



GAS GOES GREEN

Britain's Hydrogen
Network Plan

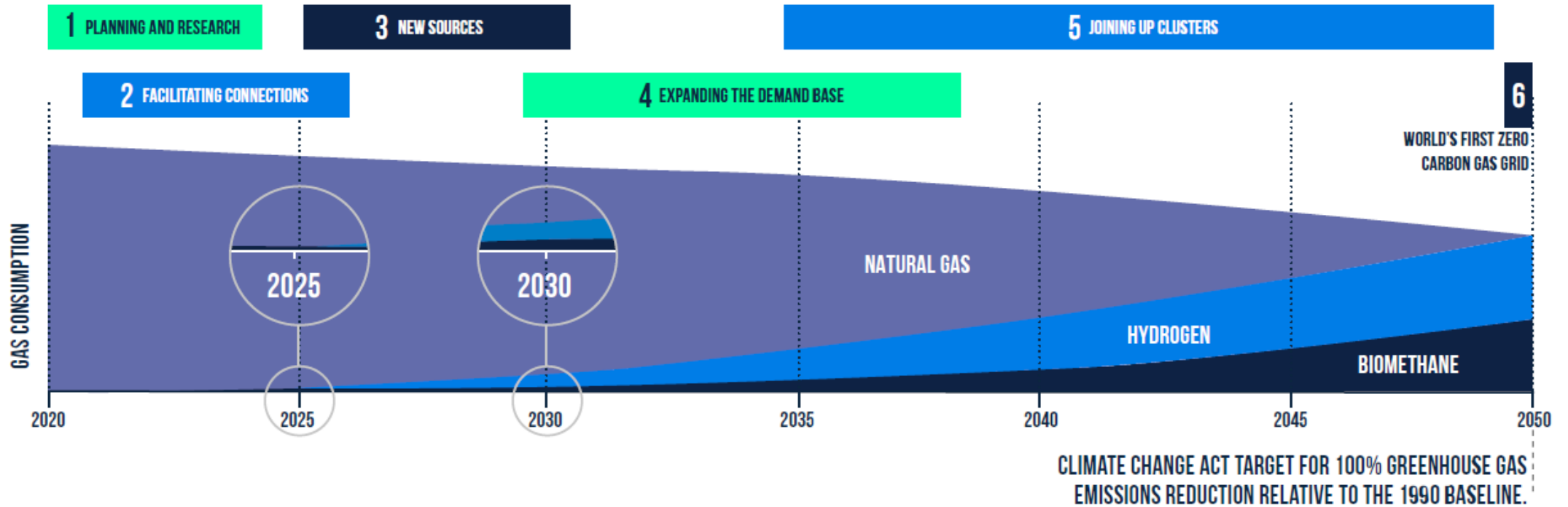
Geode Spring Seminar

26 May 2021

DELIVERING THE
PATHWAY TO
NET ZERO



Decarbonising the gas grid



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Britain's Hydrogen Network Plan

- Blueprint for delivery of the hydrogen economy
- Sets out how networks will deliver against the government's ambitions for:
 - Hydrogen blending from 2023
 - Four decarbonized industrial clusters by 2030
 - At least 5GW hydrogen production by 2030
 - A 2030 Hydrogen Town building on earlier trials and pilots



Hydrogen Network Plan: Key Tenets



SAFETY

Ensuring people's 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. Our safety work is developing the right technology and procedures across the GB system, including:

- o End-user appliances, such as domestic boilers and industrial burners;
- o The low-pressure distribution network;
- o The high-pressure transmission network.



SECURITY

Maintaining security of supply: We will deliver a hydrogen network that meets the same high levels of supply security as today, with very rare unplanned interruptions. This includes ensuring:

- o Sufficient physical network capacity and resilience to meet demand peaks;
- o Effective System Operation;
- o Linkages to sufficient hydrogen production and storage capacity;
- o Flexibility to connect new sources at more entry points.



