

GREEN STEVES

This is the One About Hydrogen

Thursday 15 June 2023



Agenda

- Introduction
- Steve C
- Steve G
- Adrian
- Q&A
- Conclusion



The Role of Hydrogen in Decarbonisation Plans

Steve Cirell

Independent Consultant specialising in local
authority renewable energy projects



The Role of Hydrogen in Decarbonisation Plans

Stephen Cirell



Stephen Cirell Consultancy Ltd

Introduction & Background

- Welcome to the latest webinar from the Green Steves
- This time its hydrogen....
- As we go through the key areas of climate change and energy for local authorities



Coverage

- What is hydrogen?
- What types are there?
- What role can it play in decarbonization?
- Examples from local government



Types of Hydrogen

- Blue hydrogen
- Green hydrogen
- Pink hydrogen
- Others



The Fossil Fuel Companies

- They intend to play a part in this ...
- But need carbon capture and storage
- The arguments for and against



Hydrogen in the UK's Decarbonisation Plans

- Government policy is developing
- There is now a Hydrogen Strategy
- The target is 10 GW of hydrogen production in the UK
- Both blue and green hydrogen is supported



Development of a Hydrogen Sector

- A whole new sector needs to be developed
- Compare with offshore wind
- Government pots of money



The Relevance of Hydrogen to LAs

- Regulatory roles
- Local authority assets
- transport
- Economic development
- Local authority investment



Examples from Local Government

- There are not many!
- Aberdeen City Council is the leader
- Merseytravel



Conclusions

- Keep a watching brief on this
- Don't discount hydrogen though ...
- ... it will have a role to play



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Legal Issues

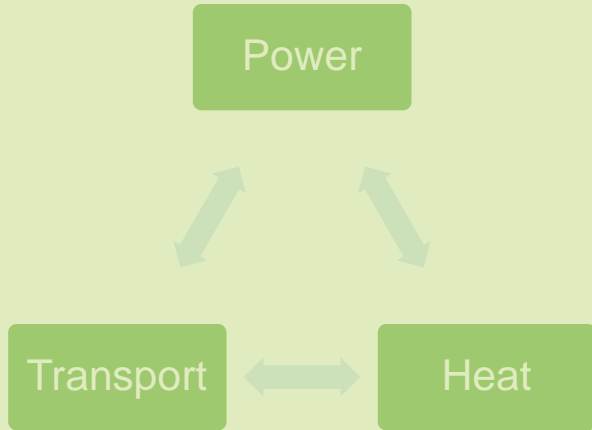
Steve Gummer

Partner of Sharpe Pritchard LLP

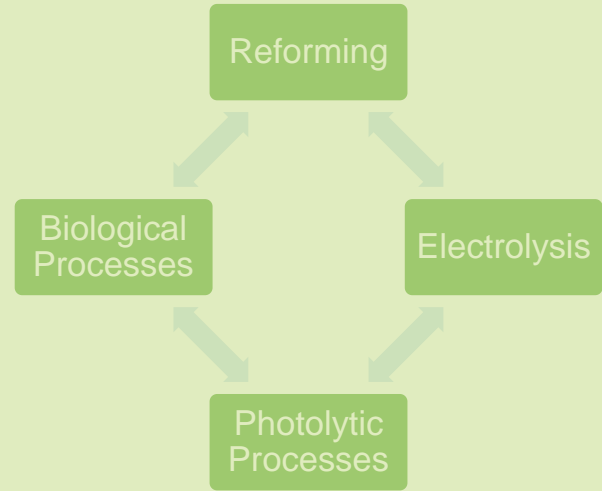
Some of the Real Basics and Some Time Wasting

- Hydrogen isn't just renewable. It's the most abundant resource in the Universe. It's not even new in the 50's it made up 50% of the gas network.
- Key attribute is that hydrogen is **CLEAN AT THE POINT OF USE**.
- Issues arise in producing/separating it. This is where the colours come from. There are all sorts:
 - **GREEN**
 - **BLUE**
 - **TURQUOISE**
 - **BROWN**
 - **BLACK**
 - **PURPLE/RED**
- Lots in the Energy Space dismiss it or think its dangerous. Most don't understand even the basics.
- People think it is green.

What can I use it for?



How do we make it?



Ok. What's Next?

