

2. Introduction

The UK's Industrial heartlands are integral to the UK economy. Contributing £170 billion each year to our economy, enabling 7.6 million jobs (1) directly and indirectly through the subsequent value chain, from manufacture of the COVID-19 vaccine through to the food that we eat.

The North West is situated in one of the most productive regions in the UK with a £185 billion GVA (economically the largest region outside of the South East of England) and a highly skilled and diverse workforce. The North West Industrial cluster holds the largest concentration of advanced manufacturing and chemical production in the UK, which is significantly energy intensive and currently produces ~50% of the UK Industrial Emissions (38 Mt CO₂e), the same as the Republic of Ireland. This is 20% more than the South East region which reflects the highly positive

economic contribution to the UK, comes with a high environmental cost (2).

Net Zero North West is an industry-led cluster acting as a public and private sector investment accelerator for industrial decarbonisation and clean growth projects in the North West. It aims to unite businesses, regional leaders, academia, and is committed to delivering a co-ordinated net zero vision for the region. The core mission of Net Zero North West is to become the UK's first low carbon industrial cluster by 2030 and the world's first net zero industrial cluster by 2040.

£206.9 billion
Investment in
the North West



providing
social uplift
and benefit
of over
£285 billion GVA

Develop a total
workforce of
660,000



new and existing
jobs across the
North West with
over **½ million**
in our industrial
cluster



Save 38.5 mega-tonnes
of greenhouse gas
emissions
(CO₂ equivalent) and
deliver the UK's first
net zero region by
2040

This bold vision for the North West will save 38.5 mega-tonnes of carbon dioxide emissions, turbocharge the UK economy by £285bn GVA and safeguard or create over 660,000 jobs.

The North West has immense breadth and diversity of decarbonisation activity, in fact it is the only region with all the elements required to deliver a low carbon industrial cluster by 2030. Contained within it are; Renewables, Hydrogen (e.g. enabling the Cheshire Salt Caverns for Hydrogen Storage), Carbon Capture Usage (e.g. enabling the Liverpool Bay gas fields for carbon capture) and Storage (CCUS), small and large scale Nuclear in Cumbria, Lancashire and Cheshire and developments in localised Smart Grids. The Net Zero North West decarbonisation strategy centres on growing regional economies in a coordinated fashion - delivering a decarbonised industrial cluster underpinned by energy security and an engaged workforce (2). Moreover, it has an advantage in building the region's key industrial strengths into innovative business models for clean energy and hydrogen, as evidenced by the HyNet project, which drives a regional hydrogen economy that has sustainable income streams.

The document 'Net Zero: Connecting Policy and Research for Climate Action' outlines that three main concepts – energy and resource efficiency, changing fuel and feedstock, and Carbon Capture and Storage (CCS) – must be married together and implemented in a full, holistic industrial decarbonisation system (3). This requires effective policy support from government to encourage industry buy-in and allow space for trialling innovative systems. Simultaneous innovation of policy and business models will ensure UK industry can decarbonise while maintaining competitiveness.

The Net Zero North West Cluster Plan will develop a deliverable investment, technology, and infrastructure blueprint to support the region's net zero transition and low carbon recovery post COVID.

The Cluster Plan has 7 underlying principles outlined below:

1. Defining the contribution that Hydrogen and CCUS can make to decarbonising industrial process emissions across the cluster geography to enable fuel switching in the energy intensive industries.
2. Developing future scenarios to forecast total regional demand for energy and energy mix by 2040.
3. Defining the baseline scenarios for growth, contraction, and transformation of industry.
4. Evaluating the impact of energy efficiency and investment in onsite generation on consumers.
5. Assessing the impact and opportunities of decentralised power generation and low carbon gas production.

6. Considering the production or manufacture of low carbon gases from within and near the cluster, including from nationally significant offshore wind, nuclear, tidal resources, and carbon capture opportunities for negative emissions.
7. Evaluating the impact of new energy infrastructure on the electricity and gas distribution.

Initially, these principles have been evaluated via four research work packages, listed below:

- Industrial Consumers (WP4) - led by EQUANS (this report)
- Electrolytic Hydrogen (WP5) - led by EQUANS
- Grid Scale Low Carbon Dispatchable Power (WP6) - led by Uniper
- HyNet and its role in Net Zero (WP7) - led by Progressive Energy and Cadent

These reports will be used to inform the remaining consortium partners in their assessment of the electricity distribution network impact, local education, skills requirements and the development and synthesis of the investment case for the North West.

This has been achieved by:

- Evaluating each sector including the distribution of industrial sites contained in the North West and calculating the respective carbon footprint produced by these consumers.
- Producing an Industrial Cluster Heat Map which shows the breadth of technologies used to generate energy at each location. Highly concentrated regions of these technologies within the North West indicate opportunities where energy and carbon saving measures should be focused.
- Reviewing the types of carbon emissions contained within the North West.
- Providing an overview of technologies that are most effective for decarbonisation by industrial consumers.
- Conducting a high-level assessment by sector to produce a decarbonisation roadmap and providing an indicative business case for recommended investment.

The aim of this report is to provide recommendations on the most effective technologies for investment when developing sectoral decarbonisation roadmaps.

