NORTH WEST CLEAN POWER

POSITION PAPER - AUTUMN 2025

north west
net zero hub

EXECUTIVE SUMMARY

Scaling up action on net zero will transform the lives of the North West's seven million residents by improving economic security, creating thousands of high-quality jobs, driving business growth, and enhancing public health through cleaner air and improved infrastructure. By leveraging government investment and private sector capital, the North West can lead the UK's transition to a net zero economy, positioning itself as a hub for green innovation and industrial decarbonisation.

This paper examines the economic drivers, key sectors and cross-cutting themes that should shape local plans to decarbonise the North West (henceforth referred to as the NW), ensuring that the transition generates long-term prosperity for businesses and communities alike.

Government investment and economic opportunity

As part of the Clean Energy Superpower Mission, the UK government's Clean Power 2030 (CP30) Action Plan outlines an ambitious investment strategy, including £60 billion over the next five years to upgrade GB's power grid infrastructure, increasing capacity for renewable energy integration. Upgrading the grid will enable £40 billion of private investment each year into clean power projects, fostering public-private partnerships that stimulate economic development and innovation.

These investments will unlock economic growth by stimulating demand for green technologies, creating jobs, attracting international investors, and ensuring that the NW can position itself as a leader in the clean energy transition.

Driving regional economic growth through net zero

The NW has the potential to move ahead of national net zero targets by harnessing its industrial expertise, skilled workforce and innovation capacity. Key economic benefits include:

Job creation and investment in training programmes to develop a workforce skilled in renewable energy, industrial decarbonisation, electric transport, and energy efficiency. This will create new employment opportunities while supporting existing workers to transition to green industries.

Industrial competitiveness and innovation: The NW is home to major industrial clusters that can drive innovation in carbon capture, hydrogen production and low-carbon manufacturing. These sectors will be essential in maintaining the region's competitive advantage in the global economy.

Energy cost savings for businesses and households: Investing in local renewable energy generation and energy efficiency will reduce energy costs, increasing residents' disposable income and improving business profitability.

Attracting investment into net zero infrastructure: The NW's leadership in net zero projects can attract domestic and international investors looking for opportunities in sustainable infrastructure, creating long-term economic resilience.

Attracting business to locate in the region: industrial, manufacturing and commercial business want to construct new premises where there are reliable supplies of clean power and the opportunity to connect to renewables, carbon capture, hydrogen and heat networks.

Local ownership and community benefits: Communities and local government can own energy generation assets and take equity stakes in energy infrastructure, accruing greater returns on investment and broader benefits to their local areas.

A leading region

The NW is already demonstrating national leadership on the net zero agenda with substantial progress across all economic sectors.

Decarbonising buildings: Local government-led housing retrofit programmes enable scaled investment to be targeted at vulnerable communities. Programmes can support the growth of local business and leverage social value.

> **The NW is demonstrating national leadership on local government-led home retrofit, having delivered over £300 million of national funding since 2020.[1]**

Transport: Public ownership and franchising of transport networks enables more rapid electrification through devolved funding. The electrification of public transport contributes to clean air targets and can avoid the need for congestion zones to be implemented.

> **Warrington's Own Buses network operates a fleet of 105 electric buses.[2] Liverpool City Region has earmarked £119 million to invest in new buses, depots and infrastructure upgrades as it rolls out franchising in phases.[3] Greater Manchester will receive £2.5 Billion for the UK's first fully integrated, zero-emission public transport system by 2030.[4]**

Industrial decarbonisation: Hynet, the UK's first Track 1 industrial decarbonisation cluster, will deliver carbon capture, utilisation and storage (CCUS) and hydrogen infrastructure in Cheshire and Warrington and North Wales with expansion potential across the NW. This will help industries decarbonise while maintaining economic competitiveness.

> **The NW is at the forefront internationally of developing carbon capture and hydrogen supply networks for heavy industry.**

SOME KEY RECOMMENDATIONS

A devolution opportunity

All parts of the NW are in the process of agreeing to devolution settlements with the UK government, which creates the opportunity for further interventions to stimulate private investment.

Expansion of English Devolution allows local governments greater control over grant funding for home and public building retrofits, integrating energy planning with regional economic development.

Key areas to develop include:

Local Growth Plans: Clean energy jobs are some of the fastest-growing sectors of the economy nationally.[5] Local Growth Plans can identify key sectors' strengths in areas and target investment to grow these specialisms.

> **There are an estimated 640,000 FTE green jobs in the UK, growing at four times the pace of overall employment.[6] It is anticipated that one in five jobs will experience a shift in demand for skills linked to net zero.**

Heat Zones & Local Energy Planning: Accelerating the electrification of heat and the implementation of heat network zones whilst improving the energy performance of buildings

Spatial Planning: Reform of the planning system to enable renewables is underway. Local government can ensure that the local planning system and spatial plans enable the expansion of low-carbon infrastructure while consulting with local communities.[7]

Regional collaboration

Collaboration is already taking place across the NW region and we have identified other areas where further collaboration can help achieve scale.

