



**GAS GOES
GREEN**

**TOMORROW'S HEAT, TODAY'S OPPORTUNITY:
INVESTING IN YOUR COMMUNITIES & INDUSTRY**

REDUCING OUR EMISSIONS FROM
INDUSTRIAL CLUSTERS



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DECARBONISING INDUSTRY IN THE UK

Many of our heavy industries rely on gas in their manufacturing processes, so electrification may not be a viable option. For these industries to decarbonise, low-to-zero carbon gases, such as bio-gas and hydrogen, need to be available as an option.

Building the world's first zero-carbon gas grid will not only allow the UK to continue strategically-important manufacturing, such as primary steel making, during the transition to net zero but will also help decarbonise nearby homes and dispersed businesses.

GOVERNMENT AMBITIONS

Reaching the target of net zero carbon emissions by 2050 will require huge change across all sectors, including industry. Industry accounts for 16% of UK greenhouse emissions. Industry plays an essential role in society, contributing **£170 billion** to the overall economy.

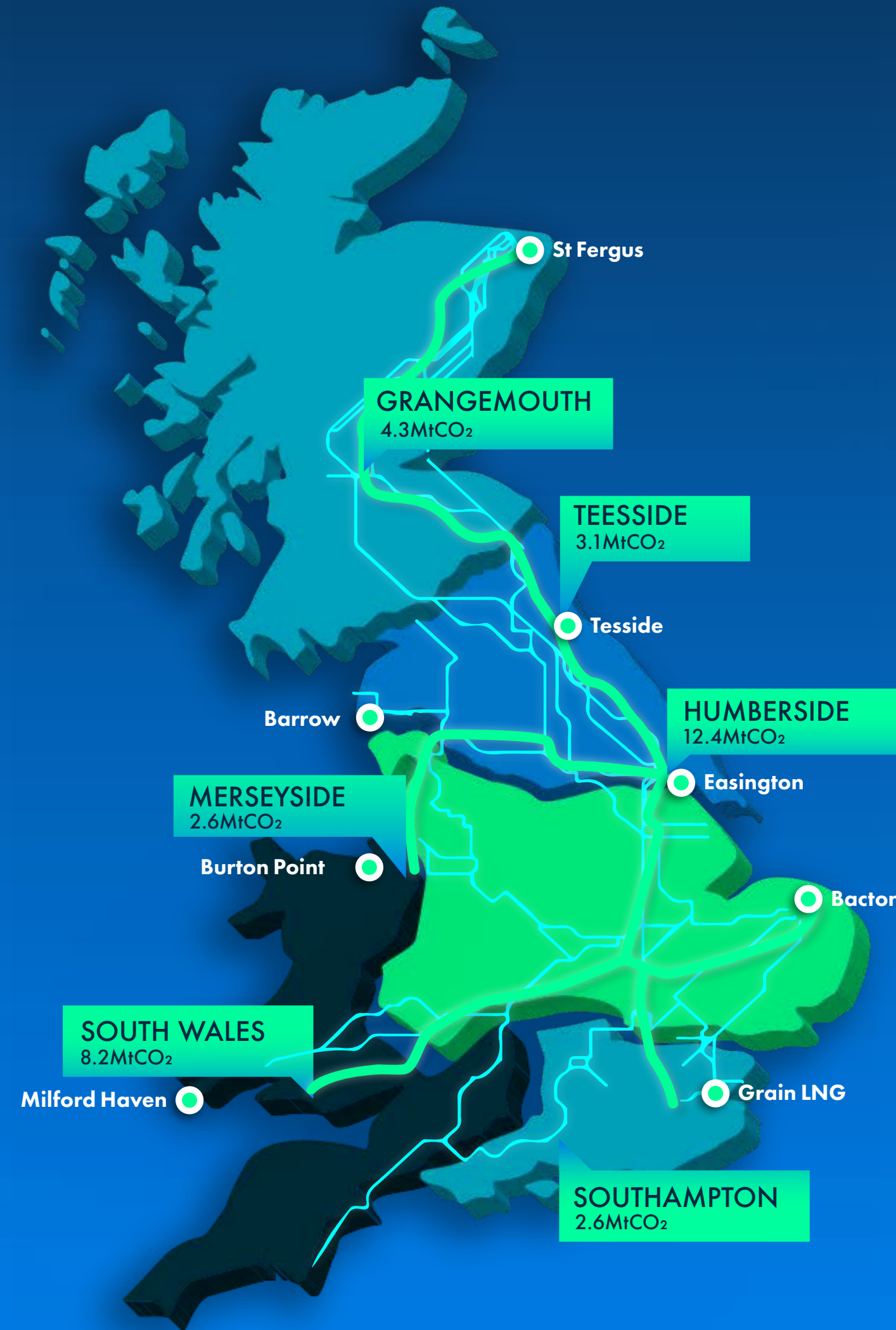


WHY ARE INDUSTRIAL CLUSTERS IMPORTANT?

Identified by the UK Government, Britain's six Industrial Clusters are distinct because they have a significant number of industrial sites in the same location that manufacture products such as chemicals, iron, steel, glass, ceramics, and paper.

They are heavy users of fossil fuels, emitting high and concentrated levels of greenhouse gas emissions. Industries within these Clusters account for some of the hardest-to-abate emissions in our economy.

Britain's gas network companies are investing in innovation projects to decarbonise these Clusters using hydrogen and biomethane. These Clusters will be joined up over time by a national hydrogen network of pipes, as proposed by National Grid's 'Project Union', acting as the backbone for a zero carbon gas grid, with the use of hydrogen expanding outwards to more homes and other businesses over time.



