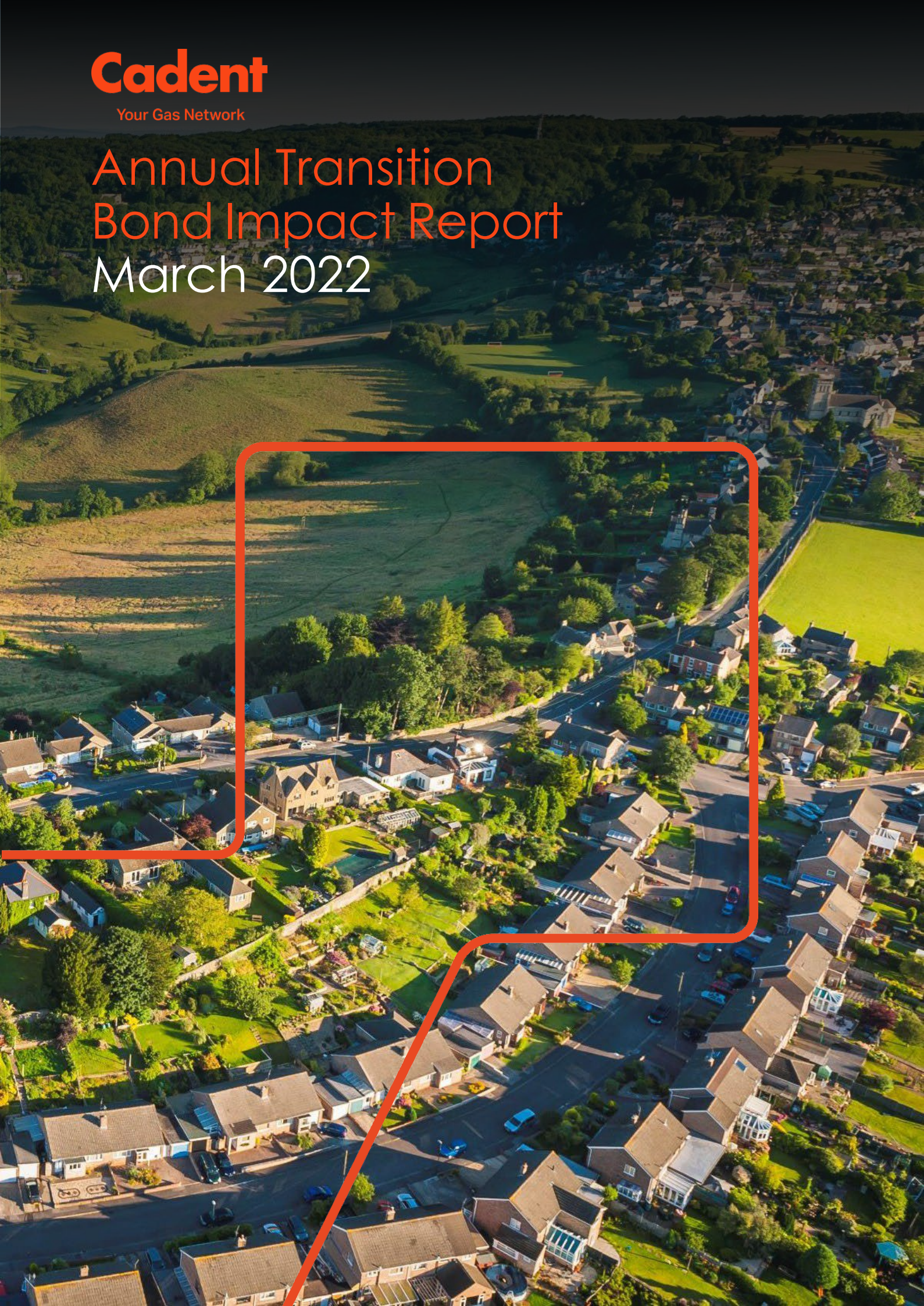
Cadent

Your Gas Network

Annual Transition Bond Impact Report March 2022



Introduction

1. Company overview

Cadent is the largest distributor of gas in Great Britain, owning and operating four of the eight regulated gas distribution networks located in the West Midlands, North West of England, East of England, and North London. The four networks operate approximately 131,000 kilometres of lower-pressure gas distribution mains serving 11 million customers both domestic and commercial. These geographies some of the largest and most densely populated cities in Great Britain, including London, Birmingham and Manchester.

We are responsible for the safe and efficient transportation of gas from the high-pressure national transmission systems to individual homes and businesses. We play a crucial role in maintaining, repairing and replacing gas pipes across our distribution networks (GDNs). As part of this, we also manage the National Gas Emergency Service telephone number on behalf of the gas industry.