Local Government Leadership: 35 councils in the NW have declared climate emergencies, developed carbon reduction plans and, in many cases, set net zero targets ahead of the national 2050 deadline.

> **The NW's aggregate timeline for decarbonisation is set for 2040, with public buildings leading the way by installing commercial heat pumps.**

Energy System Planning: In 2025, the National Energy System Operator is consulting with local government to develop Regional Energy Strategic Plans.

> **Local government can now demonstrate where investment in the power grid is most needed before major developments and secure strategic investment funding for growth zones.**

Public Awareness: Creating a cohesive approach to messaging and action around climate and a just transition across local government in the NW**.**

> **62% of the public (in the NW) want urgent action on the climate agenda.[8]**

Procurement routes: Local government contracts can mature the market and ensure the local supply chain is ready to participate in the rapid transition to a net zero energy system.

> **Around 3.2 million buildings in the NW require retrofit of a low-carbon heating solution.[9]**

Social Value: When public bodies procure projects, they can apply environmental aspects within the national social value framework.[10] All suppliers can be encouraged to develop sustainability and carbon management strategies.

Clean energy jobs: The NW is already home to leading technical colleges and training institutions that can be expanded to offer dedicated programmes in wind turbine maintenance, hydrogen production, battery technology, and energy efficiency solutions.

> **A sharp peak in workforce demand is rapidly approaching for the construction of onshore and offshore clean power projects, as well as CCUS and hydrogen infrastructure. In 2028, 35,000 full-time roles may be required, rising from a baseline of 20,000 in 2024. These are predominantly in the nuclear sector, which will also need to grow.[0]**

By embedding net zero skills into apprenticeships and retraining schemes, the region can future-proof its workforce and create thousands of new green jobs.

Commercialisation of innovation: The NW was the frontrunner in the industrial revolution and remains a centre for energy industry innovation. Devolved funding for business support and innovation can support the growth of low-carbon sector businesses and provide avenues for the commercialisation of market-ready solutions. This will enable businesses to enter into global supply chains and boost regional GVA.

Showcasing the investment opportunity:
NW political leadership and local government institutions can recognise the significant opportunity for private investment in the energy system and play an enabling role in attracting inward investment to the region.

The 10 Year Infrastructure Strategy and the Modern Industrial Strategy will provide substantial public investment in major infrastructure projects in the NW, and unlock private investment, including in transport, CCUS, hydrogen, long duration storage and nuclear.

The Great North is a mayoral-led partnership in the UK focused on boosting the economic impact and voice of the North of England.

North West of England Net Zero

Clean Power

By tracking the investment needed across different sectors, the region can partner and collaborate on promoting the green finance investment opportunity across the NW.

£ 2.6 BILLION

ONSHORE CLEAN POWER 2030

Connections Reforms, part of the Clean Power 2030 Action Plan, will organise grid connection queues at the transmission and distribution levels, unlocking investment to meet regional wind, solar and battery targets.

£ 12 BILLION

OFFSHORE WIND IRISH SEA

The Offshore Energy Alliance represents the marine energy opportunity in the NW and Wales, promoting a 7.5 GW regional portfolio and pipeline of offshore wind. Investment to build out the remaining opportunity is estimated to be worth up to £12 billion.

£ 10 BILLION

INDUSTRIAL DECARBONISATION, CLUSTER HYDROGEN & CCUS

Evidence from Net Zero NW highlights a near-term investment opportunity for industrial decarbonisation of which £10 billion is for CCUS, hydrogen and associated infrastructure.[11]

£ 11 BILLION

TIDAL RANGE POWER

The British Hydropower Association (BHA) recognises at least three potential tidal range projects in the NW, including the well-developed £3.5 billion Mersey Tidal Power scheme.

£ 16 BILLION

HEAT NETWORKS

Evidence from the national heat zoning model indicates the capital investment potential for heat network infrastructure in the NW is £16 billion.

£ 12.5 BILLION

BUILDINGS HEAT DECARBONISATION

Evidence from Display Energy Certificates for non-domestic buildings in the NW identifies the need for £15 billion of investment to implement low-carbon heating systems.

£ 2.5 BILLION

NUCLEAR POWER

Investment at Sizwell C through DCO requirements means that there will be £2.5bn invested in research and development in the NW.

£ 3.2 BILLION

ELECTRICITY DISTRIBUTION NETWORKS

Between 2025 and 2028, the distribution networks in the region plan to invest £3.2 billion to maintain the network and support the growing demand for electrification.[12]

GB Energy Local Power Plan

The Local Power Plan, supported by GB Energy and with potential financing from the National Wealth Fund, will enable local authorities and communities to invest in publicly owned decentralised clean power projects.

Public building renewables: GB Energy has announced £180 million of funding for investment in renewables in 2025, to be installed in schools and hospitals.[13] Mayors will receive discretion over the funds to develop priority projects.

