Promoting choice and value
for all gas and electricity customers

Tackling gas theft: Final impact assessment

Supporting document

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Overview:

This document sets out our final impact assessment on three schemes proposed by the industry and our final proposals to increase detection of gas theft.

This assessment is being published in support of our final proposals on measures to improve the arrangements to tackle gas theft. In addition to our consideration of the specific proposals to increase theft detection set out in this final impact assessment, our final proposals set out measures to introduce new licence obligations on gas suppliers.

Context

This document reflects the commitment set out in Ofgem's Corporate Strategy and Plan 2010-15, to support industry initiatives to introduce revised theft arrangements and consider whether further action is required.

Our proposals support several key themes outlined in our Corporate Strategy and Plan. These include promoting value for consumers, protecting the interests of vulnerable customers and helping to maintain security of supply.

The focus of this document is on the gas market. We aim to bring forward proposals for reform in the electricity market, where necessary, later this year.

Associated documents

Tackling gas theft – the way forward, March 2012. Ofgem (Ref: 35/12)

Tackling gas theft – Consultation, August 2011. Ofgem (Ref: 112/11)

Tackling gas theft – Draft Impact Assessment, August 2011. Ofgem (Ref: 112A/11)

NRPS Workgroup Report to Ofgem, 16 June 2011. Gas Forum

The Creation of a Revenue Protection Activity Co-ordination Agent (RPACA) and a Central Revenue Protection Unit (CRPU), 8 April 2011. British Gas

UNC277 - Creation of Incentives for the Detection of Theft of Gas (Supplier Energy Theft Scheme), Final Modification Report, 21 January 2011

UNC346 - An Alternative to the Supplier Energy Theft Scheme Based on Throughput, Final Modification Report, 21 January 2011

Theft of Gas and Electricity - Next Steps, January 2005. Ofgem (Ref: 06/05)

Theft of Gas and Electricity - Discussion Document, April 2004. Ofgem (Ref: 85/04)

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Executive summary

Draft Impact Assessment

In our August 2011 draft Impact Assessment (IA) consultation we set out our initial assessment of three industry proposals to increase theft detection. Our draft IA suggested that all three proposals would help reduce the incidence of theft. This would have consequential benefits for consumers and the market more widely. However, we were concerned that each of the proposals had weaknesses that would impact on their ability to deliver increased theft detection. Our consultation sought views on the relative strengths and weaknesses of the three proposals.

Ofgem's proposed package of measures to increase theft detection

Having reviewed the three industry schemes and responses to our consultation, we have decided to set out an alternative package of measures to reform the arrangements to tackle theft. Our proposals build on the three industry schemes and seek to address the identified weaknesses. Our proposals include introducing a new licence obligation on gas suppliers, establishing the principles for an incentive scheme (whose function is to encourage suppliers to detect a target number of thefts), and a Theft Risk Assessment Service (whose function is to generate theft leads for suppliers to investigate). We also urge the industry to introduce supporting measures such as a code of practice on standards for customer treatment during an investigation process.

Approach and findings

This document sets out our final IA of the three industry schemes and also includes our analysis of the relative merits of our proposed package of measures. We maintain the broad analytical approach used in our draft IA. Where we have new evidence, we have updated the data and assumptions underpinning the analysis.

Final Impact Assessment - findings

Our findings indicate that all three industry schemes and our own proposals are likely to improve theft detection. Each proposal would deliver benefits to the industry and consumers in terms of improved allocation of costs. All proposals would also deliver additional benefits in terms of future revenue from the cases detected. These benefits could then be passed through to consumers through lower bills.

Based on the findings set out in this document we consider that our proposed package of measures should be implemented. Accordingly, we do not intend to progress any of the three industry schemes.

We conclude that there are likely to be benefits in introducing an incentive scheme to address the disincentives faced by suppliers in tackling theft. The incentive scheme

would aim to encourage suppliers to conduct comprehensive investigations and increase theft detection. Our analysis points to benefits, in terms of higher theft detection, from gas suppliers pooling data and resource to better target costly theft field investigation activity. This could be of particular benefit to smaller suppliers, who may be less able to derive benefits from developing their own data analysis service than larger suppliers who will have access to more data and economies of scale.

Our proposed package of measures includes both of these elements. Our analysis indicates that, when operated together, they are best placed to deliver the targeted number of theft detections. Our analysis also suggests that, for the same number of investigations, our proposals would deliver a higher number of theft detections when compared to the three industry schemes. Implementation of our proposals is more likely to effectively mitigate economies of scale in theft detection, by providing a central risk assessment service to identify theft. They are also more likely to address potential competition distortive effects, by matching the size of the incentive scheme to the net disincentives of theft detection.

1. Introduction

Chapter Summary

In this chapter we describe the purpose of this document. We outline the three industry proposals to increase gas suppliers' performance in tackling theft. We also summarise our proposed package of measures which include introducing the Theft Risk Assessment Service and an incentive scheme.

1.1. This document supports our accompanying way forward document on improving the arrangements for tackling gas theft.[1] It sets out our final Impact Assessment (IA) on three industry schemes and our proposed package of measures to increase theft detection in the gas market.

1.2. The purpose of this IA is to explain our decision to reject the three industry schemes and to propose our alternative package of measures. Our analysis indicates that our proposed package of measures is likely to benefit consumers the most.

Industry proposals to increase theft detection

1.3. In our August 2011 draft IA consultation we conducted an initial assessment of the three industry proposals. These are summarised below:[2]

- National Revenue Protection Scheme (NRPS): A central database to profile the risk of theft risk at each supply point. The proposal would require the highest risk cases to be investigated by suppliers. The NRPS would also procure services needed to tackle theft (such as field investigators and debt collection) to be used on an elective basis.
- Supplier Energy Theft Scheme (SETS): An incentive scheme to encourage investment in theft detection.
- Enhanced SETS: This proposal builds on SETS by adding additional measures that would support suppliers' attempts to respond to the incentive scheme. It contains two key elements:
    - Firstly, a Revenue Protection Activity Co-ordination Agent (RPACA) which would provide services (such as management information on theft location and type and a telephone tip-off line) that may not be provided to the same extent in a competitive environment.
    - A second variation adds a Central Revenue Protection Unit (CRPU) to the RPACA proposal. The CRPU would provide theft management services, such as investigation agents, for use on an elective basis.

[1] In this document, gas theft describes a number of offences under schedule 2B of the Gas Act 1986 where a customer prevents a meter from correctly registering the amount of gas supplied, has damaged equipment or reconnects the supply without the relevant permission.
[2] Further detail on the industry proposals is included in chapter 3 of our August 2011 consultation document.

1.4. The NRPS proposal set out an aspiration to provide 17,000 leads for suppliers to investigate per year and for this to deliver approximately 6,000 cases of identified theft.[3] The proposer estimates that both SETS and Enhanced SETS would deliver at least 5,917 confirmed gas thefts and that this would result from at least 17,177 theft investigations per year. The base case in our analysis is the same across all proposals and assumes the industry would conduct 17,000 investigations, which would lead to 6,000 thefts being successfully found.[4]

Ofgem's final proposals to increase theft detection

1.5. Our final proposals to increase gas theft detection build on the three industry schemes and seek to make changes to address identified weaknesses. Our proposals include the following elements:[5]

- Incentive scheme. The aim of the scheme is encourage suppliers to detect a target number of gas thefts.[6]
- Theft Risk Assessment Service (TRAS). The main function of the TRAS is to generate theft leads for suppliers to investigate.
- Supporting measures. We are asking suppliers to introduce a series of supporting measures to help detect theft, such as a new gas theft Code of Practice on investigations and a national 24-hour tip-off service for the public and other third parties to report suspected theft.

1.6. The aim of the incentive scheme proposal is to deliver theft detections in line with the Theft Target.[7] For the purpose of our analysis we have set the Theft Target with reference to the best performing gas suppliers in the market.[8] Our analysis suggests that this would deliver a Theft Target of at least 6,000 confirmed gas thefts resulting from around 17,000 theft investigations per year. We expect the incentive scheme to be in place by the end of 2012.[9]

1.7. We estimate that the set-up costs of the TRAS are likely to be similar to the NRPS, ranging from £1.5m to £3m. The fixed costs of providing the TRAS are estimated to range between £6.8m and £10.2m per year. These include costs associated with data analysis and lead generation services, managing the incentive scheme, as well as the cost of investigating these leads and making any repairs to

[3] The NRPS proposal is non-specific on the absolute performance expected in detecting theft. However, the Gas Forum report refers to the potential performance that could be achieved if all suppliers performed to the standards of the highest performing suppliers currently in the market.
[4] This represents an increase of 3,100 theft detections in relation to current theft detection levels.
[5] We have provided more detail on our final proposals in chapter 4 of the way forward document.
[6] We will also move to remove an ineffectual supplier compensation scheme that currently exists in the Gas Transporter (GT) licence so that there is only one incentive scheme in the market.
[7] We propose to require that the TRAS should establish an aggregate target for the number of theft detections within a period.
[8] We consider that this is an appropriate approach over the initial period. However, in time we consider that the Theft Target should be set at a level that maximises the benefits of this activity for consumers. We consider that the TRAS could perform this function.
[9] As with SETS, we recognise the benefits of excluding British Gas over the initial period. The aim would be to give suppliers who need to catch up in terms of investment in theft detection an opportunity to respond to the incentive scheme. This issue is discussed in more detail in chapter 4.

equipment. We are consulting on requiring the TRAS to be in place by the end of 2013.

1.8. We estimate that the incentive scheme value for theft detection in the SSP market would be £8.15m, and £0.58m for theft detection in the LSP market. This would apply until the TRAS is implemented, and assumes that all suppliers participate in the scheme. Once the TRAS is implemented, the incentive pot would be £6m for the SSP market, and £0.33 for the LSP market. We would expect that the Windfall Avoidance proposed in the incentive scheme proposed by British Gas would also be applied once our proposed incentive scheme is implemented. If British Gas is excluded from participating in the incentive scheme during the first two years, the incentive pot size in this period would be £4.62m for detecting theft in the SSP market, and £0.33m in the LSP market.

1.9. In this IA we have focused on the impacts of our proposed impact assessment of the TRAS and the incentive scheme. However, where relevant we have also considered the wider impacts of our proposed supporting measures, for example the gas theft code of practice.

Structure of the document

1.10. This document is structured as follows:

- Chapter 2 sets out our approach to updating the IA
- Chapter 3 assesses the impacts on customers
- Chapter 4 assesses the impacts on competition
- Chapter 5 assesses the impacts on sustainable development
- Chapter 6 assesses the impacts on health and safety
- Chapter 7 considers risks and unintended consequences
- Chapter 8 reviews any remaining issues not previously covered

1.11. In Appendix 1 we have summarised responses to the consultation questions in our draft IA.

1.12. Appendix 2 sets out our detailed modelling of the costs and benefits of theft detection in the market. This includes the impact of the three industry proposals as well as the impact of our proposed package of measures.

2. Updating the IA

Chapter Summary

In this chapter we summarise stakeholders' views on potential amendments to the industry schemes in response to our August 2011 consultation. We set out our response to these views and then explain our approach to updating the IA.

Stakeholder views on amendments to the industry proposals

2.1. In this section we set out an overview of stakeholders' views, provided in response to our August 2011 consultation, on potential amendments to improve the industry schemes.

2.2. Respondents did not suggest introducing any substantial variations to the NRPS proposal that would require us to change any of the assumptions or data in our analysis.

2.3. In its consultation response British Gas suggested a number of improvements to the SETS proposal.[10] The potential improvements included:

- Amending the value of the incentive scheme. The original value of the scheme is around £10m for UNC277 and £12m for UNC346.[11] British Gas proposes to amend these values so that they are calculated from an assessment of the net cost a supplier will face where they move from doing nothing to detecting theft. British Gas proposed that the annual value of both schemes should be revised to around £5.46m in the first two years of the scheme, and £3.25m thereafter.[12]
- Conducting an independent annual review of the value of the incentive scheme to ensure it would be set at the appropriate level to deliver the desired results.
- Amending the definition of small suppliers under SETS, so that an additional number of small suppliers would be excluded.[13]
- Amending the way theft incentive payments are calculated under UNC346, so that they are paid out based on invoiced amounts rather than on the initial assessed amount of theft.

[10] These would therefore also be applicable to Enhanced SETS which was proposed on the basis that SETS would also be in place.
[11] Uniform Network Code (UNC) 0277, "Creation of Incentives for the Detection of Theft of Gas (Supplier Energy Theft Scheme)", and UNC346, "An Alternative to the Supplier Energy Theft Scheme Based on Throughput"
[12] British Gas assumes that industry participants will have to make an initial investment to build or procure revenue protection services during the first two years. The scheme therefore includes an allowance for capital expenditure costs, which explains the differences in its value to subsequent years.
[13] British Gas proposed an amendment to the incentive scheme to exclude suppliers with both less than 50,000 Non-Daily Metered (NDM) customers and an aggregate NDM Annual Quantity (AQ) on their portfolio of less than 10TWh.

- Amending UNC277 and UNC346 proposals so that suppliers will use the British Thermal Units (BTU) process to more quickly update the AQ value following theft detection.[14]

2.4. These proposed improvements to the schemes are not part of a formal proposal. We have therefore not amended the key features of SETS to reflect British Gas' comments. Where we consider that there would be benefits to consumers, we have taken elements of the proposed changes and adopted them within our package of proposed measures.

2.5. In addition to the potential improvements to the schemes, British Gas provided new evidence on specific aspects of our draft IA. We have considered this new information and, where appropriate, we used it to update the data and assumptions of our analysis:

- British Gas disagreed with our assessment of the average investigation costs in the draft IA. It suggested that, in assessing investigation costs, we should use the average cost per detection, and not the average cost per investigation.
- It provided evidence suggesting that the cost of conducting an investigation on a Larger Supply Point[15] (LSP) site was higher than the cost of investigating a Smaller Supply Point[16] (SSP) site.
- It amended information on the amount that it spends on tackling gas theft from £4.4m to £4m per year. Based on this revised budget, the total incentive amount under UNC277 and UNC346 would be £9.1m and 10.9m respectively.

Approach to updating the IA

2.6. In this section we provide an overview of our approach to updating the IA. We have not changed the approach to our analysis in relation to the draft IA. Where we have new information we have updated the data and assumptions that we use in our analysis. We also make an assessment of our proposed package of measures.

Approach to updating the analytical framework

2.7. In our draft IA, we modelled an individual case of theft to understand the impacts of the industry proposals. We assessed how one case of theft would affect the offender, their supplier and the rest of the industry.

2.8. We used this assessment in two ways:

- Net benefits: We refer to this analysis as **break-even analysis** which provides the break-even period for each year of theft detection activity under

[14] The proposed BTU process to amend the AQ where there is a change in the basis on which gas is consumed and there is no read history to support the change. This would require a modification to the Uniform Network Code to enable the BTU process being used in cases of theft.
[15] A supply point with an annual consumption greater than 73,200kWh (2,500 therms).
[16] A supply point with an annual consumption of less than 73,200kWh (2,500 therms).

each of the proposals. This is calculated by estimating the aggregate costs and benefits from detecting the targeted number of thefts under each of the industry proposals. We then calculate how long suppliers would need to receive future revenues from sites where theft had been detected in order to recover the costs of operating each proposal for one year.

- Distributional impacts of theft: This analysis aimed to estimate the effects of an individual case of theft by assessing how the benefits and costs of theft were distributed amongst the offender, the supplier, and the rest of the industry. We also estimated the aggregate distributional effects of theft, by assessing how different industry segments would be affected by theft under the current industry arrangements, and comparing this with the net benefits that would result from implementing each of the industry proposals to increase theft detection.

2.9. Respondents to our draft IA were broadly supportive of our analysis. They indicated that they were satisfied that we had assessed the main impacts of both theft and the industry proposals to tackle theft. In updating the IA we have therefore retained this approach and have also applied it to our proposed package of theft detection measures.

2.10. In this final IA we present our updated analysis. This is based on new information received since we published our draft IA, corrections to our modelling and additional analysis to support our proposed measures.

Changes to the data and assumptions in our analysis

2.11. The new information and assumptions used in our analysis are summarised below:

- Introducing an annual reoffending rate. This represents the proportion of offenders found stealing gas that would commit theft again in each subsequent year. Our base case assumes a rate of 5%. This will increase the break-even period for each of the proposals, although our analysis suggests that the scale of this effect is small.
- Using an average cost of investigation per detection. In our draft IA we used an average cost per number of investigations conducted, but our other assumptions on the impacts were on the basis of each case detected. Using an average cost per cases of theft detected will impact the assessment of the individual case of theft, and therefore will have an impact on the distributional effects of theft. It will also impact the calculation of the size of our proposed incentive scheme.
- Using a higher cost of investigation for LSPs. In our draft IA we used the same cost of investigation for SSPs and LSPs. A higher cost of investigation for LSPs will affect our assessment of the individual case of theft impacts, the distributional impacts of theft, and the size of our proposed incentive scheme. It will also be included in the calculation of the break-even period for each of the proposals to tackle theft.
- Introducing different demand scenarios. Our base case uses an annual average consumption of 16,500kWh for a SSP, and of 100,000kWh for a LSP.

This is the data that we used in our draft IA. We now also consider a low and a high demand scenario associated with both SSP and LSP sites. We use these different demand scenarios to test the sensitiveness of our break-even analysis and to help derive the appropriate size of our proposed incentive scheme.

- Updating our assumed industry fixed annual costs of running revenue protection activities under SETS and Enhanced SETS. British Gas indicated that their revenue protection budget for gas should be approximately £4m and not the £4.4m as indicated previously. This will impact the break-even period for SETS and Enhanced SETS.

2.12. In Appendix 2 we provide further details on the updates to the data and assumptions we use, and their impacts in our analysis.

Assessment of our package of proposals

2.13. In this final IA we have also considered our proposed package of measures, in particular focussing on introducing the TRAS and an incentive scheme. We assess the impacts of introducing these proposals and how they would compare with the impacts of the industry proposals. The updates to the analysis include:

- Assessing the net benefits of introducing the TRAS, by estimating the break-even period of using the TRAS to tackle theft.
- Estimating the size of our proposed incentive scheme and assessing its potential distributional impacts.

3. Impacts on consumers

Chapter Summary

In this chapter we assess the consumer impacts of each of the proposed industry schemes to improve gas theft detection. We also assess the consumer impacts of our proposed package of measures. This includes the potential impacts on consumer bills, the customer experience during a theft investigation and when theft is detected, data protection and theft deterrence. In later chapters we address the impacts on consumers' health and safety and specific issues relating to vulnerable customers and the fuel poor.

Impact on customer bills

3.1. Gas theft increases bills for paying gas customers, as suppliers seek to recover lost revenue. Estimates of the total value of gas theft vary considerably. Figures used for the current shrinkage calculation value gas theft at around £64m per year (or £2.85 per gas customer).[17] Using an extrapolation of the estimated cost of theft by the Allocation of Unidentified Gas Expert (AUGE), this figure could be as high as £138m (or £6.15 per gas customer).[18]

3.2. Most respondents to the consultation found it difficult to estimate the total value of theft in the market. Only one supplier put forward their view about the scale of theft. This supplier considered that the value of the stolen gas is in the region of £220m to £400m per year (or £9.80 to £17.80 per gas customer). However, no further evidence was provided.

3.3. This section considers the potential impacts on customer bills of the proposals to increase gas theft detection. The impact on customer bills is likely to be influenced by:

- Theft detection and prevention rates.
- Reoffending rates.
- Recovery rates for revenue lost through theft.
- Costs of industry arrangements to detect theft.

[17] Gas transporters are responsible for replacing the gas which is lost on their network as a result of shrinkage. Shrinkage can, for example, result from gas leaks from the distribution network, stolen gas and gas sites not being correctly registered on the network.
[18] The AUGE is responsible for estimating each year the annual value of unaccounted for gas. Theft is one of the items of unaccounted for gas, but it is not estimated directly by the AUGE. Instead it is included in an item named "Theft + Other". An indicative figure of 4.6TWh for the volume of gas taken has been provided by the AUGE. This is for the volume of the gas taken. The estimate of £138m is then calculated by using the System Average Price (SAP) to estimate the wholesale cost of the volume of gas taken, and by applying a retail value to this wholesale cost. We recognise that this is therefore a crude estimate as suppliers are likely to have contracted for the gas at a different average price than the SAP.

- Allocation of these costs between industry parties.[19]
- The extent to which suppliers pass through costs and benefits to customers.

3.4. In 2010, suppliers detected around 2,900 thefts, which we estimate had a retail value of approximately £5m.[20] In doing so, suppliers incurred around £6.5m of costs (of which approximately £3.7m were indirect costs of theft detection activities, and £2.8m were costs of investigations[21]). Suppliers reported that £2.2m was recovered from customers. This does not include the future revenue that suppliers would obtain from these customers, assuming that they keep paying their bills, which would be an additional benefit from theft detection.

Base case

3.5. Suppliers benefit from detecting theft in two ways. First, they may recover a proportion of lost revenue. Second, they may reduce the amount of unbilled consumption through reducing the volume of stolen units going forward.[22]

3.6. Our approach to this analysis estimates the impact of a year of operation of each proposal. This allows us to illustrate the costs and benefits of operating each scheme and to compare the different proposals. We have considered whether and when each proposed scheme would break-even. To do this we have analysed the additional customer charges that would need to be received (both in terms of recovered charges associated with the theft and future revenue) to cover the costs of operating the scheme for a single year.[23]

3.7. Our analysis does not include consideration of the schemes' set-up costs.[24] We also have not been provided with estimates of the set-up costs for Enhanced SETS although our initial view is that these may be similar to the NRPS. To simplify our analysis we have not included set-up costs for any of the proposals in our static analysis. This is because we have focused on the impact of individual years of running the schemes.[25] However, it is likely that the set-up costs will lengthen the break-even period, at least until the set-up costs have been recovered. Based on our analysis, the break-even period would lengthen by one month for each additional £0.324m spent on set-up costs in each of the proposals and £0.149m under the current arrangements.