- It's a part of the UK's Net Zero Agenda and has been recognised by DESNZ and the Climate Change Committee. There is also a **Hydrogen Taskforce**.
- There are four key aspects to policy development:
- **Net Zero Hydrogen Fund**
- **New Business Model for Hydrogen** – This is based on the CfD. It is to be finalised in 2023.
- **Changes to gas distribution network** – Trials by network owners.
- **Hydrogen Transport and Storage**

More generally as fuel the interaction with Renewable Transport Fuel Obligations Certificates need to be considered.

There are a series of hydrogen standards to support this.

More on Hydrogen Production Business Model

- BEIS originally consulted on the Hydrogen Business Model in August 2021.
- A Government response was published in April 2022 with indicative Heads of Terms, in December 2022 these were then updated.
- It is modelled on the standard CfD for low carbon electricity.
- The update expands and introduces several principles.
- These will be private law contracts between the hydrogen producer and government appointed counterparty.
- Producers are under additional obligations in the first two fiscal years.

01

02

03

04

DEC 2022

Q1 2023

Q2 2023

Q3 2023

Heads of Terms
Updated

Engagement with
Heads of Terms

Engagement with
Draft LCHA

Publication of final
LCHA



Payments Under HPBM

- Payments will be made monthly within prices Indexed at CPI.
- Model will support selected producers of low-carbon hydrogen by paying them a premium, calculated as a difference between a Strike Price and a Reference Price.
- Qualifying vs Non-Qualifying Volumes.

Price Discovery Incentive

A reward mechanism will be set at:

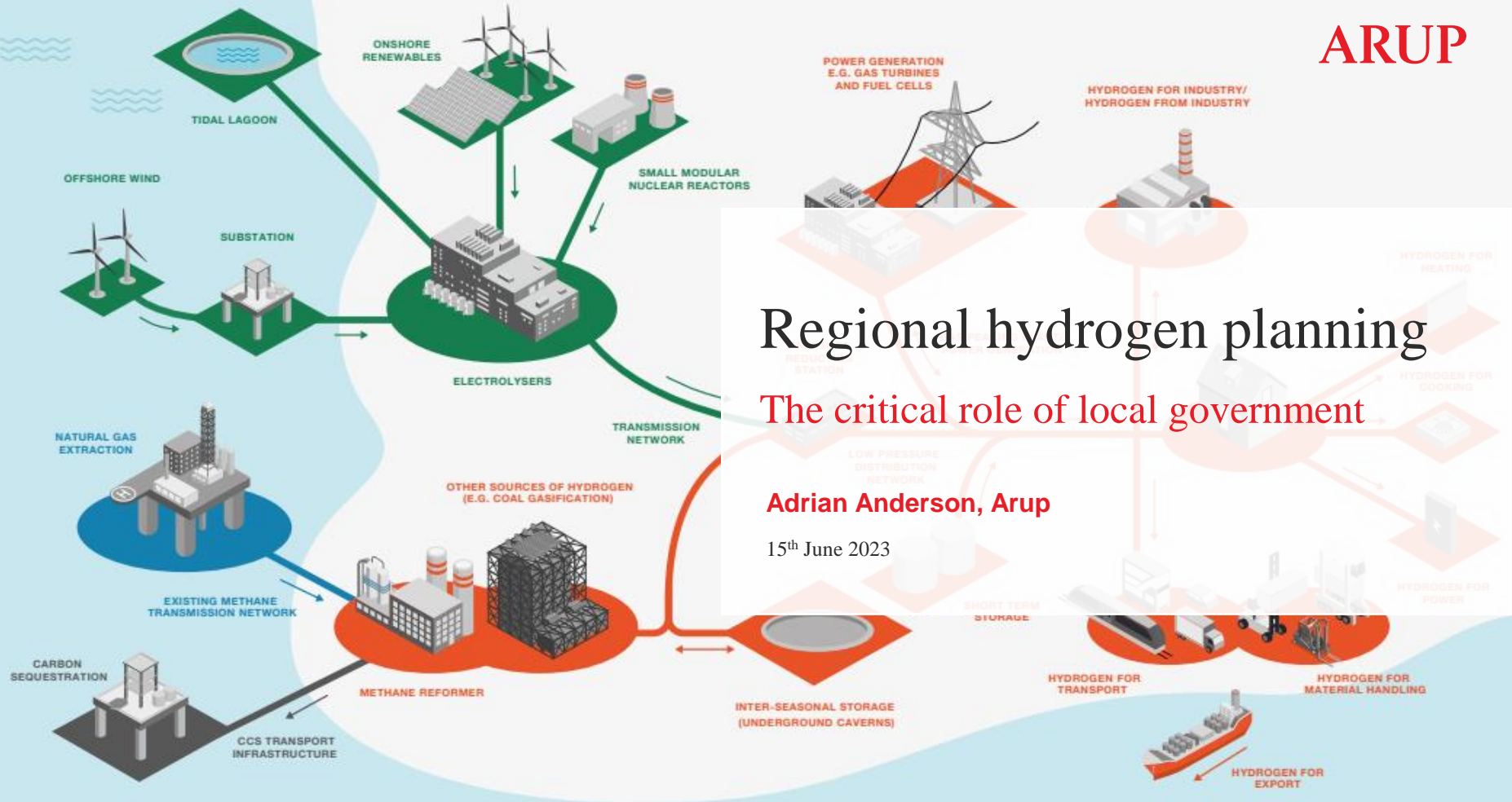
- 10% of the difference between the reference period and floor price; or
- 10% of the difference between the strike price and floor price.



