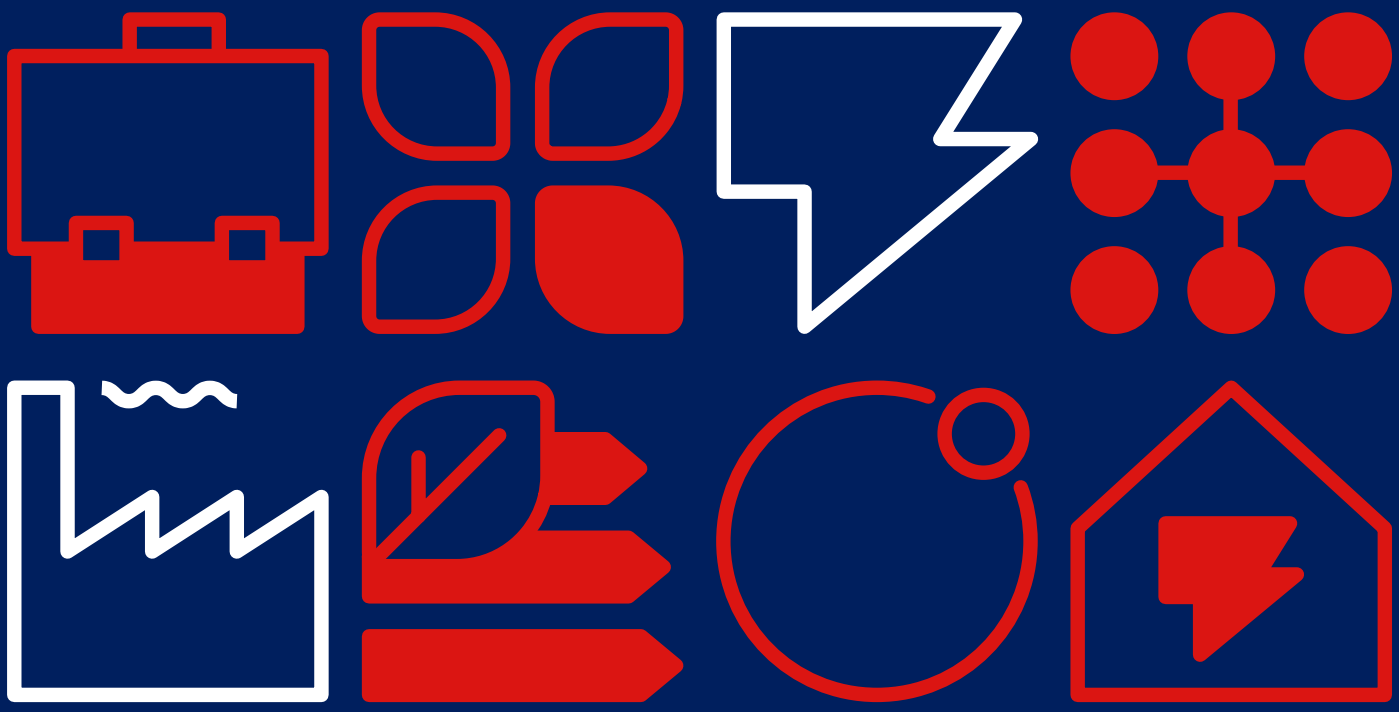
NEWID

DATGARBONEIDDIO DIWYDIANNOL GOGLEDD DDWYRAIN CYMRU
NORTH EAST WALES INDUSTRIAL DECARBONISATION

North East Wales
Industrial Decarbonisation



Acknowledgements

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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.

Contents

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 associated 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,
Net Zero Industry Wales

Executive summary

Covering over 95% of reported industrial emissions in North Wales, the North East Wales Industrial Cluster plan demonstrates how regional industrial corporate aspirations could be realised to achieve net zero industrial emissions by 2040, with a significant interim emissions reduction between 2030 and 2035. However, urgent action is needed if this outcome is to be realised.

The North East Wales Industrial Decarbonisation (NEWID) project started by screening industrial emissions in North Wales. This screening process identified that a vast majority of these emissions are concentrated in North East Wales with most (but not all) of these sites further clustered around Deeside and Wrexham. The resultant cluster plan describes the “envelope” of pathways developed demonstrating multiple options of how the industrial hubs of Deeside and Wrexham, and the companies that operate within the hubs, could 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 diverse range of industries (including manufacturing, power generation, etc) 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. However, this must be upgraded and/or deployed urgently to meet both corporate and Welsh Government Net Zero Targets.

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. This will ensure that North Wales does not get left out and left behind, ensuring a just transition to net zero in North Wales.

NEWID goal

The overarching goal of NEWID is to reach net zero industrial carbon emissions by 2040 in line with corporate net zero objectives, whilst preventing further deindustrialisation within the cluster and the associated loss of high value jobs. Further, NEWID hopes to provide a pathway that enables industry to achieve intended interim emissions targets between 2030-2035. Failing to achieve interim emissions reductions may encourage global corporate decisions to close operations in North Wales.

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. It is important to note that not all sites had mature decarbonisation plans, and in some cases decarbonisation plans were developed in collaboration with the NEWID team. 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. Industry in North East Wales contribute 15% of Welsh industrial emissions (2018 levels) (NAEI, 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.

CCUS

3.4-4 million tonnes

per year of equivalent carbon capture and storage capacity.

