

Gas external balancing- System Operator incentive scheme

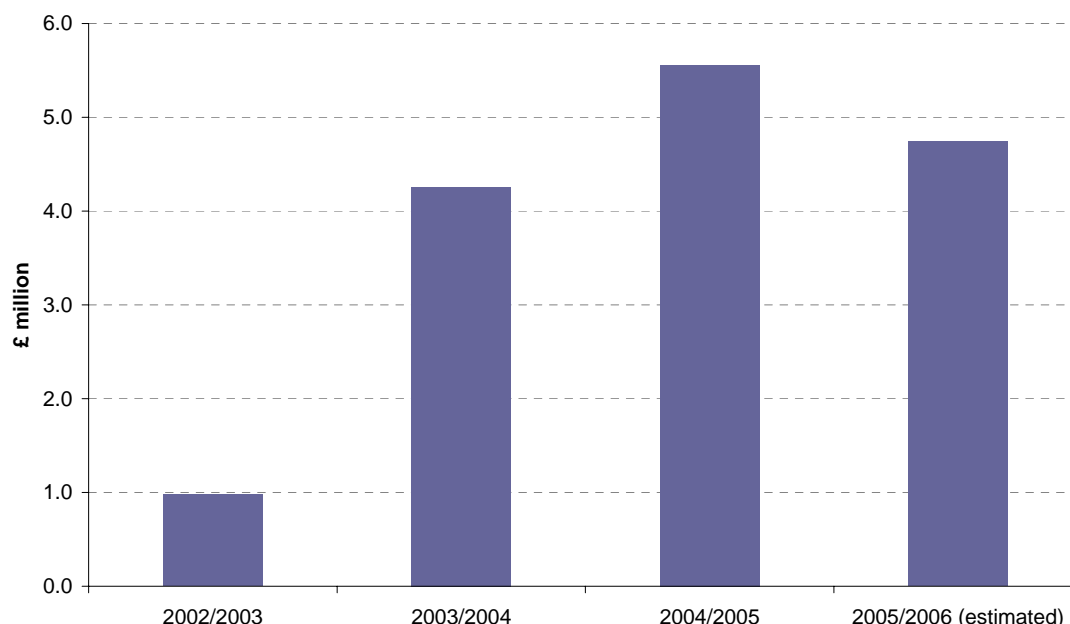
Summary of incentive schemes

There are a number of external SO cost incentive schemes in the gas market but several of these are being considered as part of National Grid Gas' (NGG) transmission price control since they relate to longer term, investment incentives¹. Consequently, this annex concentrates on the four day-to-day incentive schemes, namely:

- Two **residual gas balancing incentives**, which cover (1) the price at which NGG takes residual balancing actions and (2) the stability of the linepack within the national transmission system (NTS); and
- Two **system balancing incentive**, which target the costs of gas (1) lost due to shrinkage (losses) and (2) held in storage by NGG to provide system gas reserve.

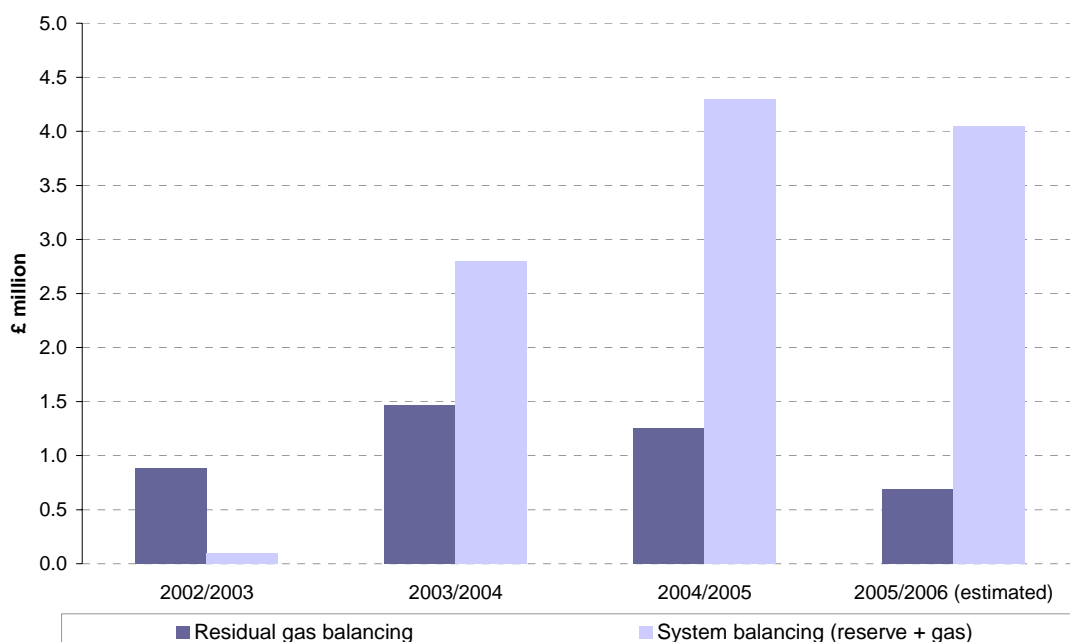
Figure B.1 shows the total incentive payments earned by NGG for each year from 2002/2003 to 2005/2006, while Figure B.2 shows the contribution of each of the two incentive schemes listed above to the total payments. In the last three years, the bulk of NGG's incentive payments have come from the system balancing incentive. For example, in 2004/05 the system balancing incentive payments were nearly four times greater than the residual balancing incentive payments.

