

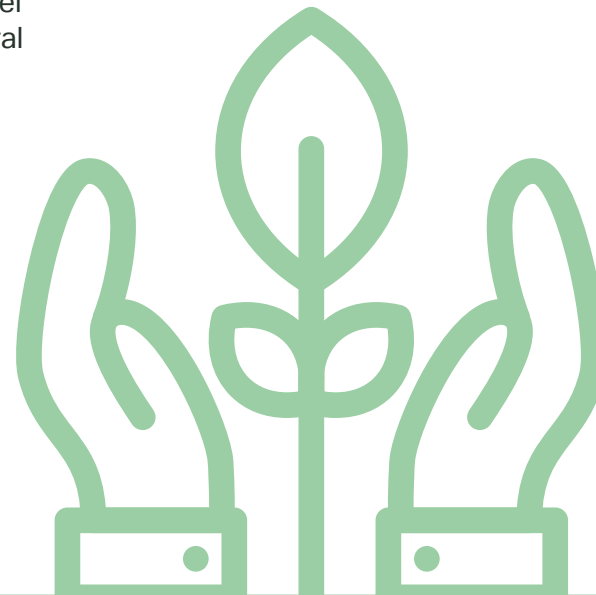
Shaping a more sustainable future

Leading the way to greener energy

We are leading the way in ensuring that the UK's gas network plays its role in securing zero carbon energy which is reliable, flexible and convenient for customers to use. The gas network can be transitioned to bring biomethane and hydrogen to our homes and our industries, massively reducing the carbon footprint of heat in the process. It can work alongside renewably generated electricity to help meet all the needs of UK customers while reaching the UK's target of being net zero by 2050.

It is now widely recognised that zero carbon gases, including hydrogen, will have to be an element of any future plans. This supports the UK in decarbonising freight and heavy transport by using fuel cells. We are playing a key part in several significant hydrogen projects to make this happen.

We promise to bring our customers with us on this journey, to ensure that they continue to have access to heat energy in the future.





Above: HyDeploy at Keele University is a UK first.

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The gas network is at the centre of the energy system and will play an important role in the transition to net zero carbon emissions

The UK's ambition to become net zero by 2050 has fundamentally changed the way we are all thinking about energy. Across the country, local authorities, large energy users, homes and businesses are considering what this means for them in outlining their own transition plans. We are doing the same in two main ways: how we operate our own business in a low carbon way and support the transport of low and zero carbon gases such as hydrogen and biomethane.

Excitingly, there has been a significant increase in pace and interest in the future role of hydrogen over the last year and we are pleased with the progress that is being made.

Providing leadership through the energy transition

Delivering net zero can't be achieved solely through the work of the gas distribution companies and so we are leading the development of industry-wide transition plans for the benefit of consumers. We continue to work with both national organisations such as the Energy Networks Association ('ENA'), the Energy Utilities Appliance ('EUA'), and the Confederation of British Industry ('CBI') to provide a common perspective to Government and regulators and also with regional and Local Authorities to help plan their energy transition.

We understand that the move to net zero requires a combined energy system that makes best use of both electricity and gas infrastructure to achieve its aims. We are extremely supportive of this approach and have recently submitted our plans in our RIIO-2 submission to show how we will work with the electricity Distribution Network Operators to deliver joined-up low carbon solutions.

Pathway to industrial decarbonisation

Decarbonisation of industrial clusters makes sense as it starts where emissions are the greatest. The gas to fuel industrial processes and the potential for carbon capture and storage are present in the same location. We have been focusing on developing our industrial cluster concept in the North West known as HyNet and this has made huge progress in 2019/20.


A clear route to decarbonising transport

We have been able to drive forward the decarbonisation of heavy transport, which is a large emitter of CO₂, through our expertise in biomethane connections and our leadership in hydrogen. We are focusing on supporting bio-CNG refuelling and the development of hydrogen for larger fuel cell vehicles.