Industrial Symbiosis

Opportunities

for Smart Local Energy System (SLES).

Fuel switching: Electrification

130-200 MW

increase in industrial electricity demand will require significant network reinforcements*.

Energy efficiency

Maximising

opportunities to reduce energy demand should be part of the design development process when implementing net zero technologies.

Fuel switching: Hydrogen

740-1,130 MW

hydrogen demand to be produced or imported and distributed.

Jobs

Approx 19,000

green jobs through reskilling for the net zero transition.

Fuel switching: Bioenergy

0 - 90 MW

of new bioenergy demand.

Economics

£2 billion+

gross value added (GVA).

*This figure does not include electricity production to support green hydrogen

Key findings

Decarbonisation of the cluster by 2040 is technically possible

Decarbonisation is possible and could be achieved by 2040 through a combination of key technical interventions, with some offsetting assumed to be required to achieve net zero. All three key decarbonisation vectors (Carbon capture and storage (CCS), hydrogen and electricity) will play an essential role in 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. This will support the decarbonisation of Deeside and Wrexham (where the major regional industrial presence is located) and the decarbonisation of multiple “mini-cluster” sites which offers a more complete decarbonisation of the region as a whole.

The transmission and distribution electricity network operators, National Grid Electricity Transmission (NGET) and SP Energy Networks (SPEN), are integral to the decarbonisation of both North East Wales and North West England.

Ongoing commitment to key anchor decarbonisation projects (such as HyNet, HyLine Gogledd, and NGET & SPEN infrastructure investment programmes) is crucial to allow certainty for infrastructure development.

Without early infrastructure development and deployment, NEWID will not reach net zero emissions by 2040.

Data from NEWID has been incorporated into SPEN’s Distribution Future Energy Scenarios 2024, published in February 2025, describing how electricity generation and demand may evolve over the next 30 years. This information has also been fed into NGET’s RIIO-T3 business plans for 2026 – 2031 to support their evidence base for further transmission reinforcement across the North Wales area. SPEN are presently reviewing the lessons learned from the first phase of the NEWID project with a view to further develop industrial engagement across the SP Manweb licence area, by rolling out initiatives similar to NEWID, working with National Grid Electricity Distribution (NGED) in Mid & South Wales, and working with Net Zero North West Industrial Cluster across the border in North West of England.

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

Collaboration between NEWID and projects developing in the North West of England is key to support industrial decarbonisation. This includes projects such as the HyNet CCS and hydrogen projects planned and underway, as well as Morecambe Net Zero and HyLine Gogledd. These provide a potential opportunity and route for transport and storage of carbon from NEWID, as well as the import of hydrogen. Collaborative partnerships with these projects will be essential for a just transition to net zero.

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 (excluding renewable electricity generation) 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 as well as private and public sector commitment to collaboration 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 further development funding and deployment funding available for the decarbonisation of distributed industrial clusters in Wales. It is essential that businesses have the support needed to ensure that relevant decarbonisation support mechanisms can be accessed.

£6.2-£9.8bn

of investment required to meet trajectories

Mona and Morgan offshore wind farms

Morecambe MNZ carbon capture facility

Project Union gas transmission repurposing for hydrogen

Ynys Mon Freeport

Morlais tidal energy generation

Holyhead hydrogen hub

Colwyn Bay

Ryhl

Holywell

HyNet England

Denbigh

Mold

Wrexham

Llangollen

Existing electricity infrastructure plans detailed in NGET RIIO-T3 Business Plan, with proposed investment in North Wales

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
- 1 National Grid Electricity Transmission existing network arrangement
- 2 Hyline Gogledd hydrogen pipeline Hynet
- 3 hydrogen and carbon pipelines
- Bioenergy
- Energy efficiency
- CCUS
- Hydrogen
- Electrification

The NEWID cluster

The North East Wales Industrial Decarbonisation (NEWID) project is a partnership of organisations based or working in North Wales. Organisations which have contributed to the project through the stakeholder engagement work package are primarily located in Deeside and Wrexham. NEWID aims to support the decarbonisation of local industry and achieve net zero emissions by 2040 (in line with regional corporate objectives), whilst preventing further deindustrialisation within the cluster and the associated loss of high value jobs.

The NEWID cluster is poised to provide the ongoing leadership, vision, and collective voice for industry within the cluster. NEWID enables collaboration both within North Wales industry and across the border to the North West of England. As a starting point, NEWID has collaborated with local industrial stakeholders to identify and quantify the financial, social and environmental impacts of specific (or potential) industrial projects, the generation of an “envelope” of credible industrial decarbonisation pathways and urgently required actions. This cluster plan presents the culmination of this initial work.

NEWID mission

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NEWID goal

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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. Not all sites had mature decarbonisation plans, and in some cases decarbonisation plans were developed in collaboration with the NEWID team. The culmination of the work done to this end is presented in this cluster plan.

