DD Supporting Evidence: EJP07 Mains Diversions

Mains Diversions (Chargeable & Non-Chargeable)

Contents

Table of Tables

Table of Figures

1. Introduction

This annex provides the additional supporting evidence requested by Ofgem in Table 34 of the July 2025 Draft Determination, addressing concerns regarding forecast workload derivation and unit costs in Cadent's Mains Diversions (Chargeable & Non-Chargeable) investment case (EJP07). This annex should be read in conjunction with EJP07.

For clarity, the feedback provided by Ofgem in Cadent's Draft Determination feedback EJP07 is shown below in Table 1.

Feedback Source	Needs Case	Optioneering	Scope Confidence	Comments
RIIO-3 Draft Determinations – Cadent **Table 34: Summary of Cadent Engineering Recommendations**	Partially Justified	Not Justified	Medium Confidence	Proposed outcome: Unjustified. We propose alternative optioneering or re-opener funding may be more appropriate. There is significant uncertainty around volumes required to be delivered in RIIO-GD3. We do not consider the proposed optioneering to support the proposed workloads. We think there was a lack of alternative approaches considered. We would like to see more robust optioneering ahead of Final Determinations to support the justification for baseline funding. An uncertainty mechanism may be more appropriate, given volume uncertainty.
22nd July Ofgem Engineering – Cadent Bilateral	• Provide sensitivity around chosen option • Provide known workload volumes • FES24 High vs Low year on impact on RIIO-3 options • Provide narrative on Min / Max options			

Table 1:Specific EJP07 feedback from the RIIO-3 Draft Determinations Cadent Annex

The EJP07 investment is driven by regulatory and legal obligations to ensure the safety, accessibility, and integrity of the gas network. This includes compliance with the Pipeline Safety Regulations 1996, the New Roads and Street Works Act 1991, and requirements under easements and protective provisions such as lift-and-shift clauses, Development Consent Orders, and Transport and Works Act Orders.

Unlike deterioration-led interventions, mains diversions are initiated by third-party development activity such as housing, infrastructure, or industrial projects that impact existing gas assets. These works are essential to maintain safe operation and fulfil legal responsibilities.

The preferred investment option is based on average annual volumes and costs from RIIO-1 and the first three years of RIIO-2, uplifted to a 2023/24 price base. This reflects actual delivery experience and aligns with our Network Asset Management Strategy. It proposes 132.60 km of chargeable and 9.36 km of non-chargeable diversions over RIIO-3, at a forecast cost of [redacted]

Ofgem have proposed a Diversions and Loss of Development Claims Re-opener for this investment; we have provided a response on our position to this within GDQ24.

2. Purpose of Document

This response provides essential clarifications and detailed justifications for key aspects of our RIIO-3 Business Plan. Its primary purpose is to:

- Provide sensitivity analysis for the chosen scenario.
- Provide known or potential workload diversion workload.
- Provide narrative on Min/Max scenario options.
- Provide FES24 sensitivity scenario.

3. Chosen RIIO-3 Workload

This section outlines historical workload volumes and annual trends for both Non-Chargeable and Chargeable Diversions. Our chosen scenario is based on data from the start of RIIO-1 to the end of year 3 of RIIO-2, as presented in Table 2 and Table 3. These datasets have been used to calculate average annual values for each diversion type for RIIO-3.

	RIIO-1									RIIO-2	
Year	**2013-14**	**2014-15**	**2015-16**	**2016-17**	**2017-18**	**2018-19**	**2019-20**	**2020-21**	**2021-22**	**2022-23**	**2023-24**
Non-Chargeable Volume (km)	1.07	1.51	2.02	1.44	0.97	3.86	1.66	3.55	1.16	0.62	2.72