The NW will be a priority in the first wave of GB Energy Local Power funding, receiving an initial investment of £39 million.[14]

Community ownership: The Local Power Plan will also support community groups with investing in energy assets and galvanising their local communities to act. They can also seek to secure benefits from privately developed projects.

Community-owned wind farms generate, on average, 34 times more financial benefit per megawatt installed for local communities than commercially owned wind farms.[15]

Community benefits: Communities can also seek benefits from privately developed projects. While community benefits from low-carbon projects are currently voluntary, onshore wind projects commonly offer £5,000 per MW annually, the UK government is consulting on making such contributions mandatory to ensure fairer, more consistent support for communities as part of the clean energy transition.[16] However, mandates cannot be implemented until 2029 at the earliest.

If all new large-scale wind and onshore solar projects developed in the North West for Clean Power 2030 contributed £5,000 per MW per year – matching the standard for onshore wind in Scotland – this could generate around £18 million annually for NW communities.

A North West local power plan

The NW can substantially contribute to the national local power plan of 8GW of local and community power by 2030.

1. Public sector renewables

The NW can develop over 1 GW of local power generation projects.[0] There is a significant opportunity for solar to be installed on the roofs of larger public buildings, as well as the potential for solar carports at public parking sites.

Several councils in the NW have developed large-scale solar schemes on public land, with more projects in the pipeline. Wind turbines in public ownership can be upgraded, and new large-scale schemes may be possible.

> **A scaling up of solar for local government in the NW can seek to blend grant funding with loan finance to deliver £500 million of investment in rooftop, car park and land-based solar power.**

2. Community energy

The North West Net Zero Hub (NWNZH) is supporting communities in developing locally owned renewable energy projects through the GB Energy Community Fund. There are 30 active projects and new groups are being supported.

> **Communities have demonstrated that they can install solar panels on the roofs of private businesses with both parties securing benefits.**

3. Flexible power

CP30 will rely on balancing the power grid on both the large and small scales. Local councils can invest in batteries on-site and host batteries on public land.

4. Heat pumps and heat networks

The electrification of heat in buildings must accelerate rapidly in the next decade. Public buildings are leading by example with commercial heat pumps. These buildings will also form the anchor for heat networks in heat zones in urban areas.

> **Installing heat pumps into 10% of public buildings and implementing heat networks could harness 425 GWh of thermal energy from the environment.**

5. Quality Warm homes

The Warm Homes Plan will invest £13.2 billion to upgrade homes across England, and the NW can continue to show leadership in delivering local authority and social housing schemes, and attract further funding from supplier-led Warm Homes Grants. Retrofit housing schemes, once established, can provide additional services such as local government and community-led energy advice programmes and incentive schemes for the able-to-pay and the private rented sector.

> **A significant portion of the Warm Homes Plan's £13.2 billion funding – covering energy efficiency and low-carbon heating – will be delivered through financial mechanisms such as grants and low-interest loans. Local government has a role in developing new delivery models for all housing types and tenures in their area.**

4. Supporting the willing-to-pay

Private investment will be needed to meet the CP30 targets. Bulk buy schemes, which have already proved successful in parts of the NW, can stimulate decentralised energy on the roofs of domestic properties.

> **Local government can help homeowners and businesses purchase solar power, batteries and heat pumps through bulk-buy and trusted trader schemes.**

Setting an ambitious target for local power

The North West can contribute over 1 GW of local power projects to the national Local Power target for 2030.

NW local power near-term investment potential:

£ 645 MILLION

PUBLIC SECTOR SOLAR POWER

£1.2 BILLION

PUBLIC BUILDING HEAT DECARBONISATION – HEAT PUMPS

£ 640 MILLION

HEAT NETWORK ANCHOR SCHEMES AND ADVANCED HEAT ZONES

£ 25.2 MILLION

COMMUNITY-OWNED ONSHORE ENERGY PROJECT PIPELINE

NW NET ZERO HUB – PUBLICLY LED PROJECT PIPELINE

As part of its technical and investment support programme, the North West Net Zero Hub tracks a pipeline of projects in development across each of the five subregions of the NW. The investment pipeline of projects that local governments are developing themselves or that they are partnering with private businesses **to deliver has a value of £2.2 billion. Overall the Hub tracks a £24 billion project pipeline.**

SEE ANNEX ONE FOR REGIONAL BREAKDOWNS

north west net zero hub

ABOUT THIS REPORT

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GMCA GREATER MANCHESTER COMBINED AUTHORITY

ENTERPRISING Cumbria PROMOTING LOCAL AND INCLUSIVE GROWTH

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Enterprise Cheshire + Warrington

PURPOSE OF REPORT

The purpose of this report is to provide a road map for the NW to localise the UK government's Local Power Plan. It aims to provide knowledge transfer across the public sector and raise awareness of good practice projects that support net zero in the NW.