MAP KEY

- SGN
- NORTHERN GAS NETWORKS
- CADENT GAS
- WALES & WEST UTILITIES
- EXISTING LIQUID NATURAL GAS TERMINALS
- BRITAIN'S SIX INDUSTRIAL CLUSTERS
- POTENTIAL OPTION FOR NATIONAL HYDROGEN NETWORK
- OTHER GAS NETWORKS

OPPORTUNITIES FOR GREEN RECOVERY

Through the price control system, Britain's five gas network companies are proposing to invest £4.3bn in decarbonising Britain's Industrial Clusters between 2021/22 and 2031/32. This will help create over 9,000 direct network jobs and over 8,000 related supply chain jobs across the country.

Industry plays an essential role in society, contributing £170 billion to the overall economy. It's crucial this sector thrives and remains competitive whilst also decarbonising. As gas networks, we're ready to invest in clean technologies to help create new jobs and drive inward investment to the UK.

Using hydrogen to decarbonise all of our industry could create 43,000 UK jobs by 2050, according to Element Energy.

In the next ten years, there are significant investment and high-tech, green job opportunities that can be created by gas network innovation projects focused on decarbonising Industrial Clusters.

£4.3BN

OF PROPOSED INVESTMENT
BETWEEN 2021/22 AND 2031/32

OVER 9,000

DIRECT NETWORK JOBS

OVER 8,000

RELATED SUPPLY CHAIN JOBS

HOW CAN DECARBONISING INDUSTRY HELP US REDUCE OUR HOUSEHOLD CARBON EMISSIONS?

The process of decarbonising our heavy industry will lay the foundation for the wider decarbonisation of Britain's gas grid, which 85% of homes rely upon for their home heating, hot water, and cooking. These emissions need to drop by 95% between now and 2050 if we are to reach our net zero emissions reductions target.

