

## Gas Distribution Price Control Review Initial Proposals Document

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### Overview:

This document contains the impact assessment appendices for the Gas Distribution Price Control Review's (GDPCR's) initial proposals document. The impact assessment appendices include the final impact assessments on facilitating network extensions, funding of xoserve, quality of service, capital expenditure rolling incentives and IQI, mains replacement incentive and volume driver.

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## Context

This is the first full distribution price control review since the sale by National Grid Gas plc (NGG) of four of its eight GDNs to three new GDN owners on 1 June 2005. As a result, the current industry structure is substantially different from that in place at the time of the previous price control review. Last year we extended the existing price control by one year. At that time we addressed a number of significant issues which had emerged since the last control was set. This included treatment of expenditure in the network which had been much higher than allowed for and the GDNs exposure to the price of gas through the way in which they were incentivised to reduce shrinkage gas.<sup>1</sup>

Work on the price control review has continued since then. In particular, the creation of separately owned, managed and operated GDNs has allowed effective comparisons to be made between the businesses despite only a short time in new ownership.

The primary focus of this document is to set out our initial proposals on appropriate operating, capital and replacement expenditure allowances and allowed revenues to take effect from 1 April 2008. It also sets out our proposals on a range of incentives and quality of service outputs.

Our next document on the GDPCR will be our updated proposals in September which will update our thinking for resubmissions during the summer by the GDNs. We expect to publish our final proposals in December 2007.

## Associated Documents

- GDPCR Fourth consultation, March 2007 (Ref. 49/07);
- GDPCR One year control final proposals, December 2006 (Ref. 205/06);
- GDPCR Third consultation, November 2006 (Ref. 203/06);
- GDPCR One year control proposals, September 2006 (Ref. 169/06);
- GDPCR Second consultation, July 2006 (Ref. 123/06); and
- GDPCR Initial consultation, December 2005 (Ref. 259/05).

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<sup>1</sup> Shrinkage is gas lost from the network through leakage, theft and own use gas.

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## Appendix 14 – Final impact assessment on facilitating network extensions

### Objectives

1.1. The objective of this impact assessment (IA) is to consider the costs and benefits associated with a number of options for encouraging GDNs to carry out gas network extensions (or infills) to non-gas communities<sup>2</sup>.

1.2. Gas is a cheaper source of energy than its conventional alternatives (e.g. electricity, oil, etc) so network extensions to non-gas communities could contribute to alleviating fuel poverty. Facilitating gas network extensions contributes to Ofgem's general duty to secure that, so far as it is economical to meet them, all reasonable demands in Great Britain for gas conveyed through pipes are met<sup>3</sup>. It also contributes to Ofgem's principal objective of protecting the interest of consumers, particularly low income consumers and those residing in rural areas<sup>4</sup>.

1.3. As gas creates fewer greenhouse gas emissions and is associated with better air quality than its conventional alternatives (see paragraphs 1.8 to 1.9 below), promoting gas network extensions helps Ofgem to contribute to the achievement of sustainable development<sup>5</sup>.

1.4. Finally, facilitating network extensions is potentially in line with the Government's social and environmental guidelines<sup>6</sup>.

### Background

1.5. According to the DTI, there are 8,996 community clusters that do not have access to a gas supply. Of these, 4,654 (representing 525,267 households) are within 2 kilometres of an existing gas main. We consider the communities within 2 kilometres of a relevant main to be more economic to connect to gas than the communities that are farther away. For these communities, other forms of energy become more economic such as microgeneration.

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<sup>2</sup> The options are based on those described in the third consultation document, Gas Distribution Price Control Third Consultation Document, 203/06, November 2006, paragraph 6.16.

<sup>3</sup> Section 4AA(2)(a), Gas Act 1986

<sup>4</sup> Section 4AA(2), Gas Act 1986

<sup>5</sup> Section 4AA(5)(ba), Gas Act 1986

<sup>6</sup> Social and Environmental Guidance to the Gas & Electricity Markets Authority.

## Key issues

### Benefits of gas over fuel types in non-gas communities

#### *Social*

1.6. According to the UK Fuel Poverty Strategy, published in 2001, a household is in fuel poverty if, in order to maintain a satisfactory heating regime, it would be required to spend more than 10 per cent of its income on all household fuel use<sup>7</sup>.

1.7. One way of reducing the incidence of fuel poverty in non-gas communities is by replacing the existing fuel source in a non-gas community with gas by extending the distribution network as gas is a cheaper source of energy for heating and cooking than its conventional alternatives. For example, annual energy costs for an average semi-detached house is about £928 using gas, about £1,309 using solid fuel, about £1,993 using peak electric, about £1,018 using non-peak electric, and about £1,053 using oil<sup>8</sup>. This would enable households to spend less on energy bills and more on other household necessities.

#### *Environment*

1.8. The choice of fuel used for heating can have significant environmental impacts; domestic households are responsible for about 27 per cent<sup>9</sup> of the UK's carbon dioxide emissions (CO<sub>2</sub>). The use of gas has environmental benefits in terms of a reduction in emissions of carbon over other fossil fuels. The use of coal and oil emits more CO<sub>2</sub> per unit of delivered energy in comparison to gas, and the use of electricity is likely to lead to higher CO<sub>2</sub> emissions than gas for heating because of the lower efficiencies in generation. Table A14.1 presents emission factors for each of gas, electricity, oil, coal and Liquefied Petroleum Gas (LPG).

**Table A14.1 - Emission factors**

Fuel type	Carbon dioxide factor (kgCO <sub>2</sub> /kWh)
Gas	0.19
Electricity	0.43
Oil	0.25
Coal	0.32
LPG	0.214

Source: DEFRA Guidelines for Company Reporting on Greenhouse Gas Emissions, July 2005

1.9. The use of gas also reduces emissions of other pollutants when compared to other domestic fuels. The burning of coal and oil fuels produces SO<sub>2</sub> emissions and

<sup>7</sup> There are two definitions – one includes Housing Benefit and Income Support for Mortgage Interest and one excluding these.

<sup>8</sup> These figures are based on data from the Department of Trade & Industry as at March 2007.

<sup>9</sup> Carbon emissions by end user 1970-2004, Digest of Environmental Statistics – DEFRA 2007

emits a high level of particles (PM10) due to their sulphur content. The emissions of both of these pollutants are close to zero from the use of natural gas.

1.10. Although there are alternative forms of energy, such as microgeneration, that may produce more (social and environmental) benefits than gas, they may only become economic the farther a household or community is from the relevant gas main. These alternative forms of energy have not been considered further in our analysis below.

### **Consumer costs associated with network extensions**

1.11. There are two main consumer costs associated with network extensions:

- up front connection costs – these mainly include infrastructure costs such as installing pipelines, mains and services to connect to the existing gas network; and
- 'in house works' costs – these are additional costs necessary to make use of a new gas connection such as installing gas central heating, insulating, and buying gas appliances.

1.12. Connection costs can be prohibitive especially for those communities that are far from the existing network. In our analysis, as shown below, we have calculated connection costs under the options to facilitate network extensions based on a notional community. Under the status quo, or "do nothing" option, our results reveal that these costs are unaffordable to the fuel poor as they can range between about £3,000 to £6,000 per customer, depending on the uptake rate.

1.13. 'In house works' costs can also be large; however there are a number of Government initiatives that can contribute towards these costs. Some of these are discussed in the next section. Where there are a high proportion of households living in social housing, a mixture of landlord contributions and grants for 'in-house works' costs can potentially meet these costs.

### **Government initiatives to address fuel poverty**

1.14. There are several government programmes that provide funding to either tackle fuel poverty or promote environmentally efficient measures. These initiatives tend to focus on specific regions and require coordination. Often non-gas communities – especially those in fuel poverty – do not have the resources to coordinate the different government funding schemes that may apply to them. There is the added complication that some fuel poor households may not even be eligible for schemes which can meet or contribute to additional costs.

1.15. The Design & Demonstration Unit<sup>10</sup> (DDU) has developed a spreadsheet that models the existing funding packages available to non-gas communities. DDU has

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<sup>10</sup> The DDU is a small industry-led team presently on secondment from National Grid to the DTI. The unit facilitates and coordinates gas network extensions.

managed pilot projects in which they identified communities that meet the eligibility criteria for a number of programmes. As a result, the pilot project communities have been able to connect to the network at substantially reduced or no cost. DDU expects that these pilot projects will provide a template for future network extension projects in deprived areas.

1.16. Specific Government programmes include benefit provisions such as Pension Credit and the Winter Fuel Payment as well as a number of schemes including Warm Front (England), Central Heating Programme, & Warm Deal (Scotland), Home Energy Efficiency Scheme (Wales), Warm Homes (Northern Ireland), Decent Homes Standard, Energy Efficiency Commitment (EEC) allowances, Community Energy, and Warm Zones Limited (WZL). There are also wider avenues of assistance available linked to regeneration programmes such as European grants, neighbourhood renewal funding, and funding from regional development agencies.

## Options

### Option 1 - No regulatory intervention

1.17. This option consists of “doing nothing” as better targeting and co-ordinating of existing government funding may be the solution rather than regulatory intervention.

### Option 3 - Implement an incentive scheme

1.18. There are two options for the form of the incentive scheme:

- option 3a – discretionary reward scheme introduced as part of DPCR4 for electricity Distribution Network Operators (DNOs). This scheme would reward the performance of companies that best serve the interests of consumers across chosen categories throughout the year, including a network extensions dimension; or
- option 3b – specifically link funding to an output measure, for example, based on the number of fuel poor connected to the gas network.

1.19. The intent of option 3 is to incentivise GDNs to find ways to increase the affordability of network extensions (i.e. ‘in house works’ costs). We envisage that GDNs would achieve this by making resources available for the coordination of existing sources of government funding, such as those aimed at tackling fuel poverty and regeneration. GDNs could either develop an in-house coordination operation or outsource the work, for example, to one of the DDU’s community interest companies.

1.20. Please note that this IA seeks to determine whether or not we should implement an incentive scheme, not which of the two forms we should adopt. In the IA, we assume the two incentive forms create the same effect.

**Option 5 – Treat income from network extensions that tackle fuel poverty as excluded revenue (as proposed by WWU)**

1.21. Under this option, GDNs would charge customers in eligible communities in accordance with their schedule of standard connection charges<sup>11</sup>. Under the current arrangements, non-gas communities are not eligible for these rates because they are located more than 23 metres from a relevant gas main. Specific criteria would need to be developed to determine eligibility.

1.22. In carrying out the network extension, GDNs would incur costs that are higher than the value of the standard connection charges paid by infill customers. To recover these costs, GDNs would be permitted to hold transportation charges received from infill consumers in a separate accounting pot. After an agreed period, income from infill consumers would be treated as usual under the price control.

1.23. This arrangement would be given effect through the price control licence conditions and the GDNs' accounting processes. It would be invisible to both suppliers and end-use customers.

1.24. Rather than constraining the GDNs to charge the standard connection charge, a more flexible approach could be for the GDNs to charge customers a level they deem appropriate based on the specific community. In this way, they could charge customers an amount that is lower than the standard connection charge if it is economic to do so as customers may not be able to pay the standard connection charge.

**Option 6 – Amend the Economic Test for network extensions that tackle fuel poverty (as proposed by NGG)**

1.25. This option involves an amendment to the Economic Test (ET) when it is applied to infill projects to fuel poor communities. Again, specific criteria would need to be developed to determine eligibility.

1.26. Under the current arrangements, the ET identifies whether a customer should pay a contribution towards network reinforcement, if required, for a new connection. It compares the marginal cost of reinforcement with the future transportation income generated by the new load over an appraisal period of 45 years for loads with an annual consumption of 58.6GWh or less and 25 years for larger loads. If the marginal cost of reinforcement is greater than the anticipated transportation income, the ET is not met, and the customer requesting the connection has to provide a capital contribution to cover the shortfall if they wish to proceed with the connection. Conversely, if the expected transportation revenue exceeds the cost of reinforcement then the GDN funds the work and the costs are recovered from all customers via

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<sup>11</sup> The standard connection charge varies a lot depending on the region and whether it includes or excludes excavation and reinstatement or whether there is no excavation on private land. It can vary from £226 to £1591 (exclusive of VAT).

transportation charges. None of the excess transportation revenue expected from the new connection is used to reduce the connection charge to the customer in this case.