[19] We consider allocation issues further in Chapter 4.
[20] This includes the total value of the gas taken over the period of the theft. Based on responses to our industry questionnaire, the average period of gas theft was estimated to be between 2.3 and 2.7 years when discovered.
[21] Where we refer to the investigation in this document we are also including within this all associated costs such as meter replacement, disconnection and reconnection costs and debt recovery costs.
[22] There may also be an additional impact on revenues as customers seek to moderate consumption once theft has been detected. We consider this issue further in Chapter 5.
[23] In our analysis we assume that the performance of each scheme in terms of investigations and detections can be maintained over the period of our analysis.
[24] Our approach is different from a dynamic break-even analysis, where set-up costs and all the other costs of a project would be matched against the project's benefits over a period of time.
[25] To incorporate set-up costs would require dynamic analysis of an enduring scheme over a number of years.

3.8. We have also considered the potential for each proposal to deliver additional benefits once break even has been achieved ie where charges continue to be recovered from customers that would otherwise have take an illegal supply.[26] Our expectation is that these benefits could be passed through to customers in terms of lower bills.

3.9. Our base case assumes that 17,000 theft investigations per year would identify 6,000 thefts.[27] We also use a reoffending rate of 5% in our base case. This represents the rate at which the recovery of charges from customers that would otherwise steal will decrease over time year on year.[28] Further details on our assumptions are set out in Appendix 2.

Findings

3.10. The TRAS and our proposed incentive scheme, as well as the NRPS, would achieve break-even for one year of operation if they generate 17 months of future revenues for the cases detected,[29] while SETS or Enhanced SETS would require 21 months of future revenues to achieve break-even.[30] The higher costs of operating SETS or Enhanced SETS leads to a longer break-even period. This means that, if the proposals deliver the proposed level of detections, the NRPS and TRAS and our proposed incentive scheme account will provide larger benefits to consumers.

3.11. Our analysis indicated that each scheme would achieve break-even more quickly than the current industry theft arrangements, as long as they deliver the proposed level of detections.

3.12. We estimate that the TRAS and our proposed incentive scheme will have a level of fixed annual costs similar to the NRPS.[31] The two proposals will therefore lead to an identical net benefit for any given impact on the overall level of theft.

3.13. Our estimates of the fixed annual costs are higher for SETS and Enhanced SETS when compared to the NRPS.[32] To deliver a net benefit, SETS and Enhanced SETS would therefore need to have a greater impact on the overall level of theft.

[26] Our modelling approach also assumes that the schemes would not impact on the average duration of theft before detection.
[27] To the extent that a proposal can deliver higher numbers of thefts, or improve on the conversion rate between investigations and identified theft, then this is likely to improve its relative merits. We have discussed the relative ability of each industry proposal to increase theft detection in Chapter 4.
[28] The reoffending rate will also impact directly the break-even period when this is higher than 12 months.
[29] Our analysis considers the impact of the 5% re-offending rate.
[30] For the purposes of our analysis we have assumed that the fixed annual costs for SETS and Enhanced SETS are the same. This is based on the assumption that investment in theft detection will be made until there are no additional benefits that can be received. We do not consider that the benefits available (ie the value of the incentive pot and the additional revenues from customers) differ between SETS and Enhanced SETS.
[31] This is based in the assumption that suppliers will opt for the delivery mechanism to tackle theft that minimizes costs, and thus scale the TRAS and incentive scheme to the level of service provided by the NRPS. Under this assumption, the fixed costs of providing the TRAS, including the data analysis and lead generation services, and managing the incentive scheme, as well as the cost of conducting 17,000 investigations, is estimated to range from £6.83m to £10.21m per year.
[32] We have derived the fixed costs of SETS and Enhanced SETS by subtracting the estimated costs of

3.14. We have summarised our results in Table 1 below. We have considered the break-even period for a single year of spending on each proposal and the break-even period for the industry's current performance (the current level of expenditure, number of investigations and number of theft detections).

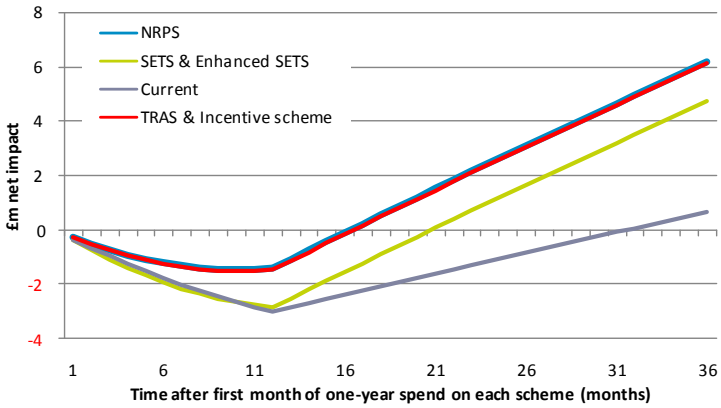
Table 1: Base case cost implications for each proposal against the current position

	Draft IA		Final IA	
	Break-even point	Additional monthly benefits after break-even	Break-even point	Additional monthly benefits after break-even*
Current position	30 months	£165,000	32 months	£149,000
SETS and Enhanced SETS	24 months	£341,000	24 months	£324,000
NRPS	17 months	£341,000	17 months	£324,000
TRAS & Incentive Scheme	N/A	N/A	17 months	£324,000

**Note: The additional monthly benefits are assumed to decrease 5% year on year*
Source: Ofgem analysis, 2012

3.15. Figure 1 below illustrates the potential improvement in revenues required to break-even, comparing a single year of spending on the NRPS, SETS and Enhanced SETS, and the TRAS and our proposed incentive scheme with the lower level of theft detections currently delivered.

Figure 1: Static analysis of one year of theft-detection activity (comparing base-case proposals with current performance)



Source: Ofgem analysis, 2012

3.16. Proposals are differentiated in our analysis only on the basis of the annual cost of operating each scheme. Therefore, the increase in net benefit arising from

conducting 17,000 investigations and finding 6,000 thefts from the total expected spend under these proposals. This is a crude measure, but reflects the assumptions of the proposer in terms of expected investment, investigation activity and results over the initial period.

each additional month of attributed future revenue is constant between proposals.[33] The break-even period is a function of several factors, including the costs of running the scheme, number of thefts identified, recovery rate of lost revenue, gas price, reoffending rate, Annual Quantity (AQ) adjustment, consumption and duration of theft.

3.17. Consultation responses did not provide sufficient evidence to enable us to quantitatively differentiate further between proposals in any of these areas. Chapter 4 considers the likelihood that each proposal will deliver or exceed the estimated level of investigations and theft detections. We differentiate below qualitatively between the proposals and set out our view that, based on the break-even periods identified for each proposal, our proposed package of measures will lead to more theft detection than the NRPS. We therefore consider that our proposed package of measures will lead to the greatest level of benefits for consumers.

Sensitivity testing

3.18. We consider that it is important to illustrate the sensitivity of our results to the assumptions set out in our base case. Figure 2, Figure 3 and Figure 4 below illustrate the range of break-even periods for each proposal based a number of sensitivities. We present these sensitivities in order of declining impact on the break-even point, given the ranges of assumptions we have tested.

3.19. We note the following key comparisons between the sensitivities tested, based on our assumed sensitivity ranges (described in Appendix 2).

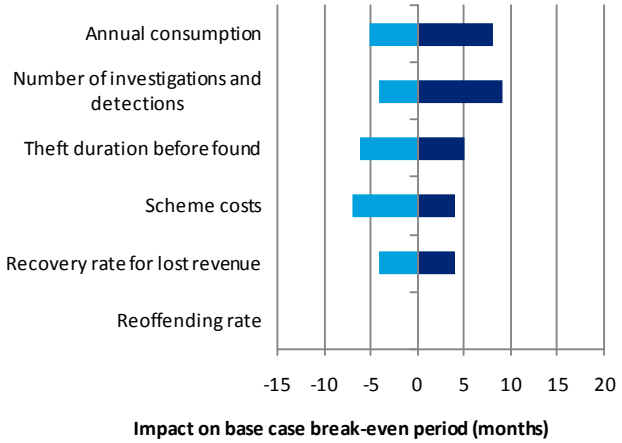
- Break-even is most sensitive to the assumed number of investigations and detections and the assumed annual consumption. If SETS or Enhanced SETS fail to improve the rate of detection above current levels, it is unlikely to deliver greater benefits than the current arrangements. SETS and Enhanced SETS are more sensitive than the NRPS and the TRAS and our proposed incentive scheme to the detection rate, given its assumed higher level of fixed cost.
- Our conclusion that each proposal would deliver an improvement over the current arrangements is robust to all other tested sensitivities.
- All of the proposals are sensitive to scheme costs. We consider a broad range of sensitivities, which reflect considerable uncertainty around the costs of each scheme.
- Theft duration has a lower impact, within the tested range of sensitivities. The sensitivity of theft duration would increase if we set a higher recovery rate.
- Recovery rate has a relatively low impact on the break-even period for all proposals. This likely reflects the narrower range of sensitivities around the recovery rate that we have considered.

[33] The gradient in Figure 1 for the 'current' scenario is different to the NRPS, SETS and Enhanced SETS, and TRAS and the incentive scheme. This reflects the lower level of thefts detected under the current arrangements.

- The reoffending rate has a negligible impact on the break-even period for all proposals. This likely reflects the relatively short break-even periods.

Figure 2: Base case break-even attributable future revenue for NRPS, including sensitivity analysis for key assumptions

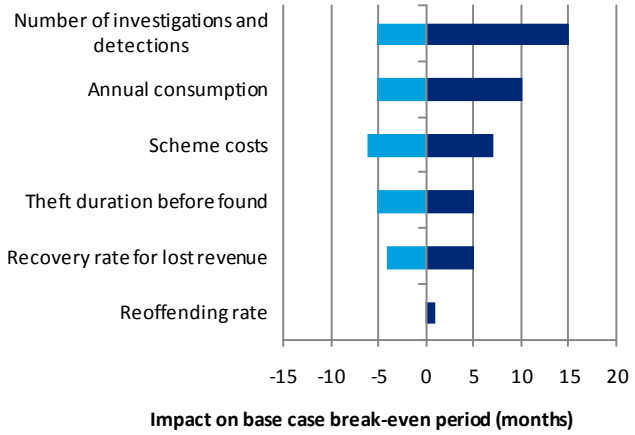
	NRPS		Sensitivity unit	Sensitivities		
	Min. break-even	Max break-even		At min value	Base case	At max value
Base case	17	17		-	-	-
Annual consumption	12	25	kWh/year (SSP,LSP)	12.4k,75k	16.5k,100k	20.6k,125k
Number of investigations and detections	13	26	(investigations, detections)	(20K, 8k)	(17k, 6k)	(8k, 3k)
Theft duration before found	11	22	months	42	30	18
Scheme costs	10	21	£m	0.99	2.86	4.30
Recovery rate for lost revenue	13	21	% (SSP,LSP)	35%, 70%	25%, 60%	15%, 50%
Reoffending rate	17	17	%	3%	5%	7%



Source: Ofgem analysis, 2012

Figure 3: Base case break-even attributable future revenue for SETS and Enhanced SETS, including sensitivity analysis for key assumptions

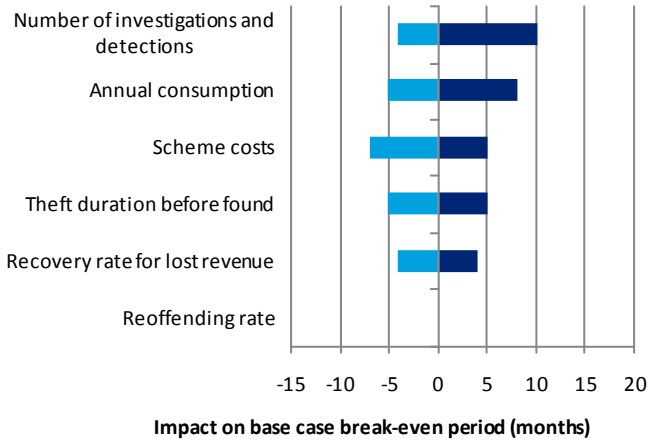
	SETS and Enhanced SETS		Sensitivity unit	Sensitivities		
	Min	Max		At min value	Base case	At max value
Base case	21	21		-		-
Number of investigations and detections	16	36	(investigations, detections)	(20K, 8k)	(17k, 6k)	(8k, 3k)
Annual consumption	16	31	kWh/year (SSP,LSP)	12.4k,75k	16.5k,100k	20.6k,125k
Scheme costs	15	28	£m	2.27	4.31	6.35
Theft duration before found	16	26	months	42	30	18
Recovery rate for lost revenue	17	26	% (SSP,LSP)	35%, 70%	25%, 60%	15%, 50%
Reoffending rate	21	22	%	3%	5%	7%



Source: Ofgem analysis, 2012

Figure 4: Base case break-even attributable future revenue for TRAS and our proposed incentive scheme, including sensitivity analysis for key assumptions

	TRAS and incentive scheme		Sensitivity unit	Sensitivities		
	Min	Max		At min value	Base case	At max value
Base case	17	17		-		-
Number of investigations and detections	13	27	(investigations, detections)	(20K, 8k)	(17k, 6k)	(8k, 3k)
Annual consumption	12	25	kWh/year (SSP,LSP)	12.4k,75k	16.5k,100k	20.6k,125k
Scheme costs	10	22	£m	1.03	2.92	4.41
Theft duration before found	12	22	months	42	30	18
Recovery rate for lost revenue	13	21	% (SSP,LSP)	35%, 70%	25%, 60%	15%, 50%
Reoffending rate	17	17	%	3%	5%	7%



Source: Ofgem analysis, 2012

Customer experience of theft detection and investigation

3.20. In this section we consider the potential impacts of each proposal on the likelihood of a customer being investigated and the quality of that investigation. Chapter 5 considers specific effects of each proposal on vulnerable customers.

Likelihood of investigation

3.21. We expect that both the NRPS and our proposed package of measures would lead to a similar level of risk for consumers that they would be investigated, regardless of who supplies them with gas.

3.22. Mandatory theft investigations, based on an agreed risk-based methodology rather than the policy of a particular supplier, would be generated centrally by the NRPS. The likelihood of a customer being investigated would be determined by the methodology employed by the NRPS for risk profiling and by the available data.[34]

3.23. The aim of the TRAS is to establish a risk-based methodology to provide suppliers with information to allow them to best meet the Theft Target. The Theft Target would be established at a level best calculated to deliver benefits for consumers and would be supported by an incentive scheme to encourage action.

3.24. The proposal for the incentive scheme, similarly to SETS and Enhanced SETS, aims to incentivise suppliers to be efficient in detecting theft to maximise the value of their incentive payments. Nonetheless, as the incentive scheme is proposed to be implemented together with the TRAS, the likelihood of any customer being investigated is defined primarily by the TRAS. Our proposed incentive scheme is therefore expected to impact less on the likelihood and more on the quality of investigations. This will minimise the possibility for customers having a different chance of being investigated for theft. Nevertheless, suppliers would be able to generate their own leads and investigate and detect theft over and above the leads provided by the TRAS.

3.25. The SETS and Enhanced SETS proposals aim to incentivise suppliers (via their shippers) to identify theft in the most efficient manner to maximise the value of their incentive payments. This may lead to a difference for customers in the likelihood of theft being investigated depending on who supplies them with gas. For example, some suppliers may respond more strongly than others to the available incentives. Our proposals attempt to address this concern by supporting the incentive mechanism with a robust central approach to generate theft leads and target investigations.

3.26. Under SETS and Enhanced SETS suppliers may also respond differently to the specific incentive measures proposed under UNC277 (number of sites identified where theft has occurred) when compared with UNC346 (volume of gas theft detected). This may influence which customers are targeted. For example, UNC346

[34] In reality, this methodology may unintentionally bias investigations towards a particular customer group or groups.

may lead suppliers to focus investigations on commercial users with higher consumption levels.[35]

3.27. We also note that the NRPS, Enhanced SETS and our proposed package of measures may offer additional benefits over SETS in tracking potential gas thefts when a consumer changes supplier. Of these proposals, our expectation is that the NRPS or our package of measures would be able to offer greater benefits.[36]

Quality of investigation

3.28. When theft is suspected or identified we consider that customers should be treated in a satisfactory manner, irrespective of who supplies them with gas. In this section we consider the ability of each proposal to deliver satisfactory standards of investigation. We have also considered whether the design of each of the four proposals will impact on a supplier's view on whether to declare that an incident should be categorised as a theft.[37]

3.29. Suppliers do not currently have industry-wide rules which detail how investigations should be undertaken. All proposals are clear that they should be supported by a code of practice setting out common minimum standards for theft investigation. The accompanying way forward document provides further details on the new gas code of practice, and our proposed obligations for gas suppliers to establish key standards for the treatment of consumers as part of an investigation. Each proposal is therefore likely to be supported by common rules for theft investigations.

3.30. We consider that there are strong commercial drivers under SETS, Enhanced SETS and our proposed package of measures to declare a suspected theft as an actual case of theft. However, we are concerned that the commercial incentives above may drive behaviour to the detriment of customers, for example, declaration of theft where this is not the case.

3.31. To deter false declarations of theft detection, the SETS proposal seeks to ensure that, where a code of practice has been established, a supplier operates in accordance with it when determining whether a theft has occurred and calculating the amount of gas illegally taken. SETS would have in place an auditor to identify whether a supplier was meeting this standard. To the extent that a supplier was not

[35] The SETS proposal (and the related elements of the Enhanced SETS proposal) would not apply to the 1.3m customers on Independent Gas Transporter (iGT) networks. SETS and Enhanced SETS are not therefore expected to increase the extent to which these customers are targeted. We do not consider that this is a material differentiator with the NRPS, TRAS or the incentive scheme. If one of these proposals were to be chosen, this issue could potentially be addressed by a modification to extend the scope of the arrangements to the iGT networks or to introduce equivalent proposals to the iGT UNC.

[36] This view is based on our assumption that Enhanced SETS would only pass on information relating to current investigations to the new supplier, ie where a theft was already suspected. In contrast, the NRPS and the TRAS would be able to assess risk for all supply points that have recently transferred (ie not just those where an investigation was underway).

[37] The implication of declaring a theft is significant for customers. Our expectation is that a supplier would seek to recover charges from that customer (such as repaying the value of the gas illegally taken and the costs of the investigation or any meter exchange). The customer may also be disconnected for example if they are not willing to pay associated charges.

able to demonstrate compliance with the required standards, then (via its shipper) it would be penalised by a reduction in its total incentive payments. These arrangements would also apply under Enhanced SETS.

3.32. We have also recognised this issue under our proposed package of measures. We consider that specific measures should be included to address this issue. These include:

- Having a single, independent auditor for both the TRAS and our proposed incentive scheme. This would enable a more holistic approach to the audit of the supplier theft investigation and detection activity. We propose that the auditor should monitor all investigation activity, and prioritise cases where consumers have complained about their treatment.[38]
- Having a regular review of the Theft Target and associated value of the incentive pot to ensure that the scheme remains fit for purpose.

3.33. In addition, our methodology for deriving the size of the incentive pot is deliberately aimed at allowing suppliers to recover their costs rather than to obtain profits from being proactive in theft detection. We set out our methodology for establishing the total value of our proposed incentive scheme in chapter 4.

3.34. Under the NRPS, the commercial incentives on a supplier to find theft when conducting an investigation are weaker. We are concerned that suppliers may not make sufficient efforts to robustly investigate a suspected theft. This is because suppliers' investigation costs (including meter replacement, disconnection and reconnection) are likely to be higher when a theft is found.

3.35. The NRPS arrangements envisage audit provisions to monitor compliance with a proposed code of practice. An independent audit would be conducted on suppliers as a matter of course during the first two years. After this initial period suppliers would be subject to compliance audits and assurance audits in response to specific issues or concerns, raised by the NRPS or other suppliers. Where a supplier is subject to an audit and problems are identified, it would be required to bear the cost of the audit.

3.36. Respondents to our August 2011 consultation did not suggest any additional performance assurance measures to the NRPS proposal to ensure that suppliers make appropriate efforts to detect theft. We therefore maintain our concerns that suppliers may face an incentive to avoid the higher investigation costs when a theft is found, and consequently not make sufficient efforts to robustly investigate suspected theft.

3.37. Our proposal for the TRAS is similar to the NRPS. As noted above we are proposing to address the weak commercial incentives to conduct robust

[38] Our proposed new gas supply Standard Licence Condition on tackling gas theft includes a requirement to inform customers on what steps they should take if they wish to dispute that theft has occurred. The new Gas Code of Practice is currently developing more detailed rules for the information that should be given to consumers as part of any investigation.

investigations through an incentive scheme that operates in parallel. The aim of our proposed incentive scheme is to encourage suppliers to detect theft at a level that delivers benefits for consumers.

Data protection

3.38. As set out in our draft IA, we consider that data analysis is an important method for detecting theft.[39] For any of the proposals, industry participants would need to ensure that they meet their obligations under the Data Protection Act (DPA) 1998.

3.39. Under the NRPS proposal, suppliers and gas transporters would be required to provide detailed information to the NRPS to allow it to profile the risk of theft at each meter point.[40] The same would apply under our TRAS proposal. The DPA 1998 implications of these proposals therefore need to be clearly understood. The DPA 1998 would also need to be considered in relation to SETS or Enhanced SETS.[41]

3.40. The Gas Forum and the proposer of Enhanced SETS both commissioned legal advice on their respective proposals and have shared this information with Ofgem. Based on this information and our further assessment, we consider that both proposals are capable of operating in accordance with the DPA 1998. However, this would need to be carefully managed and assessed on a continuous basis by parties to ensure that they continued to meet their DPA 1998 requirements.

3.41. We also consider that our proposed package of measures is capable of operating in accordance with the DPA 1998. To help support compliance with the DPA 1998 we are consulting on specific measures in our Direction to suppliers to implement the TRAS. These include a requirement to have in place and maintain a Privacy Impact Assessment.[42] Our proposals also clarify that nothing in the Direction should be seen as a requirement on a gas supplier to operate otherwise than in accordance with the DPA 1998.

