

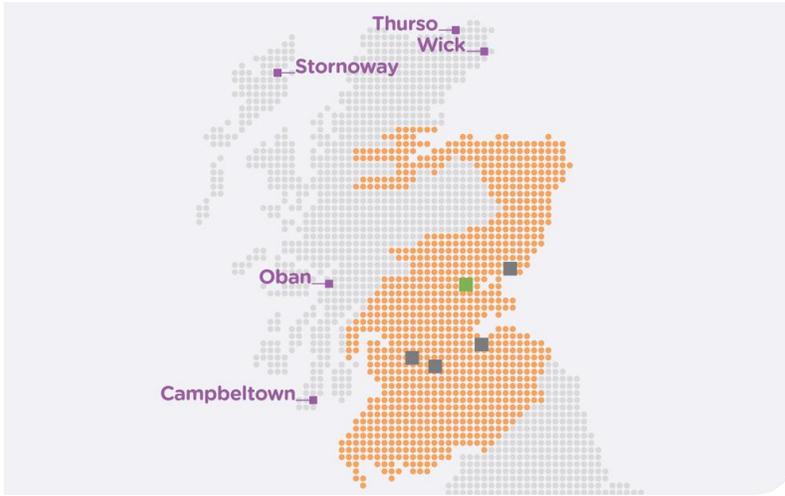
Decarbonising UK Domestic Heating - SGN

By Simon Joyce – Principal Engineer and Head of Innovation Futures

21 November 2025



Introduction to SGN

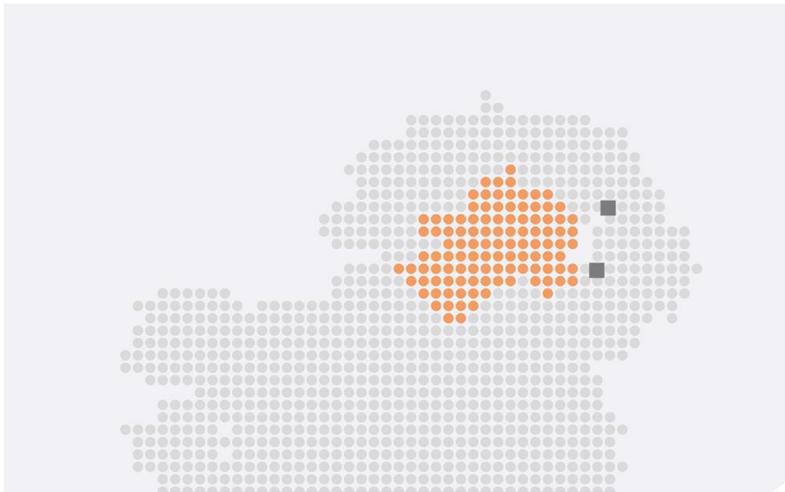


Our network distributes gas to almost 2 million homes and business in Scotland and five remote areas that are not connected to the main gas or power grid



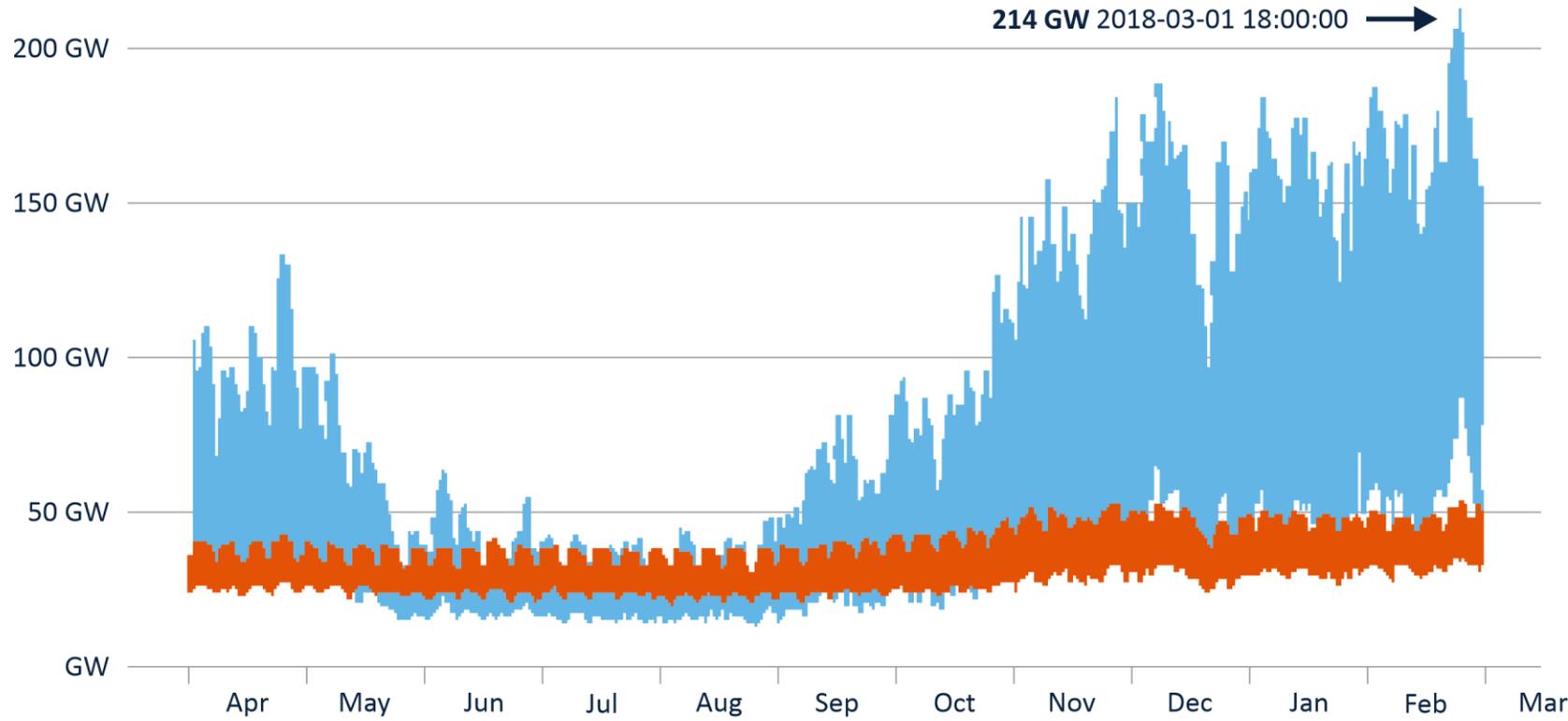
We deliver gas to nine towns in the west of Northern Ireland, with ambitions to fully decarbonise by 2030

