Cadent
Your Gas Network

Our Digitalisation Action Plan

June 2024

Our Digital Themes

Our Digitalisation Action Plan is now reflecting the progress we have made in our digitalisation journey throughout the first half of 2024.

We are in the process of preparing our next regulatory period business plan and submission therefore, in the next version of the plan we will showcase the details.

This document provides details on steps we are taking towards fulfilling our RIIO-2 commitments in the digitalisation space.

We continue to invest according to four Digital Themes we defined in our Digitalisation Strategy and welcome this opportunity to provide transparency and increase the visibility of our work to stakeholders.

Our Digital Themes

Enhance the experience of our customers

Simplify the life of our colleagues

Optimise our operations

Explore and innovate

Roadmap of our initiatives

Key	
	On track - No identified risks
	Cancelled / on hold - Significant dependency/ learning from previous milestone
	Dependency identified and mitigated
	Completed

Page Number	Initiative title	Digital themes				
		Enhance the experience of our customers	Simplify the life of our colleagues	Optimise our operations	Explore and innovate	Status
5	Digital Twin – Network Pressure and Control Management					On Hold
6	Transforming our people services					In Progress
7	Evolution of mature Smart Network					On Hold
8	Using Data to improve our Safety & Sustainability					In Progress
9	Better Supporting Our Customers in Vulnerable Situations					In Progress
10	Empowering Customer Self Service Through Technology					In Progress

Roadmap of our initiatives

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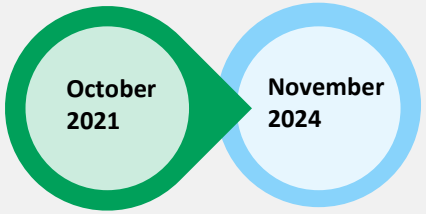
Page Number	Initiative name	Digital themes				
		Enhance the experience of our customers	Simplify the life of our colleagues	Optimise our operations	Explore and innovate	Status
11	Open Data Portal					In Progress
12	Hydrogen System Modelling Tools					In Progress
13	Biomethane Smart Control					In Progress
14	Baseline Carbon Footprint in IT					In progress
15	Leakage Detection – Emissions Reduction					Planned
16	SIF Project – Digital Platform for Leakage Analytics					Planned
17	Short Term Forecasting Model					Planned

Digital Twin – Network Pressure and Control Management

Augment human decision-making and identify value for customers by having a more intelligent operation



Digital themes

Stakeholders who will benefit

- Domestic Customers
- Business Customers
- Field Engineers
- Energy Industry and Other Utilities

Service we provide today

June 2024 update:

The current Pressure Monitoring and Control systems used in Cadent is a two-tier system:

1. The intermediate and high-pressure networks are managed by a sophisticated powered telemetry system.
2. The low and medium pressure networks are managed by 10,000 controllers and 1,000 mobile dataloggers.

Both systems are independent but provide critical information to control and manage security of supply to our customers, reduce environmental emissions and maintain system integrity and provide pressure data to validate the planning models.

The delivery date has changed as there are a number of changes which now have to been taken into consideration:

- Cadent Ops 4.0 - A use case has been identified in the London network and work has started on the design elements at the Offtake which will extend further to explore opportunities in the Medium Pressure (MP) and Low Pressure (LP) Network expected first proof of concepts (POC) November 2024.
- Digital Platform for Leakage Analytics (DPLA) - First iteration of Cadent Digital Twin for Leakage enable us to leverage the first data insights to identify the optimal locations where additional sensor will create value. This approach for prioritisation will reinforce that we use our data driven decisions to enhance the effectiveness and accuracy of the sensor network ultimately leading to better performance and resource allocation (see Slide 16).
- SecOps27 – Single Supervisory Control and Data Acquisition (SCADA) and Operational Technology refresh rationalise our existing SCADA into a single view of the gas network, which is secure by design and compliant to Enhanced Cyber Assessment Framework (ECAF) by 2027.

Service in the future

What we will have in place

The creation of a virtual representation to simulate improved network pressure and control will:

1. Provide insight to assist in our commitment on efficiency gains by optimising network efficiency (enables system analysis) using large data set from sensors.
2. Enable better planning (e.g. Future of Gas) by modelling potential connections and network constraints.
3. Accelerate emergency responses and reduce supply interruption frequency and duration.
4. Optimise operational efficiency of field services, providing richer field intelligence to make decisions.
5. Enhance our operational intelligence and agility of decision making – breaking of operational and data silos across the network and organisation, increasing visibility of and access to data on the network for colleagues and stakeholders – enable better whole systems coordination.
6. Improve asset performance (do more with less), by monitoring the behaviour of the asset and enriching data from any maintenance activities.

How the service will be accessed:

We will look to build Digital Twin(s) in an agile way, wherever possible. This means that small POC will be established and run in parallel with the current processes and technologies.

Project milestones

Milestone	Success Measure	Delivery Date	Status
Decide on the most suitable use case for Proof of Concept based on available funding and technology required.	Detailed use case prepared for design	October 2023	Completed
Use case design selected. This will be aligned to the approved Strategy.	A trial use case is being designed in North London as part of the Ops 4.0 Strategy and the first PoC to be delivered Nov 2024. Completion of ECAF security review of low-pressure assets required prior to progress.	Nov 2024	On Hold

Future Considerations

The analysis of Enhanced Cyber Assessment Framework (ECAF) requirements identified a set of priorities for further investment within our organisation as our Pressure Monitoring and Control systems fall under Critical National Infrastructure definition, hence in the scope of new guidelines.

The priority is now given to formulation of a Strategic Roadmap of investments and target state architecture determination for critical Cadent systems to ensure compliance with the Cyber Security guidance.

A set of novel sensor technologies will be tested as part of Strategic Innovation Fund project led by Cadent described on page 16.

