

Hydrogen Winter School
University of Birmingham
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Hydrogen Strategy, Policy and Funding

Funded by



Research
England

Lead academic
partners



Overview

UK Policy on hydrogen
Large scale hydrogen infrastructure funding
HyDEX approach to policy



UK Policy on hydrogen

Large scale hydrogen infrastructure funding
Regional Policy





Why is hydrogen a policy issue?

Policy Area	How?
Greenhouse Gas Ambition	Reduce demand for electricity being produced from other sources
	Act as a way of storing energy for use in peak periods
	Reduce electricity/diesel demand for transportation, particularly in the heavy vehicle sectors
	Replace gas being used in industrial processes
	Replace gas being used for heating, for example via its use in district heating systems.
Economy	By 2050 the establishment of a worldwide hydrogen economy could create a US\$2.5 trillion market and provide sustainable employment for more than 30 million people

What are the barriers to hydrogen uptake?



What are the barriers to hydrogen uptake?

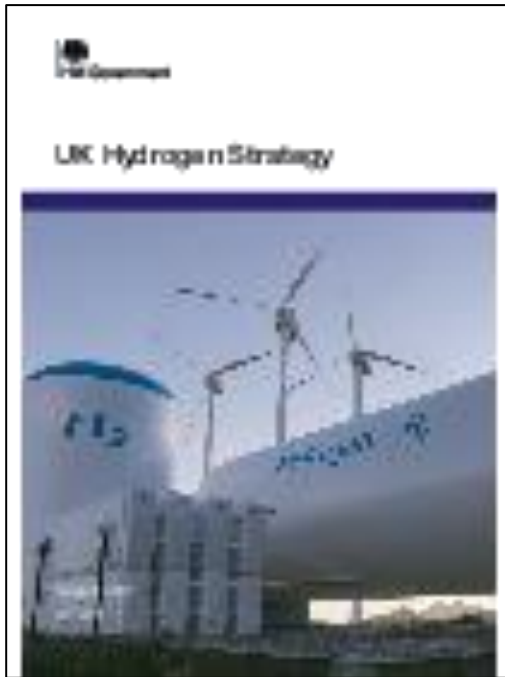
- **Cost**
- **Lack of infrastructure**
- **Hydrogen demand**
- **Supply chain for equipment**
- **Lack of regulations**
- **Safety concerns**
- **Lack of skilled workforce**
- **Innovation still needed**
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➤ **Having a government strategy and policy on hydrogen can help alleviate some of these barriers and take advantage of the opportunities identified previously**

UK Hydrogen Policy

UK Hydrogen Strategy published by DESNZ in 2021



- Supports both electrolytic ‘green’ and carbon capture (CCUS)-enabled ‘blue’ hydrogen production, alongside other potential production routes.
- Increased ambition to 10GW of low carbon hydrogen production capacity by 2030 .
- Roadmap for development of the wider hydrogen economy over the 2020s.
- Low carbon hydrogen could help to decarbonise industrial heartlands, unlocking over 12,000 jobs and up to £11 billion in private investment by 2030 across the UK.

A few specific policy areas...



	Policy Situation	Major Developments
Blending	Government sees potential economic and strategic value in blending of up to 20% hydrogen by volume into the GB gas distribution networks, in certain circumstances. Industry trials to gather evidence on safety. The evidence will be assessed by government before any steps to implement blending are taken.	Project Union is a 2000km hydrogen network across the UK led by National Gas that will connect hydrogen production centres to industrial, heat, transport and power consumers. Currently at pre-FEED stage.
Hydrogen to power	Consultation on potential design options for market intervention to support hydrogen to power. Minded-to intervene to enable hydrogen to power plants to compete in the Capacity Market.	
Home Heating	The Government is now not supporting hydrogen village trial at Redcar and will take a decision in 2026 on if/how hydrogen will contribute to heating decarbonisation. that the Government, industry and investors can work together most effectively to build a world-leading hydrogen economy.	Development of hydrogen ready home boilers.

