

April 2013

**National Grid Gas
(NTS) System Operator
Incentives –
Supporting Information
Version 5.0**

UK Gas Transmission



nationalgrid

THE POWER OF ACTION

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Version Control

Version Number	Date of Publication	Changes Made
1.0	October 2009	First issue
2.0	May 2010	Update for incentive schemes in place from April 2010
2.1	August 2010	Update of 2009/10 incentive scheme performance
3.0	June 2011	Update for incentive schemes in place from April 2011
4.0	April 2012	Update for incentive schemes in place from April 2012
5.0	April 2013	Update for incentive schemes in place from April 2013

Section 1

Introduction

1.1 Introduction to Gas System Operator Incentives

1. National Grid Gas (National Grid) operates the high pressure Gas Transmission System (NTS) in Great Britain. This System Operator (SO) function is subject to Licence¹ obligations and a number of financial incentive arrangements. These incentive arrangements encourage National Grid to minimise the overall cost of system operation to consumers, to consider environmental impacts and to support the efficient operation of the wholesale gas market.
2. These arrangements are designed to encourage National Grid to deliver outputs which provide benefits to the industry and consumers. These benefits include direct financial benefit from reductions in the costs associated with operating the gas transmission network and other benefits from meeting key performance measures (such as through improved information provision to the market).
3. The various incentive schemes provide a focus on key areas where National Grid is able to create value for the industry and consumers, allowing National Grid to retain a share of any value created (or to be penalised should targets not be met).

1.2 Background to this Document

4. This document has been produced following feedback received through responses to consultation papers and industry events. This document summarises the Gas SO Incentive Schemes applicable from April 2013.

1.3 Summary of Incentive Development for 2013/14

5. All seven of the existing incentives were reviewed for 2013 as part of the review of the SO Incentives from 2013 onwards for the RIIO-T1 period 2013 to 2021.
6. Four financial schemes have been retained (NTS Shrinkage, Residual Balancing, Day Ahead Demand Forecasting and Greenhouse Gas Emissions) and supplemented with two new financial schemes covering Maintenance activities and a further Demand Forecasting scheme in respect of the D-2 to D-5 forecasts.
7. However, the existing financial schemes for Operating Margins (OM) and Data Publication have been replaced with new licence obligations:
 - 7.1. Operating Margins² – requirement for National Grid to procure OM in an economic and efficient manner, to report on its annual procurement and to promote competition in its provision.

¹ The National Grid Gas plc Gas Transporter Licence in respect of the NTS

² Special Condition 8C: Procurement of Operating Margins

- 7.2. Data Publication³ – requirement for National Grid to publish key assumptions in development of future energy scenarios, publish winter & summer outlooks and publish operational data.
8. The UAG (Unaccounted for Gas) licence obligation to continue witnessing meter validations and carry out data centred investigations into the causes of UAG has been retained for the duration of the RIIO-T1 period 2013 to 2021.

1.4 Feedback and Contact Details

9. We welcome any feedback on this document including suggestions for additional information to incorporate.
10. Contact details and further information on Gas SO Incentives can be found on the National Grid website via the below link:

<http://www.nationalgrid.com/uk/Gas/soincentives/>

³ Special Condition 8F: Provision of information

Section 2

Financial Incentive Schemes from 1 April 2013

2.1 Summary of Current Financial Incentives

11. The following pages provide a summary of the current shallow financial SO incentive schemes which are listed in the table below:

Document Section	Financial Incentives
2.2	Demand Forecasting
2.3	Greenhouse Gas (GHG) Emissions from Compressors
2.4	Residual Balancing
2.5	NTS Shrinkage
2.6	Maintenance

2.2 Demand Forecasting

Purpose: to incentivise improvements in the accuracy of the Demand Forecasts issued by National Grid.

12. National Grid publishes national gas demand forecasts over a range of timescales. For 2013/14 the existing 'Day Ahead' scheme measuring accuracy (the absolute difference between the forecast and actual demand) has been supplemented with an additional scheme measuring the accuracy of the forecasts issued at two, three, four and five days ahead ('D-2 to D-5') of the gas day.
13. In respect of the **Day Ahead scheme**, in 2013/14 National Grid has an incentive target of an annual average absolute forecast error of 8.5mcm with an adjustment for the level of short-cycle storage injection capability as explained below. This incentive has been set for eight years commencing 1st April 2013.
14. The daily forecast error is calculated as the difference (in mcm) between the day ahead forecast NTS throughput value and the actual throughput value on the appropriate day of the year. The annual average absolute forecast error is the sum of the daily forecast errors which themselves are weighted according to the relevant day's demand as a proportion of annual demand in the relevant incentive year. Therefore forecasting accuracy on high demand days has a greater impact on performance than accuracy on lower demand days.
15. The incentive scheme parameters are summarised in the figure below.

