

Gas Security of Supply Significant Code Review

Conclusions

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Overview:

The aim of the Gas Security of Supply Significant Code Review is to reduce the likelihood, severity and duration of a gas supply emergency. We want to ensure that in an emergency the market rules provide appropriate incentives on gas shippers to balance supply and demand. We also propose a mechanism for paying large consumers if they are able to reduce their demand before an emergency. This is intended to avoid or minimise an emergency and protect consumers that incur high costs when interrupted.

In these conclusions, we confirm our decision to reform cash-out arrangements in an emergency. We also confirm our decision to proceed with the development of a centralised demand side response (DSR) mechanism and to place a licence obligation on National Grid to develop it.

Alongside this document, we are publishing a direction to implement the changes to the Uniform Network Code (UNC), and modification notices to change the gas shipper, supply and transporter licences.

Context

We began our Significant Code Review (SCR) into gas security of supply in January 2011 in response to our concerns with the gas emergency arrangements. Our proposed changes have been discussed extensively with industry stakeholders at numerous workshops. Stakeholders have also had the opportunity to provide formal input during 6 separate consultations. The last of these was our statutory consultation which we published in June 2014. We have carefully considered these representations and where appropriate incorporated them into our proposals. In response to stakeholder feedback and a UNC modification proposal, we incorporated a DSR mechanism into the SCR. We have also commissioned extensive input from four separate consultants to help develop and appraise our proposals over the course of this process.

In February 2014 we published our final policy decision to reform the commercial arrangements that would apply in an emergency. We also decided to proceed with the development of a demand side response mechanism. This would allow large consumers to voluntarily reduce their gas consumption, helping avoid an emergency or reduce the impact if one occurred.

Associated documents

Notice – Gas Transporter Licence, September 2014:

<https://www.ofgem.gov.uk/ofgem-publications/90381/gasparticularmodification-ngg.pdf>

Notice – Gas Shipper Licence, September 2014:

<https://www.ofgem.gov.uk/ofgem-publications/90382/gasslcmmodification-shipper.pdf>

Notice – Gas Supplier Licence, September 2014:

<https://www.ofgem.gov.uk/ofgem-publications/90383/gasslcmmodification-supply.pdf>

Notice – UNC, September 2014:

<https://www.ofgem.gov.uk/ofgem-publications/90384/gasscrs36cdirectiondraft.pdf>

Statutory Consultation – Gas Security of Supply Significant Code Review, June 2014:

<https://www.ofgem.gov.uk/publications-and-updates/gas-security-supply-significant-code-review-statutory-consultation>

Final Policy Decision – Gas Security of Supply Significant Code Review, February 2014:

<https://www.ofgem.gov.uk/publications-and-updates/gas-security-supply-significant-code-review-final-policy-decision>

Impact Assessment for Final Policy Decision – Gas Security of Supply Significant Code Review, February 2014:

<https://www.ofgem.gov.uk/publications-and-updates/gas-security-supply-significant-code-review-impact-assessment-final-policy-decision>

Updated Proposed Final Decision – Gas Security of Supply Significant Code Review, July 2013 (ref 128/13):

http://www.ofgem.gov.uk/Markets/WhIMkts/CompandEff/GasSCR/Documents1/130723_GasSCR_upfd.pdf

Gas Security of Supply Report, November 2012:

<http://www.ofgem.gov.uk/Pages/MoreInformation.aspx?docid=3&refer=Markets/WhIMkts/monitoring-energy-security/gas-security-of-supply-report>

Proposed Final Decision – Gas SCR, July 2012 (ref 111/12):

<http://www.ofgem.gov.uk/Pages/MoreInformation.aspx?docid=85&refer=Markets/WhIMkts/CompandEff/GasSCR>

Impact Assessment for the Proposed Final Decision – Gas SCR, July 2012 (ref 112/12):

<http://www.ofgem.gov.uk/Pages/MoreInformation.aspx?docid=91&refer=Markets/WhIMkts/CompandEff/GasSCR>

Draft Policy Decision - Gas SCR, November 2011 (ref 145/11):

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

Initial Consultation - Gas SCR, January 2011 (ref 02/11):

<http://www.ofgem.gov.uk/Pages/MoreInformation.aspx?docid=1&refer=Markets/WhIMkts/CompandEff/GasSCR>

Launch Statement – Gas SCR, January 2011:

<http://www.ofgem.gov.uk/Pages/MoreInformation.aspx?docid=2&refer=Markets/WhIMkts/CompandEff/GasSCR>

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Executive Summary

A key interest for consumers is security of supply. In the event that there is not enough gas to meet demand, a Gas Deficit Emergency (GDE) would be declared. A GDE would be managed by instructing domestic sources of supply to maximise flows and, where necessary, interrupting consumers. Given GB's increasing reliance on imports, instructing domestic supplies may not be enough to resolve the situation.

The GB gas market has historically provided secure supplies, and it is likely to remain resilient to all but the most extreme shocks. We have never experienced a GDE in GB, and the probability of one remains low. However, it is prudent to ensure that market arrangements provide appropriate incentives to maintain secure supplies. The aim of the Gas Security of Supply Significant Code Review (Gas SCR) is to reduce the likelihood, severity and duration of an emergency.

In these conclusions, we confirm our decision to reform cash-out arrangements in an emergency. We think our cash-out reforms are beneficial to consumers, market-based and help reduce the likelihood, severity and/or duration of a GDE. We also confirm our decision to proceed with development of a centralised demand side response (DSR) mechanism and to place a licence obligation on National Grid to develop it. We think this has potential benefits for consumers and could further reduce the likelihood, severity and/or duration of a GDE. However, it is important to ensure this mechanism does not create distortions. More development is needed before a fully working mechanism can be implemented.

Cash-out reform

Gas shippers who do not balance their supply and demand are subject to cash-out charges. Under current arrangements, cash-out prices are frozen in an emergency. The emergency would be managed by National Grid instructing domestic gas suppliers to maximise flows and, where necessary, interrupting consumers.

Given GB's increasing reliance on imports, managing an emergency by instructing domestic supplies to flow may not be enough to resolve an emergency. Furthermore, under current arrangements the cost of interrupting consumers (including domestic consumers) involuntarily is not factored into the cash-out price. This means the risks of interruptions in an emergency sit with consumers who are poorly placed to manage them. Thus shippers do not account for the full value consumers place on maintaining their gas supplies.

Our cash-out reforms change the imbalance prices faced by shippers in a GDE and use funds collected through cash-out to pay consumers that are involuntarily interrupted. Our reforms:

- Unfreeze cash-out prices in an emergency, with no cap on prices;
- Incorporate the cost of *involuntary* consumer interruptions into cash-out charges in a GDE – notably smaller consumers (eg domestic households) would be priced at £14/therm – our estimate of the costs of this interruption; and,
- Use funds recovered from cash-out charges to make payments to consumers for the involuntary service they provide if disconnected in a GDE.

Our cash-out reforms focus on *improving the efficiency of price signals and transferring risks from consumers to shippers*. This places appropriate incentives on market participants to deliver supply security. It ensures that the most efficient actions are taken and that the strength of the incentive is proportional to the risk of a GDE. Our impact assessments have concluded that our reforms will reduce the likelihood, severity and duration of a GDE and that they deliver net benefits.

Demand-side response

The gas market would benefit from large consumers reducing demand voluntarily ahead of an emergency. Our cash-out reforms incentivise shippers to better secure their supplies and thus avoid being short in a GDE. One step they can take is entering into commercial negotiations for voluntary DSR with larger consumers.

There are clear situations where it would be mutually beneficial for both shippers and consumers to agree to commercial interruption (eg when higher gas prices make production uneconomic). However stakeholders expressed doubts that a market for voluntary interruption would emerge of its own accord. A number of stakeholders suggested the development of a centralised mechanism for DSR.

We therefore see merit in a DSR mechanism if it can overcome some of the barriers identified by stakeholders, whilst also not distorting or foreclosing any market for commercial DSR. A mechanism that achieves this will be consistent with the aim of the Gas SCR to reduce the likelihood, severity and/or duration of a GDE. Our modelling showed that a well-designed DSR mechanism would result in a more efficient disconnection order, and so improve efficiency.

Next steps

This is intended to be the final policy document on the Gas SCR. To implement cash-out reform, we are publishing a direction under section 36C of the Gas Act 1986 for changes to the Uniform Network Code (UNC). We are also publishing modification notices for the gas shipper and supply licences. Subject to any appeal these changes will take effect from 1 October 2015.

In addition, we are publishing a modification notice for NGG's gas transporter licence. This places an obligation on National Grid to develop the DSR mechanism and submit a methodology to Ofgem for approval. This licence modification will come into effect 56 days from the date of the modification notice. Subject to any appeal against this licence modification, NGG will be obliged to:

- Develop a DSR methodology and submit it to us by 1 March 2015
- Run a trial if directed by us to do so, and submit a report on the outcomes of the trial to us alongside a final DSR methodology
- Implement the DSR methodology if directed by us to do so

We expect a DSR mechanism, if implemented, would be in place by winter 2016/17.

We are committed to monitoring the impact of our reforms following implementation. We will also continue to engage in the DSR development process and other relevant industry discussions as appropriate.

1. Introduction

Chapter Summary

This chapter provides some background on security of supply and the Gas SCR process.

Background

Gas security of supply in Great Britain

- 1.1. Natural gas is a crucial part of the energy mix in Great Britain (GB) and will continue to be well into the future. Ofgem's principal objective is to protect the interests of present and future consumers. A key interest for consumers is security of supply. For most domestic households a loss of gas supply would mean a loss of access to essential services such as heating and cooking. This could have severe consequences, particularly during winter and for the most vulnerable consumers. For industries reliant on gas as a fuel or feedstock, a loss of supplies could mean a major loss of output and possibly significant damage to machinery and equipment. A loss of gas supply for gas-fired power stations could have knock on impacts on electricity security of supply. Ensuring GB's gas security of supply is adequately protected is therefore of vital importance.
- 1.2. Historically, demand in GB has been met by domestic production. However as domestic supplies decline we are increasingly reliant on imported gas from Norway, mainland Europe and global Liquefied Natural Gas (LNG) markets. Whilst there is some uncertainty about GB's supply/demand outlook in the future, this trend of significant import dependency is expected to continue.

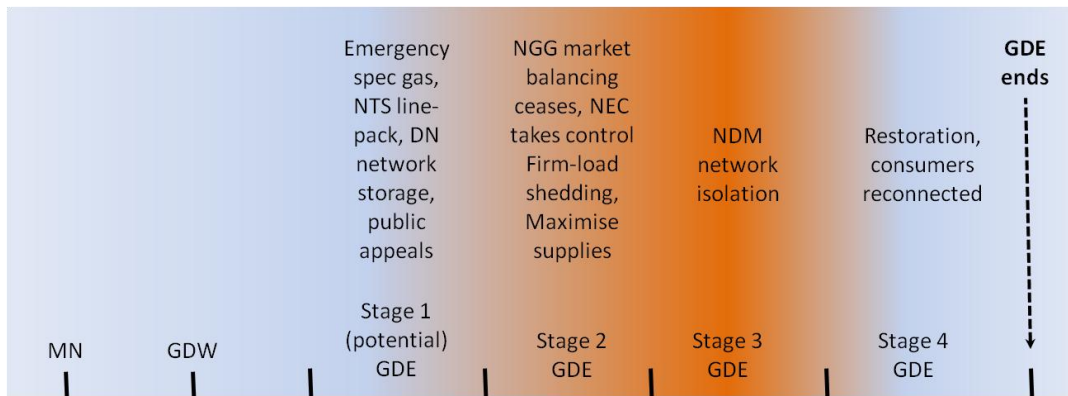
What is a Gas Deficit Emergency?

