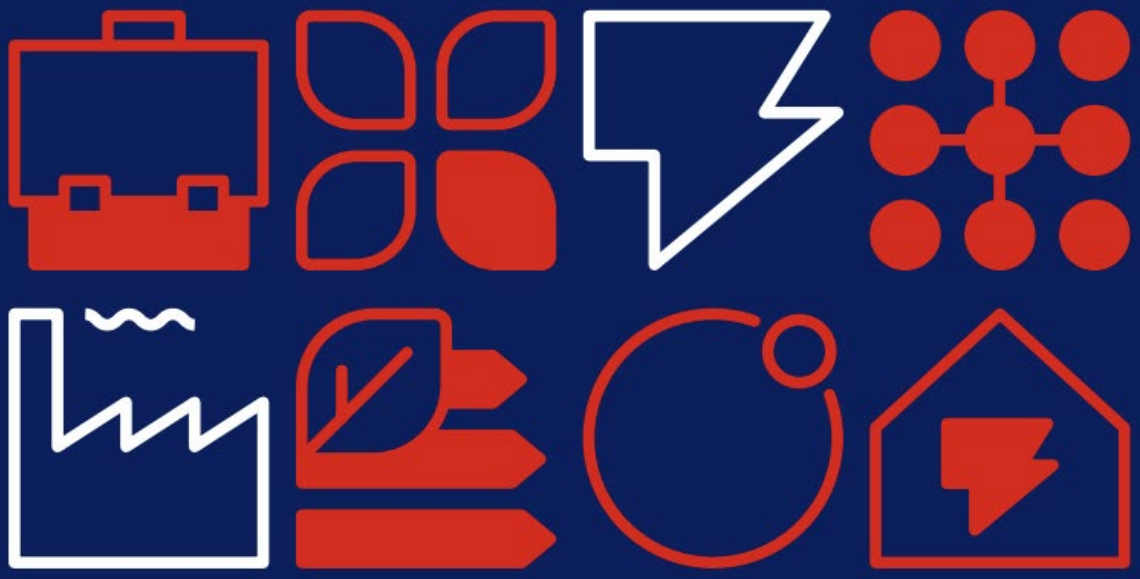
North East Wales
Industrial Decarbonisation



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The success of this project was driven by the collaborative work of the partner organisations, namely: Bangor University, Net Zero Energy Systems (NZES), Net Zero Industry Wales (NZIW), SP Energy Networks (SP Manweb), Uniper and Wales & West Utilities (WWU).

Thanks are further extended to all wider stakeholders who have contributed to this project, furthering the goal of reaching net zero industrial carbon emissions by 2050 in line with Welsh Government objectives.

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Foreword

"Wales has the opportunity to become a leading energy transition hub and a cornerstone of the UK industrial base. As a nation, Wales has a strong industrial foundation and heritage, currently based around the energy industry and foundation industries (energy production, oil and gas processing, steel, cement, paper, etc.).

These industries are a critical source of high value employment and a key contributor to the UK economy, providing energy security, as well as long term industrial resilience.

A significant proportion of the Welsh industrial base is located in the North East of Wales and the North East Wales Industrial Decarbonisation (NEWID) cluster partners have been working with key industrial, infrastructure, and academic partners in the region to develop a cluster plan. The cluster centres around two industrial hubs, i.e. Deeside and Wrexham, and links up with the Net Zero North West cluster across the Wales-England border and planned HyNet carbon dioxide and hydrogen infrastructure.

The NEWID cluster partners are committed to transition towards producing more sustainable goods and services in Wales, as set out in the cluster plan, at a pace needed to meet the legally binding targets.

However, in a globally competitive environment, the industrial partners within the NEWID cluster, like the South Wales Industrial Cluster (SWIC), need the active support of the UK Government, as well as the Welsh Government, to create the supportive culture, policy and regulatory frameworks and attractive infrastructure. This support should create a level playing field, encourage the significant investment needed to transition to net zero and prevent carbon leakage.

I really do believe that with the right support, the North East of Wales can become one of the leading clean energy transition hubs of the UK, as well as remain a cornerstone of the UK industrial base. It has the resources, the local talent and knowledge and is well located to distribute its high value goods and services across the UK – let's make this plan a reality!"

Ben Burggraaf

Chief Executive Officer of Net Zero Industry Wales

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Executive summary

The North East Wales Industrial Decarbonisation (NEWID) cluster plan describes the pathways demonstrating how the industrial hubs of Deeside and Wrexham, and the companies that operate within the hubs, are planning to decarbonise.