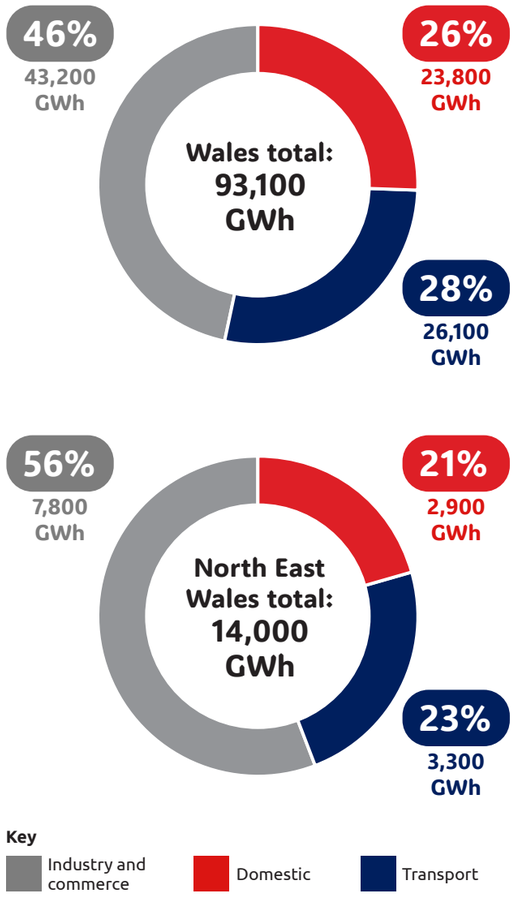
Context: where are we now?

Industry plays a significant part in the story of North Wales's energy consumption, emissions, and economy. After an initial screening process, it was identified that a vast majority of emissions derive from North East Wales, so this cluster plan focuses on industry within North East Wales.

Industrial impact

Industry plays a significant part in the story of North Wales's energy consumption, emissions, and economy. The industry in North Wales is in the most part located in North East Wales, so in this cluster plan focuses on industry within North East Wales.

- Industry and commerce contributes **56% (7,800 GWh, 2018) of the total energy demand** for North East Wales (14,000 GWh, 2018).
- In 2018, North East Wales accounted for a total of **2 $MtCO_2e$ of industrial emissions** (NAEI, 2024). This is approximately 15% of total industrial emissions in Wales (NAEI, 2024). In order to reach net zero emissions by 2040 (in line with corporate targets), it is essential that North East Wales's industry is decarbonised.
- In North East Wales, production industries are the third largest employer type in the area, **contributing over 34,000 jobs** to the local area. As such a significant employer and contributor to the local economy, it is imperative that North East Wales is able continue to attract high quality industrial jobs in the UK's decarbonised future. With existing policy alone, it is likely that North East Wales will see a significant negative impact on its people and economy, culminating in site closures and job losses, as already been seen with job losses at Airbus in Flintshire (BBC News, 2020).



Wider regional context

The NEWID cluster is home to industries across cement; chemical; food, drink and tobacco; iron and steel; power; non-ferrous metal; oil and gas; paper; vehicles; and waste sectors.

Several industrial decarbonisation groups have been established to provide leadership and cohesion in support of decarbonisation projects, including:

- **Deeside and Wrexham Industrial Hubs:** industrial hubs which can collaborate to enhance regional resilience and adaptability for the future through sharing resources, clean energy, and infrastructure (NZIW, 2024).
  - **The Deeside Decarbonisation Forum (DDF):** a public forum accelerating industrial decarbonisation across Flintshire and North East Wales by providing a common vision, voice and leadership for the region.
  - **The Wrexham Achieving Carbon Zero Forum:** shares information and best practice, and provides a platform for the discussion of decarbonisation, and help businesses to support each other on their journeys.
- **Ambition North Wales (ANW):** the regional body in North Wales. Primarily funded through the North Wales Growth Deal (£120 million), ANW is dedicating resources to support low carbon energy and high value manufacturing (ANW, 2025).
- **Flintshire - Wrexham Investment Zone:** This is the largest investment in the region to support Advanced Manufacturing. £160million will be invested over 10 years with significant project for both Flintshire and Wrexham.
- **Mersey Dee Alliance:** cross-border partnership supporting strategic economic growth across Flintshire, Wrexham, Cheshire West, and Wirral. The Mersey Dee Alliance collaborates with Net Zero North West and HyNet to develop the UK's first cross-border low carbon hub, aiming to decarbonise the region through the supply of low carbon hydrogen and carbon capture technologies (HyNet North West, 2021).
- **Net Zero North West:** an industry-led cluster that acts as an investment accelerator for industrial decarbonisation and clean growth projects in the North West of England. The North West Cluster Plan outlines a roadmap to achieve substantial decarbonisation by 2030 and net zero emissions by 2040 (Net Zero North West, 2025).

NEWID is also conveniently located close to several strategically significant energy infrastructure projects such as:

- **HyNet:** an integrated hydrogen and CCS infrastructure project for the North West Industrial Cluster which will also effect North East Wales.
- **National Grid Electricity Transmition:** The NGET RIIO-T3 Plan details the proposed investment planned for North Wales, North West of England, and the Midlands which will be completed between 2026 and 2031. This is subject to Ofgem approval of the NGET RIIO-T3 Plan.
- **North-South interconnector:** The NGET RIIO-T3 Plan details the proposed route between North and South Wales and highlights the need for further investment into the design stage of the project between 2026 and 2031.
- **Project Union:** a National Gas project to repurpose existing gas transmission pipelines and build new pipelines to create a hydrogen backbone for the UK (National Gas, 2025).
- **Morecambe Net Zero:** a planned repurposing of the Morecambe North and South gas fields, located in the Irish Sea, into an offshore CCS site. The depleted gas fields can store a lifetime potential 1 gigatonne of CO_2 (MNZ Cluster, 2023).