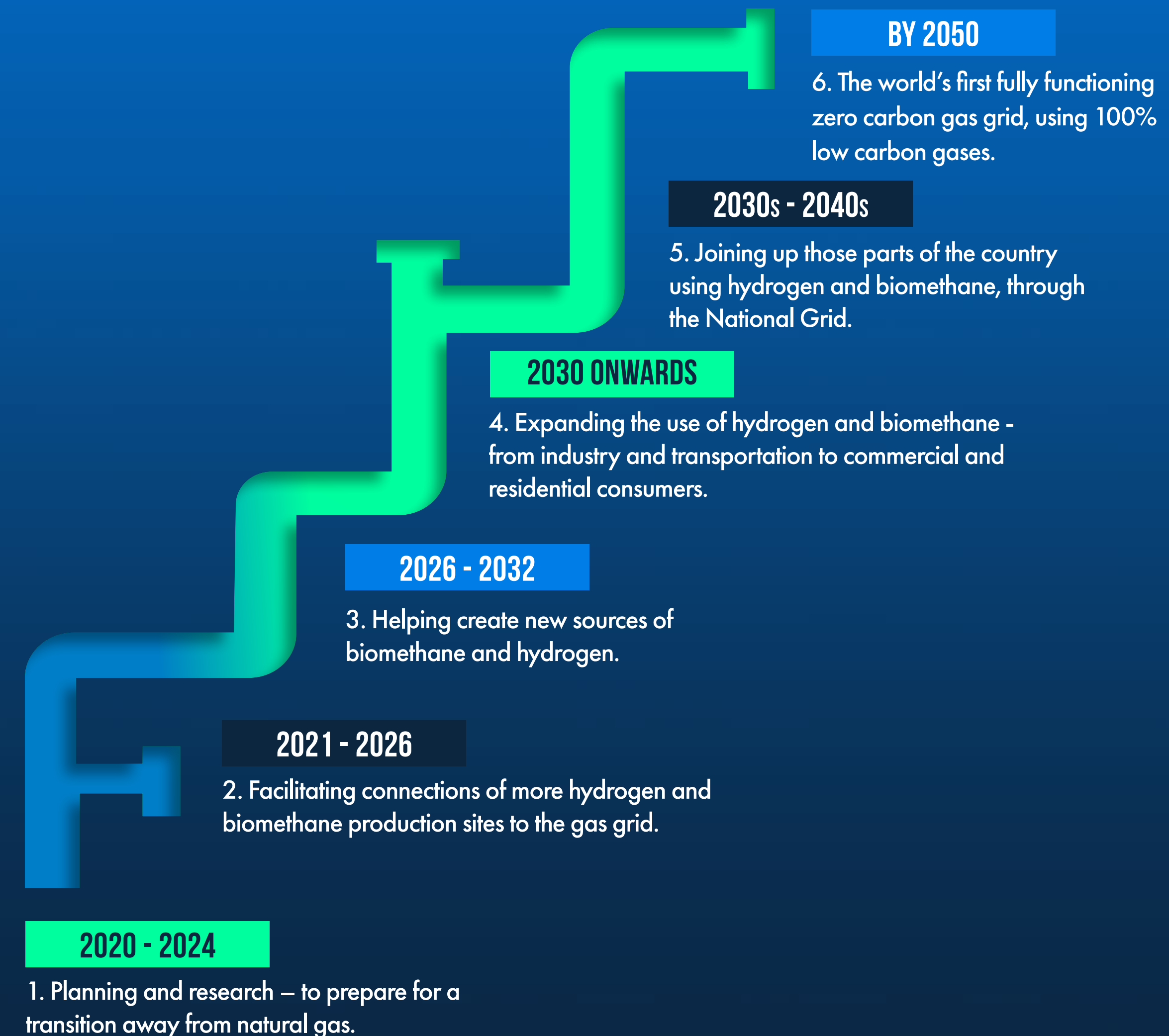
In Britain's Hydrogen Network Plan, we have set out our objectives to deliver two Clusters by the mid-2020s and two more by 2030. From 2030, we will expand the use of hydrogen and biomethane, which will work in partnership with electricity to replace natural gas, as part of Step 4 of the Gas Goes Green Pathway to Net Zero.

Our approach to expanding that supply is to develop hydrogen Clusters, initially based on anchor industrial (and transport) end-users like those in Industrial Clusters.

National Grid will repurpose the existing gas pipelines responsible for transporting hydrogen around the country, joining these Clusters together. Hydrogen use would then expand outwards over time to other industrial users and then into the wider community, including homes and businesses.

Once converted, a gas user would be supplied with 100% hydrogen, with homes using hydrogen-ready boilers for their heating, hot water and cooking. Blending of hydrogen into unconverted sections of the gas networks (up to a maximum of 20% by volume) would be used to help balance hydrogen supply and demand.

Following a cluster-based approach for hydrogen deployment into the gas network may result in a distribution of renewable gases that is highly regionalised. With hydrogen deployment beginning at Industrial Clusters, biomethane offers a means for dispersed industry to decarbonise - one that is available now.