Figure B.1: Annual incentive scheme NGG share for incentive categories reviewed



¹ For more information on both NGG's performance on these incentives, and views on the future development of these schemes, see Transmission Price Control Review: Initial Proposals, Ofgem, June 2006, 104/06, http://www.ofgem.gov.uk/temp/ofgem/cache/cmsattach/15505_10406.pdf.

Figure B.2: Annual incentive payments by incentive scheme



There have been 2 two year incentive scheme periods since 2002: the first ran from 2002/03 to 2003/04 and the second from 2004/05 to 2005/2006 and running until 2006/07.

Question B.1: Are the form and scope of the incentive schemes still appropriate?

Question B.2: Should future incentives continue to last for two years or should they be shorter or longer?

Residual balancing incentives

As outlined above, there are two residual balancing incentives relating to:

- Price Performance Measure: this incentivises NGG to maintain the price of the gas it buys or sells for residual balancing reasons for balancing actions as close to the market prices as possible (as measured by the system average price; and
- Linepack: this incentivises NGG to minimise changes in the end of day linepack.

The incentive payments related to each component are initially calculated on a daily basis. However, at the end of the year, both sets of daily incentive payments are combined into an annual total, which is subject to a cap (+£3.5m) and a floor (-£3.5m).

Daily Price Performance Incentive

Under this scheme, NGG is incentivised to minimise the daily residual balancing Price Performance Measure (PPM). The PPM is calculated daily from the spread, between the highest and lowest prices offered by the SO when performing eligible balancing action on the within-day gas market. This spread is expressed as a percentage of the System Average Price (SAP). The PPM is used to determine the daily incentive payments using a sliding scale form of incentive. Figure B.3 shows the current scheme. If the PPM is less than 10% then NGG makes a profit, capped at £5,000, and if it is greater than this, then NGG makes a loss, limited to -£30,000. The slope of the incentive payments is slightly different for gains and losses.

