



Report to:	Climate, Energy and Environment Committee
Date:	26 November 2024
Subject:	Hydrogen Use Case
Director:	Liz Hunter, Director for Policing, Environment & Place
Author:	Oluwafemi Omoniyi, Net Zero Hub Project Manager

Is this a key decision?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Is the decision eligible for call-in by Scrutiny?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Does the report contain confidential or exempt information or appendices?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
If the report does contain exempt information, what is the reason for exemption: <i>(indicate in the adjacent box the relevant paragraph of Schedule 12A, Local Government Act 1972, Part 1 – see Access to Information Rules)</i>	

1. Purpose of this Report

- 1.1 To provide the committee with an update on the hydrogen roadmap study being carried out for the West Yorkshire region, the study forms part of our evidence base and is being used to inform the emerging West Yorkshire Climate and Environment Plan and Local Transport Plan.
- 1.2 To seek steer and input from the committee on the key identified principles realised from the findings of the hydrogen study.

2. Recommendations

- 2.1 To seek a steer from the committee on the identified principles for the development of a policy position on hydrogen for West Yorkshire.

3. Information

Overview

- 3.1 Hydrogen is one of several low/zero carbon energy vectors that could be used to drive down emissions in hard to decarbonise vital sectors such as transport, industry, heat and power. It is generally expected to play a significant role in all of the pathways to net zero for the UK (such as assessed by the Climate Change Committee¹).

¹ The Sixth Carbon Budget – The UK's path to Net Zero, CCC, December 2020, [Link](#)

- 3.2 Whilst there is a drive to ramp up a hydrogen economy from the UK's National government, local and regional government also have a crucial role in ensuring the uptake and development of hydrogen technologies with the view of achieving regional net zero targets.
- 3.3 The West Yorkshire Carbon Emissions Reduction Pathways (CERPs) study details the interventions required for West Yorkshire to meet its emission reduction targets. The initial study² (July 2022) indicates a role for hydrogen in all three main pathways (balanced, maximum ambition and High Hydrogen) to becoming a net zero carbon economy in West Yorkshire. The CERPs is currently being refreshed to one pathway; the findings from the refresh will act as the evidence base for the interventions required for West Yorkshire to achieve net zero. Nevertheless, there is a little understanding and clarity on the value proposition and exact use case for the deployment of hydrogen technologies within West Yorkshire in several sectors.
- 3.4 The Combined Authority commissioned a deep dive on the hydrogen deployment and use case in West Yorkshire to help understand, using informed and evidenced data, where hydrogen fits into decarbonisation across several key sectors such as transport, domestic heating and industry. This study alongside the refreshed Carbon Emission Reduction Pathway study will also shape the key principles for the development of a policy position and action plan on hydrogen deployment within West Yorkshire. It will also directly influence the activity on hydrogen highlighted in the refreshed west Yorkshire Climate and environment plan available in 2025.

Progress to Date

- 3.5 Arup were commissioned to provide an impartial and evidence-based view of hydrogen's role in decarbonisation in West Yorkshire, considering alternative technologies and using independent data where possible. They have considered the following sectors where hydrogen could play a role in helping the region reach its net zero target;
- Domestic space heating and domestic hot water (DHW), including supply from district heat networks
 - Non-domestic (commercial buildings and small industry) space heating and DHW
 - Industrial processes (for process heat or as a feedstock)
 - Electricity generation
 - Transport

² [West Yorkshire Carbon Emissions Reduction Pathways](#)