Transforming our people services

Investing in HR Transformation Technologies

April 2022 — March 2026

Digital themes

Stakeholders who will benefit

- Customer Service
- Supply Chain
- Network Planning
- Field Engineers

Service we provide today

June 2024 update:

Service we provide today

- We have a poor user experience due to multiple entry points below 'My People Hub' to access various services and HR systems.
- There are 6 platforms in total; the master data is split across them, making a single version of the truth difficult.
- Offline talent management processes which makes succession planning challenging.

What we have done so far

We recently went live with SuccessFactors Employee self-service and Manager self-service for all back-office employees. The next phase is to implement SuccessFactors ESS and MSS to field staff, the Time recording, the implementation of the Talent Management suite and Learning Management Solution. This will complete the deployment and migrate all staff to a single platform for employee data. We are currently building the integration to Experian, Hapi and Orchid, which streamline employee benefits, rewards and occupational health.

Employee Relations case management solution has been revised to include future considerations and scope; this is due to start in June.

Service in the future

What we will have in place

As part of the further improvement, we are delivering:

- Online tool to manage Employee Relations cases via iManage; this is due to be implemented in September;
- Self-service access for colleagues in relation to their HR records – implemented for back-office staff, field staff to go live in the summer
- Reporting solution to increase employee productivity and increase data driven decision making;
- Automation of the processes for our HR teams;
- Dedicated solution for delivering our People Strategy and Talent Management processes.

How the service will be accessed:

Our HR solutions are going to be available via all devices via a URL link and via SAP Fiori app on phones and tablets.

Project milestones

Milestone	Success Measure	Delivery Date	Status
SuccessFactors Phase 2 deployed	Benefits, Spot Awards, Total Rewards implemented and integration with 3rd party applications	February 2024	**Completed**
Employee Relations Case Management solution	Secure and auditable employee relations case management solution.	Sept 2024	**Planned**
SuccessFactors phase 3 deployed	Time recording, Talent management and LMS all in a single platform.	Mar 2026	**Planned**

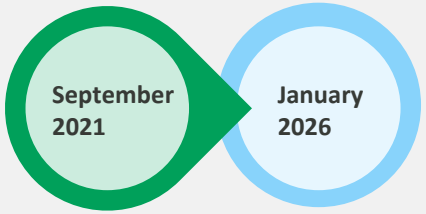
- *Completed milestones: Implemented Zoho Case Management,*
- *Implemented S4 for Payroll CD2, Established Power BI for HR reporting*
- *Employee self-service and Manager Self Service live in SuccessFactors*

Risks/Mitigations

Following a consideration of future functionality requirement, the Employee Relations solution implementation has been delayed. Alternatives to the proposed solution are being considered to ensure that these are met.

Evolution of mature Smart Network

Oil and gas exploration have seen significant operating efficiencies and asset reliability improvements from collecting more granular data, this will provide opportunities for us to improve asset reliability for our stakeholders.



Digital themes

Stakeholders who will benefit

- Government Authorities and Policy Makers
- Network Planning
- Energy Industry and Other Utilities

Service we provide today

June 2024 update:

The commitment to invest in hydrogen networks and hydrogen blending, brings complexity in operation and billing that our current network is not designed for. Hence, we need to obtain greater insight in the demands from our 11 million customers. Currently we have approximately 1,000 loggers which are placed across various strategic points in our network that inform our network modelling tools used to create network designs and operating strategies. There is a growing need to collect more information and adopt new types of solutions and devices deployed.

Cadent have developed a prototype demonstrating how data, analytics and models can be used to identify and locate gas leaks in the gas distribution network. The core functionality of the Digital Platform for Leakage Analytics (DPLA) is data-driven leakage modelling, unlocking proactive leak detection capabilities, combined with testing the application of novel gas sensor technologies, to inform better targeting of the deployment and arrangement of our in-field specialised sensors thereby streamlining 'network sensorisation' costs thus outcome of the DPLA will inform areas to install sensors to reduce carbon emissions, realise customer benefits and improve safety in a cost-effective manner - This will the first iteration of our Digital Twin.

The delivery date has changed to enable us to leverage the first data insights from the DPLA can identify the optimal locations and this prioritisation reinforces that of such data driven decisions to enhance the effectiveness and accuracy of the sensor network ultimately leading to better performance and resource allocation.

Service in the future

What we will have in place

The new low-cost smart devices and sensors will collect new data, at different levels/pressures of the network or on new assets and this will enable our maturity of the smart network by;

1. More real time operation of the network;
2. Intelligent decisions on capacity and our investments;
3. Intelligent asset management decisions such as predictive maintenance;
4. Enable design of all aspects of hydrogen/green gas transition in preparation to create safety and feasibility case for hydrogen;
5. Opportunity to create an asset portfolio of IoT connected devices (smart devices exchanging the information via internet) with alternative communication as moving to agnostic devices will enable a more competitive choice, eliminating single source supplier risks.

How the service will be accessed:

The additional data from these sensors will be introduced to increase efficiency by implementation of Robotic Process Automation (RPA), Digital Twin and Mobile Application use cases that can be implemented across the key processes.

Project milestones

Milestone	Success Measure	Delivery Date	Status
Complete Proof of Concept (PoC) to roll out new sensor and observe the data from our partner's platform. The sensors have been installed in Stoke areas and are being monitored for next 9 months.	Confirmation if new sensors provide opportunity to decrease the cost and risk associated with collecting sensor data.	August 2022	**Completed**
Installation of Street Level pressure sensors across selected areas of our network	Successful installation and collection of sensor data	TBD	**On Hold pending ECAF review**

Future Considerations

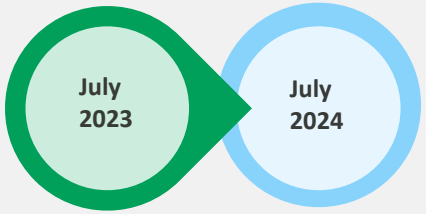
The analysis of Enhanced Cyber Assessment Framework (ECAF) requirements identified a set of priorities for further investment within our organisation and requirements for smart devices and sensors, hence in the scope of new guidelines.