Regional Hydrogen Planning

Adrian Anderson

Arup



Regional hydrogen planning

The critical role of local government

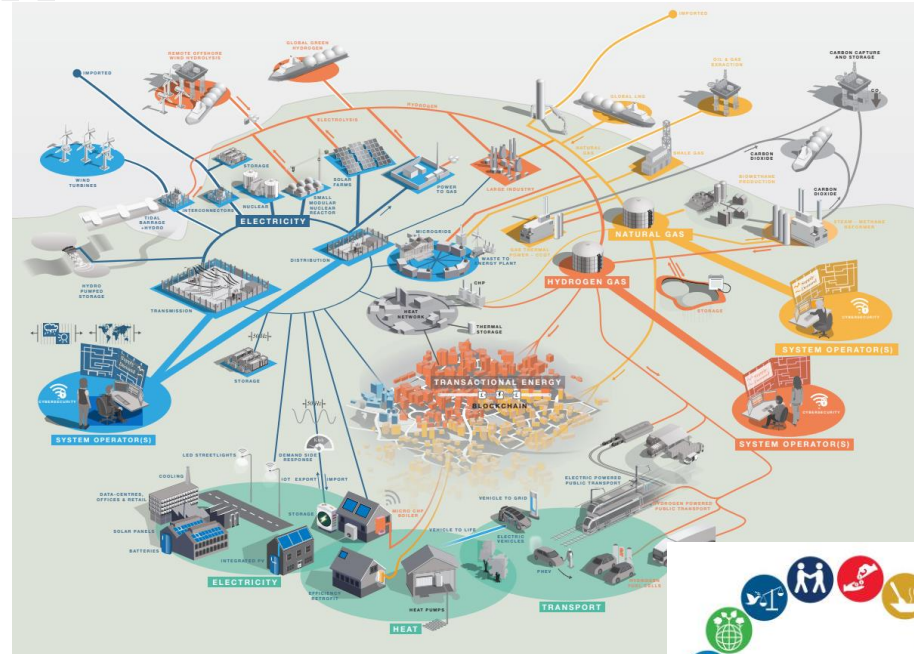
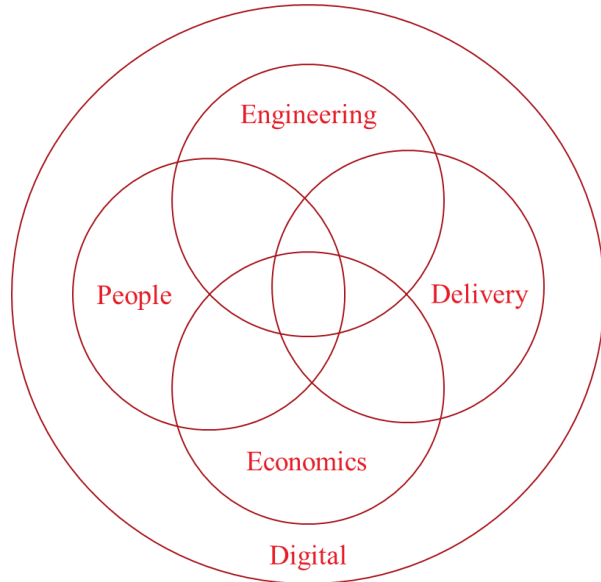
Adrian Anderson, Arup

15th June 2023

Holistic, systems thinking approach

Arup's approach to energy system decarbonisation

We are independent trusted advisors that seek solutions to support and accelerate decarbonisation of the energy system and enable those who are affected by it to thrive.