In southern England, we distribute gas to around 4 million homes and businesses - from rural counties to the south London boroughs



RAV Regulatory Asset Value	£7.26bn
Network size	74,000km
Total customer connections	6 million
Biomethane (equivalent homes capacity)	354,000
Industrial and Commercial customers	288,000
Vulnerable customers supported	233,000
Power stations connected/output	39/1.3GW
Workforce	4535 FTE
Female representation	19.1%

System Challenge: Decarbonisation Of Heat

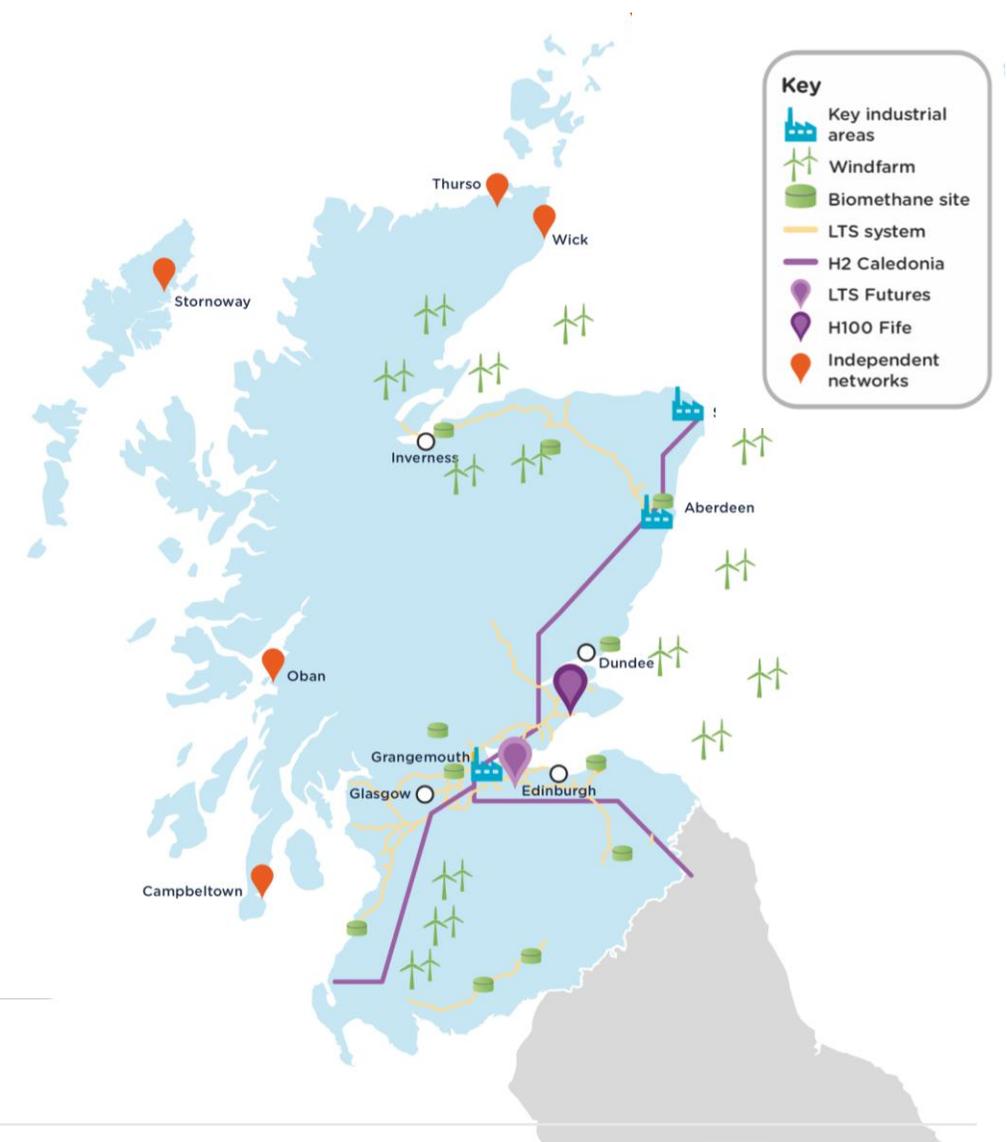
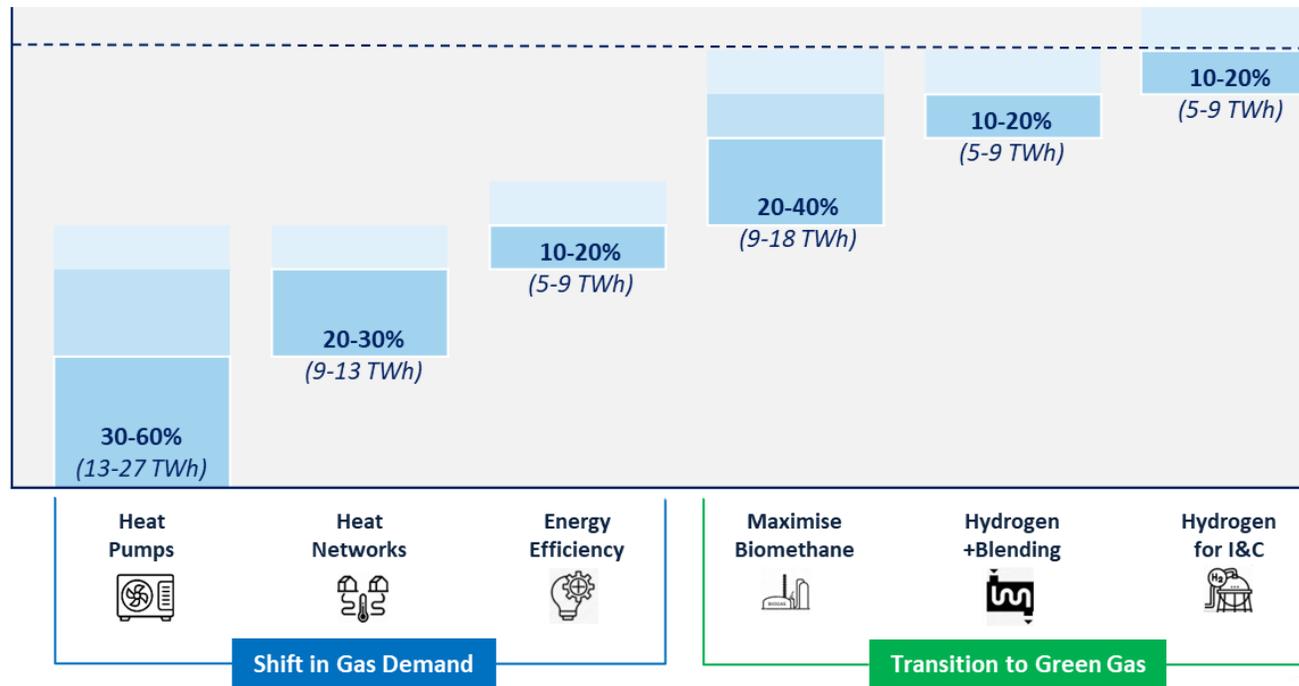


Gas and electricity demand during the 'Beast from the East' in 2018

The gas network transports **four times** more energy a day than electricity networks in the winter and we need to ensure the energy system remains secure and reliable as we decarbonise heat.

Options To Decarbonise Gas Demand In Scotland

Achieving a Net Zero gas grid could be possible through a range of technologies and blending of green gases to maximise the value of an existing asset