The priority is now given to formulation of a Strategic Roadmap of investments and target state architecture determination for critical Cadent systems to ensure compliance with the Cyber Security guidance.

- Exploring opportunities for leveraging funding from Shropshire and Herefordshire Grant to support Net Zero.
- Shaping plans for installation of smart District governor sensors and across the network following output from DPLA
- Assessment of opportunity to install sensors around electricity power generation sites that will allow integration.

Better Supporting Our Customers in Vulnerable Situations

Fully embedding the Priority Services Register (PSR) to support on-site decisions on additional welfare to support customer in vulnerable situations when temporarily off gas



Digital themes

Stakeholders who will benefit

- Field Engineers
- Customers in Vulnerable Situations
- Supply Chain

Service we provide today

June 2024 update:

Engineers require access to multiple applications to gain a complete view of customer vulnerability, with the PSR not embedded across all. The Additional Welfare Decision Tool (AWDT) currently sits alongside the PSR, making it more difficult for front line engineers to combine the data to ensure that the optimal welfare decision package is chosen each time.

This means there are further improvements that can be made to increase consistency of our safeguarding services to customers, standardisation of support measures we provide relating to customer need and traceability of the support equipment we make available to customers when in a vulnerable situation due to our works.

Service in the future

We encapsulated the guidance and knowledge within a single application that allows our engineers to leverage this information easily and consistently to best assist our customers impacted by our works when in an off-gas situation. We aim to integrate this AWDT with logistics providers so once a need is identified within the application the required items are ordered, tracked and monitored as part of the process.

What we will have in place
Fully automated safeguarding support tailored to the needs of our customers. We aim to integrate with our existing applications and with future providers via an API (Application Programming Interface) based application that enables automation, traceability and security in the delivery of our support PSR customers, or those in a vulnerable situation. The AWDT work started in July 2023 with the initial increment being delivered across Networks as Phase 1 and Phase 2 will be delivered by July 2024. We will then look to integrate into our target architecture but further assessment of this will be required.

How the service will be accessed
The service will be accessed via a Web based User Interface by our Field Force & Customer teams as well as supporting organisations (e.g. National Energy Action & British Red Cross). This is currently built on a low-code platform by Business users meaning users can design and build themselves rather than place a formal request via the IT team.

Project milestones

Milestone	Success Measure	Delivery Date	Status
Deliver a limited trial of Additional Welfare Tool to West Midlands network	App in use by engineers in West Midlands network	August 2022	Completed
Deliver Additional Welfare Tool to all networks (Phase 1)	Phase 1 progress continues (delivered to 4 out of 5 networks) although reviewing user feedback from the field force regarding the UI and making improvements.	July 2024	In progress
Enhance Additional Welfare Tool to provide delivery of services (Phase 2)	This work is due to be completed by the end of July as per the plan	July 2024	In progress

Risks/Mitigations

There is a risk that this grey IT remains in place for longer than initially though. For the future of this initiative (post Phase 2), we will take additional time to reassess the integration with our core enterprise architecture due to ‘end of life’ of some of our existing technology.

Empowering Customer Self Service Through Technology

Using guided video capture to enable customer self-survey for new gas connections

Start date

August 2024

Digital themes

Stakeholders who will benefit

- Energy Industry and Other Utilities
- Field Engineers
- Domestic Customers

Service we provide today

June 2024 update:

The customers who request a new gas connection are asked to be present at the time when our Surveyors conduct an assessment (a survey visit) of the requirements for any new connection. These visits must be arranged with significant notice and currently there is no option for our customers to 'self-survey' in their own time, avoiding the potential inconvenience of a survey visit.

What we have done so far
Our new connections process is made available to our customers currently via telephone or email.

Service in the future

Together with a technology partner, we developed a trial of a self-survey video capture application for use instead of a visit from a surveyor to the property. This is a trial of the concept and implementation of this technology and approach. The application is in development and trial phase. As such it is available to pre-selected customers and surveyors within the West Midlands network. Upon the completion of development and of a successful trial we will look to expand the scope beyond the West Midlands.

What we will have in place
A guided video survey tool for new gas connections that has been developed and trialled with both our customers and our engineers and allows our customer to self-serve if so desired. As the trial has been successful, Cadent is now preparing a formal procurement process to ensure we are selecting the best cost-to-value solution available. The expectation is for a procurement selection process to take between 4-6 months followed by a rollout programme of this initiative within chosen Cadent network.

How the service will be accessed
The service will be accessed via an app and via a web application providing an intuitive User Interface for the user with discussions ongoing about overlaying with AR & AI technology.

Project milestones

Milestone	Success Measure	Delivery Date	Status
Develop the self-survey guided video capture application	Provision of trial to selected customers/surveyors	July 2021	**Completed**
Trial the self-survey guided video capture application	Provision of trial to selected customers/surveyors	August 2021	**Completed**
Video capture application rollout	Implementation of a permanent solution	August 2024	**In progress**

Risks/Mitigations

The original milestone of March 24 for the solution rollout has not been met due to business prioritisation of more urgent work.

The tender process is currently running to enable this technology into the business.

As there is a desire to use the technology wider across different processes within Cadent the procurement process for the solution is continuing.