The opportunity

Opportunities for the cluster

When looking at the location and status of industry within the NEWID cluster, there are several opportunities which can be capitalised on to decarbonise:

Shared culture

The NEWID project has brought together actors in the NEWID cluster, to create a shared understanding of the scale of the challenge, and urgency of the actions required. This culture of coordination and collaboration should be preserved and built upon to support and deliver decarbonisation efforts.

Electrification

The project has allowed a more detailed understanding of the requirements for future electricity usage from both regional growth and decarbonisation via fuel switching contexts. This has been used to inform SP Energy Network's annual Distribution Future Energy Scenarios (DFES), and will be incorporated into the development of their next business plan submission, RIIO-ED3.

The data outputs from NEWID have also been shared and included in NGET's RIIO-T3 business plan.

This is key to enabling infrastructure development and deployment over the coming years.

Hydrogen production

Hydrogen presents a real heat decarbonisation opportunity for industries within the cluster. There is potential for low carbon hydrogen generation within the cluster and proximity to the North West Industrial Cluster HyNet project provides a potential opportunity for low-carbon hydrogen import or export via interconnection.

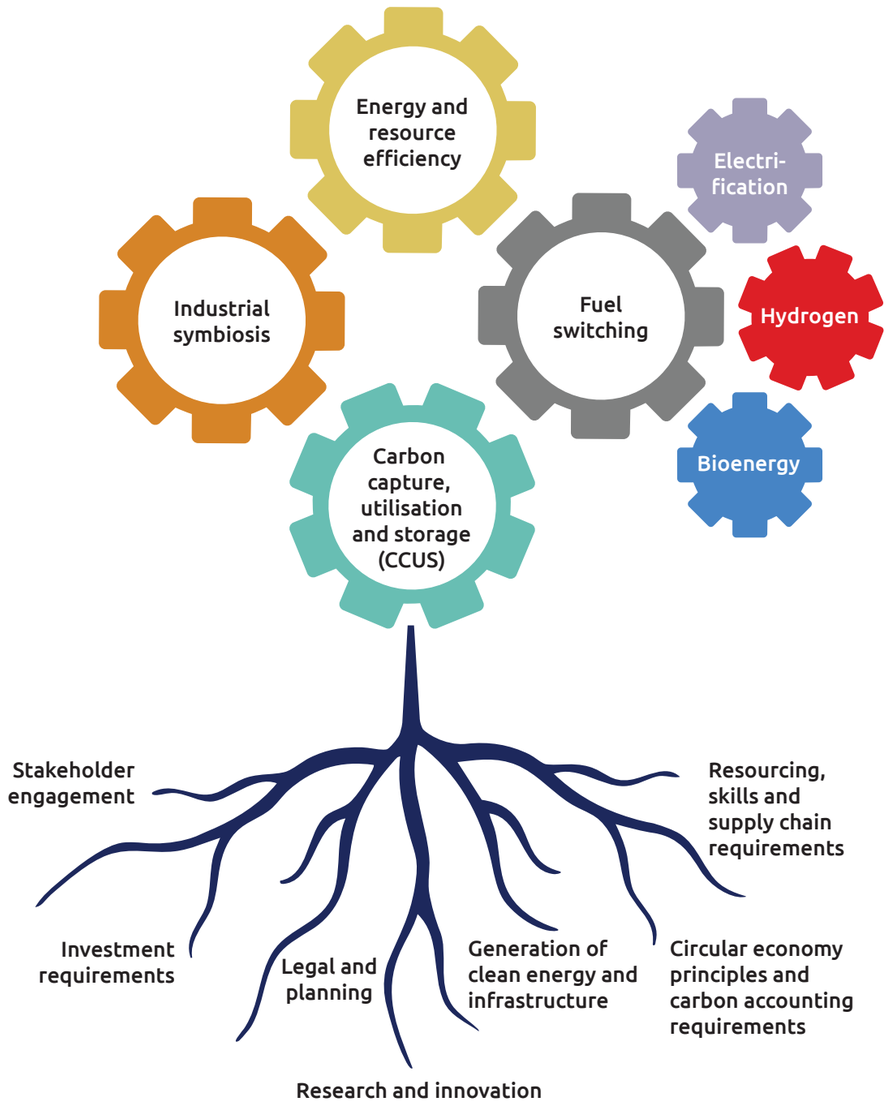
Proximity to the North West Cluster in England

North East Wales has processed oil and gas at the Point of Ayr terminal since the late 1990s. Plans have been approved to repurpose the Point of Ayr gas terminal to transport captured carbon as part of the HyNet project. For NEWID to access carbon storage, the existing routes are through projects in North West England such as HyNet or Morecambe Net Zero. This is in addition to low-carbon hydrogen import or export via interconnection to the HyNet project.

Jobs and skills growth

Without action, deindustrialisation will begin to take effect, resulting in lost jobs and skills. By acting now, jobs and skills will be retained and could be created for the region instead. This will ensure that North Wales is not left behind contributing to a just transition to net zero in the region.

The cluster plan



Cogs and roots

To structure the cluster plan, a "cogs and roots" framework has been used to ensure continuity of language between Wales' major industrial clusters whilst maintaining the unique characteristics of industrial decarbonisation in North East Wales. The main cogs originally presented in the SWIC Cluster plan (SWIC, 2023) have been modified from five to four and three additional "sub-cogs" have been added to Fuel Switching.