1.27. Under option 6, GDNs would propose to use a special version of the ET in relation to network extensions to fuel poor communities. When applying the amended ET, the GDN would compare all of the connection costs associated with a network extension, not just reinforcement costs but also new infrastructure (i.e. mains and services) costs, to the future transportation income that will be generated by the new load. When reinforcement is not necessary, only the infrastructure costs will be compared to the future transportation income. Funding would then be made available to the point where the connection cost of the infill equals the future transportation income generated from the consumer. Any excess over the future transportation costs (that is not met by government programmes) would be provided by the infill consumer.

1.28. Whereas option 3 has the potential to reduce the 'in house works' costs identified in paragraph 1.11, options 5 and 6 are directed towards reducing up front connections charges. As a result, we could implement option 3 as a complement to either option 5 or 6, which was our early view in the initial impact assessment published as part of the GDPCR third consultation document.

## Competition assessment

### Connections market

1.29. In addition to GDNs, there are other parties in the connections market that can provide network extensions such as Independent Gas Transporters (IGTs) and Independent Connections Parties (ICPs). It is important that any proposals ensure, as much as possible, a level playing field for all parties.

1.30. Option 1 involves no change in the level of competition in the connections market.

1.31. When competing against other parties, option 3 may provide GDNs a competitive advantage as they may be able to use the reward to offset some of the costs associated with coordinating. However, under option 3a, we do not consider that this would be material as the reward is not designed to cover costs.

1.32. At present, when an IGT carries out a network extension, both the IGT and the GDN receive the benefit of a future revenue stream, because:

- the IGT receives a share of the transportation charges; and
- the GDN receives the remaining share, i.e. the Connected System Entry Point (CSEP) charges.

1.33. When a GDN carries out a network extension, the GDN receives both sources of revenue (i.e. all of the transportation charges). In both options 5 and 6, the GDNs

would need to consider arrangements to ensure parties interested in network extensions are not disadvantaged.

## **Impacts, costs & benefits**

### **Environment**

1.34. As discussed in paragraphs 1.8 to 1.9, gas has environmental benefits over other fossil fuels. As such, options 3, 5, and 6 could make a positive contribution to the environment since network extensions would replace electricity, oil or coal with gas in non-gas communities. The level of environmental benefits associated with each of these options depends on how effective they are in generating network extension activity. This issue is explored in the cost and benefits section below.

1.35. As discussed in paragraph 1.10, alternative and renewable forms of energy may likely create more environmental benefits than gas but they would only be more economic to implement in communities far from the existing gas main.

### **Health & safety issues**

1.36. A case can be made for better health associated with gas heating compared to its conventional alternatives. Options 3, 5, and 6 contribute to better health insofar as they promote network extensions.

1.37. Further, as gas is a cheaper form of energy than its alternatives for heating and cooking, less money would be spent on heating bills. As a result, more money can be used for other household requirements such as medical needs.

### **Distributional effects**

1.38. Options 3, 5, and 6 would affect the fuel poor positively as they target infill projects that tackle fuel poverty. On the downside, however, option 3 may consist of existing consumers, to a small degree, cross subsidising a class of newly connected consumers because the funding for the incentive scheme will come from all customers of 'that' GDN.

### **Risks & unintended consequences**

1.39. The risk associated with option 1 is that there is no coordination of government schemes and GDNs are not incentivised to carry out network extensions. Thus a potential social and/or environmental benefit is not achieved.

1.40. Under option 3, on the one hand, there is a risk that if the incentive scheme is too generous then customers could bear costs that exceed the benefits associated with the additional network extensions. On the other hand, if the incentive scheme is not generous enough then it may be ineffective in promoting network extensions.

1.41. Under option 5, customers will be charged a standard connection charge. A risk with this is if this charge is unaffordable to fuel poor communities.

1.42. Further under option 5, network extensions will be an excluded activity. Thus any loss (e.g. if the value of the standard connection charges plus the balance of the separate accounting pot do not cover costs or if newly connected customers do not pay transportation charges, for instance, if the in-house works are delayed) cannot be borne by existing customers, rather they will be held neutral. GDNs may not be willing to carry this risk so option 5 may be ineffective in promoting network extensions.

1.43. A risk associated with option 6 is that it may be ineffective if the amended ET contribution is too small to make network extensions affordable for fuel poor customers.

1.44. Another risk with option 6 is that, in some circumstances, it could lead to existing customers cross subsidising new ones. This could occur either if any newly connected customers do not pay transportation charges (for instance, if the in-house works are delayed) or if the actual uptake rate is less than the one assumed when calculating the amended ET contribution. In the case of the latter, the amended ET contribution depends on the uptake rate. The total infrastructure costs plus any reinforcement costs are compared to the future revenue stream from transportation charges. This revenue depends on how many customers the GDN will connect in a community, i.e. the uptake rate, which the GDN will have to assume when applying the test. Consequently, it is possible (at the margin) that option 6 will result in some cross-subsidy for some projects.

1.45. Finally, an unintended consequence associated with options 5 and 6 is that those households that do not connect as part of an infill project may become eligible after 20 years<sup>12</sup> to receive free of charge the first 10 metres of pipe under the 10 metre rule<sup>13</sup>.

### Other impacts

1.46. Consistent with Cabinet Office guidelines, in preparing this impact assessment we have considered the impact of each option on:

- security of supply; and
- small businesses.

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<sup>12</sup> The charging arrangements for infills are specified in the Gas (Connection Charges) Regulations: <http://www.opsi.gov.uk/si/si2001/20013267.htm>, which were amended to 20 years (2002): [http://www.opsi.gov.uk/si/si2002/uksi\\_20021488\\_en.pdf](http://www.opsi.gov.uk/si/si2002/uksi_20021488_en.pdf).

<sup>13</sup> GT Standard Licence Condition (SLC) 4B(1) obliges any GT that makes a connection to domestic premises under section 10(2)(a) of the Gas Act (as amended) to supply and lay free of charge the first 10 metres of pipe which is in land that is not owned and occupied by the customer. Section 10(2) (a) applies to premises which are within 23 metres of a relevant gas main and GTSLC4B (1) applies to premises at which a supply is taken wholly or mainly for domestic purposes. The cost of this allowance is recovered through GTs' transportation charges levied on all customers.

1.47. With the possible exception of small businesses, we do not expect any of the options considered to have an impact on these issues. Some IGTs could fall within the definition of a small business. We will be careful to consider the impact of each option on competition in the connections market, as discussed in paragraphs 1.29 to 1.33.

### **Analysis**

1.48. There are two parts to our analysis. The first calculates the connection cost per infill customer (CCPC) under each of options 1, 5, 6 with and without option 3. Using these estimates, we assess customer affordability using some judgement. This will help us determine which option(s) will likely deliver network extension activity. The second part considers various costs and benefits including:

- social and environmental benefits;
- costs borne by existing consumers; and
- implementation costs.

#### *Connection charge per infill customer and level of network extensions*

1.49. Within non-gas communities, a large proportion of households are fuel poor. Under option 1 (i.e. do nothing), the connection charge per infill consumer (CCPIC) is unaffordable to many fuel poor communities, and hence few network extensions are carried out.

1.50. In our analysis, we have primarily used data given to us by the DTI which is based on the work of the DDU.

1.51. To calculate the CCPCs under each option, we have used a notional community which is based on the following assumptions:

- 200 households;
- all households have 3 bedrooms and are semi-detached;
- all households are within 2 kilometres of a relevant main;
- 10 per cent of households use solid fuel, 35 per cent use oil and 55 per cent use electricity (of which half are on peak and the other half are on off-peak);
- 50 per cent of households are fuel poor; and
- no reinforcement is required.

1.52. Please note that in our analysis we have not taken into account any geological or manmade features that may influence costs. The notional community that we have used represents a typical fuel poor non-gas community.

1.53. We have assessed the CCPCs based on options 1, 5 and 6 with and without option 3. To estimate the effect of option 3, we have varied the uptake rate that is used to calculate the CCPCs. In the absence of option 3, we have used uptake rates of 20, 33 and 50 per cent. When an option is being applied in combination with

option 3, we have assumed uptake rates of 67, 85 and 100 per cent. These assumptions are based on historical experience of uptake rates with and without the involvement of the DDU. According to the DDU, their work of coordinating infill projects and obtaining government funding has the effect of doubling the uptake rate of a project. Although these ranges are not precise they serve as a basis to provide an idea of the impact of uptake rates on connection charges.

1.54. We note that the combination of option 1 and option 3 is equivalent to applying option 3 as a stand alone option.

1.55. We have calculated the CCPC based on option 1 with and without option 3 using total costs incurred by the GDN (including fixed and variable costs<sup>14</sup>) and assuming a range of uptake rates (as discussed in paragraph 1.53). We have calculated the CCPC based on option 5 with and without option 3 using a figure within the range of GDNs' standard connection charges (i.e. £500) and assuming a range of uptake rates. Finally we have calculated the CCPC based on option 6 with and without option 3 using total costs incurred by the GDN (including fixed and variable costs), using the amended Economic Test (ET) contribution made by the GDN, and assuming a range of uptake rates.

1.56. To calculate the amended ET contribution under option 6, we have made the following assumptions:

- cost of capital is 6.25 per cent<sup>15</sup>;
- £100 per annum of GDN transportation charges and a 45-year<sup>16</sup> appraisal period; and
- no operating costs.

1.57. Table A14.2 sets out the CCPCs under options 1, 5 & 6 and Table A14.3 sets out the CCPCs under options 1 & 3, 3 & 5 and 3 & 6. In addition, the tables show the surplus/deficit that a GDN could make under options 5 and 6 with and without option 3. Please note that in calculating the present value of the transportation revenue we have used the same assumptions as set out in paragraph 1.56.

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<sup>14</sup> Fixed costs include feeder & local distribution mains, network design and management. Variable costs include service mains & meters, assessments and surveys.

<sup>15</sup> This figure is used as part of the Economic Test.

<sup>16</sup> This figure is used as part of the Economic Test.

**Table A14.2 – Connection charger per infill customer under options 1, 5 & 6, (2005-06 prices)**

<b>Option 1</b>			
	<b>20%</b>	<b>33%</b>	<b>50%</b>
Uptake rate			
Fixed costs	£217,281	£217,281	£217,281
Variable costs	£28,530	£47,074	£71,325
Total costs incurred	£245,811	£264,355	£288,606
<b>CCPC</b>	<b>£6,145</b>	<b>£4,005</b>	<b>£2,886</b>
PV of transportation revenue	£59,818	£98,700	£149,545
<b>Option 5</b>			
	<b>20%</b>	<b>33%</b>	<b>50%</b>
Uptake rate			
<b>CCPC</b> (ave GDN std connection charge)	<b>£500</b>	<b>£500</b>	<b>£500</b>
Total CCPCs received	£20,000	£33,000	£50,000
Fixed costs	£217,281	£217,281	£217,281
Variable costs	£20,028	£33,046	£50,069
Total costs incurred	£237,309	£250,327	£267,350
PV of transportation revenue	£59,818	£98,700	£149,545
<b>Surplus</b>	<b>-£157,491</b>	<b>-£118,627</b>	<b>-£67,805</b>
<b>Option 6</b>			
	<b>20%</b>	<b>33%</b>	<b>50%</b>
Uptake rate			
Fixed costs	£217,281	£217,281	£217,281
Variable costs	£20,028	£33,046	£50,069
Total costs incurred	£237,309	£250,327	£267,350
PV of transportation revenue (= amended Economic Test contribution)	£56,510	£93,242	£141,275
<b>CCPC</b>	<b>£4,520</b>	<b>£2,380</b>	<b>£1,261</b>
Total CCPCs received	£180,799	£157,085	£126,075
<b>Surplus</b>	<b>£0</b>	<b>£0</b>	<b>£0</b>