Theft deterrence

3.42. As described in our draft IA, there are likely to be a number of factors that determine whether a customer decides to take an illegal gas supply. These include:

[39] Our questionnaire responses show that data analysis was reported as the source of 9% of all gas theft detections in the market. However, the data provided by some parties was limited and that the significant number of theft leads reported in the other category (49%) which may, in some part, have resulted from data analysis.
[40] The data items that have initially been considered under the NRPS proposal are set out in Section 12 of the NRPS Workgroup Report to Ofgem provided by the Gas Forum.
[41] In particular, we note that the CRPU element of Enhanced SETS includes proposals to allow suppliers to pool data on a voluntary basis for analysis so that it can be used to help target investigations. On change of supplier, a supplier that was investigating a potential theft would be required to provide information to the RPACA who would then pass this information to the new supplier.
[42] A Privacy Impact Assessment is an assessment to help organisations assess and identify any privacy concerns for any project that involves changes to data collection and use. It forms part of best practice guidance issued by the Information Commissioner's Office.

- The ease with which theft can take place.
- The customer's perceived risk of detection.
- The perceived consequences of detection.

3.43. As noted above, we consider that each of the three industry schemes and our proposed package of measures would be likely to increase the rate of theft detection from current levels. This would have a consequential deterrence effect by increasing the perceived risk of being detected. We have discussed the relative ability of each proposal to increase detection in chapter 4. We consider that the NRPS, Enhanced SETS, and our proposed package of measures may also offer some additional benefits over SETS in relation to deterrence by tracking customers that change supplier.

3.44. The Enhanced SETS, NRPS proposals and our proposed package of measures would also introduce a national telephone service to receive tip-offs about gas theft. We consider that, to the extent that this and any other measures are publicised, then these may act as a theft deterrent.

Summary

3.45. In this section we set out a summary of our analysis on the impact of each proposal on customer bills and the qualitative analysis presented in this chapter.

3.46. Our assessment is that all three industry schemes and our final proposals could achieve break-even, to the extent that future revenues for each theft detected would cover the costs of operating each scheme for one year. Where future revenues are realised beyond break-even, the schemes could deliver additional benefits that could be passed through to consumers through lower bills.

3.47. Our analysis indicates that our proposals will lead to higher detection rates, and therefore deliver a higher level of benefits to customers. Based on our analysis, both our proposed package of measures and the NRPS are likely to have the shortest break-even period. This means that these proposals are likely to benefit customers the most. This analysis relies on the assumptions that we have made and the differences between the three industry schemes and our final proposals which reflect the costs that we have attributed to each scheme. Our analysis also indicates that our proposed package of measures is likely to be more effective than the NRPS proposal in addressing the quality of investigations, and providing clarity in terms of detection targets.

3.48. The weaknesses that we identified in the three industry proposals reduce the prospect of the schemes successfully achieving the targeted number of investigations and theft detections. We remain concerned that these weaknesses have not been fully addressed. Under the NRPS there are commercial incentives not to find theft during an investigation. The NRPS also did not contain a clear commitment in terms of number of investigations and theft detection targets. Under SETS and Enhanced SETS, there is a lack of a comprehensive risk-based approach to target theft detections. We were also concerned that the incentive value may lead to

disproportionate incentives for suppliers to find theft and did not seek to reflect consumer benefit on an enduring basis.

3.49. We consider that our proposed package of measures is likely to deliver greater net benefits to consumers, when compared to the industry proposals. Our scenario testing shows that the potential benefits for consumers will be impacted by the success of each proposal in detecting theft. We consider that the TRAS and our proposed incentive scheme together are likely to provide a higher degree of assurance that the targets for investigations and theft detections are met. The TRAS will provide a risk-based methodology to identify theft, as well as access to services to facilitate theft investigation. Our proposed incentive scheme will encourage suppliers to conduct investigations thoroughly and to a satisfactory standard. It will also provide the incentives to overcome suppliers' barriers in detecting theft, and encourage them to achieve their targeted theft detections. We have set out further analysis on this in the next chapter.

3.50. Table 2 below sets out a summary of the qualitative analysis presented in this chapter.

Table 2: Summary of qualitative consumer impacts

	SETS	Enhanced SETS	NRPS	TRAS & Incentive scheme etc
Likelihood of investigation	Driven by supplier response to commercial incentives.	Driven by supplier response to commercial incentives. Improved data to target investigations. Access to services to facilitate investigations.	Driven by NRPS risk based methodology. NRPS target on volume of investigations is unclear. Access to services to facilitate investigations.	Driven by risk based methodology and response to commercial incentives. Access to data services to facilitate investigations. Expectation that target volume of investigations will be set by and encouraged by incentive scheme.
Quality of investigation	Strong commercial incentive on suppliers to identify theft. Moderated by audit and threat of financial penalty.	Strong commercial incentive on suppliers to identify theft. Moderated by audit and threat of financial penalty.	Weak commercial incentive to detect theft. Performance audit. Pay cost of audit if not compliant.	Commercial incentives designed to overcome barriers to detect theft. Performance audit and threat of financial penalty.
Data protection	No impact identified.	Potential impact from exchange of data on change of supplier. Potential impact in relation to elective CRPU data analysis.	Potential impact in relation to NRPS data analysis.	Potential impact in relation to TRAS data analysis.
Theft deterrence effect	Increased theft detection provides additional deterrence effect.	Increased theft detection provides additional deterrence effect. Track customer through change of supplier process. Telephone tip-off service.	Increased theft detection provides additional deterrence effect. Track customer through change of supplier process. Telephone tip-off service.	Increased theft detection provides additional deterrence effect. Track customer through change of supplier process. Telephone tip-off service.

Source: Ofgem analysis, 2012

4. Impacts on competition

Chapter Summary

In this chapter we assess the potential impact of each industry scheme and our package of proposals on competition in the gas supply market. We first consider the impacts that may arise from the allocation of gas and transportation costs between shippers. We then consider the broader costs and benefits. Finally, we assess the competition impacts on small suppliers and potential new entrants.

Allocation of gas and transportation costs

4.1. In this section we update our previous analysis on the impact of the three industry schemes on gas and transportation costs.[43] We also set out our findings in relation to our proposed package of measures. Where theft of gas has occurred, the existing industry arrangements provide for unaccounted for gas and transportation costs to be recovered from shippers through cost smearing mechanisms.[44]

4.2. A reduction in theft is likely to lead to more accurate allocation of industry costs to individual shippers. Increased accuracy can help to promote competition in the supply of gas by improving the allocation of variable operating costs, ensuring they are linked to metered consumption on a shipper's portfolio. This should help to reduce distortions in the market. Impacts on cost allocation differ between the SSP and LSP markets and between shippers in those markets[45]. These impacts are explained in more detail below.

Cost allocation in the SSP market

4.3. In the SSP market, a shipper's gas and transportation charges are linked to the AQ at a meter point. The AQ is an estimate of the expected annual consumption at the meter point based on historic meter read data. The AQ is reviewed yearly where meter-read data has been provided by the shipper to xoserve.[46] Where a theft

[43] A gas transporter may charge a shipper for the use of its network in conveying gas to customers.
[44] Our assumption is that shippers will pass through costs to the supplier. We therefore consider that the focus of our assessment should be on competition in the gas supply market. Where necessary, we have referred to the specific role of the shipper but our view is that they would be acting on behalf of a supplier in the context of gas theft.
[45] Our analysis focuses on sites on the large gas transporters' networks. iGT sites have a different charging structure, which will impact on the allocation of costs. The main difference relates to transportation charges. These are split between the charges for the use of the iGT network, which typically remain fixed regardless of consumption, and` charges for transportation across the large gas transporters' network to the edge of the iGT network, which will be impacted by the AQ. The level of smeared costs relating to theft on an iGT network may therefore be lower than on a large gas transporter's network. Correspondingly, the effect on the offender's supplier will be greater on an iGT network.
[46] Xoserve provides a range of centralised services to the gas industry in Britain. Xoserve manages the key data associated with the gas meter points, the registration and the customer switching services for the industry. Xoserve also manages the energy allocation and invoicing on behalf of the large GTs.

has occurred, meter reads will be commensurately lower and, once submitted, these will lead to a decrease in the AQ over time.

4.4. Once a theft has been discovered, there will also be a lag in the AQ increasing to reflect actual consumption at the site.[47] For the period that the AQ does not reflect actual consumption, gas and transportation costs will be smeared to the rest of the SSP market. Once theft is detected, the customer's supplier will be able to charge the customer for the gas illegally taken (where their identity is known) and for future consumption at that site. However, the supplier's shipper will not be liable for the full industry costs associated with that gas until after the AQ has been fully readjusted.

4.5. We estimate that an average theft in the SSP market would lead to £604 of costs being smeared across SSP shippers.[48] For clarity, this figure relates to the allocation of costs between shippers rather than any change in overall charges, and has not changed from the draft IA.

4.6. Our analysis has also considered the impact of theft on shippers with different market shares. Our analysis suggests that the cost of an individual theft is higher for a larger SSP shipper as they will pick up a higher proportion of the smeared industry costs for that site. For example, a shipper with a market share of 45% would incur a net cost of £1,266 from an average case of theft in its portfolio.[49] The same case of theft would accrue a net cost of £1,053 for a shipper with a 15% market share and £953 for a shipper with a 1% market share. These net costs have increased from our draft IA, reflecting the revision to our calculation of investigations costs.

4.7. If a theft is detected, we estimate that a supplier will have a net cost from detecting a theft when compared to not taking action to detect the theft. This net cost is observed across all market shares that we have considered. Our draft IA presented information that detection would provide a net benefit to suppliers. Our revised conclusion reflects our different approach to investigation costs.

4.8. Where a theft is detected, all SSP shippers would benefit by the same amount (regardless of market share) as this simply measures the impact of recovered revenues from the customer (we assume the rate of recovery to be the same across all suppliers). Our analysis also indicates that larger SSP shippers will benefit most by theft detection by another shipper as a result of the larger reduction in exposure to smeared costs (although this benefit will be spread over a larger cost base).

Cost allocation in the LSP market

4.9. In the LSP market some charges, such as the commodity charges and the commodity element of transportation charges, are linked to the meter reads provided by shippers to xoserve. Other charges, such as the capacity element of

[47] This lag may be anywhere between a few months to several years, depending on the timing of meter read submissions and their proximity to the annual AQ review.
[48] This is based on theft occurring over a period of 2.5 years and an average annual consumption of 16.3MWh, of which 70% is illegally abstracted.
[49] Assuming our base case, where 25% of the supply charges from theft are recovered. See Appendix 2 for further details.

transportation charges for the LSP Non-Daily Metered[50] (NDM) market, will reflect the AQ. Where gas is not recorded on the meter this will lead to smeared charges for the rest of the market.[51] There is expected to be a time lag for capacity charges to decrease. As described above for the SSP market, this will reflect the annual AQ review process.

4.10. If theft from LSP sites decreases then it is expected that this will improve cost allocation by reducing the smearing of gas and transportation charges.

4.11. Once a theft is discovered, it is expected that an LSP shipper would be liable for all the meter related gas and transportation charges on a prospective basis (this does not include the AQ related, transportation capacity charge which may take time to readjust).[52]

4.12. Theft of gas in the LSP market therefore leads to two smearing effects. Firstly, a cash-flow effect of meter related charges. These charges are smeared while gas is not recorded on the meter during theft. On discovery of theft, the units illegally abstracted are reported to the gas transporter, and the supplier (via its shipper) becomes liable for the meter related energy commodity and transportation charges. Secondly, a smear of AQ related charges. Transportation capacity charges are based on the AQ and are not reconciled. When theft is discovered, suppliers are not liable to pay increased capacity charges related to the units illegally abstracted. These charges are smeared to the rest of the industry.

4.13. Despite the effect of meter point reconciliation and the reallocation of meter related charges for the period of the theft, our analysis indicates that for the base case LSP shippers have a commercial incentive to detect theft.[53] This differs from our initial views set out in our draft IA which suggested that LSP shippers had a commercial disincentive.[54] This change is largely driven by the correction to the recovery rate associated with LSP sites.[55]

4.14. Because our analysis of different market shares has attributed a constant SSP market share to LSP shippers, we have not observed a market share effect between

[50] Sites with an annual consumption of less than 58.6GWh are classified as NDM.
[51] Until April 2010, the costs of unallocated gas were met by the SSP market (unless covered by the gas transporters shrinkage requirements). From this date LSP shippers have been required to make a contribution of £2.75m towards smeared gas charges. From April 2012 LSP shippers will be required to pay a share of smeared gas charges based on the assessment of an independent expert (the AUGE). However, we note that the current rules mean that any difference in the apportionment of smeared gas charges to LSP shippers and the actual error attributable to that market would be picked up by SSP shippers. We discuss further the potential impacts of the AUGE in Appendix 2.
[52] Suppliers are required under their licence conditions to provide information to the gas transporter on the amount of gas illegally taken and this is used to reallocate charges for the period of the theft.
[53] This is based in our analysis of the marginal detection impact, which we explain further below. We also note that this may not include all of the costs that a supplier may be exposed to, eg set-up costs. In estimating the marginal detection impact, we build sensitivities to account for this uncertainty. As a result, we estimate that the LSP shippers would have a net disincentive to detect theft.
[54] Our analysis in our draft IA was intended to be based on a 60% recovery rate in the LSP sector. However, the model incorrectly used a figure of 25%.
[55] As noted above, we updated our analysis and now use the average investigation costs per detection. We also updated the cost of conducting a successful investigation in LSP sites, which is now £150 higher in relation to the assumption in our draft IA (and also in relation to the costs of a successful investigation at a SSP site). This will increase the costs for the supplier in being proactive in theft detection.

LSP shippers. In reality, differences in the SSP portfolios held by shippers that operate in the LSP market, as well as changes to the allocation rules, will have an impact on allocation. The methodology to determine the size of the incentive pot under any scheme would need to account for these impacts.

4.15. We estimate that an average theft[56] in the LSP market would lead to a cash-flow effect, from the start of theft until the moment theft is discovered, of £2,678. This relates to gas and transportation commodity charges which are smeared during theft, but reconciled once theft is found. We also estimate that the capacity charges, which reflect the AQ, would result in £985 of smeared costs to the rest of the industry (and in our model this is attributed to SSP shippers). These figures have not changed from our August draft IA.

Impact of increased theft detection

4.16. All three industry schemes and our proposed package of measures aim to increase the amount of theft detected and prevented. If successful, each would improve the allocation of gas costs. Based on our modelling assumption of an increase in theft detection levels from 2,900 to 6,000 cases per year, we estimate that this would reduce smeared costs by £0.67m and £0.13m per year in the SSP and LSP markets respectively. In the LSP market there would also be a cash-flow effect of £0.34m in relation to gas and transportation commodity charges. These figures have not changed from the August draft IA. This reduction in smeared costs would occur for every year that the additional 3,100 detected customers no longer took an illegal supply.[57] Theft detected in subsequent years would similarly reduce future unallocated gas so that the increase in accuracy could be significant if improvements in theft detection were sustained.

4.17. Benefits arising from a reduction in smearing would be accrued by all shippers in the SSP market. All of the industry schemes and our final proposals could therefore result in increased positive externalities, creating 'free rider' effects. Our view is that this could reduce distortion in the market and is likely to benefit competition. The impact on shippers in the SSP market will also be influenced by their volume market share. Shippers with larger portfolios will experience greater reductions in smeared costs, because allocation of costs is based on market share. We note that, were the allocation mechanisms to be amended, as is currently envisaged, then these effects are likely to alter.[58]

4.18. Both the NRPS and Enhanced SETS schemes would use the BTU process under the UNC to correct the AQ from the point that a theft is discovered. In its response to our draft IA consultation British Gas proposed that SETS should use the BTU process. The BTU process is also a feature of our proposed package of measures.

[56] This is based on theft occurring over a period of 2.5 years and an average annual consumption of 100MWh, of which 70% is illegal abstracted.
[57] The reduction on smeared costs would drop 5% year on year, reflecting the impact of our assumption about the reoffending rate.
[58] For example, more frequent updates to the AQ would reduce the time lag in the AQ reflecting the reduction in recorded consumption associated with a theft and any subsequent increase once a theft had been discovered.

4.19. The BTU process would replace the AQ at the point of theft detection with a value that more closely reflects the annual consumption at the site. This is likely to improve allocation in both the SSP and LSP markets as it would remove the time lag for the AQ to be amended. Our analysis in Appendix 2 indicates that this effect would decrease the commercial benefits of theft detection for an SSP shipper. In our base case analysis the reduction in benefit to the SSP shipper would be £363. The reduction in the benefit to the LSP shipper would be £591. This benefit would instead be transferred to the rest of the SSP market, which would face a reduction in smeared charges from theft. These figures have not changed from the August draft IA.

Distribution of additional costs and benefits

4.20. In this section we examine the costs and benefits of the industry schemes and of our proposed package of measures. Where possible we link these to the impacts arising from gas and transportation charges described above.

Distribution impacts of the incentive schemes

4.21. We would expect suppliers to respond to an incentive regime according to the benefit they can derive from detecting theft, given the variable costs they would incur from doing so. This excludes the costs of funding the scheme, which for an individual supplier are not linked to their theft-detection efforts.[59]

4.22. In our analysis, the marginal (dis)incentive to detect theft is given by the incremental costs and benefits of detecting a theft, when compared with the baseline of not taking action. We therefore assume that suppliers, via their shipper, would treat the requirement to pay into the scheme as a sunk cost and we have not included this in our analysis of the distribution impacts.[60]

4.23. For SSP shippers, the incremental costs and benefits of detecting a theft comprise revenue recovered from the customer (repaid charges), any payments from an incentive scheme and investigation costs.[61] For LSP shippers, in addition we include the net impact of the smeared energy commodity and transportation commodity charges.[62] Our analysis excludes future payments, given the difficulty in estimating their duration.[63] To the extent that suppliers attribute future revenue to

[59] SETS, Enhanced SETS, and our proposed incentive scheme suggest that shippers would fund the respective scheme in accordance with their market share.
[60] It is important to note that shippers will incur a cost in funding any scheme. In aggregate, payments to fund the scheme are assumed to match incentive payments, but the impact on individual suppliers will depend on their performance under the scheme (payments) and their market share (funding costs). For a scheme value of £10m, the funding requirement for a shipper with 15% of the market would be £1.5m regardless of its theft detection performance.
[61] We have separately considered the additional impact of the existing supplier compensation arrangements later in this chapter.
[62] Our analysis assumes that suppliers report the units illegally abstracted on an LSP site to the gas transporter. On detecting theft, the supplier will be invoiced the gas and transportation commodity charges associated with these units.
[63] We adopted a 5% consumer reoffending rate in our analysis. This could help in estimating the duration of the impacts from theft. However, we consider that the length of these impacts is likely to be influenced also by other factors (for example, a re-offender may be easier to discover, increased detection may lead

detection, our analysis is likely to underestimate detection incentives. In chapter 3 we examined how large these payments would need to be in order for each year of operation of the scheme to break-even.

4.24. The incentive schemes proposed are designed to encourage suppliers to detect theft. However, there is a trade-off between the size of the incentive pot and its potential distortion effects. The larger the pot, the greater the distributional impacts of the proposal. To the extent that these distributional impacts may favour one supplier over another, they may distort competition between suppliers. To minimise such potential distortions (which are hard to predict), the incentive scheme should be no larger than the value required to incentivise an appropriate target rate of theft detection.

SETS

4.25. The cost of the SETS incentive would be met by shippers in accordance with their market share. UNC277 proposes this would be determined on the basis of the number of supply points. Under UNC346, market shares would be determined by the volume of gas allocated to each shipper's portfolio. Both proposals include conditions exempting very small shippers[64] and Daily Metered[65] (DM) sites and would not relate to sites on iGT networks.

Size of the SETS incentive pot – original proposal

4.26. UNC277 proposes a total incentive value of £10m while UNC346 proposes a total incentive value of £12m. Our initial assessment is that, for each detected theft, UNC277 would provide an incentive payment of £1,519 if 6,000 thefts were detected. Under UNC346 we estimate that, based on the current split of theft detections between SSP and LSP shippers, the value of the average incentive payment would be £1,195 in the SSP market and £7,242 in the LSP market. These incentive payments have gone down from our draft IA, reflecting the revised SETS incentive pot size.

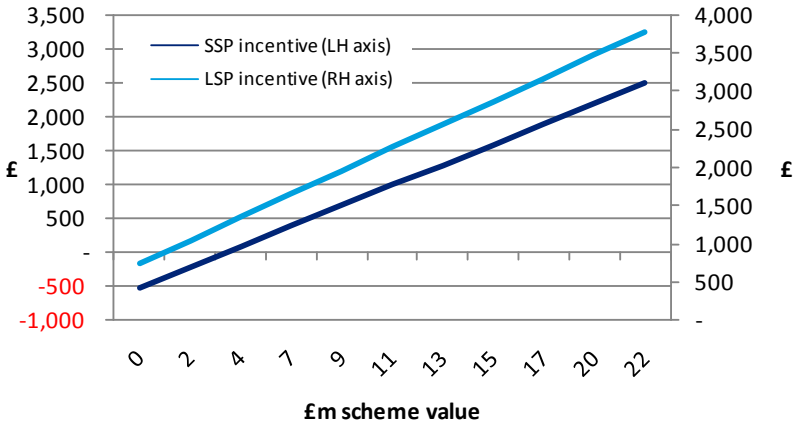
4.27. Figure 5 and Figure 6 below present our updated analysis on the marginal detection incentive (as specified) for LSP and SSP shippers arising from UNC277 and UNC346 respectively, under our base case assumptions. LSP shippers have considerably larger incentives than SSP shippers under both SETS and Enhanced SETS. Furthermore, this effect is larger for UNC346 compared with UNC277. This is because incentive payments under UNC277 are fixed per detection, while under UNC346 payments vary according to volume. The appropriate size of the incentive pot may therefore differ considerably between the two proposals.

to higher deterrent effect), making it complex to estimate.