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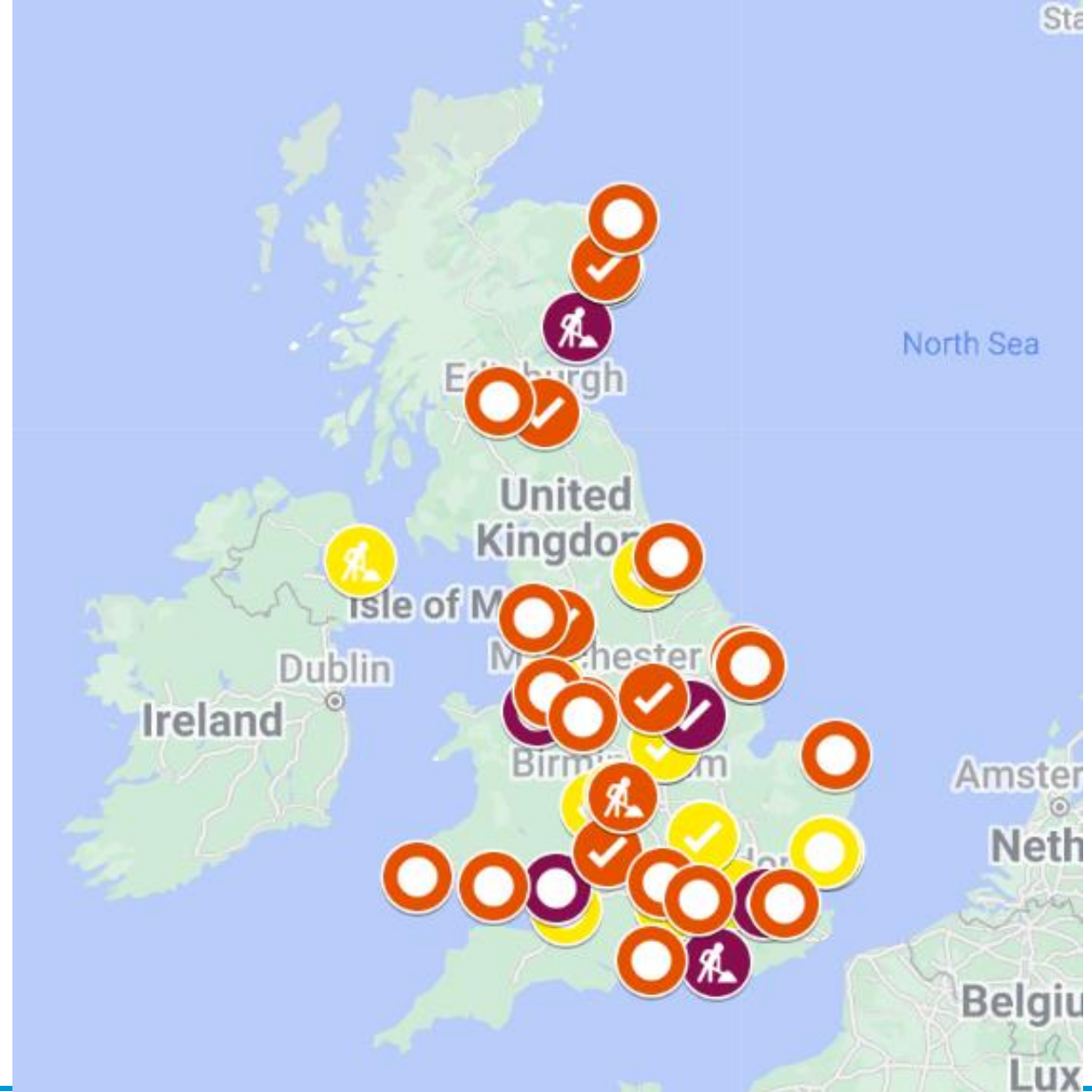
Some Key Hydrogen Infrastructure Funding

Hydrogen allocation round (HAR1): 11 electrolytic (or “green”) hydrogen projects (125MW production capacity) funded committing £2 billion via 15-year contracts and £91m in government capital plus £413m private capital and 700 jobs.

Net Zero Hydrogen Fund: £240m to supports low carbon hydrogen production capacity by 2030

Supports all forms of hydrogen production, Opened April 2022, 2nd application April 2023.