- 3.6 Only low carbon hydrogen was considered for use within West Yorkshire; this can come from a number of production routes as defined by the UK Low Carbon Hydrogen Standard³. This is in line with the UK hydrogen strategy⁴ which advocates for the use of low carbon hydrogen for meeting the UK's legally binding commitment to achieve net zero.
- 3.7 Stakeholder engagement, modelling of available data, alongside a comprehensive literature review, provided the evidence and basis for the assumptions used in the ascertaining and establishing a balanced view of hydrogen's role, working alongside other pathways, in decarbonising different sectors.
- 3.8 Initial results from the study indicate that industry, aviation and transport (bus and HGV) form the majority of expected future hydrogen demand in West Yorkshire. Review of literature at present also indicate a limited or unlikely role for hydrogen in domestic heating.
- 3.9 The low carbon hydrogen production facility planned in Bradford is currently the only planned hydrogen production scheme in West Yorkshire, and will be one of the largest plants in the UK. It has received 20% capital funding through the Government's £2bn Hydrogen Production Business Model allocation and will also receive a £500 million subsidy over 15 years. When completed, the hydrogen produced could be used to deliver hydrogen for transport and industrial users of natural gas across the region. It will also create jobs as well as training opportunities, and will foster ancillary investment and entrepreneurial ventures in the clean energy sector.
- 3.10 The remaining potential demand of hydrogen across the sectors in scope could be met by the construction of green hydrogen production facilities in West Yorkshire as well as getting further supply from large scale production in the Humber and Teesside industrial clusters through the East Coast Hydrogen Project. The deployment of hydrogen within West Yorkshire across the sectors in scope will require a skilled workforce, bringing opportunities for research and innovation that can take place in the region. The potential construction of green hydrogen production within West Yorkshire will increase commercial investment, and reduce dependency on supply from outside the region.
- 3.11 Actions and identified activities from the hydrogen use case study will feed into the emerging West Yorkshire Climate and Environment Plan and will inform the emerging Local Transport Plan.
- 3.12 The following key principles have been identified in the Hydrogen Roadmap Study and will be further considered in the development of a policy position on hydrogen across several sectors.

³ UK Low Carbon Hydrogen Standard, December 2023, [Link](#)

⁴ UK Hydrogen Strategy-[UK Hydrogen Strategy](#)

Key Principles on Hydrogen Deployment in West Yorkshire

Low Carbon hydrogen Utilisation

- 3.13 Only low carbon hydrogen as defined by the UK Low Carbon Hydrogen Standard should be deployed within the West Yorkshire region for reduction of emissions across the sectors identified. This should include all localised hydrogen production within West Yorkshire as well as hydrogen supplied to West Yorkshire from other regions.

Strategic Infrastructure Planning

- 3.14 There is a need to engage with spatial planning and through the proposed regional infrastructure strategy to establish best locations for future industrial sites and infrastructure development considering clustering. This could include supporting feasibility studies to evaluate the suitability of locations for hydrogen clusters / zones utilising evidence from the use case and LAEPs to prioritise areas.

Transport

- 3.15 Identify any public transport routes where hydrogen could potentially support our ambitions to decarbonise the public transport fleet alongside other low and zero emission options.
- 3.16 Engage with local Heavy Goods Vehicle fleets to understand their plans and to ensure that refuelling infrastructure is in place to support them. Opportunities to support joint procurement to address vehicle supply chain can be explored.
- 3.17 Engage with the airport on its plans to reduce emissions from aviation; this might include Support for Sustainable Aviation Fuel production facilities in West Yorkshire.

Industry and Businesses

- 3.18 Engage with businesses and encourage them to commit to a decarbonisation plan that involves the uptake of hydrogen where it is evidenced to be more process or cost efficient than other alternative technologies. Promote collaboration between industry and other stakeholders to drive forward potential local production clusters where business and industry have made a firm commitment to a hydrogen business plan. This should also include supporting the development of local industrial cluster decarbonisation to provide detailed insights and drive hydrogen uptake alongside other alternative technologies.

