

LDZ Energy Loss Initial Proposals Formula Year 2023/24

December 2022
Industry Consultation Document



LDZ Shrinkage Quantity Proposals

Formula Year 2023/24

Contents

Section	Content	Page
1	Purpose of Proposal	3
2	Summary of Proposal	4
3	Component Analysis	5
3.1	Leakage	5
3.1.1	Distribution Mains (and Services) Leakage	6
3.1.2	AGI Leakage and Venting	7
3.1.3	Other Losses	8
3.1.4	Total Leakage	8
3.2	Own Use Gas	9
3.3	Theft of Gas	9
3.4	LDZ Shrinkage Quantity Summary	10
4	Extent to which the Proposal would better facilitate the relevant objectives	11
5	The implications for Cadent Gas of implementing the Proposal	11
6	The implications of implementing the Proposal for Users	11
7	Analysis of any advantages or disadvantages of implementation of the Proposal	11
8	Programme of works required as a consequence of implementing the Proposal	12
9	Proposed implementation timetable (including timetable for any necessary information system changes)	12
10	Recommendation concerning the implementation of the Proposal	12
11	Cadent Gas Ltd.'s Proposal	12

LDZ Shrinkage Quantity Proposals

Formula Year 2023/24

Purpose of Proposal

1. The purpose of this paper is to present our proposals in respect of Cadent LDZ Shrinkage for the Formula Year 2023/24, as required under Section N of the Uniform Network Code.

Under Section N of the Uniform Network Code, Cadent has an obligation to estimate the LDZ Shrinkage Quantity values for the coming Formula Year and to present these to Users for consultation.

Following representations from Users, a further paper will be issued, by 1 March 2023, in which Cadent will set out its final estimate of its LDZ Shrinkage Quantity values.

We appreciate hearing the views of Ofgem and Users; these views will help inform our Final Proposals, which are due to be published on 1 March 2023. Responses to this document are encouraged and should be received no later than 1 February 2023. Communication should be directed to Matt Marshall or via the Joint Office (contact details below).

Contact: Matt Marshall, Net Zero Planner, Cadent

Email: matt.marshall@cadentgas.com

Alternatively,

Joint Office: enquiries@gasgovernance.co.uk

For the purposes of this document, 'LDZ' refers to LDZs owned by Cadent and as defined by Uniform Network Code.

2. Summary of Proposal

The LDZ Shrinkage Quantity values, which are set out within Table 1 below, reflect the losses associated with Unaccounted for Gas (leakage & theft of gas) and Own Use Gas (gas used in the operation of the system). Details of how these quantities have been determined are included in this paper. The current shrinkage volumes are shown for comparison purposes.

Table 1. Proposal 2023/24 LDZ Shrinkage Quantities

	Shrinkage Proposal 2022/23 (GWh)	2022/23 Formula Year Outturn Forecast (GWh)	Proposed Shrinkage Quantities 2023/24 (GWh)
Eastern	180.0	177.7	171.2
East Midlands	190.0	190.7	185.0
North Thames	190.0	187.9	180.4
North West	260.6	259.1	253.6
West Midlands	238.8	237.5	232.1
Cadent	1,059.3	1,052.9	1,022.2

The calculations that were used to derive the shrinkage quantity values and a summary of the underlying information are set out in this proposal.

This year's shrinkage proposal reflects a reduction of 31GWh in estimated shrinkage compared to that estimated for the current year end. The main contributing factor to the reduction is associated with the forecasted low and medium pressure mains replacement activities in 2023/24.

Safety is a critical requirement in the operation of our networks, for this reason we will continue to focus on injection of Mono-Ethylene Glycol (MEG) into our low pressure network. The continual replacement of assets with lead yarn joints means that maintaining treated percentages throughout the coming years will be difficult. This forecast assumes a decrease in treated gas conditioning length.

The system pressure that a network operates at impacts the volume of fugitive emissions, however, system pressure is impacted by factors outside of our control (for example weather). For this forecast we have assumed a system pressure that matches the baselines set by Ofgem, which are the averages of 2017/18 to 2019/20 pressures. This is the performance level Distribution Networks are targeted to perform at during R110-2. If we were to be exposed to a none typical demand year we could expect pressures to increase, contributing to an increase in emissions.