- 1.3. If shippers do not contract for sufficient gas to meet demand it may result in a Gas Deficit Emergency (GDE).¹ Figure 1 below sets out the various stages of a GDE. Prior to a GDE the System Operator (SO) – in this case National Grid Gas (NGG) – would issue a series of warnings that supplies are running low. If the situation worsens, and the mitigating actions taken by the SO are insufficient, an emergency would be declared and consumers could be interrupted. Consumer interruptions (ie consumers reducing or ceasing consumption) can also be referred to as providing demand-side response (DSR). Notably in the case of a GDE they would be doing this involuntarily.

¹ A Gas Deficit Emergency is a type of Gas Supply Emergency arising as a result of insufficient deliveries of gas being available to meet required demand on the gas system or as a result of a potential or actual breach of a safety monitor.

- 1.4. As can be seen in Figure 1, daily metered (DM) consumers (ie large consumers) would be first to be interrupted involuntarily during a process known as firm-load shedding. If this does not resolve the problem, non-daily metered (NDM) consumers (ie small consumers, including domestic households) would be interrupted involuntarily as parts of the network would need to be physically isolated.

Figure 1 - Stages of a Gas Deficit Emergency²



- 1.5. Since liberalisation in the 1990s, the GB gas market has delivered secure supplies and substantial investment in new import infrastructure. We have never had a GDE in GB and the likelihood of one occurring is low. However this should not be a reason to be complacent. We are committed to ensuring our market arrangements provide the right signals to attract gas to GB when we need it most.

The Gas SCR

What is the aim of the Gas SCR?

- 1.6. The aim of the Gas SCR has been to explore and implement appropriate market-based measures to reduce the likelihood, severity and/or duration of a GDE. This is in line with Section 36C of the Gas Act 1986 which gives us powers to direct changes to the Uniform Network Code (UNC) where they are beneficial, market based and have the effect of reducing the likelihood of a GDE occurring, and/or the severity or duration of any emergency which may occur.
- 1.7. More broadly, our principal objective is to protect the interests of present and future consumers. Key interests for consumers are secure supplies,

² MN = Margins Notice; GDW = Gas Deficit Warning. See Glossary for explanations of these terms. Full details of the National Gas Emergency Plan can be found here: https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/65596/6913-national-emergency-plan-gas.pdf

affordability and sustainability. Implementing reforms that reduce the likelihood, severity and/or duration of a GDE in a beneficial and market based manner is consistent with this duty.

- 1.8. Where our reforms entail changes to the UNC, it is important that those changes are consistent with the UNC relevant objectives.³ Reforms that reduce the likelihood, severity and/or duration of a GDE will help promote the efficient and economic operation of the gas system.⁴ In taking steps to improve security of supply, it is important to ensure that the effectiveness of competition is not unduly inhibited.⁵ This can be achieved by ensuring the economic incentives on market participants to secure consumer supplies and avoid a GDE are reasonable.⁶ Implementing reforms that succeed in striking a proportionate balance between promoting security of supply and securing competition is consistent with these objectives.
- 1.9. We have sought to develop our reforms with the above in mind. The following chapters summarise our reforms, including the previous analysis, stakeholder engagement and publications that has underpinned the development process.

How have our reforms developed?

- 1.10. Our proposed reforms have developed considerably since our draft policy decision was published in November 2011.⁷ They now fall into two areas: cash-out reform and a DSR mechanism. These different elements of our proposed reforms are addressed separately in chapters 2 and 3 respectively.
- 1.11. Both elements of our proposed changes have been discussed extensively with industry stakeholders at numerous workshops. Stakeholders have also had the opportunity to provide formal input during 6 separate consultations over the same period:
 - Initial consultation (January 2011)
 - Draft policy decision consultation (November 2011)
 - Proposed final decision consultation (July 2012)
 - DSR tender consultation (July 2013)
 - Final policy decision consultation (February 2014)
 - Statutory consultation on final policy decision (June 2014)
- 1.12. We have carefully considered these representations and where appropriate incorporated them into our proposals. In response to stakeholder feedback

³ These 8 objectives – identified as 1(a) to 1(h) – are set out in Standard Special Licence Condition A11 of the Gas Transporter Licence.

⁴ Objectives 1(a) and 1(b).

⁵ Objective 1(d).

⁶ Objective 1(e).

⁷ <https://www.ofgem.gov.uk/publications-and-updates/draft-policy-decision-gas-security-supply-significant-code-review>

and a UNC modification proposal, we incorporated a DSR mechanism into the SCR. We also made changes to our detailed proposals to mitigate the risk of perverse incentives on long shippers.

- 1.13. We have also commissioned extensive input from consultants throughout the process of developing and appraising our proposals:
- London Economics conducted a study into the value that consumers place on maintaining secure supplies.
 - Redpoint conducted quantitative modelling for our initial assessment of the impacts of our proposals.
 - ESP Consulting provided input in the early stages of discussing the design of a DSR mechanism.
 - Pöyry conducted quantitative modelling for our final assessment of the impacts of our proposals. This covered both cash-out reform and a range of potential DSR mechanism designs.

Structure of this document

- 1.14. This document marks the conclusion of our Gas SCR. It is structured in the following manner:
- Chapter 2 summarises our cash-out reforms. It sets out the content of the reforms, as well as the previous analysis, stakeholder engagement and key publications that underpin this element of our decision.
 - Chapter 3 summarises our intention to oblige NGG to continue with the development of a DSR mechanism. As with Chapter 2, it also sets out the previous analysis, stakeholder engagement and key publications that underpin this element of our decision.
 - Chapter 4 summarises the responses to our June 2014 statutory consultation. It sets out any changes we have made to the licence and code drafting as a result. Where we have not made any changes we explain why the current drafting is appropriate.
 - Finally, Chapter 5 sets out the timescale for implementing our cash-out reforms, as well as the expected process for developing the DSR mechanism methodology.

2. Cash-out reform

Chapter Summary

This chapter summarises our reforms to the gas balancing arrangements in an emergency. It also sets out the previous analysis, stakeholder engagement and key publications that underpin our decision to proceed with implementation.

Background to the reforms

What is cash-out?

- 2.1. Under the current market arrangements, shippers have a financial incentive to ensure that they balance supply and demand. If a shipper does not take the same amount of gas off the system as they put on, they face imbalance (or “cash-out”) charges. Where a shipper puts more gas onto the system than they take off (ie their supply was more than their demand) they are classed as being “long”. Where they do the opposite (ie their supply was less than their demand) they are “short”.
- 2.2. Cash-out charges are intended to reflect the cost faced by the System Operator (SO) in balancing the system. Generally the charges faced by long and short shippers are less favourable than if they had balanced their own position in the market. As such they incentivise shippers to balance their own positions.

Why cash-out reform instead of the alternatives?

- 2.3. Since our draft policy decision our view has been that reforming the market rules in a GDE is likely to be the most efficient way to achieve the aim of the Gas SCR. Our reforms have sought to ensure that the emergency cash-out arrangements provide appropriate incentives on gas shippers to balance.
- 2.4. Our initial consultation on the Gas SCR⁸ in January 2011 considered a range of measures that could be implemented to improve GB security of supply. We decided to focus on cash-out reform for the following reasons:
 - 1) A GDE will be the result of shipper imbalance. By definition a GDE arises when there is insufficient gas available to meet GB demand (ie the system is net short). The GB market is based on the principle of shippers

⁸ <https://www.ofgem.gov.uk/publications-and-updates/initial-consultation-gas-security-supply-significant-code-review-scr>

balancing their own positions and the SO acting as the residual balancer. Gas shippers are incentivised to balance supply and demand by the cash-out charges on any imbalance. As such cash-out provides incentives for shippers to take individual actions that will reduce the likelihood, severity and duration of a GDE.

- 2) We have long-standing concerns that the existing cash-out arrangements are not fit for purpose in the event of a GDE. These were expressed in detail in 2010 by Project Discovery⁹. Under current arrangements, cash-out prices are frozen in a GDE. The emergency would be managed by instructing domestic sources of supply to maximise flows and, where necessary, interrupting consumers. Given GB's increasing reliance on imports, managing a GDE by instructing domestic supplies to flow may not be enough to resolve the situation. Furthermore, interrupting consumers is a balancing action, but at present is not treated as such. As set out previously, this weakens incentives for shippers to deliver secure supplies. Under current arrangements, shippers do not face the full costs or risks of an emergency.
- 3) Shippers are best placed to implement appropriate measures to enhance security of supply if faced with the correct incentives. Our market-based reforms place incentives on shippers to enhance security of supply. Shippers are incentivised by the cash-out arrangements to balance supply and demand. Increasing the cash-out risks associated with being imbalanced in a GDE will incentivise shippers to take measures to avoid being imbalanced in a GDE. Actions could be long-term – such as investing to expand storage capacity, or short term – such as changes to trading behaviour at times of system stress. We have consistently stated that we think shippers are best placed to make these decisions. A centralised solution risks picking winners and distorting the market. As such, we think that incentivising shippers is likely to be the most efficient way to reduce the likelihood, severity and/or duration of a GDE.
- 4) The risks to GB security of supply will change over time and at present they remain low. It is therefore prudent to implement reforms that create incentives (and thus incur costs) at a level that changes over time in line with changes in the threat to security of supply. If the risk of a GDE increases, then the strength of the incentives driven by that risk would also increase. This ensures that our reforms create reasonable incentives and should drive a proportionate response.

2.5. The Security of Supply Report¹⁰ we submitted to government in November 2012 set out a range of further measures that could be taken in addition to cash-out reform. After considering and quantitatively assessing these options,

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<http://www.ofgem.gov.uk/Pages/MoreInformation.aspx?docid=73&refer=Markets/WhlMkts/monitoring-energy-security/Discovery>

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<http://www.ofgem.gov.uk/Pages/MoreInformation.aspx?docid=3&refer=Markets/WhlMkts/monitoring-energy-security/gas-security-of-supply-report>

government decided that further measures to protect security of supply (eg greater intervention in the form of supporting storage) were not cost-effective.

How have we approached cash-out reform development?

- 2.6. Even as our cash-out reforms have developed, it is important to note that they have always sought to achieve the overarching aim of the Gas SCR in two key ways: by *improving the efficiency of price signals* and by *transferring risks from consumers to shippers*. The security of supply benefits associated with each of these are discussed in the next two sections.

How have we assessed the impact of our cash-out reforms?

- 2.7. We commissioned Redpoint and Pöyry to conduct quantitative modelling to assess the merits of cash-out reform. The Pöyry analysis covered the most up-to-date version of our reforms. However, the consistent emphasis on improving the efficiency of price signals and transferring risks from consumers to shippers means that many of the findings from the earlier Redpoint analysis still provide a good guide as to the likely effect of our reform.
- 2.8. In assessing the impact of our reforms it is important to note that modelling high impact low probability events is inherently difficult and any modelling approach has limitations. In particular, both sets of modelling focused on the benefits and costs of utilising DSR more efficiently. Both sets of modelling indicated cash-out reform would result in net benefits, ranging from £0-£65m dependent on approach and scenario.
- 2.9. The modelling we commissioned was unable to quantitatively assess the dynamic effects of price signals, or the effect of transferring risks from consumers to shippers. Both these factors are a key element of the reforms that are not fully captured in the above CBA. As such we have considered the quantitative modelling results alongside a range of qualitative arguments.

The benefits of improving the efficiency of price signals

- 2.10. Our reforms to cash-out look to improve the efficiency of price signals by:
- unfreezing cash-out prices in a GDE; and,
 - ensuring cash-out prices reflect the cost of consumer interruptions.

Unfreezing cash-out prices

- 2.11. Our proposals implement an unfrozen cash-out price throughout a GDE. An unfrozen cash-out price provides incentives for shippers that better reflect the condition of the gas system on a given day by allowing prices to move with market conditions.

