2024 East of England Net Zero and Climate Resilience Summit

The role of local authorities in developing a hydrogen economy

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Introductions

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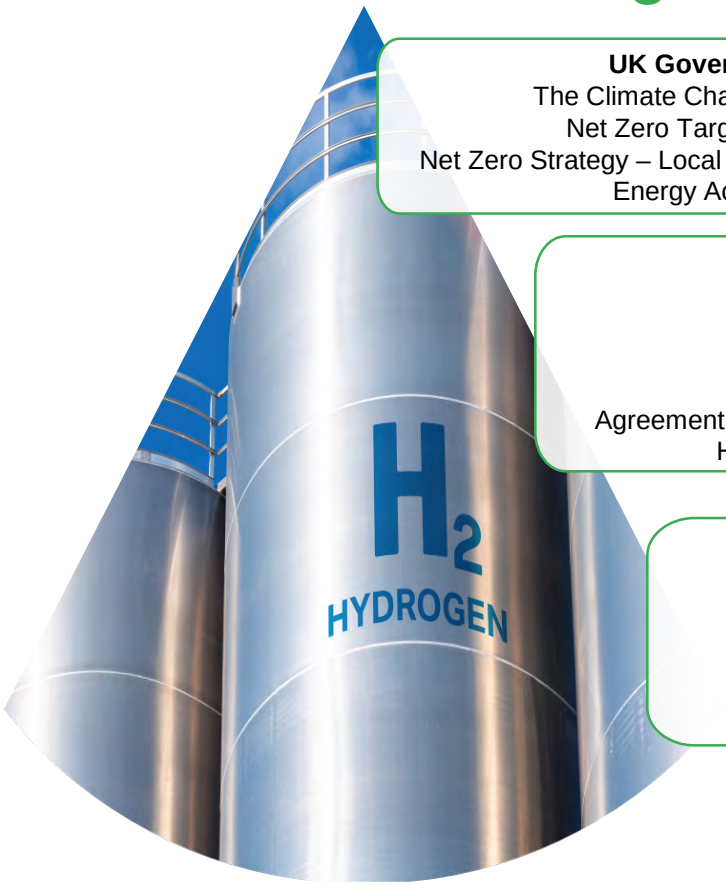
What is hydrogen?

- Hydrogen on earth is typically found in water (H_2O) or in hydrocarbons, such as CH_4
- Hydrogen gas (H_2) must be extracted from these compounds which is sometimes given a colour denotation
- Low carbon H_2 is expected to meet 20 - 30 % of the UK's final energy demand by 2050
- 99% of current production is polluting but low carbon H_2 can be produced in several ways
- But this is energy-intensive so should be prioritised for suitable applications

A National and Regional Approach



UK Government
The Climate Change Act 2008
Net Zero Target by 2050
Net Zero Strategy – Local Climate Action Chapter
Energy Act 2023

DESNZ
10GW Hydrogen Target by 2030
UK Hydrogen Strategy
Hydrogen Investor Roadmap
Net Zero Hydrogen Fund
Agreement for the Low carbon Hydrogen Business model
Hydrogen Allocation Rounds (HARs)

Authorities / Combined Authorities
Decarbonisation Plans / Climate Emergency Action Plans
Local Area Energy Plans (LAEPs)
Regional Energy Strategy Planners (RESPs)

New Government Policy on Hydrogen

- Establish the National Wealth Fund, upgrading existing functions from the UK Infrastructure Bank and British Business Bank.
- The National Wealth Fund will assess and begin to make its investments in ports, gigafactories, clean steel, industrial clusters, and hydrogen.
- Backing and building Sizewell C
- Doubling the government's target on green hydrogen, with 10 GW of production for use particularly in flexible power generation, storage, and industry like green steel
- Plans to invest £500m over the course of parliament in green hydrogen.
- Invest in development of hydrogen technology through GB Energy

East Of England – Hydrogen Projects

Bacton Energy Hub

- Gas processing hub well positioned to become a future Hydrogen production site
- Utilisation of CCS enabled Hydrogen and electrolytic Hydrogen

Freeport East – Hydrogen Hub Vision

- 500MW Green Hydrogen Hub Visions to support Port of Felixstowe and Harwich
- Investment through Net Zero Hydrogen Fund
- HGV/Port Ops refuelling hub and maritime refuelling
- Industry off-takers in Freeport area

Lowestoft Hydrogen Production Facility

- 3 Hydrogen electrolysers and storage, powered by renewable energy
- Smart local energy hub

Sizewell C

- Nuclear low carbon project
- Hydrogen used to decarbonise the construction, refuelling and maintenance hubs and SAF

Delivering in Practice

Direct Control / Asset Owners

Opportunity to support on pilot projects for use of Hydrogen in heating on Local Authority estates – where necessary supporting schemes to replace/retrofit boilers to accommodate Hydrogen.

