Hydrogen Energy Association

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Hydrogen – local authority progress and pilots

Welcome

Event Sponsor

Hydrogen SUSSEX

Agenda

10:00	**Registration and networking**
10:20	Welcome & Opening Remarks – Cllr Susan Hinchcliffe
10:30	Plenary – presentations
11:45	Break – Tea & Coffee
12:10	Opening panel speech followed by panel discussion
13:15	Lunch
14:00	Case Study Showcase & Concluding Comments

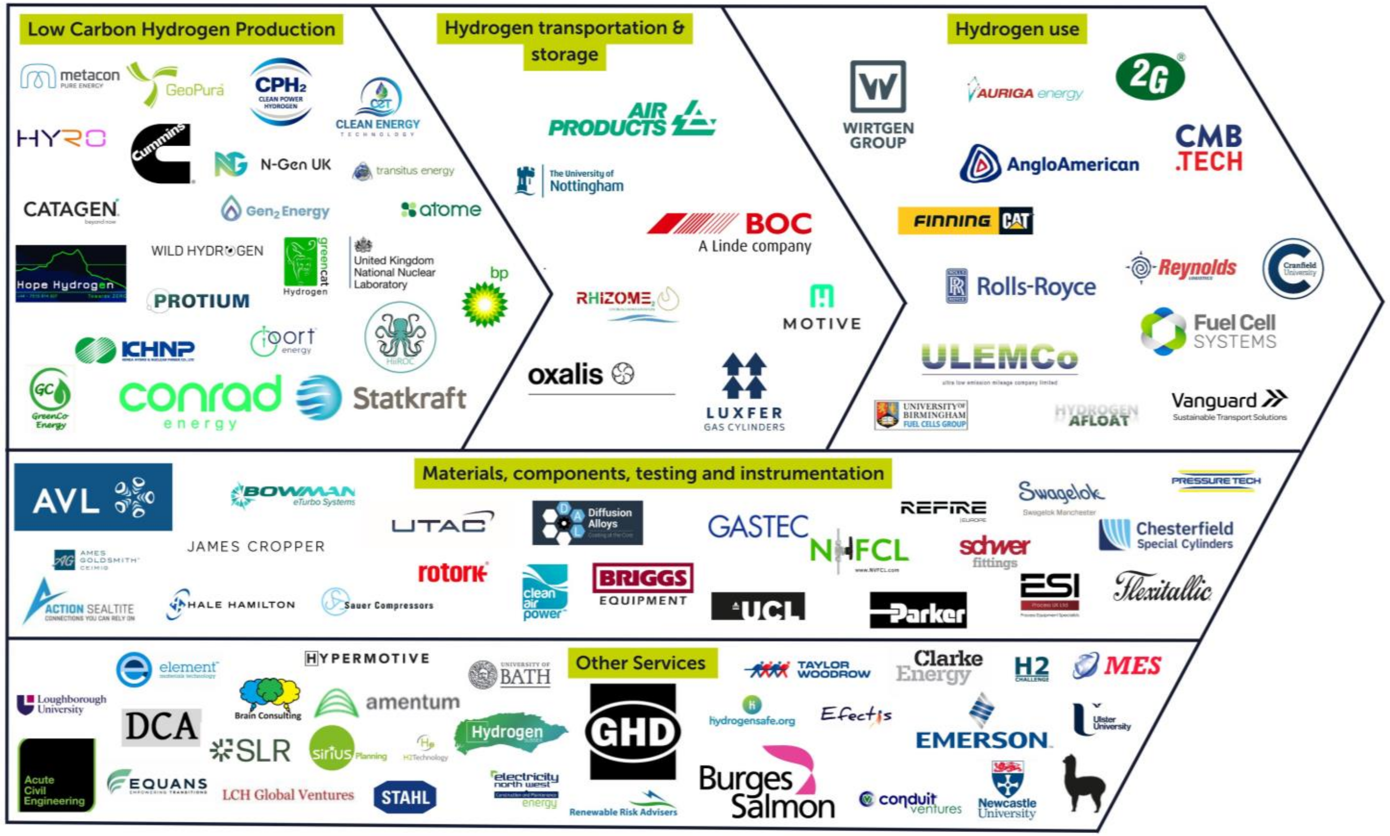
Why Hydrogen?

Celia Greaves, Hydrogen Energy Association
Wednesday 22nd January

Hydrogen Energy Association
Formerly the UK Hydrogen and Fuel Cell Association

About us

Hydrogen Energy Association



The leading UK Hydrogen trade group

Over 110 member organisations, encompassing all aspects of hydrogen and its applications

A key focal point for national and international engagement on hydrogen and its activities for UK plc and UK businesses.

Convening the Hydrogen Coordination Forum.

Delivering jobs and growth

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- The global demand for hydrogen technology is expected to increase to £700 billion annually by 2050, and there is an opportunity for the UK to be at the forefront of this new global industry, generating jobs and exports across the UK
- The UK economic opportunity out to 2030 is £11bn, with 12,000 high quality jobs focused in Teesside, across North-West & North Wales, Humber, Scotland and South-West, and many more in the supply chain. These jobs will encompass engineering, construction, manufacturing service sectors etc.
- A 10% share the hydrogen technology market alone could deliver £46bn per annum to the UK economy by 2050 and 410,000 jobs.
- Existing skills in oil and gas can help us provide global leadership in hydrogen.

Delivering energy resilience

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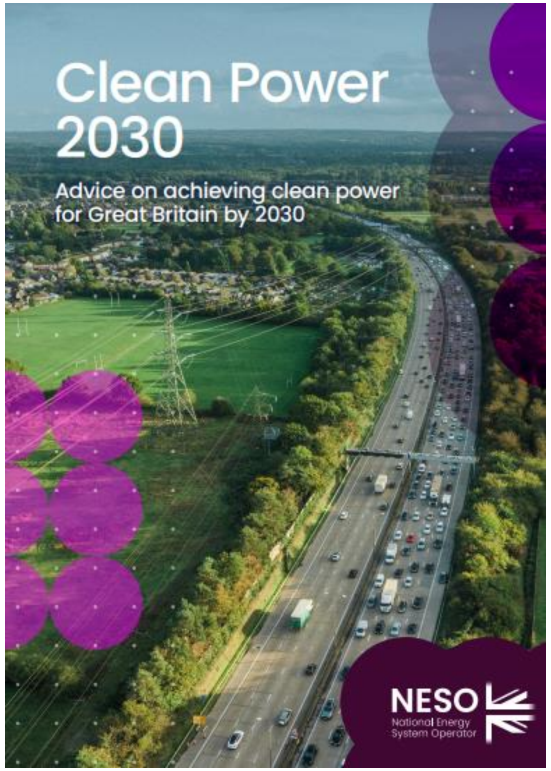

- Hydrogen allows us to balance supply and demand as we work towards our 50GW of offshore wind by 2030, with hydrogen storage as a vital buffer.
- In 2022 alone, there were 200 occasions when National Grid ESO had to pay Scottish wind farms to shut off their turbines, adding £800 million to consumer electricity bills and increasing greenhouse gas emissions by 1.3 million tonnes.
- Savings of £38bn have been identified if hydrogen is used to store energy to balance offshore wind and solar when the wind isn't blowing and the sun isn't shining.
- NESO on Clean Power by 2030: New dispatchable low carbon technologies, such hydrogen, add significant value to the system, with even relatively small levels of operational capacity materially reducing the overall challenge for the rest of the programme.

Delivering net zero

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- The UK will not achieve its decarbonisation ambitions without hydrogen.
- Hydrogen's key role is in hard to abate sectors, where electrification is not possible – heavy industry, heavy duty transport (road, shipping, aviation) and power.
- By 2050, hydrogen could account for 35% of final energy demand.

Hydrogen demand and proportion of final energy consumption in 2050

Hydrogen for Industry

- Industry can't decarbonise without hydrogen.
- Up to 50TWh of demand in industry could be met by low carbon fuels, primarily hydrogen, in 2035.
- Typical user industries include steelmaking, chemical production, and food production.
- Hydrogen is decarbonising via: Fuel switching for boilers, burners and other high temperature processes used in industrial and manufacturing operations; and process gas feedstock.
- Experience across major industrial clusters can be transferred to businesses across the UK.

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Hydrogen for transport

Sources (Clockwise from top left: ITM Power and Shell, ULEMCo, Fuel Cell Systems

- The transport sector accounts for ~40% of final energy consumption, with 80% of that being road transport.
- Decarbonisation cannot be achieved by electrification alone.
- Up to 45TWh of demand in transport could be met by hydrogen in 2035.
- Applications include road transport, rail, shipping and planes.
- Both fuel cells and combustion are options.