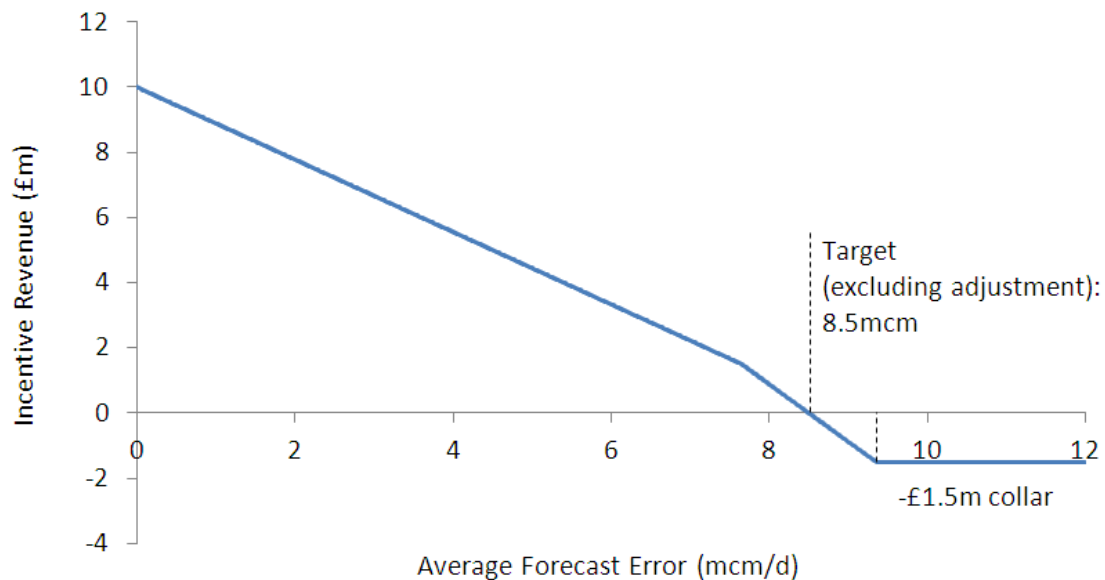


Figure 1a: Day Ahead Demand Forecasting Incentive

16. If National Grid has a demand forecast error below the target, an incentive payment will be received, however if the forecast error is greater than the target then an incentive penalty will be applied. The steeper slope of the line around the target indicates a stronger link between performance improvement and the incentive payment close to the target.

17. A forecast error of 0.85mcm below the target (7.65mcm) would mean National Grid earned £1.5m, and an error of 0.85mcm above the target (9.35mcm) would result in National Grid being penalised by the same amount. The latter represents the highest loss that National Grid is exposed to under this incentive. The maximum payment that National Grid can receive is £10m⁴.
18. To take account of the unpredictability of demand from short-cycle storage sites, an adjustment is applied in proportion to the additional injection capability at short-cycle storage⁵ in 2013/14 compared to a baseline value from 2012/13 (30.3mcm/day). The adjustment revises the day ahead demand forecasting target absolute error of 8.5mcm and is capped at additional 1mcm therefore the maximum demand forecasting target error for 2013/14 is 9.5mcm.
19. In respect of **the D-2 to D-5 scheme**, in 2013/14 National Grid has an incentive target of an annual average absolute forecast error of 16mcm. There is no adjustment for the level of short-cycle storage injection capability. This incentive has been set for two years commencing 1st April 2013.
20. The overall forecast error is equal to the average annual forecast error of the four timed forecasts for the incentive year. The annual error for each timed forecast is derived as the sum of daily forecast errors weighted according to the relevant day's demand as a proportion of annual demand in the relevant incentive year. From this perspective, accuracy on high demand days has a greater impact on performance than accuracy on lower demand days
21. The scheme parameters are summarised in the figure below.

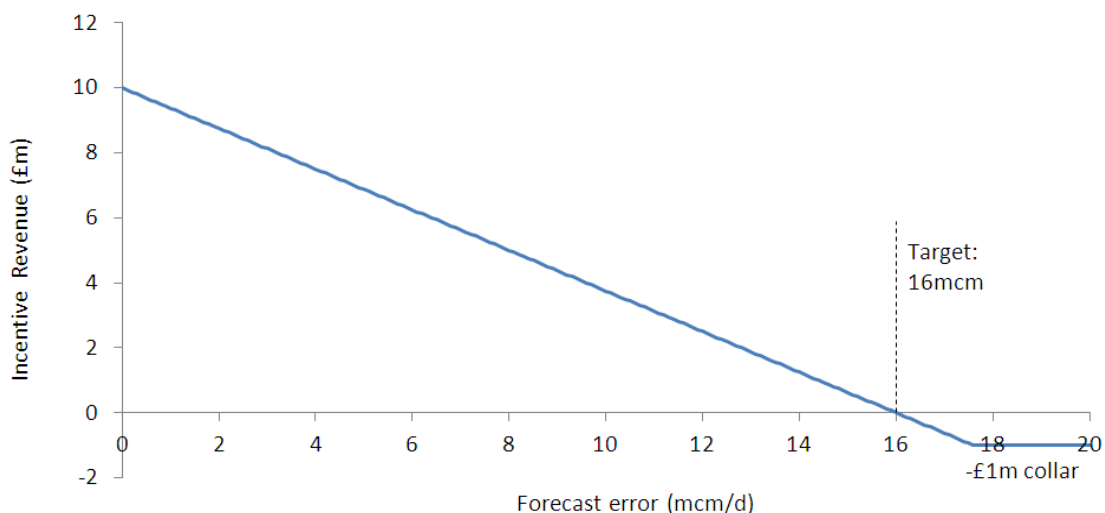


Figure 1b: D-2 to D-5 Demand Forecasting Incentive

⁴ A payment of this scale would require forecast error to be between zero and 1mcm (dependant on the target adjustment). A zero forecast error would mean a zero error on every daily forecast in the year.