In addition we:

- Connect homes and businesses, as well as renewable gas suppliers to our network;
- Work with local businesses to expand and develop our network;
- Provide extra care for those who might need it in a gas emergency

Cadent is regulated by the Office of Gas and Electricity Markets (Ofgem). Ofgem sets through a price control process the amount of revenue we can earn from network charges. The current regulatory period RIIO2 (RIIO (Revenue= Incentives + Innovation + Outputs)) operates for the period from April 2021 to March 2026. The previous regulatory period, RIIO1 ran from April 2012 to March 2021.

2. Transitioning to a more sustainable future

The UK's ambition to become Net Zero[1] by 2050 has fundamentally changed the way in which we think about energy in the UK. Across the country, local authorities, large energy users, homes and businesses are considering what this means in terms of transition plans. Given the nature of our infrastructure and the essential services that we provide, we have a unique opportunity to help drive forward the transition of the UK energy sector and to decarbonise our heat and transport systems.

- Our commitment to combating climate change is encapsulated in our RIIO2 business plan which sets out our role for the RIIO-2 regulatory period. We innovate in our day-to-day operations, continuously improving and finding new ways to deliver the highest standards of environmental performance, embedding it as part of our everyday activities and decision making, right across our network footprint.
- Our 'Future of Gas' programme looks at future energy scenarios and how we can support the delivery of the UK's hydrogen economy. We have pioneered innovation projects to demonstrate the viability of hydrogen networks through large scale demonstration projects such as HyDeploy and HyNet, we are also working with partners to connect more sustainable sources of gas, such as biomethane to our networks
- Our Environmental Action Plan (EAP)[2] outlines our commitments on climate change and has been developed through extensive stakeholder feedback.
- We are introducing electric vehicles into our fleet and we are developing hydrogen technologies and use of alternative fuelled HGV vehicles.

[1] https://www.gov.uk/government/publications/achieving-net-zero-carbon-emissions-through-a-whole-systems-approach

[2] https://cadentgas.com/nggdwsdev/media/Downloads/business-plan/APP_CAD_07-04-00-Detailed-Environmental-Action-Plan.pdf

Delivering Net Zero cannot be achieved solely through the work of the gas distribution companies. We continue to work with both national organisations such as the Energy Networks Association (ENA), the Energy Utilities Appliance (EUA), the Confederation of British Industry (CBI), and also with regional and Local Authorities to provide a common perspective to Government and regulators to help plan the energy transition.

Cadent leads the way in ensuring that the UK's gas network plays its role in securing energy for the UK that is lower carbon while also remaining reliable, flexible and convenient for customers to use. Our EAP, which formed part of our RIIO-2 submission to Ofgem, sets out our role for the next five years and demonstrates our leadership in tackling climate change through innovation and creating pathways to decarbonisation of our networks.

3. The role of Hydrogen in decarbonising heat, transport and industry and enabling a resilient energy system

This includes blending hydrogen into the gas network at a concentration of up to 20% and then later, a full transition to 100% hydrogen in the gas network. Our work, combined with the collective work across the sector, resulted in significant progress on the UK Hydrogen strategy. Key achievements include Hydrogen being number 2 in the UK government's Ten Point Plan[3] for a green industrial revolution in November 2020, and the production of the first Hydrogen Strategy[4] for the UK in August 2021.

Due to the flexibility of hydrogen as an energy vector, it is expected to play a significant role in the decarbonisation of industry, flexible power generation, aspects of transport and heat. Hydrogen is recognised as a key component in creating a balanced and resilient energy system, allowing the peak demands of winter energy needs in the UK to be met at lowest cost to the customer. Hydrogen provides a way to store energy. Utilising the gas network for this plays to the strengths of the sector, allowing electricity and gas to work in tandem.

Decarbonisation of key industrial clusters is an initial point of focus as this is where emissions are the greatest and the potential for carbon capture and storage are present in the same location. Cadent is focused on developing an industrial cluster decarbonisation project with consortium partners in the North West known as HyNet[5]. HyNet is a project that covers the full value chain of hydrogen production, carbon capture and storage, hydrogen distribution and industrial fuel switching. In 2021, this project achieved official Track 1 cluster status by the UK Government, meaning that the commercial aspects can be further developed in support of the Hydrogen Strategy's hydrogen production target. HyNet plans to be producing around 3.8GW of low carbon hydrogen by 2030, nearly 80% of the UK's target set out in the Government's Ten Point Plan. In development since 2016 by Cadent and partners Progressive Energy, HyNet has been through origination, feasibility and Front-End Engineering and Design (FEED) pre-phases. The hydrogen will be produced from natural gas using the steam reforming process which produces CO_2 as a by-product. The resulting CO_2 will be captured and together with CO_2 from local industry will be sent by pipeline for storage offshore in the nearby Liverpool Bay depleted gas fields.