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What this means for local authorities

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- Helping to meet local net zero targets
- Attracting new investment into regions
- Improving urban air quality and the health of urban populations
- Supporting local businesses looking to transition to support clean industries.
- Enhancing local energy resilience

Over 300 local authorities have declared a climate emergency, and nearly two thirds of councils in England aim to be carbon neutral 20 years before the national 2050 target.

UK Hydrogen projects map

What projects are mapped:

- Electrolytic Hydrogen
- CCUS-enabled Hydrogen
- Nuclear-enabled Hydrogen
- H2 Infrastructure Projects
- Hydrogen-Powered Transport Use
- Commercial & Industrial Use Projects
- Hydrogen for Domestic Heating Projects

- Over 70+ low-carbon hydrogen production projects, post FEED, mapped
- Aberdeen H2 Hub (400MW), Cromarty Hydrogen Hub (300MW), Lowestoft hydrogen production facility (200MW) and Hybont (250MW) are some of these pioneering projects will be the first at scale electrolytic projects online
- Many industrial use projects advancing rapidly with HEA members and their partners across the country - e.g. JC pears, Kimberly-Clark, Budweiser Brewery
- Key hydrogen mobility examples such as Fleetwide Conversion for Aberdeen City Council, and Teesside Transport Hub with various HEA members involved, including ULEMCo

https://ukhea.co.uk/uk-hydrogen-project-map/

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Thank you

ukhea.co.uk

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Formerly the UK Hydrogen and Fuel Cell Association

Strategic approach to Hydrogen by Bradford Council

Practical experience of deploying a hydrogen production project

Andrew Whittles – Assistant Director of Sustainability – Bradford Council

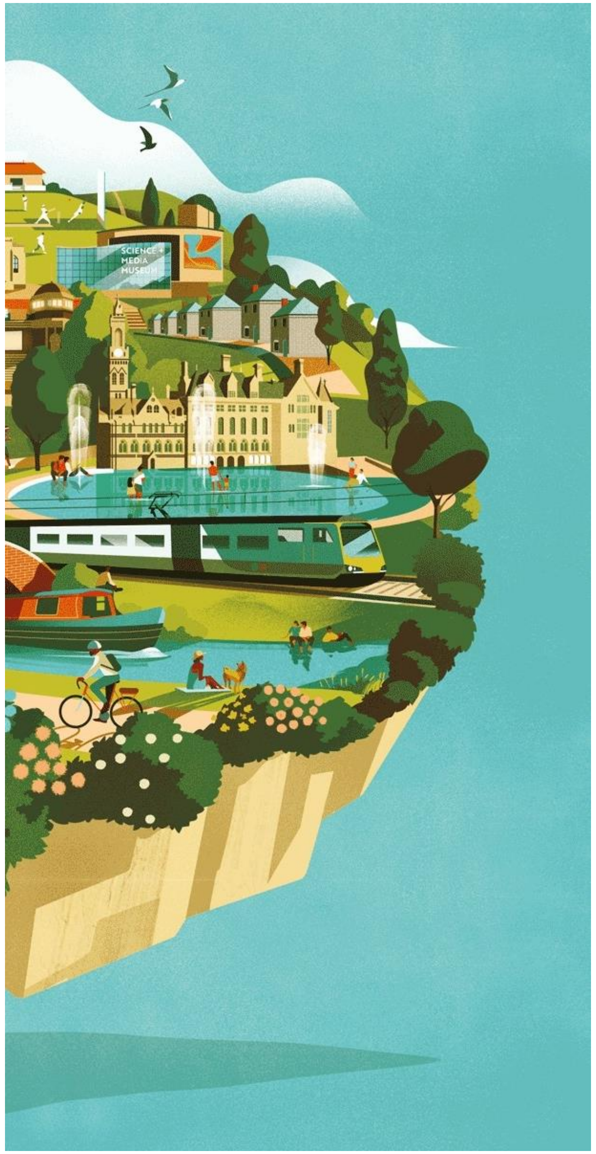
Neil Travers – Head of Business Development – N-Gen Energy

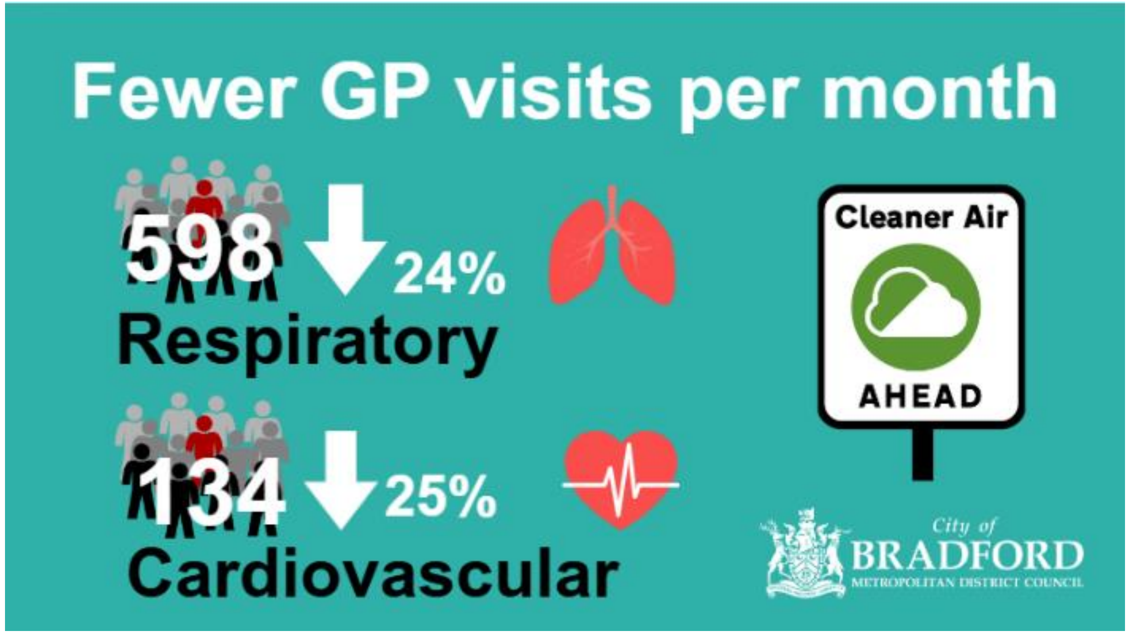
Bradford Low Carbon Hydrogen

City of BRADFORD METROPOLITAN DISTRICT COUNCIL

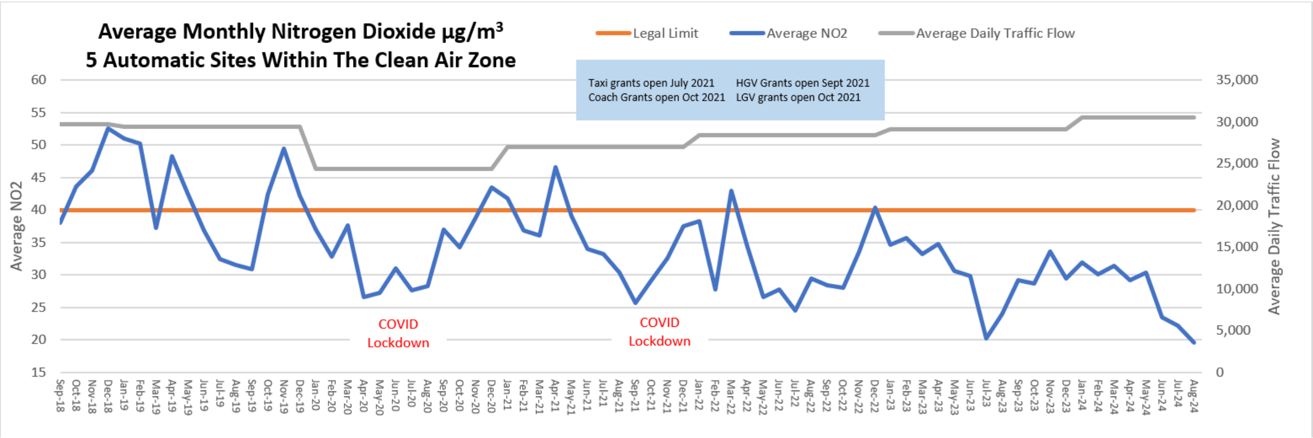
HYGEN

N-Gen UK





Bradford Clean Air Zone (CAZ)