Alongside the pathways, the plan outlines the essential and urgent private and public investment and funding required, as well as near term actions, to realise the plan and achieve net zero industrial emissions in North East Wales by 2050.

The NEWID Cluster is led by Net Zero Industry Wales in collaboration with five cluster partners (Wales and West Utilities, SP Energy Networks, Uniper, Net Zero Energy Systems and Bangor University) and is supported by key industrial stakeholders and other stakeholders in the region. The cluster plan addresses the unique challenges of a dispersed cluster and industrial sites and aims to transform regional emissions-intensive industries into a clean energy transition hub, and cornerstone of Wales' and the UK's industrial decarbonisation efforts.

The NEWID cluster is made up of a combination of manufacturing industries and has clean energy generation at its heart. Key infrastructure, both existing and planned, will enable NEWID to deliver the ambition outlined in the cluster plan.

Investment, combined with a skilled workforce and the right public sector support, can drive and deliver the huge potential that has been identified within the project and supports the growing green economy in Wales.

NEWID mission

NEWID aims to support the transformation of the industry within North East Wales to become a leading energy transition hub, and cornerstone of the UK industrial base. It does this by supporting local collaboration and business case development for infrastructure investment. It also seeks Welsh and UK Government support to provide a supportive policy and regulatory environment to attract inward investment to the region.

NEWID goal

The overarching goal of NEWID is to reach net zero industrial carbon emissions by 2050 in line with Welsh Government objectives, whilst preventing further deindustrialisation within the cluster and the associated loss of high value jobs.

From January 2024 to December 2024, NEWID's goal was to collaborate with local industrial stakeholders to identify and quantify the financial, social, and environmental impacts of specific industrial projects, pathways and actions. The culmination of the work done to this end is presented in this cluster plan.

Case for change

There is large potential for industrial decarbonisation in North East Wales, with its significant contribution to the UK's carbon emissions and the local economy. NEWID emits 15% of industrial emissions of Wales (2018 levels) (DESNZ, 2024). The North East of Wales energy-intensive industrial sector, accounts for 56% of its total energy demand, and employs over 34,000 individuals. It has strong infrastructure links to the Merseyside (Liverpool) and Greater Manchester areas. Decarbonisation is imperative to ensure the sustainability and future of North East Wales industries and avoiding deindustrialisation, allowing it to meet net zero emissions whilst securing high-quality local jobs

Scale of the challenge

The scale of change required in the cluster is demonstrated by the investment need in key interventions that are essential to decarbonisation as well as jobs and gross value added.

Cog	Scale of investment needs
CCUS	3.4-4 million tonnes per year of equivalent carbon capture and storage capacity.
Fuel switching: Hydrogen	740-1130 MWth of hydrogen demand to be produced or imported and distributed.
Fuel switching: Electrification	130-200 MW increase in electricity demand will require significant network reinforcements.
Fuel switching: Biofuels	0 - 90 MW of new biofuels demand.
Energy efficiency	Negligible reduction in energy demand from existing large emitters in industry is possible.
Industrial symbiosis	Smart Local Energy System (SLES) opportunities.
Jobs	Potential for ~20,500 green jobs.
Economics	In excess of £2 billion gross value added (GVA).

Key findings

Decarbonisation of the cluster by 2040 is technically possible

All scenarios show that decarbonisation is possible and could be achieved by 2040 through a combination of key technical interventions, with some offsetting required to achieve net zero. Carbon capture and storage (CCS) and hydrogen will be the main drivers of emissions reductions within the cluster.

Infrastructure development and deployment in the 2020s and early 2030s is critical

Unlike the six primary industrial clusters, which have large single site emitters which have formed anchor projects, the anchor projects for the NEWID cluster are likely to be associated with infrastructure development.

Ongoing commitment to key anchor decarbonisation projects (such as HyNet, SP Energy Network's (SPEN's)infrastructure programme, HyLine Gogledd and) is crucial to allow certainty to develop the infrastructure. Without early development and deployment, NEWID will not reach net zero emissions by 2040.

Data from the project is already being fed into SP Manweb's Distribution Future Energy Scenarios, which will be published in January 2025, describing how electricity generation and demand may evolve over the next 30 years, which have been fed into National Grid Electricity Transmission's (NGET) RIIO-T3 business plans for 2026 – 2031.

NEWID is reliant on collaboration with projects in the North West of England, including HyNet

NEWID cluster is reliant on projects developing in the North West of England, such as the HyNet CCS and hydrogen projects planned and underway, as well as Morecambe Net Zero, HyLine Gogledd and SPEN's infrastructure programme. These provide a potential opportunity and route for transport and storage of carbon from NEWID, as well as the import of hydrogen.