Zero Emission Road Freight Demonstrator: £200m large-scale demonstration project funded by DfT in 2023. Mix of electric and hydrogen trucks (40t+) plus infrastructure. Operational by 2025



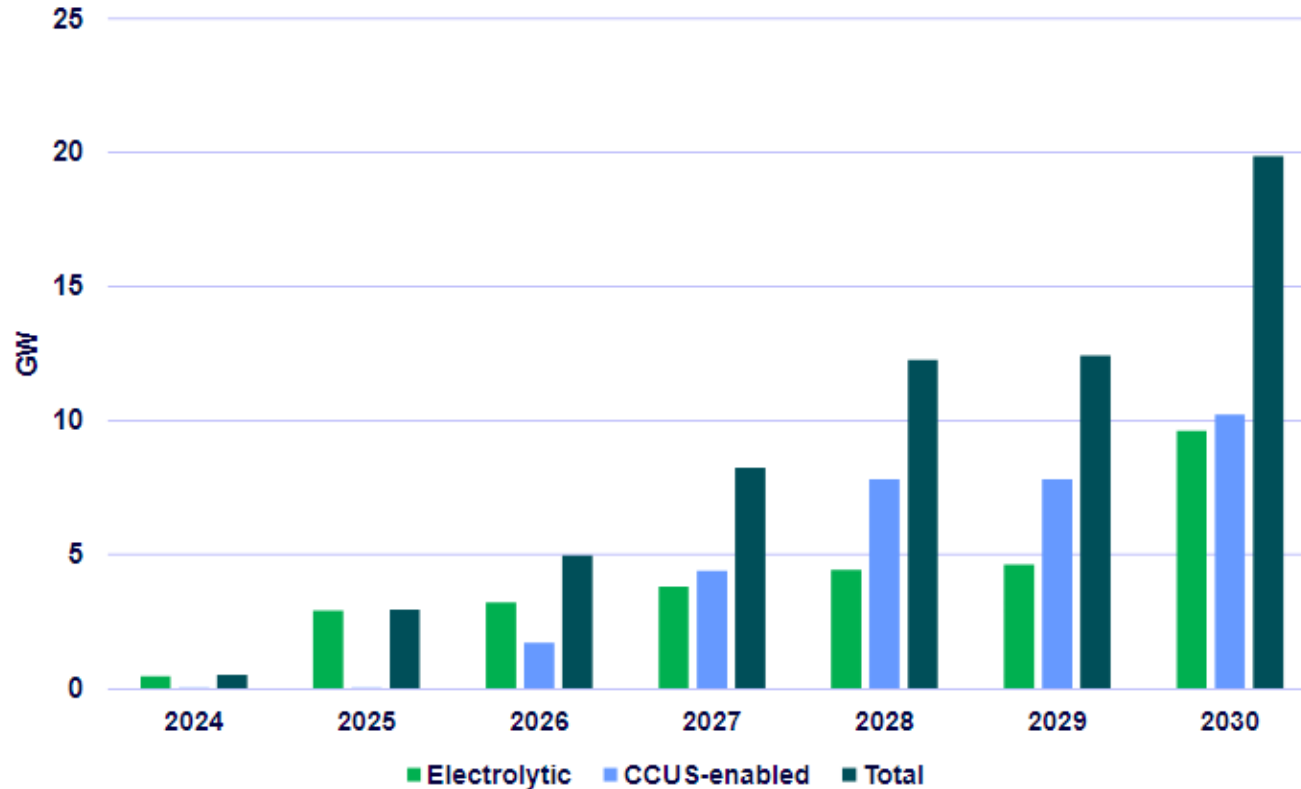
UK Hydrogen Projects (Left: Production; Right: Transport and Infrastructure)

[Ref: The UK Hydrogen Project Map - Hydrogen Energy Association \(ukhea.co.uk\)](http://ukhea.co.uk)

The known pipeline of hydrogen projects shows potential for growth and investment



Cumulative potential total GW low carbon hydrogen production capacity



Source: DESNZ Low Carbon Hydrogen production pipeline. Note that all figures here are based on potential deployment and scale up according to the projects themselves and does not relate to decisions on individual projects or volume support through specific funding allocation windows.