Cogs are defined as "key decarbonisation technologies that will be essential to mitigate or eliminate emissions associated with NEWID industries" (SWIC, 2023).

Roots are defined as "enabling activities used to support a successful transition to net zero for NEWID industries" (SWIC, 2023).

Cogs

CCUS

Technology that captures carbon emissions from industrial sources and either reuses it in other industrial processes (utilisation) or stores it (such as in underground stores) permanently or temporarily to prevent it from entering the atmosphere.

Fuel switching: Hydrogen

Utilising low-carbon hydrogen as an alternative fuel to replace traditional fossil fuels.

Fuel switching: Bioenergy

Replacing fossil fuel-based energy sources with biomass or biofuels. Bioenergy is derived from organic materials, making carbon emissions circular or negative when paired with CCS.

Fuel switching: Electrification

Replacing fossil fuel-based energy sources with electricity, with the aim of utilising low carbon electricity sources available within the North Wales region.

Energy and resource efficiency

Involves optimising the use of energy and resources in the most sustainable manner, to reduce waste and improve overall efficiency in industrial processes. It aims to lower energy consumption and associated emissions. This can be further explored in the design development phase of individual site decarbonisation projects.

Industrial symbiosis

Centres or networks, e.g. clean growth hubs, that support the development and implementation of clean technologies and practices where industry can share resources or infrastructure.

Roots

Stakeholder engagement

Active involvement of all relevant parties, including industry, government and the community, in the planning and implementation of decarbonisation strategies. Diverse perspectives are considered and builds support for initiatives.

Investment requirements

Financial resources needed to enable the transition to a low-carbon economy. It includes funding for new technologies, infrastructure, and processes that reduce emissions.

Legal and planning

Regulatory and planning frameworks necessary to facilitate industrial decarbonisation. It includes compliance with environmental laws, obtaining necessary permits, and ensuring that projects align with local and national planning policies.

Research and innovation

Developing new or adapting existing technologies and approaches to reduce carbon emissions and improve energy efficiency. It includes both fundamental research and the practical application of innovative solutions in industrial settings.

Generation of clean energy and infrastructure

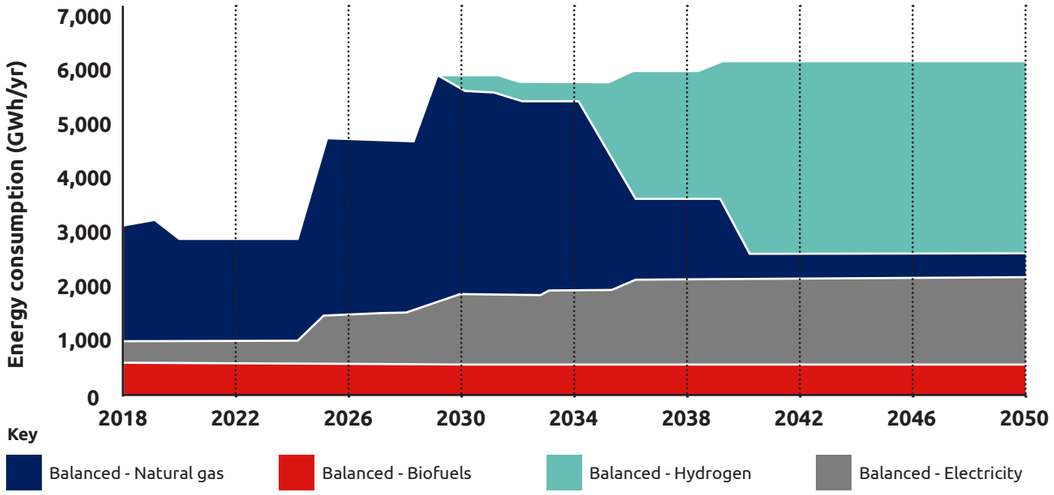
Development and deployment of renewable or low-carbon energy sources and the necessary infrastructure to support them.

Circular economy principles and carbon accounting requirements

Adopting practices that minimise waste, specifically wasted energy, and maximise resources through reusing, recycling, and regenerating. Measuring and tracking carbon emissions to monitor progress.

Resourcing, skills and supply chain requirements

Ensuring that there are sufficient resources, skilled workers, and robust supply chains to support the transition to a low-carbon economy. It includes workforce training, supply chain management, and resource allocation.



Energy consumption graph

Energy consumption trajectory

The projected annual energy use, by type, for industry in North East Wales to 2050 is shown below. Some of the figures provided by industry were in addition to their current usage rather than their total future demand.

The graph above represents the balanced pathway as presented in the NEWID Exploitation Plan. This "balanced pathway is the "no regrets" minimum of energy required within the NEWID cluster. In other words, it represents the minimum amount of low carbon energy (and in turn enabling infrastructure), needed for industry to decarbonise regardless of whether industrial stakeholders fuel switch to hydrogen or electricity.

The energy consumption trajectory shows that industrial energy consumption could increase from ~3,000 GWh/yr in 2024 to ~6,000 GWh/yr by 2050, driven by new industrial sites, and expansion and decarbonisation of existing sites. The energy demand is likely to increase for electricity and hydrogen and decrease for natural gas - if the reported fuel switching to low-carbon alternatives takes place.