Bradford Low Carbon Hydrogen

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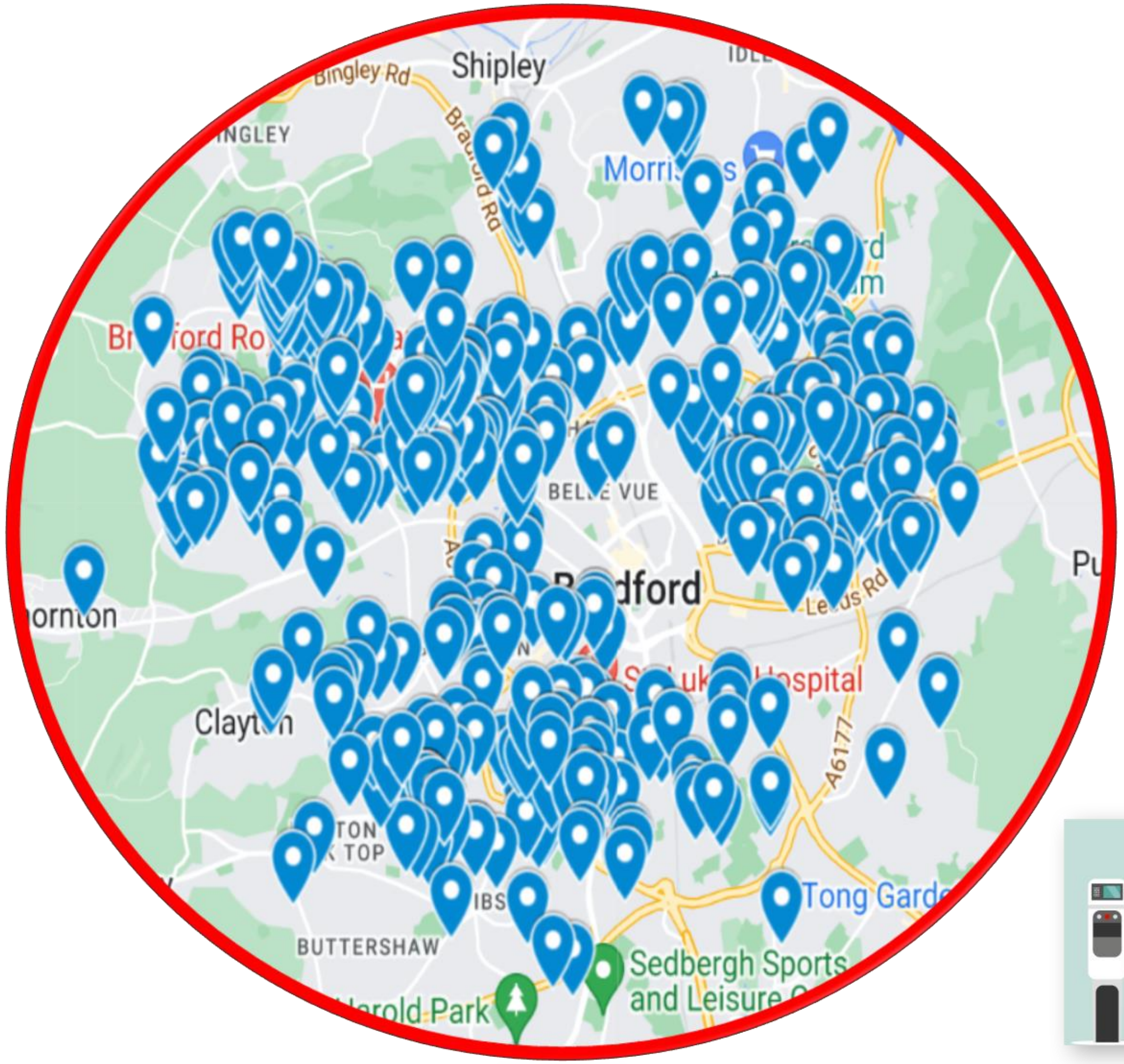

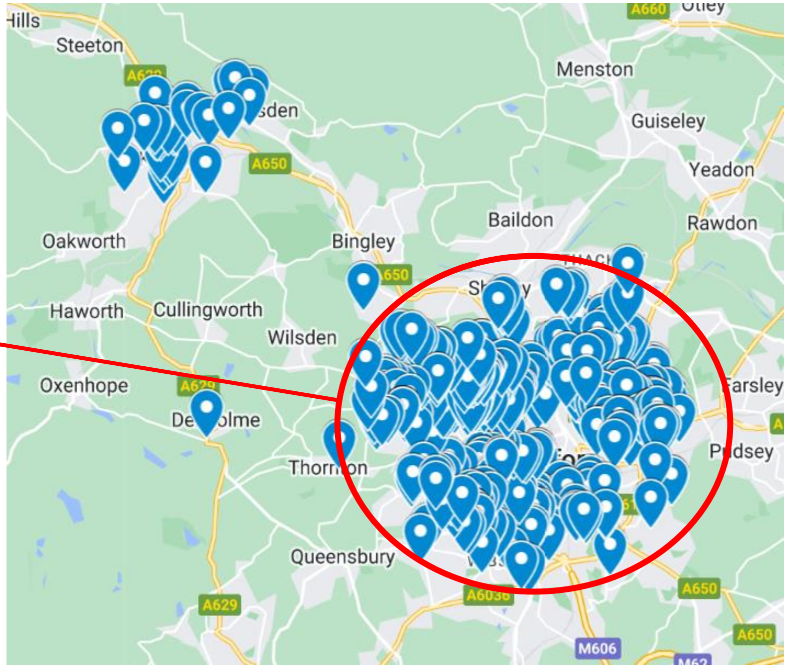

Zero Emission Vehicles & Infrastructure

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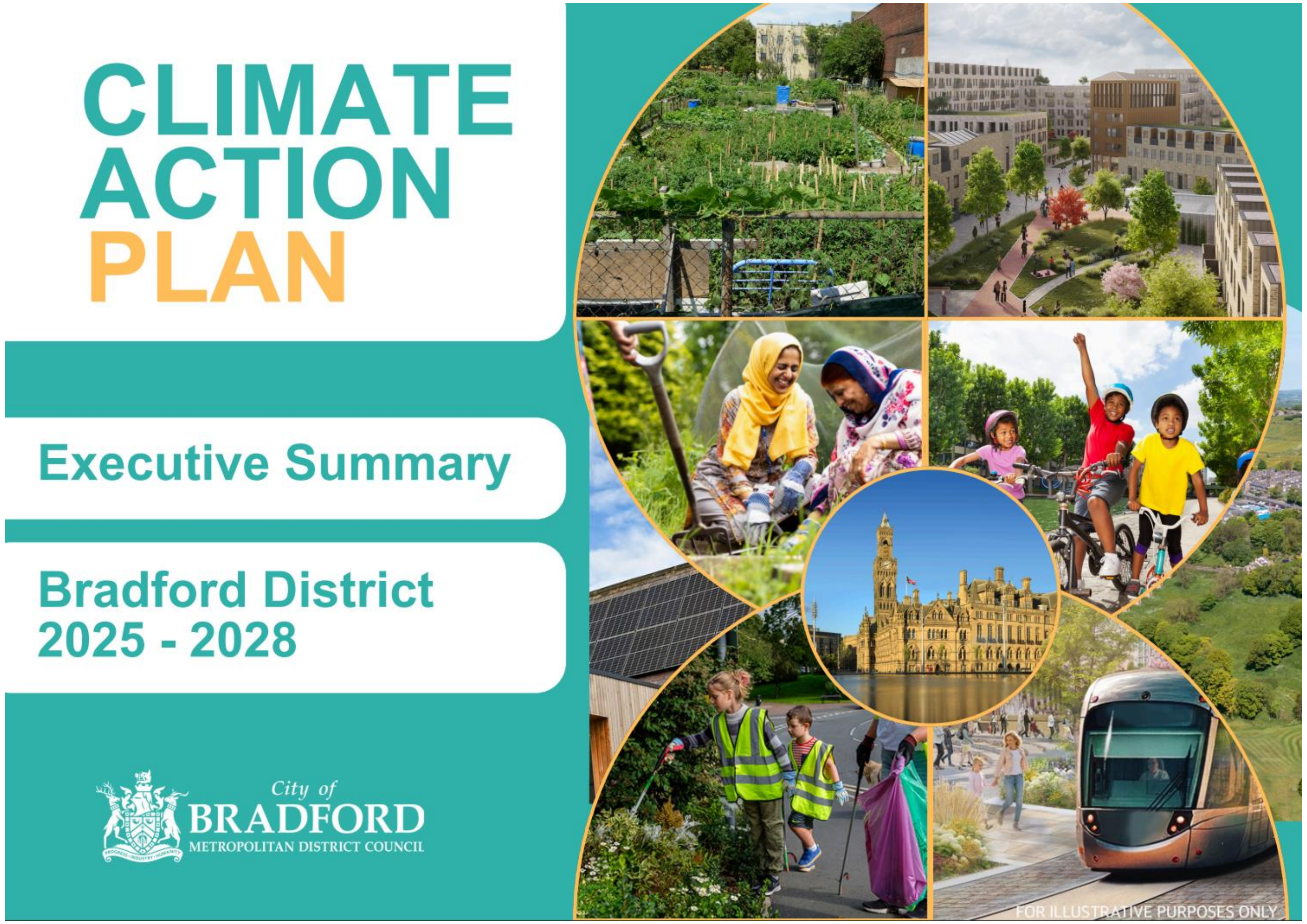