- 2.12. In the event that involuntary consumer interruptions occur, cash-out prices would be frozen under current arrangements. This could mean that prices may be frozen too low, at a level that does not reflect the value of security of supply. Moving to an unfrozen price has the potential to attract additional sources of gas to GB, by allowing prices to continue to rise if necessary as a GDE develops. Any such additional sources of gas would help reduce the severity and duration of a GDE.
- 2.13. An unfrozen price also allows cash-out prices to return more quickly to “normal” levels as a GDE is resolved. Under current arrangements cash-out prices would remain frozen until the formal end of any GDE. However, the time taken to reconnect certain consumers – particularly those interrupted during network isolation – means the formal end of a GDE may come sometime after the market is able to return to “normal” functioning. During any intervening period, cash-out prices frozen artificially high would provide excessive incentives to balance. This may cause the system to veer from being under-supplied to being over-supplied. This will entail unnecessary costs for the SO when trying to stabilise the system, and unnecessary costs for shippers who would be forced to trade at artificially inflated prices. Moving to an unfrozen price in the latter stages of a GDE would therefore help reduce the costs associated with a GDE.
- 2.14. Stakeholders have expressed concerns that an unfrozen, uncapped cash-out price could reach any level in a GDE. However, we have noted in several workshops and publications that there is no hard limit on the level that cash-out prices could reach under current arrangements. Furthermore, stakeholders also had concerns with capping cash-out prices. Shippers were concerned that any cap would act as a target for trading. NGG was concerned that any cap would limit its discretion to take actions in a GDE at prices above a cap. Consumers were concerned that any cap would limit their ability to fully recoup the costs they incur when reducing demand.
- 2.15. In moving to an unfrozen price we have considered stakeholder views and been careful to minimise the risks of unintended consequences. For instance, we have introduced criteria to ensure that unfrozen cash-out prices in a GDE will continue to be based on a System Average Price (SAP) that is robust. Similarly, we have introduced a safeguard to prevent these unfrozen cash-out prices falling as a GDE worsens. Without this there could be perverse incentives on shippers to actually worsen a GDE if it meant that the cash-out charges they faced at the end of the day were reduced.
- 2.16. Our reforms unfreeze cash-out prices throughout a GDE. This is done subject to provisions that cash-out prices do not fall as a GDE worsens and that SAP is based on robust trading data.

The importance of cash-out reflecting the cost of consumer interruptions

- 2.17. Our proposals also ensure that *involuntarily* interrupting consumers is incorporated into cash-out where this is feasible and prudent. The cost

incurred by an interrupted consumer is often referred to as their Value of Lost Load (VoLL). As we have argued throughout the SCR, involuntary consumer interruptions are balancing actions because they are taken by the SO to resolve a system imbalance. Unlike other balancing actions though, they are currently not included in the calculation of cash-out prices.

- 2.18. The result of not costing involuntary consumer interruptions taken to balance the system is to shield industry from facing the full cost that a GDE imposes on consumers. This dampens cash-out prices as a signal of scarcity at times of system stress, and leads to inefficient incentives on shippers to balance their positions and efficiently procure gas to avoid involuntary interruptions. Our concerns with this are well documented and are consistent across both gas and electricity markets (see the Electricity Balancing SCR¹¹).
- 2.19. Resolving this issue will improve incentives on shippers to appropriately protect security of supply. It is likely that any measures shippers take in response to these incentives will have the effect of reducing the likelihood severity and/or duration of a GDE.
- 2.20. We have approached the pricing of consumer interruptions in two ways: one approach for large consumers (ie DMs) and another for small consumers (ie NDMs). This is because having a daily-read meter allows for more direct engagement with the gas wholesale market through exposure to indexed prices or commercial interruption arrangements.

Our approach to pricing involuntary interruptions to DM consumers

- 2.21. DM consumers are industrial and commercial (I&C) consumers that have relatively large levels of consumption. A London Economics study we commissioned highlighted that interruption costs vary significantly between sectors (see for example Figure 2 and Figure 3 later in this document). Pöyry built on this work by looking at differences in the dispensability of parts of certain large consumers' loads. This revealed that even within sectors and within the overall loads of individual consumers, there is scope for even greater variation in the costs of reducing demand.
- 2.22. Because of their size and daily-read capability DM consumers have the ability to directly reflect these individual interruption costs in the wholesale market when providing DSR. Throughout the SCR we have been keen for DM interruptions to be priced in a market-based manner such as this. This can be done by consumers negotiating for interruptible contracts or ad-hoc interruption agreements with their shippers/suppliers. We have been careful to ensure that our proposals encourage this behaviour where possible. This is because the more efficient use of DSR in and of itself can also reduce the

¹¹ <https://www.ofgem.gov.uk/electricity/wholesale-market/market-efficiency-review-and-reform/electricity-balancing-significant-code-review>

likelihood, severity and duration of a GDE, as well as the economic costs associated with one. This is discussed in more detail in Chapter 3.

2.23. Despite the avenues open to DM consumers to provide DSR voluntarily, we have still chosen to introduce a price for DM consumers that are *involuntarily* interrupted. This is in recognition of the fact that even involuntary interruptions still constitute balancing actions. Importantly though, the price we have chosen for involuntary DM interruptions – the average SAP of the 30 days prior to the GDE (“30-day SAP”) – is not intended to reflect the interruption costs of any particular DM consumer. We also expect that any DM interruptions priced in at this level will not constitute the marginal balancing action. As such, they will not have much of a direct effect on the efficiency of price signals. Instead DM consumers are much more likely to have an impact on the efficiency of price signals through providing *voluntary* DSR. The choice of 30-day SAP is intended to ensure the incentives remain in place for this.

2.24. Our cash-out reforms treat involuntary interruptions to DM consumers as balancing actions and price them into cash-out at 30-day SAP.

Our approach to pricing involuntary interruptions to NDM consumers

2.25. Unlike DM consumers, NDM consumers are generally not able to participate directly in the wholesale market at present. This is because their meters are not read on a daily basis and so interruption cannot easily be measured or verified. As a result, our proposals directly price NDM consumer interruptions into the cash-out arrangements by introducing a proxy estimate for NDM VoLL. This is based on a typical domestic consumer and set at £14/therm. Again, this was underpinned by the London Economics study we commissioned that sought to calculate the value that consumers place on uninterrupted gas supplies. We have also taken on board some stakeholder feedback in our calculation of NDM VoLL in order to ensure it better reflects the value that consumers place on their supplies during winter.¹² The detailed rationale underpinning this is set out in past documents, notably the July 2013 updated proposed final decision letter.

2.26. Importantly, we have taken the view that it is not desirable for NDM VoLL to reflect the full marginal cost of network isolation. In part this is to limit liabilities on shippers in a GDE. Moreover, the duration of NDM interruptions is not within the control of shippers. Following network isolation, consumers must be visited individually by engineers to be safely reconnected to the system. This is the responsibility of distribution networks. Even if shippers recovered sufficient gas supplies quickly, safely reconnecting consumers could

¹² Earlier in the SCR we proposed setting NDM VoLL at £20/therm. This was based on London Economics’ estimate of a VoLL of £30/day for a domestic consumer, divided by 1.5therms/day average domestic consumption. However, any interruptions are most likely to occur during winter. Furthermore, the survey questions that formed the basis of London Economics study referred to ‘summer’ and ‘winter’. As such we revised our estimate of NDM VoLL to £14/therm. This is £30/day divided by 2.2therms/day average *winter* domestic consumption.

- still take weeks. As such we have limited the pricing-in of NDM VoLL to days when any new network isolation is initiated.
- 2.27. On these days, NDM VoLL would be incorporated into cash-out to ensure that prices reflect the value domestic consumers place on secure supplies. This means that the price signal will incentivise shippers to deliver security of supply up to the value NDM consumers place on it. Pöyry's modelling showed that our reforms have the potential to ensure that the right price signals are sent to attract gas to GB.
- 2.28. Our cash-out reforms treat involuntary interruptions to NDM consumers as balancing actions and price them into cash-out at £14/therm on the first day that they are subject to network isolation.

The benefits of transferring risks from consumers to shippers

Payments to consumers for involuntary interruption

- 2.29. The principle of recovering the cost of balancing actions from the whole of the shipper community is well established. NGG as SO is neutral to the costs of balancing the system. Cash-out is the mechanism which targets this cost recovery at shippers who contributed to the system imbalance. The interruption of consumers is a balancing action like any other, and so should be treated in the same way where this is feasible.
- 2.30. Under current arrangements, any net funds remaining or required after cash-out charges are levied and balancing actions paid for are effectively smeared across the industry via the neutrality process. In normal operation, the scale of this neutrality smear is typically small and can be either positive or negative.
- 2.31. However, in a GDE, we would generally expect the volume of short shippers' imbalances to exceed the volume of long shippers' imbalances.¹³ This is because in order for a GDE to occur the system must be short in net terms. This means that the net of cash-out charges (and so the scale of a neutrality smear) is likely to be positive and significant in a GDE. Simply recycling these monies back to the industry would likely blunt incentives from cash-out, as a shipper would effectively face less than the full cash-out price once the neutrality smear is taken into account.
- 2.32. Our proposals therefore introduce payments to interrupted consumers. These payments are recognition for the involuntary DSR service that interrupted consumers have provided to help balance the system. Funding these through

¹³ Accepting that a situation could arise where a GDE is declared early in the day but shippers are able to recover their positions before the end of the day.

cash-out charges helps maintain appropriate and reasonable incentives on shippers in a GDE and is consistent with the payment of other balancing actions. Payments are made at the levels at which involuntary interruptions are priced into cash-out (eg at NDM VoLL for NDMs or 30-day SAP for DMs).

Our approach to payments for involuntary interruptions to DM consumers

2.33. For DMs, we explained above that our proposals price in involuntary interruptions at 30-day SAP. We also set payments to DM consumers at this level. This means that it remains mutually beneficial for both DM consumers and shippers/suppliers to agree to commercial interruption.¹⁴ As was noted in the previous section, we think increased provision of voluntary DSR promotes the more efficient use of DSR and improves the efficiency of price signals.

2.34. Our cash-out reforms treat involuntary interruptions to DM consumers as balancing actions and pay them at 30-day SAP for each day that they are subject to firm-load shedding.

Our approach to payments for involuntary interruptions to NDM consumers

2.35. Our proposals are to pay NDMs at £14/therm (NDM VoLL) in the event that they are involuntarily interrupted. As with the pricing in of NDM VoLL, we are limiting payments to NDMs to the first day of network isolation. This means that we are not enacting a complete transfer of the risks of a GDE, and so many of these costs will still sit with consumers.

2.36. Our rationale for this is to limit the liabilities on shippers by only transferring a proportionate amount of the risks of a GDE, particularly given the reconnection of NDMs is beyond their control. This decision is backed up by modelling conducted by Redpoint that looked at the effect of fully pricing in the risks of NDM interruptions. Redpoint showed that fully pricing the costs of network isolation would have entailed a greater impact on consumer bills as suppliers sought to manage significantly increased risks. The result was lower net benefits for consumers than our chosen approach.

2.37. Our cash-out reforms treat involuntary interruptions to NDM consumers as balancing actions and pay them at £14/therm on the first day that they are subject to network isolation.

The benefits of transferring these risks to shippers

¹⁴ Setting the payments for *involuntary* interruptions for DM consumers at 30-day SAP means shippers and DM consumers can potentially agree mutually beneficial interruption – at a price between the involuntary DM price and the shipper’s expected cash-out price.

- 2.38. Relative to current arrangements, we expect a shipper that is short when consumers are involuntarily interrupted to incur greater costs as a result of our reforms. This targeting of costs at those that contributed to a GDE occurring has been a consistent theme throughout the SCR. Economic rationale would clearly indicate that this would provide reasonable incentives for shippers to take measures to avoid being short in a GDE. Shippers, unlike consumers, are best placed to act in response to these incentives. The measures shippers may take will reduce the likelihood severity and/or duration of a GDE. This entails improved security of supply for consumers.