ABOUT

This position paper has been published by the **North West Net Zero Hub** programme supported with funding from the **Department of Energy Security and Net Zero (DESNZ).**

*The **North West Net Zero Hub** is not liable for any decisions adopted by organisations based on the recommendations contained in this report.*

DUE DILIGENCE

This report has been reviewed and validated by:

REGEN

Information accurate as of 7 July 2025.

IN CONSULTATION WITH

- British Hydropower Association (BHA)
- Cadent
- National Energy System Operator
- Net Zero North West
- North West Business Leadership Team
- Norther Nuclear Alliance
- SP Energy Networks

CONTENTS

HOW TO READ THIS REPORT

The North West Local Power Plan Position Paper brings together information on essential decarbonisation themes into a single document. In order to provide structure to this, this report breaks down these key factors into three categories:

A. ECONOMIC FACTORS

Outlines the economic factors that can impact and are being developed to support net zero delivery.

B. KEY SECTORS

Highlights important sectors in our built and natural environment and the work going on to decarbonise them.

C. CROSS CUTTING

Describes issues that cut across every sector of Net Zero that need to be thought about across the board.

Each page is broken into three key areas for the topic being discussed:

POLICY & TRENDS

This section updates local stakeholders on national policy and trends relevant to the region.

IN DELIVERY

This section highlights current good practice that may be replicated elsewhere.

SCALING UP

This section outlines region wide action through partnership and collaboration.

NORTH WEST CONTEXT

The NW of England (NW) is home to around seven million people, and is the third most-populated region in the United Kingdom, after the South East and Greater London[17]. It has two major metropolitan areas and five cities outside of these.

The NW economy had a GVA of £220 billion in 2021 – about 9% of the UK's total GVA and the fastest growth of any UK region. The region was the home of the Industrial Revolution and retains a strong industrial base and world-class advanced manufacturing. Nearly 900 miles of coastline run from North Wales to Scotland[18].

Major transport corridors bisect the region, which welcomes 3.5 million international visitors annually. Around 70% of the NW region is classified as rural, and one-tenth of its inhabitants live in rural areas[19].

Local government in the NW comprises the ten metropolitan boroughs of Greater Manchester and the six of the Liverpool City Region, both coordinated through their respective Combined Authorities. Additionally, there are seven unitary authorities – three in Cheshire, two in Cumbria and two in Lancashire. Governance structures are evolving, with the potential for new combined authorities subject to devolution agreements with the UK government. This includes Lancashire County Council, an upper-tier authority overseeing 12 district councils, where further reorganisation is expected under the newly established Lancashire Combined County Authority.[20]

THE NORTH WEST ELECTRICITY CONTEXT

The energy system is rapidly transforming, with investment flowing into the NW. The region has a diverse and evolving power system that generates electricity from renewables, fossil fuels and nuclear power.

Renewable energy

- **Offshore wind:** 2.7 GW of offshore wind farms have been constructed in the Irish Sea[21], including the 659 MW Walney Extension and 90 MW Barrow Offshore Windfarm, with an additional 2 GW already in the development pipeline to make landfall in the NW.[22,23]
- **Onshore wind:** The NW has significantly more onshore wind deployment than other English regions, with 511 MW installed by 2025.[24] Some of the larger arrays include Frodsham (50 MW), Scout Moor (65 MW) and Liverpool Docks (10 MW).
- **Solar power**: As of 2025, the NW had over 920 MW of solar installed in the region from large-scale and rooftop installations.[2425]
  - By January 2025, 276 MW of solar power was installed from ground-mounted installations of 1 MW or above.[24]
  - By April 2025, the region had over 59,000 domestic, 9,000 small commercial and 10,000 larger non-domestic rooftop microgeneration systems, totalling c. 644 MW.[25]
- **Hydropower and tidal:** The NW hosts nearly 20 MW of hydropower capacity, including over 50 small-scale (defined as under 1 MW) river-based projects currently in operation. While no new hydropower or tidal projects have connected to the grid since 2021, four tidal range schemes have been proposed along the region's coastline.

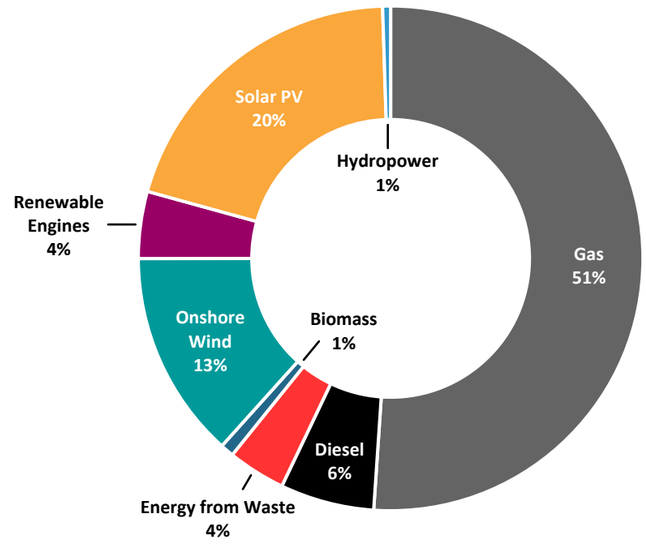
Fossil-fired power generation

- In 2020, the coal-fired power station at Fiddlers Ferry (Warrington) was retired, and the region is currently a net importer of electricity. [26]
- The role of Combined Cycle Gas Turbines (CCGT) at power stations like Carrington (Manchester) is evolving to provide power at times of peak demand when renewable generation is insufficient.