Local authorities also own fleets of heavy duty vehicles which could be converted to Hybrid/Hydrogen Fuel Cell technology.

Procurement and Commissioning

Local Government third Party Spend in 2020/21 was £64bn

Local Authorities place large contracts and purchases for external services for example in waste collection, street sweepers, fire engines etc.

Zero Emission Buses

Place Shaping

Local planning authorities have powers or influence of 1/3 emissions in the their area

Use of statutory powers and duties to develop plans that connect transport, sustainable development and energy production/usage.

Increasing use of Local Area Energy Planning (LAEP) – a local approach to decarbonise energy systems

Partnership

Co-ordinated thinking across business, academic and the private sector.

Supporting Hydrogen Hubs

Delivering in Practice

Stakeholder Engagement

Using formal consultation processes to engage and communicate with communities to help support/facilitate Hydrogen projects

BRISTOL city leap

City Wide Plans

Opportunity to include/consider Hydrogen solutions through City Wide Plans in partnership with the Private sector

e.g.

Bristol City Leap

Identify and adapt successful business models in the market.

Links into Central Government

Engaging with DESNZ to support Hydrogen Projects

For example. use of cleaner hybrid/Hydrogen trains through local authority regions where cost of electrification is prohibitively high or supporting investment on mixed hydrogen heating schemes etc.

Feasibility Studies / Research Projects

Commissioning Feasibility Studies to study the potential of Hydrogen as an energy source for the region

LCR Green H2 Vision

Charting Liverpool City Region's Hydrogen Vision and Beyond

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COMBINED AUTHORITY

HYDROGEN'S ROLE IN LIVERPOOL

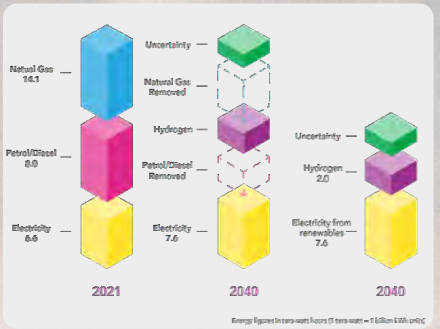
Liverpool City Region has committed to achieving **net zero by 2040**

LCRCA estimate that hydrogen will account for **>20% of final energy demand** but is near zero currently

LCRCA has invested in **20 hydrogen buses** to kickstart the local H_2 economy

The North West region is already building on **its strong hydrogen heritage**

Main use case is for **heavy industry & transport and dispatchable power generation**



Late 1890s

Late 2020s

HyNet North West

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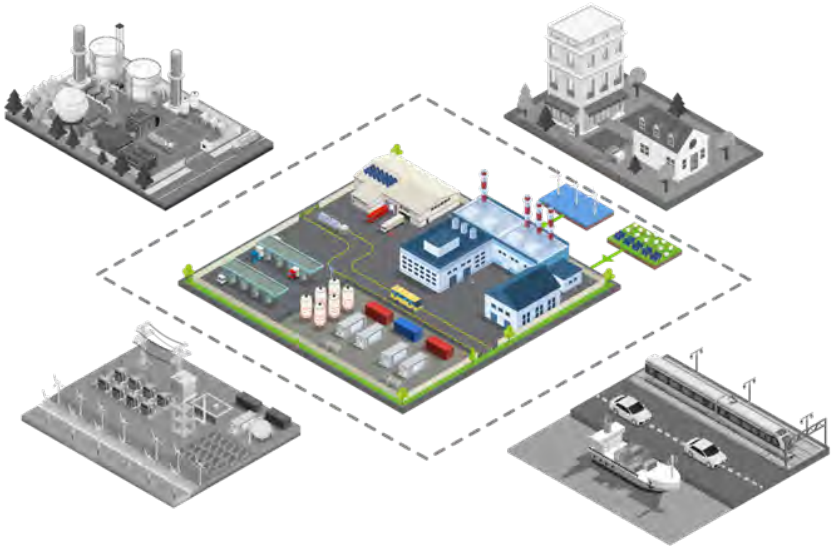
PURPOSE OF THE STUDY



The Vision focused on three areas: industrial operations, freight & logistics and municipal fleets

To determine the **size and scale** of this future economy across the six local authority areas

Establish the opportunity for **decentralised hydrogen production and/or demand hubs** by 2030

To **decarbonise hard to abate sectors** and deliver on Liverpool City Region's Net Zero and energy security ambitions

Attracting inward investment and safeguarding jobs for **long term industrial prosperity**