**Table A14.3 – Connection charge per infill customers under options 1 & 3, 3 & 5, and 3 & 6, (2005-06 prices)**

<b>Option 1 &amp; 3</b>			
	<b>67%</b>	<b>85%</b>	<b>100%</b>
Uptake rate			
Fixed costs	£217,281	£217,281	£217,281
Variable costs	£67,093	£85,117	£100,138
Total costs incurred	£284,374	£302,398	£317,419
<b>CCPC</b>	<b>£2,122</b>	<b>£1,779</b>	<b>£1,587</b>
PV of transportation revenue	£200,391	£254,227	£299,090
<b>Option 3 &amp; 5</b>			
	<b>67%</b>	<b>85%</b>	<b>100%</b>
Uptake rate			
<b>CCPC</b> (ave GDN std connection charge)	<b>£500</b>	<b>£500</b>	<b>£500</b>
Total CCPCs received	£67,000	£85,000	£100,000
Fixed costs	£217,281	£217,281	£217,281
Variable costs	£67,093	£85,117	£100,138
Total costs incurred	£284,374	£302,398	£317,419
PV of transportation revenue	£200,391	£254,227	£299,090
<b>Surplus</b>	<b>-£16,983</b>	<b>£36,828</b>	<b>£81,671</b>
<b>Option 3 &amp; 6</b>			
	<b>67%</b>	<b>85%</b>	<b>100%</b>
Uptake rate			
Fixed costs	£217,281	£217,281	£217,281
Variable costs	£67,093	£85,117	£100,138
Total costs incurred	£284,374	£302,398	£317,419
PV of transportation revenue (= amended Economic Test contribution)	£189,309	£240,168	£282,551
<b>CCPC</b>	<b>£709</b>	<b>£366</b>	<b>£174</b>
Total CCPCs received	£95,065	£62,230	£34,869
<b>Surplus</b>	<b>£0</b>	<b>£0</b>	<b>£0</b>

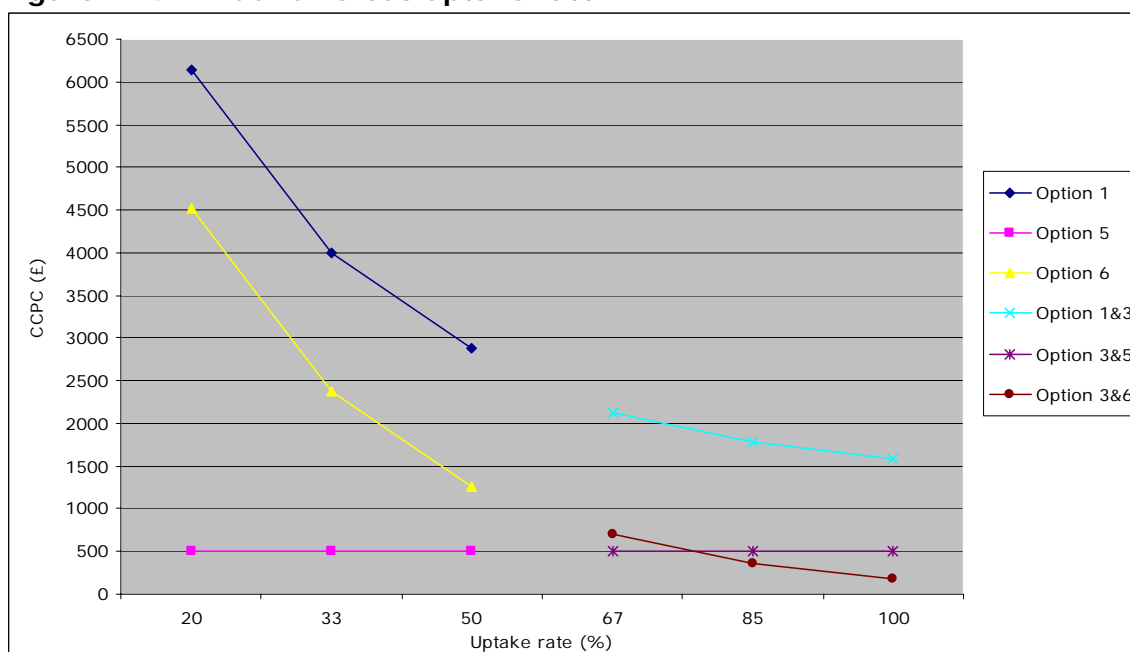
1.58. The tables show that under option 1 with and without option 3, the CCPCs are considerably higher than under all other options. This is likely to severely limit the network extensions to fuel poor communities that take place.

1.59. Under option 5 alone, if the GDN charges a standard connection charge, its net position is negative but starts to improve when option 3 is added to it. Under option 6, the GDN's net position remains neutral with and without option 3 and at all uptake rates, as it charges an amount that ensures this, subject to the actual uptake rate being the same as the one assumed.

1.60. If under option 5, the GDN is allowed to charge customers an amount it deems appropriate, this option may be similar to option 6 on appearance. However, the key difference is that the risk will still lie with the GDN under option 5 as network extensions will be an excluded activity. Consequently, a GDN may be unlikely to carry out any extensions as the risk may be too high compared to the reward.

1.61. Figure A14.1 below sets out the CCPCs calculated under the various options and uptake rates. In order to consider the impact of each of the options, we need to assess customer affordability. We consider that an affordability threshold of less than £500 for fuel poor non-gas communities is reasonable. Based on our analysis, option 3 & 6 (at the 85 per cent and 100 per cent uptake rates) achieves this while leaving GDNs at a break-even net position. If GDNs were given the flexibility to charge a reasonable amount under option 5, instead of their standard connection charge, this may result in lower CCPCs, but we do not consider that many network extensions will be delivered due to the risk. As such, option 3 & 6 still appears to be the best option based on our analysis on CCPCs.

**Figure A14.1 – CCPC versus uptake rate**



#### *Costs and benefits*

1.62. This section focuses on assessing the costs and benefits of options 3 & 5 and 3 & 6 compared to option 1 or "doing nothing", because adding option 3 makes it more likely that the options result in CCPCs that meet a more reasonable affordability threshold, as illustrated in Figure A14.1, while leaving GDNs at a breakeven or positive net position. However, option 1 & 3 still results in unaffordable CCPCs.

#### a) Social and environmental benefits likely to be delivered

1.63. To calculate the social benefits, we estimated the cost savings from using gas rather than one of its alternatives, applying the assumed fuel mix as discussed in paragraph 1.51<sup>17</sup>. To calculate the environmental benefits, we used the (monetised)

<sup>17</sup> These figures are based on data from the DTI .

reduction in emissions from using gas rather than one of its alternatives, applying the assumed fuel mix as discussed in paragraph 1.51<sup>18</sup>.

1.64. Table A14.4 presents the social and environmental benefits under option 3&5 and 3&6 as compared to option 1 or "do nothing". Under option 1, the social and environmental benefits are £0. On a per customer basis, the benefits are identical under options 3&5 and 3&6 at all uptake rates. On a total community-wide basis, the benefits are identical under options 3&5 and 3&6 but vary depending on the uptake rate examined. The table also sets out the present value of the total benefits over a 10 year asset life of a gas boiler. Again, these are identical under the options but vary depending on the uptake rate.

**Table A14.4 - Community and per customer social and environmental benefits per annum of options 3 & 5 and 3 & 6, (2005-06 prices)**

	Option 3 & 5			Option 3 & 6		
	67%	85%	100%	67%	85%	100%
<i>Social benefits:</i>						
Total social benefit	£50,569	£64,155	£75,477	£50,569	£64,155	£75,477
Ave. per customer social benefit	£377	£377	£377	£377	£377	£377
<i>Environmental benefits:</i>						
Total environmental benefit	£37,498	£47,572	£55,967	£37,498	£47,572	£55,967
Ave. per customer environmental benefit	£280	£280	£280	£280	£280	£280
Total benefits per annum	£88,068	£111,727	£131,444	£88,068	£111,727	£131,444
Total per customer benefits per annum	£657	£657	£657	£657	£657	£657
PV of per customer benefits per annum over 10 year asset life of gas boiler	£4,780	£4,780	£4,780	£4,780	£4,780	£4,780
PV of total benefits over 10 year asset life of gas boiler	£640,576	£812,671	£956,083	£640,576	£812,671	£956,083

#### b) Costs borne by existing consumers

1.65. Option 3 involves costs being borne by existing consumers. The level of these costs depends on the design of the incentive scheme.

1.66. In chapter 7 of the main document, we said that the discretionary reward scheme will have a total annual reward of £4 million available across all the GDNs (£20 million across the price control period). For the purposes of this impact assessment, we assume there is an equal split across the three categories (including initiatives to facilitate network extensions). Again, for the purposes of this impact

<sup>18</sup> Environmental costs under gas, electricity, oil and solid fuel were estimated by the DTI using the approach recommended by the European Commission's ExternE Project (Externalities of Energy).

assessment, costs borne by existing customers if option 3 is implemented will be equivalent to about £1.3 million per year or about £6.5 million over the price control period across all GDNs.

1.67. In theory, options 5 and 6 do not impose any costs on existing customers. As discussed in paragraph 1.42 and 1.44, option 6 carries a risk of cross subsidy.

#### c) Implementation costs

1.68. Under options 3, 5 and 6, there may be some implementation costs. These are expected to be minimal so we have not attempted to quantify them.

#### Scaling up our analysis

1.69. Of the 4,654 non-gas communities living within 2 kilometres of an existing gas main, about 2,000 can be considered fuel poor<sup>19</sup> which represent roughly 220,000 households.

1.70. Using the £657 total per customer benefits per annum in Table A14.4 suggests that each of the eight GDNs will have to connect about 247 non-gas households<sup>20</sup> so that costs equal benefits (i.e. total social and environmental cost savings). This represents a minimum of about 9,880 non-gas households being connected by the GDNs over the five year price control period. This analysis only considers the costs associated with option 3.

## Conclusion

1.71. Table A14.5 below summarises the impacts of options 3 & 5 and 3 & 6 relative to option 1 or "do nothing" from the perspective of the consumer.

1.72. Based on the results of this impact assessment, our initial proposal to facilitate network extensions is option 6 complemented by option 3. On balance, we consider that this has the potential to bring benefits to consumers over the price control period.

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<sup>19</sup> Based on the Government's Index of Multiple Deprivation score of 20 and greater.

<sup>20</sup> (£1.3 million / 8 GDNs) / £657

**Table A14.5 – Consumer impacts of options 3 & 5 and 3 & 6 relative to option 1 or “doing nothing”**

Category	Option 3 & 5		Option 3 & 6	
	Impact	✓, * or -	Impact	✓, * or -
CCPC	Significantly lower.	✓	Significantly lower. Also lower than option 3 & 5 when uptake rate is 85% and above.	✓✓
Level of network extensions	Higher but likely to be limited as GDNs bear risk of any loss.	✓	Higher than option 1 and option 3 & 5 as GDNs don't bear risk of any loss.	✓✓
Social & environmental benefits	PV of per customer benefits over 10 year asset life of gas boiler is £4,780.	✓	PV of per customer benefits over 10 year asset life of gas boiler is £4,780.	✓
Costs borne by existing customers	Maximum £6.5m over 5 year price control period.	*	Maximum £6.5m over 5 year price control period.  May be some cross-subsidy either if actual uptake rate is less than assumed or if any newly connected customers don't pay transportation charges.	*  *
Overall impact		✓✓		✓✓✓

## Appendix 15 – Final impact assessment on the funding of xoserve

### Objectives

1.1. The objective of this IA is to assess the appropriate funding mechanism for the continued operation of the transporter agency for the price control period 2008-13.

### Background

1.2. An important aspect of the industry restructuring that occurred as part of the GDN sales was the establishment of a transporter agency (known as 'xoserve') which provides a single, uniform interface between the IT systems of relevant gas transporters (GTs) and shippers. xoserve is responsible for a variety of functions such as invoicing shippers for use of the transportation system and managing the change of supplier process. As such, its services are crucial to both the operations of its owners (the GDNs and NGG NTS) and competition in the gas supply market.

1.3. At the time of GDN sales it was recognised that there were alternative funding models to xoserve and as part of this price control review we are considering an alternative approach. The initial impact assessment in November 2006 made a qualitative assessment of the costs and benefits associated with moving to a set of arrangements whereby receives part of its funding through a user pays mechanism.