⁵ Details of the storage sites that are utilised in the calculation are published on National Grid's website at: <http://www.nationalgrid.com/uk/Gas/soincentives/SupportingInfo/>

22. Similar to the Day Ahead incentive scheme, if National Grid's forecast error below the target, an incentive payment will be received, however if the forecast error is greater than the target then an incentive penalty will be applied.
23. A forecast error of 1.6mcm below the target (14.4mcm) would mean National Grid earned £1m, and an error of 1.6mcm in excess of the target (17.6mcm) would result in National Grid being penalised by the same amount. The latter represents the highest loss that National Grid is exposed to under this incentive. The maximum payment that National Grid can receive is £10m at zero forecast error.

2.3 Greenhouse Gas (GHG) Emissions from Compressors

Purpose: To incentivise the consideration of the environment when venting from NTS compressors

24. Compressors are utilised to increase pressures in parts of the NTS and to move gas from the sources of supply to areas of demand. The need to operate an individual compressor on any given day will depend on a number of circumstances including the sources of supply and demand, the prevailing network conditions, such as the current linepack distribution and the need to accommodate maintenance and construction plans.
25. The scheme incentivises National Grid to make the trade-off between choosing to depressurise compressor units (venting the gas within them) or to keep units on standby - which incurs costs associated with ancillary electrical equipment (vent fans, oil pumps etc) and leakage through the shaft seal. The incentive applies to both gas and electrically driven compressors.
26. The amount of natural gas vented from NTS compressors (in tonnes) results from a number of areas; namely starting a compressor, purging a compressor, depressurising a compressor or through the leakage of gas through compressor shaft seal. Under the incentive this amount is compared against a target.
27. This incentive has been set for three years commencing 1st April 2013. The incentive target for 2013/14 is 2,917 tonnes and for every tonne vented above this target, National Grid is subject to a penalty of approximately £1,269⁶. This is equivalent to £100,000 for every 79 tonnes vented above the target. As a 'downside only' scheme, National Grid does not receive any payment for target outperformance. The incentive scheme parameters are summarised in the figure below.

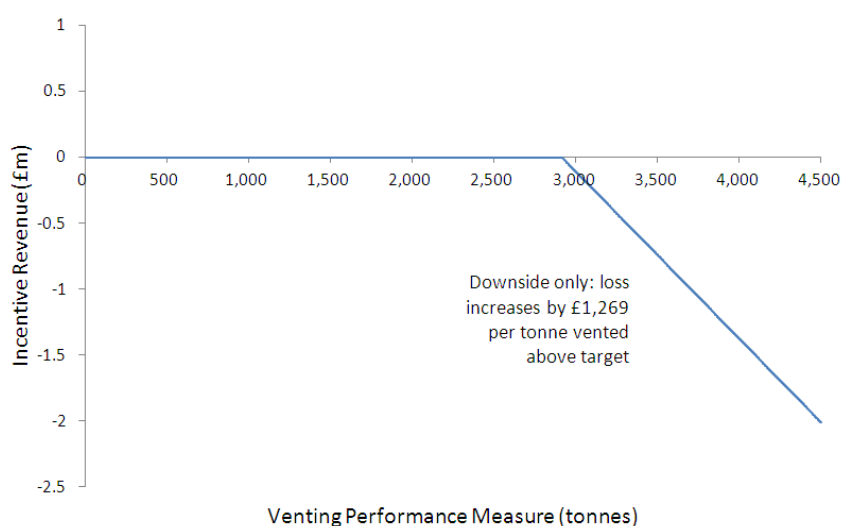


Figure 2: GHG Emissions from Compressors Incentive

⁶ Based upon the Non Traded Central Carbon Price as published by the Department of Energy and Climate Change and the venting equivalent factor that represents the number of tonnes of CO₂ equivalent.

2.4 Residual Balancing

Purpose: To incentivise the daily balancing of supply and demand whilst minimising the impact of any actions on market prices.

28. The incentive contains two elements; the Price Performance Measure (PPM) and the Linepack Performance Measure (LPM) and has been set for eight years commencing 1st April 2013.
29. The price element incentivises National Grid to execute any residual balancing trades at prices that are in a small range compared to the System Average Price (SAP) for the day. The PPM is defined as the difference between the highest and lowest prices at which National Grid trades divided by SAP. The target for 2013/14 is a price spread of 1.5% of SAP.
30. The linepack element incentivises National Grid to minimise any changes between starting and closing NTS linepack over a gas day (i.e. to achieve a balance between the supply and demand on the gas day). This is intended to ensure that any system imbalances are resolved on the relevant day, such that the costs of resolving any imbalances are targeted to those responsible for the imbalance. The target for 2013/14 is a linepack change of 2.8mcm.
31. The PPM and LPM each have their own incentive structures, which apply to each gas day in the year. The structure for the PPM is shown below.