Figure B.3: Price Incentive Payment Function

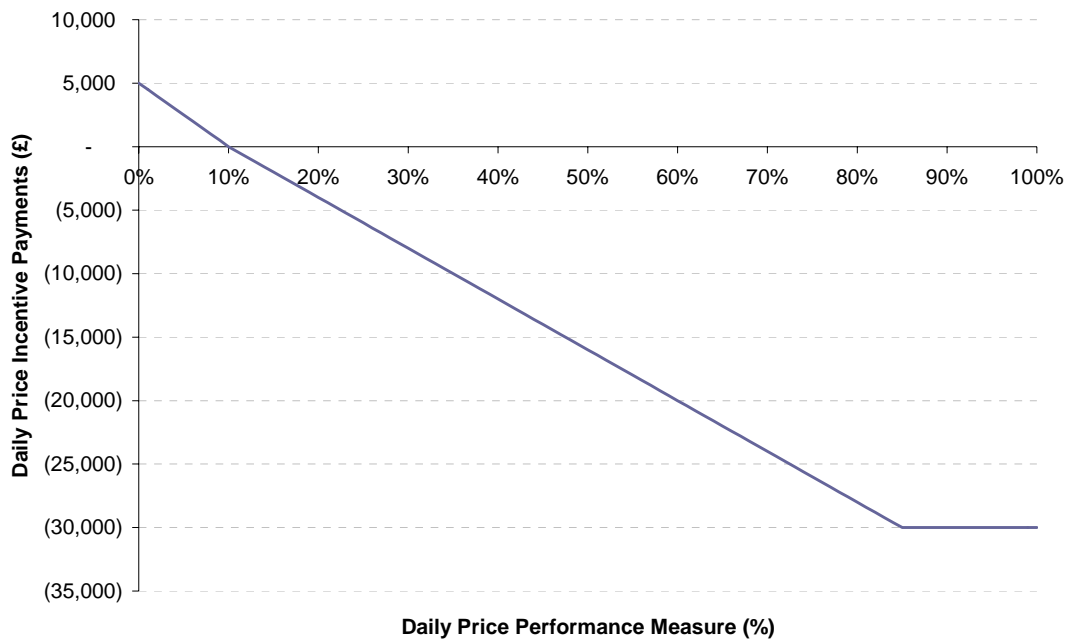
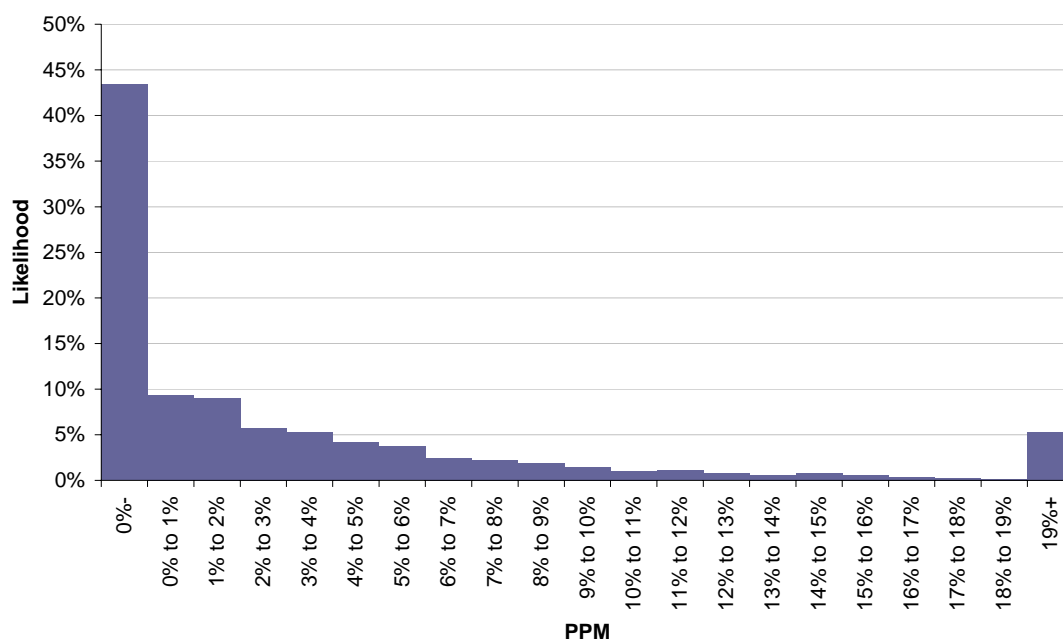


Figure B.4 shows the historical PPM distribution based on data from 2002/03 to 2005/06. NGG has made profits under this incentive scheme on 89% of days and has achieved the maximum gain i.e. PPM=0%, on over 40%. This could indicate a large number of days in which NGG took no balancing action, as in that case the difference between the maximum and minimum balancing action offer prices default to zero.

Figure B.4: Historical probability distribution of PPM, 2002/2003 to 2005/2006



Despite strong improvement from 2002/2003 to 2003/2004, NGG's performance, as measured by the number of days on which it makes a gain, under this incentive scheme has worsened over time (see Table B.1). In particular, performance dropped significantly in 2005/2006. It is possible that this drop in performance is the result of a combination of increased balancing action in 2005/2006, as suggested by trade volumes, and higher market volatility.