### Key issues

1.4. We consider that the key issues associated with the funding of xoserve and on which the options should be assessed are:

- *cost efficiency* - the funding arrangements should establish incentives for GTs, through xoserve, to incur only efficient costs. In addition, parties that influence the costs incurred by xoserve (such as shippers) should have incentives to limit the costs they impose;
- *responsiveness* - the funding arrangements should establish incentives for GTs, through xoserve, to provide services that customers want and are willing to pay for;
- *promoting competition* - the funding arrangements should support competition in the gas supply market;
- *xoserve service standards* - the arrangements should ensure that cost savings are not achieved at the expense of quality; and
- *simplicity* - the funding arrangements should not be unduly complex or costly to administer.

## Options

1.5. The two options for the funding of xoserve are:

- option 1 – do nothing; and
- option 2 – core services plus user pays.

1.6. These options are described in chapter 8 of the main document. In practice option 1 is the status quo describing the approach used to set an efficient level of costs as part of the price control and the assessment will be made by considering the impacts of implementing option 2 as compared with option 1.

## Competition Assessment

1.7. It is likely that option 2 will have an impact on shippers in a number of ways:

- it will better reflect the costs of service lines that individual shippers utilise, which in some cases may increase the total costs of the existing service while in other cases this will reduce costs to individual shippers. This effect is expected to have a limited effect on competition due to the extent that existing services have been categorised as user pays;
- in the same way, for some shippers there may be an increase in administration costs to check and process separate invoices associated with user pays; and
- option 2 will provide a more explicit and transparent opportunity for shippers to seek additional services or change the specification of existing services, for instance asking for a higher standard of service. This is likely to benefit competition by enabling shippers to differentiate or develop their service offering.

## Impacts, costs and benefits

### Environment

1.8. It is unlikely that option 2 will have a material impact on the environment. To the extent that charges for user pays services in any way reflect environmental costs, option 2 will have a marginal positive impact on the environment.

### Security of Supply

1.9. It is not considered that option 2 will impact on the security of supply of the network.

**Health and safety Issues**

1.10. It is considered that the effects of option 2 are not significant to health and safety.

**Distributional effects**

1.11. A charging methodology will be required to set down the basis for calculating the charges for user pays services and until such time that this has been developed the impact on parties will not be known in detail.

1.12. The largest impact is likely to be on shippers who are currently and will initially utilise the user pays service lines. These services will now be charged at cost and no longer bundled into the gas transportation charge. While some shippers will see an increase in their total charges for the activities undertaken by xoserve, others will see a reduction. At this time it is not clear whether these shippers form a particular segment of the supply market. Initially these changes will be relatively small due to the limited scale of the service lines identified as user pays.

**Small businesses**

1.13. None of the GDNs are small businesses and it is not expected that small business customers will be affected disproportionately from option 2. However, to the extent that different shipper groups, such as I&C shippers, utilise different xoserve services then they will be affected to a different extent by option 2. With the limited categorisation of existing services to user pays this is not considered to be significant. With time there may become greater differences in the costs and services utilised by different types of shipper. In any event these differences would be driven by underlying costs of the service.

**Risks and unintended consequences**

1.14. In responses to consultation and also through the industry dialogue, parties have raised some concern that option 2 could create some unintended consequences. For instance, by placing incentives on xoserve to generate additional income from certain service lines, they may change their behaviour to encourage greater use of these service lines by providing a poor quality of service through core services. Also shippers may reduce their reliance on a particular service to reduce cost but this could lead to other consequences such as downstream data issues not getting resolved. It will be important that robust and transparent governance and contractual arrangements are in place to minimise these risks.

## Costs and benefits

### *Costs*

1.15. We informally asked the industry dialogue group for their views on the likely potential costs arising to them from implementing option 2 (as compared to option 1) so as to improve the quality of our impact assessment. We had views provided by one shipper, two network companies, and xoserve.

1.16. Subject to the governance arrangements developed xoserve could manage the whole user pays arrangements and invoice shippers in the GDNs name as they do now. Alternatively they could invoice directly. Under either approach they considered that there would be set up costs in the order of £50k while annual running costs could be up to £75k. The two network companies did not consider that they would incur any significant cost other than that incurred by xoserve. Lastly, the shipper considered that costs would be incurred in processing and validating invoices but that this would be low not exceed 5 per cent of the value of the invoice.

1.17. Based on the proposed user pays service lines it is considered that the costs of option 2 to the industry to operate on an annual basis are unlikely to exceed £100k pa. The costs to set up are considered to be in the order of £50-100k recognising shippers, GDNs and other industry parties will need to establish governance arrangements during the course of this year which are not factored into xoserve's estimated cost.

### *Benefits*

1.18. Option 1 requires xoserve's costs (via the GDNs) to be reviewed and an efficient level of cost to be determined based on like for like replacement of UK link which is planned for the end of the price control period.

1.19. Once shippers are exposed to the true costs of a range of services through option 2 they may amend their behaviour which could impact on capacity restrictions or scope of the required systems influencing replacement plans. The expected like for like replacement cost of UK link is in the order of £70 million and therefore even marginal changes to scope of the system due to changes in user pays service lines may save significant costs to the industry and ultimately consumers.

1.20. The proposed initial scope of user pays services are relatively limited (in the order of 5-10 per cent of revenues) but using revenues as a proxy for replacement costs a 10 per cent reduction in demand for these existing user-pays services could reduce costs by up to £700k.

1.21. In addition, option 2 encourages GDNs to be more flexible and customer-focused and seek out opportunities which can be derived from their systems. It is expected that both shippers and xoserve will work together to identify new or enhanced services utilising xoserve's systems over the price control period and a user pays approach may provide the opportunity to better design the UK link replacement leading to a reduction in xoserve's costs in the medium term or

potentially getting an improved output or performance for the same cost. In addition new service lines will share some of xoserve's overheads which in turn will reduce costs to all shippers in the medium term.

1.22. These new services or enhanced existing services will benefit shippers and allow them to differentiate their products and services to customers. This is likely to facilitate greater innovation in the competitive supply market.

1.23. Although it is difficult to quantify this cost benefit, the user pays funding arrangements will have been in operation for 2 to 3 years before the scope and scale of the UK link replacement project is determined. At the very least user pays will provide the opportunity to xoserve and industry to be better informed in determining the scope and scale of the UK link replacement even if the shorter term benefits are small in scale.

1.24. We also consider that xoserve is likely to be more responsive to customer demands under a user pays approach as they would no longer be revenue limited. We do not think that option 2 will have a significant impact on quality of service of existing service lines.

## Conclusion

1.25. Our initial proposal is to implement option 2 as the basis for funding xoserve costs. On balance we consider that this has the potential to bring benefits to consumers over the price control period.

## Appendix 16 – Final impact assessment on quality of service

### Objectives

1.1. Our key objective is to review the quality of service and outputs framework to ensure that it provides an appropriate level of protection to consumers. As price controls provide strong incentives for GDNs to reduce costs there is a risk that they may achieve this by reducing quality of service. The quality of service arrangements provide an important counterbalance to this.

1.2. The objective contributes to the following Ofgem duties:

- Protecting the interests of consumers, present and future,
- The need to secure that, so far as it is economical to meet them, all reasonable demands in Great Britain for gas conveyed through pipes are met,
- The need to secure that licence holders are able to finance the activities which are the subject of obligations on them,
- Protecting the interests of individuals who are disabled or chronically sick, of pensionable age, with low incomes, or residing in rural areas,
- Promoting efficiency and economy of GDNs and the efficient use of gas conveyed through pipes,
- Protecting the public from dangers arising from the conveyance of gas through pipes or the use of gas conveyed through pipes,
- Contributing to the achievement of sustainable development, and
- Considering the effect on the environment of activities connected with the conveyance of gas through pipes.

### Key issues

1.3. We are seeking to ensure that the proposed changes to the quality of service and outputs arrangements for GDNs:

- Provide appropriate levels of protection for all consumers taking into account consumers' expectations,
- Provide sufficiently strong incentives to GDNs to drive improvements in their performance,
- Take account of the level of risk exposure for the GDNs,
- Cover areas of service valued by consumers and key areas of GDN performance,
- Provide a clear indication of GDNs' performance over time and comparatively across the different networks / companies,
- Improve the accuracy and reliability of data recorded and reported by GDNs, and
- Address any gaps in the existing arrangements.

## Options

1.4. This impact assessment considers two options for the quality of service and outputs arrangements for 2008-13:

- option 1 - do nothing, the existing arrangements are maintained; and
- option 2 - rationalising and updating the outputs and standards of performance arrangements and improving measurement.

### **Option 1 - Do nothing, the existing arrangements are maintained**

1.5. Under this option, we would maintain the existing standards of performance and outputs arrangements.

### **Option 2 - Rationalising and updating the outputs and standards of performance arrangements and improving measurement**

1.6. At present there are a number of different standards of performance and regulatory outputs in place which apply to the GDNs and are given effect through various different frameworks. In a number of cases the quality of the data recorded and reported by the GDNs is poor. Under this option we would revise these arrangements to ensure they cover areas of service valued by consumers and key areas of GDN performance. We would also rationalise the number of frameworks used which would have the benefit of simplifying the arrangements.

1.7. Under option 2 the outputs and quality of service arrangements would consist of guaranteed standards of performance and average measures of performance under licence conditions, including a balanced score card. Similar to DPCR4 we are proposing to remove the overall standards of performance and replace them where appropriate with performance measures under licence conditions or guaranteed standards. Further details on the changes proposed under option 2 are set out in chapter 5.

## Competition assessment

### **Supply and wholesale markets**

1.8. While option 2 proposes amendments to the levels and means of protection for consumers, neither option would have any effect on competition in the supply or wholesale market as they provide the same level of protection to consumers regardless of their shipper or supplier.

### **Comparative competition between GDNs**

1.9. An element of comparative competition already exists under the 'do nothing' option as energywatch publishes comparative performance data from the GDNs against the standards of performance. GDNs' performance against other quality of service and outputs arrangements is published by Ofgem in the annual Gas Distribution Quality of Service report. However, as mentioned above, the accuracy

and reliability of the data provided by the GDNs is poor for a number of these standards and for the interruptions arrangements.

1.10. The changes proposed under option 2 should improve the robustness of the data submitted for the purposes of monitoring performance and will enable us to measure and report the comparative performances of GDNs more accurately. By improving the accuracy and robustness of the data submitted we will be able to draw more meaningful comparisons between GDNs and publish this data to increase transparency and further drive comparative competition. The introduction of a balanced scorecard under option 2 will also encourage further comparative competition among GDNs as the performance scores covering these areas will be easily comparable across the networks. It may be possible in future price control periods to link GDNs scorecards to price controlled revenues to reward GDNs who perform relatively better and penalise those who perform less well, further encouraging comparative competition.

1.11. Option 2 should therefore strengthen competition between GDNs. The changes proposed under option 2 will apply to all GDNs and so there should be no negative effect on competition due to these changes.

## **Impacts, costs and benefits**

### **Environment**

1.12. Gas lost from the distribution network has an environmental impact as methane, the principle component of natural gas, is a greenhouse gas with 21 times the potency of carbon monoxide.

1.13. Both options incorporate GDNs' performance against a variety of environmental measures, including methane emissions, which are published by Ofgem. While this encourages comparative competition between the GDNs it is not likely to have a significant impact on the environment, particularly greenhouse gas emissions.

1.14. The inclusion of GDNs environmental performance in the proposed balanced scorecard under option 2 will encourage further comparative competition among GDNs when compared to the 'do nothing' option but is unlikely to have a significant impact on the environment, particularly greenhouse gas emissions.

### **Security of supply**

1.15. Both options incorporate monitoring and reporting GDNs' performance with regard to the number and duration of non-contractual supply interruptions which would be subsequently published by Ofgem. This both encourages comparative competition between the GDNs and ensures that GDNs have processes in place to efficiently monitor and report against interruptions which contributes to security of supply. Both options would also include a guaranteed standard to incentivise GDNs to restore consumers' supplies as efficiently as possible, contributing to security of supply.