Using Data to improve our Safety & Sustainability

Implementing a new Incident Management System (IMS) and Environment Reporting System (ERS)

April 2023 → October 2024

Digital themes

Stakeholders who will benefit

- Regulatory Reporting
- Business Customers
- Supply Chain
- Field Engineers
- Energy Industry and Other Utilities
- Low Carbon Connecting Parties

Service we provide today

June 2024 update:

A self-service system to record all incidents and hazards is available to all employees, contractors and third parties. The solution enables the line managers and our safety team to analyse the records, take appropriate action, investigate the cause and take proactive action to prevent repeat incidents. Having a holistic view of our safety data enables us to better protect our people, our assets and the communities we serve. The Environmental database and Action Sustainability solutions allows us to report and measure our Green House Gas emissions in line with the UKs net zero targets. The system supports us to deliver high standards of environmental performance, enhance the environment, and seeking innovative, sustainable ways to lighten our environmental footprint.

The current system provides interactive dashboards with informative data, future trends and analysis to drive action. This enables data manipulation and stratification down to levels where action and improvements can be identified and communicated. Improvements have been delivered to collate and streamline the data collection across the business, however, this is labour intensive, and work is progressing to automate this from the source. This system is a key enabler to deliver our environmental commitments throughout RIIO-2 and beyond, and support delivery Regulatory Reporting Process and the Annual Environmental Report Annual Environmental Report 2023 (cadentgas.com)

Service in the future

The automated dashboards will show our energy consumption and greenhouse gas emissions and how we are reducing our emissions to meet the UK's net zero targets.

The calculator model provides a framework and model to collate and calculate our greenhouse gas emissions.

Scope 1 covers direct emissions generated while performing day to day business activities;

Scope 2 covers indirect emissions from purchased energy;

Scope 3 covers indirect emissions in the value chain.

Project milestones

Milestone	Success Measure	Delivery Date	Status
User Acceptance Testing (UAT)	UAT signed off	(IMS) September 2022	Completed
		(UAT) January 2023	Completed
Training and Go-Live	Deployment of the Solution in production environment	(IMS) October 2022	Completed
		(ERS) April 2023	Completed
Outcome analysis	Post implementation review nearing completion. Final validation of the data and automation of the process.	(IMS) January 2024	Completed
		(ERS) Oct 2024	In progress

Risks/Mitigations

We have currently placed the development on hold and hence pushed the delivery date out with the existing vendor. We are reviewing our options such as developing in house and using a new 3rd party to continue to enhance, automate and streamline the capture of data to be displayed on real-time, interactive dashboards. The current process will continue and supports the requirements;

the risk of evaluating new options may occur in additional funding.

Open Data Portal

Digital service to make our data available to stakeholders

January 2023 → November 2024

Digital themes

Stakeholders who will benefit

- Energy Industry and Other Utilities
- Government Authorities and Policy Makers
- Low Carbon Connecting Parties
- Network Planning

Service we provide today

June 2024 update:

Our data is being made available to our stakeholders and partners as part of a reactive process. The relevant requests, after triaging, are being made available via a dedicated file exchange solution, on demand.

This process, while allowing us to securely make our information available, does not fully support visibility and accessibility principles articulated in Data Best Practice. As the relevant Data Assets are bespoke per each request, the preparation of those Assets and relevant supporting information impacts the ability to serve the Data Assets quickly.

To request any Cadent data the stakeholders are invited to contact us:

- Via form on Cadent website: https://cadentgas.com/reports/open-data/data-request-form

Service in the future

Our stakeholders require better visibility of our Data Assets and the opportunity to self-serve the Data Assets. The Data Assets should be easily accessible and searchable.

What we will have in place

We are investing in a digital service that presents the Data Assets that are available to our stakeholders and allows to access without restrictions the Data Assets that have a status of open data.
The service will allow stakeholders to search, understand and access our Data Assets, request Data Assets of interest that are not yet available through the digital tool and understand the data release dates.

How the service will be accessed

The service will be accessed via a dedicated webpage.

Project milestones

Milestone	Success Measure	Delivery Date	Status
Data on leakage within Cadent network to be added to Data Catalogue	New entries added to Cadent Data Catalogue on Cadent website	June 2024	**Completed**
Product requirements and selection	Solution Design completed and Product selected	May 2024	**Completed**
Data related to flow of gas on Cadent network	New entries added to Cadent Data Catalogue on Cadent website	August 2024	**In progress**
Product configuration	Integration of the selected product within Cadent ecosystem	October 2024	**Not started**
Open Portal Go-Live	Launch of Open Portal	November 2024	**Not started**

Risks/Mitigations

There are no risks identified at this stage for upcoming milestones.

Hydrogen System Modelling Tools

Enable the detailed design of the transition plan for 100% hydrogen

Nov 2023 → June 2026

Digital themes

Stakeholders who will benefit

- Government Authorities and Policy Makers
- Network Planning
- Energy Industry and Other Utilities
- Business Customers
- Low Carbon Connecting Parties
- Regulatory Reporting

Service we provide today

June 2024 update:

Together with other Gas Distribution Networks, we are currently working with Department for Energy Security and Net Zero (DESNZ) to build the evidence for using 100% hydrogen in our gas networks and buildings. We are involved in several hydrogen projects in partnerships with the energy sector. The four main areas we lead on are blending, domestic heating, industrial power and decarbonising heavy transport and more details are available at: What are we doing? - Cadent Gas Ltd

The Analytics & Insights teams focus is on supporting these projects, and the evidence that supports 100% hydrogen through two key areas are:

- **System Transformation & Network Modelling** – Where we provide the feasibility and network requirements to transition our existing natural gas network into a 100% hydrogen network, using digital modelling tools. We have just progressed two upgrades within current system to help support the hydrogen system modelling, with the gas volume upgrade now at User Acceptance Testing (UAT) and the Sectorisation upgrade at development stage.
- **Hydrogen Demand Modelling** – We developed our own internal demand model that supports us in producing our own hydrogen and net zero scenarios.
- **Local Area Energy Planning (LAEP)** – We support Local Authorities (LA) and Regional Bodies in developing their Local Area Energy plans through data analysis and insights

Service in the future

What we will have in place

Through the System Transformation project, we will have hydrogen viable network models to support the transformation of the gas network to a blend of natural gas & hydrogen, and eventually to 100% hydrogen. This will be achieved by upgrading our hydraulic modelling system.