Supported through **community engagement** and educational briefings

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ANALYTICAL METHODOLGY

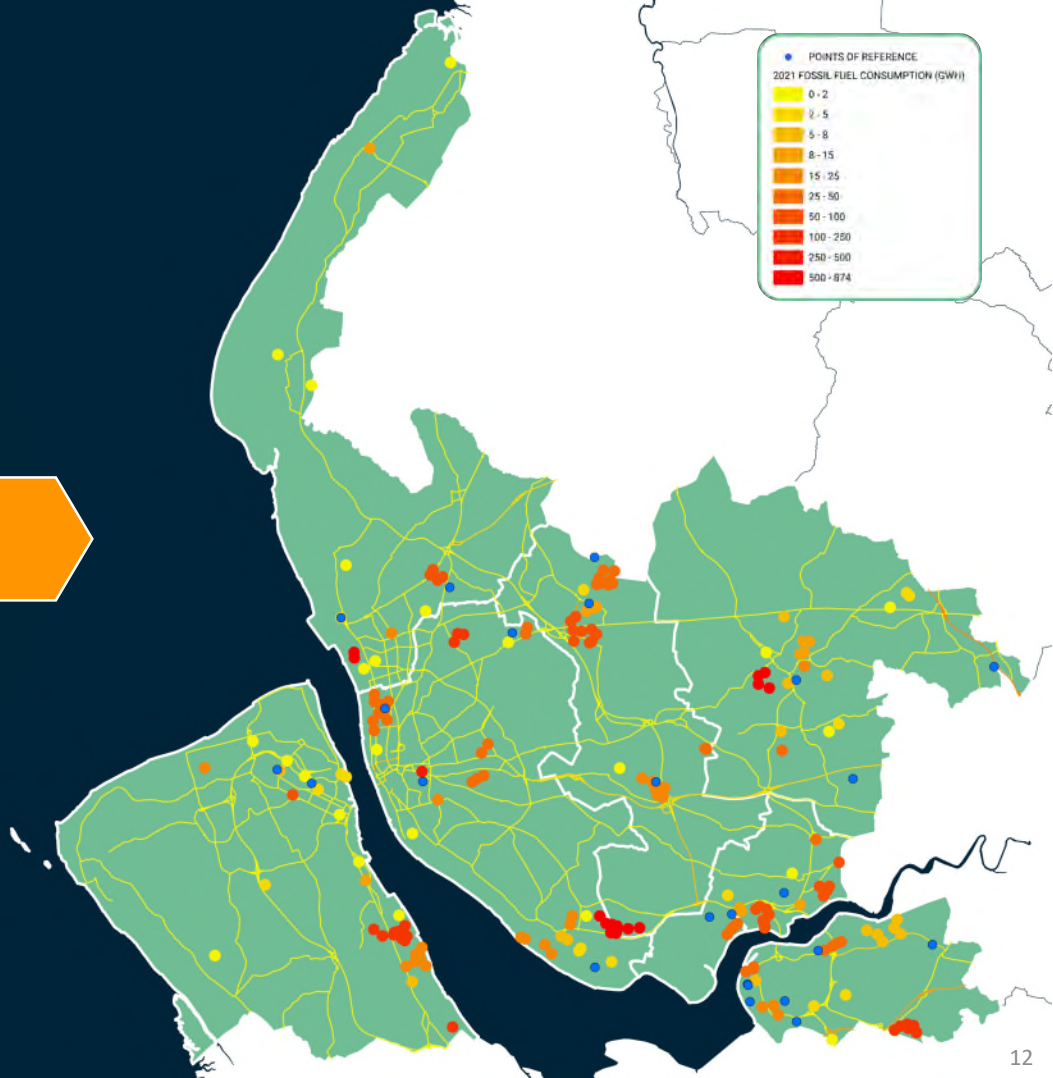
Identify **existing fossil fuel consumers** in relevant sectors to calculate baseline

Consult with local stakeholders to capture influence of local characteristics on anticipated route to net zero

Model decarbonised pathways for each consumer to forecast 2030 and 2040 hydrogen demand

Aggregate adjacent demand into **hydrogen hubs** with shared infrastructure opportunities

Verify the viability of projects and **prioritise key developments**



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PRIORITY PROJECTS

21 potential hydrogen hubs were identified across Liverpool City Region

Infrastructure and investment requirements were highlighted along with local contextual commentary

Example Hub 2: production facility with refuelling

Example Hub 1: production facility with multiple industrial and

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SKILLS & JOBS

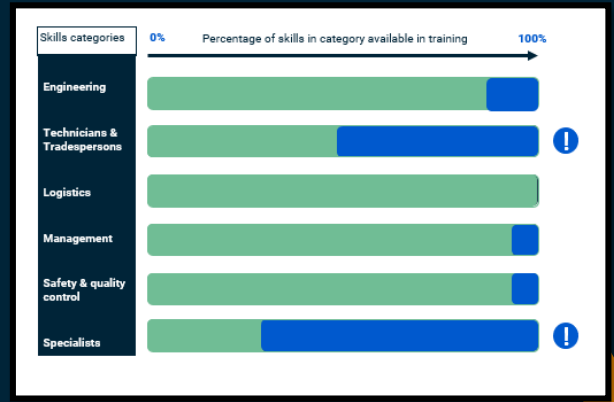
Developing a skilled technical workforce across the value chain **requires long term planning**