Accounting for NDM interruptions in shipper imbalance positions

- 2.39. To treat NDM interruptions as balancing actions and pay consumers it is essential for the volume associated with consumer interruptions to be taken into account when calculating shipper imbalances. Under current arrangements this would not happen, and this means the interruption of NDM consumers would result in shippers' imbalance positions improving. This could create a perverse incentive whereby it is in a shipper's interest to actually worsen a GDE and force the SO to involuntarily curtail some NDM consumers.
- 2.40. Our proposed reforms therefore extend existing Emergency Curtailment Quantity (ECQ) processes to ensure NDM interruptions are properly accounted for in shipper imbalances.¹⁵ This means shippers will face the correct incentives to balance in a GDE. In particular, it will ensure that the costs of a GDE fall more directly on the shippers that could be said to have 'caused' the emergency (ie those shippers that were short). Where this incentivises shippers to take measures to avoid being short in a GDE, this is likely to reduce the likelihood severity and/or duration of a GDE.

- 2.41. Our reforms incorporate NDM consumers into the ECQ arrangements on the first day that they are subject to network isolation.

Mitigating the likelihood and impact of a "shortfall"

- 2.42. Our intention is that payments to consumers are funded by cash-out charges on short shippers. However, stakeholders have expressed concerns that in certain situations these monies from short shippers may be insufficient, resulting in what we have referred to throughout the SCR as a "shortfall". Without changes, any shortfall would effectively be smeared across all shippers via the neutrality process according to their throughput on the day.

¹⁵ The ECQ arrangements adjust imbalances such that a shipper's imbalance position does not benefit from the emergency curtailment of demand (the "DR ECQ quantity"). It also ensures shippers are paid for the gas they are then obliged to deliver to the system, even though their consumers have been curtailed. Currently ECQ only applies to DM consumers.

- 2.43. We have made significant efforts to reduce the likelihood of any “shortfall” in net cash-out funds and minimise the size should one occur. We think it is very unlikely that a shortfall would arise when the system is sufficiently net short for involuntary consumer interruptions to occur. Even so, we are mindful that excessive risks should not be transferred to shippers, particularly to those shippers that are not responsible for causing a GDE. We have therefore taken several additional steps to mitigate the effects of any shortfall.
- 2.44. Our cash-out reforms introduce an additional short shipper charge and, if necessary, limit consumer payments to those received from short shippers in the event that there is a “shortfall”. In the event of shipper default we would maintain the existing arrangements. However, to maintain incentives to flow gas, neutrality smearing in a GDE will be done on the basis of throughput for the 365 days preceding any GDE.

The potential risks and costs

- 2.45. Any policy intervention aimed at improving security of supply is likely to incur some costs. As with the benefits, these have been difficult to measure. Where possible we have sought to quantify these. Otherwise we have relied on qualitative evidence and economic rationale. Our impact assessments have set out our findings and each of these has also incorporated input from consultants to enhance our assessment of the impacts of our proposals. Our policy proposals will be in line with the objectives we have set out in Chapter 1 if these costs are outweighed by the benefits.

Suppliers and shippers funding consumer payments

- 2.46. Our proposed reforms to cash-out introduce consumer payments for involuntary interruptions. In the modelling conducted by Pöyry the total payments made in each of the modelled emergencies were on average £0.7bn, with a maximum of £1.3bn. These estimates are also broadly in line with Redpoint’s modelling which produced an average of £0.3bn and a maximum of £1.5bn.¹⁶
- 2.47. These are significant costs relative to those resulting from balancing in normal day-to-day operation. However, a GDE is an exceptional event. Moreover, it should be noted that these costs currently sit with consumers who are poorly placed to manage them. When compared to the economic costs of a GDE (which were modelled by Pöyry as being potentially in excess of £50bn) a significant proportion of the risks of a GDE will likely remain with consumers even after our reforms.

¹⁶ These refer to a different version of cash-out reform than that currently proposed. In particular, the consumer payments under our updated proposals are likely lower than those modelled by Redpoint because a) we have reduced our estimate of NDM VoLL from £20/therm to £14/therm, and b) DM consumers are now paid at the lower 30-day SAP level.

- 2.48. Furthermore, the emergencies simulated by Pöyry entailed large and sometimes simultaneous infrastructure outages lasting for 2 month periods during a 1 in 50 winter. Such events are therefore very unlikely. This is reflected in the Pöyry modelling which assigned a combined probability of approximately 1 in 700 years to the four emergency events they modelled.
- 2.49. The Redpoint modelling also generally required the combination of multiple infrastructure outages with particularly cold weather for consumers to be interrupted. Their modelling also indicated that the probability of a GDE occurring is very low, with NDM interruptions appearing to occur on a 1 in 167 year basis.
- 2.50. If a GDE were to occur there would be substantial costs for consumers. Without our cash-out reforms these would be direct (eg costs to consumers of being interrupted). Following our reforms, a portion of these direct costs will be transferred to shippers, who are better placed to respond to those incentives (eg by taking steps to better secure consumers' supplies).
- 2.51. Shippers and suppliers may pass some of the costs they expect to arise from making consumer payments in a GDE back on to consumers in the form of higher bills. However, the low probability of a GDE occurring means these large consumer payment costs are very unlikely to arise. As such the expected impact on consumer bills is small. This fits with quantitative estimates of the bill impacts of our reforms by both Redpoint and Pöyry in the range of 1-11p per domestic consumer per annum.¹⁷ We have considered these costs to be a reasonable price to pay in return for the benefits of improving the cash-out arrangements. Moreover, where shippers take measures to mitigate their likelihood of being short in a GDE, any pass through of the cost of payments to consumers will almost certainly be reduced.

Possible price impacts of our reforms

- 2.52. Throughout our previous documents and workgroups we have discussed the possible impacts our reforms could have on prices – both during and outside of a GDE. This includes the direct impact *in the event* that consumer interruptions occur (eg of NDM VoLL setting cash-out prices) as well as the indirect impact of prices changing *in expectation* of an increased risk of consumer interruptions occurring. Both of these represent rational market responses to our reforms.
- 2.53. It has not always been possible to quantitatively model all of these impacts (particularly the indirect ones). Our February 2014 impact assessment noted these difficulties and provided background on the modelling approaches taken

¹⁷ Again, the policy modelled by Redpoint is not necessarily fully consistent with the final proposals. However, the high level policy remains similar enough that we can draw inferences from the results of the Redpoint modelling.

by both Pöyry and Redpoint, as well as the steps we have taken to improve any modelling in light of stakeholder feedback.

- 2.54. Nevertheless, as we have set out in previous documents, the fact that this has entailed unquantified benefits as well as unquantified costs means the difficulties quantifying these price effects is unlikely to have a significant effect on the anticipated net benefits of the reforms. We acknowledge that our reforms could entail increases in prices, and hence costs for market participants. However, these price effects could also deliver benefits, for example by attracting additional imports as the risk of a GDE increases – reducing the likelihood of a GDE occurring.
- 2.55. We have also sought to address concerns raised by stakeholders about our reforms creating a target price for the market in a GDE. In our previous documents we have set out why we think these effects are unlikely to arise. This is primarily because they are not the result of rational market behaviour. We agree that prices may rise ahead of interruptions as a rational response to increased risks, but do not think it is likely that prices would jump to a target level if the chance of interruptions is not certain.

Suppliers and shippers trading in the wholesale market

- 2.56. Changes to price signals, either direct or indirect, will have impacts on trading. Two key areas are how higher average prices in the market would affect costs in terms of posting collateral to trade or procuring spot gas (ie unhedged volumes purchased near to delivery). This could then have knock-on effects for liquidity and competition if certain shippers are forced to cease or reduce trading.
- 2.57. Shippers and suppliers generally buy and sell a significant proportion of their gas in forward markets. Contracting for gas in this manner means that much of the gas supplied to consumers during a GDE will have been insulated from any short-term fluctuations in price. However, any remaining gas that is bought on spot markets is not insulated from short-term fluctuations in price.
- 2.58. Furthermore, shippers trading in the market are generally required to post collateral when doing so. This is more readily associated with exchange trading, most notably the on-the-day commodity market (OCM) which is a fully collateralised market. Collateral is also dependent on prices, and so collateral costs for shippers procuring spot gas will also be exposed to short-term price fluctuations. For both reasons outlined above, where our reforms result in an increase in average prices, the costs of short-term trading will increase. The opposite will be the case where our reforms result in a decrease in average prices.
- 2.59. We have never had a GDE and it is very difficult to anticipate what level prices would reach in a GDE – either under current arrangements or following our reforms. The impact of our proposed cash-out reforms on average prices is therefore difficult to model. Our February 2014 Impact Assessment

illustrated this by providing a range for changes in the costs of procuring spot gas. Where prices were lower on average as a result of cash-out reform, costs were also lower. The opposite was the case where prices were higher on average as a result of cash-out reform.

- 2.60. Bearing this in mind, there are some periods where we might reasonably expect our reforms to result in higher prices than under current arrangements (eg, as a result of NDM VoLL being priced in). However, there are other periods where our reforms are likely to result in lower prices than under current arrangements (eg, towards the end of a GDE where unfrozen cash-out allows prices to return to “normal” faster).
- 2.61. To summarise, the impact of our reforms on trading costs is highly uncertain. These costs may well increase when there is a significant probability of NDM VoLL being factored into cash-out prices, but then any emergencies where NDM network isolation occurs will also cause the inefficiencies associated with maintaining a frozen price to be particularly pronounced. Moreover, as we have consistently pointed out, any risk of increased costs for shippers in a GDE should incentivise shippers to take measures to prevent a GDE occurring in the first place. Unfortunately fully quantifying trading or credit costs has not been feasible, largely due to the complexity of the processes that may cause them to either rise or fall. On balance though, we expect that changes in trading costs are unlikely to have a significant effect on the anticipated net benefits of the reforms.

Suppliers and shippers managing credit for balancing

- 2.62. We have noted throughout our publications that our proposed reforms will likely have implications for the extent of industry indebtedness for balancing (and thus required balancing credit). This is because our reforms will alter cash-out prices and potentially the extent of shipper imbalances in a GDE. Possible impacts of a general increase in industry balancing indebtedness may be increases in the costs of credit, higher barriers to entry and expansion and a reduction in competition.
- 2.63. To gauge possible balancing credit impacts, we have focused on the size of consumer payments the industry will be exposed to. This provides an indication of the net costs of a GDE. Dependent on price levels and relative imbalance positions, the credit impacts on individual shippers could differ. As with the impact on the costs of trading outlined above, this could be positive or negative, and so difficult to predict and quantify. Our statutory consultation document also set out how we looked at evidence of the impact of high prices in other markets, notably in the USA. In both cases, the evidence suggested that the credit risks being placed on shippers by our reforms are manageable.
- 2.64. In previous documents, we have also recognised that our cash-out reforms have brought broader potential concerns with the credit arrangements into focus. We are supportive of the discussions that have already begun at some industry meetings to consider these issues. Industry is able to raise a

modification to propose resolutions to these issues if this is thought to be necessary. We have maintained throughout the SCR that the industry is best placed to consider these issues. Ofgem would always give due consideration to any changes the industry may deem necessary to the existing credit arrangements. As with other industry discussions, we are open to engaging and participating as appropriate.