In addition, developing our Hydrogen Demand Modelling into a system-based digital interface allowing us to model future energy scenarios in support of requirements from Local Authorities and Regional Bodies for open datasets for their net zero transition plans.

How the service will be accessed

The outputs of the work will be directly shared with DESNZ as part of System Transformation.

Project milestones

Milestone	Success Measure	Delivery Date	Status
Discovery phase of digital tool based on existing excel process for modelling future hydrogen demand	Discovery phase of digital tool based on existing excel process for modelling future hydrogen demand	June 2023	Completed
Development phase of a digital scenario modelling tool and associated data platform	The information and logic provided by Cadent to the developer required further development, resulting in a delay. Acceptance criteria have been amended and agreed	July 2024	In Progress
Hydraulic Modelling System Sectorisation Upgrades	System upgrades agreed and signed off.	June 2026	Planned

Risks/Mitigations

The project has been delayed due to technical understanding of the gas network and was held up until an adequate resource was available from Cadent to share operational and network understanding with the development team. This blocker has now been removed, enabling project delivery to continue with UAT being conducted over June 2024.

Biomethane Smart Control

Investigate ways of decarbonising country's gas networks

May 2022 – March 2024

Digital themes

Stakeholders who will benefit

- Government Authorities and Policy Makers
- Network Planning
- Energy Industry and Other Utilities
- Low Carbon Connecting Customers

Service we provide today

June 2024 update:

We have been supporting increasing levels of biomethane onto our networks for several years now and it's great to see others sharing the excitement about this low carbon gas. More details are available at: Biomethane - Cadent Gas Ltd. On Cadent networks today we have 45 entry connections with the ability at maximum capacity to heat the equivalent of over 300,000 homes.

Under the OptiNet initiative we collaborated with a smart energy technology company and Wales & West Utilities to understand how intelligent control and compressor technology can be used to maximise flows from Biomethane Sites. This is due to commission in the Summer 2024.

We now have sites within the East Midlands that actively monitor the pressure of the network and react to keep pressures low enough for our entry customers to inject, whilst also ensuring security of supply to our exit connection customers.

OptiNet will be the first in grid compressor in the UK to reverse the flow of gas back up the pressure tiers creating capacity for green gas injection. This will be the first of many for Cadent as we adapt the way be operate our network to displace fossil fuel transportation with green gas.

Service in the future

What we will have in place

The aim of the Biomethane Smart Control project is to develop capability to optimise pressure management and compressor operation as we see increasing levels of biomethane connecting to our network, alongside the installation of new compressors to manage flows.

To enable efficient connection of new biomethane plants to our network, we expect to see compressor installations to move gas up through our pressure tiers. How these compressors are operated alongside other pressure control equipment will play a significant role in enabling more green gas into our networks. This could then shape how we look at releasing capacity going forward.

Project milestones

Milestone	Success Measure	Delivery Date	Status
Compressor commissioning and field trial	The first UK compressor to enable capacity for green gas entry is due to commission in Summer 2024.	September 2024	In progress
Learnings from OptiNet project	Validation of the concept of enabling increased biomethane flows by compressing gas on the network following commissioning and field trial of the compressor	November 2024	In progress
Socialisation of entry reinforcement reopener	Submission for additional funding to increase the number of green gas entry connections acting as a direct displacement for natural gas.	May 2024	In progress

Risks/Mitigations

Expanded milestones include commissioning and learnings, so appropriate lessons learned can be undertaken.
A process to help socialise the cost of compressors and other entry reinforcements will also be vital to remove a key barrier to new biomethane connections.
A decision has been made to ask for additional funding through our Regulatory process (Re-opener process) in spring of 2024.

Baseline Carbon Footprint in IT

Assess the opportunity to drive sustainability through the IT Supply Chain

Dec 2022 → March 2025

Digital themes

Stakeholders who will benefit

- Government Authorities and Policy Makers
- Energy Industry and Other Utilities
- Supply Chain
- Business Customers

Service we provide today

June 2024 update:

Currently the IT sector in the UK is immature with respect to acceptability levels for carbon footprint, as well as reporting parameters.

The Carbon Trust has categorised emission types into three different Scopes, and the IT industry has adopted Scope 3 as the most relevant for reporting the fugitive emissions related to services, they supply to us.

We are engaging with its main IT suppliers to encourage data gathering, establish monitoring frequency, reporting metrics and where available, document net zero initiatives.

We are also investigating the evidence for renewable energy claims with respect to carbon credits, carbon offsetting, green energy purchase agreements and Renewable Energy Guarantees of Origin (REGO) certificates.

We have successfully incorporated Sustainability and Equity, Diversity & Inclusion (ED&I) into our Pre-Qualification Questionnaires (PQQs) with a substantial 10% weighting. This will be used in all procurement events in IT.

Service in the future

What we will have in place

By running a full fiscal cycle of procurement events with the new PQQ sustainability questions included, we will move closer to establishing the minimum standards all IT suppliers will need to meet to qualify for future tenders. The minimum threshold will require the use of certificated carbon offsetting initiatives as well as Green Power Purchase Agreements as components of the supplier's strategy. We will also develop a tiered threshold framework that is inclusive of SME suppliers who have may have more limited means of accessing renewable energy initiatives.