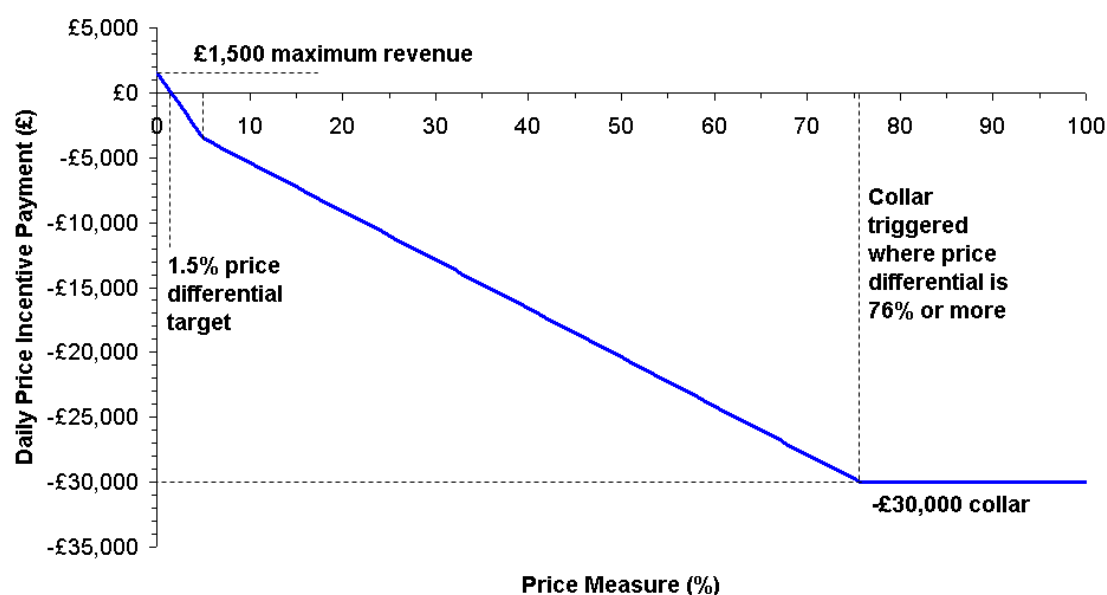


Figure 3a: Price Measure of the Residual Balancing Incentive

32. If the PPM is below 1.5% on a given gas day then National Grid receives an incentive payment up to a maximum of £1,500. Conversely if the PPM is above 1.5% then National Grid incurs a penalty up to a maximum of £30,000.
33. The incentive structure for the LPM is similar to that for the PPM and is shown below.

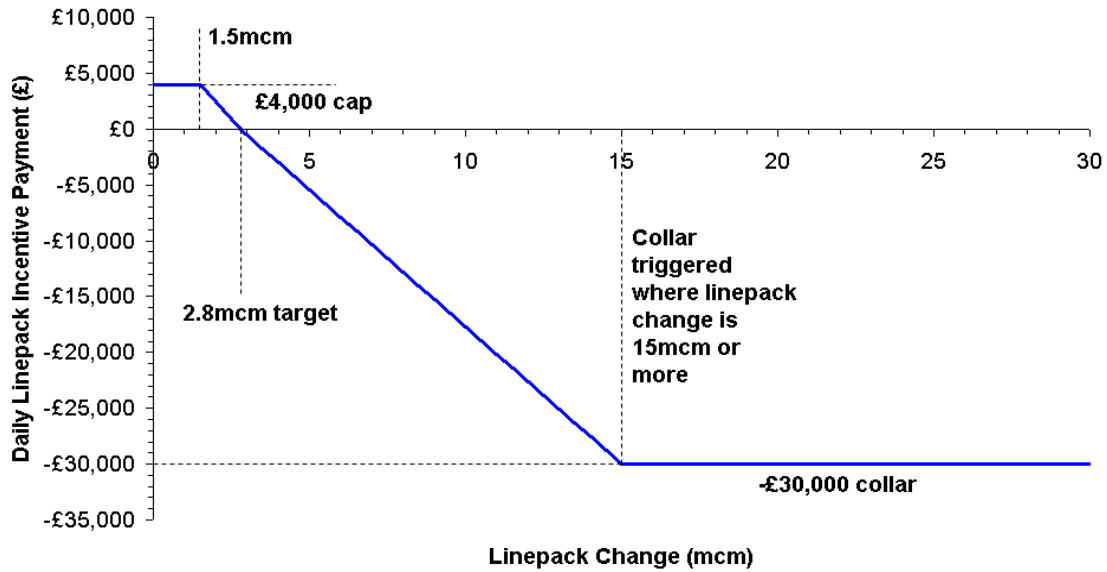


Figure 3b: Linepack Performance Measure of the Residual Balancing incentive

- 34. If the LPM is below 2.8mcm on a given gas day then National Grid receives an incentive payment up to a maximum of £4,000. This maximum applies at 1.5mcm, so there is no incentive for National Grid to balance the system beyond this point. Conversely if the LPM is above 2.8mcm then National Grid incurs a penalty up to a maximum of £30,000.
- 35. The sum of all of the daily payments for linepack and price performance under the Residual Balancing incentive are annually capped at £2m and collared at -£3.5m in 2013/14 as shown in the figure below.