CUSTOMERS

Focussing on people's needs: Our hydrogen network will have a strong customer focus, supporting consumers to decarbonise in a convenient and cost-effective way, including through interim steps to enable rapid decarbonisation, covering:

- o Domestic convenience and utility;
- o Transport sector convenience and utility;
- o Industrial sector convenience and utility;
- o Interim steps to reduce emissions rapidly and early, including blending and hybrid heating systems;
- o Energy-content billing.



SUPPLY
CHAIN

Delivering jobs and investment: We will deliver the supply chain to construct and convert the network needed to allow 100% hydrogen to be introduced on time, which includes:

- o Equipment, including appliances and long-lead items;
- o Skilled people.

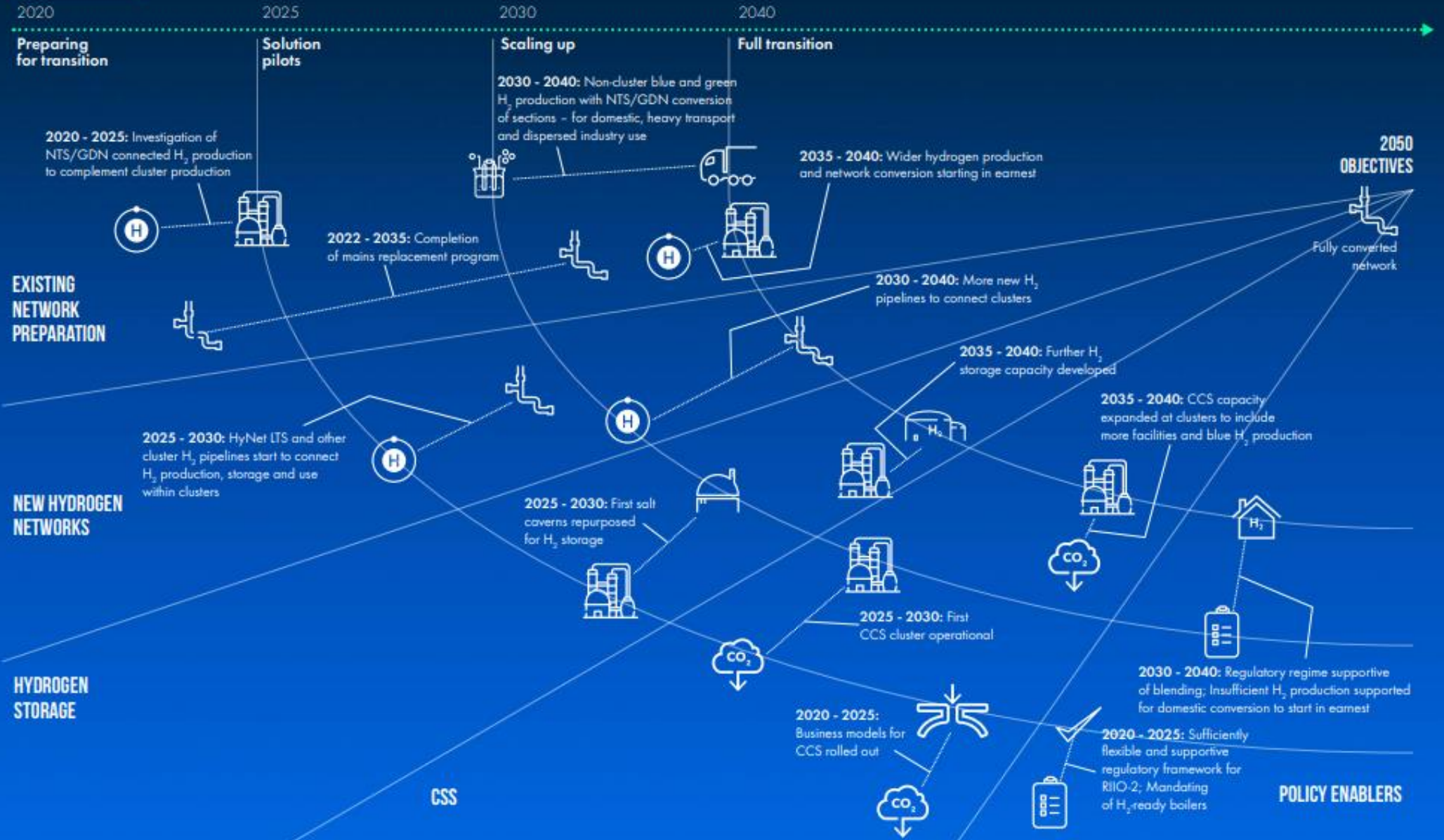


Delivering the Hydrogen Network Plan

	HOUSEHOLDS	INDUSTRY	POWER	TRANSPORT
SAFETY	Domestic 100% hydrogen safety case - Hy4Heat (led by BEIS)			
	Distribution grid 100% hydrogen safety case and other safety studies- H21 and phase 2, H100 FIFE, Network safety and impacts board projects.			
	Transmission grid re-purposing safety and feasibility- HyNTS future Grid phase 1			
SECURITY OF SUPPLY	Hydrogen network operation and resilience - transmission modelling. Distribution modelling. System operator transition to Hydrogen			
	Market framework for hydrogen - Gas Markets Plan (GMaP)			
	New hydrogen networks - Aberdeen vision (new network element) HyNet Homes			
	Hydrogen Production directly connected to networks- project Cavendish, H100 Fife, H21 Phase 3 , HyNet homes			
CUSTOMER FOCUS	Cluster Hydrogen - Networks support to industrial cluster projects, including HyNet, zero Carbon Humber, Acorn, Net Zero Teesside, South Wales industrial Cluster and Southampton water			Enabling hydrogen in transport - H2GV, Cadent Gas Transport pathways
	Domestic use trials: 100% hydrogen Neighbourhood and 100% hydrogen village- H100 Fife. H21 Phase 3, HyNet homes	Hydrogen de blending for specific customers- De-blending N1A, HyNTS Future Grid Phase 2		