Table 2: Volume of Non-Chargeable Diversions

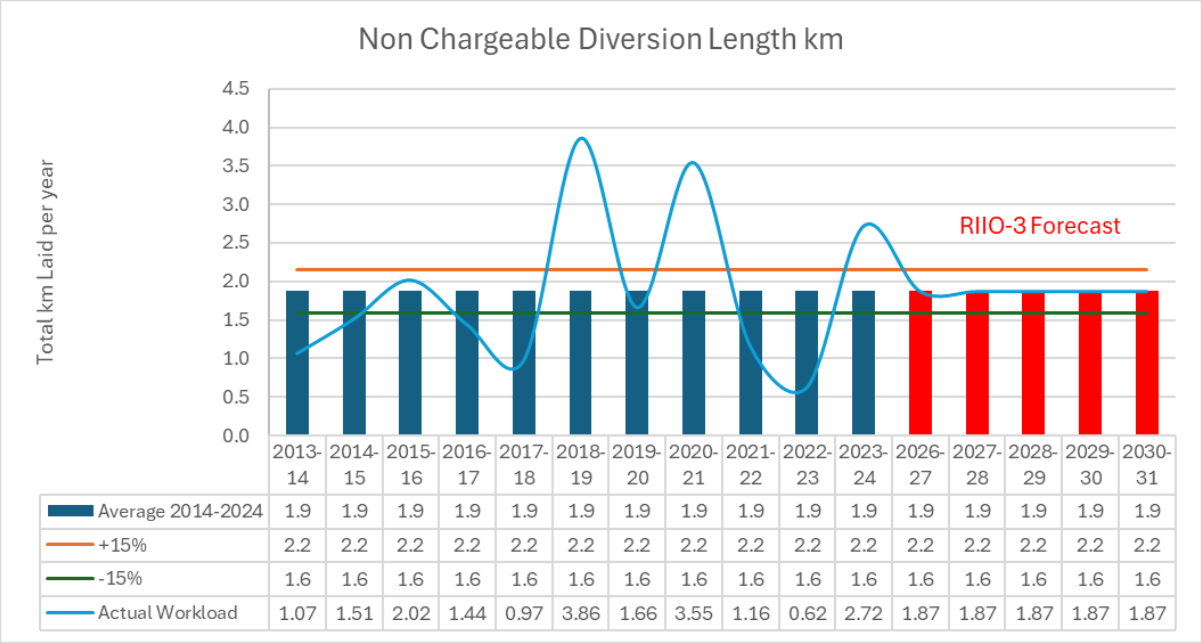
	RIIO-1									RIIO-2	
Year	**2013-14**	**2014-15**	**2015-16**	**2016-17**	**2017-18**	**2018-19**	**2019-20**	**2020-21**	**2021-22**	**2022-23**	**2023-24**
Chargeable Volume (km)	21.38	26.17	26.42	28.54	35.17	26.34	26.87	28.27	31.47	23.80	17.27

Table 3: Volume of Chargeable Diversions

The two graphs presented below illustrate the preferred forecasting scenario. This approach leverages historical diversion volumes recorded during RIIO-1 and the initial three years of RIIO-2. By calculating the average annual volume across this period, a forward projection is established for RIIO-3.

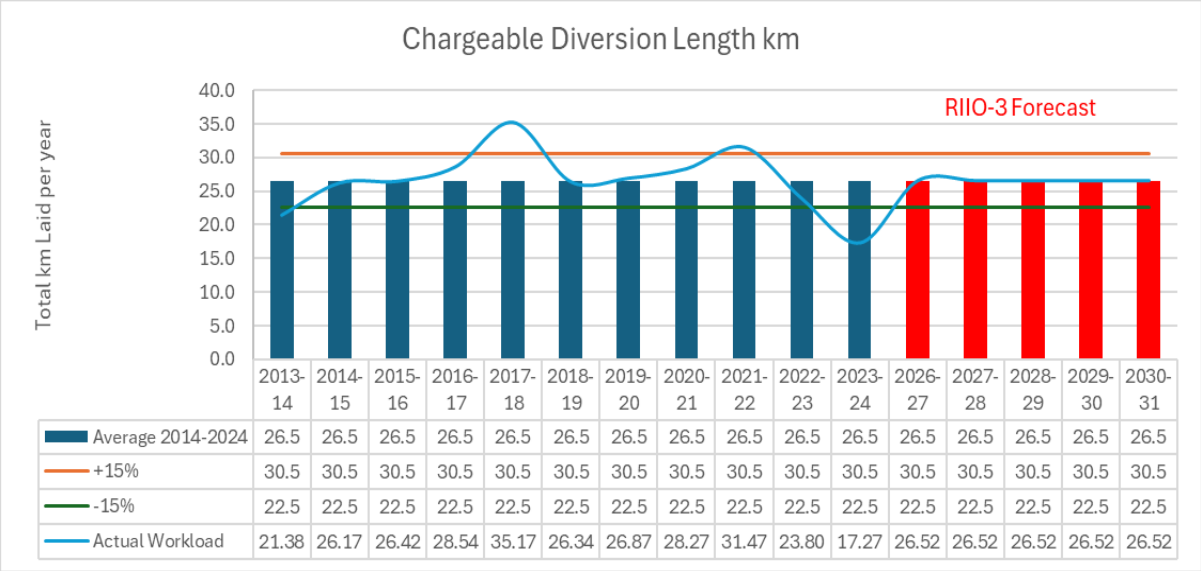
This methodology provides a consistent and data-driven basis for estimating future diversion activity. The ±15% bands are included to reflect a realistic tolerance around the average diversion length, capturing 73% of historical actual values and helping to illustrate acceptable variation over time.