Table B.1: Comparison of PPM performance, 2002-2006

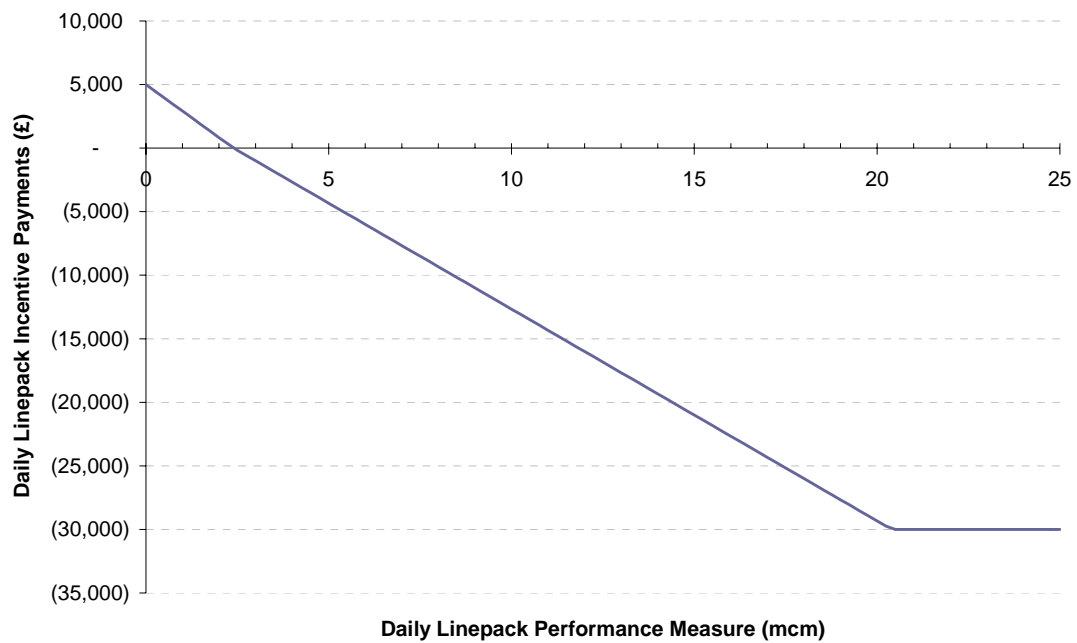
Financial Year	NGG total trade volume (TWh)	SAP day-on-day volatility	Probability of reaching or exceeding PPM target	Standard deviation, PPM	Median, PPM	Average, PPM
2002/2003	10.2	16%	92.10%	7.03%	1.50%	3.59%
2003/2004	6.2	13%	93.90%	7.05%	0.55%	2.87%
2004/2005	4.8	11%	89.30%	7.15%	0.00%	3.34%
2005/2006	6.0	17%	80.50%	11.71%	1.12%	6.38%
Overall	27.2	14%	88.90%	8.58%	0.73%	4.04%

Linepack incentive

The linepack incentive is similar in structure to the PPM incentive, and has the same daily cap and floor, but, in this case, NGG's performance is measured by the Linepack Performance Measure (LPM). The LPM is the absolute value of the change in linepack, in mcm, between the start and close of the day.

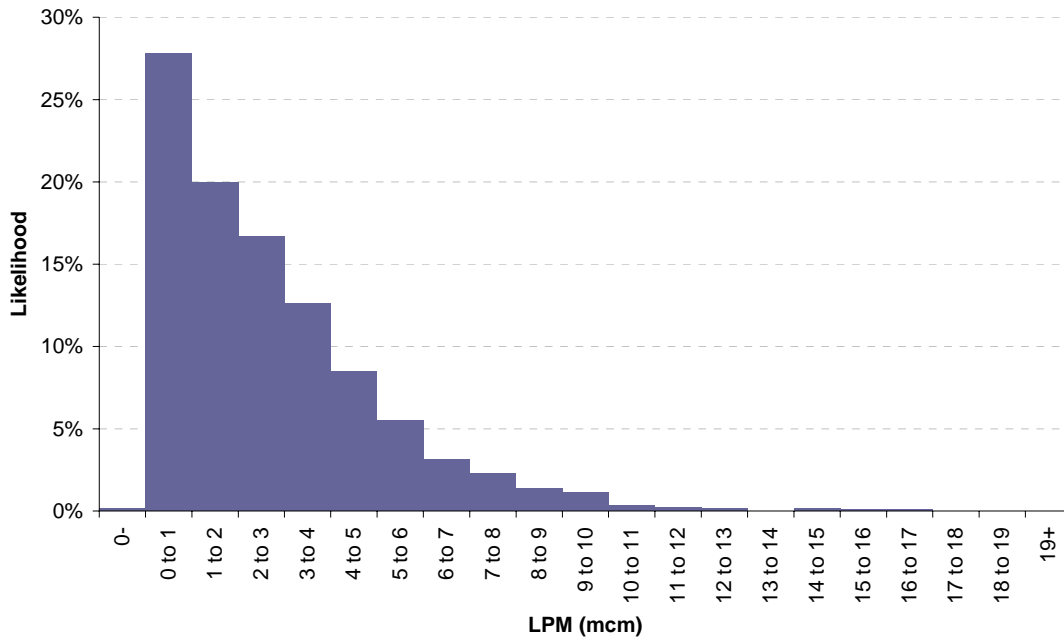
Figure B.5 illustrates the current scheme. If the change in linepack is less than 2.4 mcm, then NGG receives a payment whilst if the change is greater than this it has to make a payment. As in the PPM incentive, the slope of the incentive payments is slightly different for gains and losses.