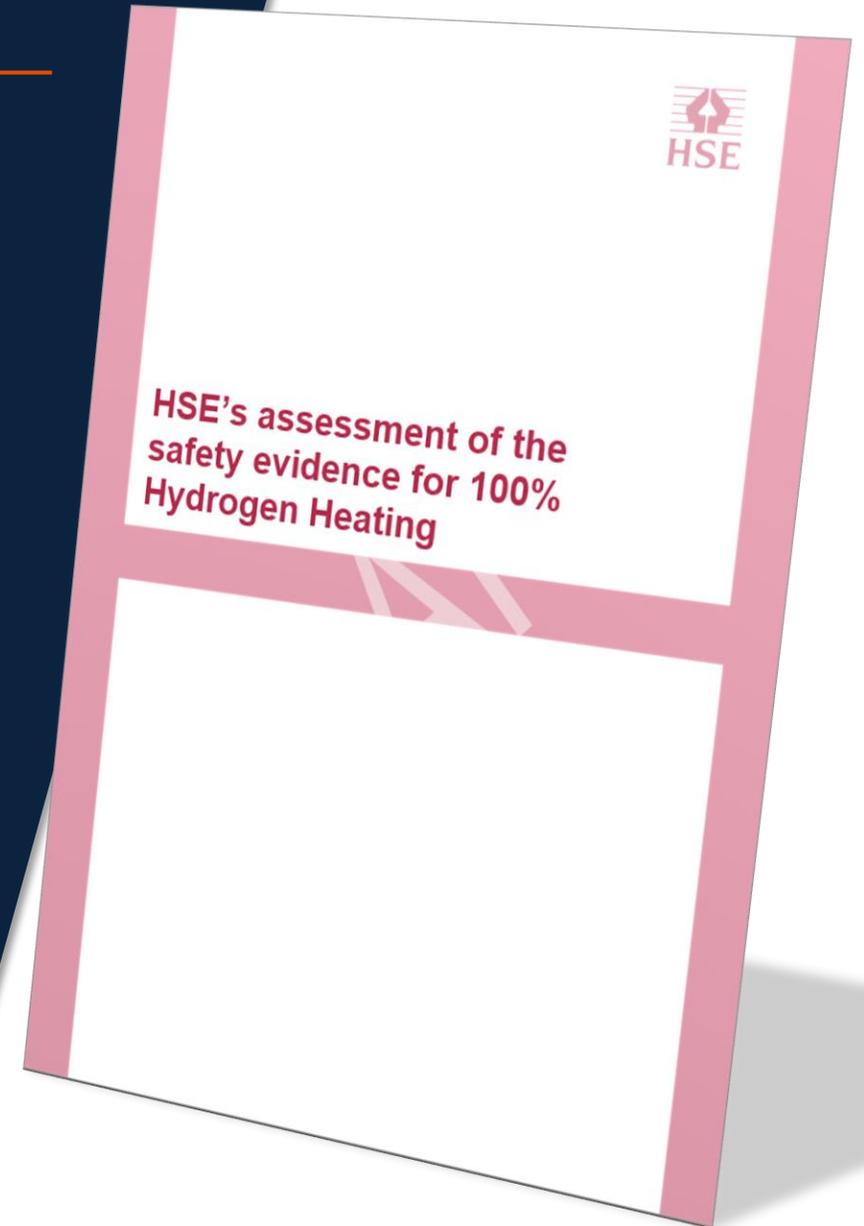


Hydrogen



Comprehensive Formal Assessment (CFA)

- HSE was tasked by DESNZ to assess the risks of using 100% hydrogen in current networks for domestic heating.
- HSE reviewed whether GDNs provided credible evidence supporting the safe ALARP conversion and rollout of hydrogen heating.
- The HSE identified what will be needed for the assurance of safety when considering the transition