*Years 2024-2026 are omitted as currently best estimates in the BPDT



	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19	2019-20	2020-21	2021-22	2022-23	2023-24	2026-27	2027-28	2028-29	2029-30	2030-31
Average 2014-2024	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9
+15%	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2
-15%	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6
Actual Workload	1.07	1.51	2.02	1.44	0.97	3.86	1.66	3.55	1.16	0.62	2.72	1.87	1.87	1.87	1.87	1.87

Figure 1: Non-Chargeable Diversion Length (km)



	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19	2019-20	2020-21	2021-22	2022-23	2023-24	2026-27	2027-28	2028-29	2029-30	2030-31
Average 2014-2024	26.5	26.5	26.5	26.5	26.5	26.5	26.5	26.5	26.5	26.5	26.5	26.5	26.5	26.5	26.5	26.5
+15%	30.5	30.5	30.5	30.5	30.5	30.5	30.5	30.5	30.5	30.5	30.5	30.5	30.5	30.5	30.5	30.5
-15%	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5
Actual Workload	21.38	26.17	26.42	28.54	35.17	26.34	26.87	28.27	31.47	23.80	17.27	26.52	26.52	26.52	26.52	26.52

Figure 2: Chargeable Diversion Length (km)

4. Alternative Options

Alternative forecasting options for mains diversions were considered as part of the development of the Engineering Justification Paper. These options including maximum volume, minimum volume, and 80% of minimum volume scenarios are documented in the supporting evidence file 'EJP07-SE-Mains Diversions (chargeable & non-chargeable)'. These options were presented and discussed with Ofgem during the bilateral engagement meeting held in July 2025.

- The MIN option takes the minimum delivery per diameter band across the RIIO-1 period and first three years of RIIO-2 for each diameter band then uses the total as the overall minimum expected each year.
- The MAX option takes the maximum delivery per diameter band across the RIIO-1 period and the first three years of RIIO-2 for each diameter band then uses the total as the overall maximum expected each year.
- The 80% of Minimum take minimum delivery per diameter band across the RIIO-1 period and first three years of RIIO-2 for each diameter band then uses 80% of the total as the overall minimum expected each year.

5. Future Energy Scenarios and Diversions Forecasting

Cadent is required under its Gas Transporter license to maintain a network capable of meeting a 1-in-20-year peak winter daily demand. As part of RIIO-3 planning, Cadent reviewed the Future Energy Scenarios (FES24) Holistic Transition pathway and determined it to be unsuitable as the core supply-demand scenario for forecasting mains and service diversions. This conclusion is based on several key limitations:

- Underestimation of Peak Demand: FES24 does not reflect the statutory requirement to maintain peak capacity, which is central to Cadent's safety and resilience obligations.
- Insufficient Granularity and Localisation: FES scenarios are designed for strategic decarbonisation planning and lack the network-specific detail required for operational forecasting. Diversion activities are highly localised and reactive, making high-level national scenarios inadequate for this purpose.
- Reactive Nature of Diversions: Diversions are driven by external factors such as third-party infrastructure developments (e.g., HS2, water and electricity projects), legal easements, urban expansion, and new building developments. These are customer-led and unpredictable in timing and location, meaning there are no internally scheduled diversions planned for RIIO-3. Nonetheless, diversion work remains a critical and continuous part of Cadent's operations.