[64] Under the original UNC277 and UNC346 proposals, shippers with a market share (in terms of supply points and volume respectively) of zero (when calculated to four decimal places) would be excluded from the requirement to participate in the scheme. This would equate to shippers with less than approximately 110 supply points and an expected throughput of gas of less than 2.6GWh per year for UNC277 and UNC346 respectively. In the response to our draft IA British Gas suggested to exclude from the schemes Suppliers with both less than 50k NDM customers and an aggregate NDM AQ on their portfolio of less than 10TWh.

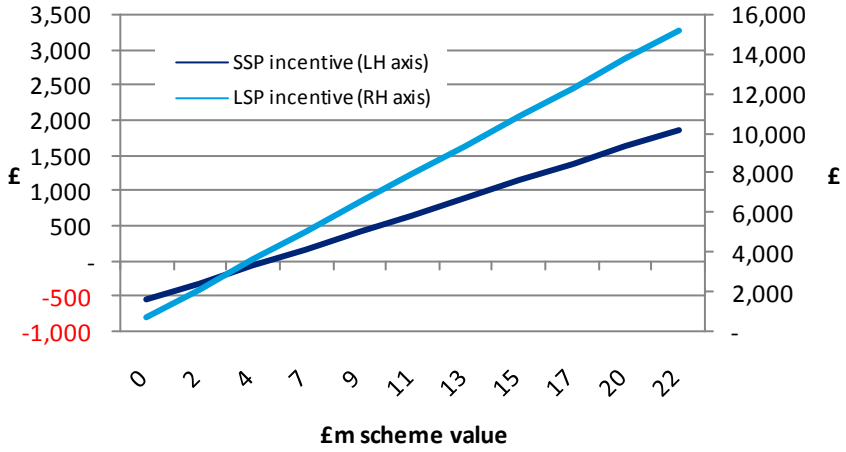
[65] Sites with an annual consumption of greater than 58.6GWh.

Figure 5: Net detection incentive for a supplier – UNC277 (base case)



Source: Ofgem analysis, 2012

Figure 6: Net detection incentive for a supplier – UNC346 (base case)



Source: Ofgem analysis, 2012

4.28. The proposer expects that the number of detections incentivised will increase over time even as the incentive pot size remains constant. This has however not been quantified, neither it has been substantiated in evidence. We have therefore not captured this proposed dynamic effects in our analysis.

4.29. Throughout this document, our results are based on the current gas settlement arrangements. These arrangements are currently under review.[66] Were the arrangements to alter then this would very likely impact on the returns that a supplier could receive for detecting a theft under all proposals.

4.30. In our draft IA we asked for views on whether the net incentives to detect theft under SETS (and Enhanced SETS) were sufficient or excessive, given the

[66] For example, Project Nexus is considering changes to introduce meter point reconciliation to the SSP market.

modelled rate of 6,000 detections per year. In its response, British Gas noted that our draft IA provided suppliers with a more accurate understanding of the costs and benefits of theft detection. British Gas used this additional data to re-model the value of its proposed incentive scheme. Its revised approach compared the impacts of a supplier doing nothing with the impacts of a supplier taking action to detect theft. We have adopted the key features from this alternative approach when designing our own incentive scheme.

Concerns on SETS competition impacts

4.31. Our modelling assumes that each supplier has a similar cost base and is equally efficient in detecting theft. However, some parties, including respondents to the UNC277 and UNC346 consultations and respondents to our August 2011 consultation, expressed concerns that factors outside of a supplier's control could have a material distortive impact on competition. These effects were recorded in our August draft IA and are set out in Table 3.

Table 3: Factors potentially distorting competition

Factor	Description	Potential impact
Economies of scale in analysing data	More customer data can help target investigations more effectively	Larger suppliers may be at an advantage
Economies of scale in investigations	Potential for lower unit costs of investigations with higher volumes	Larger suppliers may be at an advantage with increased buyer power and geographic density of customers Costs of access to services may be prohibitive for small suppliers
Prevalence of theft	Variation in theft prevalence between supplier portfolios will impact on their ability to detect theft	Theft in the portfolios of smaller suppliers is more likely to vary from the average. New entrants may have less theft in their portfolios
Gaming	Potential for misreporting of theft occurrence (UNC277) or theft volumes (UNC346) to achieve incentive payments	Incorrect allocation of incentive payments and reduced incentive to detect theft (as marginal value of incentive payments decreases)

Source: Ofgem analysis, 2012

4.32. British Gas recognises that some suppliers may require additional time to respond to the SETS incentive scheme when compared to those suppliers that have already made significant investment in proactive theft detection. Accordingly, as it considered that it was likely to have made the most investment to date in theft detection, British Gas proposed that it would not participate in the scheme (ie it would not pay in or receive payments) for the first two years of its operation. This is known as the "Windfall Avoidance" measure. The Windfall Avoidance measure and

audit controls should help to mitigate competition concerns relating to the effect of SETS.[67]

Enhanced SETS

4.33. Enhanced SETS may offer additional benefits over the SETS proposal by seeking to address concerns about suppliers' relative ability to compete for incentive payments. In particular, Enhanced SETS could address some of the concerns noted above in Table 3 on economies of scale in data analysis and investigations.

4.34. The proposer favours Enhanced SETS in relation to SETS. The proposer reinforces its view in its consultation response that Enhanced SETS would mitigate competition concerns. The RPACA would facilitate suppliers' access to data items and therefore mitigate any negative impacts from economies of scale in analysing data. While not accepting that larger suppliers have an advantage detecting theft, the proposer considers that the CRPU would mitigate this concern by providing theft detection services. The proposer does not accept either that the prevalence of theft differs between suppliers portfolios, and indicated that, if its revised methodology to calculate the size of the incentive pot (set out in its response to our August 2011 consultation) were to be adopted, this would mitigate any gaming concerns.

4.35. Other respondents to the consultation also noted that Enhanced SETS would provide useful additional services to the industry, when compared to SETS. Most respondents however were concerned about the competition distortions created by UNC277 and UNC346 incentives. The majority of respondents also disagreed with the proposer in relation to the distribution of theft and argued that this would differ across suppliers' portfolios.

4.36. The RPACA may help to improve the management data available to all suppliers to help them understand the types of theft in the market and their geographical location and provide additional sources of leads, for example through the telephone tip-off line. The CRPU would seek to ensure that suppliers had access to services in the market such as theft investigators. Signing up with the CRPU provider of theft investigation services may reduce transactional costs and ensure geographical coverage, in particular for small suppliers. In addition, the CRPU would be able to provide data analysis services to suppliers that do not have in-house expertise or do not wish to invest in such capability. However, the costs of such services may still be higher for small suppliers, for example due to economies of scale or in-house provision.

4.37. In its response to our draft IA, the proposer also suggested additional changes to mitigate any potential competition distributional concerns (for example, introducing an independent review of the value of the incentive scheme). We have adopted the most relevant changes suggested by the proposer in our proposed package of measures, and assess the respective impacts together with the assessment of our proposals.

[67] In addition, suppliers must ensure that they are compliant with Chapter I and/or Chapter II prohibitions of the Competition Act 1998 and/or the prohibitions contained in Articles 101 and/or 102 of the Treaty on the Functioning of the European Union (the "TFEU").

NRPS

4.38. The central costs of the NRPS[68] would be funded by all suppliers based on their supply point market share. The costs of other activities where suppliers have a choice of service provision from the NRPS or an alternative provider would be met by the supplier that required that service. The costs of meeting its requirements may therefore vary between suppliers based on their characteristics (eg the extent to which economies of scale can be realised), the characteristics of their portfolio (eg the prevalence of theft) and the number of leads that they would be required to investigate.

4.39. Our analysis of the distribution of benefits in Appendix 2 shows that suppliers operating in the SSP market would benefit from improved allocation once a theft has been discovered by another supplier. The NRPS proposal could therefore lead to some "free rider" effects if, for example, one supplier was required to investigate higher numbers of cases and identified a greater proportion of theft.

4.40. In our draft IA we set out a number of concerns in relation to the NRPS proposal. These included:

- Theft detection target. We noted that suppliers may have different views on the appropriate level of theft investigations to undertake in the market and what standards should be set for suppliers and the NRPS. This view may be driven by the relative benefits that suppliers can achieve from theft detection. We were therefore concerned that performance targets could be driven by suppliers' competitive positions, and would be set at the lowest acceptable figure to the industry, rather than what is proportionate in terms of customer benefits.
- Performance assurance. As noted in chapter 3, a supplier may attempt to reduce its costs by not investing in investigations that meet satisfactory standards. Our analysis indicates that the costs of an investigation are lower where theft is not found (for example there will be no costs for meter replacement). The NRPS proposal includes provision for audits, to understand whether suppliers (or their agents) are meeting the required standards and financial consequences when they fail to do so. This may in part mitigate this risk although we were concerned that it may be difficult after the event to determine whether a supplier had made sufficient efforts, for example as there would not be statutory rights of entry for the auditor to examine any meters.
- Ability to innovate in theft detection. Data analysis is only one of a number of sources of leads for theft detection.[69] One of the concerns raised in relation to the NRPS is that it does not facilitate improvements and innovation in the detection of theft from sources other than data analysis.

[68] For example the costs of establishing and running the data services to determine which sites should be investigated.
[69] Data provided by suppliers, summarised in Appendix 2 of the accompanying consultation, indicates the sources of theft detection are: data analysis (9%), meter readers (19%), metering service providers (3%), tip-offs provided via the GT and xoserve (20%) and other (49%).

4.41. The majority of respondents to our draft IA supported the view that the NRPS could complement other means of theft detection. They suggested that the NRPS should be reviewed regularly, to ensure continuous improvement and a proper definition of theft detection targets. Some respondents indicated that the NRPS could innovate, and could be a facilitator of industry innovation in theft detection. They argued that the NRPS will therefore not exclude investment in other sources of theft detection.

4.42. The majority of respondents also supported the principles of the NRPS, but highlighted the difficulty in setting out an absolute performance target. They also noted the need to introduce additional measures. These, they argued, should ensure that the NRPS is proportional to the benefits it can generate. One respondent also indicated that a proper performance assurance framework could be developed once the scheme was up and running and the industry had a better understanding of its impacts.

4.43. We did not receive specific views on what performance measures should be developed. We remain concerned that the NRPS performance arrangements may not be sufficient to assure the quality of investigations. We also remain concerned that the NRPS objectives are not sufficient clear to ensure that it establishes targets in the best interests of consumers.

Ofgem's proposed package of measures

4.44. We consider that our proposals, and in particular the TRAS and our proposed incentive scheme could mitigate the potential competitive distortions noted above in relation to SETS and Enhanced SETS. We also consider that our package of proposals will address the performance assurance concerns in relation to the NRPS and set appropriate targets for detection.

Incentive scheme

4.45. Our proposed incentive scheme aims to remove or significantly mitigate the barriers suppliers face in detecting theft, by providing additional incentives for theft detection.

4.46. As noted above, we consider that the incentive pot should therefore be no larger than the value required to incentivise an appropriate target rate of theft detection. The barriers suppliers face in detecting theft include:

- Marginal detection disincentive. Our analysis in Appendix 2 indicates that suppliers may face a net cost when they are proactive in detecting a theft.[70] The incentive scheme should be specified to offset this marginal detection disincentive.

[70] This is clearer in the SSP market, where our analysis indicates a negative marginal impact for all the scenarios tested.

- Operational and capital expenditure. To be able to find the targeted level of theft detection, suppliers will need to invest in robust theft detection processes. The set-up costs of building these theft detection activities will be an initial barrier for suppliers in meeting their performance targets.
- Transitory data analysis costs. We consider that the ability to analyse data and profiling the risk of theft within suppliers' portfolios is an important source of leads. This could also have a significant impact in the efficiency of theft detection. Until the TRAS is implemented and fully operating, we propose that the incentive pot could be scaled to cover the costs suppliers may face with these activities[71].

4.47. We develop these further below. Our proposal for designing the size of the incentive scheme includes all of these costs.

Marginal detection disincentive

4.48. As noted above, the marginal (dis)incentive to detect gas theft is given by the incremental costs and benefits of detecting a theft, when compared with the baseline of not taking action. Our analysis indicates that in the base case suppliers face a net cost of £537 when they detect a theft in the SSP market, when compared to them taking no action. In the LSP market, suppliers would have net benefit of £731.

4.49. This suggests that the incentive scheme would be applied only in the SSP market, if it were designed to cover net cost of finding theft. Our analysis assumes that each supplier has a similar cost base and is equally efficient in detecting theft. However, we acknowledge that in practice there is uncertainty for example about the level of consumption, suppliers' costs, or the level of recovery from theft.

4.50. We have built sensitivities to account for this uncertainty in our analysis.[72] Based in the result of our sensitivity analysis, we estimate that the net detection disincentive in the SSP market ranges from £478 to £1,361. In the LSP market, we estimate that the impacts on suppliers range from a net benefit to be proactive in detecting theft of £1,545 to a net cost of £925.

4.51. Based on this range, we assume that the marginal detection impacts of being proactive in theft detection correspond to the 80th percentile of the worst case scenario. Under this assumption, we estimate that suppliers will have a marginal detection disincentive in the SSP and LSP markets of £1,120 and £539 respectively. Assuming a detection target of 6,000 thefts, this would lead to an incentive pot value of £6.025m for theft detection in the SSP market, and an incentive pot value of £0.335m for theft detection in the LSP market.

[71] Consequently, our analysis reflects this proposal.
[72] Appendix 2 provides further details about the sensitivity analysis.

Investment and data analysis costs[73]

4.52. Suppliers would have to undertake operational and capital expenditure in theft detection activities to increase their current level of theft detection. They would also meet costs in building or procuring theft detection services, such as data analysis,[74] while the TRAS is in the process of being implemented.[75] We recognise that there may be some scale effects associated with theft detection and data analysis, and therefore this may be a barrier for suppliers to become efficient in detecting theft.

4.53. The incentive scheme could account for these impacts, by scaling the incentive pot size to counteract these potential barriers. We estimate that the set up costs that the industry will be required to undertake in theft detection processes ranges from £0.25m to £0.75m.[76] In our base case, we assume that the operational and capital expenditure (set up costs) will be £0.5m. The value of the incentive scheme pot could therefore be uplifted by £0.5m for the first year of the scheme.

4.54. We use the NRPS and the SETS ongoing costs in relation to data analysis, audit, xoserve and suppliers other costs as a proxy of the costs suppliers could face in building or procuring services for theft detection, in advance of the implementation of the TRAS. We estimated in our draft IA that the costs for these services could range from £0.8m to £3.4m. Our base case for assessing our proposed incentive scheme assumes that these data services would have a cost of £2.1m. We expect the TRAS to be implemented with a one year lag in relation to the incentive scheme. Under this transition period, the incentive pot value could be increased by £2.1m to account for the costs of any interim theft detection services.

4.55. Adding the set-up and data analysis costs to the marginal cost of detecting theft would leave the incentive pot value for theft detection in the SSP market at £8.15m (or £1,515 per theft detection). This would potentially apply for the first year of the scheme. Once the TRAS is in place (which is expected to be after the initial year of the scheme), the allocation for set-up costs and theft detection services would be excluded from the incentive scheme. The size of the incentive pot would then be £6m (or £1,120 per theft detection) in the subsequent years. The incentive pot value for the initial year in the LSP market would be £0.58m (or £934 per theft detection). Once the TRAS is implemented, the incentive pot value would be £0.33m (or £539 per theft detection).

[73] In this section we present our view on how the incentive pot could be further developed. We recognise this would need to be established in practice through a modification to an industry code.
[74] Or making use of existing sources of leads, for example notifications of suspected theft provided via the gas transporter in a more efficient way. Xoserve statistics seem to indicate that not all suppliers are investigating these leads.
[75] We acknowledge however that the type of services could not be at the same level that a central, industry sourced body could provide.
[76] The main source for this estimate is the request for information to potential service providers from the NRPS workgroup.

Incentive scheme competition impacts

4.56. We consider that TRAS and our proposed incentive scheme, implemented together, are in a better position to address the competition concerns highlighted in Table 3, in relation to SETS.

4.57. The TRAS seeks to address concerns on individual supplier's different economies of scale in analysing data. It does this by centrally profiling the risk of theft within each supplier portfolio and all suppliers will be in a similar position to access this service.

4.58. Our proposed methodology identifies the size of the incentive pot needed to address the overall net disincentive that suppliers have in detecting theft. Our aim is for the size of the incentive to account for the potential barriers suppliers face in detecting theft. This would encourage a proportionate level of investment in theft detection, and aims to mitigate any potential competition distortions (which would occur, for example, if incentive payments were higher than the costs of detecting theft). It may also remove or significantly mitigate gaming opportunities from the scheme.[77]

4.59. We consider that our proposals should incorporate the following features to improve their effect:

- Independent and regular review. As the schemes become operational it is likely that the degree of knowledge and understanding of theft increases. A review of the schemes would be fundamental to make sure they adapt to this increased knowledge, and also to the potential evolution of theft over time. This would allow updating targets and services specification to ensure that the benefits to consumers from the schemes are proportional to the efforts made. The review of the schemes may also play an important role in enabling it to innovate, and potentially to drive innovation in theft detection across the industry.
- Windfall avoidance. We would expect that the Windfall Avoidance proposed in UNC277 and UNC346 would also be applied once our proposed incentive scheme is implemented. If British Gas would not participate in our proposed incentive scheme during the first two years, the incentive pot size in this period would be £4.62m for detecting theft in the SSP market, and £0.33m in the LSP market. The Windfall Avoidance should help to mitigate the concerns about the ability to compete from suppliers that may not be as advanced in terms of theft detection investment.[78]
- Audit. Ensure that a robust audit mechanism exists for the TRAS and our proposed incentive scheme. Audit provisions linked with the independent review of performance could be an effective mechanism to address any

[77] To the extent that incentive payments do not over-incentivise theft detection, the risk from potential misreporting of theft occurrence would be mitigated.
[78] We are also aware that Ofgem is currently considering a request from British Gas to adopt an alternative meter inspection regime. If implemented, this new regime may include requirements on British Gas in terms of theft detection. Should this become the case, we consider that British Gas should be excluded from the incentive scheme.

competitive concerns arising from potential variations in the prevalence of theft between supplier portfolios.

TRAS

4.60. The intention is for the TRAS to provide information to suppliers to assist their theft investigations. This will set out a risk rating for sites and provide notification on which premises, in the best view of the TRAS, should be investigated to the target amount of theft. Under this scheme, the information provided by the TRAS will help suppliers to meet the Theft Target. Our analysis suggests that the incentive pot size, together with implementation of the TRAS and the new licence obligation[79] should be sufficient to encourage suppliers proactively detect theft.

4.61. Suppliers will not be precluded from going beyond the theft detection target indicated by the TRAS. We expect that, where suppliers assess that there are benefits in doing so, the TRAS would not inhibit them from using information provided by the TRAS to investigate other premises or they could separately innovate and invest in alternative methods of detection.

4.62. We also envisage that our proposals would address concerns about the performance assurance framework under the NRPS. As noted in chapter 3, we expect that an appropriately designed incentive scheme would provide commercial incentives for suppliers to conduct investigations up to the point that it was no longer economic to do so. This would incentivise suppliers to conduct robust investigations and identify theft where it was appropriate to do so as part of these investigations.[80]

Existing industry compensation arrangements

4.63. A scheme is currently available to compensate a supplier that has failed to recover money from a customer that has taken an illegal supply despite having used its reasonable endeavours. Its aim is to address potential disincentives that a suppler may have from seeking to detect theft. Many parties in the industry consider that this scheme is not fit for purpose and a proposal (UNC231V) has been made to improve governance and the amounts payable to suppliers.[81]

4.64. Our analysis, presented in Appendix 2, considers the impact of UNC231V for investigation and meter works costs only. Based on an average theft case in the SSP market, the supplier would be better off by up to £1,256 when it finds a theft and receives a compensation payment. In the LSP market the supplier would be better of by up to £670. These costs would be funded by all shippers based on volume market share.

[79] Our expectation is that suppliers should investigate the highest ranked cases in accordance with their licence requirement to detect, prevent and investigate theft or that there should be objective justification for not doing so.
[80] We would expect the TRAS to provide regular information to suppliers on the level of theft detected in the market to deter any party from gaming with the incentive scheme.
[81] Ofgem consulted in December 2010 on whether UNC231V should be implemented. We intend to publish our decision on this modification in conjunction with our decision on which, if any, of the three industry proposals considered in this document should be implemented.

4.65. Therefore, a compensation scheme operated in conjunction with the NRPS, would be likely to make theft detection a profitable exercise (ie not just an overall net benefit) for suppliers. Were this to operate in conjunction with SETS, Enhanced SETS or our proposed incentive scheme then it could lead to an even greater increase in the profitability of theft detection and potentially stimulate further investment.

4.66. The majority of responses to our draft IA supported the view that a compensation incentive mechanism would allow suppliers to recover the costs of investigating theft. However, these respondents noted that the current compensation scheme is burdensome and complex to use, did not address suppliers' disincentives to detect theft and should be amended.

4.67. We consider that the introduction of our proposed incentive scheme would be more effective in addressing the disincentives then the current compensation arrangements. We consider that our proposal would provide a proportionate solution by using an incentive scheme to encourage suppliers to detect theft to a target level. We consider that our approach is more transparent and offers better value for consumers. We also consider that it would distort the anticipated effect of our proposed incentive scheme if the current compensation arrangements were retained. For example, it would allow suppliers to potentially over recover costs when theft is identified.