Figure B.5: Linepack Incentive Payment Function



NGG has made fewer gains under the LPM incentive than under the PPM incentive, as Figure B.6 shows. On only 55% of days, has NGG received a payment and it has never received the maximum daily payment.

Figure B.6: Historical probability distribution of LPM, 2002/2003 to 2005/2006



NGG’s performance has remained relatively stable over time, as shown by Table B.2. NGG has suggested that the day-to-day management of linepack is largely driven by operational requirements, with the incentive scheme having little impact.

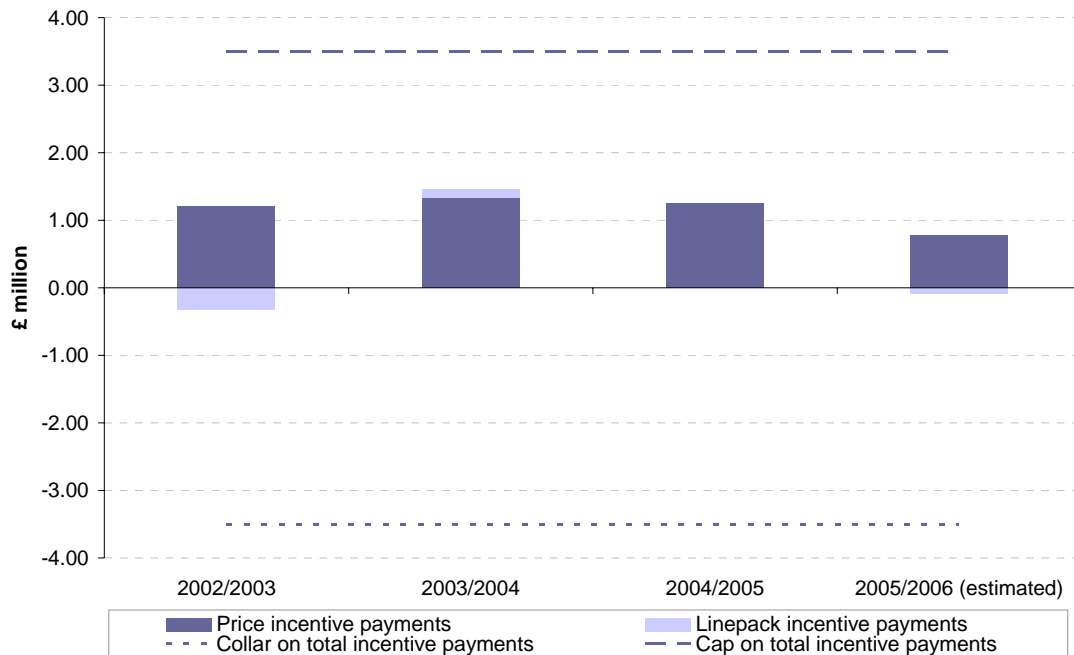
Table B.2: Comparison of LPM performance, 2002-2006

Financial Year	Probability of reaching or exceeding LPM target	Standard deviation, LPM (mcm)	Median, LPM (mcm)	Average, LPM (mcm)
2002/2003	50.20%	2.63	2.39	3.09
2003/2004	62.80%	2.20	1.92	2.39
2004/2005	55.40%	2.08	2.11	2.57
2005/2006	54.00%	2.28	2.15	2.71
Overall	55.00%	2.32	2.11	2.69

Overall residual balancing incentive

Figure B.7 shows how the payments under the PPM and LPM incentives have combined to yield overall residual balancing incentive payments in relation to the collar and cap on total residual balancing incentive payments.

Figure B.7: Annual residual gas balancing incentive payments, collar and cap



Over the past four years, incentive payments have remained well within the cap and floor. As indicated above, the majority of residual balancing incentive payments are attributable to the PPM incentive. Indeed in two years (2002/03 and 2005/06), NGG made a loss under its LPM incentive. Overall, the payments have remained broadly constant at around £1m.