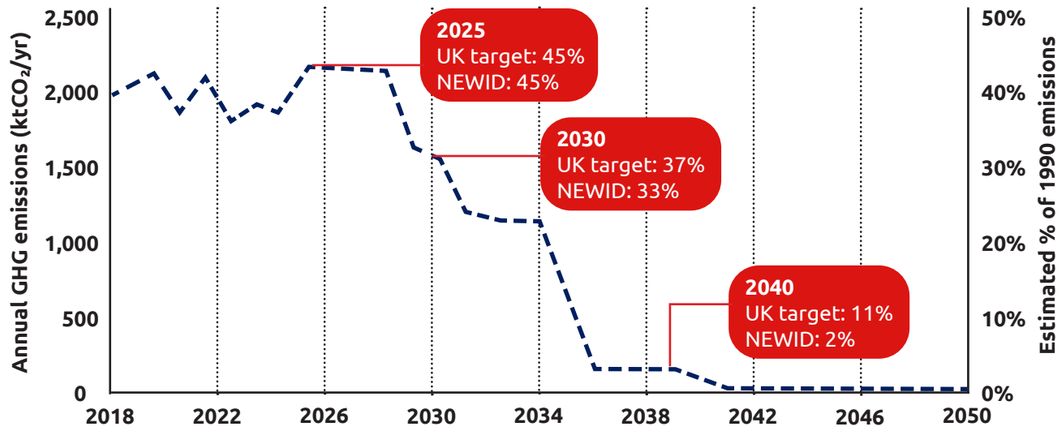
Emissions trajectory

The projected annual greenhouse gas emissions for industry in North East Wales to 2050, if the fuel switching and changes reported by stakeholders come into effect are shown below.

The emissions trajectory shows that significant decarbonisation in the cluster is achievable by 2040, with greenhouse gas emissions significantly decreasing from over 2 $MtCO_2e/yr$. The residual 30 $ktCO_2e/yr$ seen at 2040 could be offset through high quality carbon credits to achieve net zero.

The UK government's Industrial Decarbonisation Strategy in 2021 set out "our ambition for decarbonising industry in line with net zero: our expectation is emissions will need to reduce by at least two-thirds by 2035 and by at least 90% by 2050" (DESNZ, 2021). The graph shows that North East Wales can reduce emissions faster than both the UK and Welsh Government emissions targets and in line with corporate emissions reductions targets in the region.

Emissions trajectory graph



How do we get there?

Investment requirements

CCUS

- Underground carbon storage
- Infrastructure to connect to HyNet CO_2 pipeline/ Morecambe Net Zero
- Carbon capture technology at emission site

Fuel switching: Hydrogen

- Electrolytic hydrogen production and associated storage
- Hydrogen transmission and distribution infrastructure changes (pipelines)
- Hydrogen fuel switching through low carbon hydrogen within an industrial process

Fuel switching: Electrification

- Development of greater electricity generation capacity
- Fuel switching within industrial processes

Fuel switching: Bioenergy

- Building bioenergy plants

Energy and resource efficiency

- Given the positive strides already taken to enhance energy efficiency, minimal opportunities have been identified to date, but it is anticipated (particularly as the cluster grows) that future opportunities will be available and should be prioritised.

Industrial symbiosis

- SLES systems, battery and flexibility opportunities

Enablers

- NEWID coordination role
- Government support and funding to enable the actions in this plan and derisk the project for private investment.

Actions

For the NEWID cluster to reach net zero emissions by 2050, ten key short-term actions have been developed with the project partners. The project partners have committed to undertaking these.

Expand the NEWID cluster membership and establish the mechanisms to continue into the future.

NZIW will seek to expand the NEWID collaboration to include wider membership of industry in the region.

Alongside membership fees, NZIW will seek additional funding routes to enable the ongoing coordination and management of NEWID.

When: 2025 onwards

Share information and knowledge within the NEWID cluster.

Knowledge and information sharing within the cluster is essential to enable co-ordination and collaboration amongst projects to understand the scale of change, infrastructure requirements, and potential for industrial symbiosis, to support decarbonisation. NZIW will establish a clear route for knowledge and information sharing including data and information sharing agreements. NEWID partners will continue to engage with WWU and SP Manweb to feed into their future business planning activities.

When: 2025

Collaborate and engage with the North West Cluster to capitalise on geographical proximity.

NZIW and NEWID partners will continue to actively engage with the North West cluster in England to enable the NEWID cluster to benefit from the developments adjacent and developing into North East Wales. NEWID will seek connections between NEWID and HyNet and/or MNZ to be included in the North West plans so that sizing takes into account the requirements of NEWID from the outset.

When: 2025 onwards

Continue to engage in the UK Government's CCUS Cluster sequencing and consider resilience for CCUS.

HyNet has been chosen as a Track-1 CCUS cluster. NZIW and NEWID partners have and will continue to engage with HyNet with respect to the UK Government CCUS track process and seek for track expansions or future tracks to provide further resilience to the project that is in development. The NEWID partners will also consider non-pipeline transport options for carbon from the cluster, should HyNet or other carbon pipeline connections not be available at the right time or at all.

When: 2025 onwards

Develop the enabling energy infrastructure required to decarbonise.

Existing and new NEWID partners will continue to support and contribute to the work of WWU on HyLine Gogledd Cymru to enable the project to come to fruition.

NEWID members will also undertake pre-emptive infrastructure development studies to enable the right infrastructure to be developed at the right time for the cluster, taking opportunities to link this with adjacent developing infrastructure e.g. such as that being developed in England's North West Cluster or elsewhere. This is particularly key to unlocking the relevant CCS infrastructure needed to decarbonise North East Wales.