The impact of any variation between the actual and assumed factors underpinning these Shrinkage Proposals will be picked up in the post year Shrinkage Assessment and Adjustment process in July 2023.

We take pride in our forecasting accuracy, the forecast and outturn for each year from the commencement of RIIO-GD1 is shown in Table 2.

Table 2. Shrinkage Proposal Accuracy

	2022/23	2021/22	2020/21	2019/20	2018/19	2017/18	2016/17	2015/16	2014/15	2013/14
Proposal (GWh)	1,059	1,101	1,139	1,170	1,221	1,273	1,282	1,334	1,403	1,505
Outturn (GWh)	1053 (Forecast)	1,089	1,121	1,172	1,215	1,272	1,311	1,329	1,370	1,451
Difference (GWh)	6	12	18	2	6	1	29	5	33	54
Difference (%)	0.6%	1.1%	1.6%	0.2%	0.5%	0.1%	2.3%	0.4%	2.4%	3.6%

The Daily Shrinkage Quantity values, shown in Table 3, will be used as the basis Cadent Gas Ltd.'s LDZ Shrinkage gas procurement during the Formula Year in question.

Table 3. Proposed LDZ Daily Shrinkage Quantity Values for 2023/24 Formula Year

	Daily Shrinkage Quantity (kWh)
Eastern	467,624.5
East Midlands	505,419.4
North Thames	492,988.1
North West	692,814.7
West Midlands	634,061.3
Cadent	2,792,908.0

3. Component Analysis

This section of the document presents an analysis of the components of LDZ Shrinkage that make up the estimates for the Formula Year 2023/24 proposal.

3.1. Leakage

Leakage represents the largest component of the LDZ Shrinkage Quantity. Leakage is estimated using the agreed leakage model, which is controlled under Special Condition 1F of the GDN Licences. Under paragraph 1F.17 Distribution Networks have the obligation to annually review the leakage model to ensure that it meets the obligation, specified under paragraph 1F.13, of:

- (a) the accurate calculation and reporting of gas shrinkage and leakage from each of the LDZs operated by the licensee; and

Any proposed modifications to the leakage model would be subject to consultation with the industry, be independently assessed and submitted to Ofgem for approval.

DNs also have an obligation by 31 July each year to assess and publish the leakage volume for the previous financial year; the latest approved model is used for this assessment.

For the purpose of analysis, leakage may be split into three categories:

- Distribution Mains (including service pipes)
- Above Ground Installations (AGIs)
- Other losses

Distribution mains and services leakage is a feature of normal system operation.

AGI leakage includes the routine venting of control equipment.

Other losses include gas lost as a result of interference damage and broken mains. These losses are caused by specific events and are not continuous.

3.1.1. Distribution Mains (and Services) Leakage

The leakage of gas from the Distribution Mains system, which includes service pipe leakage, is calculated by combining the results of the 2002/03 National Leakage Test programme with the following network specific information:

- Pipe asset data
- Annual average system pressure (ASP) in each network
- Measured concentration of Mono-Ethylene Glycol (MEG) joint treatment chemical in the gas
- Annual metallic service replacement

Leakage is calculated by multiplying the annual average mains pressure in each network by the Main and Service Pipe Leakage Factors determined by the 2002/03 National Leakage Test programme and the relative lengths of mains/numbers of services in each network. Where applicable, i.e. cast iron mains only, the Pipe Leakage Factors are adjusted to take into account the measured concentration of MEG.

There has been, and will continue to be, significant replacement of iron mains, in line with Cadent Gas Ltd.'s mains replacement policy. These proposals assume an estimated amount of mains replacement applicable for the 2023/24 leakage assessment.