Nuclear power

- Heysham Power Station (Lancashire) significantly contributes to GB's low-carbon electricity supply. Since beginning operations in 1988, it has produced 540 TWh of electricity, equivalent to approximately 20 TWh per year, or 6% of GB's total electricity output in 2023.[27]
- Sellafield (Cumbria) is the historic home of nuclear generation and is now a world leader in decommissioning.

Baseline generation technology mix in the NW



Taken from FES 2023. Nuclear is excluded from regional Grid Supply Point (GSP) data because it is aggregated at the transmission system level.

A RAPID TRANSFORMATION FOR CLEAN POWER

The National Energy System Operator (NESO) has published Clean Power 2030.[28] NESO recommends that to meet a 2030 target for decarbonising power, annual offshore wind installations must increase by at least three times. Onshore wind installations will need to double, solar capacity will need to triple, and installations of all types of energy storage will need to increase significantly across GB.

Responding to this advice, the UK government released the Clean Power 2030 (CP30) Action Plan.

CP30 will require £40 billion in annual investment in clean power generation and flexibility between 2025 and 2030, alongside an additional £60 billion investment in energy networks.[29, 30]

Around 1.3 GW is needed in ENWL's and SPEN's distribution network licence areas. There is 420 MW under construction in the NW and a further 8 GW in planning.

This is just the start of a transformation of the energy system in the NW, which has the potential to rapidly decarbonise and become a net exporter of electricity again.

Fossil fuel consumption in heat and transport is anticipated to shift largely to electricity. While this shift brings innate energy efficiency savings due to the improved efficiencies of electric vehicles and electric heating systems compared to internal combustion engines and gas boilers, it will still drive an anticipated doubling in electricity demand by 2050.

SCALE OF THE CHALLENGE

But the scale of the challenge to decarbonise other heat, industry and transport sectors cannot be underestimated:

Natural gas for heating will need to be replaced in the 3,400,000 domestic properties in the NW. In 2023, 88% of homes were supplied by the gas grid in the NW.[31]

In the NW, 45% of homes require around £4,000 of investment to reach EPC A-C, while the remaining 55% – rated EPC D-G – face higher upgrade costs, ranging from £7,300 to £15,400.[32]

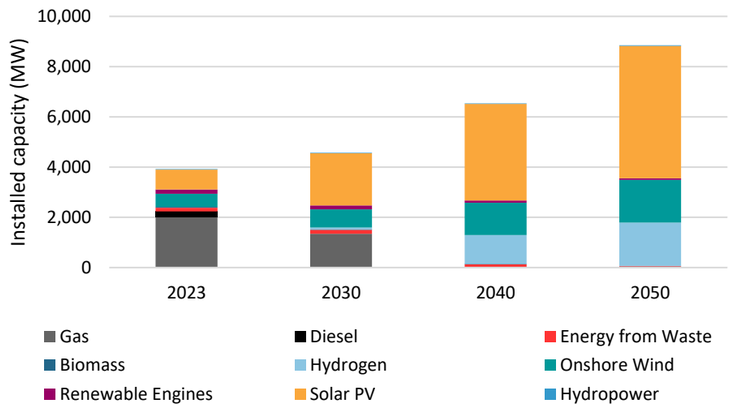
Only 55% of customers across ENWL's remit had smart meters installed by the end of 2024. Across the NW parts of SP Energy Networks remit 54% of customers have smart meters installed.

50% of commercial buildings must be converted to low-carbon heating solutions, including connections to heat networks in town centres.[33]

Using 2023 figures, 30 TWh of fossil gas combustion for industry will need to be replaced.[34] Where processes cannot be electrified, they can be substituted for low-carbon fuels like hydrogen or by capturing carbon emissions.

High-grade agricultural land is not generally suitable for solar installations, however NW research into Agrivoltaics is demonstrating the in some cases there may are benefits to co-location of renewables with agricultural crops, grazing or greenhouses on lower grade land.

Projected generation technology mix in the NW by 2050



Taken from FES 2023 – Holistic Transistion scenario. Nuclear is excluded from from regional Grid Supply Point (GSP) data because it is aggregated at the transmission system level.