Ultimately the ambition is to set Science-Based Targets for our suppliers, with contractual obligations and pecuniary consequences for below-target performance, which will underpin IT sector maturity on how net zero is achieved.

Cadent believes that better adoption of sustainable IT initiatives will be achieved through sector-wide co-ordination of threshold setting, to prevent an anti-competitive state for IT suppliers.

The cross-sector collaboration on defining the threshold settings is going to be a primary focus up to December 2025.

We will support key suppliers to interact with the resources contained in the Sustainability School and their maturity and progression through the engagement levels (bronze to gold).

Project milestones

Milestone	Success Measure	Delivery Date	Status
Adoption of Tool by 60% of Vendors by Spend	Widen study group to encompass 60% of IT by vendors by spend	February 2023	Completed
Incorporation of sustainability in Cadent IT Procurement Process	Sustainability and ED&I now has a weighting of 10% in our tender processes. A recent major tender has demonstrated that suppliers are responding in well-structured, considered ways in order to maximise their scores for this section.	January 2024	Completed
Expansion of Metrics Beyond MtCO2e	Increase number of metrics reported to include water usage and emissions related to professional services.	March 2025	Planned

Risks/Mitigations

At present, collection of the necessary data is a manual activity and as such is not sustainable every month.
We have also learnt that there are inconsistencies in monitoring frequency between the vendors which may lead to bias in the collected data.
Cadent has adjusted its aspiration based on this learning and is now collaborating with others within the industry to set SMART goals and thresholds for the IT supplier base. The cross-sector collaboration on defining the threshold settings is going to be a primary focus throughout 2024.
This will support with extending the information we get as well as targeting action to reduce our carbon footprint.

Leakage Detection – Emissions Reduction

Emissions Reduction Optimisation

April 2023 – August 2024

Digital themes

Stakeholders who will benefit

- Government Authorities and Policy Makers
- Energy Industry and Other Utilities
- Supply Chain
- Network Planning

Service we provide today

June 2024 update:

We are piloting a solution (Advanced Leak Detection, currently provided by Picarro) that offers an innovative set of technologies presenting a major opportunity to locate and quantify actual emissions, their sources and inform the optimisation of our emissions reduction plan. The solution collects methane and ethane concentrations, Global Positioning System (GPS) and windspeed data from vehicle mounted sensors and uses an algorithm developed through machine learning to form an output. The project is called Network Emission Management.

We have used this technology so far in our North London and West Midland networks, with 14,098km (total) of gas mains surveyed so far. The data collected measures the network's leakage with view to assess the following strategic objectives:

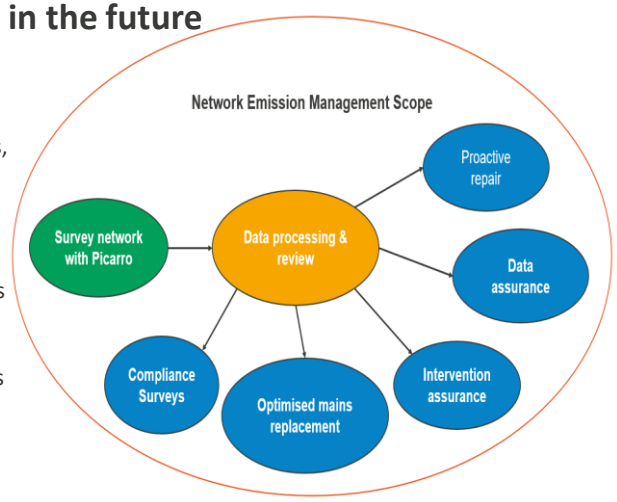
1. Assess field-measured results against the incumbent shrinkage model
2. Risk based approach to prioritising repairs for highest emitting gas leaks; so far, we have found 456 leak indications above an action threshold, with a 90% find rate.
3. Informs and optimises our strategic mains replacement investment programme planning.

Service in the future

Advanced Leak Detection cars will survey our network proactively, at first with a frequency of once per year to collect a baseline view of emissions, and then with risk-based frequencies.

Leak Indications found above threshold will flow through our work management system to be visited by a First Call Operative (FCO), with remedial actions to follow.

All data collected will be used to prioritise our mains replacement programs, as well as feed into our business planning and other processes (see right)



Project milestones

Milestone	Success Measure	Delivery Date	Status
Funding request submitted Business Case & Costs	Submission of Network Emission Management as part of the Non-Operational IT Reopener	September 2023	**Completed**
Scale Up Go/No Go	Decision to scale the technology across all Cadent networks. Based on the reopener outcome.	April 2024	**Delayed - Working with Ofgem for Net Zero Reopener Submission**
Detailed Benefits Case Definition	Retrospective analysis of optimising mains replacement and conducting proactive repairs. This will occur once we have surveyed some areas in Fulham 3 times	July 2024	**Planned**

Risks/Mitigations

A "go" decision to scale up will require system changes to the Proactive Escape process of allocating the work to our Field Force Engineers:

- Allow FCOs to view the location of the leak indications in our systems. This currently happens in a separate system that is unsuitable for larger volumes in case of the enterprise rollout.
- Automation of the creation of a Proactive Escape work orders in Cadent systems for Field Force Engineers.

In March, members of the IT team visited Italgas to understand how they plug proactive leak data into their work management system. Currently work is prioritised to automate proactive leak data through ArcGIS, SAP and Click to rapidly respond to areas where leak indications are found using our FCOs.