Question B.3: Are daily incentive payments, subject to annual cap and floor, still appropriate?

Question B.4: Are both residual balancing incentive schemes still required?

System balancing incentives

As outlined above, there are two components to the system balancing incentive payments:

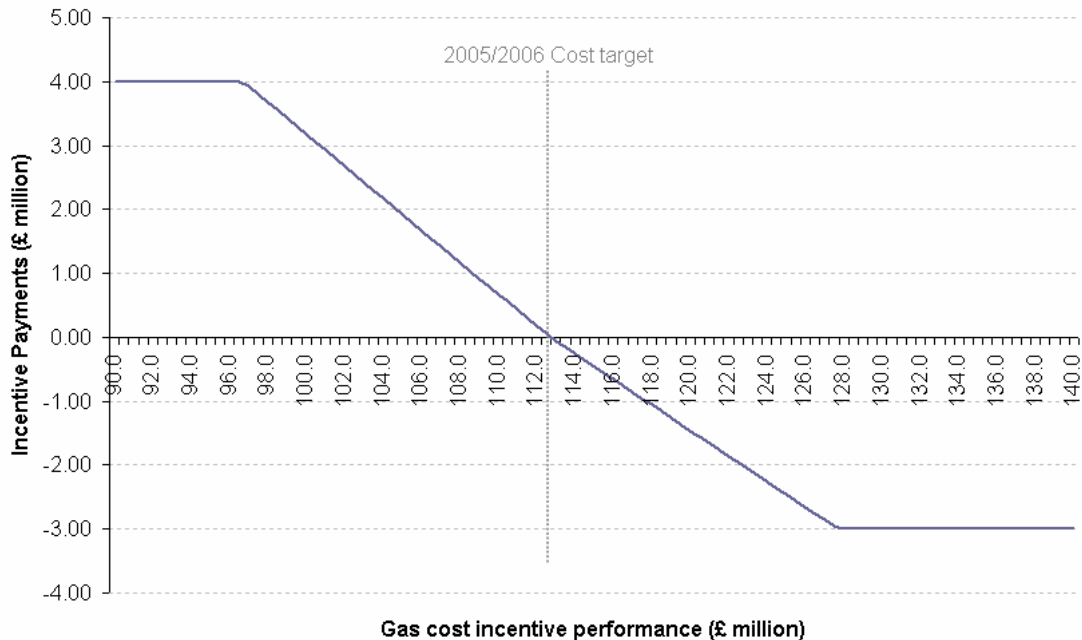
- **Gas cost incentive:** targets the costs of:
 - Provision for gas lost from shrinkage, including gas used in compressors and losses; and
 - Operation of electric NTS compressors.
- **System reserve incentive:** targets the cost in respect of storage capacity (or at import terminals) that has been booked or used for the purposes of satisfying OM requirements

Unlike the residual gas balancing incentives, the system balancing incentives work on an annual basis. However, they are also sliding scale incentives although the system reserve incentive has 100% sharing factors and no cap or floor.

Gas cost incentive

The structure of the current gas cost incentive scheme is shown in Figure B.8.

Figure B.8: Gas cost incentive performance



The incentive target for each year is indexed to gas market prices through the gas reference price, which is applied to a target shrinkage volume. The gas reference price for incentive years 2002/2003 and 2003/2004 was defined in the SO license based on forward prices at the time. The gas reference price for incentive years 2004/2005 and 2005/2006 is calculated from the average of the prices of quarterly forward products from the previous year, volume weighted by total shipper net flows into the NTS from beach and storage terminals (net of injections) from two years previously.

As a result of this indexation, the gas cost performance target has risen year-on-year with UK forward gas prices. Although NGG's gas costs have also increased for the same reason, Table B.3 shows that NGG has received the maximum possible incentive payment (cap) of £4 million every year since 2003/2004.