To support planning for these essential activities, Cadent has adopted a five-year centralised supply-demand forecast developed with the National Energy System Operator (NESO). This forecast incorporates actual demand and historic delivery volumes and assumes a modest reduction in demand between 2030 and 2032. It provides a more robust and locally responsive basis for investment decisions than FES24.

Further detail on the FES review and Cadent's planning methodology is available in Appendix 10 Network Asset Management Strategy (NAMS), section 3.2.

6. Diversion Impact Assessment Based on Future Energy Scenarios

The Future Energy Scenarios (FES) outline varying levels of gas demand reduction across the UK by 2031, as illustrated in Figure 3. These scenarios reflect national trends and do not provide granular insights into specific regions or confirm that entire connected segments will transition away from gas. As such, they are not sufficient on their own to accurately estimate the impact on network diversions.

To illustrate this, we have applied a pragmatic and proportionate approach:

- **GWh Reduction Basis**: We began by taking the total GWh reduction indicated under each FES scenario.
- **Cadent Network Share**: As Cadent represents approximately 50% of the UK gas distribution network, we halved the total GWh reduction to reflect Cadent's share.

Diversion Impact Assumption: Recognising that not all customer loss translates directly to diversion loss, we applied a conservative assumption that only half of the customer loss would result in a reduction in diversions. This reflects a 2:1 ratio — meaning a 33% reduction in customers would equate to a worst-case 16.5% reduction in diversions.

This approach ensures that our assumptions are grounded in available data while avoiding overestimation of the impact on diversions. It provides a reasonable worst-case scenario for planning purposes, aligned with the broader transition outlined in the FES.

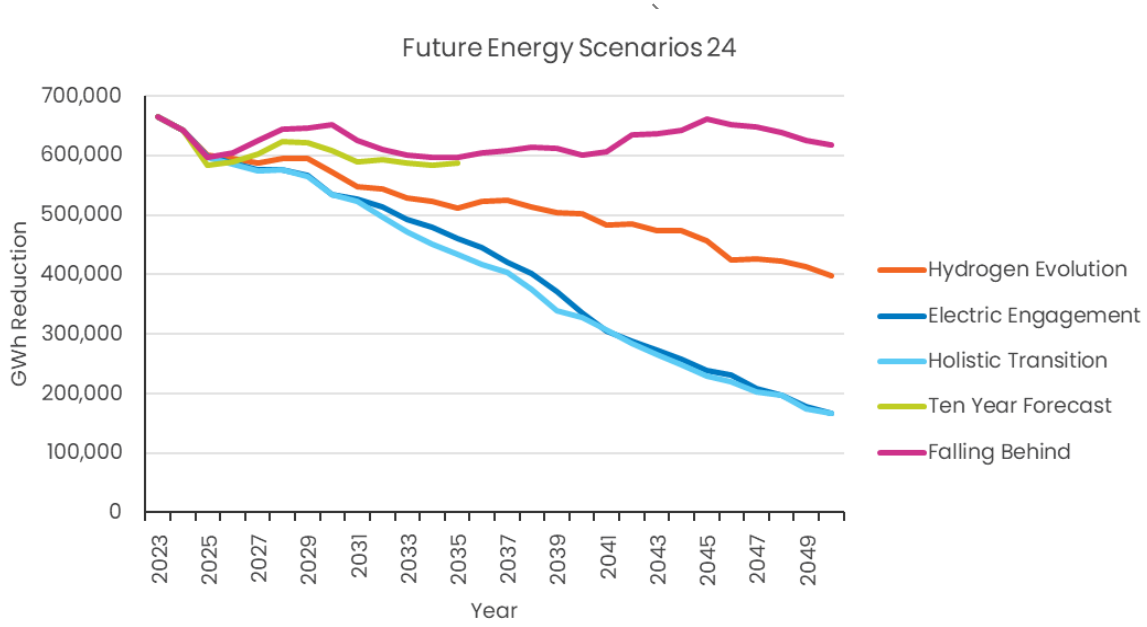


Figure 3: Future Energy Scenario[1]

GWh Loss and Customer Impact Assumptions by 2031

Table 4 outlines the projected GWh reduction by 2031 under each Future Energy Scenario (FES).