1.16. Historically the data provided by the GDNs with regard to interruptions reporting is of poor quality. Option 2 seeks to improve the completeness and accuracy of this data which will enable more meaningful comparisons to be drawn between GDNs, strengthening incentives for improved security of supply. Furthermore, the inclusion of the number, duration and accuracy of this data in the proposed balanced scorecard will encourage further comparative competition among GDNs when compared to the 'do nothing' option again strengthening incentives for improved security of supply, although this impact is likely to be relatively small.

### **Health and safety issues**

1.17. The current quality of service and outputs arrangements include a number of measures and service standards which have health and safety impacts including responding to gas emergencies and answering the emergency telephone number, reporting performance against the HSE's mains replacement programme, greenhouse gas emissions, the number of publicly reported gas escapes, instances of gas in buildings, iron pipe fractures and failings, and any gas loss of containment incidents.

1.18. There are also standards of performance for GDNs to meet in relation to the health and safety of consumers including prompt reinstatement of a consumer's premise after work to re-lay service pipes.

1.19. Both options listed above incorporate monitoring and reporting of GDNs' performance with regard to the above measures and the publication of performance information. As discussed above this would both encourage comparative competition between the GDNs and ensure that GDNs have processes in place to efficiently monitor and report against those measures which have health and safety implications.

1.20. Option 2 proposes a consolidation and simplification of existing obligations on GDNs rather than removal of the obligations, i.e. the overall standard obligation to answer emergency and enquiry telephone calls within 30 seconds becomes a licence condition. Option 2 may marginally strengthen incentives to improve health and safety through increased comparative competition as GDNs performance for attending gas emergencies, methane emissions and accuracy of pipeline records are included in the proposed balanced scorecard.

### **Distributional effects**

1.21. Both options should not result in an unequal distribution of costs as any increases or decreases in costs will apply across all consumers equally.

1.22. At present, quality of service issues focus upon domestic and smaller non-domestic customer groups. Larger consumers tend to seek more appropriate protection on an individual basis through bilateral agreements or insurance. Both options will have a neutral effect on larger consumers.

1.23. Consumers connected to IGT networks are not currently covered by third party damage and water ingress arrangements. Option 2 proposes to incorporate these arrangements into the existing supply restoration guaranteed standard thereby providing the same level of protection for consumers whether they are connected to an IGT network or a GDN.

### **Small businesses**

1.24. Option 2 proposes a change to provide improved protection to small business consumers by incorporating their compensation arrangements for supply restoration with the guaranteed standards framework.

1.25. Option 2 also proposes a number of changes which will impact on IGTs who are small businesses. The key change affecting IGTs is including third party damage and water ingress interruptions into the supply restoration guaranteed standard. Previously IGTs were not required to make compensation payments to their consumers for these types of interruptions. While this provides improved protection for consumers connected to IGT networks it may result in increased costs for IGTs, however, we expect these will be minimal.

### **Risks and unintended consequences**

1.26. There are a number of risks associated with the 'do nothing' option. The current quality of service and outputs arrangements are complex and in some instances do not provide robust information or allow easy comparisons of GDNs' performance. If this issue is not addressed it may be difficult to understand how some aspects of the performance and quality of service provided by GDNs is improving or otherwise, both over time and between companies.

1.27. A further risk with the 'do nothing' option is that the current quality of service and outputs arrangements may no longer be driving improvements in GDNs' behaviour. They may not be providing appropriate consumer protection if standards are set at an inappropriate level or no longer reflect the key performance areas valued by consumers. The "do nothing" option would also not address any of the gaps in the existing arrangements, for example where some standards do not apply to IGT customers.

1.28. Option 2 seeks to address the issues outlined above by implementing a range of improvements to the current framework, in particular by simplifying the framework and improving the quality and reliability of data reported by GDNs. A programme of consumer research has informed the changes proposed under option 2 to ensure that the standards are reflective of consumers' expectations and address any gaps identified or areas where consumers perceive the performance by GDNs can be improved. The changes proposed under option 2 aim to ensure that outputs and standards of performance are set at appropriate levels and provide a sufficiently strong incentive for GDNs to drive improvements in performance.

1.29. Option 2 also seeks to make amendments to simplify and rationalise the quality of service and outputs arrangements to enable more robust data reporting and easier comparison between GDNs.

**Costs and benefits**

1.30. The costs and benefits of the individual amendments proposed in option 2 are outlined in Table A16.1.

**Table A16.1 - Costs and benefits of option 2 relative to the 'do nothing' option**

<b>Proposed change</b>	<b>Cost impacts of option 2 relative to "do nothing"</b>	<b>Overall costs</b>	<b>Benefits of option 2 relative to "do nothing"</b>	<b>Overall benefits</b>
<b>Removal of Overall Standards of Performance (OSOPs)</b>				
Telephone calls – replace with a licence condition	There is no change to the service levels GDNs are required to provide only a change in which framework gives rise to this obligation. As such, there will be no change in costs for GDNs or consumers.	-	Almost all domestic and business consumers (over 90%) found this standard important and considered it to be very good or reasonable. Removing the OSOP and including it in the licence improves the enforceability of this obligation and provides improved protection for consumers.	✓ ✓
Advance notice of planned interruptions – replace with a GSOP	GDNs will incur additional costs to make compensation payments in the event of failures and to administer these payments. Using data from 2005-06 and 2006-07, we have calculated that average payments per GDN on current levels of performance would cost £20k. GDNs have provided a range of costs to administer these payments from £0 - £64k per GDN.	£20k - £84k per GDN p.a.	Over 85% of all consumers found this standard important and almost all (over 94%) thought the standard proposed was appropriate. Under this change, consumers will receive compensation payments in the event of individual failures. Notifying consumers is a key part of planned replacement work and avoids delays. GDNs with appropriate records of consumers connected to the relevant parts of their network should have minimal failures. As such, we do not consider it appropriate to provide GDNs with an allowance for these costs. Consumers will therefore have improved protection at no additional cost.	✓ ✓ ✓

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Proposed change	Cost impacts of option 2 relative to "do nothing"	Overall costs	Benefits of option 2 relative to "do nothing"	Overall benefits
Information on restoration times – assessed through the customer satisfaction survey	GDNs will incur a small initial cost associated with implementing this change as additional questions will need to be included in their existing customer satisfaction surveys. We expect this cost to be negligible.	Negligible	GDNs have difficulty in recording their performance against this standard. Including this area in the customer satisfaction survey removes the reporting burden and ensures that Ofgem can continue to monitor performance in this area and take action in the event that there is a decline in performance.	✓
Responding to complaints – replace with a GSOP	GDNs will incur additional costs to make compensation payments in the event of failures. We expect there to be only minimal additional costs to administer these payments as the GDNs will already have the consumers' details and monitor response timeframes under the existing standard. Using data from 2005-06 and 2006-07, we have calculated that average payments per GDN on current levels of performance would cost £2.5k. GDNs have provided a range of costs to administer these payments from £0 - £37.5k per GDN.	£2.5k - £40k per GDN p.a.	Over 75% of all consumers found this standard important and 70% found the proposed standard acceptable. Under this change, consumers will receive compensation payments in the event of individual failures. GDNs should have appropriate systems in place for handling consumers concerns regarding their performance. As such, we do not consider it appropriate to provide GDNs with an allowance for these costs. Consumers will therefore have improved protection at no additional cost.	✓ ✓
Attending gas emergencies – replaced with a licence condition	There is no change to the service levels GDNs are required to provide only a change in which framework gives rise to this obligation. As such, there will be no change in costs for GDNs or consumers.	-	This standard was considered important by 95% of consumers and acceptable by almost 90%. Removing the OSOP and including it in the licence improves the enforceability of this obligation, providing improved protection for consumers.	✓ ✓

Proposed change	Cost impacts of option 2 relative to "do nothing"	Overall costs	Benefits of option 2 relative to "do nothing"	Overall benefits															
<b>Changes to Guaranteed Standards of Performance (GSOPs)</b>																			
Supply restoration – reduce event cap, include small non-domestic consumers and TPWI interruptions (with a cost pass through mechanism)	Under both options, GDNs will incur costs to make compensation payments in the event of failures. As part of the previous price control we provided GDNs with an allowance for an efficient level of payments under this GSOP. We also provided an allowance for the GDNs to insure against large TPWI incidents and for payments that fell into the insurance excess. We consider it appropriate to provide GDNs with an allowance for an efficient level of compensation payments.	£1.6m (£360k less than under option 1) All GDNs p.a.	<p>90% of consumers rated this standard important and 85% found it acceptable.</p> <p>The inclusion of all compensation arrangements regarding interruptions into one guaranteed standard simplifies the framework, making it easier for consumers and GDNs to understand.</p> <p>This change will provide improved protection for consumers, particularly small business consumers and consumers connected to IGT networks who will be captured by this standard for all interruptions.</p> <p>In light of the reduction in GDNs liabilities through a smaller event cap of 30,000 consumers and the introduction of a cost pass-through mechanism for larger TPWI interruptions, smaller opex allowances would be required under option 2 when compared to the 'do nothing' option.</p> <p>Average annual allowance for all GDNs under each option (2005-06 prices):</p> <table border="1" data-bbox="1062 984 1791 1122"> <thead> <tr> <th>Option</th> <th>GSOP allowance</th> <th>TPWI allowance</th> <th>TOTAL</th> <th>Cost per customer</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>£418,647</td> <td>£1,538,639</td> <td>£1,957,286</td> <td>£0.09</td> </tr> <tr> <td>2</td> <td>£418,647</td> <td>£1,178,039*</td> <td>£1,597,486</td> <td>£0.08</td> </tr> </tbody> </table> <p>* It should be noted that in the event a GDN experiences a large TPWI event in which the compensation amount exceeds the GDNs liability threshold (1.5% of annual revenue cap), 95% of the costs in excess of the threshold will be passed through to consumers. The likelihood of an event of this size occurring is small and modelling shows the cost impact on consumers would also be very small.</p>	Option	GSOP allowance	TPWI allowance	TOTAL	Cost per customer	1	£418,647	£1,538,639	£1,957,286	£0.09	2	£418,647	£1,178,039*	£1,597,486	£0.08	<p>✓</p> <p>✓</p> <p>✓</p> <p>✓</p>
Option	GSOP allowance	TPWI allowance	TOTAL	Cost per customer															
1	£418,647	£1,538,639	£1,957,286	£0.09															
2	£418,647	£1,178,039*	£1,597,486	£0.08															

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Proposed change	Cost impacts of option 2 relative to "do nothing"	Overall costs	Benefits of option 2 relative to "do nothing"	Overall benefits
Reinstatement – shorten timeframe	GDNs may incur additional costs as a result of increased compensation payments in the event of failures associated with the shortened timeframe. We expect there to be only minimal additional costs to administer these payments as the GDNs should already have appropriate systems in place under the existing standard. GDNs have provided cost estimates for this change which range from £0 - £200k per GDN p.a.	Minimal	77% of domestic consumers and 82% of businesses found this standard important. Businesses found this standard less acceptable than consumers. Shortening the timeframe for this standard and strengthening this incentive will address concerns raised by consumers regarding the timing and quality of reinstatement works. Most GDNs currently complete reinstatement works within 2-3 days and have indicated that this change will have a minimal impact on their costs. We therefore do not consider it appropriate to provide GDNs with an allowance for these costs. This change will result in improved protection and service for consumers at no additional cost.	✓ ✓
Alternative heating and cooking facilities – apply to priority consumers and those who request it	There is no change to the service levels GDNs currently provide. The change proposed will ensure GDNs obligations under the standard match the current service levels provided. There will be no change in costs incurred by GDNs or consumers.	-	Almost all consumers found this standard important (91%) and acceptable (94%). Matching the current level of service provided by GDNs to the obligation under the standard provides improved protection for consumers, particularly as GDNs are incentivised to reduce costs.	✓ ✓