UK Policy on hydrogen

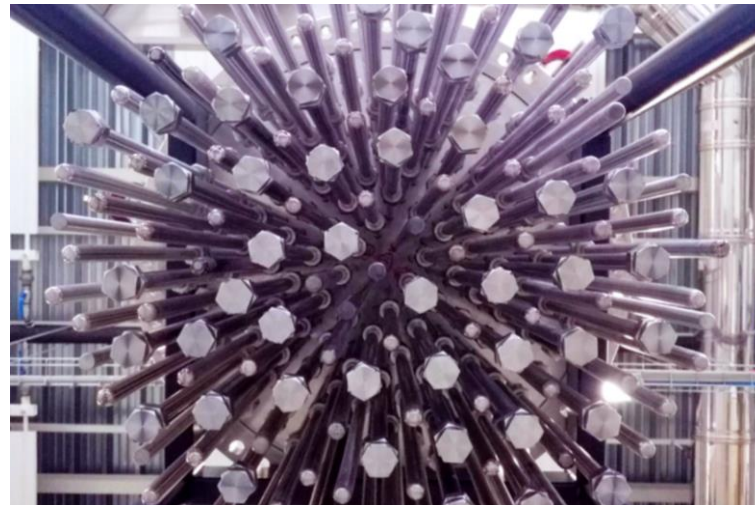
Large scale hydrogen infrastructure funding