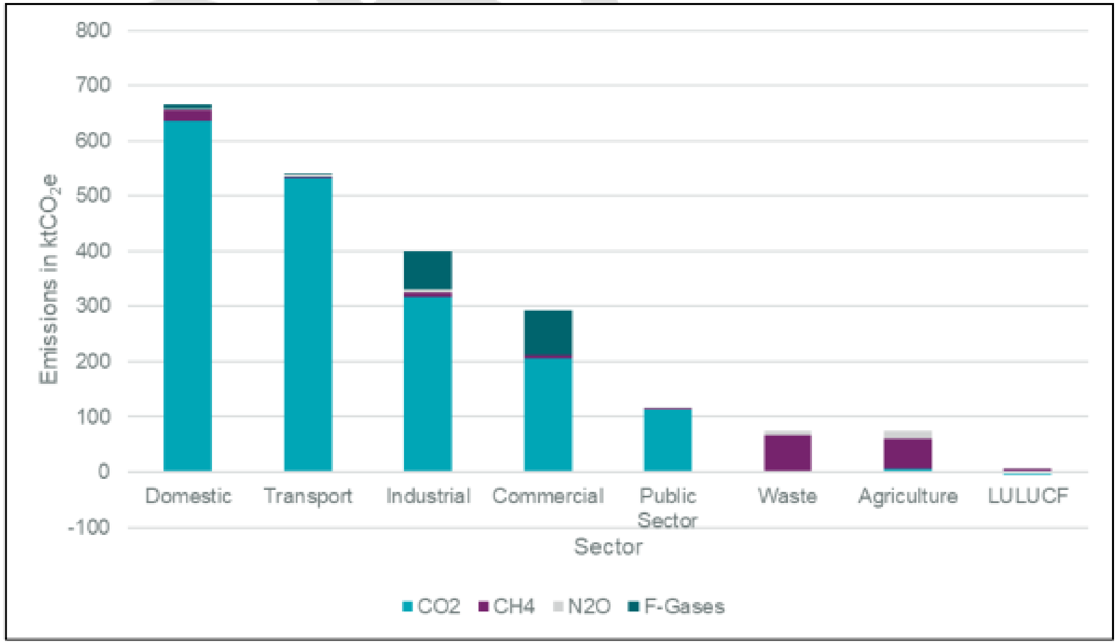

Draft Climate Action Plan for Consultation

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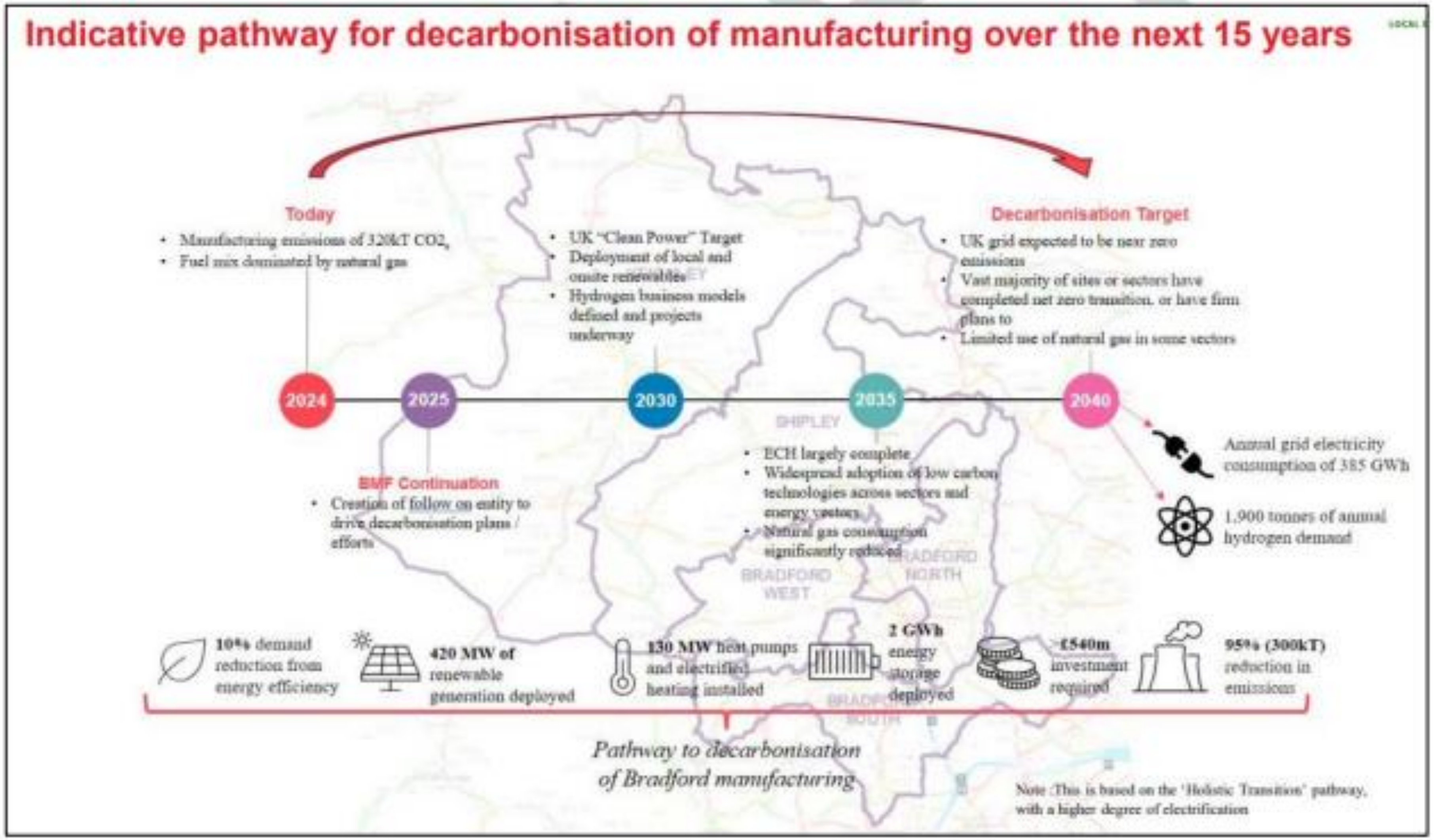

BRADFORD MANUFACTURING FUTURES

LOCAL INDUSTRIAL DECARBONISATION

Local Industrial Decarbonisation Programme

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Bradford Energy Network (BEN)

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Zero Emission Vehicle & Infrastructure Plan

Practical experience of deploying a hydrogen production project

Neil Travers – Head of Business Development – N-Gen Energy


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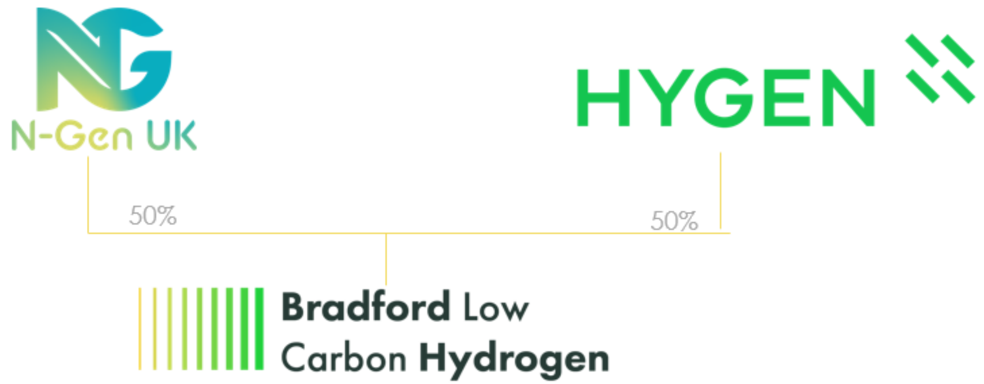
Bradford Low Carbon Hydrogen