BY 2050

6. The world's first fully functioning zero carbon gas grid, using 100% low carbon gases.

2030s - 2040s

5. Joining up those parts of the country using hydrogen and biomethane, through the National Grid.

2030 ONWARDS

4. Expanding the use of hydrogen and biomethane - from industry and transportation to commercial and residential consumers.

2026 - 2032

3. Helping create new sources of biomethane and hydrogen.

2021 - 2026

2. Facilitating connections of more hydrogen and biomethane production sites to the gas grid.

2020 - 2024

1. Planning and research – to prepare for a transition away from natural gas.

HOW WE CAN DECARBONISE BRITAIN'S INDUSTRY



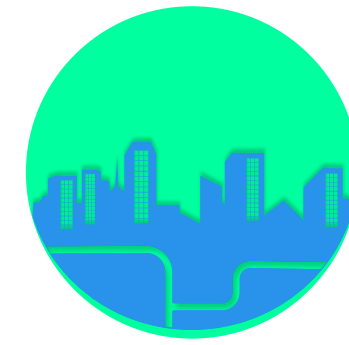
EFFICIENCY

- Improving resource and material efficiency reduces demand on natural resources
- Integrate processes within Clusters to share energy and materials
- Develop the circular economy value chain



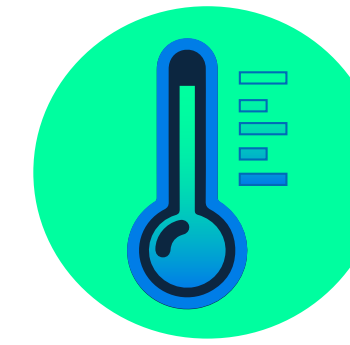
PRODUCTION & USE OF HYDROGEN

- Produce low-to-zero-carbon hydrogen from the most economical source
- Use hydrogen for hard to electrify industrial processes



CARBON CAPTURE USAGE AND STORAGE

- Capture carbon from energy production
- Use captured carbon for industrial and manufacturing processes
- Store carbon underground



ELECTRIFICATION

- Electrify low-medium temperature and pressure processes
- Generate low cost, renewable electricity on-site

BENEFITS OF NETWORKS IN DECARBONISING INDUSTRY

1.

Maintaining the future resilience of our energy system.

2.

Helping meet hydrogen demand in different locations around the country.

3.

Stimulating the UK's hydrogen production industry.

4.

Learning lessons for the decarbonisation of other sectors.

5.

Creating early decarbonisation opportunities for communities around Clusters.

INNOVATION PROJECTS DECARBONISING INDUSTRIAL CLUSTERS

PROJECT UNION

As low-carbon clusters develop, National Grid will be ready to link them using repurposed pipes carrying hydrogen. By connecting these Clusters, we can increase the security of supply and the resilience of the gas network.



Net Zero
Teesside

Aims to deliver the UK's first zero-carbon Industrial Cluster through deploying CCUS technology. The project plans to capture up to 10 MtCO₂e.

During construction, the project could enable an annual gross benefit of up to £450 million and support up to 5,500 direct jobs.

HyNet
North West

Includes the development of a new hydrogen pipeline to supply hydrogen to industry and the creation of the UK's first carbon capture usage and storage (CCUS) infrastructure.

These changes can save over 1 MtCO₂e every year.



Led by Northern Gas Networks, the H21 programme is delivering evidence in support of a transition to a 100% hydrogen future.

H21 is testing existing gas network infrastructure's suitability for delivering hydrogen.

SWIC

A partnership between industry, infrastructure companies, the public sector and academia, the South Wales Industrial Cluster (SWIC) will help decarbonise heavy industry in South Wales, preserving 113,000 manufacturing jobs and creating thousands of new green jobs by 2050.



The Southampton Water cluster will support the decarbonisation of local industry and transport. Currently, the area, which is home to one of the UK's largest and busiest ports, sees around 2.6 million tonnes of CO₂ emitted each year. SGN are investigating the feasibility of developing a hydrogen super-hub at the Port of Southampton to help deliver hydrogen production and distribution across the entire south coast.

enda
energynetworks
association