1. Upstream: Production
2. Midstream: Storage & Distibution
3. Downstream: End-use Applications

141,000 jobs are required in the LCR area to achieve net zero

The number of hydrogen jobs will **need to more than double** by 2030

Gaps in the current training ecosystem were highlighted that need to be addressed



** Skills gap analysis carried out in conjunction with local providers*

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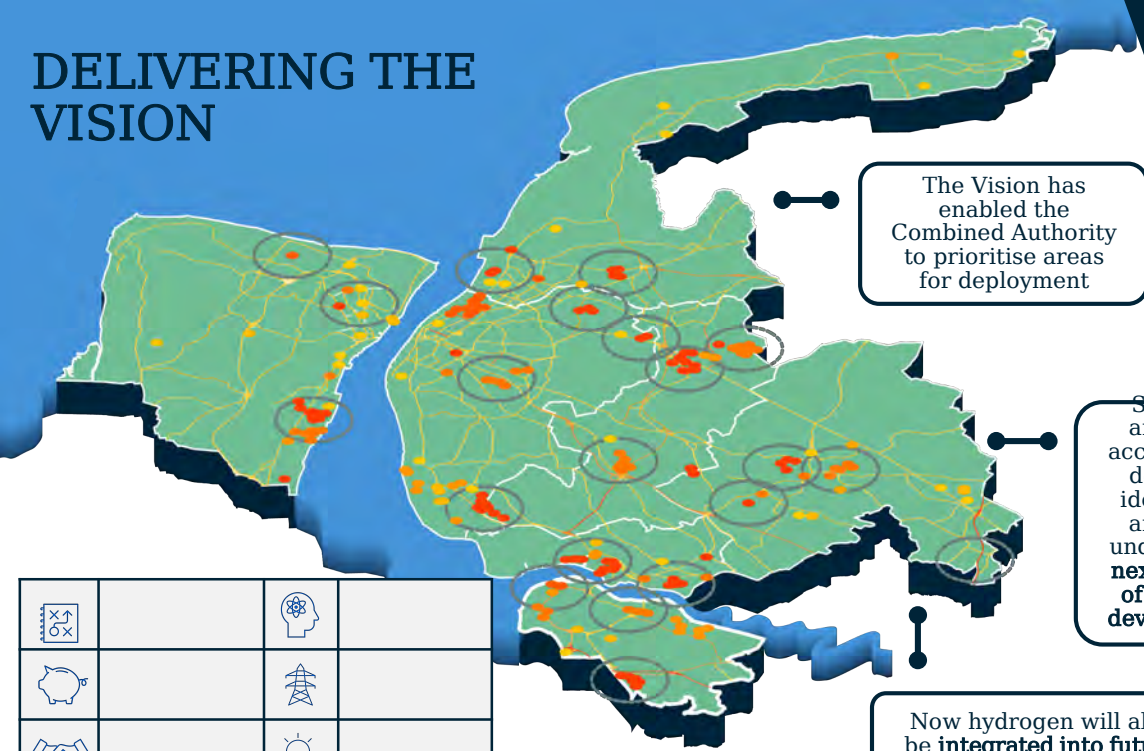
DELIVERING THE VISION



The Vision has enabled the Combined Authority to prioritise areas for deployment

Several areas of accelerated demand identified are now undergoing **next stages of project developmen t**

Now hydrogen will also be **integrated into future LAEPs** for the region

There are **10 other key priorities** for the region to achieve this goal

KEY 2030 LCR STATS:

21	Potential hydrogen hubs across LCR
1,000	GWh/a of potential hydrogen demand
225	MWe of electrolyser capacity
10+	Local business already embracing hydrogen
226,000 +	Tonnes of CO_2 saved each year from 2030
570+	New hydrogen jobs created in LCR by 2030
£810m+	Investment opportunity

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Workshop questions

Question 1

What do you see as the main benefit of hydrogen in the region?

- Decarbonisation of heat
- Transport and mobility
- Sustainable aviation fuels
- Decarbonisation of industry
- Academic and research opportunities
- Creation of jobs and skills
- Hydrogen production and supply
- Don’t know enough
- Limited or no benefit of hydrogen in the region

Question 2

What do you see as the main challenges to achieving the top priority from question 1?

Question 3

What is/are the key action(s) to achieve the main benefit(s)?

Actions