Suppliers and shippers taking measures to mitigate risks

- 2.65. The limitations of modelling high impact, low probability events have meant that arriving at a complete estimate of the costs faced by shippers and suppliers has not been feasible. All modelling we have commissioned has focused on the expected cost of consumer payments arising from cash-out reform. This has resulted in quantitative estimates of the bill impacts of our reforms in the range of 1-11p per domestic consumer per annum. While our assessments have not quantified all costs, as set out earlier in this chapter there are also benefits that have not been quantified.
- 2.66. Throughout the Gas SCR we have persistently made the point it is for shippers and suppliers to determine how they mitigate the risks they face. One of the cheapest and most effective ways is for them to change their behaviour. This could include taking measures that reduce their likelihood of being short in a GDE. As we have discussed in previous documents, such measures may include:
- negotiating for commercial interruption,
 - diversifying supplies,
 - holding more storage capacity or altering the usage of existing capacity,
 - investing in new infrastructure, and so on.
- 2.67. This is not an exhaustive list. The key point is that shippers and suppliers are best placed to decide what mitigation measures are the most appropriate.
- 2.68. In general though, if the risks of a GDE occurring are very low, the rational response may well be to take no mitigating measures. Here the upfront costs of taking steps to mitigate the risks of a GDE are likely greater than the costs associated with simply remaining exposed to the risks of high cash-out prices and emergency consumer payments. When the risks of a GDE occurring are relatively high the opposite is the case.
- 2.69. The incentive to take mitigating actions is proportional to the risk of an emergency. Putting our reforms in place now, even though risks are low, ensures that should security of supply risks increase then shippers will face stronger incentives. These incentives will support actions that reduce the likelihood, severity and/or duration of an emergency. It also ensures disproportionate actions are not incentivised when the risks of an emergency are low.

- 2.70. The effect of shippers and suppliers taking the kinds of mitigation measures set out above is that most of them would result in discernable improvements to security of supply. This has clear benefits for consumers in the form of more secure supplies. Our reforms incentivise these actions, so we consider they will reduce the likelihood severity and/or duration of a GDE. Incentives from cash-out reform should ensure that shippers only take actions that are cost effective in reducing their risks of exposure in an emergency.

Gas and electricity interactions

- 2.71. Thus far this chapter has dealt with the impact of the Gas SCR cash-out reforms in isolation. However, there are also interactions with the electricity market. These are affected by the reforms proposed as part of the Electricity Market Reform (EMR) Capacity Mechanism (CM) and Electricity Balancing SCR (EBSCR). These reforms could increase the penalties incurred by electricity generators that fail to generate at times of system stress.
- 2.72. As mentioned in previous documents, changes in the generation mix mean that a GDE is almost certain to result in electricity curtailments, although a GDE will be extremely rare. If such an event arises, any gas-fired power stations that provide DSR in the gas market will likely incur higher costs than has been the case in the past (ie, due to increased electricity market penalties for failing to generate). To cover these increased costs gas-fired power stations will almost certainly increase the price that they attach to their DSR. This could entail gas-fired power stations offering DSR on the OCM at a price in excess of £88/therm.¹⁸
- 2.73. We have been very mindful of the risks of electricity market penalties feeding through into the gas market and have sought to ensure our cash-out reforms provide appropriate incentives and price signals. We have worked closely with the EBSCR team to ensure the reforms we are introducing to balancing in both gas and electricity markets are consistent. Central to policy development has been the role for market participants to determine their own response to arrangements and actions they may take to mitigate risks. This includes gas-fired power stations.
- 2.74. Furthermore, we would note that any increase in I&C consumers voluntarily offering DSR ahead of a GDE (be it through commercial negotiations or the DSR mechanism) would almost certainly reduce the likelihood of pivotal gas-fired power stations being curtailed. This goes some way to mitigating concerns regarding electricity market penalties feeding through to the gas market. It also means the Gas SCR could provide benefits to electricity security of supply. There has also been general acceptance that this risk is not

¹⁸ Should Demand Control actions have to be taken in the electricity market, EBSCR reforms mean that power stations that are short will face a cash-out price equal to £3000/MWh from 2015/16. This will then rise to £6000/MWh by 2018/19. These equate to equivalent gas prices of £44/therm and £88/therm respectively for a 50% efficient gas-fired power station.

a product of our reforms to the gas cash-out arrangements and would exist even if the Gas SCR reforms were not put in place.¹⁹

Other impacts

- 2.75. There are a number of additional potential risks and costs that we have considered that have not yet been covered. The main ones are summarised here. More detailed discussions of these issues can be found throughout previous publications, most notably in our impact assessments.
- 2.76. On the subject of competition, a GDE may entail risks of financial distress for shippers, particularly small shippers. This stems from the potential impacts a GDE may have on liquidity, credit and shipper liabilities. Similarly, the costs that could be incurred in the event of a GDE may act as a barrier to entry. Both these factors could reduce competition in the market. We have weighed these risks and consider that a significant reduction in competition is unlikely, and that our appraisal of the relative benefits of our reforms remains robust.
- 2.77. We have also sought to understand potential impacts on neighbouring markets and cross-border flows. Our reforms ensure price signals in GB reflect the value that GB consumers place on secure supplies. If prices in an interconnected market exceeded the NBP (National Balancing Point) price our reforms in no way preclude gas from flowing to that market. This is entirely in line with the principles of the internal market whereby gas should flow to those that value it most.
- 2.78. On health and safety, the Health and Safety Executive (HSE) supports our approach and has indicated that it is broadly satisfied that our reforms to the cash-out arrangements and a centralised DSR mechanism will have no adverse effect on the health and safety standards associated with preventing or managing a network gas supply emergency.
- 2.79. There are also some areas that we have not discussed at length on the grounds that our reforms are unlikely to have much of an effect (eg environmental sustainability).

Our decision to proceed with implementation

2.80. This chapter has set out:

- the background to our focus on the cash-out arrangements;

¹⁹ This is because there is no hard cap on gas cash-out prices either before or after our reforms. Almost all stakeholders have been opposed to a hard cap on cash-out prices for a range of reasons.

- what we think the benefits of this will be (ie shippers responding to more efficient price signals and risks transferred to them from consumers); and,
- how we have considered the potential risks and costs of our reforms.

2.81. In light of the arguments we have made here, in previous documents and at numerous stakeholder workshops, we are confident that our proposals are beneficial to consumers, are market-based and will help reduce the likelihood, severity and/or duration of a GDE. As outlined in Chapter 1, this means they are also consistent with the Authority's principal objective and general duties – as well as the UNC's relevant objectives. It is on this basis that we have decided to proceed with implementation.

Why implement cash-out reform now?

- 2.82. We have concerns that the current cash-out arrangements in an emergency may not provide efficient price signals and are not fit for purpose in light of our increasing dependency on imports. We think cash-out reforms are in consumers' interests as it will help ensure efficient price signals and act to reduce the likelihood, severity and/or duration of a GDE. It is therefore prudent to implement cash-out reform as soon as possible.
- 2.83. There is strong evidence that the other element of our reforms – namely the DSR mechanism – may also have further benefits for consumers and help reduce the likelihood, severity and/or duration of a GDE. However, for this to be the case the mechanism must be designed properly and avoid distortions to the rest of the market. In order to do this, further development by NGG in partnership with industry stakeholders is needed. As set out in Chapter 3, this is what we are looking to initiate.

3. Demand-side response mechanism

Chapter Summary

This chapter summarises our decision to oblige National Grid to proceed with developing a DSR mechanism. It sets out the previous analysis, stakeholder engagement and publications that underpin our decision.

Background to the reforms

What is demand-side response?

- 3.1. Demand-side response (DSR) is when consumers reduce their demand, usually as a reaction to an increase in the price of gas or in return for a payment. DSR can be an important tool to help alleviate system stress and facilitate the market clearing supply and demand.

What are the benefits of more voluntary demand-side response?

- 3.2. The previous chapter on cash-out reform focussed on *involuntary* DSR (ie when NGG has to unilaterally stop supplies to consumers). A central feature of the Gas SCR is attaching a price to these consumer interruptions. Our cash-out reforms directly price involuntary consumer interruptions into the cash-out arrangements by introducing proxy estimates for consumers VoLLs (eg the £14/therm NDM VoLL for NDM consumers).
- 3.3. However, an alternative market-based way of attaching a price to consumer interruptions is by consumers providing DSR *voluntarily* in the wholesale market. Revealing the cost of consumer interruptions through the provision of voluntary DSR is actually preferable because:
 - it facilitates *more efficient price signals* by allowing market prices to reflect the value that individual consumers place on their supplies, rather than relying on a proxy estimate;
 - it *helps efficiently transfer risks from consumers to shippers* by ensuring consumers are paid in line with their own individual VoLL;
 - it promotes the *efficient utilisation of DSR* which is important for minimising the economic costs associated with a GDE; and,
 - it ensures more DSR is available ahead of a GDE to be used by either NGG or shippers to avert a GDE in the first place.
- 3.4. These potential benefits are consistent with the aim of the Gas SCR to reduce the likelihood, severity and/or duration of a GDE. They are also consistent with our wider duties and the principles on which the UNC is based.

Who can offer demand-side response on a commercial basis?

- 3.5. Because of their size, DM consumers can offer DSR in sufficient volumes for it to be considered in the market alongside other forms of supply. Also, because of their daily-read capability any DSR provided can be measured and verified in line with the daily balancing of the gas market. This is not the case for NDM consumers who are generally much smaller and do not have daily-read capability.
- 3.6. However, even though DM consumers can provide DSR in a manner that is consistent with the needs of the wholesale market, the cost of doing so will vary considerably depending on the consumer. Furthermore, physical limitations may mean that for some consumers, providing DSR is not feasible at any likely market price. For instance, a number of industries use gas for large continuous processes which cannot be quickly switched off and on (eg, ceramics, glass, chemicals etc.). Interrupting too much consumption too quickly may result in catastrophic plant damage in these industries.
- 3.7. Even where safe and timely DSR can be achieved, it is often the case that interruption must last for a minimum period of time for it to be viable and restarting production can sometimes take weeks or even months. This necessarily increases the risks associated with providing DSR as the expected length of a possible period of high prices is often highly uncertain.
- 3.8. Despite these limitations, analysis conducted by both Pöyry and Redpoint indicated that there are still significant volumes of voluntary DSR that could be offered by DM consumers and that it would be beneficial to encourage this.

Why should shippers be incentivised to contract for demand-side response?

- 3.9. It was set out in Chapter 2 that shippers who are short in a GDE may face significant costs. Our cash-out reforms will increase these costs. Economic rationale would indicate that this should incentivise shippers to better secure their supplies and thus avoid being short in a GDE.
- 3.10. One step they can take is negotiating for commercial DSR with larger consumers. As the price of gas increases during periods of system stress, some businesses may find that continuing to consume gas for production purposes becomes uneconomic. In these circumstances, a consumer may opt to cease consuming gas of their own accord.
- 3.11. As prices rise it may also become mutually beneficial for a shipper to pay a consumer to reduce or stop consuming gas. This is particularly the case where a shipper is at risk of being short and the short cash-out price is significantly higher than the average price in the market. Upon entering into such an arrangement with a consumer, the shipper is no longer obliged to purchase expensive gas and take this gas off the system, thus improving its imbalance

position. Meanwhile the consumer receives a payment that is better than the profits it would have made from continuing to consume gas.

- 3.12. Furthermore, if the shipper has contracted forward for the consumer's gas, it will likely have done so at a "normal" market price. In a situation where prices have spiked considerably, the shipper can sell this gas back to the market. The profits from doing so can then be shared between shipper and consumer.
- 3.13. All of the above highlights how consumers and shippers can benefit from the efficient, voluntary provision of DSR at times of system stress. We consider our cash-out reforms will only further incentivise this kind of behaviour.

Why might a centralised DSR mechanism be needed?

- 3.14. Despite the apparent merits of shippers and consumers coming to arrangements for voluntary DSR, a number of consumer stakeholders have expressed doubts that such arrangements will arise. Large consumers highlighted a potential lack of trust between shippers and consumers, particularly regarding being interrupted for commercial purposes. Large consumers were more comfortable being interrupted by the SO in response to genuine system tightness, rather than by a shipper for commercial purposes.
- 3.15. Furthermore, it was noted that energy is not necessarily the core business of many I&C consumers. Because a GDE is a low-probability high-impact event, many consumers may view the upfront costs associated with arranging to provide DSR (eg calculating VoLL, negotiating contract terms etc) as outweighing the benefits (eg improved risk mitigation). The alternative of negotiating for DSR in a more ad-hoc manner if and when a tight market materialises may also not be feasible, particularly if a GDE develops quickly.
- 3.16. Through continued engagement with stakeholders, a centralised DSR mechanism emerged as a possible solution to these barriers to commercial DSR. We still think cash-out price signals could encourage commercial DSR to come forward and that this would likely be the most efficient outcome. However, we recognise the stakeholder feedback mentioned above. We therefore see merit in a DSR mechanism if it can overcome some of the barriers identified by stakeholders, whilst also not distorting or foreclosing any market for commercial DSR.