New entrant and smaller supplier issues

4.68. As noted above, the impact on cost allocation of finding a theft is likely to be lower for smaller suppliers in absolute terms. However, the impact of theft detection and investigation activity may be greater for these parties. Smaller suppliers may have fewer resources and be less able to benefit from economies of scale. Smaller portfolio sizes may also mean that they are more likely to have a distribution of theft that differs from the average.[82]

Impacts on new entrants and smaller suppliers from specific industry proposals

4.69. Under SETS, very small suppliers would be excluded from the incentive scheme. For smaller suppliers not excluded, the scale of liability would be in proportion to their market share. However, these suppliers could be disadvantaged by a lack of data for use in profiling the risk of theft. Variation in theft characteristics between regions and limited access to physical theft investigation services are likely to reduce economies of scale in theft detection. In its response to our draft IA, the proposer of SETS considered that the definition of smaller suppliers should be revised. The proposer considered that this would contribute to mitigate significantly these concerns, as under the new definition only suppliers with more than 50,000 customers or 10TWh aggregate NDM AQ would be included in the scheme.

[82] Some parties have argued that new entrant suppliers would have lower than average numbers of customers that take an illegal supply as customers that are taking an illegal supply have lower incentives to switch supplier on price grounds.

4.70. The Enhanced SETS proposal seeks to address concerns about access to services for parties (including smaller suppliers) in the market and issues relating to economies of scale. In particular, the CRPU service would provide data-analysis services and theft-investigation services, although it would not set prices. The RPACA would provide management information on types of theft and location as well as leads for investigation through the telephone tip-off service.

4.71. The NRPS proposal does not distinguish between smaller suppliers, new entrants and other suppliers. All suppliers would be treated in a consistent manner in terms of their requirement to investigate leads generated by the NRPS against defined standards. A key difference between NRPS and SETS (and to some extent Enhanced SETS), is that data analysis would be done centrally using data from all suppliers. We consider that this is likely to increase smaller suppliers' efficiency in detecting theft. However, one potential outcome is that smaller suppliers could be asked to investigate a disproportionately high number of cases depending on the methodology used by the NRPS, although this may be unlikely.

4.72. To enable all suppliers (including smaller suppliers and new entrants) to meet their obligations to investigate under the NRPS, services (such as field investigation services) would be offered by the NRPS. The cost of these services may be higher than could be achieved by large suppliers (eg through greater ability to use in-house arrangements). However, we consider that there are benefits of guaranteed access to services and that suppliers would still be able to procure services from alternative providers if they better met their needs.

4.73. As we note above, we also consider that the TRAS and our proposed incentive scheme address more effectively the concerns about economies of scale in data.

Summary

4.74. Our analysis suggests that theft detection improves allocation of gas and transportation charges. The application of the BTU process under the NRPS, SETS and Enhanced SETS would further improve allocation but would decrease the incentives on SSP shippers to detect theft. Our proposed package of measures, and in particular our proposed incentive scheme would address this issue by scaling the payment incentives to include the impacts of using the BTU process.

4.75. We consider that the original SETS proposal offers considerable commercial incentives to detect theft. However, we remain concerned that the methodology to calculate the appropriate size of this incentive was not well established.[83] Enhanced SETS seeks to address a number of these competition concerns and we think in this respect it is an improvement over SETS.

4.76. The NRPS is likely to offer advantages in the ability to pool industry data and target resources at the sites with the highest potential of risk. This would be of particular benefit to small and medium suppliers who could benefit from these

[83] The proposer made a number of suggested revisions in its response to our draft IA. Where relevant we have included and assessed these revisions in our proposed package of changes.

economies of scale. The net benefits of increased detection across the market are likely to be felt most strongly by large suppliers in the SSP market, but others will also benefit. The concerns we highlighted in our draft IA however still remain. These include the level of measures in place to establish appropriate targets under the NRPS proposal in terms of investigations and theft detections that link to customer benefits. We are also concerned that suppliers may have commercial incentives not to investigate suspected theft to satisfactory standards.

4.77. We consider that our proposed package of measures, which encompasses an incentive scheme with access to a central risk assessment resource to help target theft investigation, would provide the best value for money for consumers. Implementation of these arrangements would be more likely to address effectively the economies of scale in theft detection. It is also more likely to address potential distributional effects from the incentive scheme by providing access to theft detection services and limiting the size of the pot to a compensation level based on suppliers' expected costs. We also consider that operating both the TRAS and our proposed incentive scheme will encourage suppliers to both conduct investigations, and to do so to a high standard so that thefts are more likely to be detected.

5. Impacts on sustainable development

Chapter Summary

This chapter assesses the potential impact of the industry schemes and our proposed package of measures on four key sustainable development themes.[84] These themes are: promoting energy savings, managing the transition to a low carbon economy, eradicating fuel poverty and protecting vulnerable customers and ensuring a secure and reliable gas supply.

Promoting energy savings

5.1. Where gas is taken illegally, customers are less likely to be price sensitive and motivated to moderate consumption.[85] While not all customers that take an illegal supply will necessarily increase their consumption, reducing theft is likely to have a positive impact on reducing consumption and will therefore promote energy savings.

5.2. In addition, customers that are taking an illegal supply are likely to be less inclined to invest in energy saving measures as the return on that investment would be moderated by the reduced consumption recorded.

5.3. Respondents generally agreed with these two principles, although they were unable to provide evidence. In terms of the distribution of benefits between the three industry proposals, (as noted earlier) it is not clear what approach will yield the greatest number of theft detections, and therefore has the greatest impact on promoting energy savings. However, it is expected that Enhanced SETS is expected to lead to more theft detection than SETS.[86]

5.4. As set out in previous chapters, we consider that our proposed package of measures would more robustly tackle gas theft. We therefore consider that our proposals are at least as good as the industry schemes in promoting energy savings.

Managing the transition to a low-carbon economy

5.5. Responses to our draft IA have not quantified the likely reduction in consumption that would result from detecting theft. We are therefore unable to

[84] Our December 2009 Guidance on Impact Assessments notes that we will consider five broad themes. In addition to the themes set out in this chapter we have also considered the potential ability of the proposals to support improved environmental performance. In respect of this theme we do not consider that there are likely to be any additional benefits to those noted in this chapter.
[85] Anecdotal evidence supports this view. For example, some customers that are taking an illegal supply might regulate heating temperature by opening windows and doors rather than turning down the thermostat.
[86] There may also be a difference in outcomes under SETS depending on whether UNC277 or UNC345 are chosen. Our assessment is that a greater focus on the volume of theft taken under UNC346 may have additional energy saving benefits over UNC277, which focuses on the number of theft incidents.

provide a quantitative assessment on the carbon savings derived from the industry schemes and our proposals. To the extent that any of the industry schemes or our proposed package of measures are successful in increasing the levels of theft detection from 2,900 to 6,000, we expect that the increase in energy saved will have a positive effect on the reduction of carbon emissions. We do not consider this to have a material effect on our analysis.

Eradicating fuel poverty and protecting vulnerable consumers

5.6. Improved detection of theft is likely to benefit the broader interests of fuel poor and vulnerable customers by reducing customer bills and improving safety.

5.7. In relation to those already in fuel poverty, the proposed increase in theft detection is likely to feed through into a reduction in customer bills, albeit marginally. Customers caught taking an illegal supply are likely to be requested to pay back charges. This may have a greater impact for vulnerable customers and those in fuel poverty that have taken an illegal gas supply. It may also move some customers into fuel poverty.

5.8. As noted in chapter 3, a new Gas Code of Practice is currently being developed under the SPAA change control arrangements. All of the industry schemes and our proposals are intended to be supported by this new code of practice that will set out standards for the treatment of customers. Our expectation is that these codes should contain specific provisions for the treatment of vulnerable customers and those that would have difficulty paying charges.

Ensuring a secure and reliable gas supply

5.9. We consider that increased theft detection could improve network reliability. This effect may result from a reduction in gas leaks or explosions that require an emergency partial shutdown of the distribution network. This is expected to have a positive impact on customers' ability to use gas for cooking and heating their homes.

5.10. Anecdotal evidence from gas transporters suggests that incidents of theft that result in emergency partial shutdown of the network are relatively rare. We discuss the health and safety implications of increased network reliability in chapter 6.

5.11. Reducing theft (and therefore better understanding patterns of gas consumption) has the potential to assist gas transporters with network planning to ensure that gas demand can be met. However, gas transporters have generally indicated that this issue is not sufficiently material to have an impact on their planning decisions.

6. Impacts on health and safety

Chapter Summary

In this chapter we assess the direct and indirect impacts of gas theft on health and safety and examine the potential benefits that could result from each of the three industry schemes and our proposals.

Direct impacts on health and safety

6.1. Physical interference with metering and associated equipment for the supply of gas to premises carries safety risks for those that undertake this activity and for those that live in, or close to, premises where this has occurred. Those parties that work legitimately with this equipment, such as meter installers, installers of consumer appliances, meter readers and the emergency services that attend incidents may also be placed in danger. We consider that increased detection rates are likely to reduce the overall direct impact of gas theft on health and safety.

6.2. In our draft IA we reported the following evidence of impacts on health and safety and further information was not provided by respondents.

- Information provided by the Health and Safety Executive (HSE) on reported dangerous occurrences or dangerous gas fittings[87] suggested that actual harm reported to it resulting from gas theft is relatively rare. We noted that these figures may not represent all occurrences as it is not likely that all incidents are identified or reported to the HSE. In some circumstances customers who have been injured as a result of theft may actively seek to avoid this becoming known by the relevant authorities.
- Evidence provided by one supplier suggested that the instances of actual harm are significantly higher. It reported that it was aware of two deaths and at least 36 injuries during 2010, two of which were serious, and were caused as a direct result of gas theft by customers.

6.3. The majority of those who responded to our draft IA considered that the strong incentives introduced by SETS and Enhanced SETS would encourage suppliers to be competitive, and could potentially pressure suppliers to fake theft detections. As a result, this could lead to a higher number of low quality investigations and stronger incentives to disconnect a greater number of domestic consumers. This could have a negative impact on vulnerable customers on health and safety. In addition, two respondents considered that SETS and Enhanced SETS may provide disincentives for suppliers to work together to tackle gas theft for the benefit of industry and consumers.

[87] The HSE provided information on 68 incidents reported to it under the Reporting of Injuries, Diseases and Dangerous Occurrences Regulations 1995 (RIDDOR) requirements with possible links to gas theft. The information related to reported dangerous occurrences and notifications of dangerous gas fittings. Of the 68 cases, none provided clear evidence of physical harm resulting from the theft of gas.

6.4. Respondents generally considered that the NRPS would result in the greatest overall benefit to health and safety, as its centralised approach placed a greater emphasis on preventing theft across industry rather than on particular suppliers' portfolios that were better able to respond to the incentives under SETS or Enhanced SETS.

6.5. We consider that all of the industry schemes and our proposals would lead to an improvement in health and safety by increasing theft detection. We note that commercial incentives under SETS and Enhanced SETS may create some distortions in the way that theft is tackled across suppliers.

6.6. We consider that our proposals are at least as good as the proposed industry schemes in promoting theft detection efficiency, due to the potential to uncover a number of dangerous and unsafe connections before they escalate to harmful situations for those in close proximity. The 24-hour tip-off line for members of the public, police and other third parties to report suspected theft, will also allow consumers to play a more active role in reporting potential cases of theft.

Indirect impacts on health and safety

6.7. As noted in chapter 5, increased theft detection is likely to improve network reliability by reducing gas leaks or explosions which require an emergency partial shutdown of the distribution network. This will positively impact on customers' ability to use gas for cooking and heating their homes. In such instances, there may be beneficial impacts on the health of customers, in particular those that are vulnerable.

6.8. Gas transporter standards of performance[88] require that where there is an interruption to the supply to the premises of a priority domestic customer[89], the gas transporter must provide alternative cooking and heating facilities at the customer's premises. Therefore we consider, in respect of those customers that are likely to be most impacted by supply interruption, increased theft detection is likely to lead to an improvement, but that these impacts are to some extent already mitigated.

[88] Guaranteed standard of performance 3 (Regulation 9) – priority domestic customers. See The Gas (Standards of Performance) Regulations 2005 (http://www.opsi.gov.uk/si/si2005/uksi_20051135_en.pdf), and The Gas (Standards of Performance) (Amendment) Regulations 2008. (http://www.opsi.gov.uk/si/si2008/uksi_20080696_en_1)

[89] A domestic customer that is of pensionable age, disabled or chronically sick whose details are on the Priority Service Register maintained by gas suppliers in accordance with SLC 26 of the gas suppliers licence and which have been provided to the relevant gas transporter.

7. Risks and unintended consequences

Chapter Summary

In this section we consider the potential risks and unintended consequences associated with each of the three industry schemes and our proposals not covered elsewhere in this IA. These include the potential impacts on customer complaint levels and the effect of increased public awareness of theft.

Increase in complaints

7.1. Increased theft investigations and detected theft could lead to additional enquires to suppliers and customer support agencies. Customers may complain if they consider that they have been treated poorly, regardless of whether they have taken an illegal supply.

7.2. The three industry schemes and our proposed package of measures refer to the development of codes of practice on the conduct of theft investigations. This is an important measure that would set out standards for engagement with customers. We are further proposing to support these minimum standards through our proposed changes to gas supply licence conditions to establish minimum standards for investigations.

7.3. We recognise that additional enquiries and complaints from customers may arise as a consequence of increased theft detection activity. In some cases these contacts may be made in an attempt to further avoid paying for charges. However, we consider that this will be an important issue to monitor to understand whether this has resulted from poor performance on the part of an individual supplier or the whether the practices adopted by suppliers, for example in codes of practice, should be amended.

Increased awareness of the potential for theft

7.4. Both Enhanced SETS and the NRPS, as well as our proposals, aim to introduce and publicise a national customer tip-off telephone service. Other developments, including increased detection rates and better information on the scale of theft may also increase publicity. One of the potential unintended consequences of the industry proposals is that they bring this activity to the attention of customers, including electricity customers, who may not have previously considered it.

7.5. Our view is that any potential negative impact could be mitigated by a strong public message from the industry that clearly set out the dangers of taking an illegal supply and the consequences and likelihood of being caught. This message should be matched with effective arrangements to detect theft.

7.6. Given the strong links between the gas and electricity markets, we consider that publicising new arrangements to tackle gas theft should be coordinated with operators in the electricity market. In particular, arrangements should be in place for passing tip-offs from customers and other parties between the electricity and gas markets so that they can be investigated by the relevant party.

8. Other impacts

Chapter Summary

In this chapter we assess the other impacts of the three industry schemes and our package of proposals not previously considered. These include implementation timescales, some additional features of the proposals and the impact of the proposals on gas transporters.

Implementation and future development

8.1. In this section we consider the implementation timescales for all the proposals, in order to understand when the impacts considered in this assessment would be likely to have effect.

8.2. The NRPS workgroup indicated that the NRPS proposal could be implemented within 12 months of an Ofgem decision. SETS could be implemented shortly after an Ofgem decision. xoserve would require between 35 to 51 weeks in making the required system changes, but this work could run in parallel to the first year of the scheme. Under Enhanced SETS, the RPACA could be implemented within nine to 15 months. The CRPU service could be live within 18 to 24 months of an Ofgem decision.

8.3. We propose to require that the TRAS is implemented by 31 December 2013. We would also welcome a change to an industry code being raised to introduce an incentive scheme in accordance with the principles set out in chapter 4 of the accompanying way forward document. Given the previous industry work, we consider that such as scheme could be in place by the end of this year.

8.4. We aim to introduce the new licence requirements on suppliers to detect, prevent and investigate theft during summer 2012. Suppliers would be required to act in accordance with these licence obligations, if introduced, and therefore make efforts to detect theft from this point in time.

8.5. We consider it is important to assess the success of policy once it has been implemented. Under our proposed Direction we are asking the TRAS to commission and publish an independent assessment at least every two years. The TRAS will also have to publish management information and performance assurance reports. We expect that these arrangements will provide evidence on how well the schemes are performing. We would expect to conduct our own assessment if these arrangements prove not to enable sufficient clarity on how the schemes can be evaluated.

Additional features of each proposal not previously considered

8.6. All the proposals are likely to increase the detection of other sources of unaccounted for gas in the market, such as unregistered and shipperless sites as well as damaged or faulty meters. As an example, where an unregistered site was identified, the TRAS proposal would provide information to customers alerting them to the consequences of not signing up to a supplier.

8.7. Both the NRPS and Enhanced SETS would introduce a database of stolen meters. We adopt this proposal in our proposed package of measures. The aim is to help an investigator identify when a stolen meter was being used to assist with the illegal taking of gas.

Role of gas transporters

8.8. Each of the three industry proposals is likely to generate increased number of theft investigations. Our working assumption is that investigations will increase from the current 8,100 per year to 17,000 per year. In some cases, the investigation may identify a potential theft in conveyance or an unregistered site which is the gas transporters responsibility to investigate.[90]

8.9. It is not clear which of the proposals would have the most significant impact for gas transporters. In our draft IA we requested views on whether changes were required to the current theft related regulatory arrangements for gas transporters. We also requested views on whether gas transporters should be required to adhere to a code of practice on the conduct of their investigations.

8.10. The majority of respondents agreed that gas transporters should adhere to the code of practice. They also agreed that gas transporters have an important role in tackling gas theft, and also in dealing with shipperless and unregistered sites. Some respondents however noted that gas transporters should be allowed to recover costs associated with theft detection and investigating unregistered sites. Chapter 4 in the accompanying way forward document provides further details on our thinking in relation to this issue.

[90] Under SLC 7 of the gas transporters licence a gas transporter is required to investigate the suspected taking of gas in conveyance. Theft that occurs upstream of the emergency control valve (ECV) is presumed under the licence to be theft in conveyance. We consider that where a supply is taken without a supplier being responsible (eg an unregistered site) then this is also considered to be gas taken in the course of conveyance. See http://epr.ofgem.gov.uk/document_fetch.php?documentid=14307

Appendices

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Appendix 1 – Summary of consultation responses

1.1. Our draft IA sought the views of interested parties on our assessment of the impacts of three industry schemes to better tackle gas theft. We received 18 responses. This appendix lists all those that responded and summarised their views.

List of respondents

	Name
1	Association of Meter Operators
2	British Gas
3	Corona Energy (confidential response)
4	EDF Energy
5	Energy Retail Association
6	EON
7	First Utility
8	Gas Safe Register
9	Gazprom
10	IBM
11	National Grid
12	Power Data Associates
13	RWE nPower
14	Scottish Power
15	Shell Gas
16	Sohn Associates
17	UKRPA
18	Wales and West Utilities

Summary of responses

1.2. Responses received by Ofgem which were not marked as being confidential have been published on Ofgem's website (www.ofgem.gov.uk). Copies of non-confidential responses are also available from Ofgem's library.

1.3. The following is a summary of those responses that were received.

Chapter 2: Impacts on consumers

Question 1: What do you consider to be the scale of theft in the GB gas market? Do you consider that there is a material difference in the prevalence of gas theft

between suppliers' customer portfolios? What factors drive any considered difference in theft distribution?

1.4. Aside from one respondent, all respondents were unable to provide a quantitative view on the scale of theft in the gas market. A Big 6 supplier considered that the scale of theft was between £220m and £400m per annum, whilst others considered that the scale of theft was unknown. A Big 6 and a small supplier considered that the Allocation of Unidentified Gas Expert (AUGE) would help identify the level of theft.

1.5. The majority of respondents considered that theft varied materially between supplier portfolios. This may be because theft is less prevalent in the non-domestic sector, more prevalent in city and urban areas, or theft is most common from credit meters. One Big 6 supplier considered that suppliers with a high proportion of consumers that had not switched are more likely to have a higher incidence of theft on their portfolios.

Question 2: Where theft has been detected, how long on average would you expect future revenues from a customer to fully reflect their consumption, ie what is the expected reoffending rate over time. Do you expect there to be a material difference under each of the three proposals?

1.6. A Big 6 supplier estimated that consumer reoffending rates were around 5 per cent within 12 months and considered that there would be a material difference under the three proposals. This supplier considered that re-offenders are only likely to be caught where a supplier is incentivised to make extra investment in re-visiting sites. It further considered that only SETS and Enhanced SETS provide such incentive. Another Big 6 supplier considered that the repeat offender rate was approximately 3 per cent across all customer types and sectors. The latter argued that only SETS would incentivise a supplier to make the extra investment to re-visit sites and identify re-offenders.

1.7. One Big 6 supplier considered that customers who are detected stealing gas may choose to switch supplier under SETS as there is no commercial incentive to share information. Another Big 6 supplier and a small supplier considered that re-offending was unusual once a customer has been identified as stealing gas.

Question 3: For each industry proposal, are the proposed compliance measures sufficient to ensure suppliers conduct investigations to satisfactory standards and thereby protect customer interests? Are there any further measures that should be introduced to help address any perceived weakness?

1.8. A Big 6 supplier considered that SETS and Enhanced SETS would create a commercial "bounty" for finding theft, which could lead to inappropriate and disproportional behaviour by revenue protection agents. Another Big 6 supplier considered that both SETS and Enhanced SETS create a risk of over-zealous supplier behaviour. One respondent considered that the NRPS did not have a defined assurance regime. Others however considered that NRPS had sufficient audit

procedures to ensure satisfactory and consistent level of performance across the gas industry.

Chapter 3: Impacts on competition

Question 4: Are there any material differences between suppliers' ability to compete for incentive payments between UNC277 and UNC346? Would Enhanced SETS address any potential concerns raised about suppliers' ability to compete?

1.9. Some respondents considered that, under UNC346, suppliers operating in both markets may have a perverse incentive to target LSP premises more heavily than SSP premises. In contrast, a Big 6 supplier considered there were no material differences for incentive payments between UNC277 and UNC346 as the issues are likely to be similar for the majority of suppliers under either proposal.

Question 5: Do you consider that the current NRPS proposal is likely to establish and realise targets for theft detection that are proportionate to the potential customer benefits? If not, what additional measures do you think are needed to meet this aim?

1.10. Respondents generally agreed that the current NRPS proposal was likely to establish and realise the targets for theft detection. One Big 6 supplier did not agree. Two respondents considered that the targets should be reviewed on a regular basis.

1.11. Some respondents recommended additional measures for the NRPS. They suggested that the industry should agree key performance indicators, that the cost of running NRPS should be below the cost saved by industry with the thefts detected, and that there should be a means for the industry to address any issues or wind down the scheme. One Big 6 supplier suggested that rather than using a fixed target, the commercial arrangements may allow for service providers to be incentivised to investigate more theft cases.