Hydrogen project viability - technical

- Needs case
- Land
  - Availability
  - Long term availability
  - Environmental impacts
  - Risk assessments
- Power supply
  - Capacity constraints
  - Reinforcement and route to connection
- Water
  - Potable water
  - Waste water treatment plants
  - Natural springs
  - Wells
- Technology choices

Hydrogen project viability – economical

- Government support and subsidies through Hydrogen Production Business Models
  - Hydrogen Allocation Rounds
  - Low Carbon Hydrogen Agreement
  - Low Carbon Hydrogen Standards
  - Strike price
  - Price parity to counterfactual high carbon fuels



- Stakeholders
  - Investors
  - Community support
  - Local stakeholders
  - Bradford Council, including planning and consents
  - Third party utility providers
  - Off takers
- Power Purchase Agreement – up to 80% of running costs

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Bradford Low Carbon Hydrogen

Key challenges

- Time from project conception to operation
- Impact of delays– investor and offtaker confidence
- Establishing the market – supply and demand
- Long lead times for key equipment
- Emerging technologies

Thank-you

Liverpool City Region Green Hydrogen Vision Case Study

Equans UK & Ireland | HEA x APSE Hydrogen Event | 2025

FREDDIE MINTER
Hydrogen Solutions Manager
Freddie.minter@equans.com

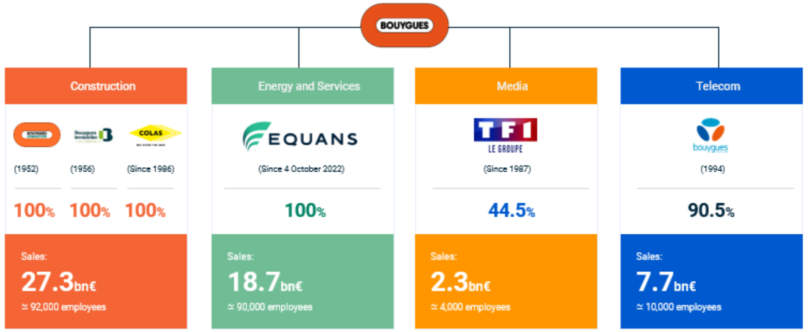
EQUANS

EQUANS – A WORLD LEADER IN ENERGY SERVICES

COMPANY PROFILE

Equans designs, installs and supplies tailor-made solutions to improve its customers' equipment, systems and technical processes and optimize their use as part of their energy, industrial and digital transitions.

A BOUYGUES GROUP COMPANY



OUR MISSION

EQUANS

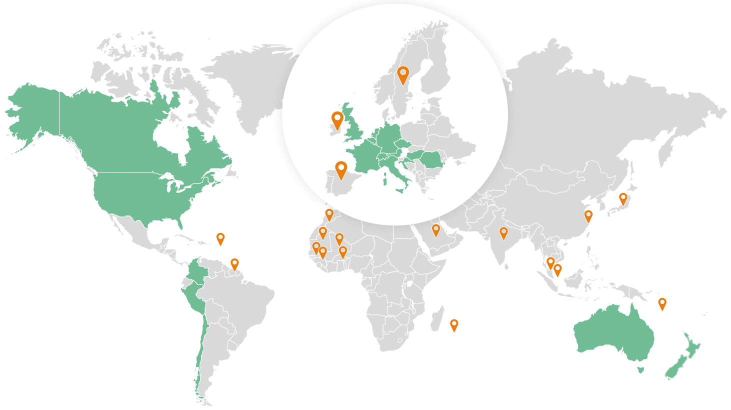
Accelerating our customers' transitions to a low carbon and resilient world

Energy transition
Reducing our customers' carbon footprint

Digital transition
Collecting, analysing, storing and protecting data to create value & solve city and citizenship challenges

Industrial transition
Optimising productivity and supporting the reindustrialisation of regions

EQUANS GROUP



≃ €18.76 bn
of revenues in 2023

≃ 90,000
employees

20 Countries
with global footprint

OUR SPECIALISED GLOBAL BRANDS

EQUANS DIGITAL

CARBON SHIFT – AN EQUANS COMPANY

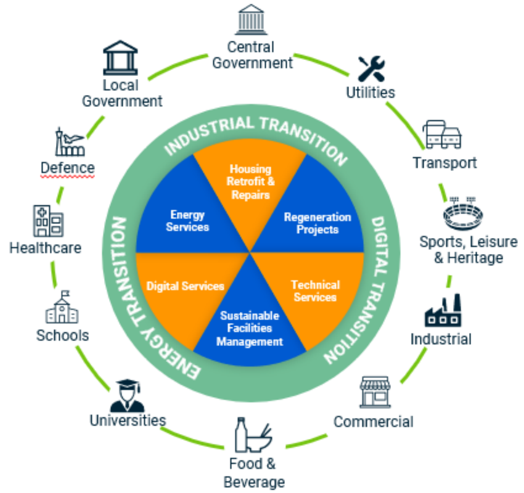
EQUANS SOLAR & STORAGE

UK OVERVIEW

PEOPLE
Over 15,000 employees

FINANCIAL
>£2bn turnover

INDUSTRIES
Strategic supplier to government, blue chip businesses and mission critical infrastructure



EQUANS HYDROGEN OVERVIEW

50+	>20	HAR1	5+ YEARS	EXPERTISE	PARTNERSHIPS
experts in **hydrogen processes**	**Hydrogen projects / studies** completed	**Pre-FEED** and **FEED study** completed	since **the first H2 projects**	**Feasibility, Front-End Design, EPC, O&M**	**For Innovation** **For Procurement**

Top projects

Design & engineering centres

Equans Group footprint

CA – 100 MW project in construction as main contractor

UK 1 operational project and pre-FEED and FEED for HAR1 project

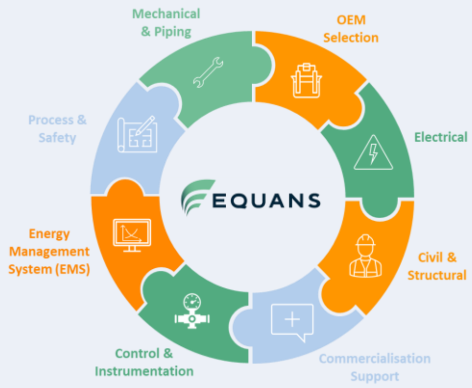
FR – MW scale projects in operation and large-scale hydrogen and e-fuels (>200MW) projects in design

GER – MW scale projects in operation including 5MW high pressure project commissioned in 2024

NL & BELUX – Actively involved in innovation projects

Our expertise:

- In-house engineering
- Industrial & process capabilities
- Excellent safety performance
- Global scale with local precision
- Broad network of suppliers
- Integrated service provision