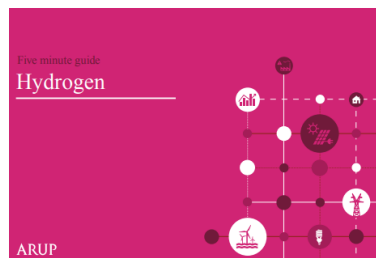
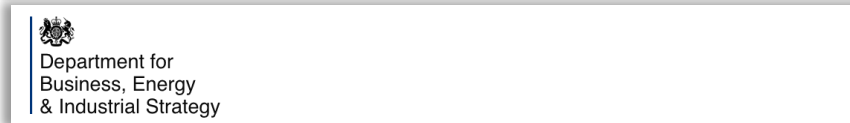
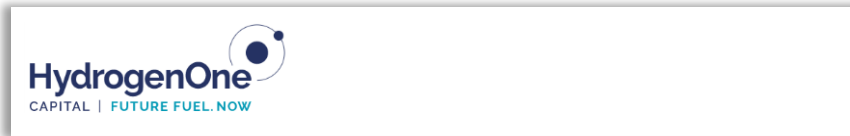
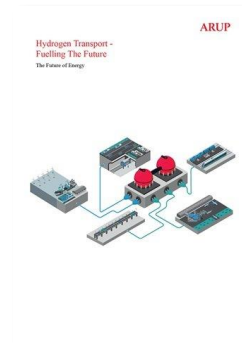
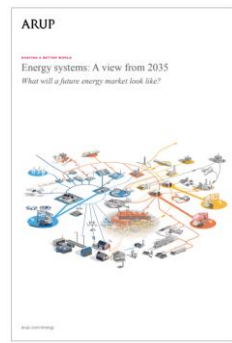


Thought Leadership

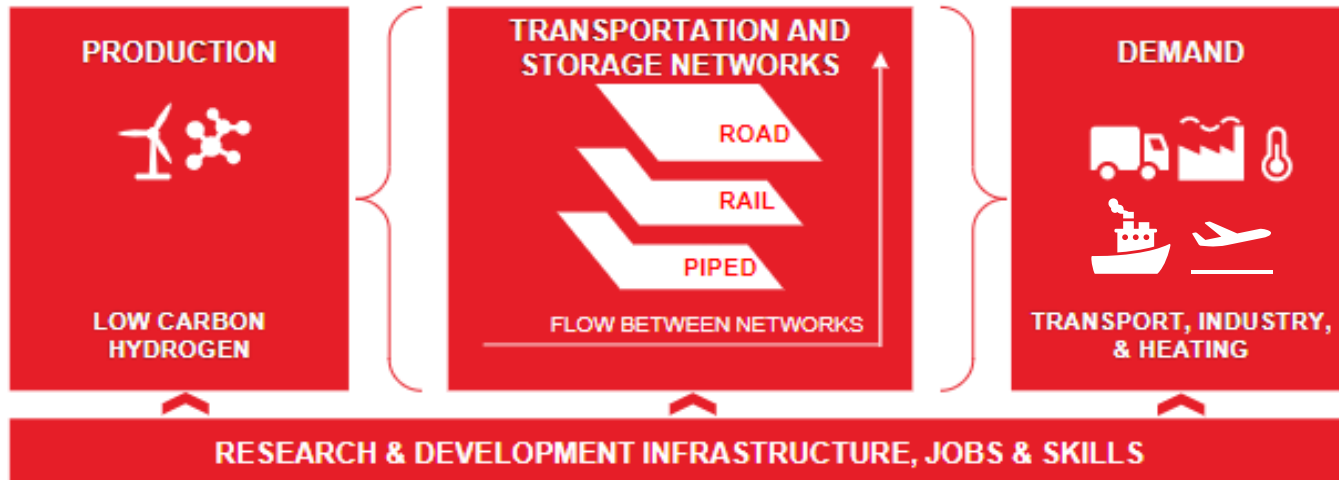
Enabling change, creating value, building trust

Arup is a thought leader in exploring and articulating hydrogen's role in the energy system as it transitions to zero carbon emissions. We have applied this expertise to a wide range of assignments to create value for our clients.