[1] Data from NESO https://www.neso.energy/document/364551/download

To estimate the equivalent customer impact, we have applied a representative breakdown of Cadent's customer base: **90% Domestic**, **9% Commercial**, and **1% Industrial**. Each category is assigned a typical annual consumption coefficient:

- **Domestic**: 0.015 GWh per customer
- **Commercial**: 0.066 GWh per customer
- **Industrial**: 0.5 GWh per customer

Using these coefficients, we have translated the total GWh reduction into an estimated number of affected customers across each segment.

Scenario	GWh reduction 2031	Total Customer loss	Customer loss percentage	Diversion Reduction
Hydrogen Evolution	117,891	3,618,289	33%	16%
Electric Engagement	139,463	4,280,373	39%	19%
Holistic Transition	143,487	4,403,877	40%	20%
Ten Year Forecast	76,612	2,351,362	21%	11%
Falling Behind	39,469	1,211,375	11%	5%

Table 4: FES scenario impact on diversions

While FES scenarios suggest a reduction in gas demand, they do not reflect the reality that decarbonisation is occurring sporadically at the household level. The gas network remains essential for many homes, and infrastructure is retained even when some properties switch to low-carbon heating. This is due to the interconnected nature of the network, where removing one section of the network can impact service to others. Therefore, diversions and reinforcements will continue to be required, supporting a planning approach focused on managing variable demand rather than widespread decommissioning.