HYDROGEN'S ROLE IN LIVERPOOL

LCR aims for net zero by 2040

H2 = >20% of final energy demand

LCRCA has invested to kickstart the local H_2 economy

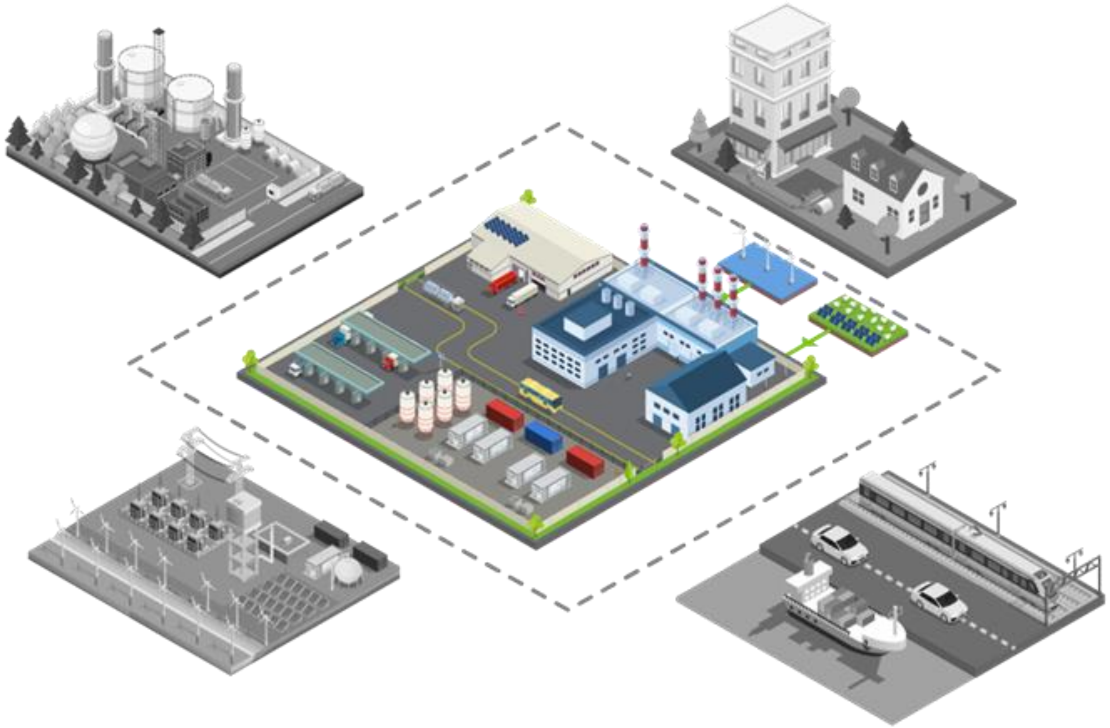
A region with strong hydrogen heritage

Heavy industry & transport and dispatchable power generation

EQUANS
EMPOWERING TRANSITIONS

LIVERPOOL CITY REGION COMBINED AUTHORITY

PURPOSE OF THE STUDY



The Vision focused on three areas:

a)industrial operations
b) freight & logistics
c) municipal fleets

To determine the size and scale of this future economy

Establish the opportunity for decentralised hydrogen hubs by 2030

Decarbonise hard to abate sectors & deliver energy security

Attract investment and safeguarding jobs for long term industrial prosperity

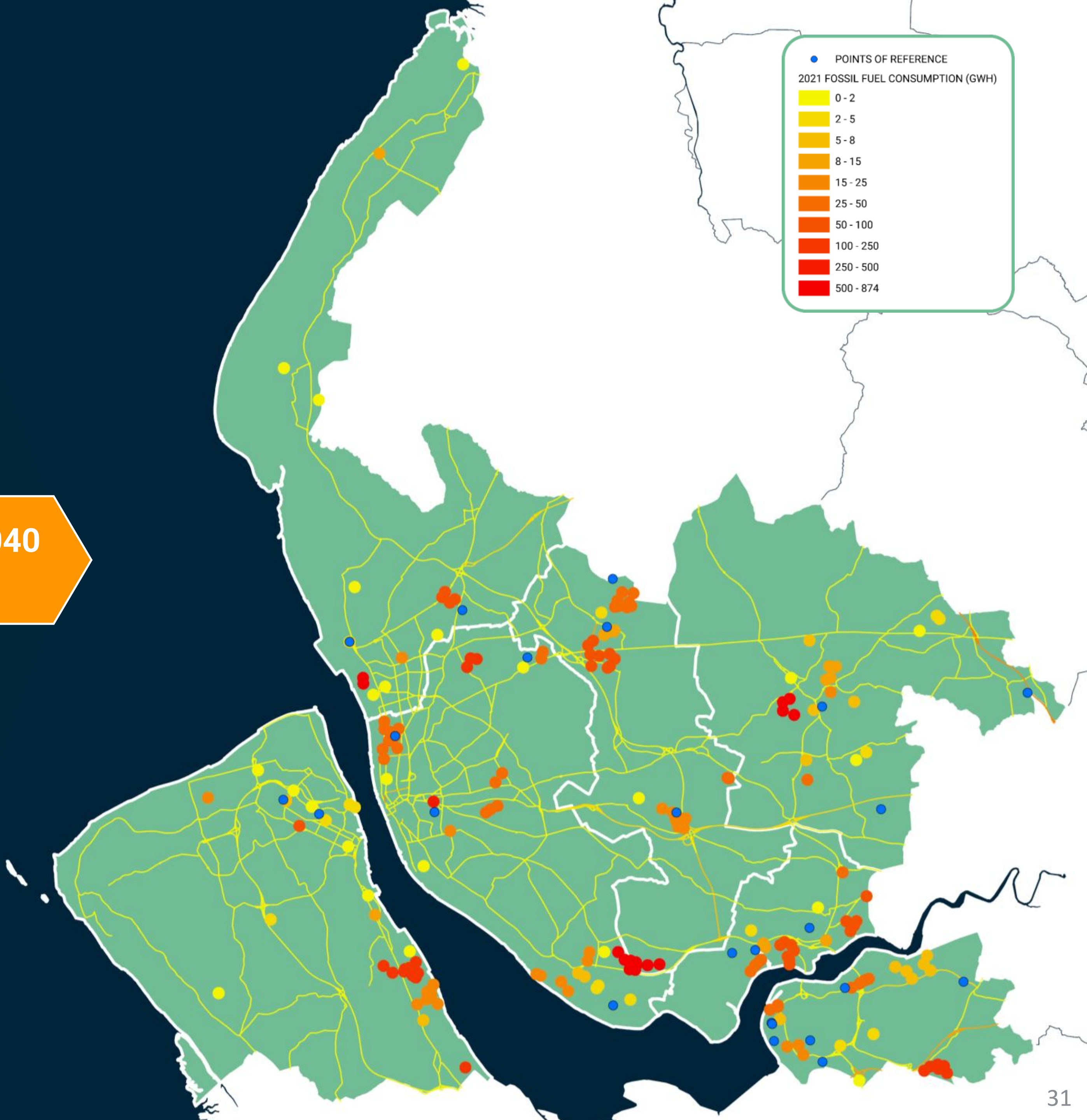
Supported through community engagement and educational briefings

EQUANS EMPOWERING TRANSITIONS

LIVERPOOL CITY REGION COMBINED AUTHORITY

ANALYTICAL METHODOLGY

- **Identify consumers to calculate baseline**
- **Consult with local stakeholders on anticipated route to net zero**
- **Model decarbonised pathways to forecast 2030 and 2040 hydrogen demand**
- **Aggregate adjacent demand into hydrogen hubs with shared infrastructure**
- **Verify viability of projects and prioritise key developments**