to using hydrogen for heat in the Safety Assurance Protocol & Gap Analysis Report v2 2020. 65 demonstration points.
- GDNs and DESNZ created and managed the R&D evidence base for HSE's assessment - 80% of this was provided by SGN.
- **This report is HSE's independent evaluation of that evidence. Due for release soon.**



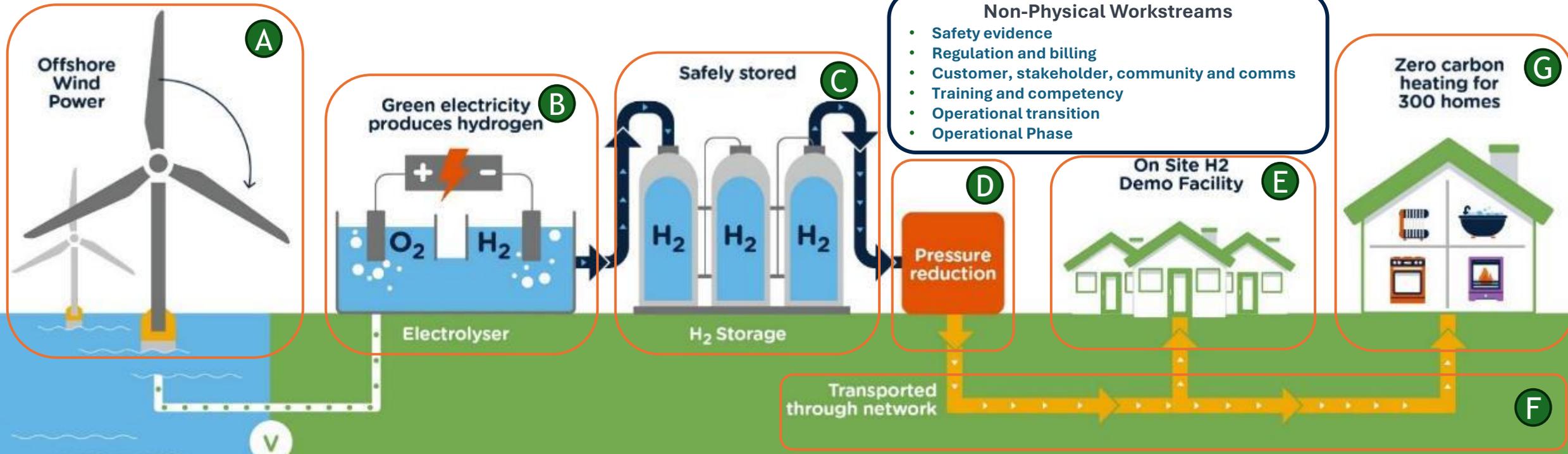
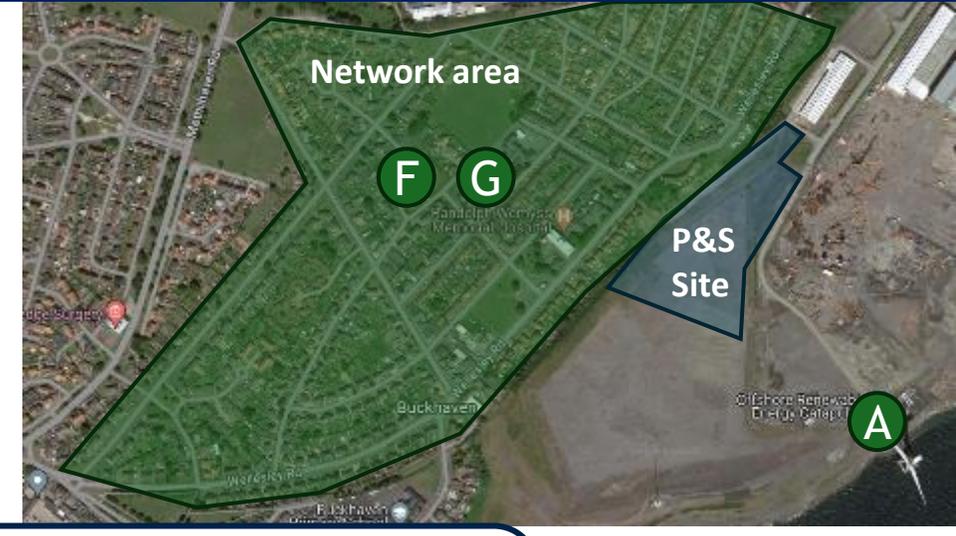
H100 Fife Project