	Testing of 20% blending for 2023 start- HyDeploy, HyDeploy2			
	Energy content billing to allow blending - future billing, Real Time Networks			
	Hybrid Heating and hydrogen - Project Freedom, HyHy, HyCompact			
	Mains replacement and readiness for hydrogen, including training- iron mains risk reduction programme, network training programme.			
SUPPLY CHAIN	Entry Connection for decarbonised gas- Entry connection standardisation			
	Cross- sectoral stakeholder engagement to communicate hydrogen network plan and secure feedback			

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AMBITION TO ACTION FOR THE NETWORKS





Projects underway across Britain



Objectives	H100 project is looking to construct and demonstrate the UK's first network to carry 100% hydrogen
Status	Engineering design stage
Timeline	Construction Summer 2021



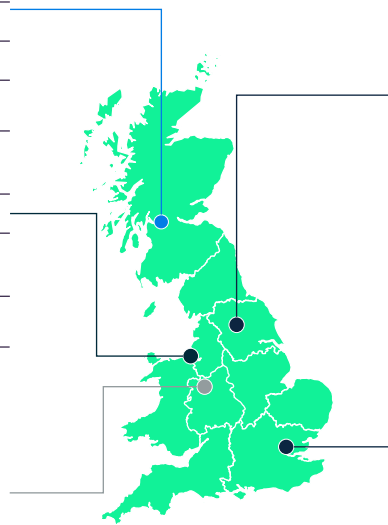
Objectives	Demonstrate hydrogen production from natural gas with CCUS, distribution, and use at scale
Status	Engineering design stage
Timeline	FID is required by the end of 2022 to enable deployment of the project on schedule (delivery in 2023-26)



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
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	-	-
Timeline	-	Delivery in 20/21	Delivery in 2023-28



FutureGrid

Objectives	<ul style="list-style-type: none"> • Determine the viability of utilising existing infrastructure to enable the Isle of Grain region to supply decarbonised hydrogen to London and the South East. • Ascertain what additional infrastructure would be required if the Isle of Grain was to supply all of London's hydrogen, including the identification of critical environmental issues and ecosystem mapping of stakeholders. • Develop a roadmap for hydrogen development in the region
Status	Live – Funding from Network Innovation Competition
Timeline	Construction in 2021

THANK YOU

