



**GAS GOES
GREEN**

**Gas Goes Green
Decarbonising Heating
May 2021**

**DELIVERING THE
PATHWAY TO
NET ZERO**

Decarbonising heat will be a huge challenge



Sector progress

Decarbonisation of heat

Consumer options

Purpose of today

- **significant progress in decarbonising the power sector**
- EVs offer **great potential in the decarbonisation of road transport**

- Decarbonisation of **heat remains the greatest challenge**
- Heat represents approx **one third of emissions**
- **25 million homes require a low carbon solution**

- Decarbonising heat requires a **mix of locality-specific solutions** and a **step change in energy efficiency**
- There is a **role for all low carbon technologies**

- **Consumer experience, affordability, safety and resilience**
- Today we will **focus on hydrogen heating**

We believe that hydrogen has an important role in the transition to Net Zero by 2050



Cost

- **the lowest cost of a whole system transition to Net Zero** through utilising existing infrastructure
- Blue and green hydrogen **could be cheaper than gas within a decade**, based on BEIS carbon price assumptions



Consumer

- A **mix of low carbon technologies will be needed** to decarbonise heat and **provide consumers with a choice of low carbon options**
- Hydrogen offers an opportunity to decarbonise residential heat with **no change in experience for domestic consumers**



Resilience

- The UK energy system has **benefitted from world-leading resilience** as gas networks can manage seasonal energy demand






Safety

- The gas industry is **working closely with the HSE to demonstrate the safety case** and build on an existing evidence base
- **hydrogen has the potential to be safer** than the current

Consumers: We need to focus on consumer experience as we seek to decarbonise heat

 <p>Different heat solutions</p>	<p>a mix of low carbon technologies and these will vary by locality</p>	 <p>Consumer consent</p>	<p>challenges involved in the deployment of new technologies within a domestic setting</p>	 <p>Resilience for consumers</p>	<p>A safe, uninterrupted supply of heat is non-negotiable to all consumers</p>
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Number of properties	Suitability	Description
<p>8 – 13m (37% – 57%)</p> 	<p>limiting factors to installing a heat pump including space constraint and poor thermal efficiency</p>	<p>solid brick walls, uninsulated and/or space constrained</p>
<p>3 – 4m (14% – 18%)</p> 	<p>require some thermal efficiency improvements to be made suitable for heat pump installation, such as the insulation of cavity walls and heating system upgrades</p>	<p>detached, semi-detached, bungalow and end-terrace properties built with cavity walls but are currently uninsulated</p>
<p>7 – 10m (33% – 45%)</p> 	<p>no limiting factors and require minimal or no upgrade requirements to be made heat pump ready.</p>	<p>detached, semi-detached, bungalow and end-terrace properties built post 1990s and buildings that have already been insulated</p>



