



Gas Volume Methodology

NTS Shrinkage Incentive

30 June 2021

nationalgrid

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Executive summary

This document is the first Gas Volumes Methodology for the RIIO-2 period. It describes the seasonal, quarter and daily gas volumes used in calculating benchmark costs, and the prices used to determine best case, worse case, and average costs. The first year for which this Gas Volumes Methodology will apply will be formula year 2022/23.

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1. Introduction

For the RIIO-2 period starting 1 April 2021, National Grid Gas plc's Gas Transmission Licence states that (Part K: Management of NTS Shrinkage Costs, paragraph 5.6.57):

The licensee must, by 1 June 2021, have in place a Gas Volumes Methodology, which will remain in place for each Regulatory Year except if modified in accordance with 5.6.59, detailing the calculations by which the licensee determines:

- a) seasonal forecast gas volumes;
- b) quarter forecast volumes;
- c) the prompt daily volumes to be bought and sold; and
- d) the costs to apply to the volumes referred to in sub-paragraphs 5.6.57(a) to (c).

Note that line (d) is interpreted as meaning the prices to apply to the volumes to calculate costs.

These volumes and prices will be used to calculate benchmark costs for reporting actual costs against (Licence paragraph 5.6.60):

- a) best case scenario NTS Shrinkage costs, excluding costs in procuring electricity;
- b) worst case scenario NTS Shrinkage costs, excluding costs in procuring electricity;
- c) average NTS Shrinkage costs, excluding costs in procuring electricity;

This document is the first such Gas Volumes Methodology and will first apply to shrinkage gas procured for formula year 2022/23.

For the RIIO-1 price control period, from 1 April 2013 to 31 March 2021, National Grid Gas was required to publish an annual methodology statement. These statements specified how forecasts of gas shrinkage components would be calculated and the input data that would be used. The forecasts were used for volume targets that were included in the calculation of an overall cost target.

Because of the timing of the publication of Final Determinations for RIIO-2 (in December 2020), and the subsequent licence consultation, it was not possible to put in place a Gas Volumes Methodology for Regulatory Year 2021/22. The first year for which this Gas Volumes Methodology will apply will be formula year 2022/23.

For 2021/22, we will report actual costs, but not best case, worst case and average benchmark costs, in regulatory reporting tables, reports and narratives. We will explain the background to the actual costs and the gas market context in the Shrinkage Procurement Report, provided to ofgem by 31 July 2022, under licence paragraph 5.6.60.

Our approach for 2021/22 is shown at the end of this document.

2. Calculation of Volumes

National Grid Gas will calculate seasonal and quarterly forecast volume requirements by

- Forecasting total gas shrinkage volume for periods of the Regulatory Year at different times ahead of delivery, and
- Choosing a proportion of this volume as a requirement for those periods.

Table 1 shows an example of when each of the volume requirements would be published. The table also shows the time periods that would be used to calculate the prices used for benchmark costs (described later). This example considers procurement for Formula Year April 2022 to March 2023.

Formula Year	Season	Period used to calculate seasonal benchmark costs	Seasonal volume requirement published	Quarters	Period used to calculate quarterly benchmark costs	Quarter volume requirement published	Prompt	Period used to calculate daily benchmark costs
Apr 22 – Mar 23	Apr 22 – Sept 22	Oct 21 – Mar 22	Sep 21	Apr 22– Jun 22	Jan 22 – Mar 22	Dec 21	All days in formula year	Within day
				Jul 22– Sept 22	Apr 22– Jun 22	Mar 22		
	Oct 22 – Mar 23	Apr 22 – Sep 22	Mar 22	Oct 22 – Dec 22	Jul 22– Sept 22	Jun 22		
				Jan 23 – Mar 23	Oct 22 – Dec 22	Sep 22		

Table 1. Example for Formula Year 2022/23, showing dates for each season/quarter, the periods used to calculate benchmark costs and when the volume requirements would be published

2.1 Forecasting total gas shrinkage volumes

Forecasts will be calculated for the volume in each half of the formula year, known as seasons: April to September (Summer), and October to March (Winter).

These will be calculated seven months ahead of the season. For example, in September 2021, a forecast is completed for Summer 22 (April to September 2022).

Shrinkage gas volume forecasts will also be calculated, in GWh, for each quarter of the formula year (April to June, etc).

For each quarter, forecasts will be calculated four months ahead of that quarter. For example, in December 2021, a forecast will be calculated for Q1 22 (April to June 2022).

Gas shrinkage has three components:

- Compressor Fuel Usage is the energy used to run compressors to manage pressures within the gas transmission system. This can either be gas or electricity, depending on the power source for the specific compressor.

- Calorific Value Shrinkage is gas which cannot be billed due to application of the Gas (Calculation of Thermal Energy) Regulations 1996 (amended 1997).
- Unaccounted for Gas is the remaining quantity of gas which is unallocated after taking into account all measured inputs and outputs from the system.

As the components are independent quantities, the total gas shrinkage will be forecast by considering the three components individually and summing these individual forecasts.

The method of forecasting the components of total gas shrinkage will be flexible. National Grid Gas will consider the historical range of outturns, established trends, established drivers for change, and expectations of these drivers over the forecast period. This will allow forecasts to adapt to changing operational conditions, and avoid risks of adhering to fixed formulae and obtaining misleading results.