1.12. One respondent expressed the need for Government and Ofgem to provide clear guidance as to whether the objective of the proposed changes is to minimise the financial impact on consumers or maintain the rule of law.

Question 6: Would the NRPS prevent some suppliers from realising additional commercial benefits from theft detection that may be available to them, eg by going further that the NRPS mandated investigation requirements? Would the focus of the NRPS proposals on data analysis reduce the overall efficiency of the market in theft detection by excluding investment in other sources of detection?

1.13. The majority of respondents considered that the NRPS would not prevent suppliers from going further than the NRPS mandated investigation requirements.

1.14. Question 7: For each of the three industry proposals, is a scheme necessary to compensate a supplier when it is not able to recover its costs from theft?

1.15. The majority of respondents considered that suppliers were rarely able to recover all gas charges from consumers that had taken an illegal supply. They noted that without a compensation scheme, a supplier may be dis-incentivised to use its full resources to investigate theft. In the case of NRPS, a Big 6 supplier considered an additional compensation scheme would be required.

1.16. A Big 6 supplier supported the retention of the existing supplier compensation arrangements, referred to as the Reasonable Endeavours Scheme (RES), although in tandem with other large suppliers, considered that it was administratively complex to operate. These respondents suggested that the scheme should be reviewed.

Question 8: Do you consider that cost and availability of services to support theft detection and investigation is a material issue for small suppliers?

1.17. The majority of respondents considered that smaller suppliers found it difficult to access revenue protection services, noting economies of scale as a particular issue. These respondents argued that the NRPS would allow a level playing field for all suppliers.

1.18. Two respondents held the view that there are a large number of suppliers who offer competitive revenue protection services. This would remove the need for a potentially costly and inefficient capital expenditure in a central single provider.

Chapter 4: Impacts on sustainable development

Question 9: What percentage reduction in consumption would you expect customers to make when an illegal gas supply is detected? To what extent do you consider that this would result from a response to increased costs and/or an increased propensity to invest in energy efficiency measures?

1.19. Many respondents considered that once illegal supply had been identified, they expect consumption would reduce, although respondents were unable to provide evidence supporting this assumption. A Big 6 supplier considered that where gas is taken illegally, consumers are less likely to be price sensitive and motivated to moderate consumption and therefore consumption would be higher.

Chapter 5: Impacts on health and safety

Question 10: Do you have any further information on safety incidents where harm has directly resulted from theft of gas.

1.20. Respondents did not provide any further information on safety incidents.

Question 11: Do you consider that any of the proposals are likely to reduce the health and safety of any particular individuals?

1.21. Some respondents argued that the NRPS would increase theft detection compared to other proposals. It therefore would have a positive effect in reducing health and safety risks.

1.22. One respondent considered that under SETS and Enhanced SETS there was a risk that suppliers could be pressured to find higher levels of theft. This could result in a higher number of low quality investigations which could potentially lead to increased health and safety risks.

Question 12: Which proposal do you consider will have the greatest overall benefit on health and safety?

1.23. The majority of respondents considered that the NRPS would have the greatest overall benefit on health and safety. This is because it placed emphasis on preventing and detecting theft across industry rather than focusing on particular suppliers' portfolios.

Chapter 7: Other impacts

Question 13: Do you consider that the proposed implementation timescales for each proposal are realistic and achievable. If not, what do you consider to be a realistic timeframe? What additional measures, if any, do you consider should be undertaken to secure implementation within a reasonable timeframe?

1.24. Two respondents considered that SETS could be implemented immediately following an Ofgem decision and could be operational in 2-3 months. In contrast, one respondent disagreed with the suggested timeframe stating that xoserve would require 35-51 weeks to make the necessary system changes. Two respondents disagreed with the proposal that ESETS could be implemented shortly after an Ofgem decision. They considered that the timescales for delivering the RPACA and CRPU have not been subject to industry validation.

1.25. One respondent considered that the timetable proposed for the NRPS was unachievable, and suggested 2014 as a workable assumption. Others considered a possible timescale of 18 months. One respondent suggested delivering NRPS capabilities through a phased approach, for example, some theft analytics could be implemented in shorter timeframes.

Question 14: Do you consider that gas transporters should be required to adhere to a code of practice on the conduct of theft investigations?

1.26. The majority of respondents agreed that gas transporters should be required to adhere to a code of practice, or other arrangements on the conduct of theft investigations. The majority of respondents also supported the incorporation of the code of practice within the SPAA.

Question 15: What impact will either of the three industry proposals have on the annual number of investigations of theft in conveyance that gas transporters undertake and the total cost of undertaking these?

1.27. Two of the Big 6 suppliers considered that all of the proposals would result in an increase in the annual number of investigations of theft in conveyance. This is because they would lead to an increase in the number of theft investigations by suppliers where potential theft in conveyance may be identified.

1.28. Some respondents considered that the NRPS services providers could undertake this activity on behalf of the transporters. Transporters would therefore benefit from information sharing and economies of scale. One respondent considered that SETS would not introduce any benefits in terms of gas transporter investigations.

Question 16: What, if any, changes to the regulatory arrangements need to be made to enable gas transporters to adhere fully to their requirements to conduct theft investigations?

1.29. Respondents suggested a number of changes to the regulatory arrangements. A Big 6 supplier considered that a modification to the UNC (UNC399) which aimed to provide transparency on gas transporter theft detection activity should be implemented as soon as possible. Industry could then assess whether further regulation was necessary.

1.30. Some respondents argued that the gas transporter licences obligations should mirror supply licence requirements to ensure a level playing field. Some respondents suggested that gas transporters should be allowed to recover costs of investigations where no theft of gas is identified and the costs of investigating illegal connections.

Appendix 2 – Theft modelling

1.1. This appendix provides further details of the analysis summarised in chapter 3 and chapter 4 of this document. We describe our analytical framework and approach for both the market impacts and the distributional impacts of theft.

1.2. Our modelling and assumptions are based on the best information available to us. Moreover, our estimates are based on current industry arrangements. Were market arrangements to change materially, our results could not be relied upon without first verifying the impact of any such changes.[91]

1.3. The structure of this appendix is as follows:

- Key modelling assumptions and updates to our draft IA. These assumptions are consistent throughout both strands of our analysis (net industry impacts and distributional analysis).
- Aggregate market impacts of theft and proposed detection measures. This section includes a description of sensitivity scenarios used in our break-even analysis above.
- A description of the distributional impacts of thefts occurring in both the SSP and LSP market.
- Analysis of the impacts of the three industry schemes and our proposed package of measures on the distributional impacts of theft in the SSP and LSP markets, including sensitivity analysis.

Key modelling assumptions

1.4. Several modelling assumptions are consistent throughout our approach. These are outlined in Table 4 below.

1.5. For clarity, unless specifically stated, when we refer to a shipper in this appendix, we are referring to the shipper with a contractual relationship with the supplier whose customer has taken an illegal gas supply. We assume that there is an exclusive contractual relationship between the shipper and the supplier and that their share of the relevant market considered would be the same.

[91] From April 2012 LSP shippers will be required to pay a share of smeared gas charges based on the AUGE's assessment. This could potentially increase the impact of theft in the LSP market compared to the results from our analysis. Considering an individual case of theft, we estimate that the AUGE could reduce the cash-flow effect (see paragraph 4.12), if the charges from theft smeared to the SSP market are being repaid by the LSP market under the AUGE arrangements. We note however that this effect would be limited to the gas energy commodity charges, and would not cover transportation charges. In relation to aggregate effects, we estimate that the balancing between the number of thefts found in the LSP and the SSP market would impact, in the following year, the allocation of the volumes in the Theft + Other source of unidentified gas, as set out by the AUGE, between these two markets.

Table 4: Summary of assumptions for base case

Description	Assumption
Duration of theft before discovery	2.5 years[92]
SSP average customer consumption	16,500 kWh per year[93]
LSP average customer consumption	100,000 kWh per year
Percentage of annual consumption illegally consumed	70% (11,550 kWh for SSP and 70,000kWh for LSP)
Average retail value of a case of illegal abstraction of gas in the SSP market	£448 per year
Average retail value of a case of illegal abstraction of gas in the LSP market	£2,717 per year
Investigation costs (including meter replacement, disconnection and reconnection charges)	SSPs: £600 where theft is found and £200 where it is not; LSPs: £750 where theft is found and £200 where it is not;
Average investigation costs to find one theft (including meter replacement, disconnection and reconnection charges) (including assumed weighting between successful and unsuccessful investigations)	SSPs: £967 LSPs: £1,117
Recovery rate in the SSP market[94] (including charges for gas taken, the investigation and meter replacement, disconnection and reconnection charges)	25%
Recovery rate in the LSP market (including charges for gas taken, the investigation and meter replacement, disconnection and reconnection charges)	60%
NRPS, SETS and Enhanced SETS assumed number of investigations	17,000 per year
NRPS, SETS and Enhanced SETS assumed number of theft detections	6,000 per year

1.6. We have not included the potential impact of the current arrangements for supplier compensation (known as the Reasonable Endeavours Scheme) or any proposed variations to this in our base case. We have separately considered these impacts later in this appendix.

[92] Ofgem issued a questionnaire to assess how the industry was performing in tackling illegal abstraction. Based on the responses we received, the average length of illegal abstraction varies between 2.3 to 2.7 years.
[93] The consumption figure is based on historic average domestic demand. For further information see the factsheet published by Ofgem on 18 Jan 2011, "Typical domestic energy consumption figures". http://www.ofgem.gov.uk/Pages/MoreInformation.aspx?file=domestic%20energy%20consump%20fig%20FS.pdf&refer=Media/FactSheets
[94] There are some cases where it is the gas transporters responsibility to investigate theft. In these instances we assume that the gas transporter will recover 100% of the amount charged to the customer for the units illegally abstracted.

Aggregated market costs and benefits of tackling theft

1.7. Chapter 3 considers the aggregate impacts of each proposal for increasing theft detection. This analysis assumes that an 'average' theft can be aggregated to estimate overall market impact. By doing so we assume that theft cases are homogenous and do not therefore take into account variations between the characteristics of theft arising in individual suppliers' portfolios. We therefore do not seek to assess distributional impacts between suppliers.

1.8. Chapter 3 also includes a summary of our sensitivity testing. We conclude that our assessed benefits of introducing each scheme are relatively robust to our tested variations in some key input assumptions. This section outlines further details of the specifications for this sensitivity testing.

Analytical framework

1.9. Our analytical framework takes a static approach, whereby we assess an individual year of theft detection spending. While this can be translated into an equivalent annual amount of theft reduction, based on repeated years of spending (if a scheme is enduring), our analysis does not capture dynamic impacts or interactions between our assumptions over time.

1.10. For simplicity, we assume in this aggregate analysis that all costs and benefits associated with detection (such as recovery of foregone revenue) are attributed to the month in which the associated detection took place, with the exception of future revenue (see below). We also assume that detections resulting from one year's spend on detection activity is distributed evenly across the year in which theft detection activity takes place.

1.11. One benefit from theft detection is the revenue suppliers may be able to recover from charging a customer for the units illegally abstracted. A further benefit is the additional revenue that suppliers will now be able to collect from these customers who are paying for, rather than taking an illegal gas supply. Future revenue can be attributed to theft detection only if theft detection itself triggered the revenue collection. This future revenue stream cannot go into perpetuity, as individual thefts are likely to have a limited duration, even without detection. One key output from our analysis therefore determines the length of future revenue-stream which would need to be recovered in order to deliver net benefits for the industry.

1.12. We use this approach to consider whether and when one year of operation of each proposal would break-even. Our break-even analysis is based on attributing future revenues to theft detection – where a theft has been detected customers are assumed to be requested to repay the full charges for the gas taken and to be billed prospectively for the full value of gas consumed.

1.13. For example, an illustrative break-even period of 24 months describes the time taken for the recovery of outstanding charges and a reduction in future unbilled

revenue for 6,000 thefts (our modelling assumption for the annual detection rate under each of the proposals) to be equivalent to the cost of operation of the theft detection proposal for a year.

1.14. It is also possible that each proposal would deliver additional benefits once break even has been achieved, if charges continue to be recovered from customers that would otherwise have taken an illegal supply. These benefits could potentially be passed through to customers in terms of lower bills.

1.15. The extent to which this effect can be observed will depend on the expected duration of the additional revenue stream from customers that would otherwise have taken an illegal supply. In the draft IA we asked for views on the anticipated reoffending rate over time. We received two responses, both from gas suppliers, who estimate a reoffending rate within their portfolios of 3% and 5%.

1.16. We use a reoffending rate of 5% in our base case. This represents the rate at which the recovery of charges from customers that would otherwise steal will decrease over time. The future additional benefits (future revenue) once break even has been achieved will therefore decrease 5% year on year. The re-offending rate would also enable further consideration of the dynamic, cumulative impact of theft detection.[95] Given that the reoffending rate impacts the four proposals to the same extent, considering dynamic effects would add extra complexity to the analysis, but wouldn't change the conclusions achieved with the static analysis. Based on this, we have not developed further the dynamic analysis. Our analysis does not include consideration of the schemes set-up costs.

Base case

1.17. We define the counterfactual as the current scenario, which we estimate based on the current level of theft-detection activities. We then compare performance of the each proposal against this counterfactual. Our base case assumes that each proposal is sufficiently effective to investigate 17,000 cases and detect 6,000 thefts. Our analysis of aggregate impacts initially compares the base case against the counterfactual to establish whether the industry proposals would be an improvement on the current situation.

1.18. We assume that the recovery rate of unbilled charges does not vary between schemes and remains at current levels.[96] Future revenue is not discounted in our analysis. Given the short payback periods within our static framework, this is unlikely to have a material impact on our results or conclusions.

[95] A reoffending rate of 5% would suggest that the impacts of one year of theft detection activity may be spread over a period of 20 years (assuming that the reoffending rate is constant over time and all offenders will reoffend at some point).
[96] The recovery rate is assumed to be 25% in the SSP market and 60% in the LSP market. To simplify our analysis we have assumed that in these cases full recovery occurs at the point of detection. We acknowledge that, in reality, recovery may take place over a significant time period.

1.19. For simplicity we also assume that a customer's consumption rate will not alter once theft is detected.[97] In addition, our analysis does not capture changes in the effectiveness of theft detection in reducing theft, which might be expected if the schemes are operated over a number of years. It seems reasonable to expect that some thefts are harder to detect than others and, moreover, that easy-to-detect thefts will be identified first. If so, the marginal benefit of spending might reduce over time after repeated years of scheme operation. This effect is likely to be more pronounced the greater the overall reduction in thefts.

Aggregated market modelling assumptions

1.20. In addition to the modelling assumptions described above, we have made one further key assumption – that 90% of cases and investigations are attributed to the SSP market and 10% to the LSP market. We have based this assumption on responses to an industry questionnaire.[98] Data from this questionnaire indicates that 8,100 investigations were conducted in 2010, resulting in approximately 2,600 cases of illegal abstraction from SSP sites and 300 from LSP sites. We use this data to inform our 'current' scenario.

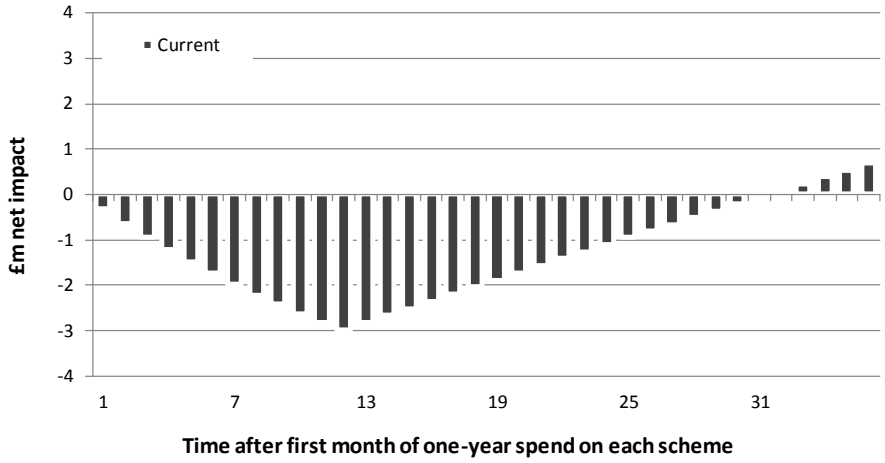
Current performance level

1.21. Our analysis examines the net aggregate impacts on the industry resulting from one year of spending on theft detection and assumes that this generates 2,900 theft detections (resulting from 8,100 investigations). Under these assumptions, theft detection delivers a positive net industry impact if each theft detected continues to generate future revenue (at the detected consumption level) for a further 32 months beyond the first month of spending on detection. Figure 7 below illustrates the overall net industry impact of one year of spending. The impact of that year's spending will continue for as long as the supplier receives additional revenues from customers.

[97] In our draft IA we asked for views on how consumption would change in response to theft detection. While respondents supported the principle that consumption would rise during theft and fall after theft being found, we have not received further evidence that would enable us to quantify this effect. Our assessment of the future revenue is likely to be overestimated to the extent that there would be a drop in consumption after theft being found.

[98] We have assumed that the 6,000 detected thefts would comprise of 5,379 cases occurring on SSP sites and 621 cases occurring on LSP sites. According to the industry questionnaire data, GTs are responsible for finding approximately 7% of the annual cases of illegal abstraction. To keep our analysis simple, we have not considered the impacts of cases found by GTs. We also have the indication that AUGE data points to approximately 3% of the gas theft cases occurring in LPS sites, and 97% in SSP sites. There is also likely to be a difference between our and the AUGE estimate of the volume of gas theft for an individual LSP site. For simplicity and also to maintain consistency with the sources for all our others assumptions, we retain in our analysis the 10%-90% split between LSP and SSP cases as per the industry questionnaire data. Were we to adopt a 3%-97% split while not changing our other assumptions, then it is likely that the impact of theft in the LSP market in our analysis would be reduced.

Figure 7: Break-even analysis of current detection activity



Source: Ofgem analysis, 2012

1.22. Current performance delivers a net benefit if each theft detected within the year continues to give rise to future revenue otherwise foregone until 32 months after the beginning of that year's spending. Therefore, on average, thefts detected in that year would need to give rise to 26 months of future revenue.

1.23. In each subsequent month beyond the point of break even, in which revenues can be attributed to each theft, current activity would deliver a further £149,000 of additional benefit.[99]

Sensitivity testing

1.24. We conducted sensitivity testing on a range of input assumptions to our analysis. We concluded that each proposal delivers significant improvements over the current situation. Sensitivity testing suggests that this conclusion is robust to a range of sensitivity tests on key input assumptions. We summarised the impacts of our sensitivity testing in chapter 3. In this section we give further detail of the specification of the parameters used for this testing.

1.25. We include two more variables in our sensitivity testing compared to our draft IA. These are the average annual consumption and the reoffending rate. Five of six variables we have assessed were applied consistently across our analysis of all the proposals (number of investigations and cases, average annual consumption, theft duration before detection, the recovery rate for lost revenue, and the reoffending rate). The other variable relates to the cost of the particular proposal and varies between each scheme.

1.26. First, we consider scenarios for the number of investigations and theft detections. In addition to the current number of investigations and cases (Scenario A), we constructed a 'base case' scenario, (Scenario B) reflecting expectations of

[99] This would drop 5% year on year to reflect the impact of the reoffending rate.

each proposal and three further plausible scenarios. Table 5 below outlines these scenarios and a rationale for each. Less detection would increase the break-even period (by reducing revenue recovered), while more investigations increase the break-even period by increasing costs. In our sensitivity analysis (shown in chapter 3), we have presented the results for Scenario A and E, which showed the greatest variation from the base case.

Table 5: Scenarios for number of cases and investigations

Scenario	Investigations	Detections	Detection Rate	Rationale
Scenario A	8,100	2,900	36%	'Current scenario' based on industry data
Scenario B	17,000	6,000	35%	Proposed level of investigations and detections – 'base case'
Scenario C	24,000	6,000	25%	Proposed level of detection achieved, but only at a lower detection rate
Scenario D	17,000	7,650	45%	Proposed level of investigation achieved, but with a higher rate of detection
Scenario E	20,000	8,000	40%	Both proposed investigation and proposed detection rate are exceeded

Source: Ofgem analysis, 2012

1.27. Second, we implement a test of sensitivity to the duration of theft before detection. The range of tested sensitivities and rationale are summarised in Table 6 below.

Table 6: Scenarios for duration of theft activities

Scenario	Average duration of theft (months)	Rationale
'Low' duration	18	We consider +/- one year to be a reasonable range for the average duration of theft. We have no information with which to estimate the distribution of theft duration. We have assumed a symmetric distribution around the mean duration.
'Moderate' duration (base case)	30	Our base case takes an approximate mid-point between the maximum and minimum industry estimates of the duration of theft before found (2.3 - 2.7 years).
'High' duration	42	As above, mean plus one year.

Source: Ofgem analysis, 2012

1.28. Third, for all of the proposals we test sensitivity to the recovery rate applied to lost revenue (the proportion of unbilled revenue which a supplier can recover from the customer). The range of sensitivities and a description of rationale are summarised in Table 7 below. A lower recovery rate leads to a longer break-even period.

Table 7: Scenarios for recovery rate

Scenario	Recovery rate	Rationale
'Low' recovery rate	SSP:15% LSP:50%	We have applied variation of + / - 10% to the base case duration, for both LSP and SSP recovery rates.
'Moderate' recovery rate (base case)	SSP:25% LSP:60%	These values have been developed in consultation with the Gas Forum NRPS working group
'High' recovery rate	SSP:35% LSP:70%	As above, base case + / - 10%.

Source: Ofgem analysis, 2012

1.29. Fourth, we test the sensitivity to the average annual consumption. The range of sensitivities and rationale are summarised in Table 8 below. A lower average consumption will lengthen the break-even period.