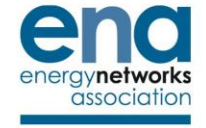
Demonstrating capability





HYDROGEN AND YOUR HOME

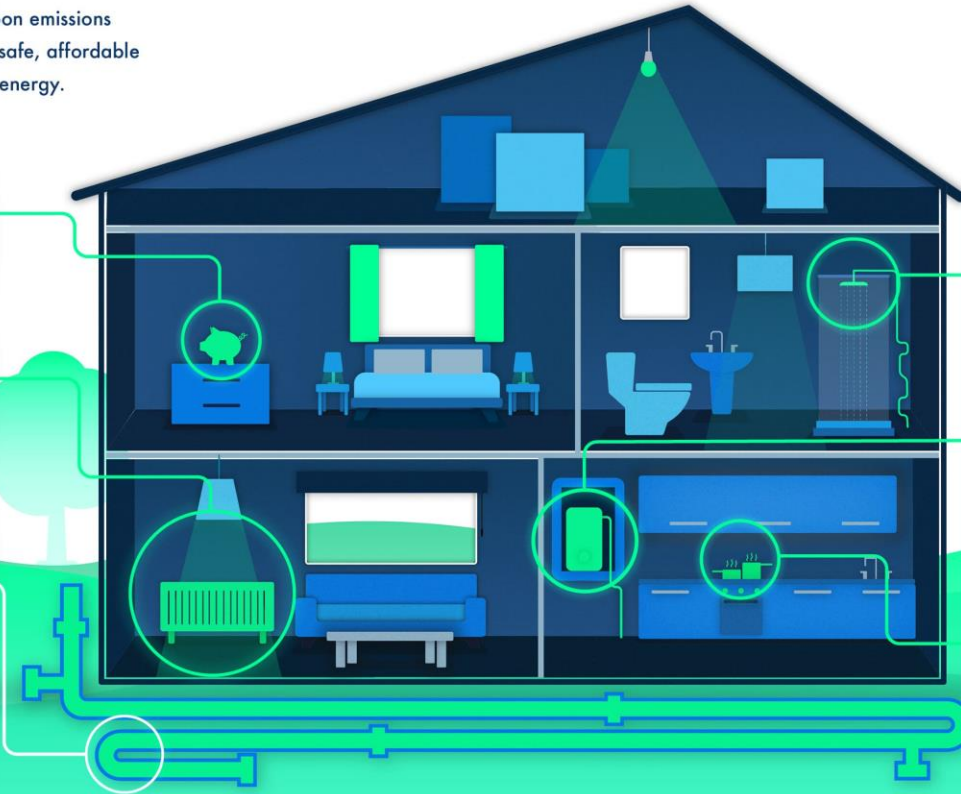
Replacing natural gas with hydrogen will reduce carbon emissions from heating, cooking and hot water in a way that is safe, affordable and practical, with no impact on the way we use our energy.



A hydrogen-ready boiler will cost roughly the same as a normal gas boiler, and running Britain's energy system on both hydrogen and electricity will save billpayers £13bn a year by 2050.

Hydrogen can be used with your existing central heating system, avoiding the need for expensive changes to the structure of your home.

Hydrogen can be produced from sources such as renewable wind, solar and industrial sites that remove and capture the carbon from natural gas. The UK gas network is well prepared for hydrogen. Nearly two-thirds of Britain's local gas pipes have already been replaced with new, hydrogen-ready pipes. Subject to approval from the energy regulator, all of the local gas pipes will be replaced by 2032.



Replacing natural gas with hydrogen means we can continue to heat our homes and hot water, and cook our food, in exactly the same way as we do now.

Hydrogen-ready boilers are the same shape and size as normal gas boilers and won't require major changes to install them.

The smell of the gas you currently use is added artificially as a safety measure. We will do the same with hydrogen.

THE CHALLENGE OF REDUCING OUR CARBON EMISSIONS

To meet our climate change responsibilities, Britain's households will need to reduce their carbon emissions from almost 3 tonnes a year today, to just 138kg in 2050. Heating our homes in a green way will be essential.

GUARANTEEING YOUR SAFETY

Working closely with the Health & Safety Executive, our innovation projects are making great progress and results have shown that using hydrogen in the natural gas grid is fundamentally safe. In the future, hydrogen appliances will require the same world leading Gas Safe checks as gas appliances do today. And unlike natural gas, using hydrogen removes the risk of carbon monoxide poisoning.

