iii) As set out in Section 2.11, Ofgem has not taken account of the counterparty credit impacts which will raise costs to shippers, National Grid and the operator of cleared markets nor the "smearing back" of liabilities across the shippers who had properly managed their imbalance exposures (Section 8.10). This promotes inefficiency and is inconsistent with Ofgem's duty to promote effective competition.
- (iv) As outlined in Section 2.15, the proposal will mean that consumers are not well placed to assess those shippers who may not correctly assess the cost of risk mitigation measures. This will lead to a distortion of the gas market and is inconsistent with Ofgem's duty to promote effective competition.

⁴⁸ Ofgem has been criticised previously "in balancing quantified costs against qualitative benefits... [for failing] sufficiently to explain the nature of the benefits relied on..., and the way in which the benefits had been balanced and weighed against the costs" . E.ON UK plc v. Gas and Electricity Markets Authority (CC02/07), para 7.7

11.1.4 Under S4AA(1C) of the GA86, Ofgem must have regard to whether there is any other manner (whether or not it would promote competition) in which it could carry out its functions which would better protect the interests of consumers.

- (i) While Centrica has recognised that there are some inefficiencies with cash-out prices being frozen at too low a level, it considers that there are market reforms which would address any such inefficiencies without the risks and costs associated with Ofgem's PFD. Indeed, Centrica has already raised one such modification (Section 1.10 et seq.).
- (ii) Centrica believes that Ofgem should therefore consider whether this alternative modification (or others that the industry may develop) may better achieve the stated objectives of Ofgem's PFD. Any failure to do so would be a fundamental breach of its duty under this provision.
- (iii) In particular, we note that by going down the Section 36C route, Ofgem has virtually removed the possibility for industry-led alternatives that would otherwise be available under the normal SCR route. It is therefore even more important in these circumstances that Ofgem considers carefully the flaws in its analysis, and the merits of alternatives, before imposing a PFD which is, in our view, clearly wrong and unsupported by the evidence, and therefore contrary to its principal objectives and duties. Its failure to do so is inconsistent with its duty under Section 4AA(1C) of the GA86.

11.1.5 Under S4AA(5A)(b) GA86 Ofgem must have regard to the principle of following best regulatory practice. In the context of these proposals that means that its actions should be underpinned by robust cost benefit analysis with proper sensitivity testing⁴⁹.

- (i) As outlined in E.ON UK Plc's successful appeal against the PFD of the Gas and Electricity Markets Authority⁵⁰, any conclusion regarding the benefits of a PFD to consumers must be adequately supported and must be approached in a consistent and principled manner⁵¹.
- (ii) Throughout this response, Centrica have outlined a number of inaccuracies and failings in Ofgem's IA and interpretation of Redpoint's CBA, in particular the marginal increase in security of supply (Section 2), the increased cost of wholesale gas (Section 3), the availability and cost of DSR (Section 6/7), the costs of other risk mitigation measures (Section 8) and the resulting unduly low estimate of the impact on customer bills.

⁴⁹ HM Government has outlined in its own publication, "Impact Assessment Guidance" available at <http://www.bis.gov.uk/assets/biscore/better-regulation/docs/i/11-1111-impact-assessment-guidance>, that it will regulate only where "where analysis of the costs and benefits demonstrates that the regulatory approach is superior by a clear margin to alternative, self-regulatory or non-regulatory approaches". In addition, "[t]here will be a general presumption that regulation should not impose costs and obligations on business, social enterprises, individuals and community groups unless a robust and compelling case has been made".

⁵⁰ E.ON UK plc v. Gas and Electricity Markets Authority (CC02/07).

⁵¹ Para. 7.10 and 7.13.

- (iii) Centrica recognises that the assessment of any proposal involves a degree of judgement and discretion. However, as outlined at Section 10 of this response, Centrica considers that the flaws in Ofgem’s analysis go beyond the latitude for that judgement and result in an outcome detailed in the IA that is manifestly wrong and therefore does not provide robust and compelling support for the conclusion that the PFD will, or is sufficiently likely to, deliver the promised net benefits to consumers.