How have we approached DSR mechanism development?

- 3.17. In our 2012 report to Government on Gas Security of Supply, we noted a DSR mechanism was an option that could further enhance security of supply if cash-out reform failed to encourage commercial DSR negotiations. As already mentioned, feedback from stakeholders suggested that commercial DSR negotiations would in fact fail to materialise without further intervention. One stakeholder also raised a UNC modification to introduce a centralised mechanism to facilitate the SO procuring DSR from consumers.

- 3.18. In light of this we committed to exploring the merits of a centralised DSR mechanism and commissioned ESP Consulting to provide input on some of the key design issues. In July 2013 we issued a consultation on designs for a DSR mechanism that was informed by this research. We have also held several workshops to discuss key issues.
- 3.19. After considering stakeholder responses to our consultation, we commissioned Pöyry to quantitatively assess the merits of a range of DSR mechanism designs, alongside their updated modelling of our cash-out proposals. This analysis informed our February 2014 final policy decision which proposed placing a licence obligation on NGG to develop a DSR mechanism in accordance with a set of principles. These principles are in Table 1 below.

Table 1: DSR mechanism principles

Reference in licence condition	Aim of the DSR principle
8I.4 (a)	Shippers will need to submit offers on behalf of consumers.
8I.4 (b)	The methodology will set out which end consumers are eligible to participate in the DSR mechanism.
8I.4 (c)	The mechanism is intended to avert an emergency. A GDW (gas deficit warning) is the trigger point at which NGG may utilise mechanism.
8I.4 (d)	Exercised DSR bids should be factored into the cash-out price and if it is the highest balancing action it should set the short cash-out price.
8I.4 (e)	The DSR mechanism should provide a route to market for a wider range of consumers than currently access the market.
8I.4 (f)	The DSR mechanism must not foreclose the market for commercial interruption products, or penalise self-interruption by consumers.
8I.4 (g)	The DSR mechanism should be designed to ensure no harm to operation of normal traded markets. Some consideration of the impact on electricity markets may be necessary.
8I.4 (h)	The DSR mechanism must be cost effective to minimise cost to consumers. Therefore NGG must procure DSR in an economic and efficient manner.

What is the rationale for the DSR principles?

- 3.20. In the first instance these principles are intended to ensure any DSR mechanism addresses the frictions preventing voluntary DSR from emerging. For instance, the principles specify that only the SO will be able to exercise DSR procured in the mechanism, and only in specific circumstances when the system is under stress. This deals with the lack of trust between consumers and shippers mentioned earlier.
- 3.21. Second, the principles are intended to ensure that any risks and unintended consequences that may be associated with a centralised DSR mechanism are minimised. In particular, the principles highlight the importance of any mechanism being consistent with existing arrangements and avoiding any

adverse effects on incentives for commercial DSR to arise. This is in line with our view that such a mechanism may even kick-start a market for commercial interruption in the medium to long term as industry becomes more familiar with the concept of providing DSR on a commercial basis.

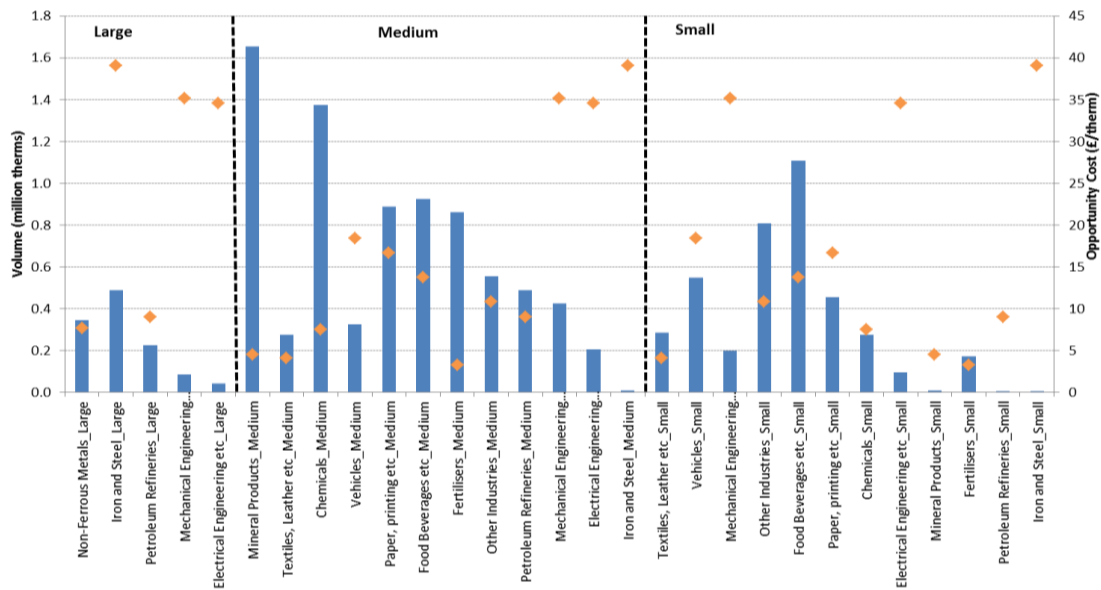
- 3.22. Last, the principles are intended to ensure that the DSR mechanism *increases the efficient use of voluntary DSR, improves the efficiency of price signals and transfers risks from consumers to shippers*. The following sections discuss the benefits associated with achieving these three aims in more detail.

The benefits of encouraging the efficient use of demand-side response

The benefits of protecting consumers with high interruption costs

- 3.23. In the event of a GDE under current arrangements, DM consumers would be disconnected in size order during firm load shedding. Also each consumer is interrupted in a binary on/off fashion. There is no scope for consumers to reduce their demand incrementally where some of their load is more dispensable. An illustration of this kind of “largest first” disconnection order can be seen in Figure 2 below.

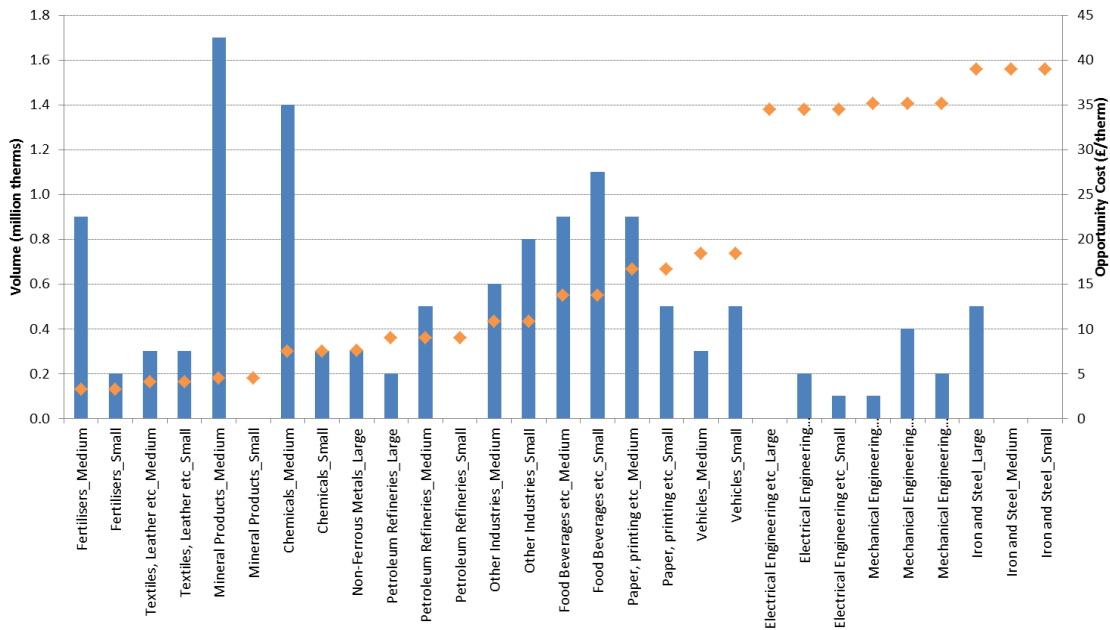
Figure 2: Illustrative inefficient I&C disconnection order



- 3.24. This approach is inefficient with respect to the economic costs incurred by society. The cost of interruption varies between consumers, and is not necessarily a function of size. As such, involuntary interruptions in firm-load shedding do not reflect the differing values that these consumers place on avoiding interruption.

3.25. Reordering interruptions in a more economic and efficient manner – ie in price order not in size order – would result in reductions in the economic costs associated with a GDE if one were to occur. Those consumers that incur the highest costs of interruption would only be interrupted after consumers with lower interruption costs. An illustration of a re-organised disconnection order (here based on sectoral opportunity costs) can be seen in Figure 3 below.

Figure 3: Illustrative efficient I&C disconnection order



3.26. Alongside any commercial arrangements to provide DSR, a centralised DSR mechanism would facilitate this more efficient use of DSR. By encouraging consumers to reveal their interruption costs and offer to reduce portions of their load voluntarily ahead of a GDE, a DSR mechanism allows the SO to curtail participating consumers in order of cost, rather than in order of size.

3.27. Figures 33, 36, 37 and 38 in Pöyry’s report all show that a more efficient disconnection order reduces the costs of a GDE. The reduction was greatest when a DSR mechanism is in place, but cash-out reform also delivered similar, though smaller, benefits. This was in large part because the modelling assumed that cash-out reform alone is only likely to encourage a marginal increase in commercial DSR. In part this is in line with stakeholder feedback. However, this is also partly because the modelling did not account for how the price effects from cash-out reform may encourage commercial DSR to come forward.

3.28. The scope for the more efficient use of DSR to reduce the economic costs of a GDE was also reflected in Pöyry’s final CBA.

Table 2: Cost-benefit analysis of various reform options (£ million to 2030)

Policy scenario	Current	Cash-out reform	Cash-out reform + NGG platform	Cash-out reform + Strawman 2 (exercise only)		Cash-out reform + Strawman 3 (inc option fees)	
				Inc.	Exc.	Inc.	Exc.
Gas-fired power station eligibility	N/A	N/A	N/A*				
Gone Green	£0.0	£0.0	-£34.3	-£41.0	-£41.0	-£91.3	-£162.3
High Demand	£0.0	£2.7	£37.5	£30.8	£20.5	-£35.5	-£89.3

*N/A for modelling purposes only

3.29. The DSR principles specify that DSR is intended to be utilised to avert a GDE in line with other eligible balancing actions.

The benefits of having more voluntary DSR available to avert a GDE

3.30. As well as reducing the economic costs associated with a GDE, a DSR mechanism that creates a more efficient disconnection order also has the potential to reduce the likelihood of a GDE occurring in the first place. This is because it entails participating consumers offering to reduce demand voluntarily ahead of a GDE. This gives the SO additional tools with which to manage and potentially avert a GDE. A modelled example of this happening can be seen in Pöyry’s report in Figure 34 and Figure 35.

3.31. The DSR principles specify that the DSR mechanism should provide a route to market by facilitating a wider range of consumers voluntarily providing DSR.

The benefits of improving the efficiency of price signals

3.32. Chapter 2 highlighted how involuntary consumer interruptions are not currently costed in a GDE. The effect of the current non-costing of consumer interruptions taken to balance the system is to shield industry from facing the full costs that a GDE imposes on consumers. This dampens cash-out prices as a signal of scarcity at times of system stress, and leads to reduced incentives on shippers to balance their positions and efficiently procure gas to avoid consumer disconnections.