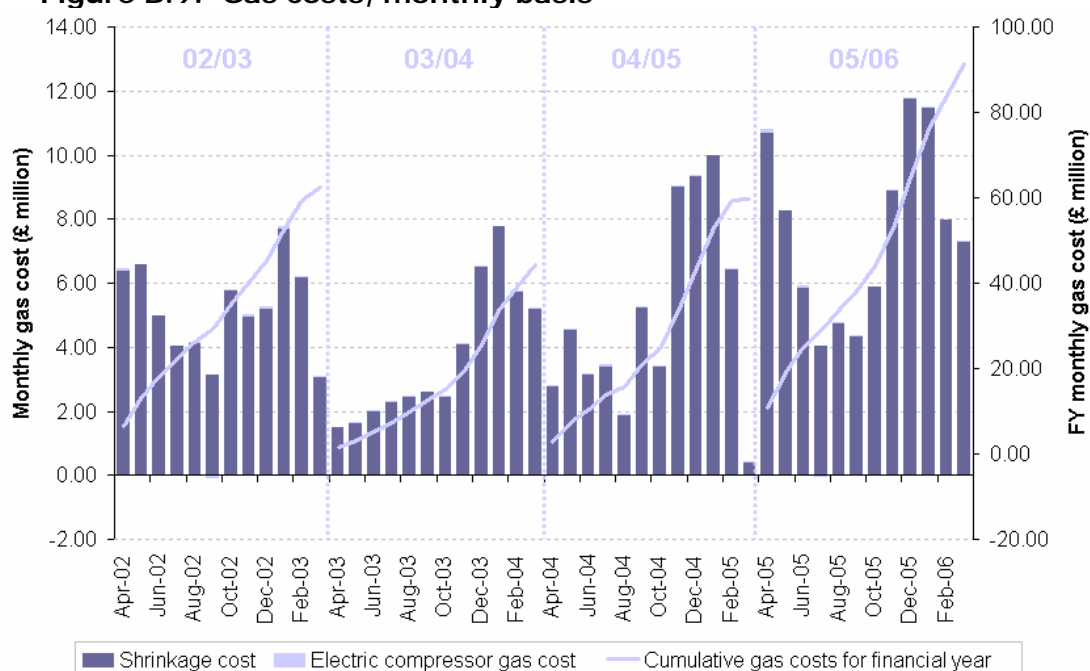
Table B.3 - Annual gas cost incentive payments, NGG share

Year	Gas cost reference price (p/kWh)	Target (£ million)	Costs (£ million)	Incentive payments (£ million)
2002/2003	0.70	58.5	62.4	-0.8
2003/2004	0.71	61.9	44.4	4.0
2004/2005	0.91	82.6	59.7	4.0
2005/2006	1.25	112.7	91.4	4.0
Overall	N/A	315.7	257.9	11.2

According to NGG, the cost £0.8 mn borne in 2002/2003 was due to the higher use of gas-powered compressors than anticipated, namely due to higher-than-expected quantities of gas landing at the northern terminals, thus having to be transported to the major demand centres and export point in the South. In response to this, NGG adjusted its operational strategies in relation to shrinkage, including improving operation modelling, reconciling of a number of metering errors and improving of metering standards. These actions, combined with strong trading performance, resulted in better performance and high incentive payments in the following years.

Due to the nature of the prompt gas market, there is significant seasonality in the costs of shrinkage within year. Figure B.9 shows gas costs on a monthly basis, and indicates that there is significant difference in the cost of gas from summer to winter.

Figure B.9: Gas costs, monthly basis



System reserve incentive

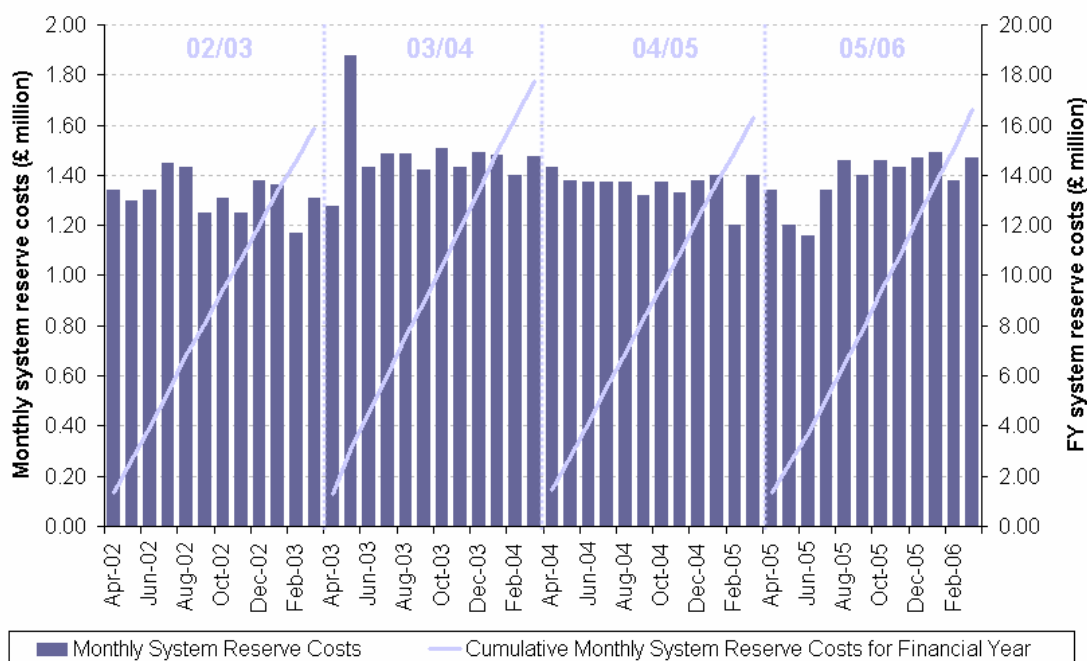
Table B.4 shows that NGG's target cost has remained essentially constant over the last four years and that NGG exposure under this scheme has been limited – it has either made modest gains or losses.