11.1.6 Under S4AA(1A)(c) of the GA86, the interest of consumers include the interests in the fulfilment by Ofgem of the objectives in Article 40 of the Third Gas Directive.⁵² In Centrica’s view, with the PFD Ofgem has failed to have regard to the objective in Article 40 (c) of the Directive of “*eliminating restrictions on trade in natural gas between Member States ... and enhancing the integration of national markets which may facilitate natural gas flow across the Community*”.

- (i) In the exercise of its duties, Ofgem must have regard to the importance and development of the single market for gas supply in the EU.
- (ii) Ofgem notes the impact of the Third Energy Package, the Gas Target Model and the Gas Security of Supply Regulation which aim to improve cross border efficiency through the removal of barriers to trade. Ofgem argues that its PFD ensures that gas flows to where it is most needed based on price differentials (IA, para 3.98).
- (iii) However, in Centrica’s view, Ofgem’s PFD is likely to lead to a distortion in the EU internal gas market as, by creating artificially high prices in or around a GDE in the UK, gas will be redirected to the UK, thereby promoting market inefficiencies without objective justification. This could in turn have a knock on effect of increasing gas shortage in other Member States and increasing EU gas prices, in particular if other regulators adopt similar proposals.
- (iv) As outlined in Section 2.3 of this response, there are strong parallels to the Spanish regulator’s actions in 2005⁵³ of increasing cash-out prices in case of system shortages. Such regulatory intervention prompted Ofgem to raise its concerns with the European Commission⁵⁴ adducing a breach of Treaty provisions on competition for entities with special or exclusive rights under Article [106] of the Treaty on the Function of the European Union.

11.2 Failure to have regard to the purposes of Standard Special Condition A11⁵⁵

⁵² Directive 2009/73/EC concerning common rules for the internal market in natural gas and repealing Directive 2003/55/EC.

⁵³ The Spanish regulator decided to set charges for suppliers who are out of balance at 150% of the higher of two cash out prices in the UK and US.

⁵⁴ Ofgem’s letter to Letter to the Competition Directorate General dated 25 November 2005, available at http://www.ofgem.gov.uk/Markets/WhIMkts/CompandEff/TPAccess/Documents1/13020_256_05.pdf.

⁵⁵ (S175(4)(b)(ii) EA04.

- 11.2.1 In Centrica's view, Ofgem failed properly to have regard to the purposes of Standard Special Condition A11 in that, contrary to the relevant objective (e) of that Condition, the PFD does not provide reasonable economic incentives to meet the domestic security standard.
- 11.2.2 The purpose of Standard Special Condition A11 is to facilitate the relevant objectives in that condition and, in the context of modifications to the UNC, to better facilitate those objectives⁵⁶.
- 11.2.3 Standard Special Condition A11 provides that one of those objectives (objective (e)) is the provision of reasonable economic incentives for relevant suppliers to secure that the domestic customer supply security standards are satisfied as regards the availability of gas to their domestic customers.
- 11.2.4 The PFD creates a significant burden on shippers and suppliers on the premise that it improves security of supply. However, Ofgem's own analysis demonstrates that the domestic security standard in the Gas Transporter Licence Standard Special Condition A11 is comfortably met and this response outlines that the PFD is disproportionate to the costs both for shippers/suppliers and customers (Section 3, 4 and 8). If the Ofgem PFD does not achieve a higher standard, or if it involves undue costs in order to achieve the defined standard, it will be acting *ultra vires*.
- 11.2.5 As set out at Section 10 of this response, Ofgem's IA has underestimated the annual impact on gas bills (we estimate that this will be in the order of £4.40 rather than 11p) and it has failed to consider, in particular the counterparty credit impacts which will raise costs to shippers, National Grid and the operator of cleared markets (Section 3.8).
- 11.2.6 In addition, the PFD only brings about limited and somewhat uncertain benefits to gas supply security. As mentioned in Section 2, Redpoint's modelling claims an annualised reduction of unserved NDM demand which, on an annual average basis, is equivalent to just 104,000 therms p.a. – less than 0.001% of annual NDM gas.
- 11.2.7 Accordingly, the PFD does not better facilitate the relevant objective of providing reasonable economic incentives to secure domestic customer supply security standards. Indeed, the costs outweigh any benefits to security of supply and the PFD creates incentives that are far from "reasonable" within the meaning of Standard Special Condition A11.