3.33. A key part of our cash-out reforms is ensuring market prices reflect the cost of consumer interruptions should they arise. Throughout the SCR we have been keen for DM interruptions to be priced in a market-based manner that is consistent with their diverse interruption costs and ability to engage more directly with the wholesale market. The DSR mechanism is intended to facilitate this, alongside commercial interruption. In the event that DSR from the mechanism is utilised, it will be treated as a balancing action and priced into cash-out. This will ensure that price signals reflect the value that affected consumers place on maintaining their supplies, thus improving the incentives on shippers to appropriately protect security of supply. Where this incentivises shippers to take measures to avoid being short in a GDE, this should have the effect of reducing the likelihood, severity and/or duration of a GDE in the same manner that was set out in Chapter 2.

- 3.34. The DSR principles specify that voluntary interruptions of DM consumers who offer DSR in the mechanism should be treated as eligible balancing actions. Any such DSR that is exercised will therefore be priced into cash-out.

The benefits of transferring risks from consumers to shippers

- 3.35. Consumers that are interrupted through a DSR mechanism would be paid for the DSR they provide. These payments for voluntary DSR would be consistent with the treatment of other balancing actions.
- 3.36. Furthermore, funding these payments for voluntary DSR through the balancing arrangements allows for a transfer of risks from consumers to shippers. This transfer is comparable to the treatment of involuntary DSR by our cash-out reforms, and in both cases it is important for maintaining appropriate incentives on shippers in a GDE. In particular, such payments will ensure that the costs of a GDE fall more directly on the shippers that could be said to have "caused" any GDE (ie short shippers). Where this incentivises shippers to take measures to avoid being short in a GDE, this should have the effect of reducing the likelihood, severity and duration of a GDE.
- 3.37. The DSR principles specify that voluntary interruptions to DM consumers who offer DSR in the mechanism should be treated as eligible balancing actions. Any such DSR that is exercised will be paid for this service accordingly.

The potential risks and costs

- 3.38. If a DSR mechanism is implemented following NGG's development process, this would necessarily entail some potential costs and risks. Some of these are relatively certain (ie the upfront costs of establishing and running a DSR mechanism, or any option fees in the event that these are included). Where we have assessed the merits of a DSR mechanism in our February 2014 Impact Assessment, these more certain costs have been accounted for quantitatively. As such they already feature in Pöyry's CBA, presented earlier.
- 3.39. Other costs are less certain. These in part stem from uncertainties regarding the bids that may be received in any DSR mechanism. If these bids are exercised this will necessarily affect prices and have knock-on impacts for trading and balancing. As noted in Chapter 2 with respect to cash-out reform, these effects have been more challenging to quantify.
- 3.40. Our Final Policy Decision also identified a number of risks and unintended consequences specific to a centralised DSR mechanism. These included:
- the risk of distortions to the traded market (eg by moving DSR currently available to all shippers over to the centralised DSR mechanism where it is only available to the SO);
 - the risk of producing inefficient and/or uncompetitive bidding outcomes (eg due to low participation or strategic bidding); and,

- the risk of unduly inhibiting any commercial market for interruption that may emerge in the future.
- 3.41. The principles that the DSR methodology must satisfy have been written with these in mind. Following development in partnership with industry stakeholders, NGG will submit a DSR methodology to Ofgem. When considering whether to proceed with implementing the submitted DSR methodology, we will weigh the benefits against the costs, including the extent to which the methodology addresses the risks set out above.
- 3.42. The DSR principles specify that DSR must be procured in an economic and efficient manner. The principles also specify that the DSR mechanism should not unduly preclude the emergence of commercial interruption arrangements and should minimise distortions and unintended consequences.

Our decision to commit to further development

- 3.43. This chapter has set out:
- The background to our interest in a DSR mechanism
 - What we think the benefits of a DSR mechanism could be (ie shippers responding to more efficient price signals and risks transferred to them, as well as the additional benefits of voluntary DSR being used more efficiently)
 - How we have considered the potential risks and costs
- 3.44. In light of the arguments we have made here, in previous documents and at numerous stakeholder workshops, we are confident that a DSR mechanism has the potential to be beneficial to consumers and could help reduce the likelihood, severity and/or duration of a GDE. It is on this basis that we have decided to oblige NGG to continue with developing the DSR mechanism.

Why the delay in introducing a DSR mechanism?

- 3.45. As mentioned in the previous chapter, we are keen to act on reforming cash-out as soon as possible and our proposals to do so are already fully formed. Discussions regarding the DSR mechanism, on the other hand, have highlighted a number of key design issues that require further work before a viable DSR mechanism could be implemented. As such we anticipate the DSR mechanism being implemented at a later date.

4. Responses to the statutory consultation

Chapter Summary

This chapter summarises the comments received on the draft licence and code text published with our statutory consultation. It sets out any changes we have made to the licence and code drafting as a result. Where we have not made any changes we explain why the current drafting is appropriate.

Our statutory consultation on new licence conditions

- 4.1. In June 2014 we published a statutory consultation on changes to the gas transporter licence held by NGG in respect of the NTS. This placed an obligation on NGG to develop a DSR methodology that met a number of principles set out within the licence condition. We also published new shipper and supply licence conditions that we considered were necessary to implement our cash-out reforms. We invited comments on these draft licence conditions.
- 4.2. Alongside this we published UNC legal text. This had been updated following responses to our February 2014 Final Policy Decision.

Stakeholder feedback on licence and code drafting

- 4.3. We received two responses to our statutory consultation.
- 4.4. One respondent said they did not support our reforms. They did support the idea that some reform to the current emergency cash-out arrangements could prove beneficial to GB security of supply. However they believed that our proposals go beyond what is necessary to sharpen the incentives on shippers to ensure demand is met. Furthermore, they believed that the cost to customers had not been considered as carefully as it might have been. They did not believe our proposals meet the criteria of being beneficial, market based, and reducing the likelihood, duration or severity of an emergency occurring.
- 4.5. Throughout the Gas SCR we have assessed the impact of our reforms and discussed this extensively with stakeholders. Our previous impact assessments and publications have set out quantitative and qualitative arguments to demonstrate the benefits of our reforms. We consider that our reforms to cash-out place the right incentives on those who are best placed to manage them.
- 4.6. The other respondent supported the principle of the Gas SCR. They also agreed that a mechanism through which consumers can signal their willingness to make available additional demand side volumes compliments

the SCR solution. However they did highlight concerns that developing a centralised DSR mechanism before the incentives created by the Gas SCR are fully assessed by industry might affect the emergence of commercially interruptible products.

- 4.7. We welcome the support for a centralised DSR mechanism. While it is difficult to assess the impact of cash-out reform without experiencing an actual GDE we do not consider that our proposals will prevent the emergence of commercially interruptible products. Indeed the principles set out in the licence condition specify that the methodology should not do this.

UNC legal text

- 4.8. Our changes to the UNC deliver the intent of our policy reforms. They set out the new arrangements for determining cash-out in a GDE and the incentives on shippers to ensure they have contracted for enough gas to meet demand. It describes how cash-out will be unfrozen and dynamic in an emergency and be set by the most expensive balancing action taken by the SO. The code drafting also describes how payments to consumers for providing DSR will be calculated.
- 4.9. A respondent believed that some of the code drafting was deficient in that it said a GDE can be caused by a "Transportation Constraint affecting deliveries of gas to the Total System". They were concerned that a problem with the onshore network might prevent NGG from accepting deliveries from shippers who had made attempts to bring gas into GB. Such an emergency could result in a GDE under current arrangements. The Gas SCR has not sought to change the definition of a GDE in the UNC or transporter safety case. We regard the definition of the circumstance that could lead to a GDE as out of scope of this SCR.
- 4.10. One stakeholder commented that the proposed legal drafting introduces terminology which is inconsistent with existing UNC references. They noted that the code referenced "Stage 2+ GDE" and "Stage 2 or higher" whereas existing references were to "Stage 2 or higher" only.
- 4.11. There were some instances within the code where Stage 2 or higher had been incorrectly used. These have been corrected to say Stage 2+. However in the majority of cases the original text has been retained. References to Stage 2+ are referring to financial consequences as a result of the Gas SCR and apply throughout from that point. Other areas refer to the action expected rather than financial consequences so the original text has been kept.
- 4.12. The respondent also expressed concern that the legal text was not aligned with the business rules in respect of assessing the validity of a dynamic, market based SAP for use in cash-out calculations. The Business Rule states that to be valid, SAP must meet the three conditions listed, whereas the legal text states that none of those three conditions must be met.

4.13. We have reviewed the business rules and code drafting. The criteria in the business rules describe the conditions under which SAP would be deemed invalid. However it is preceded by wording that states the relevant Day's SAP will be required to meet these criteria. This is incorrect and is an error in the draft business rules. Our consultation documents have been clear on our policy intent on this issue. The legal drafting correctly reflects our policy intent. That is, in respect of a Day in Stage 2+ GDE on which the total volume traded is:

- less than 250,000 therms/day, or
- less than 5 trades, or
- less than 5 counterparties,

then SAP shall be the Fall Back SAP. We also consider that it is clear that all criteria must be met for SAP to be valid. As such we have not amended the code drafting.

4.14. We have also corrected some typographical errors that were highlighted in responses.

NGG, gas shipper and supply licence conditions

4.15. Our statutory consultation set out changes to the NGG's licence as well as gas shipper and supply licences. The new licence condition on NGG places an obligation on them to develop a DSR methodology, submit it to the Authority, and subject to approval and successful trial, implement it. It sets out the principles that the methodology must meet and these are described earlier in this document.

4.16. The shipper and supply licence conditions ensure that payments received from NGG in respect of DSR are passed onto consumers. They do not prescribe how the payment should be made but should be as soon as is reasonably practicable.

4.17. We received no comments on the draft licence conditions for NGG, shipper or supply licences. Our views on the licence drafting have not changed. As such we have made no changes to the licence drafting.

5. Next steps

Chapter Summary

This chapter sets out how the timescale for implementing our cash-out reforms. It also describes the expected process for developing the DSR methodology.

Cash-out reform

- 5.1. Alongside this document we have published a direction under section 36C of the Gas Act 1986. This sets out the changes to the UNC that we consider necessary to implement our reforms of the cash-out arrangements in a GDE.
- 5.2. Relevant parties have 15 working days to seek permission to appeal our decision on the UNC changes to the Competition and Markets Authority (CMA). Subject to any appeal, these changes will take effect from 1 October 2015. This is to allow Xoserve sufficient time to develop the necessary system changes and means that the new arrangements will be in place for winter 2015/16.
- 5.3. We are also publishing modification notices to change the gas shipper and supply licences. Parties have 20 working days to seek permission to appeal on the licence changes. Subject to any appeal, the new licence conditions will also come into force on 1 October 2015. This will ensure that any payments for DSR that arise after that date are passed onto consumers as intended.

DSR methodology

- 5.4. We are also publishing a modification notice in respect of NGG's gas transporter licence to obligate them to:
 - Develop a DSR methodology and submit it to the Authority
 - Run a trial if directed by the Authority to do so
 - Submit a report of the outcomes of the trial to the Authority alongside a final DSR methodology
 - Implement the DSR methodology if directed by the Authority to do so
- 5.5. Subject to any appeal to the CMA the licence condition on NGG will come into effect 56 days from the date of the direction.
- 5.6. NGG will submit a methodology to the Authority by 1 March 2015. Within 90 days of receiving the methodology the Authority will direct NGG whether to carry out a trial. If we do not approve the methodology we may ask NGG to resubmit it. The direction will set out the conditions and timescale for this.

- 5.7. Where NGG is directed to carry out a trial they must submit a report to the Authority within 28 days detailing the outcome of the trial. If the Authority does not direct otherwise within 28 days of receiving the report, NGG will be expected to develop any UNC modifications or system changes necessary to implement the methodology. Assuming that the methodology is approved and a trial is successful, we expect the DSR mechanism to be implemented in time for winter 2016/17.
- 5.8. We note that NGG has raised UNC modification 0504 in order develop the DSR methodology.²⁰ We encourage NGG to continue working with stakeholders so that this can be achieved.