- 3.19 Supporting the development of hydrogen zoning plans to identify areas where hydrogen can be effectively integrated with end user requirements as well as education and identification of clear decarbonisation pathways for sites not close to planned hydrogen routes, with a focus on alternative technologies and electrification where hydrogen is not feasible.
- 3.20 Support large scale fuel switching projects by aiding their application for national funds, speeding up permitting applications and providing support for infrastructure upgrades.
- 3.21 Further evidence gathering and facilitation of technical support for SMEs.
Leadership, Skills, Collaboration and Funding
- 3.22 Engage with central government to inform and direct national policies on hydrogen deployment.
- 3.23 Engage with key projects such as the East Coast hydrogen project and project union which may play a role in the distribution of additional hydrogen into West Yorkshire.
- 3.24 Working with National Government, Combined Authority stakeholders and end users, leverage government funding and private sector investment to support hydrogen projects where relevant, support feasibility studies and scaled pilots to explore hydrogen applications where relevant.
- 3.25 Invest in skills development and innovation to build a workforce capable of supporting hydrogen technologies. Monitor the progress of hydrogen projects and adapt policies as needed to address emerging challenges and opportunities.

4. Risks and Mitigations

- 4.1 There are no risks directly arising from this report at the time of writing however there are wider risks relating to the findings of the study, these include a risk of losing jobs to other regions without a clear policy to give confidence to investors and users. There is also a risk that some of the outcomes and findings from the study might not align with already proposed plans from some regional stakeholders. Key stakeholders include but are not restricted to businesses and industries, organisations who have a vested interest in hydrogen deployment, residents and local partners. To address this, we will engage in further discussions with relevant stakeholders to identify and mitigate any contentious issues.
- 4.2 There might be a strong dependency on hydrogen produced in other regions if additional green hydrogen production facilities are not constructed within West Yorkshire. Following the publication of the hydrogen study, we will consider further engagement with key projects outside of west Yorkshire that might be key for hydrogen deployment within West Yorkshire.

- 4.3 There is a risk of a lack of awareness and acceptance of hydrogen in communities that are likely to be affected by any planned developments on future hydrogen deployment. The combined authority alongside its partners will engage with wider community stakeholders on the role of hydrogen alongside other alternative technologies as appropriate.

5. Tackling the Climate Emergency Implications

- 5.1 The deployment of hydrogen within West Yorkshire could help reduce emissions in hard to decarbonise sectors including industry. The principles set out in this report (although not exhaustive) will help the combined authority engage with key stakeholders within the region with the view of developing a policy position for hydrogen. This position will set out key actions for hydrogen deployment within west Yorkshire and will be incorporated into the Climate and Environment Plan for west Yorkshire.

6. Inclusive Growth Implications

- 6.1 There are no direct inclusive growth implications arising from this report at the time of writing. We would ensure that inclusivity is central to any policy position developed following further engagement on the principles discussed in this report. Any future policy position on hydrogen will ensure that its deployment within West Yorkshire supports both our climate goals and considers social equity. This includes but is not limited to ensuring inclusivity in jobs created, ensuring training, and considers support for communities where hydrogen is deployed.

7. Equity and Diversity Implications

- 7.1 The Combined Authority will ensure that Equality Impact Assessments (EqIAs) are carried out on all schemes that are developed out of the actions contained in the final hydrogen use case report.
- 7.2 The combined authority will ensure its policy position on hydrogen emphasises that any future deployment delivers the economic and social benefits of acting on the climate and environment emergency in an equitable and inclusive way. The future deployment of clean energy within West Yorkshire in the drive to achieve our net zero aspirations will have significant benefits for the population of West Yorkshire, including in respect of public health, air quality, investment in green jobs, and reducing fuel poverty, amongst others.

8. Financial Implications

- 8.1 There are no financial implications directly arising from this report. The cost of actions and interventions in the hydrogen use case study will be further considered through the next phase of the development of the WY Climate and Environment Plan and the Local Transport Plan.

9. Legal Implications

9.1 There are no legal implications directly arising from this report.

10. External Consultees

10.1 Extensive external consultation and stakeholder engagement has taken place as the hydrogen use case study has been developed. This ranges from local authority officers, through to key stakeholders and Committee Members. Further external engagement is planned with wider stakeholders on the refreshed Climate and Environment Plan.

11. Background Documents

11.1 There are no background documents referenced in this report.

12. Appendices

None.