Click to download publications

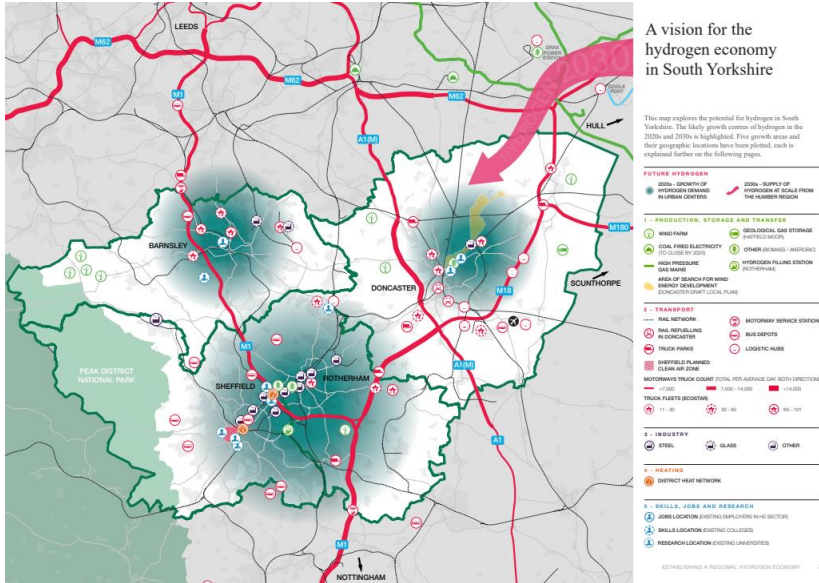


Components of the Hydrogen Ecosystem



Establishing a Regional Hydrogen Economy

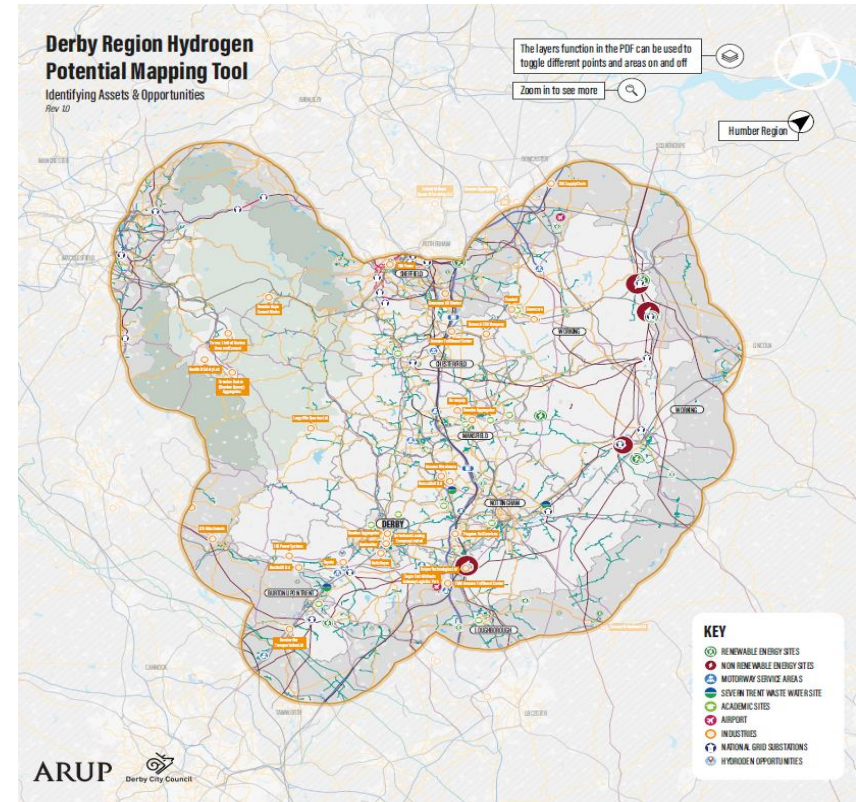
South Yorkshire



- We created a compelling vision describing the way in which South Yorkshire can decarbonise, while leveraging legacy assets and ascendant local skills to deliver strong regional and national benefits
- The study created a hydrogen vision based on the region's thriving industrial legacy endows South Yorkshire with the crucial skills and infrastructure needed to become a leader in hydrogen, driving socioeconomic and environmental gains.
- This final report, published [here](#), conducted thorough stakeholder engagement across Barnsley, Doncaster, Rotherham and Sheffield, and was created in partnership with Sheffield City Region Mayoral Combined Authorities.