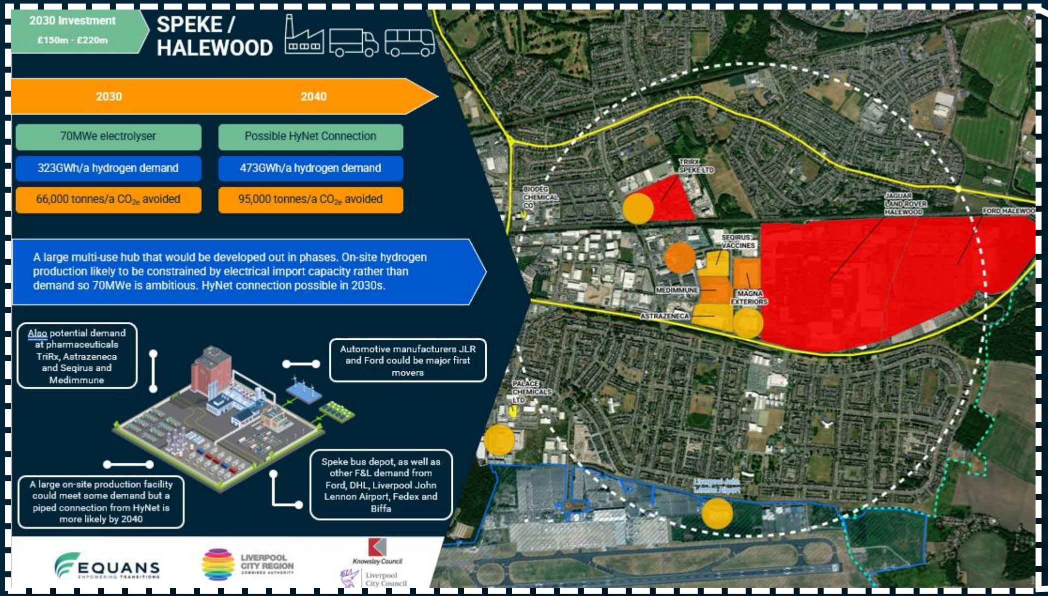
EQUANS EMPOWERING TRANSITIONS

LIVERPOOL CITY REGION COMBINED AUTHORITY

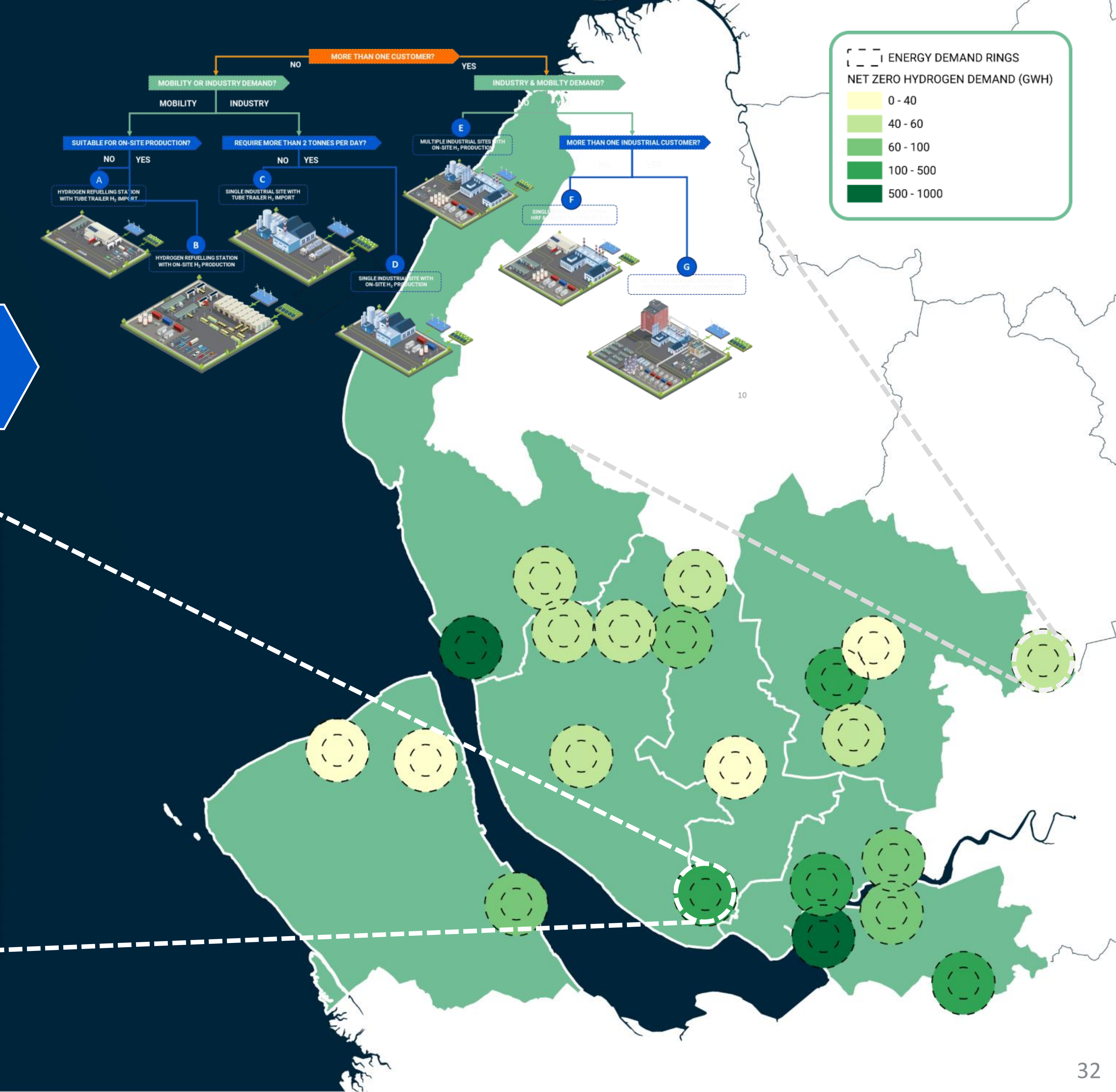
PRIORITY PROJECTS

21 potential hydrogen hubs

Infrastructure and investment requirements



Example Hub 1: production facility with multiple industrial and mobility users

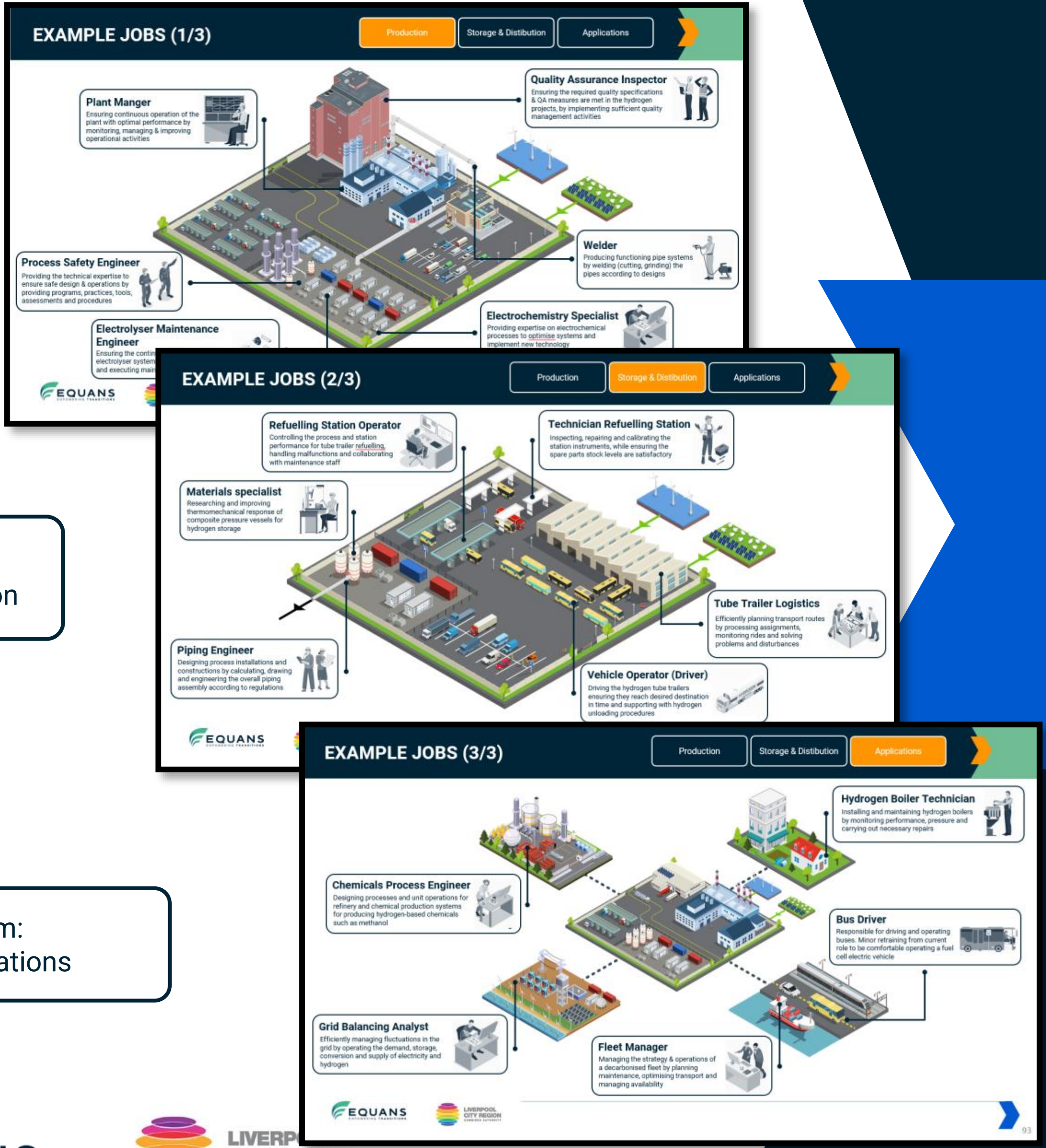


SKILLS & JOBS

1 Upstream: Production

2 Midstream: Storage & Distibution

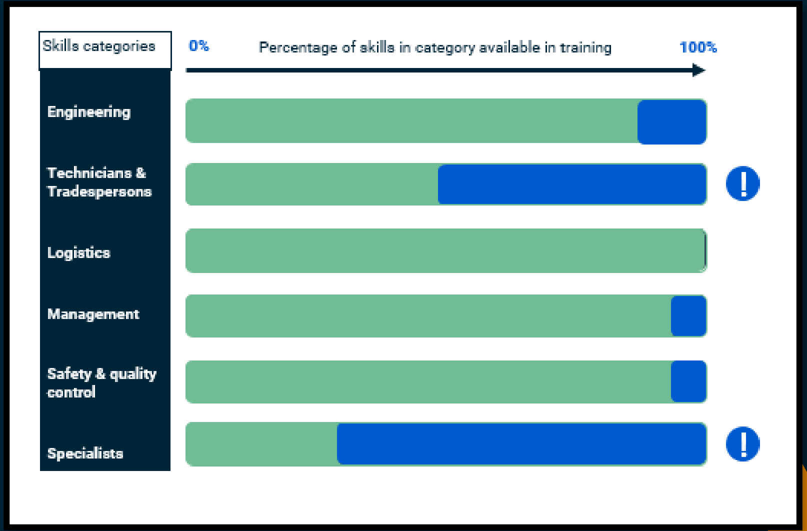
3 Downstream: End-use Applications



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 identified



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

EQUANS EMPOWERING TRANSITIONS
LIVERPOOL CITY REGION COMBINED AUTHORITY

COMMUNITY ENGAGEMENT & EDUCATIONAL BRIEFINGS

- Awareness-raising and upskilling are key
- Briefing sessions and accompanying educational literature shared with LCRCA and LA staff
- Knowledge dissemination for teams responsible for strategy, finance and planning
- Engagement with local NGO representatives from the LCR Climate Partnership
- Consultations identified actions to galvanise the public


HYDROGEN IN SOCIETY

What makes green hydrogen green?

Hydrogen will be a large minority of our energy system future

HYDROGEN ECONOMY: INFRASTRUCTURE & STORAGE

A functioning hydrogen economy will require infrastructure to align supply and demand

Policy

Liquid storage

Compressed gas storage

Underground storage

Hydrogen carriers: solids

Hydrogen carriers: Ammonia & methanol

GREEN HYDROGEN PRODUCTION: KEY CONSIDERATIONS

Electrolytic hydrogen production requires modest space, but significant power and water supply and precise balance of plant

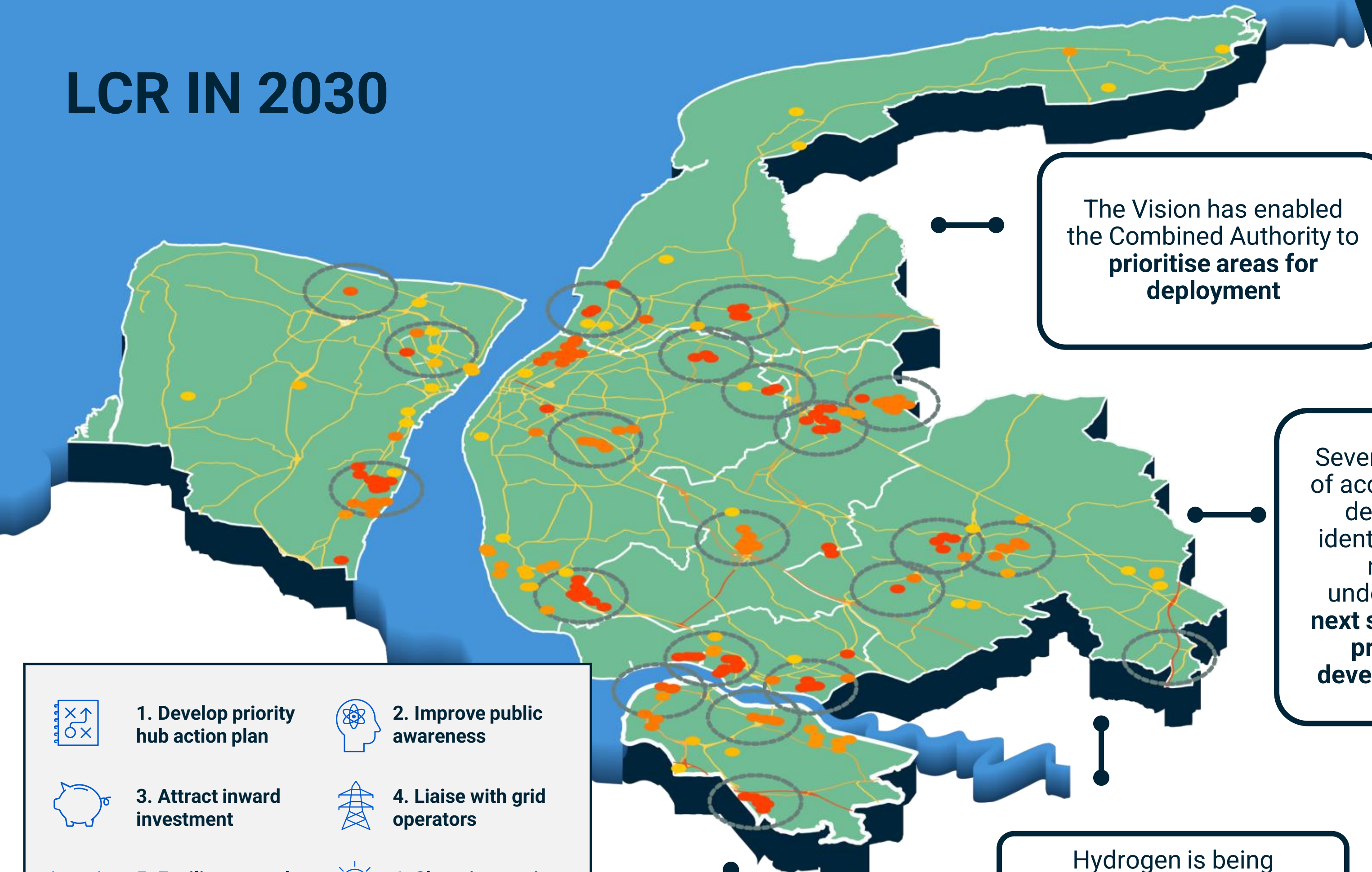
Treating hydrogen as a silver bullet

Health & safety challenges

Environmental impact of new pipelines

Water consumption and future scarcity

LCR IN 2030



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 development**

Hydrogen is being **integrated into future LAEPs** for the region