[3] https://www.gov.uk/government/publications/the-ten-point-plan-for-a-green-industrial-revolution

[4] https://www.gov.uk/government/publications/uk-hydrogen-strategy

[5] https://hynet.co.uk

In terms of domestic/non-industrial projects, in 2019, HyDeploy became the first project in the UK to inject a blend of up to 20% by volume of hydrogen into the existing gas supply. Over the 17-month trial period at Keele University, the project focused on the safe management of the blending process. The project proved successful, with the hydrogen blends having been safely and efficiently distributed to a broad range of users within the Keele University gas network. This includes 100 domestic properties and up to 30 university campus buildings, such as office blocks, lecture theatres and laboratories.

4. Developing Hydrogen for Transport initiatives

Over the past year, we have led a study, in conjunction with the other gas networks, to understand the transition to a decarbonised future, focusing on how the transition may be achieved and the competing and complementary nature of different low emission transport fuels and technologies over time. Whilst the project has considered the whole economy, it focuses predominantly on transport, especially HGVs, as an early adopter of green gases and as a key enabler to net zero emissions.

5. Enabling and supporting Biomethane being connected into our network

We continue to lead the gas networks in supporting growth of the UK biomethane sector, by turning food, farm and other wastes, otherwise destined for landfill, into a gas to fuel homes and HGVs. We now have 36 biomethane producing plants on our networks, with volumes entering our network equivalent to the heating demands of as many as 228,180 homes (Source: utilitiessavings.co.uk). The growth of distributed gas generation, principally in the form of biomethane production, brings with it many challenges and Cadent is adapting to these. For example, the need to balance entry and exit requirements is being addressed by the introduction of smarter network management. With this, Cadent will be able to accept more biomethane connections, adding more green gas capacity into the network. This project is the first of its kind and aims to demonstrate the benefits of an optimised network solution for the first time in the UK.

6. Mains replacement

We continue to focus on reducing our environmental impact through existing operations and activities. The majority of Cadent's greenhouse gas emissions are from gas leakage. Leakage is the unintentional loss of gas to the atmosphere during the operation of the gas network. Across the company, this leakage equates to 0.43% of Cadent's total transported gas and there is immense focus to reduce this further[6]. The most important actions being taken to reduce leakage are replacing older metallic pipes with new plastic pipes, ensuring that joints between metallic pipes remain in good condition through gas conditioning; and managing average system pressures as low as possible to reduce volumes. Further, a working group, including other networks and plastic pipe manufactures, has been created to investigate how to reduce the carbon inputs to the plastic pipe manufacturing process.

[6] The estimate of leakage is based on measurements of how leakage in various pipe materials and sizes in various conditions when operate at different pressures, which is then modelled according to the average pressures at which the network is operated each year. This is a common and accepted approach across the industry

Spoil generated from Cadent's mains replacement programme, digging up and replacing thousands of kilometres of old gas pipes, is our most material source of waste to landfill. During RIIO-1 Cadent outperformed its 90% diversion to landfill target and also outperformed its RIIO-1 target[7] of importing no more than 30% first use aggregate. During RIIO-2, less than 10% of our backfill will be first use aggregate in the North West and East of England, and 5% in the West Midlands and North London. Achieving these targets will support a more circular approach to the management of a high-volume waste stream. Setting challenging targets for waste management supports further innovation to reduce spoil arising from no- or low- dig approaches to mains replacement and repair.

I. Cadent's Transition Bond issuance

In December 2019, Cadent published its Transition Bond framework which embedded the four pillars of Green Bond Principles. The use of proceeds outlined in the framework are: Retrofit of Gas Transmission and Distribution Networks, Renewable Energy, Clean Transportation and Energy Efficient Buildings.

The framework sets out that projects financed and/or refinanced through the net proceeds of any Transition Bond notes are evaluated and selected by a working group of representatives with the required level of expertise and seniority from Cadent.

In February 2020, Cadent conducted a series of debt investor meetings throughout Europe to introduce investors to the Transition Bond Framework and communicate Cadent's broader ESG strategy. Members of Cadent's senior leadership team met with investors in London, Amsterdam, Paris, Frankfurt and Munich. The feedback on the Framework and Cadent's strategy was positive, with investors supportive of Cadent's approach to a Transition labelled issuance.

Following the successful roadshow, on 4th March 2020, Cadent (rated Baa1 by Moodys and BBB+ by S&P and Fitch) issued the UK's first Transition Bond. The second issuance against the framework was on 19th March 2021 in the amount of €625m.