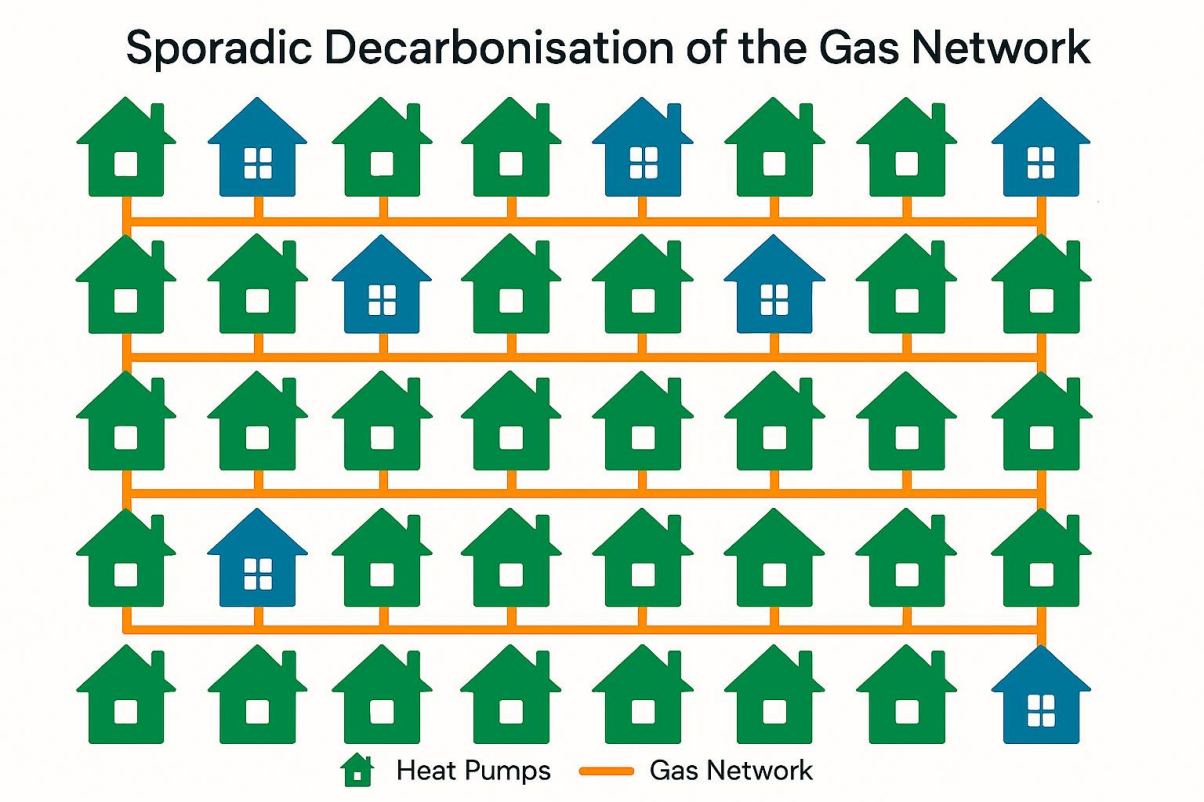


Figure 4: Household-Level Decarbonisation and Gas Network Interconnectivity

Figure 5 shows the projected reduction in average diversion volumes from RIIO-1 and RIIO-2, based on forecasts from NESO's ten-year outlook and the Holistic Transition Pathways, reflecting the impact of the energy transition by 2031.

*Assumes 2:1 ratio reduction from average forecast

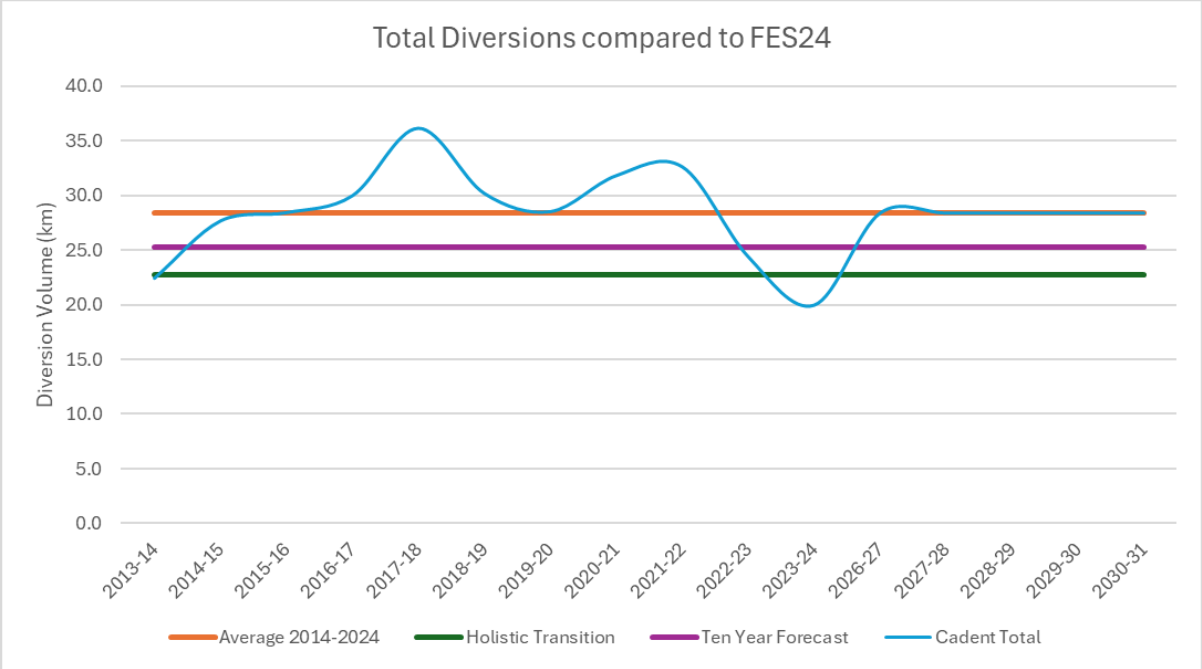


Figure 5: Diversion volume forecast including Holistic transition and Ten-Year FES scenario

CADENT - CONFIDENTIAL