Proposed change	Cost impacts of option 2 relative to "do nothing"	Overall costs	Benefits of option 2 relative to "do nothing"	Overall benefits
Rationalisation of the connections standards for quotations and provision of dates	There is no change to the service levels GDNs currently provide. The change proposed will improve and simplify the presentation of the connections standards. There will be no change in costs incurred by GDNs or consumers.	-	The simplification and improved presentation of the standards makes it easier for customers to understand the level service they are entitled to without changing the degree of protection afforded to customers.	✓ ✓
<b>Changes to other outputs reporting requirements</b>				
Rationalisation of outputs reporting	We expect that the cost savings for GDNs and consumers resulting from the rationalisation of the outputs reporting to be minimal.	-	GDN and consumers will benefit from the marginally lower costs associated with the removal of reporting burdens where the data provided is not useful.	✓
Improving interruptions reporting	GDNs are currently required to report interruptions data to Ofgem. Introducing minimum requirements for the completeness (95%) and accuracy (90%) of this data does not change GDNs existing obligations but will ensure that the data reported is accurate and reliable. This change should not result in increased costs as under the previous price control GDNs were provided with an allowance of £5m in total to develop appropriate systems for interruptions reporting.	-	This will improve the robustness of interruptions data provided by GDNs and will enable more valid comparisons to be made between the performance of GDNs both relative to one another and over time. Consumers will see benefits in GDNs performance in this area resulting from enhanced comparative competition.	✓ ✓

Proposed change	Cost impacts of option 2 relative to "do nothing"	Overall costs	Benefits of option 2 relative to "do nothing"	Overall benefits
Additional customer satisfaction surveys	GDNs will incur increased costs to undertake the additional surveys. We consider that a small additional allowance is appropriate to fund this change.	£35k	Covering emergency services and connections performance in the customer satisfaction survey enables the more intangible elements of GDNs performance in these areas to be monitored. It enhances comparative competition between the GDNs and incentivises improved performance across these areas for consumers.	✓ ✓
Accuracy of pipeline records reporting	There will be a minimal increase in costs for GDNs to report against these new measures.	Minimal	Strengthening incentives on GDNs to improve performance in this area through a reporting regime will benefit competition in the provision of connections by IGTs and ICPs and enable GDNs to maintain their assets efficiently and safely and minimise safety risks to others when they are carrying out excavation works in the vicinity of gas pipelines.	✓ ✓ ✓
Balanced scorecard	No change in costs for GDNs or consumers as the measures included are already reported to Ofgem.	-	A balanced scorecard will enhance comparative competition between GDNs, enabling performance on key service areas to be better compared across the different GDNs and over time.	✓ ✓
<b>SUMMARY</b>	Most of the changes proposed under option 2 do not have any cost impact on GDNs or consumers. Where the changes proposed in option 2 increase costs to GDNs this is off-set by the reduction in the allowance required for supply restoration compensation payments.		option 2 will result in improved protection for consumers and will encourage further comparative competition between GDNs by improving the accuracy and reliability of data recorded and reported.	

## Conclusion

1.31. Our initial proposal is to implement option 2 as this will better protect the interests of consumers and will encourage further comparative competition between GDNs by improving the accuracy and reliability of the data recorded and reported by GDNs. Option 2 will also enable the comparisons made to be more valuable and reliable.

## Appendix 17 – Final impact assessment on the capital expenditure rolling incentives and the IQI

### Objectives

1.1. In DPCR4 we implemented new techniques to incentivise GDNs to minimise capex spend and seek further efficiency savings. In this document we review the impact of these arrangements and consider whether it is appropriate to implement these techniques as part of the GDPCR.

1.2. The objective of this impact assessment is to further Ofgem's principal objective to protect the interests of consumers. It also helps Ofgem secure that licence holders are able to finance their authorised activities.

### Key Issues

1.3. Under standard price control arrangements we set companies a capex allowance for spend based on our view of their reasonable costs. As capex assets are depreciated over their asset lives, GDNs earn a rate of return based on the forecast allowances and keep any savings they make against this allowance for the duration of the price control. At the end of the price control period we review the actual cost of investment and for the remaining years of the capex asset life and the GDNs earn a rate of return on the actual efficient costs they incurred.

#### **Inflating capex allowances**

1.4. One of the challenges for us is in setting allowances for GDNs when the companies have better quality information about the need for expenditure and have an incentive to inflate their forecasts in order to benefit from rewards for cost savings. It can therefore be difficult for us to differentiate between investment costs necessary to maintain network integrity and artificially inflated capex forecasts.

#### **Varying strength of incentives**

1.5. Another concern with the current arrangements is that savings that GDNs make at the start of the price control are retained for a longer period than savings made mid way through the control. Moreover, savings made in the final year of the price control would not be taken into account when resetting allowances for the following price control so these savings could be retained by the GDNs for six years.

#### **Risks of over investment/ deferring necessary investment**

1.6. The varying strength of incentives can provide companies with perverse incentives over the timing of their capital expenditure. For example a strong incentive at the start and end of the price control can provide incentives for GDNs to defer necessary investment. In comparison weaker incentives towards the end of the incentive period may not encourage companies to make efficiency savings and

may not discourage overspending against the allowance as companies are exposed to a relatively small proportion of the overspend.

### **Uncertainties associated with an ex post efficiency review and the implications for price control reopeners**

1.7. A further concern with the current arrangements is that we review GDN costs at the end of the price control period to determine whether costs have been incurred efficiently and if so to include the actual costs in the GDN's regulatory asset value (RAV). GDNs therefore face uncertainty associated with how we would treat over or under spend; for example if there are unexpected increases and reductions in costs, under what circumstance we might agree to a price control reopener. In principle we consider that price control reopeners should be avoided if possible as resetting the parameters within a price control can reduce its incentive properties.

1.8. We consider that the strength of the incentives can have an impact on these uncertainties. For example relatively strong incentives could provide the GDNs with strong incentives not to over spend as there is a risk that we would not agree to a price control reopener. With weaker incentives we would not be able to determine whether the change in costs was due to weak incentives that do not sufficiently discourage over spend, or an external factor.

## **Options**

1.9. In this section we include two options which are either to do nothing or to implement capex rolling incentives and the IQI. We have not proposed an option introducing capex rolling incentives without the IQI as rolling incentives are likely to strengthen the capex incentives, which may in turn encourage GDNs to inflate their capex bids.

### **Option 1- Do nothing**

Under this option we would retain the standard capex incentives and would not address any of the risks associated with the current incentive arrangements.

### **Option 2 - Implement a capex rolling incentive with the IQI**

1.10. Under this option the capex rolling incentive would be implemented to ensure that any savings are retained for a fixed period while the IQI would determine the strength of the incentive.

1.11. The IQI incentivises GDNs to provide us with an accurate forecast of their capex. It sets out a matrix of efficiency incentives and additional income that GDNs earn depending on the ratio of their capex forecast to our consultant's forecast (which may have been subject to adjustment by us).

1.12. GDNs that forecast capex broadly in line with our consultant's forecast earn a higher efficiency incentive and additional income than GDNs who have forecast capex

significantly higher than our forecast. The additional income is a reward to companies who forecast capex spend close to our consultant's forecast. The efficiency incentive sets the incentive rate for future efficiency savings.

1.13. GDN's maximise their overall income by choosing a forecast that matches their intended capex spend, including if they intend to spend more than our consultants forecast.

1.14. Under this option we would publish the IQI and then allow GDNs to re submit their capex forecast in order to encourage the GDNs to provide us with their most accurate capex forecasts. We would also review GDN performance against the IQI on an annual basis through the cost reporting framework.

## Competition assessment

1.15. None of the options are likely to have the impact of preventing, restricting or distorting competition as they deal with incentives for monopoly gas distribution companies.

## Impacts, costs and benefits

### Environment

1.16. None of the options are likely to have an impact on the environment.

### Security of supply

1.17. None of the options are likely to have an impact on security of supply. However if GDNs are exposed to relatively strong incentives under the IQI, without robust short term and long term quality of supply incentives there is a risk that they could be incentivised to defer necessary investment which could lead to a deterioration in network quality and could at its extreme have an impact on security of supply. We intend to strengthen the quality of service incentives as set out in chapter 5.

### Health & safety issues

1.18. None of the options are likely to have health and safety issues.

### Distributional effects

1.19. Incentive revenues are recovered from GDN charges. The distributional effect of any of the options would have the same effect as any increase or reduction in GDN charges.

**Small businesses**

1.20. None of the GDNs are small businesses, and small business customers will not be affected disproportionately as proposals would impact all customer bills equally.

**Risks & unintended consequences**

1.21. The risks associated with option 1 have been discussed above and are associated with GDNs inflating their capex bids and the implications that varying incentive strengths can have in terms of making efficiency savings, over spending against the allowance and deferring necessary investment.

1.22. The risk associated with option 2 has also been discussed above and is the risk that a GDN with a relatively strong efficiency incentive may choose to defer necessary investment. This will be managed through robust quality of supply and capacity outputs and the annual cost reporting obligations, which will ensure that the GDN could not benefit from deferring investment by asking for the money again in a subsequent price control.

**Costs & benefits***Minimising the risk of over bidding on the capex allowance*

1.23. Under option 1, without an information quality incentive, there are strong incentives for the GDNs to inflate their capex forecasts in order to make artificial efficiency savings. Option 2 provides incentives for GDNs to provide us with an accurate forecast of their capex. It will not be possible to quantify the impact of this in the GDPCR until GDNs have had the opportunity to re-submit their capex.

*Minimising the risk of deferring necessary investment*

1.24. There is a risk with option 2 that a GDN with a relatively strong incentive arising from the IQI could pursue efficiency savings by deferring investment at the expense of quality of service and capacity outputs in the short and long term. Moreover, if we set stronger incentives for low capex bid GDNs the risk is potentially greater than if we set strong incentives for high capex bid GDNs as the former may have less scope for out-performance in relative terms. Under option 1 the risk of deferring investment is greater at the start and end of the price control when the incentives are relatively strong. The risks can be mitigated through the annual cost reporting requirements that we are developing as part of this price control to monitor investment and ensure that GDNs do not get the funding for the same allowance in subsequent controls. We are also reviewing the quality of service obligations and network capacity output measures to minimise this risk.

*Minimising the risk of over investment in the network*

1.25. Table A17.1 below gives an indication of the incentive strength over the current price control period.

**Table A17.1 - Efficiency incentive strength over the period of the price control**

Asset life = 45 years

Cost of capital = 4.84%

No years that savings are retained	PV of Incentive strength
7 years	39.3
6 years	34.7
5 years	29.8
4 years	24.6
3 years	19.0
2 years	13.1

1.26. As discussed above under option 1 the incentives for capex efficiency are likely to be strongest in the last year of the price control period, when savings could be retained for six years, and the first years of the price control. Towards the latter years the incentive rate falls and there is a greater risk of over investment as GDNs are exposed to a lower proportion of over spend.

1.27. With option 2 the incentive strength is consistent over the period of the price control. It may also be appropriate to increase the strength of the incentive under the IQI so that GDNs with higher capex forecasts relative to our consultant's forecast also have strong incentives to minimise over investment.

*Minimise uncertainties associated with an ex post efficiency review and price control reopeners*

1.28. Under option 1 GDNs face uncertainty associated with how we will treat any under or over spend as part of our ex post efficiency review and under what circumstances we will consider a price control reopener.

1.29. With option 2 we would rely on the IQI to ensure that GDNs have firstly forecast spend accurately and on the strength of the efficiency incentives to ensure that investment is undertaken efficiently. We therefore would not need to undertake an ex post efficiency review. We would monitor spend annually and GDNs would have greater certainty that their spend would not be reviewed ex post.

1.30. Under option 2, if GDNs had relatively stronger incentives for efficiency this could minimise the risk of price control reopeners. We are less likely to re-open the price control as there is less risk that unexpected changes in costs would arise due to weak efficiency incentives.

*Minimise the cost of implementation and regulation*

1.31. There are no implementation costs for option 1 as we are retaining the current arrangements. Under option 2 there are costs associated with introducing the IQI for both the companies and for us. GDNs will need to determine the appropriate capex forecast to maximise their capex revenues and our costs would be associated with devising the IQI. Consequently, the implementation costs for option 2 are unlikely to be significant.

1.32. The cost of regulation under option 1 is higher than with option 2 as we need to undertake a detailed ex post assessment to determine the efficient level of GDN spend in order that the RAVs reflect actual efficient spend. This greatly outweighs any cost associated with implementing the IQI and analysis of the appropriate parameters. While any company that wishes to prepare a re-bid may need to undertake its own analysis beforehand, the resources this entails are unlikely to outweigh the resources entailed in preparing evidence to contest an ex-post assessment.