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

1. Develop priority hub action plan
2. Improve public awareness
3. Attract inward investment
4. Liaise with grid operators
5. Facilitate supply chain partnerships
6. Share innovation learnings
7. Codevelop training with industry
8. Engage potential offtakers
9. Provide coordinated voice to government
10. Align other industry groups

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

EQUANS EMPOWERING TRANSITIONS · LIVERPOOL CITY REGION COMBINED AUTHORITY · ST HELENS · WIRRAL · HALTON · Liverpool City Council · Knowsley Council · Sefton Council

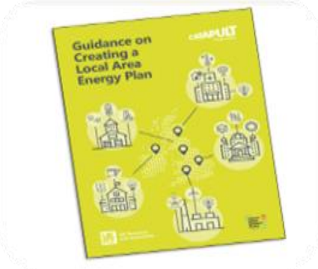
LOCAL AUTHORITY ACTION AREAS

ASSET OWNERSHIP

Direct reduction in Authorities Scope 1 emissions e.g., converting heavy-duty vehicles to hydrogen

PROCUREMENT

Authorities place large contracts for external services in buses, waste collection, street sweepers, fire engines. Locally integrated transport networks are area of growth



WHOLE-SYSTEMS

Collaborate with Net Zero Hubs to deliver Local Area Energy Plans to identify cross vector challenges and engage with NESO for wider national planning

HyNet North West

PARTNERSHIPS

Coordinated developments across business, academic and the public sectors

STAKEHOLDER ENGAGEMENT

Using formal consultation processes to engage and communicate with communities

DEVOLUTION REVOLUTION

Increased autonomy of funding through devolution will open up opportunities to fund for hydrogen innovation or capital deployment

LINKS TO GOV

Engaging with DESNZ to support hydrogen projects: policy shaping, letters of support and bidirectional messaging between national and local

PLANNING

Upskilling Local Planning Authorities to understand principles of hydrogen projects and wider landscape

Microsoft Teams

Record H2 PPT for Bradford H2 Event -

2025-01-21 13:02 UTC

Recorded by

Prasad, Kunal - Oxfordshire County Council

Organized by

Prasad, Kunal - Oxfordshire County Council