Four million private internal combustion engine (ICE) vehicles licensed in the NW will need to be replaced with ultra-low emission alternatives.[35] As of Q2 2024, there were 118,000 licensed ultra-low emission vehicles (ULEVs) in the region, representing nearly 3% of all registered vehicles.[36]

As of January 2025, the NW has the second fewest public EV chargers, with 66 per 100,000 – well below the UK average of 109 per 100,000. Of those NW chargers, only 20 per 100,000 are high-speed (50+ kW) – again, below the UK average of 21 per 100,000.[37]

NORTH WEST STATISTICS

NORTH WEST CARBON EMISSIONS BASELINE

The UK is committed to contributing to its Nationally Determined Contribution (NDC) to reduce emissions by 81% compared to 1990 levels by 2035.[38]

In 2022, the NW region was responsible for 10% of the total annual UK greenhouse gas (GHG) emissions,[39] having reduced it's emissions by 70% since 1990, mainly driven by shifts in the fuel mix for electricity generation.

Since 2005, every sector has experienced a decline in GHG emissions, with the domestic and commercial sectors seeing the most significant declines. Nevertheless, reducing the remaining emissions will likely be the most challenging.

The top two sectors, accounting for almost 50% of the NW Region's GHG emissions, are transport and domestic, followed by industry and agriculture, which account for another 30%.

The NW is connected via the transmission network to offshore wind in Scotland and the Irish Sea, with several landing points along its coastline. As a result, the region's monthly average carbon emissions from grid electricity are often significantly lower than the UK average – at times, by as much as 70% in 2024.[0] However, the carbon intensity of electricity remains a matter of national, rather than regional, significance.

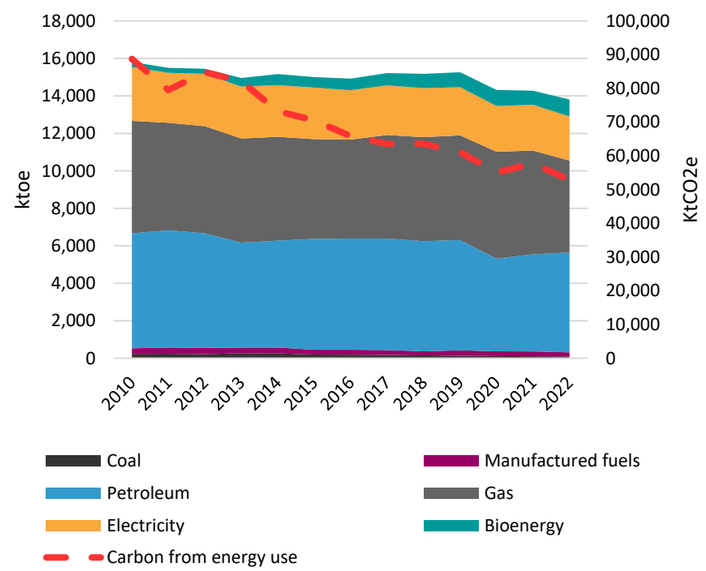
Sectoral emissions – fuels overview

Within the top emitting sectors, natural gas constitutes the primary source of emissions for both domestic (70%) and industrial (34%) activities. Following natural gas, electricity consumption represents the second largest contributor to emissions within the domestic sector. Conversely, the commercial sector exhibits a different emission profile, with electricity consumption being the largest contributor (54%), followed by natural gas (39%).

NORTH WEST ENERGY USAGE BASELINE

The NW's annual energy use is 160 TWh, which is 11% of the national energy use. Gas and petroleum are the two major fuel sources in the NW.

Energy consumption against carbon emissions in the NW



Between 2020 and 2023, there was a 24% rise in installed solar PV capacity, equating to a 23% rise in electricity generation from solar.[40] No development in hydropower, onshore or offshore wind capacity has resulted in steady fluctuations in generation capacity, depending on yearly weather patterns.

While electricity accounts for 17% of NW energy consumption, there will be an increasing reliance on electricity in the future.

The Seventh Carbon Budget states that by 2040, electrification and low-carbon electricity supply are expected to deliver 60% of the emissions reductions required by our pathway, constituting the most significant single share.

In NW England and North Wales, the lower-voltage electricity networks are managed by Electricity North West Limited (ENWL) and ScottishPower Energy Networks (SPEN) (both part of the Iberdrola group). Between 2025 and 2028, the networks plan to invest £3.2 billion to maintain the network and support the growing demand for electrification.[41]

NW ENERGY SAVING AND ENERGY GENERATION POTENTIAL

The energy efficiency hierarchy recognises that the most cost-effective way to save energy is to avoid using it in the first place.

Reducing energy demand across society could cut annual carbon emissions by 15% and should be promoted as part of a broader cultural shift toward achieving net zero. [42]

Further energy efficiency savings are possible through improvements to building fabric, system performance, refurbishment and replacement. National scenarios for net zero usually assume that a reduction of more than a third in energy demands can be achieved economically.

Low-carbon technologies can satisfy remaining energy demands. There is considerable scope to expand clean power generation across the NW, as demonstrated by reviewing past evidence of the region's renewable generation potential.

NORTH WEST POWER POTENTIAL

PLANNING QUEUE & CONNECTIONS REFORM

Connections Reform has established regional 2030 and 2035 transmission and distribution network targets for onshore wind, solar power and battery energy storage systems (BESS).

