

HyNet Industrial Cluster



Map showing the HyNet region

Overview

The HyNet Cluster is located in the northwest of England and North Wales, focusing on the decarbonisation of industry, through low-carbon hydrogen production and carbon capture and storage.

The region is tackling environmental challenges whilst advancing hydrogen supply and carbon dioxide transportation and storage infrastructure to support the UK's net zero goals.

Key initiatives include:

- **A significant number of operators** in the HyNet cluster are planning to generate hydrogen for their own use, rather than relying on the planned hydrogen supply network, prompting adjustments to forecasted permit applications.
- **Engagement with stakeholders** has increased focus on self-sufficient hydrogen production, aligning with long-term goals of reducing carbon emissions and securing clean energy.
- The project also aims to reduce industrial reliance on fossil fuels by supporting the shift towards hydrogen as a primary energy source.

Key Environmental Capacity Challenges

Water quality

- Cumulative impacts of residual emissions from low-carbon technology on water quality is unclear.
- Risks from wastewater discharges, whether direct or through treatment networks, remain.
- Higher abstraction will risk saline intrusion deterioration of groundwater quality.

Water availability

- Surface and groundwater availability may be a limiting factor for development around the south-west of the industrial cluster.
- Water abstractions in this area are at high levels, with pending licence review changes.
- If developers use non-public water supply from licences that are up for review, this may impact operations unexpectedly.

Air quality

- Stakeholders identified hydrogen leakage as both an industrial and regulatory challenge.
- Concerns exist over nitrosamines and nitramines, which require improved monitoring frameworks and regulatory adaptation.
- Current air quality monitoring does not adequately track key pollutants, including NO_x, ammonia (NH₃), amine degradation products and hydrogen emissions.

Recommendations

To effectively deploy low-carbon technologies in the HyNet Industrial Cluster we need to prioritise water management integration and research.

Innovation

- Conduct further research on cumulative effects.
- Assess potential thermal, toxicological and ecological impacts.
- Consider policy, climate change and innovative wastewater reuse and recycling.
- Carbon capture must address secondary emissions and advance non-amine solvent research.

Collaboration

- Integrate water management into spatial planning.
- Hydrogen leakage requires greater monitoring and risk assessment.