Table 8: Scenarios for average annual consumption

Scenario	Average annual consumption	Rationale
'Low' average annual consumption	SSP:12,375 kWh/year LSP:75,000 kWh/year	We have applied variation of + / - 25% to the base case duration, for both LSP and SSP recovery rates.
'Moderate' average annual consumption (base case)	SSP:16,500 kWh/year LSP:100,000 kWh/year	These values have been obtained from the industry questionnaire data, and from Ofgem guidance on the annual average consumption
'High' average annual consumption	SSP:20,625 kWh/year LSP:125,000 kWh/year	As above, base case + / - 25%.

Source: Ofgem analysis, 2012

1.30. Fifth, we run sensitivity testing to the reoffending rate. The range of sensitivities and rationale are summarised in Table 9 below. A lower reoffending rate will shorten the break-even period.

Table 9: Scenarios for reoffending rate

Scenario	Reoffending rate	Rationale
'Low' reoffending rate	3%	We have applied variation of + / - 2% to the base case reoffending rate
'Moderate' reoffending rate (base case)	5%	This reoffending rate resulted from new evidence obtained from the consultation responses
'High' reoffending rate	7%	As above, base case + / - 2%.

Source: Ofgem analysis, 2012

Cost sensitivities – NRPS

1.31. Each industry proposal includes estimates of the costs of implementing the proposals. The costs considered below are ongoing costs only. Our static analysis assesses the impacts of an individual year of spending and does not consider up-front costs of setting up each scheme.[100]

1.32. The Gas Forum workgroup estimated that the annual operating costs of running the data solution ranged between £0.5m and £1.5m. It indicated that the administration and management costs of running the other NRPS services such as field investigations and debt recovery may range between £0.2m and £0.8m, and that the ongoing annual audit cost would be around £60,000.

1.33. Based on the NRPS report and our further analysis we have set out three different cost scenarios for the NRPS. Our low-cost scenario uses the lower estimate provided by the NRPS workgroup, while our moderate-cost scenario uses their higher estimate. We also created a high cost scenario to assess the impact of costs surpassing the workgroup's higher-cost estimate. We have also included an estimate of the costs for suppliers and other parties (eg xoserve) providing data to the NRPS to allow it to conduct its risk assessment. These costs are summarised in Table 10.

[100] To incorporate set-up costs would require dynamic analysis of an enduring scheme over a number of years.

Table 10: NRPS annual costs (excluding investigations costs), (£)

	Scenario		
	Low	**Moderate**	**High**
Data Analysis solution	500,000	1,500,00	2,500,000
Administrative / Management	200,000	800,000	1,000,000
Audit	40,000	60,000	80,000
Other costs (xoserve, suppliers own costs)	250,000	500,000	750,000
Total annual costs	990,000	2,860,000	4,330,000
Investigation costs		5,800,000	
Annual cost of a fully comprehensive NRPS solution	6,790,000	8,660,000	10,130,000

Source: Ofgem analysis, 2012

Cost sensitivities – SETS and Enhanced SETS

1.34. For the purpose of our analysis we assume that, in aggregate, suppliers will invest an amount in theft detection which is equal to the total value of incentives available. In practice, it is difficult to predict the likely level of investment, given differences between suppliers' theft detection cost curves (including economies of scale), customer portfolios and perceived efficiencies in theft detection.[101]

1.35. For the purpose of our analysis we have assumed a mid-point between the revised incentive pots of UNC277 and UNC346 as our moderate cost case. British Gas revised the revenue protection budget applied exclusively to gas to £4m (down from £4.4m in our draft IA). Based on this revised budget, the incentive pots of UNC277 and UNC346 would be £9.1m and 10.9m respectively.

1.36. However, under Enhanced SETS, the establishment of a service for use by market participants may lead to reduced costs and uncertainty. We applied a similar approach here as when analysing the costs of the NRPS, and defined three cost scenarios for SETS and Enhanced SETS, presented in Table 11 below.

[101] There may be important scale effects in setting up and running a revenue protection unit. For example, smaller parties may have less buyer power or may not achieve minimum scale required to make this activity cost effective. Other larger suppliers may benefit from economies of scale. Other factors may also affect a supplier's efficiency in theft detection such as its portfolio characteristics on theft prevalence and geographical distribution.

Table 11: SETS and Enhanced SETS annual costs (excluding investigation costs), (£)

	Scenario		
	Low	Moderate	High
Suppliers revenue protection units	8,000,000	10,000,000	12,000,000
Audit	30,000	50,000	70,000
Other costs (xoserve)	40,000	60,000	80,000
Total annual costs of revenue protection units under SETS / Enhanced SETS (including investigation costs)	8,070,000	10,110,000	12,150,000
Investigation costs		5,800,000	
Estimated annual cost of revenue protection units (excluding investigation costs)	2,270,000	4,310,000	6,350,000

Source: Ofgem analysis, 2012

Cost sensitivities – Ofgem proposals (TRAS and the incentive scheme)

1.37. For the purpose of our analysis, we assume that the costs of providing the TRAS and our proposed incentive scheme would be similar to the costs of providing the NRPS. This is because the type of service is similar, and we expect suppliers to minimise their costs when choosing their theft detection processes and procedures.

1.38. Using this approach, we estimate that the administration and management costs as well as the annual operating costs of running the data solution would be the same as in the NRPS, ranging between £0.7m and £2.3m. We consider that there is scope for savings in having a single auditor to audit both the TRAS and our proposed incentive scheme. We assume that the audit cost would be around £60,000, which is the higher of the audit costs between the NRPS and SETS and Enhanced SETS. We also assume that suppliers would have to meet other costs both with the TRAS and our proposed incentive scheme. These would be similar to the costs suppliers were estimated to face with the NRPS and SETS and Enhanced SETS proposals, approximately £560,000 in our base case.

1.39. We have set out three different cost scenarios for the TRAS and our proposed incentive scheme. Our low-cost and high-cost scenarios use the lower and upper estimates in the NRPS cost scenarios except for audit costs, where we use the highest low and upper estimates between the NRPS and SETS and Enhanced SETS proposals, and for other costs, where we add the low and upper estimates of theses schemes. These costs are summarised in Table 12.

Table 12: TRAS and our proposed incentive scheme annual costs (excluding investigations costs), (£)

	Scenario		
	Low	**Moderate**	**High**
Data analysis solution	500,000	1,500,00	2,500,000
Administrative / Management	200,000	800,000	1,000,000
Audit	40,000	60,000	80,000
Other costs	290,000	560,000	830,000
Total annual costs	1,030,000	2,900,000	4,410,000
Investigation costs		5,800,000	
Annual cost of a fully comprehensive TRAS and incentive scheme solution	6,830,000	8,720,000	10,210,000

Source: Ofgem analysis, 2012

Marginal detection disincentive – Ofgem proposed incentive scheme

1.40. The marginal (dis)incentive to detect gas theft is given by the incremental costs and benefits of detecting a theft, when compared with the baseline of not taking action. Table 13 and Table 14 below present the base case the net impacts the supplier would meet from being proactive in detecting theft.[102]

1.41. For SSP shippers this comprises revenue recovered from the customer (repaid charges) and investigation costs. For LSP shippers, in addition we include the net impact of the smeared energy commodity and transportation commodity charges.[103] Suppliers face a net cost of £537 when they detect a theft in the SSP market, when compared to them taking no action. The analysis also indicates that suppliers would face a net benefit of £731 when detecting theft in the LSP market.

Table 13: Supplier net cost of being proactive, SSP market (£)

	Impact of theft when it is detected	Impact of theft when no action is taken	Impact of being proactive
Lost revenue with theft	-1,121	-1,121	-
Recovered revenue from detecting theft	430	-	430
Savings with smeared costs to the industry	604	604	-
Investigation costs	-967	-	-967
Total	-1,053	-516	-537

Source: Ofgem analysis, 2012

[102] There is an expectation that going forward the industry will be using the BTU process. Our analysis in this section therefore includes the impacts of using the BTU process.
[103] We are excluding the scheme incentive payments for the time being. Our analysis assumes that suppliers report the units illegally abstracted on an LSP site to the gas transporter. On detecting theft, the supplier will be invoiced the gas and transportation commodity charges associated with these units.

Table 14: Supplier net benefit of being proactive, LSP market (£)

	Impact of theft when it is detected	Impact of theft when no action is taken	Impact of being proactive
Lost revenue with theft	-6,792	-6,792	-
Recovered revenue from detecting theft	4,525	-	4,525
Savings with smeared costs to the industry	985	3,662	-2,678
Investigation costs	-1,117	-	-1,117
Total	-2,399	-3,129	731

Source: Ofgem analysis, 2012

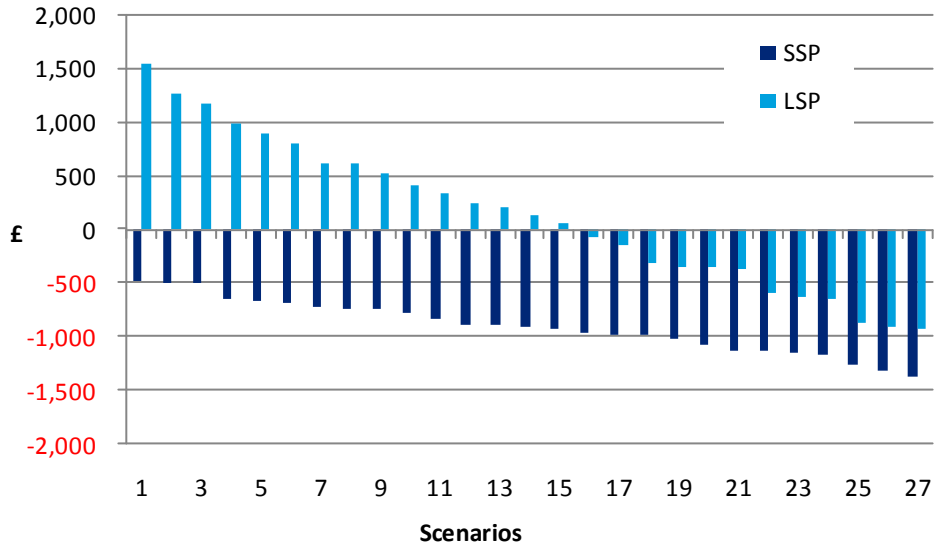
1.42. This suggests that the incentive pot size should account for the net cost of finding theft in the SSP market, if the incentive scheme were to offset any marginal detection disincentive. There would be no similar requirement for an incentive in the LSP market, as the base case suggests that suppliers would have a net benefit from being proactive in theft detection.

1.43. Our analysis assumes that each supplier has a similar cost base and is equally efficient in detecting theft. However, we acknowledge that in practice there is uncertainty for example about the level of consumption, suppliers' costs, or the level of recovery from theft. We consider it is important to acknowledge this uncertainty in our analysis. We have therefore built sensitivities to account for uncertainty in our conclusions.

1.44. In conducting our sensitivities analysis we have considered the variables to which the base case is likely to be more responsive. This includes the average cost of investigating a case of theft, the customer average annual consumption, and the level of recovery that the supplier would obtain once theft is found.

1.45. We have built scenarios for each of these variables, and consider the net impact on the supplier from each of the potential mix of these scenarios. Figure 8 below presents the different net impacts on the supplier for each of these scenarios:

Figure 8: Detection net incentive/disincentive for a supplier



Source: Ofgem analysis, 2012

1.46. Suppliers have a net disincentive to be proactive in theft detection in the SSP market for all the scenarios we have tested. We estimate that this net detection disincentive ranges from £478 to £1,361. The net impact on suppliers is more responsive to the sensitivities in the LSP market. We estimate that the impacts on suppliers range from a net benefit to be proactive in detecting theft of £1,545 to a net cost of £925.

1.47. Our analysis attempts to incorporate the risk from uncertainty in the assessment of the net impacts of theft detection. Given the range of marginal detection impacts for the different scenarios, from the best case to the worst case scenario, we assume that the marginal detection impacts of being proactive in theft detection correspond to the 80th percentile of the worst case scenario. Under this assumption, the marginal detection impact will include a larger proportion of the potential variability of key variables that affect the impacts of tackling theft. This results in an estimate of the marginal detection impact that incorporates some of the uncertainty that suppliers face with theft detection. We estimate therefore that suppliers will have a marginal detection disincentive in the SSP and LSP markets of £1,120 and £539 respectively. This represents an incentive pot value of £6.025m for the SSP market, and £0.335m for the LSP market.

Standalone analysis – the impact of theft

1.48. In chapter 4 of this document we present the results of our 'standalone' analysis, which examines the distributional impacts of a single theft. We conducted this analysis based on an average volume of theft. Detecting a theft will increase suppliers' revenue in the short term. Nonetheless, the net impacts of reducing theft detection should reduce suppliers' costs in the long run. These cost reductions should be passed on to consumers, to the extent that competition is effective.

1.49. In addition to the assumptions stated at the start of this appendix, in this section we assume a market share of 15% for the supplier (and its shipper) supplying the offending customer.[104] Market share determines the proportion of smeared costs of stolen gas (value of the gas and transportation costs) charged to the shipper or smeared across other shippers.

1.50. We separately consider the distributional impacts of theft in the SSP market and the LSP market. Each is summarised below.

Standalone analysis of the SSP market

1.51. In this section we consider how different parties are affected by a representative 'average' case of gas theft in the SSP market.

1.52. A key element influencing distributional impacts in the SSP market is the smearing of gas and transportation charges. These costs are allocated to SSP shippers based on portfolio size by volume. For example, an SSP shipper with a 15% market share would pay 15% of all smeared costs, while the remaining 85% will be allocated to the other SSP shippers based on their market share.

1.53. Table 15 outlines the impacts on each participant of a single case of theft with year 1 being the first year of theft. In our model, the theft is found part way through the third year.

Table 15: Impact of a single (average) gas theft in the SSP market, (£)

	Year 1	Year 2	Year 3	Year 4	Total
Offender					
Avoided Supply Charges	448	448	224	-	1,121
Charges recovered by the supplier	-	-	-430	-	-430
Total Impact on offender	**448**	**448**	**-206**	**-**	**690**
Supplier/Shipper where illegal abstraction occurred					
Lost/recovered revenue from offender:	-448	-448	206	-	-690
Avoided energy and transportation costs with units illegal abstracted	-	142	284	284	711
Investigation costs	-	-	-967	-	-967
Supplier's share of SSP industry smeared costs – Energy, Transportation (15% of RbD)	-	-21	-43	-43	-107
Total Impact on supplier	**-448**	**-327**	**-519**	**242**	**-1,053**
Cost to SSP industry (excluding the offender's Supplier/Shipper)					
Energy and transportation costs with units illegal abstracted (85% of RbD)	-	-121	-242	-242	-604
Total Impact on SSP, excluding offender's supplier	**-**	**-121**	**-242**	**-242**	**-604**

Source: Ofgem analysis, 2012

1.54. In our base case the consumer avoids net charges of £690. On detecting the theft, the supplier charges the customer for £1,121, representing the value of the units of gas illegally abstracted, plus any additional costs incurred investigating the theft. The supplier recovers £430 on detecting the theft. The consumer net avoided charges are lower in relation to our draft IA, and the supplier's recovered revenue is higher, which reflects the increase in the average investigations costs.

[104] Our assumption is that a supplier's LSP market share will not impact on the SSP standalone case.

1.55. Gas and transportation costs incurred by the shipper are derived from the site AQ. Theft over a 2.5 year period is expected to lead to a reduction in the AQ.[105] In this case, any charges not allocated to the shipper of the offender's supplier will be paid by the SSP market. In our model, we assume that it would take 18 months for the AQ to fully reflect the drop in metered consumption due the units illegally abstracted and similarly to subsequently increase once the theft is discovered and remedied.[106] If the supplier uses the BTU process, the AQ would be updated immediately following the theft detection. Analysis on the impacts of using the BTU process is further detailed in the next section.

1.56. The relevant shipper pays for a proportion of the gas and transportation costs smeared through Reconciliation by Difference (RbD),[107] equal to its market share. Other SSP shippers pay for the remaining 85% of these costs. Any supplier active in the SSP market is therefore materially affected by illegal abstraction occurring in the portfolio of another SSP supplier.

1.57. In summary, under our modelling of an average theft in the SSP market, the offender's supplier will have a net cost of £1053, resulting from lost revenue with units illegal abstracted, the cost of investigation, and the avoided gas and transportation costs. The avoided industry costs from the offender's supplier will be borne by the SSP industry, which will face a net cost of £604. The difference between the sum of the net costs and the net benefits to the customer (£690) is £967, which represents the average costs of an investigation.[108] The increase in the average cost of investigation, in relation to our draft IA, is on the basis of the higher net cost to the supplier in our final IA.

Impact of market share on SSP standalone case

1.58. In this section we summarise the impact of market share and the recovery rate of charges on the distributional impacts of theft.[109]

1.59. We have modelled the impact of theft for shippers with SSP market share volumes of 1%, 15% and 45%.

[105] Gas costs and transportation charges are allocated to suppliers based on an estimate of the annual consumption for each site in its portfolio, known as the AQ. Under the current gas arrangements for the SSP market the AQ is updated once a year, based on the metered consumption obtained by suppliers.
[106] For the purpose of our modelling, we assume that during the first year the offender's supplier will continue paying for the wholesale gas costs and transportation charges as if no illegal consumption were taking place. During the second year, the supplier would pay these charges for half a year (six months). From this point forward, the AQ is updated to reflect the unmetered units of gas illegally abstracted, and the supplier will avoid payment of charges related to the stolen gas. The time taken for an AQ to adjust to match changes in consumption will also have impacts in the final two years of the model once theft has been detected. For the purpose of our model we have assumed that, once illegal abstraction is found (after 2.5 years), the SSP market will continue paying the wholesale gas and transportation charges for the units illegal abstracted for another 18 months – up to the start of year five, the moment where the AQ is updated to meet the level of actual consumption.
[107] Reconciliation by Difference (RbD) is the method of reconciling the difference between actual (metered) and deemed (estimated) measurements of gas allocated to Small Supply Points (SSPs).
[108] The average cost of an investigation is an additional cost on top of the costs of the units illegally abstracted, which is why the distribution of costs and benefits from theft does not add up to zero.
[109] Other variables will also affect the distribution of impacts between parties. For example, the extent to which the AQ is adjusted to reflect metered consumption will impact on the allocation of costs between the offender's supplier and the SSP market. However, for the purpose of this appendix we have presented analysis on two variables to demonstrate the potential impact and uncertainties that suppliers face.

1.60. We also test sensitivities on four cases varying according to the recovery rate of charges linked to illegal abstraction. These are, no recovery, 5% recovery, 25% (which is the assumed industry average in the SSP market), and full recovery of charges. We have also considered the impact of undetected theft over both a 2.5 and 4 year period.[110] Table 16 below summarises the key costs and benefits, as well as their distributional impact on parties.

Table 16 Market share and recovery rate sensitivity analysis for the SSP standalone case, (base case is 25% recovery and 15% market share), (£)

	1%	15%	45%
4 Years theft, no investigation			
Offender	1,569	1,569	1,569
Supplier/Shipper (where illegal abstraction occurred)	-584	-723	-1,021
RbD industry (excluding the offender's Supplier/Shipper)	-985	-846	-547
LSP industry (excluding the offender's Supplier/Shipper)	-	-	-
2.5 Years theft, no investigation			
Offender	1,121	1,121	1,121
Supplier/Shipper (where illegal abstraction occurred)	-417	-516	-730
RbD industry (excluding the offender's Supplier/Shipper)	-704	-604	-391
LSP industry (excluding the offender's Supplier/Shipper)	-	-	-
No recovery			
Offender	1,121	1,121	1,121
Supplier/Shipper (where illegal abstraction occurred)	-1,383	-1,483	-1,696
RbD industry (excluding the offender's Supplier/Shipper)	-704	-604	-391
LSP industry (excluding the offender's Supplier/Shipper)	-	-	-
5% average recovery			
Offender	1,035	1,035	1,035
Supplier/Shipper (where illegal abstraction occurred)	-1,297	-1,397	-1,610
RbD industry (excluding the offender's Supplier/Shipper)	-704	-604	-391
LSP industry (excluding the offender's Supplier/Shipper)	-	-	-
25% average recovery			
Offender	690	690	690
Supplier/Shipper (where illegal abstraction occurred)	-953	-1,053	-1,266
RbD industry (excluding the offender's Supplier/Shipper)	-704	-604	-391
LSP industry (excluding the offender's Supplier/Shipper)	-	-	-
100% average recovery			
Offender	-600	-600	-600
Supplier/Shipper (where illegal abstraction occurred)	337	238	24
RbD industry (excluding the offender's Supplier/Shipper)	-704	-604	-391
LSP industry (excluding the offender's Supplier/Shipper)	-	-	-

Source: Ofgem analysis, 2012

1.61. Our analysis demonstrates that the higher the market share of the offender's supplier, the higher the proportion of the smeared industry costs that they will bear

[110] We have considered a theft that stops after 2.5 years to allow comparison with a detected theft where no charges are recovered. We have also considered a 4 year period to show the impact on a supplier if theft is ongoing past the average duration period for detected theft.

from one case of illegal abstraction. Consequently, the remainder of the SSP market will bear a smaller share of these costs.

1.62. While this indicates that the marginal impact of a case of illegal abstraction is higher for a supplier with a higher market share, there may also be an important scale effect when considering the aggregated impacts of illegal abstraction. For example, a supplier with a larger portfolio would have more scope to spread these costs across the units of gas it supplies.

1.63. Comparing our base case with not seeking to find a theft, we can see that this would deliver a net cost for suppliers for all market shares tested. This conclusion changed from our draft IA (where it was estimated a net benefit to the supplier), reflecting the higher average investigation costs used in our final IA. With a 25% recovery rate, the net cost from illegal abstraction to the supplier ranges from £953 to £1266. This represents a net cost when compared to not tackling illegal abstraction even if assuming that theft stops after 2.5 years.

1.64. In relation to the scenarios that we have tested, all suppliers would be expected to achieve a net benefit where the recovery rate from the customer is greater than 58% when compared to not finding the theft. However, comparing no activity to find theft with a zero recovery of charges, we can see that this would represent a significant cost for all shipper market shares analysed.