Table 4. Estimated LDZ Low Pressure Leakage for 2023/24 Formula Year

	Low Pressure Leakage	
	Tonnes	GWh
Eastern	6,981.9	104.1
East Midlands	5,861.9	87.8
North Thames	7,847.8	117.0
North West	11,385.7	172.2
West Midlands	10,670.7	160.0
Cadent	42,748.0	641.0

Table 5 below, shows the estimated Medium Pressure leakage on an LDZ basis:

Table 5. Estimated LDZ Medium Pressure Leakage for 2023/24 Formula Year

	Medium Pressure Leakage	
	Tonnes	GWh
Eastern	937.7	14.0
East Midlands	2,609.3	39.1
North Thames	1,225.7	18.3
North West	939.5	14.2
West Midlands	1,281.0	19.2
Cadent	6,993.2	104.7

3.1.2. AGI Leakage and Venting

The figures for leakage from Above Ground Installations have been taken from the findings of the 2003 Above Ground Installation Leakage Test programme. The asset profile determined as part of the 2022/23 final assessment is deemed reflective of future years and so used for the purpose of forecasting 2023/24 estimates. Table 6, shows the estimated AGI leakage and venting on an LDZ basis:

Table 6. Estimated AGI Emissions for 2023/24 Formula Year

	AGI Emissions (includes leakage and routine equipment venting)	
	Tonnes	GWh
Eastern	2,642.8	39.4
East Midlands	2,626.2	39.3
North Thames	1,958.6	29.2
North West	3,002.1	45.4
West Midlands	2,563.9	38.4
Cadent	12,793.6	191.7

3.1.3. Other Losses

Gas may be lost from LDZ equipment as a result of specific events, namely broken mains and interference damage to plant, in addition to ongoing leakage. These losses are known collectively as 'other losses'.

To forecast the impact of this component is difficult due to the uncertain nature and the uncontrolled external influences, for the purposes of the 2023/24 estimate the quantities used matches those from 2022/23. Table 7 below shows the amount of gas lost because of other losses on a LDZ basis, which is proposed as the estimate for 2023/24:

Table 7. Estimated 2023/24 Other Losses

	Other Losses	
	Tonnes	GWh
Eastern	33.5	0.5
East Midlands	72.5	1.1
North Thames	26.7	0.4
North West	56.4	0.9
West Midlands	35.5	0.5
Cadent	224.7	3.4

3.1.4. Total Leakage

Table 8 demonstrates the total amount of estimated leakage for Formula Year 2023/24 on an LDZ basis with the leakage expressed in GWh.

Table 8. Estimated 2023/24 Formula Year LDZ Leakage Summary

	Leakage (GWh per annum)
Eastern	158.0
East Midlands	167.2
North Thames	164.8
North West	232.6
West Midlands	218.2
Cadent	940.8

3.2. Own Use Gas

Own Use Gas is treated as a consolidated quantity, calculated as a factor of annual LDZ consumption, to be procured on a flat daily basis.

In line with this methodology, Cadent Gas Ltd proposes to apply a fixed LDZ Specific daily quantity for OUG equivalent to 0.0113% of annual LDZ consumption. This factor represents the estimated national average that was determined by Advantica in 2002.

The estimated 2023/24 Own Use Gas quantity values are shown Table 9.

Table 9. Estimated 2023/24 LDZ OUG Quantity Values

	Forecast LDZ Consumption GWh/annum	OUG GWh/annum	OUG kWh/day
Eastern	42,109.2	4.8	13,000.9
East Midlands	56,775.5	6.4	17,529.1
North Thames	49,872.2	5.6	15,397.7
North West	66,849.0	7.6	20,639.2
West Midlands	44,457.4	5.0	13,726.0
Cadent	260,063.4	29.4	80,293.0

3.3. Theft of Gas

UNC Section N 1.3.2 states that LDZ Shrinkage shall include, and Cadent Gas Ltd is therefore responsible for, gas illegally taken upstream of the customer control valve and downstream where there is no shipper contract with the end-user.

As with Own Use Gas, Theft of Gas is treated as a consolidated quantity calculated as a factor of annual LDZ consumption to be procured on a flat daily basis.

The responsibility for Theft of Gas is split between Gas Transporters and Shippers. Transporter Responsible Theft has been deemed 0.02% of LDZ Consumption. Table 10 shows the estimated 2023/24 Theft of Gas Quantity Values:

Table 10. Estimated 2023/24 LDZ Theft of Gas Quantity Values

	Forecast LDZ Consumption GWh/annum	ToG GWh/annum	ToG kWh/day
Eastern	42,109.2	8.4	23,010.5
East Midlands	56,775.5	11.4	31,024.9
North Thames	49,872.2	10.0	27,252.6
North West	66,849.0	13.4	36,529.6
West Midlands	44,457.4	8.9	24,293.7
Cadent	260,063.4	52.0	142,111.4