2030 CONNECTIONS TARGETS - DISTRIBUTION[43]

DNO	ONSHORE WIND (MW)	SOLAR POWER (MW)
Installed today	**502.4**	**564**
SPEN CP30 targets*	**700**	**1,500**
ENWL CP30 targets	**1,000**	**1,500**
Total CP2030 targets (both DNOs)	**1,700**	**3,000**
Total queue (both DNOs)	**409**	**2,950**
Of which in planning	**2.6**	**500**
Of which planning granted	**0**	**246**

***SPEN data covers Cheshire and Merseyside**

Deployment of onshore wind capacity remains at an early stage relative to CP30 goals, but is anticipated to advance following a change in onshore wind planning policy in 2040. The current installed capacity represents less than 30% of the 2030 target for onshore wind. Although several projects are in the connection queue, only a small proportion has progressed to the planning phase.

Solar deployment is in a stronger position, with the connection queue nearly equivalent to the 2030 target. While the current installed capacity remains well below target, continued support through the planning and permitting pipeline is essential to translate this potential into operational capacity.

BESS deployment is already nearing the CP2030 target, with 428 MW operational. Notably, the volume in planning (8,550 MW) far exceeds the 2030 requirement by over eight times.

POTENTIAL FOR RENEWABLES BY EACH TECHNOLOGY

The Future Energy Scenarios (FES), published annually by NESO, allocates estimated generation potential to each region of the UK across four scenarios. The Holistic Transition scenario balances electrification for most uses and the reliance on other fuels to decarbonise the economy.

Several studies have been conducted in the NW to show the potential for renewable energy development in the region. While potential development opportunity often far outstrips the actual need for the region's contribution to net zero, it's useful to highlight the extent to which viable opportunities are available.

The table below shows current installed capacity in the NW, along with future estimated capacity from the FES Holistic Transition figures, for comparison with other studies.

Technology	MW - Today	FES 2025 - Holistic Transition*	MW - Potential*
Domestic Solar	564	4,279*	2,522***
Commercial Solar			
Solar on Land	0		324,714
Onshore Wind	502.4	1,053*	32,079***
Offshore Wind	2,700	n/a	n/a
Tidal Range	0	n/a	8,000***
Hydropower (River)[0]	19.4	n/a	13***
Nuclear	0.5	n/a	n/a
BESS	427.9	7,010*	n/a

***Includes data from ENWL and SPEN DFES workbooks**

****Total CP30 figures for D3, 25% of D5 based on approximate land area**

***** Based on NW Renewable Capacity Study 2010 (NW Regional Development Agency), supported by other published evidence and with updates and additional technologies calculated by NW Net Zero Hub. (File Notes, NW Clean Power Plan, June 2025)**

LOCAL POWER

Great British Energy's Local Power Plan aims to support local authorities and communities to develop and own clean energy assets, with a national target of 8 GW.

The NW can contribute over 1 GW of local power projects to the national Local Power target for 2030.

Larger public sector buildings in the NW have sufficient roof space to host approximately 1 GW of solar power.[0] In the near term, the most cost-effective opportunities can be prioritised to support the development of 500 MW of projects. This could include:

- Several councils in the NW have developed large-scale solar schemes on low-value public land, with more projects in the pipeline and identified in screening studies. 150 MW is a reasonable near-term ambition.
- There is also an opportunity to harness solar energy from solar carports on public land, as demonstrated by Salford City Council's anticipated installation of solar carports at the council's Turnpike Depot and Swindon Hall Road Depot.
- The public sector in the NW currently operates many small to medium-sized wind turbines, with significant potential for upgrading these and adding other large-scale projects on public land. These could contribute to clean power targets.
- The public sector and regional utilities have land that can also host renewable infrastructure. A link can be made with the ambition for communities to invest in locally-owned schemes.

A. ECONOMIC FACTORS

This section outlines the economic factors that impact and are being developed to support net zero delivery.

Factors include:

- **A1- LOCAL GROWTH**
- **A2- RESIDENTS & COMMUNITES**
- **A3 BUSINESS SUPPORT**
- **A4- GREEN FINANCE**
- **A5- SPATIAL PLANNING**
- **A6- WORKFORCE & SKILLS**

ECONOMIC FACTORS:

A1. LOCAL GROWTH

POLICY AND TRENDS

The English Devolution White Paper sets the stage for further devolution of powers and budgets to local government, leading to the creation of more strategic authorities.[44] Additional resources to support the decarbonisation of the economy will be devolved to be managed by existing strategic authorities.

Greater Manchester has a Trailblazer Devolution Deal and Liverpool City Region is recognised as an Existing Strategic Devolved Authority.

Local areas will be invited to update Local Growth Plans (LPGs) as part of ongoing devolution deals with government. These plans outline short-term growth aspirations, initially looking at the 5-10 year horizon. They will assess the current state of the local economy – including GVA, productivity and labour market dynamics – and define strategic and effective interventions to achieve these.