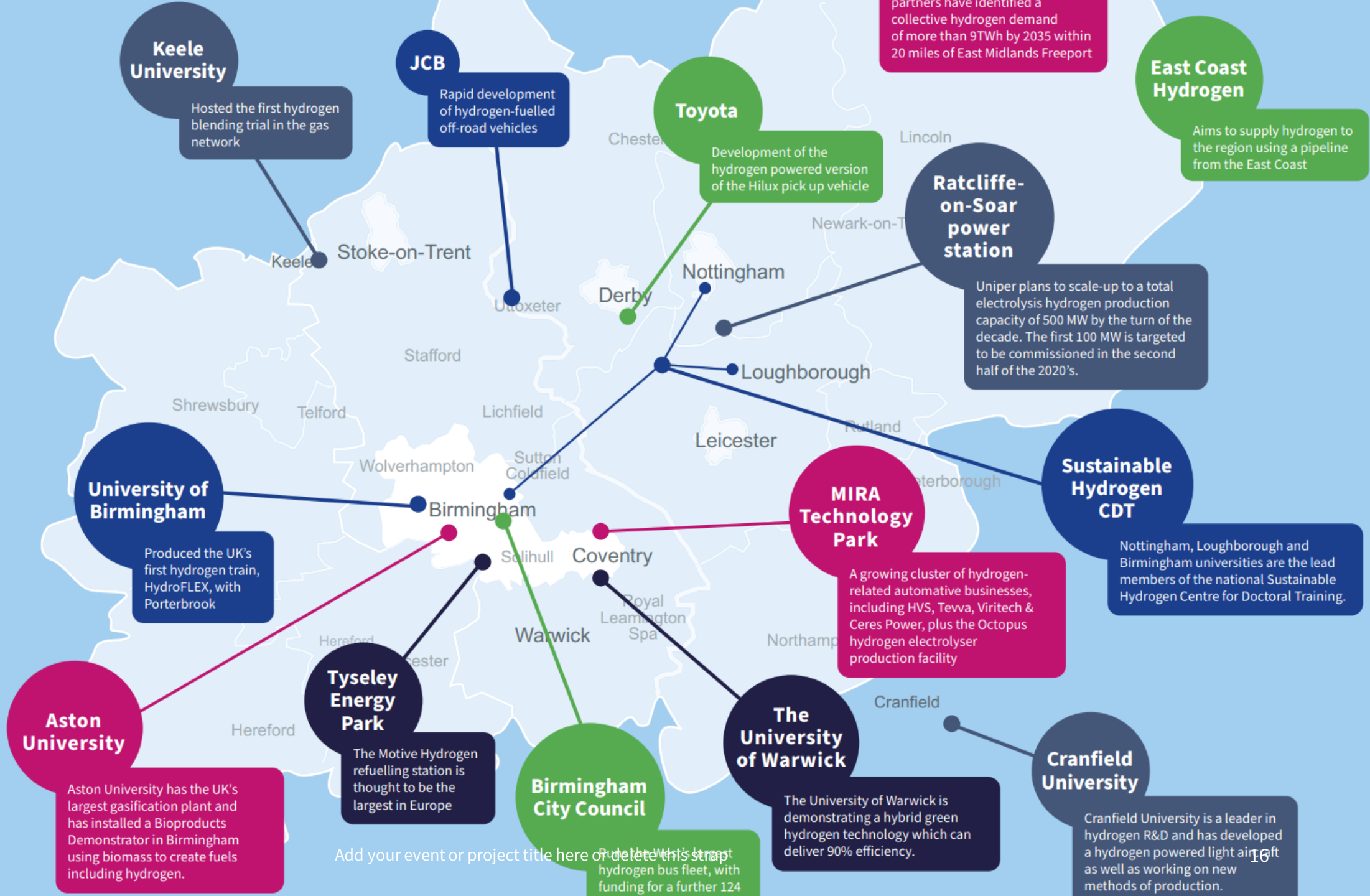
Regional policy

The Midlands Hydrogen Ecosystem

- Worcester-Bosch, Baxi and Cadent (hydrogen boilers and gas networks),
- Intelligent Energy (fuel cells),
- Alstom and Porterbrook (hydrogen trains),
- Toyota (hydrogen vehicles),
- Horiba-MIRA (vehicle test and host of R&D cluster),
- Caterpillar, Faun Zoeller and JCB (heavy vehicles), DVNGL, BSI, Cenex (established low carbon transport consultancy),
- Equans (District Heating Networks), SSE, Progressive Energy
- ITM Power nearby, Siemens and ENGIE are also working closely with regional partners in next-generation hydrogen production and storage.