SIF Project – Digital Platform for Leakage Analytics

Reduce gas network leaks and emissions in a cost-effective way

September 2023 → **January 2026**

Digital themes

Stakeholders who will benefit

- Energy Industry and Other Utilities
- Government Authorities and Policy Makers
- Network Planning
- Domestic Customers
- Business Customers
- Regulatory Reporting

Service we provide today

June 2024 update

In order to demonstrate of the viability of combining data modelling capabilities with innovative leak sensor technologies to detect, localise and characterise gas leaks we have:

- **Through Ofgem's Strategic Innovation Fund (SIF) process, completed a Discovery (in May 2022) and Alpha phase (in Feb 2023) projects, explored and carried out the following activities for the concept of a Digital Platform for Leakage Analytics (DPLA):**
    - **System Architecture & Design:** The platform requirements, system architecture & model design were defined in preparation for the Beta phase Minimum Viable Product (MVP) buildout.
    - **Technology Recommendations:** A range of innovative, in-field leak detection technologies were analysed
    - **Change Impact Assessment:** The expected level of impact and potential adaptation strategies was assessed across four dimensions of the gas networks: job roles, people & skills; processes; systems & tools; and behaviours & attitudes.
    - **Regulatory Options:** Identification of four impacted areas to the Regulatory Framework, Asset Management, Regulatory reporting and outputs and the Shrinkage and Leakage model.
    - **Business Case:** Determination of the value of the DPLA and to compare the cost/benefit of different scenarios, including technologies deployed, timelines and leak reduction rates.
    - **Stakeholder Engagement:** Identified and engaged with 4 key groups of stakeholders. 1) Customers: collected customer responses to the DPLA concept through a survey. 2) Industry: engaged with Ofgem on the regulatory aspect and with gas shippers to ensure the DPLA will meet their needs. 3) Customer stakeholders: such as Citizens Advice and Fuel Bank UK, to ensure DPLA will also benefit vulnerable customers. 4) Sustainability stakeholders:
    - **Commercial Recommendations:** Commercial design options were identified and evaluated from three key perspectives: the party responsible for 1) building the platform 2) marketing the platform and 3) owning the platform.
- **In June 2023, the submitted application for the Beta SIF funding to develop the DPLA was successful.**

Service in the future

The DPLA will provide a step change to move from the static approach to a data driven one to dynamically detect and report methane leaks to a much greater level of accuracy and granularity to enable networks to act far more proactively. The current Shrinkage and Leakage Model (SLM) has been in place for 20 years and is based on legacy data and studies from 1994-2022 and has remained as a static approach since.

What we will have in place:

We are planning to develop a prototype demonstrating for how data, analytics and models can be used to identify and locate gas leaks in the gas distribution network. The core functionality of the DPLA is data-driven leakage modelling, unlocking proactive leak detection capabilities, combined with testing the application of novel gas sensor technologies, to inform better targeting of the deployment and arrangement of our in-field specialised sensors thereby streamlining 'network sensorisation' costs.

Shaping the future network, the DPLA's mission is to reduce carbon emissions, realise customer benefits and improve safety in a cost-effective manner: https://smarter.energynetworks.org/projects/cad_sif0005/

Project milestones

Milestone	Success Measure	Delivery Date	Status
Stage 1 Delivery – Data preparation	Data validation completed and determination of suitability of the data for model development	January 2024	Completed
Stage 2 Delivery – Data model development	Data models built, tested and produce adequate outputs and performance	December 2024	In Progress
Stage 3 Integration – System Integration with existing systems	Successful integration of DPLA alongside and within Cadent's core systems	Jan 2026	Planned

Risks/Mitigations

There is a risk that the validation of all extracted data (due to volumes and complexity) for the model development is not going to be possible within the specified timeframe.

The mitigation proposed is to validate the information from key sites in the first place to ensure that findings are representative to overall project trail and are representative to determine the suitability of key drivers (the most significant data) that is expected to influence the model development.

Short Term Forecasting Model

Forecasting Emergency Workload

April 2023 — March 2025

Digital themes

Stakeholders who will benefit

- Field Engineers
- Network Planning
- Domestic Customers

Service we provide today

There is a requirement to forecast reactive emergency work to ensure the right amount of field force engineers are available to protect customers and manage emergency standards of service.
We currently create manual forecasts based on weather forecasts and actual workload volumes over the last three years. This is then split out by location and by hour to provide a forecasted resource requirement to meet demand.
This can be very variable with a 25%+ on day variance which means that either Cadent makes too many resources available incurring avoidable cost or there is a shortage of resources which might result in failure to attend gas emergencies within required Service Level Agreements (SLAs)

Service in the future

There is an ambition to test more advanced modelling tools, utilising Machine Learning (ML) and Artificial Intelligence (AI) to increase the accuracy of the predictions and less variability within the forecasts for emergency work.

The model will provide workload forecasts and resource requirements to maintain standards at an hour-by-hour level seven days in advance.

The new modelling tool with give clear visibility of forecast performance, volumes and locations to enable Cadent's operational workforce to accurately plan resources to enable workload delivery and ensure Emergency standards of Service (98% of all emergency jobs attended within one hour of the customer call) are met.

Project milestones

Milestone	Success Measure	Delivery Date	Status
User Interface	Deploy a UI that enables internal stakeholders to access forecast and metrics on forecast performance	Jan 2024	Completed
Hour by Hour & Regional Forecast	Deploy forecasts at depot level by hour	Oct 2024	Behind
Testing & Refinement	Continual testing and refinement of forecasts to ensure greater accuracy and operational efficiency	Mar 2025	On Track

Risks/Mitigations

While the tool provides very promising results, the data is manually introduced to the tool to refresh the forecasts. This is being mitigated by stringent process and governance around data updates, to avoid any data errors.

An assessment of required integration needs to be carried out to ensure that the further development and adoption of the tool meets both the strategic business intention and ensure scalability of the solution.

Summary of projects closed in previous publication

Optimising Delivery Capability

Overview

Field Service Management (FSM) was an investment that has replaced end of life IT systems used by Field Operations teams (Emergency, Repair, Maintenance and Connections).
The software has now been replaced with a market leading product that brings many opportunities for future digital capabilities.