Work with NGET and SP Manweb will also be undertaken to allow for the right enabling electricity infrastructure to be planned and built including consideration of electrolysis and electricity use for CCS. This cluster plan has fed into SP Manweb's latest Distribution Future Energy Scenario (DFES) (to be published in January 2025), describing how electricity generation and demand may evolve in the SP Manweb licence area over the next 30 years. Critically the work has fed into SP Manweb's RIIO-ED3 business plan, which will run from 2028 to 2033.

When: 2025 and into the 2030s

Learn from the existing primary clusters.

NZIW will seek to establish a framework for knowledge sharing and dissemination between NEWID and the primary six clusters to enable NEWID to learn from and build upon work done to date and prevent duplication of effort. This could be done using the existing UK-wide Industrial Decarbonisation Research and Innovation Centre (IDRIC).

When: Ongoing

Understand the requirement for, and develop, electrolytic hydrogen projects.

NEWID partners will seek to formalise the understanding of demand profiles for hydrogen in the cluster. Through engagement with HyNet, NEWID partners will investigate if and when hydrogen could be supplied from, or to, HyNet. In parallel, NEWID partners will seek to understand the requirement for electrolytic hydrogen projects to meet demand where HyNet is unable to deliver hydrogen at the right time. NEWID will develop local electrolytic hydrogen production projects and associated storage requirements accordingly to provide hydrogen to the cluster from 2030 onwards.

When: 2025-2028

Raise the NEWID cluster profile on both the national and international stage.

NEWID will seek to raise the profile of the cluster both locally and nationally to represent its needs in upcoming items such as the Welsh national energy plan, Regional Energy System Plans (RESP) for Wales, SP Manweb and WWU business planning, government policy decisions, local planning policy, ANW's endeavours including the regional skills partnership, and Welsh Government's communication strategy, for example.

There is an opportunity to showcase NEWID on the international stage as an exemplar of a distributed cluster.

When: Ongoing

Understand the opportunities for digital infrastructure to enable the cluster to visualise how energy and infrastructure could be shared.

Digital infrastructure and solutions will be used to provide investors, funders, and industry in the cluster with the ability to understand energy demands, supply opportunities, and infrastructure requirements. This will enable consideration of how energy could be shared in the form of smart local energy systems (SLES) and the impact of economies of scale on energy infrastructure design and costs. Jobs are already being created in the digital space within SPEN, and further digital jobs and skills will be required to enable the transition.

When: 2025-2030

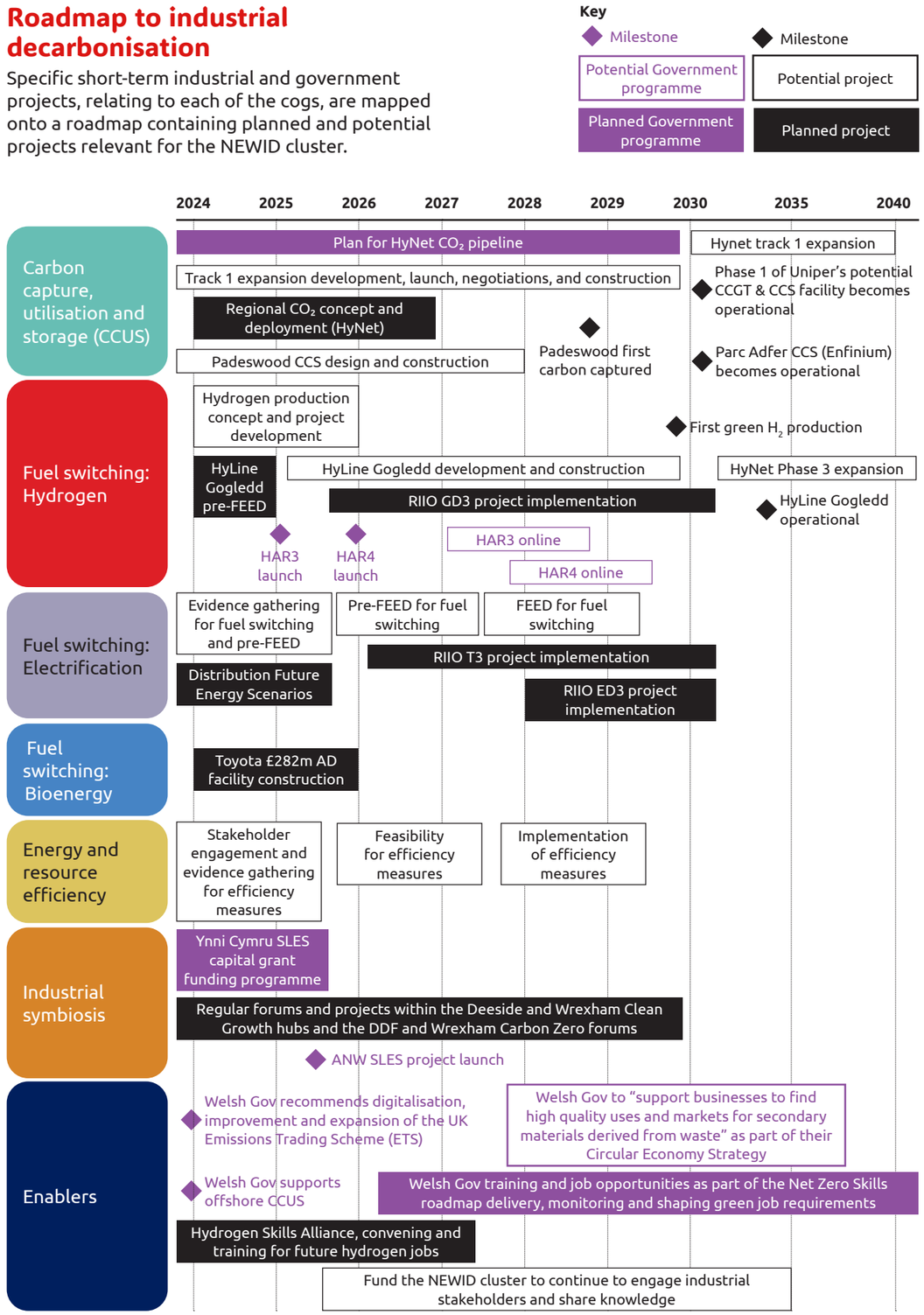
Build on successful foundation of skills transformation programmes within SP Manweb and WWU.