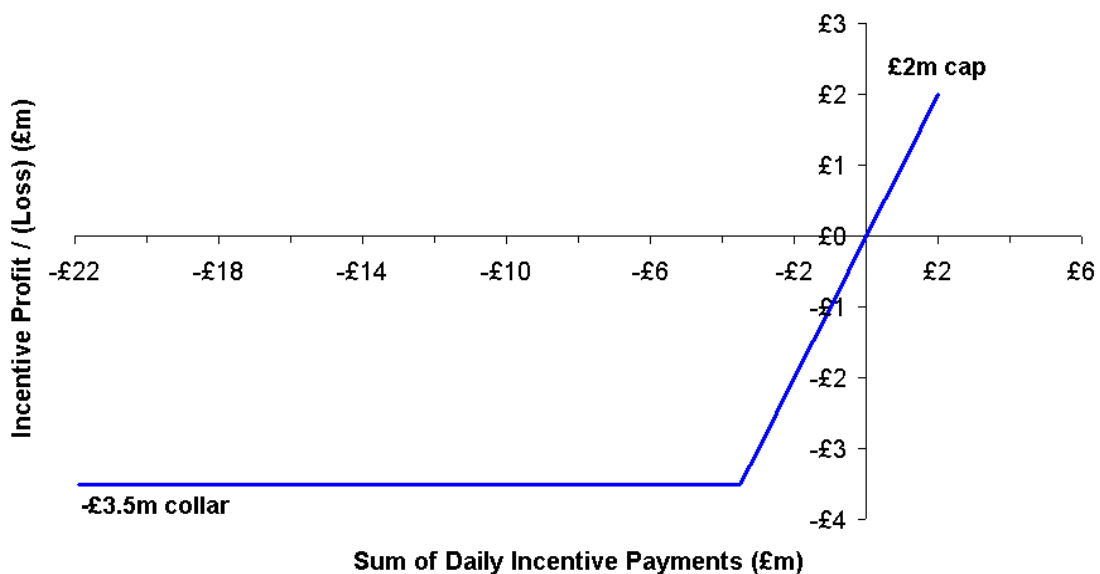


Figure 3c: Residual Balancing Incentive Parameters

2.5 NTS Shrinkage

Purpose: To incentivise an efficient overall cost of shrinkage through efficient system operation and energy procurement.

36. NTS Shrinkage covers the gas and electrical energy which is used in operating NTS compressors, and the gas that cannot be accounted for and billed in the measurement and allocation process. The components that comprise NTS Shrinkage are summarised as:
 - Compressor Fuel Use (CFU): The energy used to run compressors to transport gas through the NTS. For gas driven compressors this is Own Use Gas, for electric driven compressors this is Electric Compressor Energy;
 - Calorific Value (CV) shrinkage: The energy which cannot be billed due to the provisions of the Gas (Calculation of Thermal Energy) Regulations 1996 (amended in 1997); and
 - Unaccounted for Gas (UAG): The quantity of gas which remains after taking into account all measured inputs and outputs from the system, own use gas consumption, CV Shrinkage and the daily change in NTS linepack.
37. The form of the NTS Shrinkage incentive is a bundled cost minimisation incentive across all components of shrinkage, with a target principally derived from an energy procurement cost benchmark.
38. This 'Energy Procurement Target' is derived from a volume forecast and variance (the difference between the forecast and actual volume outturn). This is multiplied by gas and electricity reference prices for forwards procurement (of the forecast volume) and prompt procurement (of the variance volume) to derive a cost target. The volume forecast consists of CFU, CV Shrinkage and UAG volumes determined in accordance with an NTS Shrinkage Methodology Statement published by National Grid.
39. The overall cost target is also subject to:
 - An adjustment for comparison of outturn CFU and CV Shrinkage volumes compared to 'efficient' levels;
 - An allowance for the Transmission Network Use of System charges incurred in respect of electrically driven compressors; and
 - An adjustment for other shrinkage costs including environmental scheme compliance, electricity supply charges and other energy trading costs.
40. This incentive has been set for eight years commencing 1 April 2013. The incentive scheme parameters are summarised in the figure below.

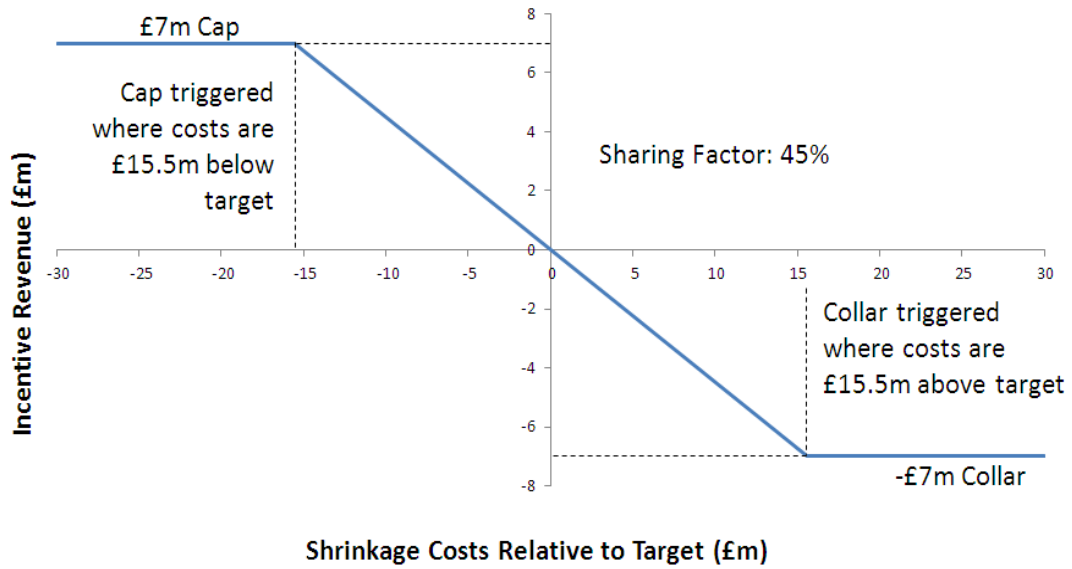


Figure 4: Shrinkage Incentive

41. If total spend against the incentive is below the target National Grid receives a payment equivalent to 45% of the under spend, subject to a limit of £7m. Conversely, if total spend against the incentive is in excess of the target, National Grid incurs a penalty of 45% of the overspend, subject to a limit of £7m.