Factors that will be considered include:

- For forecasting gas compressor fuel use (CFU), any established dependence of CFU on supply patterns, the available forecasts of supplies, and the likely levels of use of gas and electric powered compressors.
- For Calorific value shrinkage (CVS), the results of work to investigate the causes of CVS, and the likelihood of CV capping in individual regions of the National Transmission System.
- For Unaccounted for gas (UAG), the results of work to investigate the causes of UAG, and any established pattern of levels of UAG at different times of the year.

2.2 Calculating seasonal and quarterly volume requirements

For each season, the requirement will be calculated in the seventh month ahead of that season, by multiplying the latest forecast total gas shrinkage by a percentage chosen for long-term purchase. This percentage will be chosen at the time to balance risk and reward between forward and prompt prices, driven by market fundamentals. This will consider current market prices, current market direction, and the context of historical market price variation.

For each quarter, the requirement will be calculated in the fourth month ahead of that quarter, by multiplying the latest forecast total gas shrinkage by a percentage chosen for medium-term purchase. This will take into account the previous seasonal volume requirement. Again, this percentage will not be fixed, but driven by the market fundamentals at that time.

2.3 Calculating prompt daily volumes

For each day, National Grid Gas will continue to forecast total gas shrinkage a short period ahead (from week ahead to working day ahead) of the day, and take into account differences in the actual shrinkage and the commercial Shrinkage allocation in previous days, as the basis for the commercial Shrinkage allocation for that day.

This is in accordance with Uniform Network Code – Transportation Principal Document Section N, paragraph 2.1.2.

For the purposes of calculating benchmarks, the prompt daily volume will be calculated as equal to the commercial allocation for that day, netting off the seasonal and quarterly forecast requirements.

3. Calculation of Costs

The volumes set out above will be used to calculate benchmark costs, in order to measure gas procurement performance. Actual costs will be compared to a best case cost, a worst case cost and an average cost.

3.1 Best case scenario gas procurement costs

For each formula year, the best case scenario gas procurement costs will be calculated by

- For each season, the seasonal volume requirement will be costed using the lowest market prices of that season seen in the six months ahead of delivery (when it was the front season).
 - The price applied will be calculated by
 - Ordering the trades in price order, lowest price first,
 - Selecting the lowest-priced trades whose cumulative volume is greater or equal to the seasonal volume requirement.
 - Calculating a weighted average price of the selected trades.
 - This will be based on data for all market trades done for the front season on the platforms used by National Grid Gas for exchange and broker trading.
 - This will then be compared to the actual weighted average price of the Shrinkage trades action in the seasonal market for that time period.
- For each quarter, the quarterly volume requirement will be costed using the lowest market prices of that quarter seen in three months ahead of delivery (when it was the front quarter).
 - The price applied will be calculated by
 - Ordering the trades in price order, lowest price first,
 - Selecting the lowest-priced trades whose cumulative volume is greater or equal to the quarterly volume requirement.
 - Calculating a weighted average price of the selected trades.
 - This will be based on data for all market trades done for the front quarter on the platforms used by National Grid Gas for exchange and broker trading.
 - This will then be compared to the actual weighted average price of the Shrinkage trades action in the monthly market for that time period.
- For each day, the prompt daily volume will be costed using the lowest within day prices on that day.
 - The price applied will be calculated by
 - Ordering the trades in price order, lowest price first,
 - Selecting the lowest-priced trades whose cumulative volume is greater or equal to the prompt daily volume.
 - Calculating a weighted average price of the selected trades.

- This will be based on data for all market trades done for the within day market on the platforms used by National Grid Gas for exchange and broker trading. This data will include trades done at all times of the gas day, including after normal business hours. Most trades for shrinkage are currently completed during normal business hours.
- This will then be compared to the actual weighted average price of the Shrinkage trades action in the daily markets for that time period.

The annual best case scenario gas procurement costs will then be determined as the sum of the best case costs for the two seasons, the four quarters, and all the gas days in the formula year.

3.2 Worst case scenario gas procurement costs

For each formula year, the worst case scenario gas procurement costs will be calculated using the same method as for best case costs, except the highest market prices will be used instead of the lowest prices.

3.3 Average case scenario gas procurement costs

For each formula year, the average gas procurement costs will be calculated using the same method as for best case costs, except weighted average market prices will be used instead of the lowest prices. These weighted average market prices will be calculated using all market trades.

4. Application of this methodology

This methodology will apply to the formula year starting 1 April 2022, and subsequent years of the RIIO-2 period, up to and including the formula year starting 1 April 2025, unless modified in accordance with the licence.

4.1 Approach for 2021/22

As noted above, it was not possible to put in place a Gas Volumes Methodology for Formula Year 2021/22. Table 2 below shows the approach for 2021/22.

Formula Year	Season	Period used to calculate seasonal benchmark costs	Seasonal volume requirement calculated	Quarters	Period used to calculate quarterly benchmark costs	Quarter volume requirement calculated	Prompt	Period used to calculate daily benchmark costs
Apr 21 – Mar 22	Apr 21 - Sept 21	n/a	n/a	Apr 21- Jun 21	n/a	Mar 21 Internal forecast	All days in formula year	n/a
				Jul 21- Sept 21	n/a	Mar 21 internal forecast		
	Oct 21 – Mar 22	n/a	Mar-21 internal forecast	Oct 21 – Dec 21	Jul 21 – Sep 21	Jun 21		
				Jan 21 – Mar 21	Oct 21 – Dec 21	Sep 21		

Table 2. Formula Year 2021/22

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