1.33. With option 2 the IQI would encourage GDNs to forecast their spend accurately while strong efficiency incentives are likely to reduce the risk of inefficient spend. As a consequence we could rely on the incentives to ensure that GDNs spend efficiently which would negate the need for a detailed ex post efficiency review. This would therefore significantly reduce our workload and the associated costs of undertaking a price control review which could have an impact on companies licence fees.

## Conclusion

1.34. A summary of the impact of the two options are set out in Table A17.2 below. Our initial proposal is that option 2 is the most appropriate option.

**Table A17.2 - Summary of the costs and benefits of the options for the capex rolling incentive and IQI**

	Minimise risks arising from asymmetric information	Minimise risk of deferring necessary investment	Minimise risk of over investment in the network	Minimise uncertainties associated with ex post review and price control re-openers	Minimise the net costs of implementation and regulation
Option 1: No capex rolling incentive or IQI	x	x	x	x	x
Option 2: capex rolling incentives with IQI	✓	xx	✓	✓	✓

## Appendix 18 – Final impact assessment on the mains replacement incentive

### Objectives

1.1. Our objective is to assess the appropriate funding mechanism for mains replacement costs to enable GDNs to meet the mains replacement targets set by the HSE; to provide funding for the costs associated with meeting that target; and to encourage GDNs to minimise costs associated with meeting the target.

1.2. The objective of this impact assessment is to further Ofgem's principal objective to protect the interests of consumers. It also helps Ofgem:

- secure that licence holders are able to finance their authorised activities; and
- protect the public from the dangers arising from the conveyance of gas through pipes or the use of gas conveyed through pipes and from the generation, transmission, distribution or supply of electricity.

### Background

1.3. In 2002 the HSE initiated the mains replacement programme which required Transco to decommission iron gas mains within 30 meters of premises over 30 years to reduce the risk of injury to people arising from fire or explosion as a consequence of a sudden failure by fracture or corrosion of iron gas distribution mains.

1.4. Currently the GDNs are required to survey the remaining mains pipes annually and to submit volumes of mains replacement to the HSE for approval for each financial year. The assessment of these volumes is based on a risk model that has been approved by the HSE. In 2002 we agreed to provide funding arrangements for the first five years of the mains replacement programme.

1.5. The GDNs are subject to a matrix of mains costs setting out the unit costs for a range of diameter bands and indicative volumes of mains abandoned for each diameter band. From the matrix the price control projection is derived by multiplying the unit cost by volume for each diameter band. The price control projection is the GDNs' initial price control allowance. On an annual basis GDNs report the length of mains actually abandoned by diameter band. These are multiplied by the matrix unit costs to give a total matrix cost.

1.6. Essentially GDNs are allowed to pass-through the costs of increased workload (or savings from reduced workload) to customers subject to the constraint that total costs in the price control period cannot be greater than the total allowance. GDNs bear 50 per cent of overspend if unit costs are higher than projected. GDNs retain 33 per cent of efficiency savings if costs are lower than projected. The mains replacement incentive provides an adjustment to the initial price control allowance.

## Key issues

### **Incentives to minimise mains replacement costs**

1.7. The mains replacement incentive was put in place to encourage the GDNs to minimise costs. Mains and services replacement forms a significant part of each GDN's overall costs, approximately £3.2 billion for all the GDNs for the next price control, if the GDNs' incentives to make efficiency savings are undermined then this could result in significant costs to consumers. For example if the annual mains replacement allowance is significantly greater or less than forecast this can undermine the incentives for GDNs to make efficiency savings.

### **Incentives to game mains replacement arrangements**

1.8. GDNs have an incentive to game the arrangements if it results in higher revenue; for example, if there is a single unit cost to cover both mains and services replacement which implies that GDNs replace an implicit number of services per kilometre of mains replaced, GDNs may focus on replacing mains with fewer services on them to maximise its revenues.

### **Flexibility of arrangements to deal with changes in work programme**

1.9. As mains replacement costs constitute a significant proportion of capex costs changes in the annual mix of mains diameters replaced from that forecast could enable GDNs to make short term windfall gains or losses. This could undermine the incentives for efficiency.

### **Ease of implementation**

1.10. The options will be judged on the ease of implementation as arrangements which are harder to implement could have cost implications for companies which are likely to be passed on to consumers.

### **Refinements to the mains replacement incentive**

#### *Unit costs for larger diameter pipes*

1.11. Smaller diameter pipes tend to have a higher fault risk than larger pipes. The previous price control period focussed on the replacement of smaller diameter pipes, as it was agreed that the replacement of larger diameter pipes could be undertaken later in the mains replacement programme, and a single unit cost was included for all pipe sizes greater than 12 inches.

1.12. Many of the GDNs intend to replace larger diameter pipes during the next price control period. The costs associated with the replacement of larger diameter pipes are significantly higher than smaller diameter pipes and therefore we are proposing to include three additional unit costs for 12-18 inch pipes, 18-24 inch pipes and pipes of greater than 24 inches in the mains replacement incentive.

*The inclusion of services costs*

1.13. Services costs are excluded from the mains replacement incentive as the replacement of service pipes does not form part of the HSE's mains replacement programme. However, GDNs incur service pipe replacement costs associated with mains replacement. There is also a relationship between the number of services re-laid or transferred and the diameter of mains replaced. In general the smaller the diameter of mains replaced the greater the number of services per km of mains replaced.

1.14. As part of the impact assessment we have therefore included two options for incorporating services costs. The first option is to retain the current form of the mains replacement incentive which sets out a unit cost per km of mains replaced but the unit cost would account of both mains and services costs. In order to do this we would need to make some assumptions about the number of services replaced per diameter of mains replaced. The other option is to set a separate unit cost for services costs but to include it in the mains replacement incentive.

*Alignment of mains replacement incentive with the capex incentives*

1.15. The current mains replacement incentive places strong incentives on GDNs to minimise the unit cost of mains replacement. If costs are higher than forecast, GDNs are exposed to 50 per cent of these costs and if costs are lower than forecast, GDNs retain 33 per cent of the savings. In comparison under the current capex incentives GDNs are exposed to 31 per cent of over and under spend. This has provided GDNs with strong incentives to minimise mains replacement costs but can skew efficiency incentives in favour of mains replacement to the detriment of other capex costs. In practise, having reviewed GDN costs from the previous price control this has tended to result in lower unit costs for mains replacement and higher costs for associated services costs.

1.16. As part of the impact assessment we have therefore amended the mains incentive so that GDNs are exposed to symmetrical incentives for over and underspend and these incentives will be consistent with the capex incentive.

## Options

### **Option 1a - Retain the mains replacement incentive with a service replacement unit cost built into the mains replacement unit cost**

1.17. Under this option we would retain the current mains replacement incentive but would include three additional unit costs for larger diameter pipes.

1.18. We would also align the incentives so that GDNs are exposed to the same incentive strength for over and under spend and the incentive would be the same strength as the capex incentive. Under these proposals the capex incentives would determine the strength of the mains replacement incentive.

1.19. Services costs would be included in the mains replacement incentive. For each diameter of mains replaced we would include the unit costs for services replacement. In so doing we would need to assume a certain number of services per km of mains replaced for each diameter of mains. The data provided by GDNs indicates that there are more services per km for smaller diameter pipes. However the GDNs have noted that they do not specifically collect data on the number of services replaced per km of mains replaced so they have used their engineering judgement in the data they have provided to allow us to derive a single unit cost for both mains and services replacement. GDNs would continue to report the mains replacement data as currently but their outturn costs would include services costs as well as mains costs. The mains replacement incentive would continue to be subject to a five year cap equal to the five year aggregate of the price control projection allowance.

### **Option 1b - Retain the mains replacement incentive with separate unit costs for service replacement**

1.20. This option is similar to option 1a however instead of a unit cost covering both mains and services costs we would set separate unit costs for services relaid and services transferred. We would also set initial volumes for each of these services costs and the total costs would feed into a single price control projection allowance. GDNs would then report the mains replacement data as current and also the number of services replaced. The overall outturn costs would include both mains and services costs.

### **Option 2 - Implement a mains replacement allowance**

1.21. Under this option we would set an annual mains replacement allowance. GDNs may make windfall gains and losses against the incentive on an annual basis. Overall the five year allowance would be equal to the five year cap set under options 1a and 1b. However, there is currently no cap on capex and repex.

## **Competition assessment**

1.22. None of the options are likely to have an impact on competition as they deal with funding of mains replacement costs for monopoly gas distribution companies.

1.23. However, the mains replacement incentive allows the allowance to adjust to changes in costs arising from changes in volumes. GDNs therefore adjust their charges annually to take account of adjustments to their costs. As mains replacement costs are significant this could result in a level of volatility in charges which could, at its extreme, impact on competition in the gas supply market.

## **Impacts, costs and benefits**

### **Environment**

1.24. The mains replacement incentive provides funding to reduce the total volume of gas lost through leakage which can pollute the land, groundwaters and air, by

which it contributes to greenhouse gas emissions. However, the requirement to replace mains pipes, the criteria by which the replacement should be prioritised and the volume of mains replacement is agreed annually between the HSE and the GDNs, consistent with the risk based approach. As we have limited the overall revenue that the GDNs can earn from mains replacement, either by fixing an allowance or setting a cap, there are no incentives for the GDNs to overshoot the volume agreed with the HSE. Therefore none of the options have a greater or lesser impact on the environment than the others.

### **Security of supply**

1.25. A reduction in gas leakages, and gas leakage related incidents, will contribute (although minimally) to security of supply. As discussed in 5.1 none of the proposed options provide greater incentives than the others to minimise gas leakage as overall mains replacement workloads are agreed between the GDNs and the HSE.

### **Health & safety issues**

1.26. The mains replacement requirements are intended to minimise the health and safety risks associated with gas leakage from cast iron mains pipes. As discussed in 5.1 none of the proposed options provide greater incentives to minimise this risk than the others as the volume of mains replacement is agreed between the GDNs and the HSE.

### **Distributional effects**

1.27. The costs associated with the mains replacement programme is funded through the price control allowances and these costs are recovered from GDN charges. The distributional effect of any of the options would have the same effect as any increase or reduction in GDN charges.

### **Small businesses**

1.28. None of the GDNs are small businesses, and small business customers will not be affected disproportionately as proposals would impact all customer bills equally.

### **Risks & unintended consequences**

#### *Gaming opportunities*

1.29. With options 1a and 1b there is an incentive for the GDN to replace pipes with the lowest diameter size for the relevant band rather than the highest diameter size in the band if that is more appropriate. Under option 1a there are also incentives for the GDNs to replace mains with the fewest services attached. Under option 2 there is a more general incentive to replace mains and services that have the lowest replacement cost. These risks are mitigated to some extent by the obligation for GDNs to replace mains based on risk however within the risk strategies there is some, albeit limited, scope to cherry pick the mains to be replaced.

*Over or underestimating allowances*

1.30. As the allowances are based on forecasts of costs under all of the options there is a risk that we either over or underestimate the mains allowance. Consequently the GDNs could make windfall savings or incur costs both of which will undermine the incentives to make efficiency savings. This risk is somewhat mitigated by reviewing GDN forecasts.

**Costs & benefits**

1.31. In this section, we compare the quantitative and qualitative benefits and costs associated with the three refinements to the mains incentive and then compare options 1a, 1b and option 2. The benefits and costs of the three options are judged on the basis of four criteria:

- incentives to minimise mains replacement unit costs
- minimise the risks of gaming the allowances
- flexibility of arrangements to adjust to changes in work programme
- ease of implementation.

*Including larger diameter mains pipes in the mains replacement incentive*

1.32. As discussed above the GDNs have assessed the risk of faults in iron mains and have so far deferred the replacement of larger diameter pipes. As pipes of highest risk have been replaced the GDNs' replacement programme will include increasing amounts of larger diameter mains pipes. If we were to exclude these costs from the mains replacement incentive the GDNs will be exposed to the additional costs of the larger diameter pipes. The unit cost for pipes of 24 inches and greater are much higher than the cost of 12-18 inch pipes, over 1.5 times higher. Six of the eight GDNs have forecast that they will need to replace pipes of 24 inches or greater with an average replacement of approximately 4km for each GDN. Excluding larger diameter pipes will therefore increase their risk exposure and they would seek a higher cost of capital to mitigate this risk.