We have progressed our national bio-CNG refuelling infrastructure, with nine public access stations connected to our network, a further three under development. Our National Distribution Centre fleet now benefits from operating nine bio-CNG trucks, avoiding emissions of up to 500 tCO₂e/year with a new bio-CNG refuelling station opened in June 2020.

Our research and innovation portfolio explores key aspects associated with the future use of hydrogen in transport. Our HyMotion project and report (2019) shows the way for hydrogen refuelling infrastructure costs; the impact of hydrogen blends on conventional engines; and the impact of gas impurities in hydrogen distributed in new and/or repurposed gas networks on hydrogen Fuel Cell Electric Vehicles.

Finally, we are also working to decarbonise our own First Call Operative fleet of circa 1,100 vehicles. This initiative is expected to deliver a reduction in emissions of 4,000 tCO₂e/year by 2026.



The overall HyNet project has seen investment of £14.5m from Government.

H
Hydrogen
1.00g



HyNet – A concept becoming reality

HyNet North West is an integrated Hydrogen/Carbon Capture Utilisation and Storage project which will decarbonise heavy industry in the Cheshire, Liverpool and Manchester regions and provide hydrogen to decarbonise domestic heat, heavy transport and flexible power generation. It was originally conceived by Cadent and Progressive Energy Ltd and funded by Ofgem's Network Innovation Allowance (NIA). As the project has moved from feasibility into engineering design, several industrial consortia have been formed to progress the different elements of the HyNet project chain which this year has seen investment to date of £14.5m from Government.

2020 saw most of the key elements of HyNet becoming a reality: industrial scale hydrogen production takes the form of the UK's first low carbon hydrogen plant at Essar Oil UK's Stanlow refinery in Ellesmere Port.

The £7.5m project will produce 3TWh of low-carbon and low-cost hydrogen, and capture over 95% of the carbon used in the process.

HyNet has also received £5.2m to fund live trials of hydrogen fuelling at Unilever's Port Sunlight manufacturing site, and at Pilkington's Greengate Works glassmaking plant in St Helens which will be a world first. The projects will demonstrate that hydrogen can be used as a substitute fuel for natural gas in manufacturing processes, helping industry transition to a low-carbon future and leading the way for others to follow.

The next milestone in the delivery of HyNet is to start the detailed design work this year for each element of the infrastructure which includes Cadent's new 80 km hydrogen pipeline.

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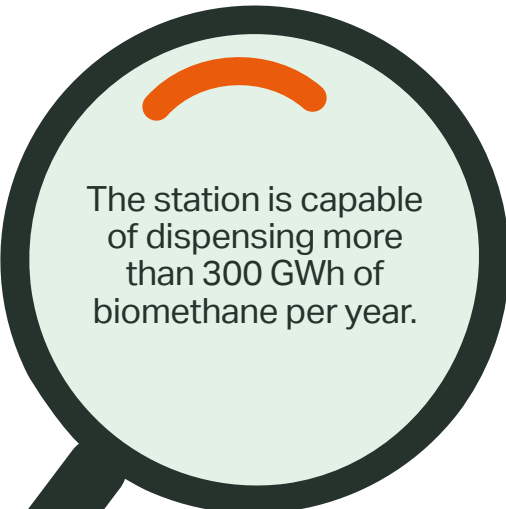
Biomethane connections

We support the growth of the UK biomethane sector by turning food, farm and other wastes, otherwise destined for landfill, into a gas to fuel homes and transport. We now have 35 biomethane producing plants on our networks, with the potential volumes entering our network equivalent to the heating demands of as many as 218,690 homes. (Source: utilitiessavings.co.uk)

The growth of distributed gas generation, principally in the form of biomethane production, brings with it many challenges so we are adapting to these and the need to balance entry and exit requirements through the introduction of smarter network management. With this we will be able to accept more biomethane connections, adding more green gas capacity into our network. This project is the first of its kind and we aim to demonstrate the benefits of an optimised network solution for the first time in the UK.