11.3 The PFD was based wholly or partly on the following errors of fact⁵⁷

- 11.3.1 Centrica notes that Ofgem's PFD is based on a number of errors in fact, which are material to the outcome of its decision⁵⁸. Ofgem makes specific and material errors regarding:

⁵⁶ See paragraph 1, 7 and 15(b) of Standard Special Condition A11.

⁵⁷ (S175(4)(d)) EA04.

⁵⁸ An error must be material to the outcome of a decision in order for a decision to be regarded as 'wrong' under s175(4)(d) EA04, see *E.ON UK plc v. Gas and Electricity Markets Authority (CC02/07)*, para 5.17

- (i) *The security of supply arising from the PFD.* Redpoint's analysis understates the current security standard (Redpoint analysis, Section 8.1) in that no account has been taken for the potential for regasification terminals to contribute to supply flexibility, ignoring an important element of current supply security (Section 2.3).
- (ii) *The cost of wholesale gas as a result of the PFD.* Ofgem's IA fails to account for the increase of NBP prompt market for gas during or prior to a GDE or the increase in NBP forward contract prices. This is demonstrably wrong - see Section 3.
- (iii) *The impact of the PFD on electricity prices.* Ofgem's IA does not account for any impact on wholesale power prices during or prior to a GDE; this is proven to be incorrect in light of the increased cost of wholesale gas - see Section 4.
- (iv) *The calculation of the appropriate VoLL.* Ofgem's IA adopts a cash out price on the basis that it equates to an estimated value of VoLL for domestic customers, being £20 (PFD, para 1.10). The figure of £20 is incorrect in that (a) the figure of £20 is based on an estimated security standard which has been separately revised (Section 5.2); (b) it ignores the VoLL for NDM calculated by LE (which includes non-household customers who have a lower VoLL) (Section 5.4); and (c) it ignores the concept of LoLP (Section 5.5/5.6). As well as exposing shippers to undue risk and customers to undue cost, these errors promote inefficient customer interruption - see Section 5.
- (v) *The availability of DSR.* Ofgem has underestimated the level of DSR under current arrangements (Ofgem and Redpoint assume that no I&C interruption will occur at any price) and over-estimated the level of DSR available under the PFD (Section 6.10) relative to previous experience (Section 6.4 et seq.) and independent reports (Section 6.8/6.9). These errors overstate the benefits which are attributable to the PFD - see Section 6.
- (vi) *The costs of securing DSR volumes.* Ofgem's IA assumes that that DSR from the DM sector will be available for a cost of £51m NPV (IA, para 3.112, table 9). This estimate wrongly assumes that DSR will be available more cheaply than at present and wrongly ignores industry experience of, the Operating Margins tender process (see Section 7.7). This error understates the costs of the PFD - see Section 7.
- (vii) *The costs to 'downstream' shippers of risk mitigation measures.* While recognising that shippers will need to implement risk mitigation measures (IA, para 3.5), Ofgem's IA has failed to capture these costs - see Section 8.

11.3.2 The above errors, as described more fully in this response, are material to the outcome of the decision.

11.3.3 Given the impact that each of these errors has on the assessment of the costs/benefits of the PFD as outlined in Ofgem IA (Section 10), Centrica considers that Ofgem decision is based on a number of plain errors of fact.