Skills transformation programmes are underway within both SPEN and WWU, these are focused around digital, AI and communication. There is best practice established to take forward that would be beneficial for the wider NEWID partners to learn from. The transition is wider than utility companies and industry itself, there will need to be organisational and government supported training programmes to provide the leadership and governance required. Schools, colleges and universities will need to work with industry to support new job opportunities in the clean energy sector.

When: Ongoing

Roadmap to industrial decarbonisation

Specific short-term industrial and government projects, relating to each of the cogs, are mapped onto a roadmap containing planned and potential projects relevant for the NEWID cluster.



Asks for UK Government

Funding for decarbonisation of distributed industrial clusters in Wales (mid-late 2020s)

The six primary clusters in the UK were provided with the opportunity and support to turn their plans into real projects via the IDC deployment funding. To turn this cluster plan into action, NEWID requires the equivalent investment and support from UK Government to develop key anchor projects and deployment studies. This is critical to enable FIDs to be taken, and business plans to be approved, in the mid to late 2020s and early 2030s.

Funding support mechanisms for industrial site R&D is critical to help them identify their preferred decarbonisation solutions. This will enable decarbonisation projects to begin across the region in a timely manner and allow for knowledge sharing with other distributed clusters.

Increased investment in skills and training related to industrial decarbonisation (late 2020s)

Further investment into understanding the skills and training requirements within North East Wales is required.

Government should establish a national coordinator, with a localised approach, to be able to plan for and secure the workforce of the future for clusters including NEWID.

Long-term policy and regulatory certainty with respect to industrial decarbonisation and related technologies (2025)

UK Government should provide distributed clusters with the long-term policy and regulatory certainty required to drive investment into distributed clusters. Certainty is required regarding technologies and commitments of the previous government include:

- UK Government should reaffirm its commitment to undertaking the HAR3 and HAR4 processes.
- UK Government should clarify and outline its position with respect to biomethane/biomass policy.

As part of the UK Government commitment to undertaking CCUS cluster sequencing as part of tracks 1 and 2, government should consider a further track 1 expansion to provide resilience to projects in development and communicate to the market whether future tracks will be undertaken.

Glossary

Anchor projects
Significant projects that serve as foundational efforts to enable broader decarbonisation initiatives.

Bioenergy
Renewable energy derived from organic materials, such as biomass or biofuels. Biofuels can also be paired with CCS (BECCS).

CCUS
A technology that captures carbon emissions from industrial sources and either reuses it in other industrial processes (utilisation) or stores it underground to prevent it from entering the atmosphere.

Cluster plan
A strategy for decarbonising industrial regions through collaborative efforts.

Decarbonisation
The process of reducing carbon emissions associated with industrial and other activities.

Department for Energy and Net Zero (DESNZ)
UK Government department overseeing energy and net-zero strategies.

Electrification
The process of replacing fossil fuel-based energy systems with electric-powered alternatives.

Emissions Trading Scheme (ETS)
A market-based approach to controlling pollution by providing economic incentives for reducing emissions.

Fast moving consumer goods (FMCG)
Products that are sold quickly and at a relatively low cost.

Fuel switching
Transitioning from one type of fuel to another, typically to a lower-carbon alternative like hydrogen, electricity or bioenergy.

Green jobs
Employment in an activity that contributes to protecting or restoring the environment, including those that mitigate or adapt to climate change (ONS, 2024).

Hydrogen economy
The adoption of hydrogen as a low-carbon energy source.

Industrial Decarbonisation Challenge (IDC)
A UK Government initiative to reduce industrial emissions.

Low carbon technologies
Innovations designed to reduce carbon emissions, such as hydrogen, electrification, and bioenergy.

Net zero
Achieving a balance between the greenhouse gases emitted into and removed from the atmosphere.

NEWID goal
A specific, measurable, and time-bound outcome, that aligns with the NEWID mission.

NEWID mission
A broad, long-term purpose and reason for existence. The mission defines the NEWID overarching objectives and values.

Smart local energy system (SLES)
Systems supporting the efficient and sustainable use of energy locally.

South Wales Industrial Cluster (SWIC)
A group of industries in South Wales working collaboratively to decarbonise (SWIC, 2023).

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