Table B.4 – System reserve incentive payments, NGG share

Year	Target (£ million)	Costs (£ million)	Over(+) or under(-) performance (£ million)
2002/2003	16.8	15.9	0.9
2003/2004	16.6	17.8	-1.2
2004/2005	16.6	16.3	0.3
2005/2006	16.6	16.6	0.0
Overall	66.6	66.6	0.0

Figure B.10 shows NGG's system reserve cost on a monthly basis. Apart from the spike in May 2003, these have been relatively constant over time with little discernable seasonality. The May 2003 spike was caused by NGG having to acquire gas within Grain LNG in order to cover its Operating Margins obligations for winter 2004/2005 because of low injection rates at Grain during summer 2004, due to the import project works during that period.

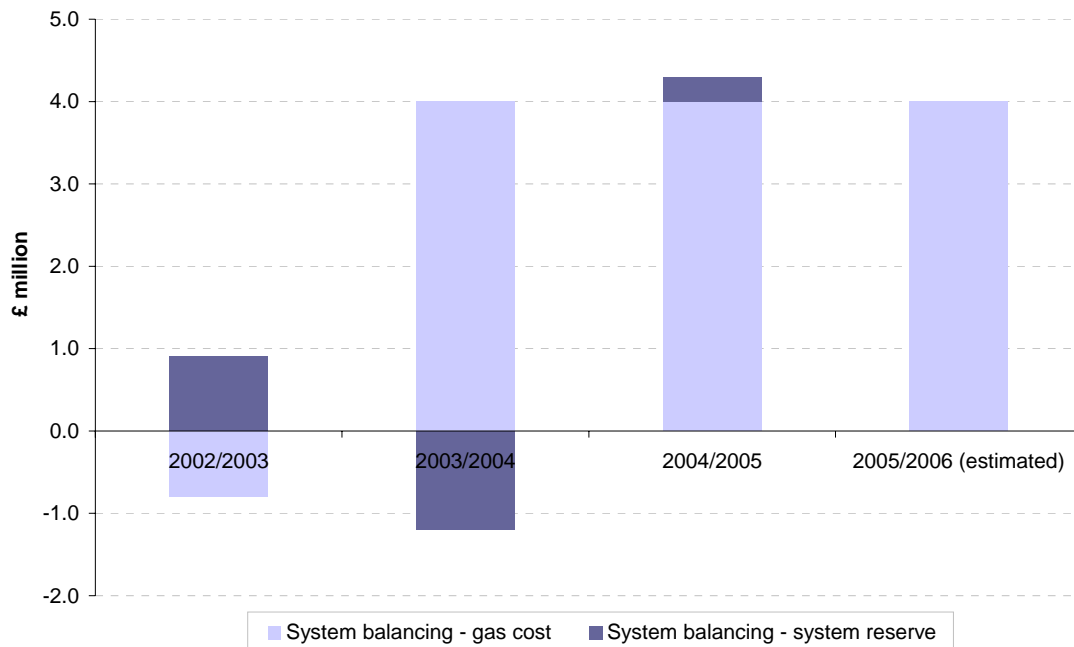
Figure B.10: Monthly system reserve costs



Overall system balancing incentive

Figure B.11 shows that the bulk of NGG's system balancing incentive payments have come from the gas cost incentive, although in 2002/03 NGG made a loss under this incentive.

Figure B.11: Annual system balancing incentive payments



Question B.5: Are both system balancing incentive schemes still required?

Question B.6: Is NGG's 100% exposure under these incentives still appropriate?