Decarbonisation and safety

Safety is central to everything we do. We are maintaining this focus throughout the development of our green initiatives. A major part of the HyDeploy project has been to assure safety before we deliver the blended gas. Working with our partners Progressive Energy and the Health and Safety Executive, we have safety tested every single gas appliance in 100 homes. In addition to the gas safety checks, we have also tested all 130 appliances with bottled hydrogen. All appliances passed this hydrogen test which is strong initial evidence that customers will not need to replace their gas appliances should a hydrogen blend be made available more widely. Further work is also being carried out across the industry to establish the safety aspects that would need to be considered and established as safe for 100% hydrogen trials.



The station is capable of dispensing more than 300 GWh of biomethane per year.



Cadent supports development of the largest bio-CNG refuelling station in Europe

The Warrington bio-CNG refuelling station located adjacent to the M62, which is owned and operated by CNG Fuels, can refuel 12 trucks simultaneously from 10 dispensers. The station is capable of dispensing more than 300 GWh of biomethane per year, which equates to a reduction in greenhouse gas emissions from HGVs of 80 – 100,000 tonnes each year. Development costs were in the region of £5 million, the station taking approximately two years to consent and build, and six months to construct. The station opened in November 2019 and is expected to serve a minimum of 200 trucks by the end of 2020. Most of these trucks will be using this facility as their primary source of fuel. Major customers include Hermes with a total of 83 trucks, and Home Bargains who also use the facility for their 10 trucks. ASDA and Argos also use the facility.



If we implemented HyDeploy across the UK tomorrow, it would save an estimated 6 million tonnes of CO₂ – the equivalent of taking 2.5 million cars off the road.”



HyDeploy at Keele University is a UK first

HyDeploy is the UK's first live pilot to blend zero carbon hydrogen into a gas network to heat homes and businesses. The HyDeploy demonstration is blending up to 20% (by volume) of hydrogen into Keele University's existing natural gas network, supplying 100 homes and 30 faculty buildings. We chose Keele for the trial because it has its own private gas network and the buildings on the campus closely mirror what you would expect to find in a small UK town.

Backed by Ofgem's Network Innovation Competition, the £7 million project is led by Cadent in partnership with Northern Gas Networks (NGN), Keele University, the Health and Safety Executive (HSE) Science Division, integrated hydrogen energy systems manufacturer ITM-Power, and independent clean energy company Progressive Energy.

The purpose of the HyDeploy pilot is to show that hydrogen can be blended with natural gas and used in the same way that consumers currently use natural gas. The 20% volume blend means that customers can use their gas supply as normal, without any changes being needed to gas appliances or pipework, while still cutting carbon emissions. If a 20% hydrogen blend were rolled out across the country it could save around 6 million tonnes of carbon dioxide emissions every year, the equivalent of taking 2.5 million cars off the road.

HyDeploy is the UK's first live pilot to blend up to 20% hydrogen into a gas network to heat 100 homes and 30 businesses.



HyDeploy @ Keele

Our hydrogen is split from water. Our electrolyser uses 100% green electricity.

www.hydeploy.co.uk

Shaping a more sustainable future

Improving the environment

We are committed to delivering high standards of environmental performance, protecting the environment and seeking new, innovative and sustainable ways to do business. Managing the environment is about more than just reducing risk and minimising our impact; it's about implementing best practice environmental solutions to drive efficiency, save money and preserve natural resources.

We are now in our 22nd year of having our environmental management system certified to the international standard ISO14001. Over the past 22 years, we have dramatically reduced our impact on the environment, by managing our waste and reducing greenhouse gas emissions.

However, with the next regulatory framework period will come several changes to the way in which key areas of environmental performance are measured. In addition to these regulatory changes to, for example, the measurement of waste to landfill, we believe that the time is right to reassess our approach to measuring other areas such as our carbon footprint and emissions.