²⁰ [0504 - Development of a Demand Side Response Methodology for use after a Gas Deficit Warning](#)

Appendices

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Appendix 1 – Summary of consultation responses

1.1. In June 2014 we published a statutory consultation on licence changes we considered necessary to implement our proposals. We also published changes to UNC that we intend to make using the powers available to us through section 36C of the Gas Act 1986. We received non confidential responses from one gas shipper and the system operator. These responses are published on the Ofgem website²¹. This appendix summarises stakeholder responses.

1.2. One respondent supported the idea that a reform of the existing cash-out arrangements could improve GB security of supply. However they believed that the proposals went further than were necessary. They felt that the costs to consumers had not been fully considered and the proposals did not meet the criteria of being beneficial, market based, and reducing the likelihood, duration or severity of an emergency occurring.

1.3. The same respondent said the draft UNC text was deficient in that a problem with the onshore network which prevented shippers from bringing into GB, even when they had contracted to do so, would be classed as a GDE. They considered this was important when determining who is at “fault” for a GDE. Furthermore they considered that the UNC text introduced terminology inconsistent with the existing UNC and, in the case of the fall back price, was not consistent with the business rules.

1.4. The second respondent supported our reforms. However in the case of a centralised DSR mechanism, they considered it might be appropriate to wait until the effects of cash-out reform had been realised. This may avoid minimising the appetite for consumers and shippers to agree commercial interruption arrangements.

1.5. They also highlighted the interactions between the gas and electricity markets as a result of the Electricity Balancing SCR and Electricity Market Reform Capacity Mechanism. The respondent noted that the Gas SCR reforms would not largely change the risks associated with the interactions of electricity market penalties feeding through into the gas market.

²¹ <https://www.ofgem.gov.uk/publications-and-updates/gas-security-supply-significant-code-review-statutory-consultation>

Appendix 2 - Glossary

A

Authority (The)

The Authority is the Gas and Electricity Markets Authority (GEMA). GEMA is the governing body of Ofgem and consists of non-executive and executive members and a non-executive chair.

C

Cash-out

National Grid Gas is responsible for residual balancing of the gas system. The prices paid for these balancing actions are then passed onto long and short shippers. That is, long shippers are paid at one rate for their positive imbalance and short shippers have to pay at a different rate for their negative imbalance. These charges are known as cash-out prices.

Cash-out (dynamic)

Dynamic cash-out means that the level of the cash-out is unfrozen and continues to change in response to circumstances upon declaration of stage 2 of an emergency.

Cash-out (frozen)

Under current gas emergency arrangements the cash-out price is frozen when stage 2 of an emergency is declared. That is, the cash-out price remains at the level it was at this time for the duration of the emergency.

D

Daily-metered (DM) consumer

This is a gas consumer with a meter which allows their consumption to be measured on a daily basis.

Demand Side Response (DSR)

A demand side response is a short-term change in the use of, in this case, gas by consumers following a change in the balance between supply and demand.

E

Emergency curtailment arrangements

The emergency curtailment arrangements provide for payments to be made to shippers in the event that transporters instruct, under the direction of the Network Emergency Coordinator, the curtailment of gas off-takes at any relevant supply

point. Shippers are still required to pay cash-out on their imbalances but curtailed quantities are subject to a trade between the shipper and the residual balancer at the Emergency Curtailment Trade Price.

Emergency Curtailment Trade Price

This is the price at which a shipper's emergency curtailment quantity is paid. This is determined as the 30 day average System Average Price.

European Gas Security of Supply Regulation

Regulation (EU) No 994/2010 of the European Parliament and of the Council of 20 October 2010 concerning measures to safeguard security of gas supply and repealing Council Directive 2004/67/EC. This regulation aims to improve European gas security of supply, and places a number of requirements on member states.

F

Firm consumer

This is a consumer with a non-interruptible gas supply contract. These consumers cannot be instructed to reduce their demand or have their demand curtailed except for following the announcement of stage 2 or greater of an emergency.

Firm load shedding

Upon declaration of stage 2 of an emergency, the Network Emergency Coordinator may instruct transporters of gas to instruct consumers stop using gas. This is known as firm load shedding. Firm load shedding starts with the largest consumers – who are typically large industrial users or power generators.

G

The Gas Act (1986)

The Gas Act is a piece of primary legislation that prohibits persons from engaging in specified activities unless authorised to do so by a licence granted by the Authority. The Gas Act also sets out the powers of the Authority in carrying out its functions under Part I of the Gas Act.

Gas Deficit Emergency (GDE)

A Gas Deficit Emergency is a type of Gas Supply Emergency arising as a result of insufficient deliveries of gas being available to meet required demand on the gas system or as a result of a potential or actual breach of a safety monitor.

Gas Supply Emergency

A Gas Supply Emergency is defined in the Uniform Network Code as the occurrence of an event or series of events that results in, or gives rise to a significant risk of, a loss of pressure in the gas system which may lead to a supply emergency.

H

Health and Safety Executive (HSE)

The Health and Safety Executive (HSE) is the national independent watchdog for work-related health, safety and illness. The safety case produced by the Network Emergency Coordinator must be submitted to the HSE for their approval.

I

Interconnector (Gas)

The gas pipelines and associated terminals which connect the European and UK gas transmission networks.

Interruptible contract

An interruptible contract may be signed by gas consumers where the relevant transporter and/or supplier have the ability to ask a consumer to reduce its off-takes (generally daily metered consumers). These contracts allow the transporter and/or supplier to disconnect the consumer (in or out of an emergency) in order to manage demand on the system. Consumers may sign these contracts in return for reduced rates on their gas supply.

L

Licensee (Gas)

The Gas Act requires parties involved in the gas industry to be licensed by the Authority. As licence holders, these parties are required to comply with a number of licence conditions.

Licence condition

All parties licensed by the Authority to partake in gas industry activities are required to meet certain licence conditions. The licence conditions for the gas industry are categorised into transporter, shipper, supplier and interconnector licence conditions. The licence conditions are separated into standard licence conditions which apply to all licensees of one type (eg transporters) and special licence conditions which apply only to a specific party (eg National Grid Gas).

Liquefied Natural Gas (LNG)

Liquefied Natural Gas is natural gas (predominantly methane, CH₄) that has been converted temporarily to liquid form for ease of storage or transport.

Liquidity

Liquidity is a measure of the number of times a given commodity is traded. A low liquidity can mean that it is difficult for new entrants to enter into and grow in a market.

M

Market Balancing Action (MBA)

An action taken by National Grid Gas to balance the system in which it enters into a transaction with a party so that that party will agree to make an acquiring or disposing trade nomination. The prices at which these trades are made set cash-out prices.

Modification (Code)

The Uniform Network Code (UNC) is the framework which sets out the gas transportation arrangements for those parties licensed under the Gas Act 1986. This code has developed through modifications raised by signatories to the UNC. It is still possible for modifications to be made through this industry led process. However, the introduction of the Significant Code Review process now allows for Ofgem to lead on the development of modifications before directing them to be raised.

N

National Grid Gas (NGG)

National Grid Gas (NGG) is the Gas Transportation licence holder for the North West, West Midlands, East England and London Gas Distribution Networks. NGG also hold the Gas Transportation licence for the gas National Transmission System (NTS). Prior to 10 October 2005, NGG was known as Transco.

National Transmission System (NTS)

This is National Grid Gas' high pressure gas transmission system. It consists of more than 6,400 km of pipe carrying gas at pressures of up to 85 bar (85 times normal atmospheric pressure).

Network Emergency Coordinator (NEC)

The Network Emergency Coordinator is responsible under safety legislation for the coordination of a gas supply emergency.

Non-daily metered gas consumer (NDM)

This is a gas consumer who does not have a meter which can be read on a daily basis. This includes small consumers, including domestic consumers.

Neutrality

This refers to the system of Balancing Neutrality Charges which are used under the Uniform Network Code (UNC) to ensure that National Grid neither benefits nor loses financially from the balancing actions it is required to undertake. The charges reflect the difference between all amounts received and paid by National Grid for gas used to balance the system and are spread across all signatories of the UNC on the basis of their usage of the transportation system.

O

[On-the-day Commodity Market \(OCM\)](#)

This is the market on which trading takes place to allow NGG to balance the system. Shippers may also trade with each other on the OCM.

P

[Post Emergency Claim \(PEC\)](#)

The post emergency claims arrangements are used to recompense parties for flowing additional gas onto the system in an emergency if opportunity costs for shippers to do so exceed the cash-out price they received for being long.

[Project Discovery](#)

Project Discovery is Ofgem's investigation published in 2010 into whether or not future security of supply could be delivered by the existing market arrangements over the coming decade. A copy of the report and associated documents can be accessed on our website.

[Public Appeal](#)

An appeal made by National Grid Gas to consumers in the event of a Gas Supply Emergency to reduce gas use.

S

[Safety case](#)

The Gas Safety (Management) Regulations 1996 set out the requirement for each transporter of gas to publish a safety case which must be approved by the Health and Safety Executive. These safety cases must demonstrate the method by which the holder will ensure the safe operation of its network. In the case of the Network Emergency Coordinator (NEC), the safety case includes details of the procedures that the NEC has established to monitor the situation throughout a supply emergency and for co-ordinating actions across affected parts of the gas network.

[Safety and Firm Gas Monitor Methodology \(Safety Monitor\)](#)

The Safety Monitor provides a requirement for sufficient gas to be held in storage to meet a number of criteria. This requirement remains valid in the event of a GDE.

[Significant Code Review \(SCR\)](#)

The SCR is a new modifications process introduced through the Code Governance Review. This process allows Ofgem to develop modifications proposals before directing them to be raised.

Shippers

Gas shippers buy gas from producers and sell the gas onto suppliers, and are defined as entity which introduces, conveys and takes out gas from a pipeline system.

Smearred/shared cost

This is a cost that is spread across all relevant parties. For example, the costs to National Grid of a certain activity may be spread across all shippers involved in the Great Britain gas market.

System Average Price

This is the weighted average price of all trades on a given day.

System Marginal Buy Price

The System Marginal Buy Price is the greater of the system average price plus the default system marginal price, and; the price of the highest balancing action offer price in relation to a Market Balancing Action taken by National Grid Gas for that day.

System Marginal Sell Price

The System Marginal Sell Price is the lesser of the system average price minus the default system marginal price, and the price of the lowest balancing action offer price in relation to a Market Balancing Action taken by National Grid Gas for that day.

System Operator

This is the entity responsible for operating the Great Britain transmission system and for entering into contracts with those who want to connect to and/or use the transmission system. National Grid is the GB system operator.

T

Therm

A unit of heating value equivalent to 100,000 British thermal units (Btu).

Transporter (Gas)

The holder of a Gas Transporter's licence in accordance with the provisions of the Gas Act 1986.

U

Uniform Network Code (UNC)

The UNC defines the rights and responsibilities for all users of gas transportation systems in Great Britain. The UNC is, in effect, a contract between the gas transporter and the users of its pipeline system.



Uniform Network Code (UNC) – Section Q

Section Q of the UNC is the main framework which sets out the arrangements that will be in place in the event of declaration of a gas emergency.

V

Value of Lost Load (VoLL)

This is the theoretical price at which a consumer would rather have their gas supply disconnected than continue to pay for a firm supply.

Appendix 3 - Feedback questionnaire

1.1. Ofgem considers that consultation is at the heart of good policy development. We are keen to consider any comments or complaints about the manner in which this consultation has been conducted. In any case we would be keen to get your answers to the following questions:

1. Do you have any comments about the overall process, which was adopted for this consultation?
2. Do you have any comments about the overall tone and content of the report?
3. Was the report easy to read and understand, could it have been better written?
4. To what extent did the report's conclusions provide a balanced view?
5. To what extent did the report make reasoned recommendations for improvement?
6. Please add any further comments?

1.2. Please send your comments to:

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