1.65. Additional revenue recovered from customers is not smeared. Therefore there are no market share impacts when the recovery rate varies. The marginal impact of the recovery rate is therefore constant across cases 1 to 5 in Table 16 above.

Standalone analysis of the LSP market

1.66. In this section we consider how different parties are affected by a representative 'average' case of gas theft in the LSP market. Table 17 below summarises the key impacts on individual parties resulting from one customer illegally abstracting gas in the LSP sector.[111]

[111] We have modelled the effects in the LSP NDM market. We have not considered the implications of our model for the LSP DM market. Our expectation is that the number of thefts in the LSP DM market is small (although they may be high value).

Table 17 Impact of a single (average) gas theft in the LSP market, base case, (£)

	Year 1	Year 2	Year 3	Year 4	Total
Offender					
Avoided Supply Charges	2,717	2,717	1,358	-	6,792
Charges recovered by the supplier	-	-	-4,525	-	-4,525
Total Impact on offender	**2,717**	**2,717**	**-3,167**	**-**	**2,267**
Supplier/Shipper where illegal abstraction occurred					
Lost/recovered revenue from offender:	-2,717	-2,717	3,167	-	-2,267
Avoided energy and transportation costs with units illegal abstracted	1,260	1,492	-1,584	463	1,631
Investigation costs	-	-	-1,117	-	-1,117
Supplier's share of SSP industry smeared costs – Energy, Transportation (15% of RbD)	-189	-224	-164	-70	-646
Total Impact on supplier	**-1,646**	**-1,449**	**302**	**394**	**-2,399**
Cost to SSP industry (excluding the offender's Supplier/Shipper)					
Energy and transportation costs with units illegal abstracted (85% of RbD)	-1,071	-1,268	1,748	-394	-985
Total Impact on SSP, excluding offender's supplier	**-1,071**	**-1,268**	**1,748**	**-394**	**-985**

Source: Ofgem analysis, 2012

1.67. In our base case the consumer avoids a total of £6,792 of charges. On detecting the theft, the supplier charges the customer for this value, plus any additional costs incurred investigating the theft. When the customer's supplier identifies the theft after 2.5 years it will be able to charge the customer for the units stolen. The supplier recovers £4,525 on detecting the theft. This is higher than we estimated in our draft IA, reflecting the higher LSP investigation costs and the higher average investigations costs we assume in the final IA.[112] During the period of illegal abstraction the supplier will also avoid paying transportation and gas charges,[113] which are estimated at £4,309 (excluding charges returned to the market).[114]

1.68. Our analysis assumes that suppliers report the units illegally abstracted on an LSP site to the gas transporter.[115] The supplier will therefore be invoiced the wholesale and transportation costs associated with these units other than transportation capacity charges. The SSP market will no longer bear these costs.[116]

1.69. In summary, under our modelling of an average theft in the LSP market, the offender's supplier will have a net cost of £2,399, resulting from lost revenue with units illegal abstracted, the cost of investigation, and the avoided gas and transportation costs. The net impact on the supplier is higher in relation to our draft IA, reflecting higher marginal and average investigation costs assumed in the final

[112] We updated our analysis and use now the average investigation costs per detection. We also updated the cost of conducting a successful investigation in LSP sites, which is now £150 higher in relation to what we assumed in our draft IA (and also in relation to the costs of a successful investigation in a SSP site).
[113] We assume that, when theft occurs, the supplier retains the liability for the capacity element of transportation charges.
[114] These costs have historically been smeared through the RbD mechanism to the SSP market but going forward they are also expected to be allocated to the LSP market. As noted previously, recent changes to the market mean that the LSP sector will now contribute to the cost of unaccounted for gas. From April 2012 LSP shippers will bear costs on the basis of an assessment made by the AUGE. Therefore, we expect that in future, that the value of the avoided charges is likely to be allocated to LSP shippers.
[115] Where a theft has occurred and the GT has requested information on the volume of gas illegally taken, the supplier is required under SLC 17.3 to provide this information where it is reasonable to do so.
[116] Our analysis suggests that, if an LSP supplier does not declare the volume of gas taken to the gas transporter, such that they do not become liable for transportation and gas charges, this would significantly decrease the impact of an average theft on the LSP supplier and increase its impact on the wider market.

IA. These avoided costs from the offender's supplier will be borne by the SSP industry, which will face a net cost of £985.[117] There is no difference in the smeared costs between our draft and final IA. The difference between the overall industry costs and the customer's benefits is £1,117. This is the assumed cost of an average the investigation.

Impact of market share on LSP standalone case

1.70. As with the SSP market, we assess the impact of market share of the offender's supplier and of recovery rate on distributional impacts of theft. Again we consider three market share scenarios; 1%, 15% and 45%. To isolate the effect on the LSP market, we hold SSP market share constant at 15%. We also consider the same recovery rates as with the SSP market. Table 18 below summarises the key costs and benefits, as well as their distributional impact on parties.

1.71. As with the SSP case, we include a scenario in which theft goes undetected for a period of 4 years.

1.72. Unlike the SSP market, costs to the customer's supplier are independent of the supplier's market share in the LSP market, because its exposure to RbD costs is a function of its SSP market share only. Supplier costs of each undetected theft are estimated at £5,007 if the theft would have lasted for 4 years (at 15% market share). For a theft lasting 2.5 years, the cost to the same supplier would be significantly less at £3,129, due to the shorter duration. These impacts are the same as in our draft IA. Finding a theft but failing to recover charges increases the supplier impact to £6,924 of costs (by the average cost of an investigation). This is higher in relation to the IA to reflect the higher marginal and average investigation costs used in our final IA.

1.73. At a 60% recovery rate, the offender's supplier incurs a net benefit than if it had not identified the theft. This differs from our initial views set out in our draft IA which suggested that LSP shippers had a commercial disincentive. This change is largely driven by the correction to the recovery rate associated with LSP sites.[118]

[117] Potentially with some of these costs being expected to move to the LSP market once the AUGE arrangements are in place in April 2012

[118] Our analysis in our draft IA was intended to be based on a 60% recovery rate in the LSP sector. However, the model incorrectly used a figure of 25%.

Table 18 Sensitivity analysis on key assumptions of the LSP standalone case, (£)

	1%	15%	45%
4 Years theft, no investigation			
Offender	10,867	10,867	10,867
Supplier/Shipper (where illegal abstraction occurred)	-5,007	-5,007	-5,007
RbD industry (excluding the offender's Supplier/Shipper)	-5,860	-5,860	-5,860
LSP industry (excluding the offender's Supplier/Shipper)	-	-	-
2.5 Years theft, no investigation			
Offender	6,792	6,792	6,792
Supplier/Shipper (where illegal abstraction occurred)	-3,129	-3,129	-3,129
RbD industry (excluding the offender's Supplier/Shipper)	-3,663	-3,663	-3,663
LSP industry (excluding the offender's Supplier/Shipper)	-	-	-
No recovery			
Offender	6,792	6,792	6,792
Supplier/Shipper (where illegal abstraction occurred)	-6,924	-6,924	-6,924
RbD industry (excluding the offender's Supplier/Shipper)	-985	-985	-985
LSP industry (excluding the offender's Supplier/Shipper)	-	-	-
5% average recovery			
Offender	6,415	6,415	6,415
Supplier/Shipper (where illegal abstraction occurred)	-6,547	-6,547	-6,547
RbD industry (excluding the offender's Supplier/Shipper)	-985	-985	-985
LSP industry (excluding the offender's Supplier/Shipper)	-	-	-
60% average recovery			
Offender	2,267	2,267	2,267
Supplier/Shipper (where illegal abstraction occurred)	-2,399	-2,399	-2,399
RbD industry (excluding the offender's Supplier/Shipper)	-985	-985	-985
LSP industry (excluding the offender's Supplier/Shipper)	-	-	-
100% average recovery			
Offender	-750	-750	-750
Supplier/Shipper (where illegal abstraction occurred)	618	618	618
RbD industry (excluding the offender's Supplier/Shipper)	-985	-985	-985
LSP industry (excluding the offender's Supplier/Shipper)	-	-	-

Source: Ofgem analysis, 2012

Application of the BTU, incentive payments, and existing compensation arrangements to the standalone case

1.74. This section summarises potential impacts of the industry proposals on the distributional impacts of a single theft.

BTU process

1.75. All the proposals except SETS include measures to increase the accuracy of cost allocation once theft has been discovered.[119] This mechanism would take effect through the BTU process. It would require the AQ to be adjusted to reflect the actual consumption at the site (rather than consumption recorded on the meter) once the theft is discovered. This will correct the allocation of charges between SSP shippers on a prospective basis once theft has been found.

1.76. In the SSP market the offender's supplier (via its shipper) would then, on a prospective basis, be liable for gas and transportation costs that had previously been smeared over the SSP market. This would remove the current time lag for AQs to be adjusted following the discovery of a theft and would reduce the smeared costs borne by the SSP market, from £604 to £242. These costs would be borne by the customer's supplier and would therefore reduce the potential benefits of detecting a theft. We have modelled this effect below in Table 19 below.

Table 19 Effect of the BTU process in the SSP standalone case (SC)

	SC	SC with BTU	Difference
Offender	690	690	-
Supplier	-1,053	-1,415	-363
SSP market (excluding offender's supplier)	-604	-242	363
LSP market (excluding offender's supplier)	-	-	-

Source: Ofgem analysis, 2012

1.77. Suppliers are required to inform the gas transporter of the volumes of gas illegally taken in the LSP market. The gas transporter will adjust the shipper's charges to cover the period of the theft other than for transportation capacity charges. On a prospective basis, meter point reconciliation is expected to lead to the accurate allocation of charges other than for capacity which will take time to adjust in line with the AQ. Adding the BTU process would therefore increase the accuracy of the allocation of transportation capacity charges on a prospective basis and would reduce incentives on a supplier to detect theft. Our analysis is set out in Table 20 below.

Table 20 Effect of the BTU process in the LSP standalone case (SC)

	SC	SC with BTU	Difference
Offender	2,267	2,267	-
Supplier	-2,399	-2,989	-591
SSP market (excluding offender's supplier)	-985	-394	591
LSP market (excluding offender's supplier)	-	-	-

Source: Ofgem analysis, 2012

[119] British Gas suggested including the BTU process as part of SETS in its response to our August 2011 consultation.

Incentive payments under SETS and Enhanced SETS

1.78. In this section we examine the potential impact of the incentive payments available under SETS and Enhanced SETS. We assume investigation costs are constant at the current amount. We assume market share is 15%, consistent with our base case assumption. Therefore a supplier (via its shipper) would be liable for 15% of the total costs of the incentive scheme. However, we have not included supplier's costs in funding SETS or Enhanced SETS as these are assumed to be fixed costs and will not impact on a marginal effect of detecting a theft.

SETS

1.79. There are two proposals under SETS. UNC277 rewards suppliers for the number of thefts discovered. For this proposal we have assumed that 6,000 thefts are discovered across the market. Our analysis in Table 21 and Table 22 below shows that, for our average theft case in the SSP market, the introduction of SETS or Enhanced SETS would provide suppliers with an additional benefit of £1,519 (under UNC277) or £1,195 (under UNC346) for each theft found. In the LSP market the effect is the same under UNC277 (suppliers have an additional benefit of £1,519 with the introduction of SETS). With UNC346 the additional benefit is estimated at £7,242.

Table 21: Impact of the SETS on the SSP standalone case (SC)

	SC		SETS (UNC277)	Difference		SETS (UNC346)	Difference
Offender	690		690	-		690	-
Supplier	-1,053		466	1,519		142	1,195
SSP market (excluding offender's supplier)	-604		-604	-		-604	-
LSP market (excluding offender's supplier)	-		-	-		-	-

Source: Ofgem analysis, 2012

Table 22: Impact of the SETS on the LSP standalone case (SC)

	SC		SETS (UNC277)	Difference		SETS (UNC346)	Difference
Offender	2,267		2,267	-		2,267	-
Supplier	-2,399		-880	1,519		4,844	7,242
SSP market (excluding offender's supplier)	-985		-985	-		-985	-
LSP market (excluding offender's supplier)	-		-	-		-	-

Source: Ofgem analysis, 2012

Enhanced SETS

1.80. We have extended our analysis on SETS above to Enhanced SETS. In doing so we have modelled the impact of the BTU process which we consider to be the main difference in the allocation of costs. As shown in Table 23 and Table 24, the impact is universally to slightly reduce the overall benefit to suppliers, when compared to SETS, and transfer that benefit to the SSP market.

Table 23: Impact of Enhanced SETS on the SSP standalone case (SC)

	SC		SETS (UNC277)	Difference		SETS (UNC346)	Difference
Offender	690		690	-		690	-
Supplier	-1,053		103	1,156		-220	832
SSP market (excluding offender's supplier)	-604		-242	363		-242	363
LSP market (excluding offender's supplier)	-		-	-		-	-

Source: Ofgem analysis, 2012

Table 24: Impact of Enhanced SETS on the LSP standalone case (SC)

	SC		SETS (UNC277)	Difference		SETS (UNC346)	Difference
Offender	2,267		2,267	-		2,267	-
Supplier	-2,399		-2,989	-591		4,253	6,651
SSP market (excluding offender's supplier)	-985		-394	591		-394	591
LSP market (excluding offender's supplier)	-		-	-		-	-

Source: Ofgem analysis, 2012

Incentive payments under Ofgem's proposed incentive scheme

1.81. In this section we examine the potential impact of the incentive payments available under our proposed incentive scheme. There are two different types of incentive payments under the incentive scheme. In the initial year of the scheme, the incentive payment covers the marginal detection disincentive, ongoing costs and set-up costs. We estimate that the incentive payment during this period is approximately £1,515 for each theft found in the SSP market, and £934 for each theft found in the LSP market. In subsequent years, the incentive payments cover only the marginal detection disincentive. These are £1,120 and £539 for each theft found in the SSP and the LSP market respectively. These impacts are shown in Table 25 and Table 26 below.

Table 25: Impact of our proposed incentive scheme on the SSP standalone case (SC)

	SC		Incentive Scheme (Initial year)	Difference		Incentive Scheme (After initial year)	Difference
Offender	690		690	-		690	-
Supplier	-1,053		100	1,152		-295	757
SSP market (excluding offender's supplier)	-604		-242	363		-242	363
LSP market (excluding offender's supplier)	-		-	-		-	-

Source: Ofgem analysis, 2012

Table 26: Impact of our proposed incentive scheme on the LSP standalone case (SC)

	SC		Incentive Scheme (Initial year)	Difference		Incentive Scheme (After initial year)	Difference
Offender	2,267		2,267	-		2,267	-
Supplier	-2,399		-2,055	343		-2,450	-52
SSP market (excluding offender's supplier)	-985		-394	591		-394	591
LSP market (excluding offender's supplier)	-		-	-		-	-

Source: Ofgem analysis, 2012

Supplier compensation arrangements

1.82. Compensation arrangements (known as the Reasonable Endeavours Scheme) currently exist for gas suppliers to recover certain costs where a theft has been discovered and the supplier had not been able to recover these costs, despite making reasonable, defined, efforts to do so.[120] The costs that a supplier is eligible to recover relate to any shipper charges that the gas transporter would have levied for the amount of gas illegally taken and investigation (including meter works).

1.83. For the purposes of this section we have modelled the potential impact on cost allocation of compensation arrangements that allowed a supplier to fully recover its investigation and metering costs when these have not been recovered from the customer. That is, where we had previously assumed a 25% recovery rate for these charges in the average case, we have assumed 100% recovery with these costs being smeared back to the rest of the shipping community. These results are shown in Table 27 and Table 28 below.

Table 27 Impact of the RES and the schemes to tackle theft on the SSP standalone case (SC)

	SC Without RES	SC with RES	SC RES impact	SETS (UNC277)	SETS (UNC346)	NRPS	Enhanced SETS (UNC277)	Enhanced SETS (UNC346)
Offender	690	690	-	690	690	690	690	690
Supplier	-1,053	203	1,256	1,722	1,398	-160	1,359	1,035
SSP market (excluding offender's supplier)	-604	-1,446	-841	-1,446	-1,446	-1,083	-1,083	-1,083
LSP market (excluding offender's supplier)	-	-414	-414	-414	-414	-414	-414	-414

Source: Ofgem analysis, 2012

Table 28 Impact of the RES and the schemes to tackle theft on the LSP standalone case (SC)

	SC Without RES	SC with RES	SC RES impact	SETS (UNC277)	SETS (UNC346)	NRPS	Enhanced SETS (UNC277)	Enhanced SETS (UNC346)
Offender	2,267	2,267	-	2,267	2,267	2,267	2,267	2,267
Supplier	-2,399	-1,729	670	-210	5,513	-2,320	-801	4,922
SSP market (excluding offender's supplier)	-985	-1,434	-449	-1,434	-1,434	-843	-843	-843
LSP market (excluding offender's supplier)	-	-221	-221	-221	-221	-221	-221	-221

Source: Ofgem analysis, 2012

1.84. We also modelled the potential impact on cost allocation of the compensation arrangements and the incentive payments under our proposed incentive scheme. These results are shown in Table 29 below.

[120] Based on the data provided by xoserve, only one supplier made claims for these compensation payments during 2010. A total of 409 claims were made during the first 11 months of 2010, leading to the payment £121,125.

Table 29 Impact of the RES and our proposed incentive scheme to tackle theft on the SSP and LSP standalone case (SC)

	SSP		LSP	
	Incentive Scheme (Initial year)	Incentive Scheme (After initial year)	Incentive Scheme (Initial year)	Incentive Scheme (After initial year)
Offender	690	690	2,267	2,267
Supplier	1,356	961	-1,385	-1,780
SSP market (excluding offender's supplier)	-1,083	-1,083	-843	-843
LSP market (excluding offender's supplier)	-414	-414	-221	-221

Source: Ofgem analysis, 2012

Appendix 3 - Glossary

A

Annual Quantity (AQ)

The sum (measured in kWh or therms) of the annual consumption of all meters on a site. AQs are based on historical usage from previous years.

Allocation of Unidentified Gas Expert (AUGE)

An independent expert to determine a methodology for the allocation of unallocated gas, to be appointed under the terms of UNC Modification Proposal 229.

AQ Review

A review of the User's determination of the AQ in respect of a Supply Meter Point.

C

Central Revenue Protection Unit (CRPU)

The CRPU is part of the Enhanced SETS proposal. The role of the CRPU would be to enter the market to offer services to suppliers to help them respond to the incentive scheme set up under SETS.

Customers

Parties who have a contract with a supplier to take gas at a Supply Point.

D

Daily Metered (DM) Supply Points

Supply points that have annual gas consumption greater than 58.6GWh. DM Supply Points are equipped with mandatory telemeter equipment, such as a datalogger. Any supply point which is directly connected to the NTS will also be daily metered.

Distribution Connection and Use of System Agreement (DCUSA)

A multi-party contract between the licensed electricity distributors, suppliers and generators of Great Britain. It is concerned with the use of the electricity distribution systems to transport electricity to or from connections to them.

E

Emergency Control Valve (ECV)

A valve which limits the supply of gas to an individual Supply Point.

Enhanced SETS

Enhanced SETS builds on the SETS proposal to increase theft detection. In addition to a code of practice on theft investigations it would add the RPACA and may also add the CRPU.

G

Gas Distribution Network (GDN)

A network through which gas is taken from the high pressure transmission system and distributed through low pressure networks of pipes to industrial complexes, offices and homes. There are eight GDNs in Britain, each covering a separate geographical region.

Gas Transporters (GTs)

Holders of a licence to operate a system to convey gas granted under section 7, paragraph 4 of the Gas Act 1986 as amended.

I

Independent Gas Transporter (iGT)

An operator of a small local gas network, most of which are being built to serve new housing. iGTs may levy transportation charges on shippers.

L

Larger Supply Point (LSP)

A meter point with an annual consumption greater than 73,200kWh (2,500 therms).

N

National Revenue Protection Service (NRPS)

A proposal to increase theft detection by establishing a central database to profile theft risk at each supply point. It would require the highest risk cases to be investigated by suppliers.

R

Reconciliation by Difference (RbD)

A methodology for reconciling the difference between allocated and actual energy consumed by small supply points which have an AQ of up to 73,200kWh.

Revenue Protection Activity Co-ordination Agent (RPACA)

The RPACA is part of the Enhanced SETS proposal. It would provide services (such as management information and a telephone tip-off line) that may not be provided to the same extent in a competitive environment.

S

Supplier Energy Theft Scheme (SETS)

A proposal to increase theft detection by introducing incentives on shippers. It would be implemented through either UNC277 or UNC346.

Supply Point Administration Agreement (SPAA)

A multi-party agreement to which all domestic gas suppliers and all gas transporters are required by their licences to accede. It sets out the inter-operational arrangements between gas suppliers and transporters in the GB retail market.

Shipper

An agent who arranges for the conveyance of gas over the distribution network to final consumers. Shippers pay transportation charges to the relevant gas transporter and are holders of a licence given under Section 7A (2) of the Gas Act 1986 as amended.

Smaller Supply Point (SSP)

An SSP is a supply point with an annual consumption of less than 73,200kWh (2,500 therms).

Supplier

Holders of a licence to supply gas given under Section 7A (1) of the Gas Act 1986 as amended or a person excepted from the requirement to hold a licence by virtue of paragraph 5 of schedule 2A of the Act.

Supply Meter Point (SP)

A point at which consumers take gas off the gas transporter's network.

T

Theft of gas

Describes a number of offences under schedule 2B of the Gas Act 1986 where a customer prevents a meter from correctly registering the amount of gas supplied, has damaged equipment or reconnects the supply without the relevant permission.

U

Unallocated Gas

Gas which is offtaken at a gas transporter's without being charged to any one shipper.

Uniform Network Code (UNC)

The contractual framework for the NTS, GDNs and shipper.

X

xoserve

A joint venture delivering transportation transactional services, owned by the large gas transporters and the transmission operator.