We believe that consistency and transparency is important, particularly regarding these important measures. We will, wherever possible, use generally accepted methodologies for recording and reporting these measures, and seek to use appropriate and consistent benchmarks to aid comparison and understanding. Measures such as these will necessarily change from time to time and where they do, we will seek to provide year-on-year comparisons on a consistent basis for clarity.



Greenhouse gas ('GHG') emissions reductions since 1990

70%

Our target was 45% by 2020

Reducing leakage from our network

The majority of our GHG emissions are from leakage. Across our networks, this leakage is estimated to be less than 0.5% of the total we transport and we are working hard to reduce this further.

Our estimate of leakage is based on measurements of various pipe materials and sizes in various conditions when operated 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. The most important actions we can take to reduce this leakage are to replace metallic pipes with plastic, to make sure that the joints between metallic pipes remain in good condition through gas conditioning and to keep the average system pressures as low as possible.



Our mains replacement programme delivers our greatest reduction in greenhouse gas emissions. Since 2013/14 we have replaced over 11,000 km of metallic pipe with polyethylene. This has been the main contributor to our delivery of a reduction of over 295,000 tonnes CO₂ per year, the equivalent of taking more than 150,000 vehicles off the road.

Clearly, COVID-19 has disrupted our schedule for mains replacement work and may well affect our performance results at the end of the next period. We will endeavour to make up the lost production while maintaining the highest standards of safety and the lowest levels of disruption for our customers.

We are actively engaging with Government departments and Ofgem to explore how to carry out our mains replacement work faster over the remaining years of the programme to deliver even greater reductions in emissions.

Minimising waste from our worksites

Our mains replacement programme – digging up and replacing thousands of kilometres of old gas pipes – has the potential to create significant amounts of waste.

Across our entire supply chain, we have regulatory targets to ensure that we send no more than 10% of excavated spoil wastes to landfill and import no more than 30% virgin aggregate for backfill. We regularly beat these targets by:

- using low-dig and no-dig techniques;
- inserting new plastic pipe into old metallic services;
- using vacuum excavation;
- working with partners in the recycled aggregates sectors.

Left: Presenting our new green fleet – biomethane HGV, CNG and electric vans and hydrogen cars.

We have reduced waste volumes significantly over the past five years for our mains replacement programme and routinely divert more than 95% of our waste from landfill.

Limiting our carbon footprint

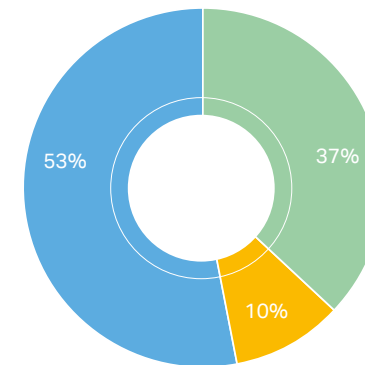
We recognise our responsibility to help the UK meet its greenhouse gas target. GHG emissions include our business carbon footprint together with our energy use in offices, vans and company cars.

In 2019/20 we reduced energy consumption in our offices and depots by 9% and over 90% of the electricity we use to light and power our offices and depots is from certified renewable sources, contributing to further reductions in our business carbon footprint.

We have reduced our average emissions from our company car fleet from 106 g/km to 94 g/km, and 39% is now electric/hybrid. Over the course of 2019/20 we have supported:

- procuring efficient vehicles for our fleet;
- a cap on company car emissions;
- offering 'green' incentives to company car users, which are taken up by 90% of drivers;
- operating a no-idling policy for our vans at worksites.

Business carbon footprint



- Scope 1 – All Direct Emissions from owned or controlled sources (energy, consumption and transport)
- Scope 2 – Indirect Emissions from the generation of purchased electricity, steam, heating and cooling
- Scope 3 – All Other Indirect Emissions that occur in Cadent's value chain

29%

Reduction in our business carbon footprint since 2013