H100 Fife: Aerial view



H100 Fife – Overview of the project



H100 Fife: Customer & Community

Engagement: Timeline & Progress

The background

- Area of high deprivation
- Unemployment & Social issues
- 34.5% of children live in food and fuel poverty

Our goals

- Understanding the community, their priorities and how to gain support > Shaping our Customer offer
- Unemployment > Employment
- No trust in large organisations > Investment & Community benefits

The engagement

- Community events to raise awareness of the project & its benefits
- 'Pay-what-you-can' sport camps over school holidays & School workshops to offer experiences otherwise unaffordable
- Sponsorship of foodbanks & community events
- Participation in local organisations' events, meetings & forums
- Recruitment of local resources

Next steps

- Final customer recruitment campaign underway
- Social media campaigns, including videos of team & community champions at Hydrogen Demo Homes
- Visual checks of customer properties as we head towards first connection in Autumn
- Continuation of local sponsorships & investment
- Hosting customers and prospective customers at our Hydrogen Demonstration Facility
- Continuing to engage with policy makers and industry to talk about H100 Fife and SGN's broader decarb priorities



Arrival in the community

Informational postcards & Community partnerships

Face to face engagement (Campaign 1)
School workshops

Partnership door to door information
Regular customer events going forward
Community Engagement

Customer home surveys
Customer Welcome Pack (Bundle 1)

Customer connection Agreements
CAP Days
Savanta questionnaires

Community & Partnership
Further customer engagement (Campaign 2)

Production site live
First customers connected
Full live trial and continue to connect new customers

January 2021

March 2022

September 2022

November 2022

November 2023

April 2024

July 2025

> January 2026



Fife pupils get hands-on with green gas at STEM Futures Festival

We welcomed nearly 100 pupils from Parkhill and Mountfleurie Primary Schools as part of this week's annual STEM Futures Festival.

FEATURED



UK's first hydrogen training centre opens for next generation of green gas engineers

We are celebrating the opening of the UK's first hydrogen training centre for gas engineers alongside our partners Fife College.



East Fife Community Football Club Camps kick off for a third year

Holiday multi-sport camps at East Fife Community Football Club have officially kicked off last week, with support from the team at SGN's H100 Fife project and a familiar