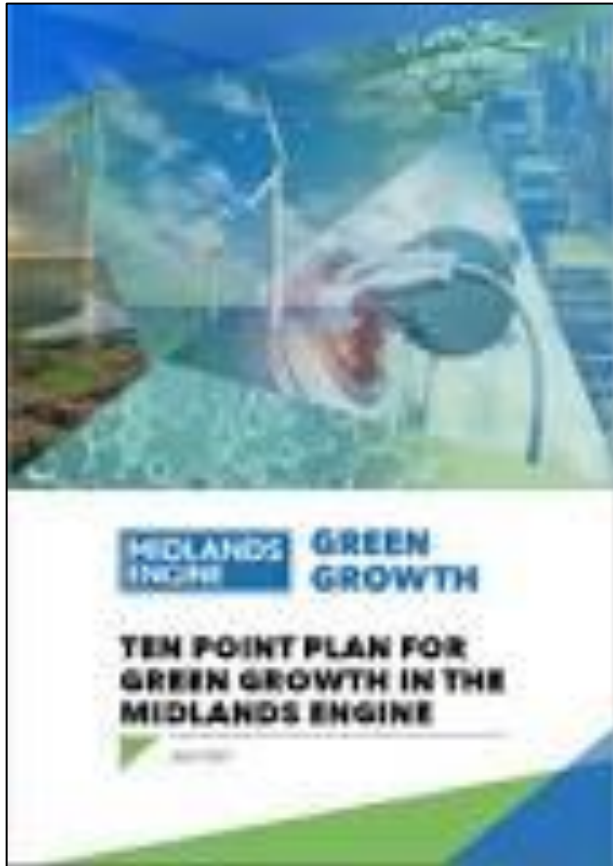






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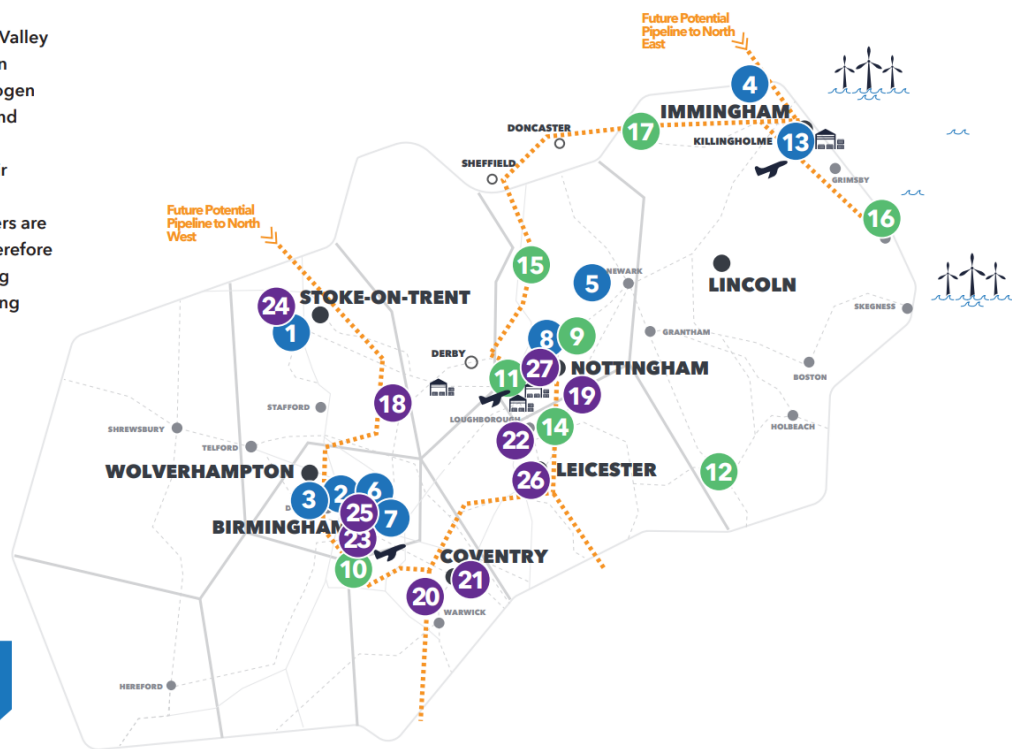
Regional Hydrogen Policy