Ongoing coordination is required to enable collaboration both inside and outside the cluster

This project has brought together actors in the NEWID cluster to create a shared understanding of the scale of the challenge and the urgency of the actions required. A single coordinating body

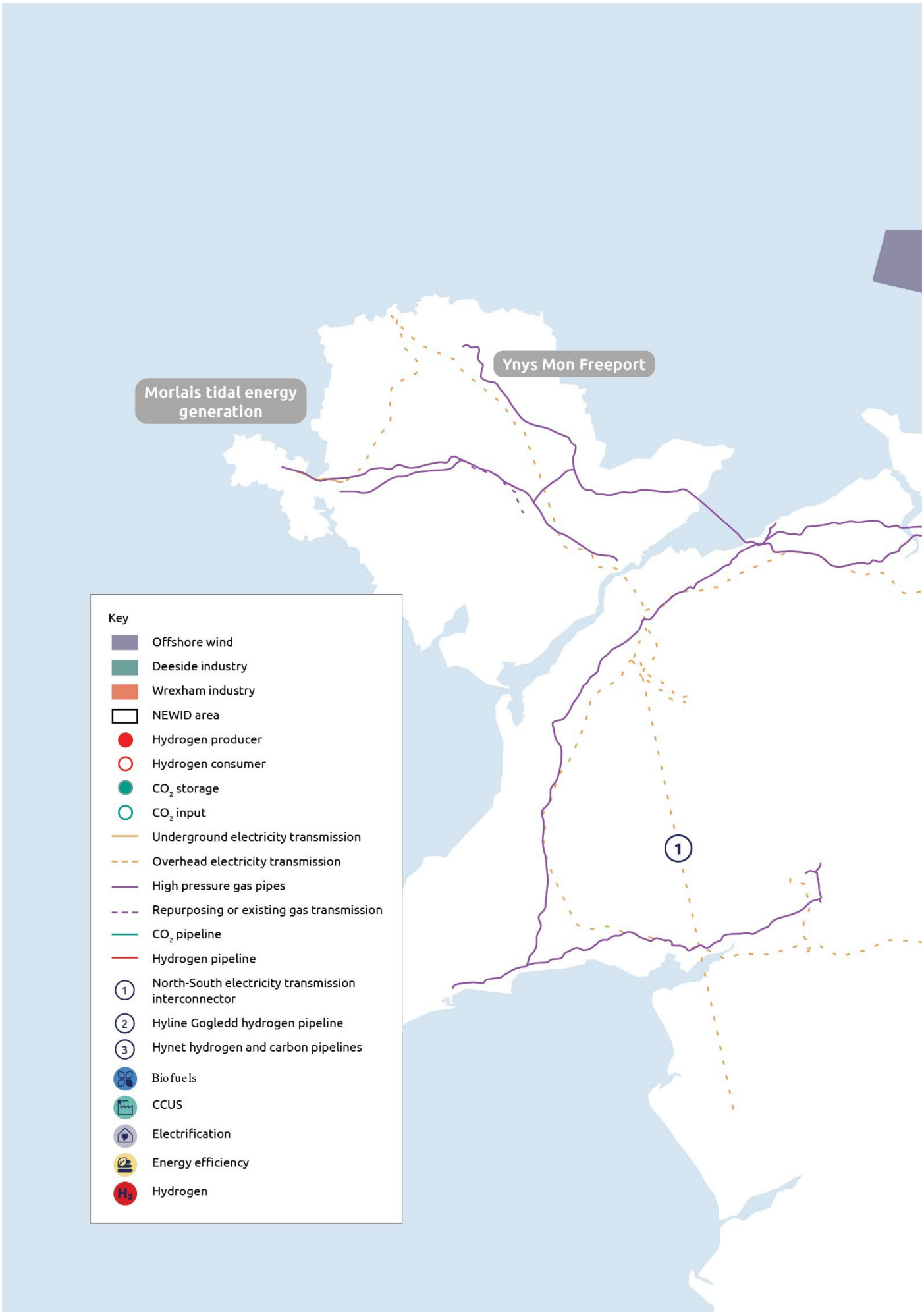
for NEWID will be able to provide the required ongoing leadership, vision, and collective voice for industry within the cluster.

Significant public and private investment and support is required

Approximately £6.2- 9.8 billion of CAPEX investment is required across decarbonisation technologies, with the investment most notably required in CCS, hydrogen, and electrical transmission connections. Although some investment programmes and incentives exist in the region and nationally, they are currently insufficient to enable the cluster to fulfil its aims.

Public sector support is urgently needed to de-risk projects and unlock the private investment needed to enable deployment of decarbonisation infrastructure to reach net zero by 2040.