We're supporting Methilhill Primary School and Kidney Kids

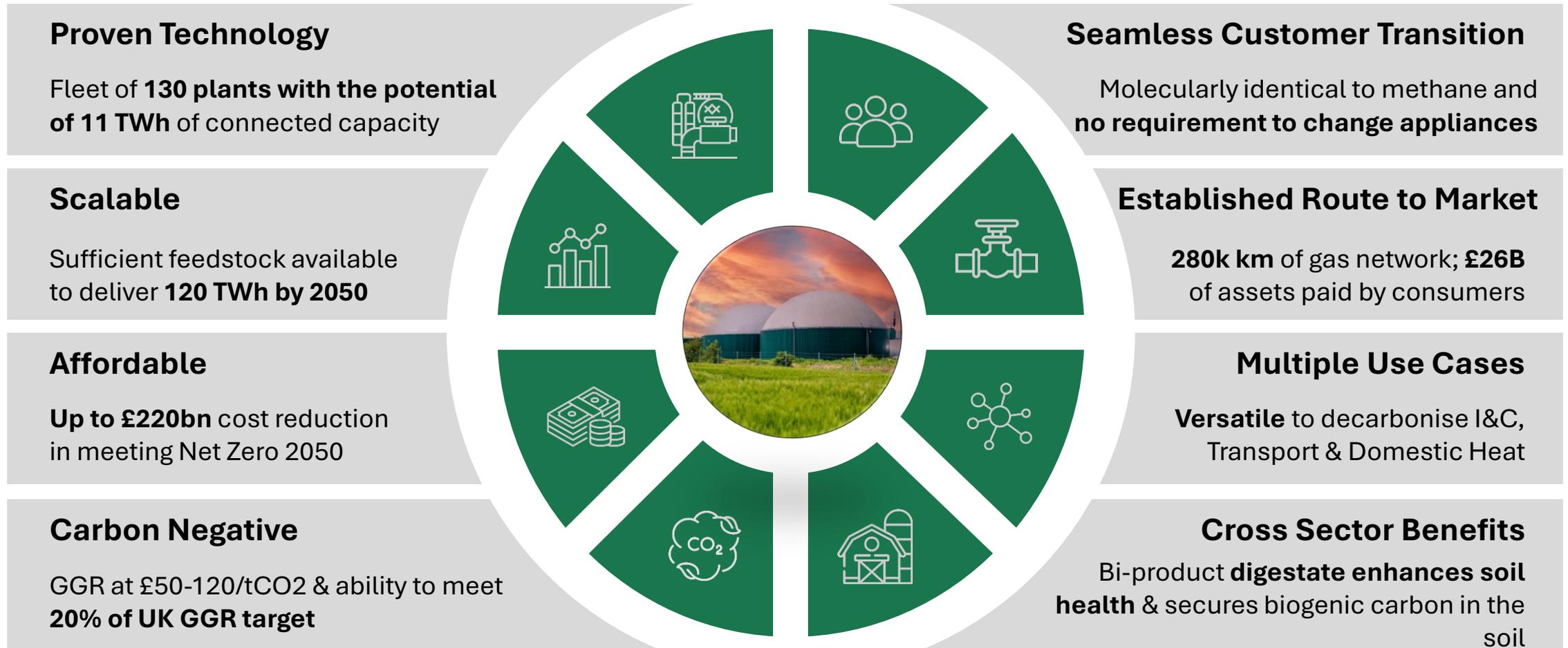
We're proud to support Methilhill Primary School in Levenmouth as they partner with Kidney Kids to promote healthier hydration habits among students.



Biomethane



Biomethane is emerging as a real opportunity to decarbonise gas using an affordable technology that offers a seamless customer transition to net zero