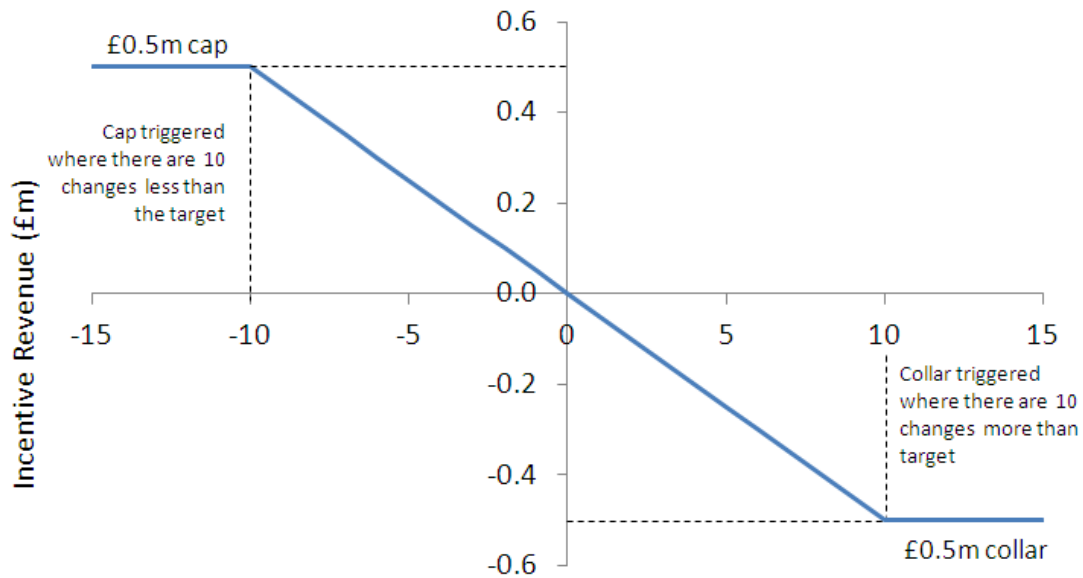
2.6 Maintenance

Purpose: To incentivise the efficient planning and execution of network maintenance impacting customers at direct exit connections⁷ from the NTS.

42. In order to ensure the ongoing reliability and integrity of the NTS in line with regulatory and safety requirements, National Grid is required to periodically undertake maintenance of the pipeline system. Where the conduct of this work requires an outage, or to reduce the flexibility available (e.g. where steady gas flows may be required) at one or more direct exit connections, National Grid may 'call' one or more 'Maintenance Days' in accordance with the Uniform Network Code (subject to any site specific limitations).
43. To enable customers to make any necessary arrangements, National Grid is required to provide advance notice of its intention to call Maintenance Days in the form of a Maintenance Plan. From 1 April 2013 National Grid is subject to a new Maintenance Incentive with two distinct schemes, one incentivising the minimisation of National Grid initiated changes to the plan and the other incentivising the minimisation of the use of Maintenance Days to perform the required maintenance. Both schemes have been set for two years.
44. In respect of the **Changes Scheme**, in 2013/14 the target number of Maintenance Days⁸ subject to change initiated by National Grid is equal to 14.5% of the Maintenance Days workload within the year. Incentive performance is derived from a comparison between the target and the actual number of Maintenance Days subject to change. Changes within scope include changes to dates (including reduction or increases to the number of days for a specific job) or cancellation of days.
45. If the actual number of days changed is equal to target then incentive revenue is zero. If the actual number of days changed is less than the target then a payment of £50,000 per change below target is accrued up to a scheme cap of £0.5m (for 10 changes or more below target). If the actual number of days changed exceeds the target then a penalty of £50,000 per change in excess of the target is accrued to a scheme collar of -£0.5m (for 10 changes or more above target). The incentive scheme parameters are summarised in the figure below.

⁷ Direct exit connections to the NTS include individual NTS Supply Points and NTS Connected System Exit Points, but exclude offtakes to Distribution Networks.

⁸ Where a single maintenance activity affects multiple NTS Exit Points on a day, this is construed as a single Maintenance Day for the purposes of the Maintenance Incentives.



Number of Changes Initiated by National Grid Compared to Target

Figure 5a: Changes Scheme of the Maintenance Incentive

46. The **Use of Days Scheme** incentivises National Grid to minimise the number of Maintenance Days it uses to undertake in line inspections and valve operations. In 2013/14 National Grid has an annual incentive target (in days) comprised of the sum of benchmark durations as follows:
- Valve Operations – an annual target of 44.65 days (reflecting the relatively stable workload levels for this activity);
 - Short in-line inspections (for pipeline lengths of 10km or less) – a target per inspection undertaken within the year of 4.23 days; and
 - Long in-line inspections (for pipeline lengths exceeding 10km) – a target per inspection undertaken within the year of 5.53 days.
47. Incentive performance is then derived from a comparison between the target and the actual number of Maintenance Days used by National Grid. If the actual number of days used is equal to target then incentive revenue is zero. If the actual number of days used is less than target then a payment of £20,000 per day below target is accrued up to a scheme cap of £1m (for 50 days or more below target). If the actual number of days used exceeds the target then a penalty of £20,000 per day in excess of the target is accrued to a scheme collar of £1m (for 50 days or more above target). The incentive scheme parameters are summarised in the figure below.