[7] https://cadentgas.com/nggdwsdev/media/Downloads/business-plan/APP_CAD_07-04-00-Detailed-Environmental-Action-Plan.pdf

II. Allocation of Proceeds and Impact reporting

The proceeds of the Transition Bonds have been and will continue to be allocated in line with the Transition Bond Framework.

At 31/12/2021, Cadent had issued €1,125m Transition Bond notes, equivalent to £975.9m at issuance. The first issuance was in March 2020 and was for €500m (£439.2m, ISIN XS2116701348) and the second was in March 2021 for €625m (£536.7m, ISIN XS2320438653). The proceeds of these issuances have been allocated in full against the eligible category - Retrofit of gas transmission and distribution networks. The below assessment covers issuance and impact against the framework from April 2020 to March 2021 covering proceeds from the second issuance under the Transition Bond Framework.

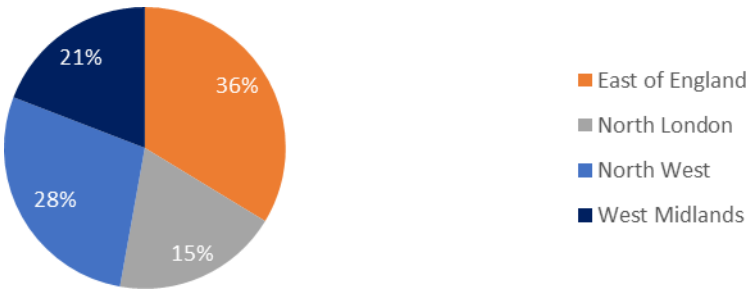
Projects in this category that have been evaluated and selected for financing by Transition Bonds includes Cadent's spend on Mains and Service Replacement (Repex) only. The March 2021 issuance of €625m (£536.7m) was fully expensed against the total Repex category spend in 2020/21 of £648.2m, thus maintaining a buffer over the net proceeds of £111.5m.

Impact of the allocated projects

The impact of this spend allocated can be calculated using Cadent's Ofgem approved leakage model for 2020/21, which is prorated to the allocated proceeds amount (£536.7m).

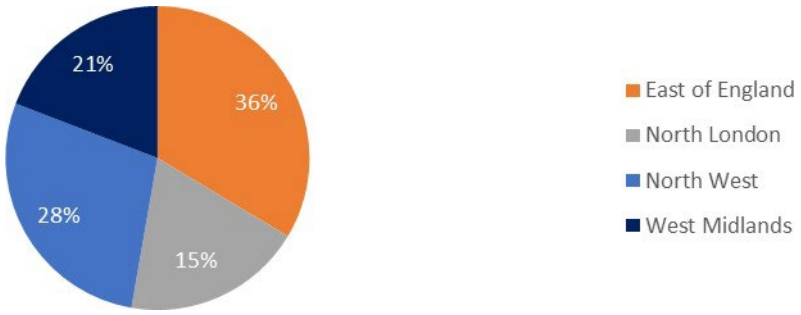
The impact of this spend is summarised in the tables below.

Reduction in leakage as a result of the 2020/21 Repex project (in GWh/yr)



	East of England	North London	North West	West Midlands	Total Cadent
Reduction in Leakage (GWh/yr)	12.9	5.6	10.2	7.6	36.2

Estimated annual GHG emissions avoided (in tCO_2e)



	East of England	North London	North West	West Midlands	Total Cadent
Annual GHG emissions avoided (in tCO_2e)[8]	15,776.1	6,830.5	12,464.5	9,363.5	44,434.6

The conversion to tonnes of CO2 equivalent for this paper used a global warming potential factor of 25 for consistency purposes and matches that of previous submissions. The Green House Gas Protocol reports GWP for methane as 28, if we used this then annual emissions avoided would be 49,748.0 tCO2e.

The leakage model underpinning the impact calculations in this report is the Shrinkage Leakage Model (SLM). It is used by each Distribution Network to calculate emissions from the transportation network. The SLM was built by Advantica and the methodology within it is agreed by Ofgem. Ofgem do not provide procedures or guidance as to how to complete the SLM, however the Distribution Networks meet periodically to ensure a standardised set of modelling rules. On an annual basis the Distribution Networks have a Licence obligation to review the methodology and application of the SLM and to investigate ways to improve the accuracy of the calculation. Changes to the methodology within the SLM requires Ofgem approval and expert review.

[8] Original publicly available Leakage model https://www.gasgovernance.co.uk/sf (password = jointoffice). Changes have been made to assumptions in the original leakage model since publication.

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