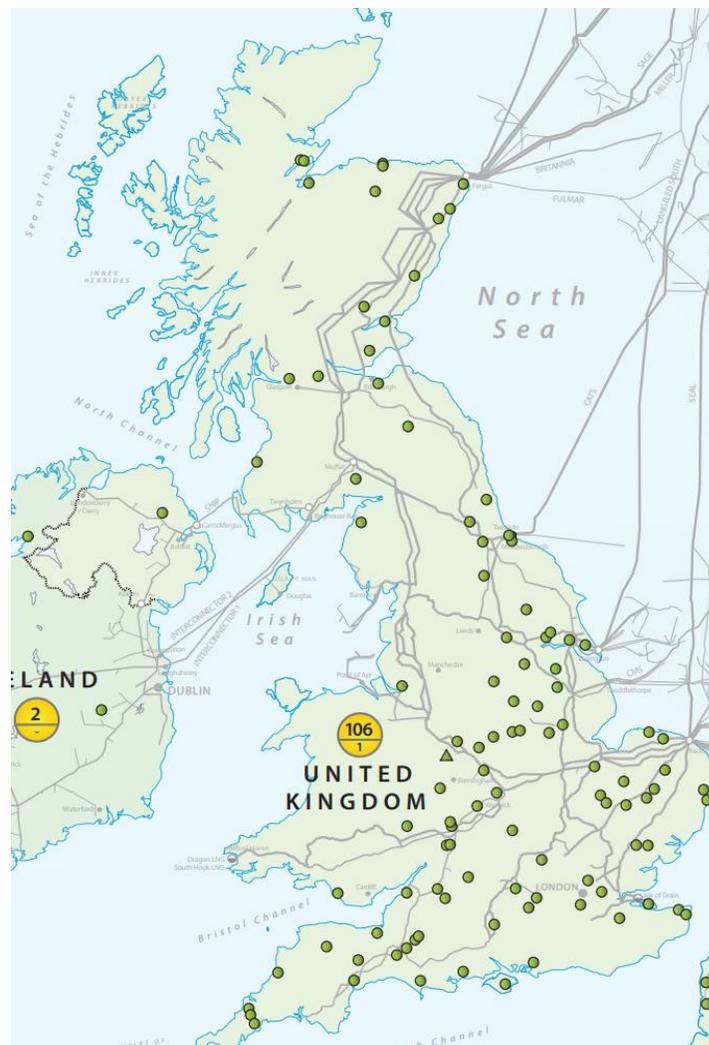


UK biomethane: Market overview

Snapshot

Key Highlights	Biogas	<ul style="list-style-type: none">▪ Current Production: There are currently over 700 operational Anaerobic Digestion (AD) plants in the UK, processing 36 million tonnes of waste annually, and producing 21 TWh of green gas.▪ Applications: Traditionally, biogas has been primarily used in Combined Heat and Power (CHP) systems to generate renewable electricity and heat on-site. The declining support for CHP projects, however, has encouraged a shift toward upgrading biogas to biomethane.
	Biomethane	<ul style="list-style-type: none">• Grid Injection: Approximately 7.5 TWh of biogas was upgraded to biomethane and injected into the grid from around 130 injection plants. It is currently the only operational technology actively decarbonising the UK's gas grid.• SGN Network: There are 42 biomethane plants connected to our networks, which can supply the equivalent of over 320k domestic properties with a GD3 target of one million connected customers by 2031. We also have a commercial interest in around 20 existing Gas to Grid (GtG) sites.• Conversion Potential: There is a significant opportunity to increase biomethane production by upgrading the biogas currently used in older CHP plants. Estimates suggest that a large portion of the roughly 19 TWh of biogas currently burnt in CHP could be upgraded and injected into the gas grid.
	Potential Opportunity	<ul style="list-style-type: none">• Net Zero Target: Based on estimated feedstock availability there is potential to reach over 100TWh by 2050. This could satisfy 20%–50% of the UK's gas demand or potentially almost all demand with the adoption of hybrid heating systems. Whilst there is the potential for significant growth, the market remains relatively immature and undergoing a level of consolidation.

UK map of Biomethane GtG sites



Hybrid Heating Systems



Hybrid Heating Systems

Hybrid Heating Systems have seen international success in supporting heat decarbonisation:

- HHS are a low-carbon heating option that combine a new or existing gas boiler with an electric heat pump to provide reliable heat and hot water all year-round
- HHS are able to seamlessly switch between the heat pump and boiler to minimise running costs and maximise carbon savings
- HHS using natural gas reduce carbon emissions by up to 70%, and this increases to 90% when using biomethane today
- HHS are more cost-effective per tonne of CO₂ saved than heat pumps across most housing types, especially when using existing boilers
- A recent study with engagement with GDNs, DNOs, and independent studies indicate there is strong potential for hybrids i.e. those on oil or LPG

Across GB, there are 160 local authorities where more than 40% of their building stock could benefit from the adoption of a hybrid heating system. These are primarily located across Scotland, Wales, and North England where older housing stock is concentrated.



Hybrids improve energy affordability, deliver short- & long-term decarbonisation and provide optionality for consumers



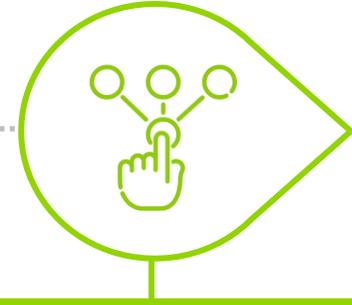
Hybrids improve energy affordability

- Trials have demonstrated HHS can reduce energy bills for consumers, by up to 16% compared to traditional boilers and 20% to heat pumps
- HHS ease pressure on the electricity grid, offering additional time for continued network investment, and minimise gas network decommissioning activities
- HHS offer a viable low-carbon heating solution for vulnerable consumers and fuel poor households



Hybrids deliver carbon savings today & full decarbonisation in the future

- The counterfactual to a hybrid is not a heat pump, but rather another boiler. This is demonstrated by adoption figures, with annual heat pump installations only at ~90,000 vs. ~1.7 million gas boiler replacements
- HHS can reduce carbon emissions by 70% today compared to boilers and can be net-zero compliant in the future with increased green gas / biomethane injection. Much like heat pumps, which will only be net zero once power is decarbonised.



Hybrids maintain consumer choice

- Consumer choice in heating is essential. With ~11 million homes 'difficult to electrify' and many British homes spatially constrained, HHS offer a practical stepping stone AND long term solution
- HHS can disrupt the cycle of households only considering heating upgrades when their boilers fail through retrofitting
- HHS maintain consumer familiarity and are easy and non-disruptive to install

Postcode Modelling



Postcode Modelling Enables Us To View The Transition From A Property-level

Geolocating domestic and commercial consumers, and the understanding of the geographic distribution of industrial connections, drives SGN's network view

At the heart of the Postcode Model is an understanding of consumer choice at a local level to model choices in an Agentic AI simulation



Consumer, commercial and industrial segmentation by postcode
e.g. What type of person/commercial actor occupies each postcode