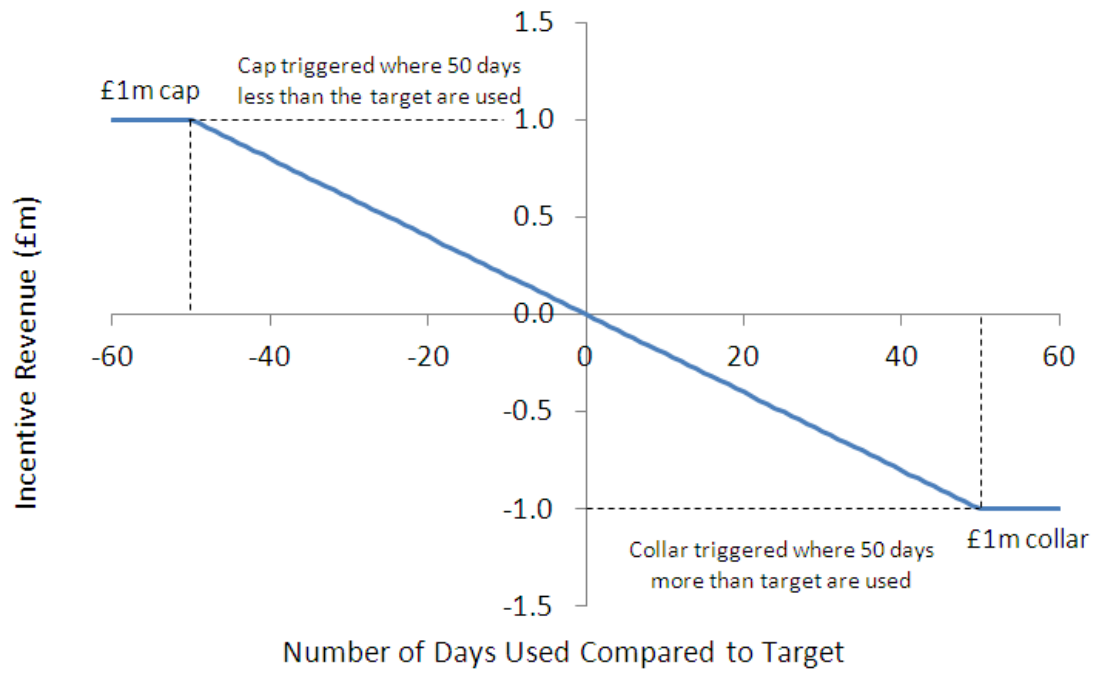


Figure 5b: Use of Days Scheme of the Maintenance Incentive

Section 3

Incentive Performance

3.1 Quarterly Reports

48. Since December 2008, National Grid has published quarterly information on incentives on its website at:

<http://www.nationalgrid.com/uk/Gas/soincentives/Performance+Reporting/>

3.2 Summary of Past Performance

49. Feedback received through responses to consultation papers and industry events identified a requirement for information on incentive performance from previous years. The tables below have therefore been produced to summarise National Grid's incentive performance for the last five incentive years (where available).
50. Please note that incentive schemes often change from year to year so consideration should be given to this when comparing performance figures across years.

Demand Forecasting Incentive

Incentive Year	Incentive Target	Performance	Incentive Performance
2007/08	4.0%	2.77%	£3.66m
2008/09	3.5%	2.65%	£3.14m
2009/10	3.0%	2.66%	£2.1m
2010/11	2.85%	2.75%	£1.02m
2011/12	2.75%	3.37%	(£1.6m)

Operating Margins Incentive

Incentive Year	Incentive Target	Performance	Incentive Performance
2007/08	£25.91m	£26.12m	(£0.21m)
2008/09 ⁹	£20.81m	£18.36m	£2.45m
2009/10 Utilisation	£0.27m	£0.02m	£0.25m
2009/10 Holdings	n/a ¹⁰	£17.10m	n/a
2010/11	n/a ¹¹	£17.11m	n/a
2011/12	£17.32m ¹²	£15.52m	£0.36m

⁹ 2008/09 data is an aggregation of the utilisation and holding elements of the scheme which were introduced this year.