BLENDING HYDROGEN INTO THE GAS GRID

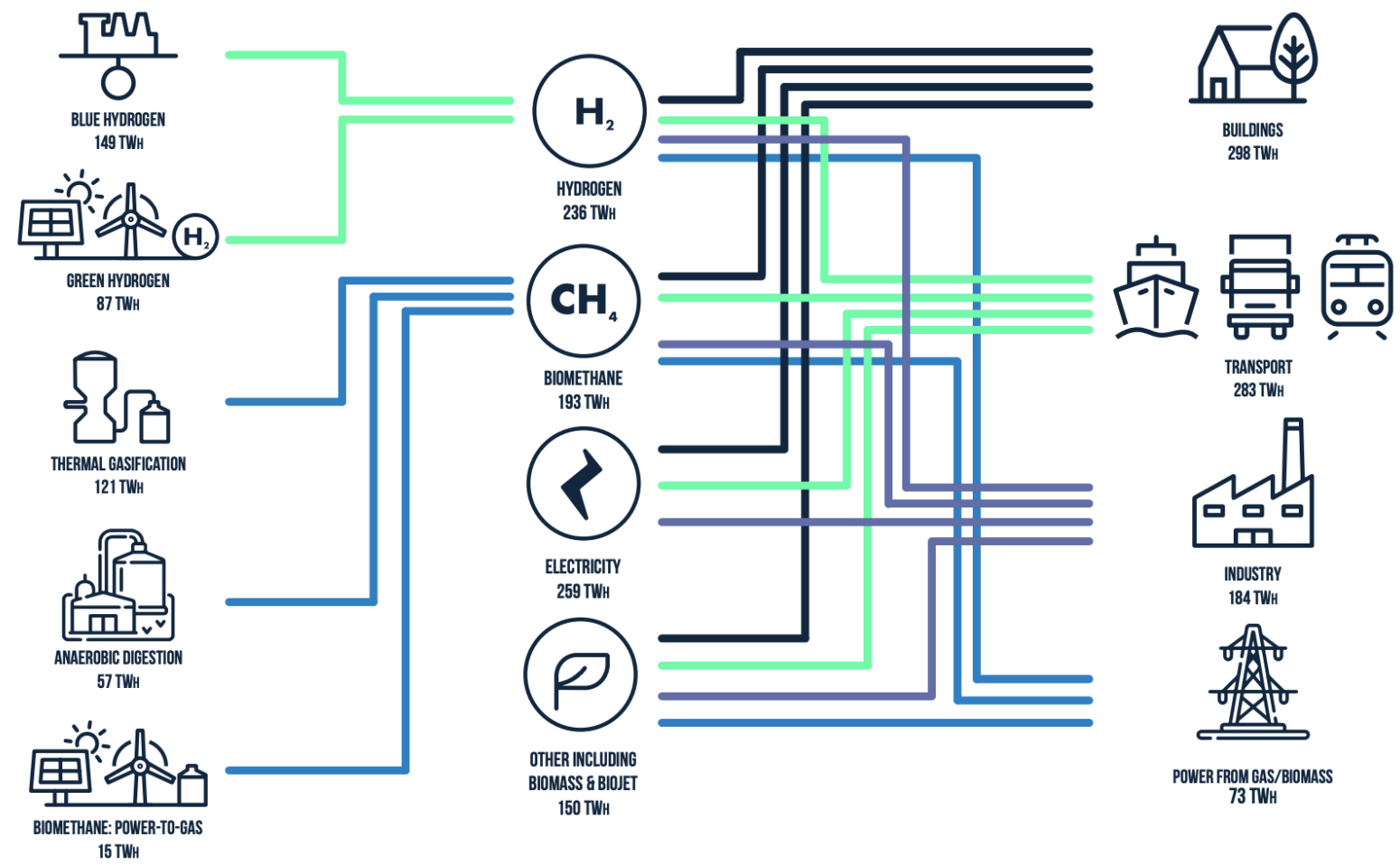
Household cookers and gas boilers are already capable of managing a gas mix of up to 20% of hydrogen without an impact on the way people use those appliances. The annual carbon emissions saving will be equivalent to taking up to 2.5m cars off the road. Gas networks are on track to start blending gas into the supply to a small town from 2021.





HOW OUR PATHWAY TO NET ZERO WILL MEET BRITAIN'S 2050 ENERGY DEMAND

Meeting Britain's 2050 energy demand through the Gas Goes Green Pathway to Net Zero.