Reasons to pivot

Field Service Management now allows us to:

- Enable new capabilities such as customer appointment booking and streamlined field data capture. These capabilities will enhance both the customer and colleague experience of working with us.
- Provide a simplified technology offering to our field operatives and increased quality of our operational data.
- Allow back office Operational teams to allocate any type of job, to any field operative, anywhere, thus optimising how operatives' working time is used.

Milestone	Success Measure	Delivery Date	Status
Roll out field data capture tool to the whole of Cadent	The solution is utilised on a day-to-day basis. Support activities transfer from project to business as usual and exit criteria is met and signed off	July 2022	Completed
Simplification of current technology	Removal of duplication of data capture and adding in automated pre-population of data for some fields	December 2023	Completed

Using data to manage the integrity of our assets

Overview

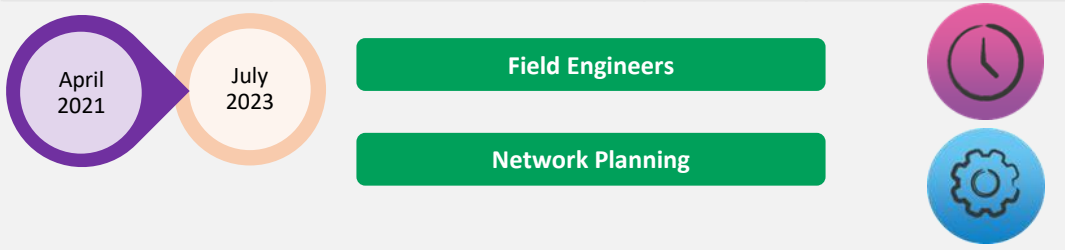
The introduction of Pipeline Safety Regulations 1996, resulted in several separate solutions being introduced for our Local Transmission System (LTS) pipelines to demonstrate compliance of our organisation with the regulations.

Reasons to pivot

The aim of Pipeline Integrity System is to act as a repository of related operational data and calculations to drive insights and allow more accurate risk-based analysis of integrity of the Local Transmission System and drive selection and definition of the asset maintenance activities.

The solution is now used by teams in all Cadent Networks including Cathodic Protection service into the same product.

Milestone	Success Measure	Delivery Date	Status
Risk Methodology information available for East of England network	Risk Methodology and Risk Score allocation available in the solution	December 2022	Completed
Solution available in North West and North London network with West Midlands to be planned in January 2023	Users have access to North West, North London with West Midlands to be planned in January 2023	April 2023	Completed
Go Live Cathodic Protection new Data Logger App and migration of Uptime into Synergi for Network to complete the full deployment of the Pipeline Integrity System	Full delivery of Pipeline Integrity System including CP module and loggers' data capture capabilities	July 2023	Completed



Summary of projects closed in previous publication

Presumed Open Data – Data Request Process

Service we have today

Data Users interested in accessing Cadent Data Assets can find a dedicated area on Cadent website:

Open Data - Cadent Gas Ltd

Dedicated section of Cadent website allows our stakeholders to understand the data that has been classified as Open Data and is available for use:

Data Catalogue - Cadent Gas Ltd

We have also explained to potential Data Users the process of security classification of Cadent Data Assets:

Open Data Triage Process - Cadent Gas Ltd

We invite our stakeholders to provide feedback on this service by visiting a dedicated subpage on our Cadent website:

Feedback Request Form - Cadent Gas Ltd

Milestone	Success Measure	Delivery Date	Status
Roll out field data capture tool to the whole of Cadent	The solution is utilised on a day-to-day basis. Support activities transfer from project to business as usual and exit criteria is met and signed off	July 2022	Completed
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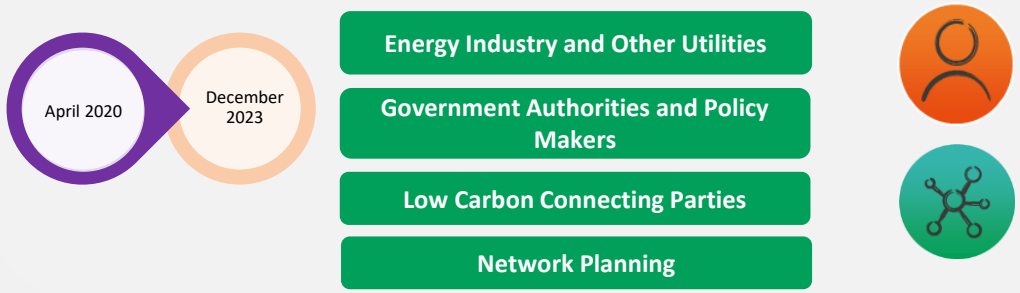

Cadent
Your Gas Network

Our previous Digitalisation Action Plan

Dec 2023: Digitalisation Action Plan - Dec 2023 (cadentgas.com)

June 2023:Digitalisation Action Plan – June 2023 (cadentgas.com)

Dec 2022: Digitalisation Action Plan - Dec 2022 (cadentgas.com)

June 2022:Digitalisation Action Plan - June 2022 (cadentgas.com)

Dec 2021: Digitalisation Action Plan - Dec 2021 (cadentgas.com)

Dec 2020: Digitalisation Action Plan - Dec 2020 (cadentgas.com)

Open to You

Keeping the conversation flowing

Being open and transparent is part of our culture, we would welcome hearing from our customers and communities to improve the value we deliver. Your comments and suggestions on our Digitalisation Action Plan are valued.

There are multiple ways you can engage with us and share your views and comments

- Comment on Facebook
- Comment on X
- Comment on LinkedIn
- Comment on Instagram
- Comment on TikTok
- Email us your feedback
- Send us your Feedback by post
- Call us on 0800 389 8000