*Including service replacement costs in the incentive*

1.33. As discussed above when the GDNs undertake mains replacement they also replace the services associated with the mains. As mains replacement costs vary with the diameter of mains replaced so do services volumes and therefore costs. GDNs may make annual windfall gains and losses if the services costs associated with mains replacement are greater or less than their allowances.

*Alignment of mains replacement incentives with capex incentives*

1.34. PB Power undertook some analysis of the unit costs for services and mains replacement which indicated that there was a trend towards increasing unit costs for services replacement costs and a trend towards lower unit costs for mains replacement during the price control period. As the current mains replacement incentive is stronger than the current capex incentives, GDNs' incentives to make efficiency savings are skewed towards savings in mains replacement. The risks are

reduced by including services costs associated with mains in the mains replacement incentive however there could still be scope for skewing capex efficiency decisions with other replacement work, including services costs not associated with mains replacement. Alignment of the mains incentive with the capex incentives would address this issue.

*Incentives to minimise mains replacement unit costs*

1.35. Under each of the options the GDNs have the same strength of incentives to minimise mains replacement costs. Options 1a and 1b may provide stronger incentives to minimise costs as the incentives to minimise costs under option 2 could be undermined if the GDNs make windfall gains or losses against their allowances.

*Minimise the incentives to game the allowance*

1.36. Under option 1b the GDNs may have incentives to replace mains with the smallest pipe in each diameter range to maximise mains revenues.

1.37. Under option 1a there may also be the potential for gaming around the implied number of services replaced per km of each mains diameter replaced. The scope for gaming is likely to be limited as GDNs mains replacement programmes are determined by risk but if it is likely that if two mains have the same risk profile, then there is an incentive for the GDNs to defer the mains that has more services.

*Flexibility of arrangements to deal with changes in work programme*

1.38. The mains replacement incentive was introduced to protect GDNs from year on year variation in the diameter mix of mains pipes replaced. Option 2, which would set an allowance for mains replacement, is likely to be the least flexible of the three options. The impact of this is shown in the table below.

1.39. Table A18.1 below shows, for 2004-05 to 2006-07 the annual differences between the price control projection allowance, i.e. the allowance we would have set at the time of the last price control for mains replacement, with allowances determined by the current form of the mains replacement incentive. It shows that there is year on year variation between the two allowances. For example East of England would have made increasing losses if a mains replacement allowance had been set while North West would have made windfall gains.

**Table A18.1 - Annual differences between the price control projection allowance and the allowance determined by the mains replacement incentive for 2004-5 to 2006-7, (£m, 2005-06 prices)**

	2004-5 difference in allowances	2005-6 difference in allowances	2006-7 forecast difference in allowances
East of England	-2.61	-15.10	-18.75
London	2.68	11.38	10.91
North West	7.06	10.70	8.60
West Midlands	-3.05	4.82	-5.56
Northern	0.59	0.16	-1.64
Scotland	1.22	0.35	-5.40
Southern	2.01	1.85	-1.36
WWU	-0.52	-1.42	-2.84
Absolute average difference	2.47	5.72	6.88

1.40. Both options 1a and 1b take account of the changes to the diameter mix of mains replacement but the benefit of option 1b is that it would take account of variations in services numbers per km of mains replaced as well as the diameter mix of mains. To get a better understanding of the relationship between services replacement and mains replacement we asked the GDNs to provide us with data on the services replacement volumes by per km of each diameter band of mains abandoned. Table A18.2 summarises the average number of services replaced for between 2005-06 and 2012-13 which was provided by seven of the GDNs.

**Table A18.2 - Volume of service replacement by diameter band of mains abandoned per km of mains replaced**

Mains de-commissioned	number of services re-laid per km of mains replaced	number of services transferred per km of mains replaced
</ =3"	58	50
4-5"	59	50
6-7"	58	49
8-9"	57	48
10-12"	54	46
12-18"	17	14
18-24"	5	4
>24"	5	4

1.41. The data shows that the number of services replaced per km of mains replaced is significantly higher for smaller diameter pipes. However all the GDNs have noted that they used engineering judgement to derive the data and that they do not currently collect data on the number of services replaced by mains diameter.

1.42. Therefore it may be more appropriate to allow flexibility to deal with changes to service replacement costs in the absence of actual and consistent data on service replacement volumes by mains diameter.

#### *Ease of implementation*

1.43. None of the options are likely to impose significant costs on the GDNs. Option 2 would be the simplest option in terms of implementation as it we would set allowances and monitor GDN performance on an annual basis.

1.44. Under option 1a we would incorporate services costs into the mains replacement incentive and the GDNs would be required to report their annual outturn costs and volume of mains replaced. For the purposes of transparency it may be appropriate to disaggregate outturn costs by mains and services and to collect data on the volume of services replaced as well as the number of services replaced by diameter of mains replaced.

1.45. Option 1b would require changes to the licence to incorporate a separate service replacement unit cost. As well as the required reporting obligations for option 1a GDNs would also have to report on the volumes of services re-laid and transferred.

## Conclusion

1.46. Table A18.3 below summarises the impact of the three options for the treatment of mains replacement costs. Our initial proposal is that implement option 1b is the appropriate way forward.

**Table A18.3 - Summary of the impact of the options for the treatment of mains replacement costs**

	Minimise mains replacement unit costs	Minimise incentives to game allowance	Deal with changes in work programme	Ease of implementation
Option 1a: mains incentive incorporating services costs	✓✓	x	✓	✓
Option 1b: mains incentive separately identifying services costs	✓✓	✓	✓✓	✓
Option 2: set a mains replacement allowance	✓	✓✓	x	✓✓

## Appendix 19 – Final impact assessment for the volume driver

### Objectives

1.1. Our objective is to review whether it is appropriate to retain, amend or remove the volume driver.

1.2. The objective of this impact assessment is to further Ofgem's principal objective to protect the interests of consumers. It also helps to secure that:

- licence holders are able to finance their authorised activities, and
- so far as it is economical to meet them, all reasonable demands for gas conveyed through pipes are met.

### Key issues

1.3. In the current price control<sup>21</sup>, 35 per cent of the GDNs' allowed revenue varies with gas throughput on their networks. The rationale is that the GDNs' costs of operating the network increase when the volume of gas flowing through the network increases.

1.4. The volume driver was derived from analysis as part of the 2002 price control review. The volume driver had been determined on the basis that capacity in each LDZ is driven by peak capacity requirements which can be represented by the level of annual demand. By multiplying the marginal cost of LDZ capacity by peak LDZ demand it was calculated that the cost of additional capacity was between 25-50 per cent of total allowed revenues and the 35 per cent volume driver reflected a value within this range.

1.5. The volume driver takes account of throughput growth by comparing throughput volumes in the current year to volumes in the previous year. Steady growth over the price control period, which was forecast at the time of the 2002 price control review, would therefore result in a year on year increase in revenue through the volume driver commensurate with the costs of meeting peak capacity requirements. However, smaller variations in throughput and in particular throughput related to variations in weather are unlikely to trigger significant changes in LDZ capacity (unless particularly severe weather affected the calculation of 1 in 20 peak demand).

1.6. GDNs consider that throughput related costs are broadly associated with gas shrinkage and odorant costs. Data on odorant costs for 2005-06 appears to indicate

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<sup>21</sup> The volume driver mechanism is designed for a price control covering several years so is not applicable for the one year extension.

the costs are approximately £0.25m to £0.5m per GDN which is approximately 0.1 to 0.2 per cent of the relevant GDN total transportation costs. Shrinkage gas is gas lost through the network primarily as a result of leakage but also arises from theft and from gas used for operational purposes. GDNs are required to procure gas to offset the gas lost from shrinkage. Leakage volumes increase with the increased gas throughput while the price of shrinkage varies with the wholesale gas price.

1.7. As part of the one year price control extension arrangements we implemented the shrinkage incentive which protects GDNs from gas price volatility by linking the shrinkage price to the forward price of gas. GDNs are also protected from risks associated with changes in total throughput.

## Options

### **Option 1 - retain the gas throughput volume driver**

1.8. Under this option we would retain the volume driver so that 35 per cent of revenue varies with year on year variations in gas throughput.

### **Option 2 - remove the gas throughput volume driver**

1.9. Under this option we would remove the volume driver from the price control.

## Competition Assessment

1.10. None of the options are likely to have the impact of preventing, restricting or distorting competition as they deal with incentives for monopoly gas distribution companies.

## Impacts, costs and benefits

### **Environment**

1.11. The total volume of gas lost through leakage pollutes the land, groundwater and air, contributing to greenhouse gas and methane emissions. However, none of the options provide incentives for GDNs to control shrinkage volumes and therefore none of the options are likely to have an impact on the environment.

### **Security of supply**

1.12. Gas leakage, and gas leakage related incidents, will have an impact (although minimally) on security of supply. However, as discussed above none of the options provide incentives for GDNs to control shrinkage volumes and so the options are not likely to have an impact on security of supply.

### **Health and safety issues**

1.13. None of the options are likely to have health and safety issues.

**Distributional effects**

1.14. Volume driver revenues are recovered through GDN charges. The distributional effect of any of the options would have the same effect as any increase or reduction in GDN charges.

**Small businesses**

1.15. None of the GDNs are small businesses, and small business customers will not be affected disproportionately as proposals would impact all customers' bills equally.

**Risks and unintended consequences**

1.16. If we retain the volume driver GDNs would be exposed to costs, in the event that weather is warmer than expected, for the duration of the price control. Alternatively they could earn additional revenues, if the weather is colder. This is not reflective of their costs associated with throughput and could impact on their incentives for efficiency.

1.17. Currently, 35 per cent of distribution charges are commodity related and 65 per cent are capacity related. If we were to retain the volume driver the proportion of commodity related charges would be consistent with the proportion of allowed revenues that varies with throughput. If the volume driver were removed the discrepancy could lead to the GDN over or under recovering allowed revenues.

**Costs and benefits**

1.18. In this section, we compare the quantitative and qualitative benefits and costs associated with the two volume driver options. The costs and benefits are judged on the basis of three criteria:

- minimise uncertainty over costs;
- greater cost reflectivity; and
- minimise implementation and enforcement costs.

*Minimise uncertainty over costs*

1.19. Option 1 is likely to be more appropriate if the volume driver provides an adjustment to revenues associated with cost uncertainty at the time of setting the price control. Shrinkage costs are uncertain but as these costs are taken into account in the shrinkage incentive. Option 1 is redundant and could expose the GDNs to greater risk if there is a greater variation in the volume driver than there is in shrinkage costs. Moreover the volume driver could reflect a duplication of a revenue adjustment to the GDNs.

*Greater cost reflectivity*

1.20. As discussed above if we were to implement option 1 GDNs would be exposed to variations in revenue associated with weather patterns rather than changes in underlying costs. The volume driver varies by 35 per cent however our analysis of

shrinkage costs for 2002-3 to 2006-7 (with forecast data for 2006-7) indicates that shrinkage costs have varied between 2 and 7 per cent of total transportation revenue<sup>22</sup>. The lack of cost reflectivity is likely to reduce the incentives on GDNs for efficiency which is not in the interests of consumers.

*Minimise implementation and enforcement costs*

1.21. Option 2 would result in less price control complexity than option 1 in terms of calculating allowed revenues. It also places an additional burden on the GDNs and Ofgem in terms of implementing, monitoring and auditing the drivers.

## Conclusion

1.22. Table A19.1 below summarises the impact of the two options for volume driver. Our initial proposal is that option 2 is the appropriate way forward.

**Table A19.1 - Summary of the impact of the options for the volume driver**

	Criteria		
	Minimise uncertainty over costs	Greater cost reflectivity	Minimise implementation and enforcement costs
Option 1 – retain volume driver	No effect	✘	✘
Option 2 – remove volume driver	No effect	✓	✓

<sup>22</sup> For the purposes of the analysis total transportation revenue is the sum of annual capex, opex (including pensions and shrinkage) and repex costs and excludes other costs such as licence fees, rates, k factor adjustments etc.