3.4. LDZ Shrinkage Quantity Summary

Table 11 shows the proposed LDZ Shrinkage Quantity Values for the Formula Year 2023/24 in GWh per annum:

Table 11. Estimated 2023/24 LDZ Shrinkage Quantity Values

	Leakage (GWh)	OUG (GWh)	Theft (GWh)	Total (GWh)
Eastern	158.0	4.8	8.4	171.2
East Midlands	167.2	6.4	11.4	185.0
North Thames	164.8	5.6	10.0	180.4
North West	232.6	7.6	13.4	253.6
West Midlands	218.2	5.0	8.9	232.1
Cadent	940.8	29.4	52.0	1,022.2

Table 12 shows the estimated Daily Shrinkage Quantity values applicable for the 2023/24 Formula Year in kWh per day:

Table 12. Estimated 2023/24 LDZ Daily Shrinkage Quantity Values

	Daily Shrinkage Quantities (kWh)
Eastern	467,624.5
East Midlands	505,419.4
North Thames	492,988.1
North West	692,814.7
West Midlands	634,061.3
Cadent	2,792,908.0

4. Extent to which the Proposal would better facilitate the relevant objectives

This proposal provides a robust estimate of LDZ Shrinkage Quantity values for the Formula Year 2023/24. As a result, the gas usage and loss in transportation within the LDZs will be reflective of actual conditions. This in turn facilitates the achievement of efficient and economic operation of the system, as Cadent Gas Ltd will be incentivised to identify opportunities to reduce Shrinkage in future years. It will also lead to better targeting of costs to Users through the reconciliation process and this is consistent with securing effective competition.

5. The implications for Cadent Gas Ltd of implementing the Proposal

(a) Implications for the operation of the system:

We are not aware of any implications for system operation resulting from implementation of this Proposal.

(b) Development and capital cost and operating cost implications:

The proposed LDZ Shrinkage Quantity values lead to a fair allocation of operating costs between LDZ systems.

(c) Extent to which it is appropriate for Cadent Gas Ltd to recover the costs, and proposal for the most appropriate way for Cadent Gas Ltd to recover the costs:

It is appropriate for each LDZ to incur a share of the overall Shrinkage Energy dependant upon the actual shrinkage in that LDZ.

(d) Analysis of the consequences (if any) this proposal would have on price regulation:

The proposal is consistent with the establishment and operation of Distribution Network specific transportation charging formula.

6. The implications of implementing the Proposal for Users

This proposal improves the equability and accuracy of cost targeting across all Users.

7. Analysis of any advantages or disadvantages of implementation of the Proposal

Advantages: Good representation of the actual system usage and losses leading to improved cost targetting.

Disadvantages: Cadent Gas Ltd is not aware of any disadvantages.

This paper outlines our Initial Proposals. We appreciate hearing the views of Ofgem and Users; these views will help inform our Final Proposals, which are due to be published on 1 March 2023. Responses to this document are encouraged and should be received no later than 1 February 2023. Communication should be directed to Matt Marshall or via the Joint Office (contact details below).

Contact: Matt Marshall, Net Zero Planner, Cadent

Email: matt.marshall@cadent.com

Alternatively,

Joint Office: enquiries@gasgovernance.co.uk

8. Programme of works required as a consequence of implementing the Proposal

The only required modification is the input of LDZ Daily Shrinkage Quantity values into GEMINI.

9. Proposed implementation timetable (including timetable for any necessary information system changes)

Following publication of our Final Proposals, Users will have until 15 March 2023 to request that Ofgem issue a Standard Special Condition A11 (18) disapproval of this proposal; this provision is in the Uniform Network Code Section N 3.1.8.

If no disapproval notice is issued beforehand, it will be our intention to implement revised LDZ Daily Shrinkage Quantity values from 05:00 hrs on 1 April 2023.

10. Recommendation concerning the implementation of the Proposal

We recommend the proposed LDZ Daily Shrinkage Quantity values be implemented with effect from 05:00 hrs on 1 April 2023.

11. Cadent Gas Ltd.'s Proposal

This report contains our initial Proposals for the LDZ Daily Shrinkage Quantity values for the Formula Year 2023/24.