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Thank you

Register your interest

GasGoesGreen@energynetworks.org



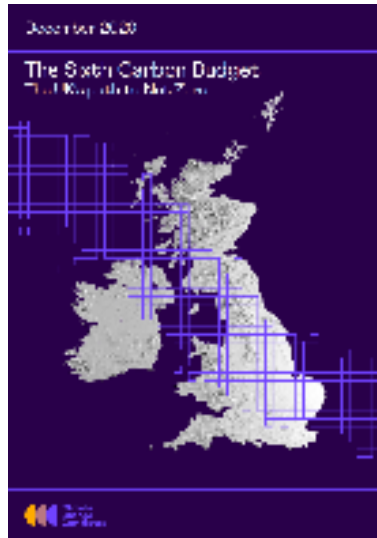


The UK Government recognises hydrogen's crucial role in meeting Net Zero

Ten Point Plan & Energy White Paper

CCC 6th Carbon Budget

Hydrogen Strategy



Britain's Hydrogen Network Plan

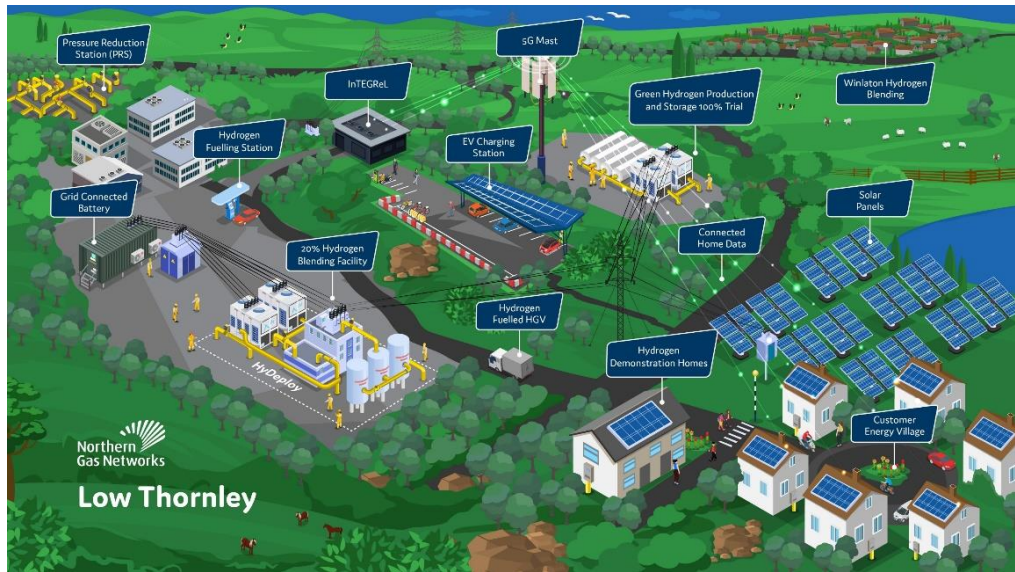
- Comprehensive plan setting out the detail of activity gas networks are undertaking/will undertake to deliver hydrogen between now and 2050.
- Published January 2020.
- Includes how networks will deliver Govt hydrogen plans in 10PP & 2020 Energy White Paper.
- Sets out system needs/requirements & how gas networks will ensure H2 meets them.
- Underpinned around four 'key tenets', to set how networks will:
 1. Ensure the safe delivery of hydrogen.
 2. Maintain security of energy supply.
 3. Work with people's needs.
 4. Deliver jobs and investment.