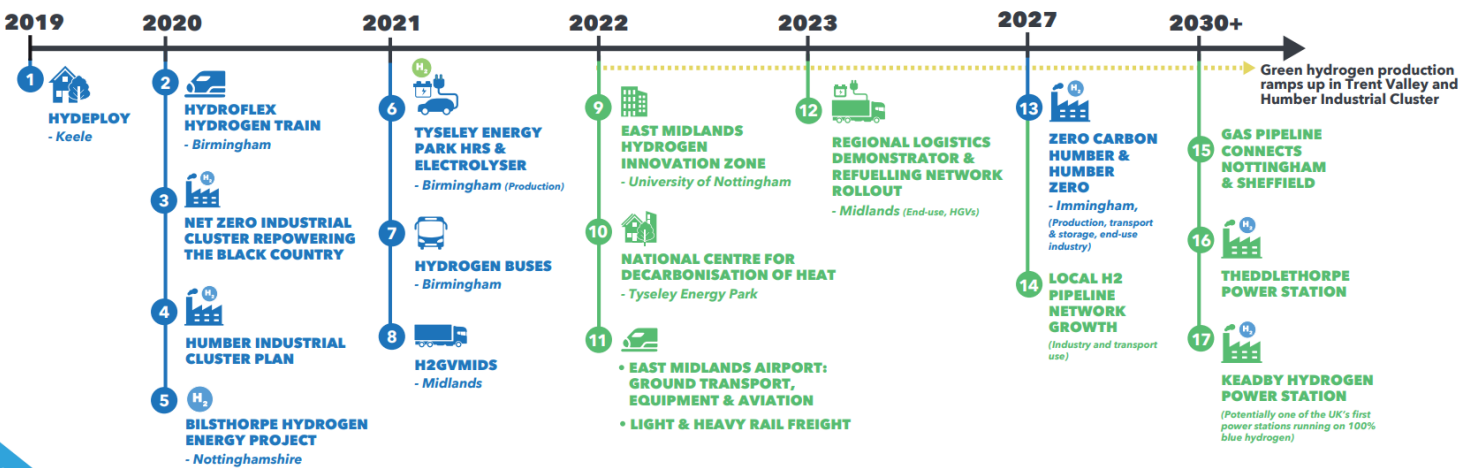
ACCELERATING GROWTH THROUGH THE MIDLANDS ENGINE HYDROGEN TECHNOLOGIES VALLEY

HYDROGEN TECHNOLOGIES STRATEGY 2021

The Midlands Engine Hydrogen Technologies Valley is an ecosystem that links hydrogen production with end users - based on industrialising hydrogen technologies at scale, enabled via academic and supply chain development support. This map showcases a snapshot of our partners and their projects across our region - local clusters that combine to create a regional capability. Partners are moving rapidly to act on opportunities and therefore this map can only show some of the pioneering and high-potential work that is continually being activated in our region.



PURSuing OPPORTUNITIES IN POWER, HEAT & TRANSPORT



Our region is rightly recognised for our advanced engineering expertise and track record of manufacturing excellence. We have the capabilities and strategic intent to develop and industrialise a broad range of hydrogen technologies for power generation, heat and transport applications, as well as extending hydrogen operations across our entire region.

Our Midlands Engine Hydrogen Technologies Valley vision maps the roll out of facilities, demonstration assets and infrastructure along with a supporting innovation ecosystem.

Our partners have identified a host of opportunities to invest in projects that transition our region to a hydrogen-enabled green growth economy. These projects leverage our industrial clusters and transport corridors, as well as the green growth opportunities linked to ongoing investments in clean energy assets.

This willingness to invest is illustrated by a snapshot of example projects in the timeline shown below. The pace of development is rapid with a wide range of opportunities being pursued across power generation, heat and transport.

HYDROGEN FACILITIES & RESEARCH

- 18. **ALREWAS GAS COMPRESSOR**
- 19. **BRITISH GEOLOGICAL SURVEY**
- 20. **WARWICK MANUFACTURING GROUP**
- 21. **MANUFACTURING TECHNOLOGY CENTRE**
- 22. **LOUGHBOROUGH UNIVERSITY**
- 23. **CENTRE FOR FUEL CELL & HYDROGEN RESEARCH - UNIVERSITY OF BIRMINGHAM**
- 24. **KEELE UNIVERSITY**
- 25. **ASTON UNIVERSITY**
- 26. **UNIVERSITY OF LEICESTER**
- 27. **UNIVERSITY OF NOTTINGHAM**