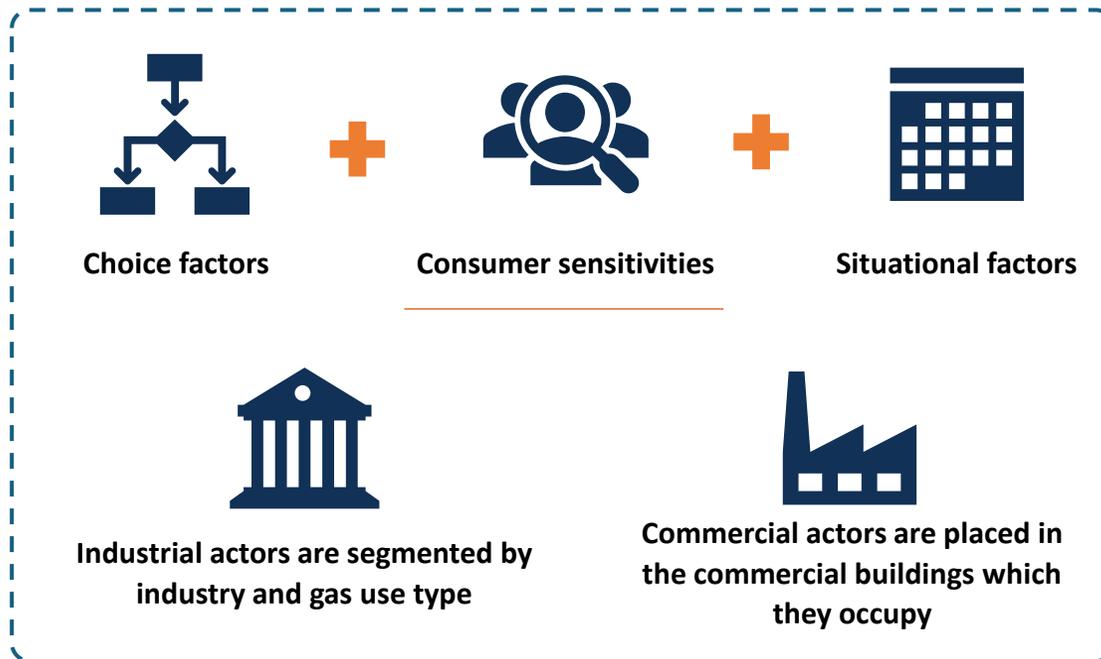
Property and energy Infrastructure
E.g. Property attributes, the system constraints



Local government policy
e.g. Differing local authority investment and schemes



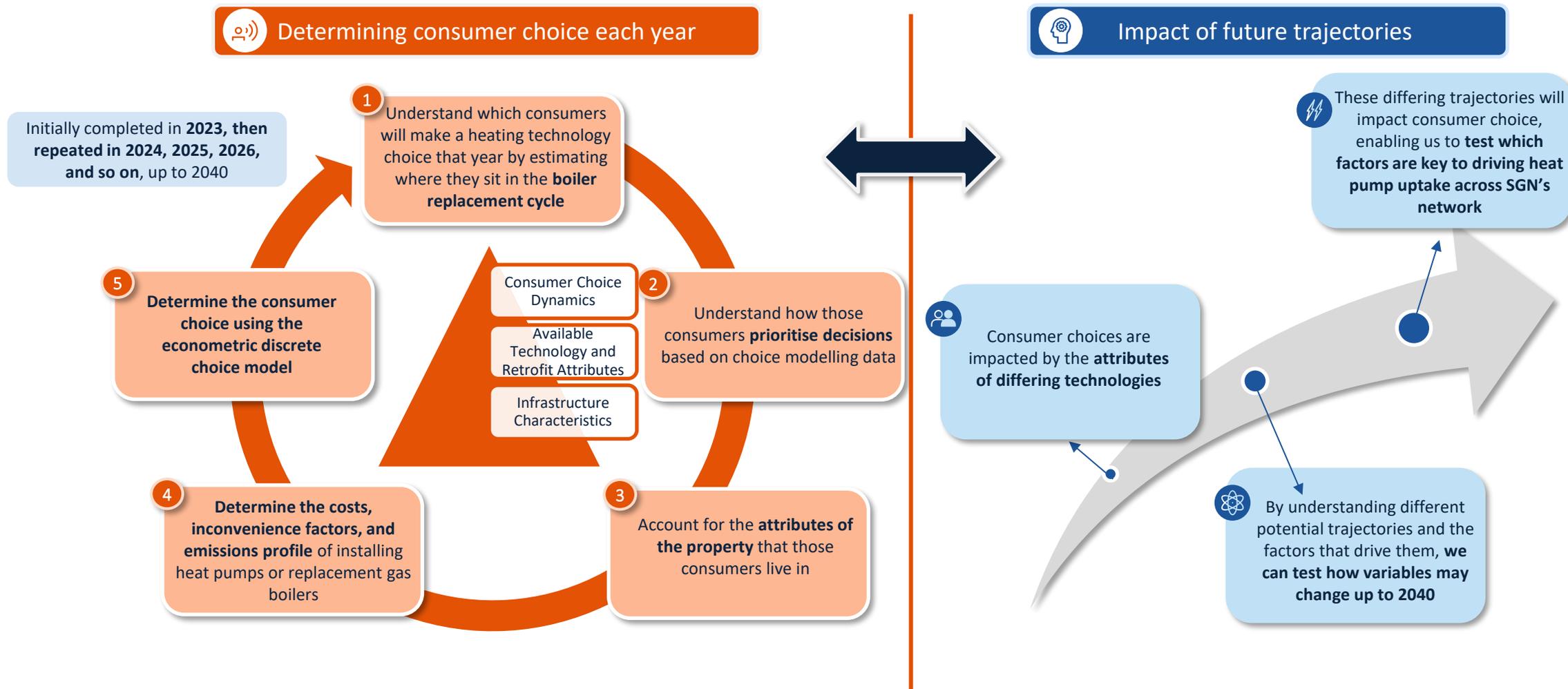
Future scenarios
e.g. How the factors above may change into the future, and how that will impact consumer choice



Consumer Choice Forecasting Model

Determining heating technology choice across SGN's network

Utilising a database of 6 million SGN connections allowed us to understand consumer segments and property types within the network at a household and postcode level – this granularity forms a solid foundation to determine future consumer choice



Thank you