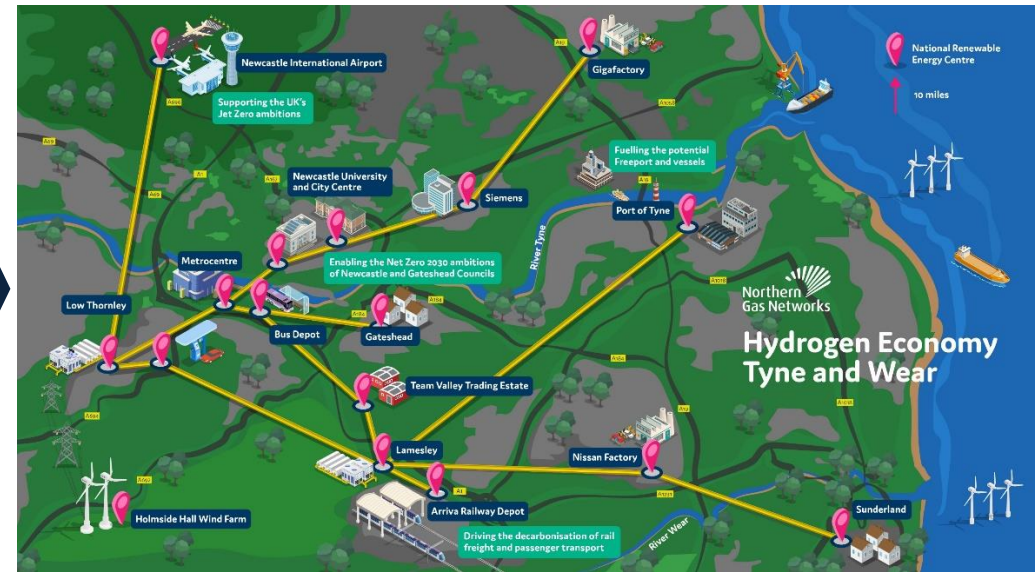


Progress: the transition to Hydrogen is already underway – come and visit Low Thornley!

Low Thornley will host the Hydrogen Demonstration homes and facilitate the blending of hydrogen into the local village of Winlaton in 2021



The impact of the development at Low Thornley will be felt across the Tyne and Wear region, supporting decarbonisation and delivering jobs and investment in the local economy





Working together as an industry



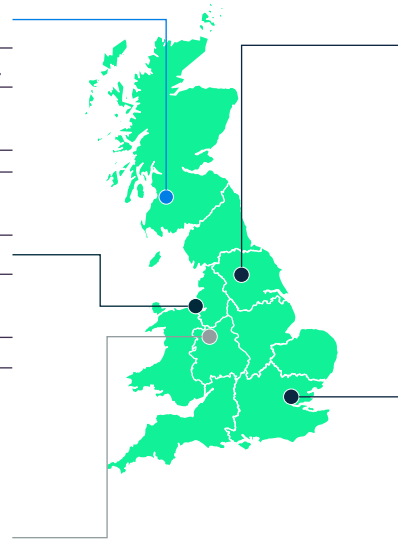
Objectives	<ul style="list-style-type: none"> To construct and demonstrate the UK's first network to carry 100% zero carbon hydrogen to homes (i.e. generation, storage & distribution), produced from offshore wind. Participating customers will use hydrogen boilers, heaters and cooking appliances in their homes during the 4.5-year initial trial.
Status	Go ahead for Ph1 as part of Ofgem November 2020 NIC decision.
Timeline	Ph1: Initial 300 homes in Levenmouth from the end of 2022. Potential expansion of up to 1,000 homes.



Objectives	Demonstrate hydrogen production from natural gas with CCUS, distribution, and use at scale
Status	Engineering design stage
Timeline	FID is required by the end of 2022 to enable deployment of the project on schedule (delivery in 2023-26)



Objectives	<ul style="list-style-type: none"> First project in the UK to inject Hydrogen into a natural gas network Demonstrate that 20% volume blend of hydrogen with natural gas in homes is safe with lower emissions than current natural gas Demonstrate that blending hydrogen is not disruptive and costly for customers because they will not need to change current cooking and heating appliances
Status	Live pilot began in January 2020 at Keele University (Phase 1). 650 households and commercial properties to start receiving blended H2 nr Gateshead in early 2021 (Phase 2).
Timeline	Project to end in October 2021



	H21 Leeds City Gate	H21 NIC	H21 North of England
Objectives	Demonstrate technical feasibility and economic viability of UK gas distribution networks conversion to 100% hydrogen	Demonstrate that a hydrogen network can be managed to the same safety standard of current natural gas networks	Produce a strategic report setting out the design requirements for infrastructure to convert the North of England to hydrogen between 2028 and 2035 – project delivery 2023-2028
Status	Completed in 2016	Reporting due	-
Timeline	-	Expected H1 2021	Delivery in 2023-28

HyNTS FutureGrid

Objectives	<ul style="list-style-type: none"> HYNTS FutureGrid will develop understanding of how hydrogen interacts with existing network transmission. The FutureGrid test facility will connect to the existing H21 distribution facility creating a representative UK Hydrogen Testing and Training Facility
Status	HYNTS FutureGrid funding announced in Ofgem November 2020 NIC decision.
Timeline	Ph1 commences May 2021