HYDROGEN TECHNOLOGIES STRATEGY

DECEMBER 2021

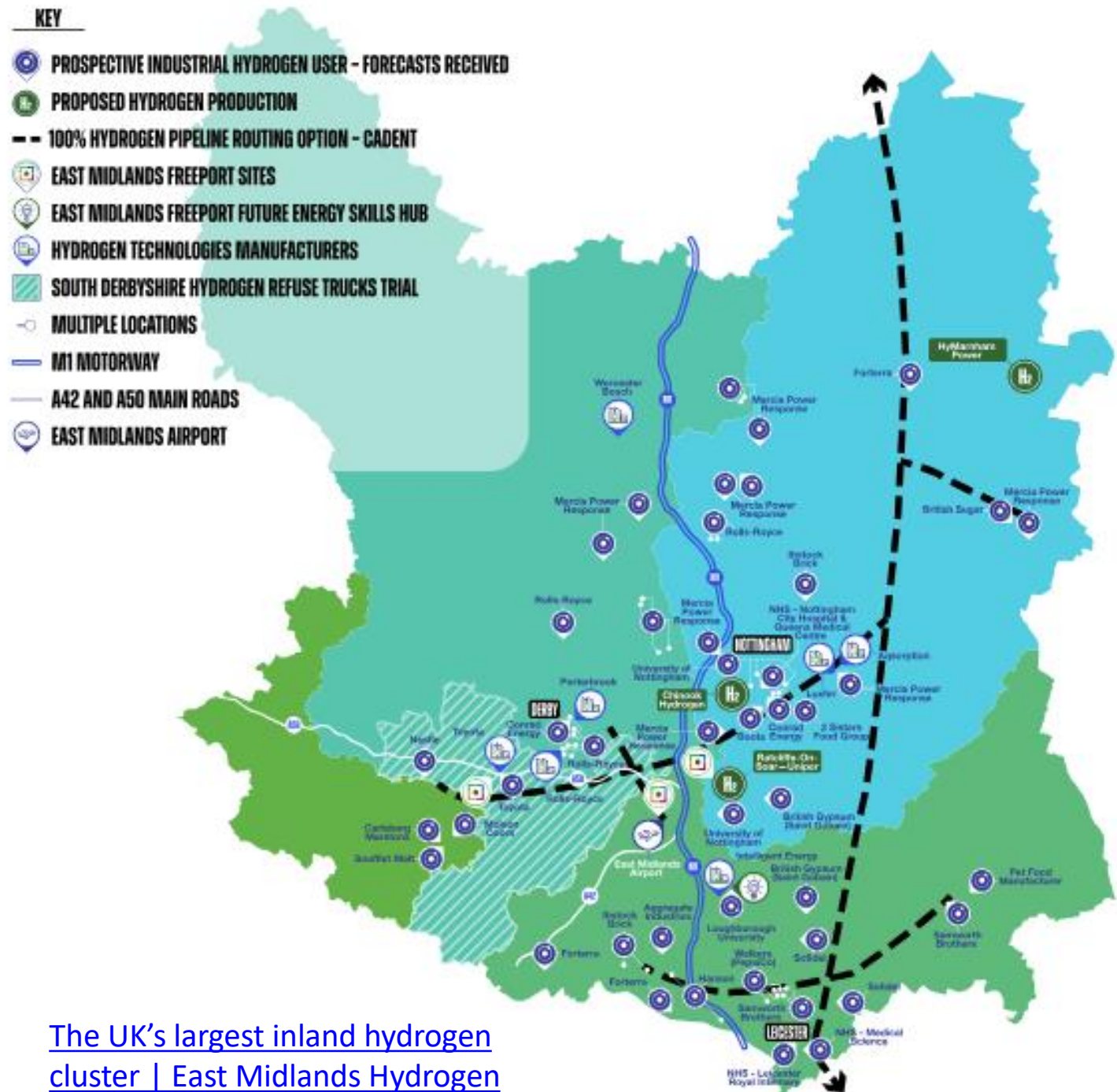
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East Midlands Hydrogen

- Cluster of hydrogen demand forecasts from around 70 industrial sites in the Nottinghamshire, Derbyshire and northern Leicestershire regions
- Major hydrogen pipeline
- More than 10TWh of hydrogen by 2040 in total, with carbon savings of 1.9 MT/yr (= 860,000 homes)



Our Regional Hydrogen Work

Policy Brief:

- [Midlands-Hydrogen-Policy-Brief.pdf \(hydrex.ac.uk\)](https://hydrex.ac.uk/Midlands-Hydrogen-Policy-Brief.pdf)

Areas where we think development is needed:

- Midlands-based hydrogen road-freight schemes.
- Deployment of Midlands hydrogen rail.
- Hydrogen production.
- Construction and agriculture. There is significant interest from both sectors for hydrogen demonstration and

Local Authority Toolkit

Local Authority Workshops



Creating a new hydrogen economy in the Midlands

POLICY BRIEF ON HYDROGEN IN THE MIDLANDS

Creating clean energy and jobs through the development of the regional hydrogen economy



The Toolkit: structure

- Four key areas: production, storage & distribution, demand & end use, skills
- Within these areas:
 - Policy Summary
 - Technological overview
 - Case studies
 - Opportunities
 - How Local Authorities can support hydrogen development
- Data and Mapping
- Online user-friendly resource



Hydrogen Refueller at Toyota Derby
Photo courtesy of Fuel Cell Systems

Thank you

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