Establishing the D2N2 H₂ Roadmap

- A project commissioned by Derby City Council, partnering with regional authorities and key stakeholders, used a thematic engagement process to draw together a compelling vision describing the way in which Hydrogen can decarbonise the D2N2 East Midlands region, by leveraging legacy assets, manufacturing heritage and ascendant local skills.
- A major theme of the region is the use of former power station sites and one of the UK's last coal fired power sites to generate clean growth through the use of hydrogen.
- Launched Sept 2020 and can be found [here](#).

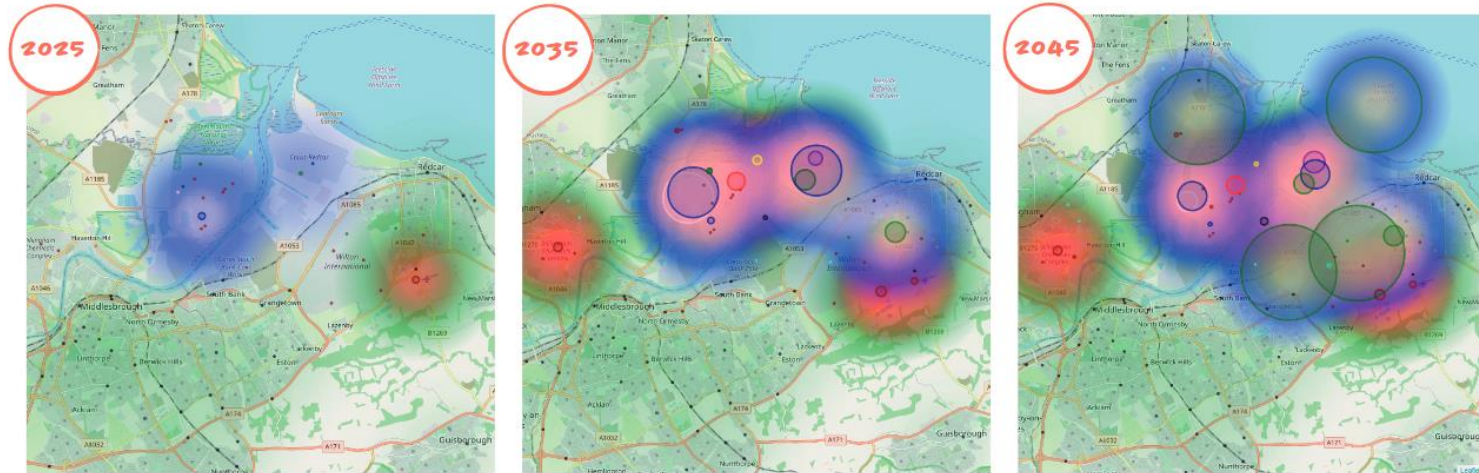


Tees Valley Hydrogen Vision



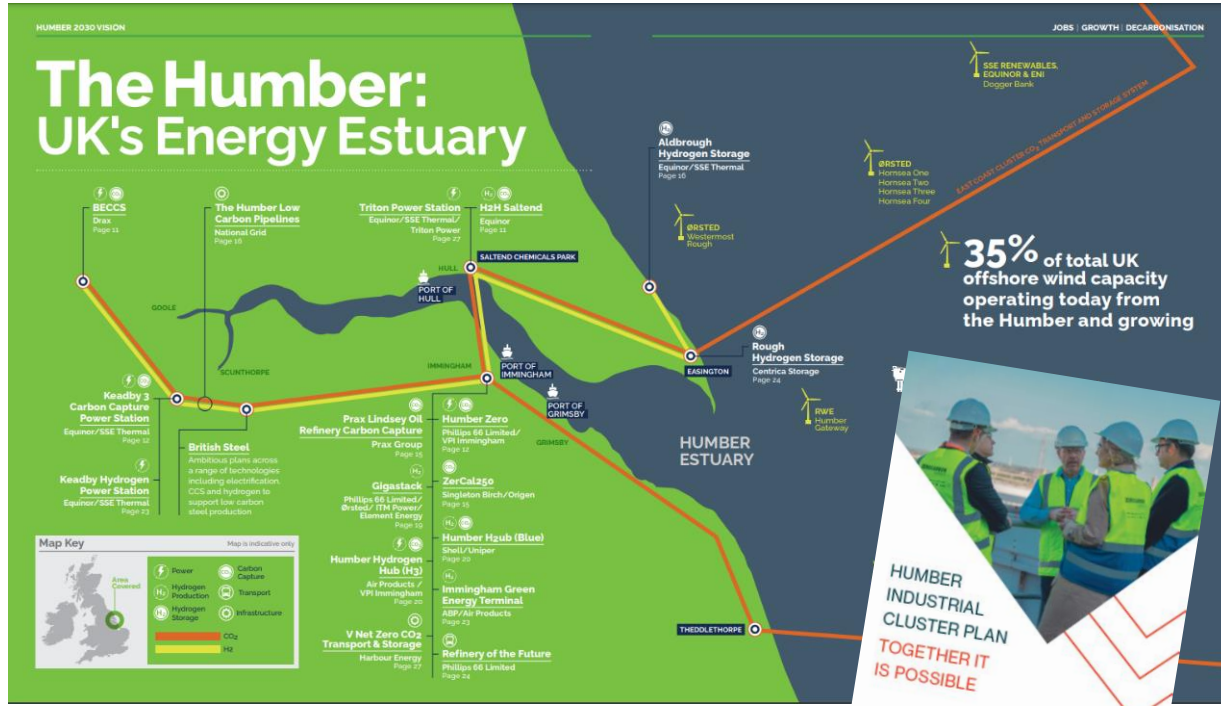
Figure 3

The Tees Valley Hydrogen Vision is built on the analysis of scenarios and modelling of the ramp up between today and 2050 of both hydrogen supply (shown in blue- white) and hydrogen demand (shown in green- red).



Arup led study funded by BP, Kellas, NGN and TVCA with the aim to provide an ambitious vision for hydrogen in Teesside. The combined commitments of hydrogen producers on Teesside means it will produce 25% of the UK's 10GW 2030 target becoming a 'Superplace' for hydrogen in the UK. Launched in Nov 2022 [here](#).

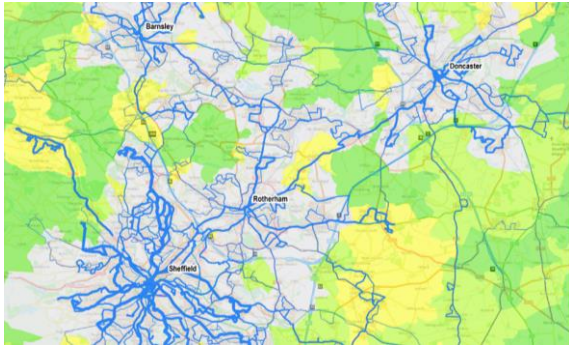
Humber Industrial Cluster Plan (HICP)



- Arup was commissioned to deliver a blueprint for deep decarbonisation by 2030 and net zero by 2040 and sustainable-equitable-resilient growth in the UK's largest emitting industrial cluster.
- Arup's work was to deliver the final plan, it included inputs from other consultancies including in depth modelling.
- The HICP was published in March 2023 [here](#).
- Our thought piece on the HICP is [here](#).

Zero emission buses

Route selection and implementation



Future Roadmap to Zero-emission Buses - South Yorkshire

Utilising our innovative Zero Emission Bus Operating Model, the model outputs the optimal zero-emission technology, investigating battery electric and hydrogen. Two operating models for hydrogen buses were considered. a) Onsite production : Electrolyser at the depot b) Offsite production: Road tanker to depot where storage and dispensing occurs only.



Hydrogen Bus Implementation - Liverpool City Region

Given the potential for Hydrogen production across the city region, Liverpool City Region see the bus network as a key tool in demonstrating the commercial viability of hydrogen and act as a catalyst to develop a future network of hydrogen refuelling stations for use by both public / private vehicles.

We shape a better world

Adrian.Anderson@arup.com

Any Questions?



Conclusion