A key ask of the UK Government is to make deployment funding available for the decarbonisation of distributed industrial clusters in Wales.


Morlais tidal energy generation
Ynys Mon Freeport
Key
Offshore wind
Deeside industry
Wrexham industry
NEWID area
Hydrogen producer
Hydrogen consumer
CO_2 storage
CO_2 input
Underground electricity transmission
Overhead electricity transmission
High pressure gas pipes
Repurposing or existing gas transmission
CO_2 pipeline
Hydrogen pipeline
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3 Hynet hydrogen and carbon pipelines
Biofuels
CCUS
Electrification
Energy efficiency
H_2 Hydrogen
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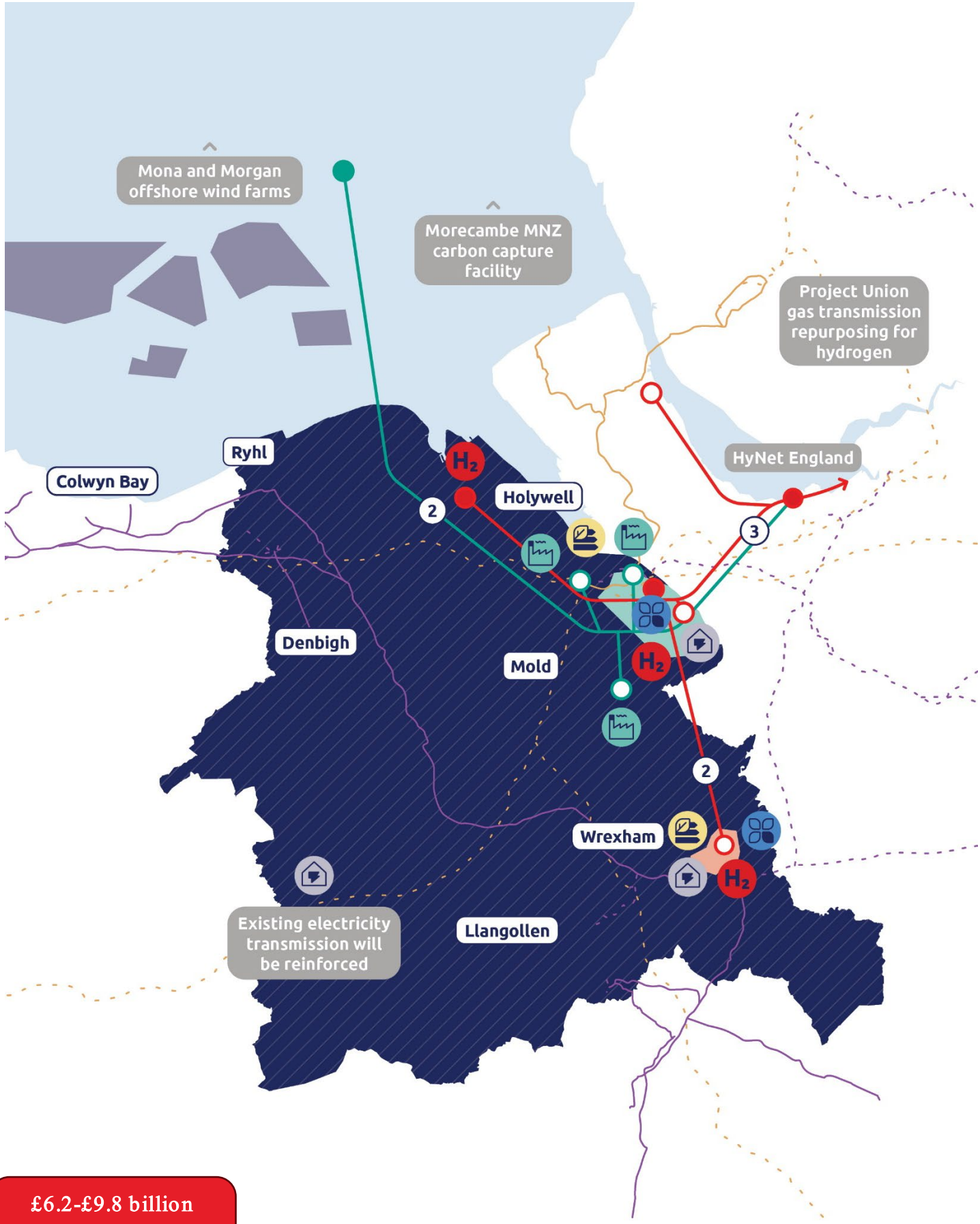

£6.2-£9.8 billion

of investment required to meet trajectories