¹⁰ Operating Margins holdings costs subject to pass through in 2009/10

¹¹ Operating Margins costs subject to pass through in 2010/11

¹² Operating Margins incentive in operation in 2011/12

Greenhouse Gas Emissions Incentive

Incentive Year	Incentive Target	Performance	Incentive Performance
2008/09	2,086 tonnes	1,850 tonnes	£0.058m
2009/10	1,977 tonnes	1,634 tonnes	£0.140m
2010/11	3,007 tonnes	3,347 tonnes	(£0.209m)
2011/12	3,007 tonnes ¹³	3,000 tonnes	£0

Data Publication Incentive

Incentive Year	Incentive Target		Performance		Incentive Performance
	Availability	Timeliness	Availability	Timeliness	
2007/08	99.86%	75%	98.74%	93.3%	£0.46m
2008/09	99.3%	90.5%	99.9%	88.9%	£0.06m
2009/10	99.3%	90.5%	99.7%	87.8%	£0.05m
2010/11	99.3%	90.5%	99.66%	91.63%	£0.06m
2011/12	99.3%	90.5%	95.18%	76.75%	(£0.01m)

Residual Balancing Incentive

Incentive Year	Incentive Target (daily)		Performance (average, all days in year)		Incentive Performance
	Price	Linepack	Price	Linepack	
2007/08	10%	2.4 mcm	2.63%	2.49 mcm	£1.41m
2008/09	10%	2.4 mcm	2.22%	2.41 mcm	£1.54m
2009/10	5%	2.8 mcm	2.90%	1.97 mcm	£1.63m
2010/11	2.5%	2.8 mcm	1.58%	2.05 mcm	£0.95m
2011/12	1.5%	2.8mcm	1.57%	2.46mcm	£0.252m

Shrinkage Incentive

Incentive Year	Incentive Target	Performance	Out-performance	Incentive Performance
2007/08	£127.0m	£79.4m	£47.6m	£4m
2008/09	£140.4m	£149.5m	(£9.1m)	(£0.06m)
2009/10	£246.4m	£139.4m	£106.9m	£5m
2010/11	£139.3m	£114.1m	£25.2m	£5m
2011/12	£124.6m	£94.7m	£29.9m	£5m

¹³ Target quoted is mid-point between upper and lower limit (deadband)

UAG

Incentive Year	Incentive Target	Performance	Incentive Performance
2009/10	2,862 GWh	7,716 GWh	£0m
2010/11	2,862 GWh	6,313 GWh	£0m
2011/12	2,862 GWh	4,812 GWh	£0m

Section 4

Impact of Incentive Payments on Charges

Feedback received indicated that publishing a standing item on the link between incentive revenues and charges faced by Users would be helpful. Therefore, this section summarises the impact of incentive payments on the SO commodity charge.

51. National Grid's incentive payments are recovered from shippers through the SO commodity charge, which National Grid has a reasonable endeavours obligation to only set twice a year on the 1st April and the 1st October.
52. For the financial year 2011/12 the incentive revenue from all of the shallow incentive schemes amounted to 1% of the total SO commodity charge.

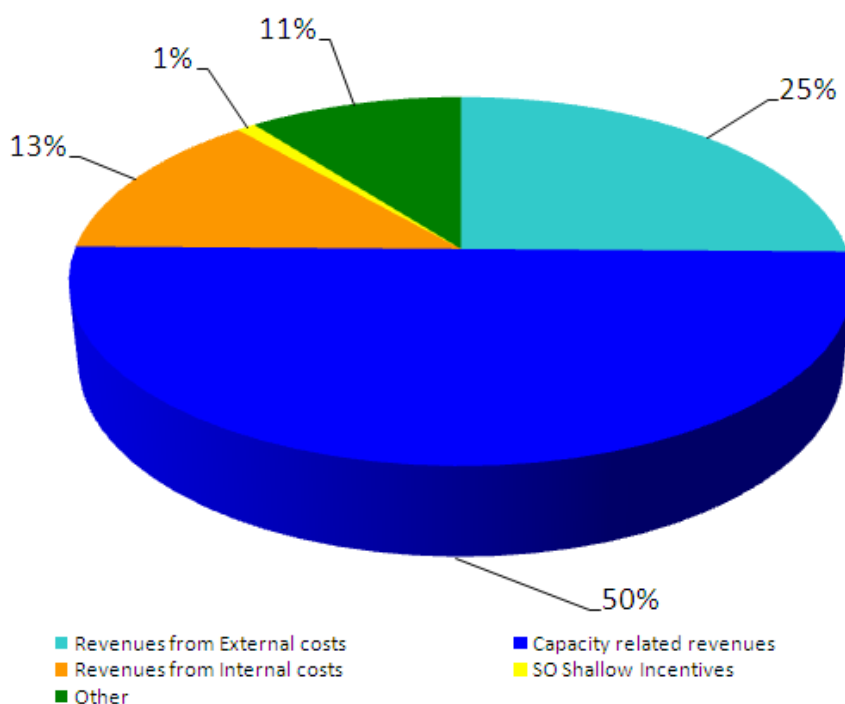


Figure 6: 2011/12 SO Commodity Charge

53. National Grid publishes a quarterly update on charges report, which contains either the actual SO commodity charge or the latest forecast of the charge. This report also includes supporting data on how these charges have been calculated and can be found (with previous versions) on the National Grid website.

54. As a rule of thumb, an increase of £2m in the costs recovered through the SO commodity charge would correspond with an increase in the SO commodity charge of approximately 0.0001p/kWh applied to both entry and exit flows.
55. For an 11GWh (~1 mcm/d) peak-day load with an annual load factor of 50% a £1m increase in incentive revenues would equate to an increase in the SO commodity charge on exit allocations of approximately £2000. As the SO commodity charge is levied on both NTS Entry and NTS Exit allocations, the total increased costs to a shipper in this example would be £4000. The impact on an individual consumer's bill will depend on the nature of its contractual relationship with its shipper/supplier.