Clean growth and net zero have long been recognised as important pillars of local growth within local industrial strategies. Invest 2035 is the UK's new national industrial strategy, a ten-year plan to encourage investment in high-growth sectors. In support of this, a statutory Industrial Strategy Council will be established. Clean energy industries are among the eight growth-driven sectors that will be prioritised.

IN DELIVERY

All sub-regions in the NW have a combined authority or intend to establish a strategic authority in this parliament. Devolution agreements, including measures for decarbonising the economy, are being negotiated across the region, with priority given to mayor-led strategic authorities in Cumbria and Cheshire and Warrington (mayors to be elected in 2026[45]) and the Combined County Authority in Lancashire, subject to council and government agreement in each case.

There is a business board for each of the five subregions of the NW. These boards are active in promoting economic growth and making recommendations to strategic authorities.

Local Growth Plans are a statutory requirement for mayoral combined authorities, making them particularly significant for the NW. With Greater Manchester and Liverpool City Region already progressing formal plans, and other areas set to gain mayoral status under devolution, the region is well-positioned for strategic development and stronger collaboration with the UK government.

In the NW, projects supported through devolved funding settlements currently in delivery aim to enhance community infrastructure, skills training and the growth of Small and Medium-Sized Enterprises (SMEs). Clean growth is a cross-cutting aim.

Launched in April 2025, the Greater Manchester Integrated Settlement provides a single government funding pot and a systemwide vision to tackle inequalities, support communities and deliver environmental goals, complementing GMCA's Low-carbon Sector Plan, which promotes green sector growth.

Under the last government, the UK Shared Prosperity Fund (UK SPF, which replaced historic EU funding in 2022) aimed to reduce economic inequalities and promote local economic growth. Alongside the UK SPF, the Levelling Up Fund has provided capital funding for infrastructure projects such as regeneration and transport.

Liverpool City Region and Greater Manchester host ten investment zones.[46] They have been created to encourage economic regeneration and attract high-growth sectors. Investment Zones seek to attract clean energy, green tech and sustainable infrastructure.

The NW is also home to the Liverpool City Region Freeport, which will link several tax and customs sites to the Port of Liverpool, the UK's largest western-facing port, which handles 45% of trade from the United States.[47]

SCALING UP – LOCAL ACTIONS

1. **Ensure that net zero action is enabled through Devolution Agreements:** Establishing devolution in areas and deepening devolution agreements will enable the tools and mechanisms to address the local economy and growth tailored to each area's unique makeup.

2. **Business boards** can retain an ongoing interest in clean energy and the net zero agenda and make updates on net zero activity a returning item on their agendas.

3. **Harness local strategic investment:** Local government strategic investment programs, managed by combined authorities, can support businesses in energy and environmental goods and service supply chains to grow through investment in facilities and enabling infrastructure.

4. **Local partnerships for net zero:** To grow the local economy, deeper partnerships between industry, the public sector, the third sector, and academia can identify and promote local clusters of expertise. These clusters can unlock higher levels of productivity within regions and around investment zones and act as sector hubs, attracting and retaining talent.

5. **Attracting inward investment:** Areas can aim to attract and retain clean energy industries, including Foreign Direct Investment, which will allow them to develop and re-invest in their clusters and build an ecosystem of talent, new technologies and productivity.

ECONOMIC FACTORS:

A2. RESIDENTS & COMMUNITIES

POLICY AND TRENDS

DESNZ public attitudes tracker (2024) found that 80% of people said they were very or fairly concerned about climate change.[48] Research by the NW Green Energy Taskforce identified a variety of demographics with different attitudes to the climate, highlighting that messaging must consider the cultural and political underpinnings of people's views.

The Climate Change Committee identifies that local authorities have a key role in the energy transition through direct control over buildings and fleets, procurement and commissioning, and place-shaping.[49] They are also critical in involving local communities while fostering a just transition – prominent principles across a range of UK government policy.

Housing decarbonisation is a key part of engagement for residents and communities. Early adopters of energy efficiency measures and low-carbon heating technology are entering the market. Still, this sector must grow to reach decarbonisation targets, understanding that homeowners, renters and landlords face barriers to large-scale change (e.g. finance, behavioural, knowledge and awareness). (See also RETROFIT, page 2121)

IN DELIVERY

The Climate Literacy Project began in Greater Manchester and is now an international framework for explaining fundamental climate concepts. Many public bodies in the NW have implemented climate literacy training for staff and leaders. Warrington Council for example have trained around 845 officers and 42 of the council members with more than 1,500 having completed online training.[50]

The NWNZH is supporting local communities to invest in energy assets and consider their role in local and place-based community net-zero pathways. Community projects can help reach local residents and promote further uptake. Many Community Energy Fund (CEF) projects administered in the NW include connecting with local residents, building awareness and fostering trust.

The NWNZH has supported a nationally significant innovation project to assess the economic and social benefits of small-scale retrofit, including communal heating for terraces of houses in Rossendale.[51] The project identifies the need to empower communities to implement schemes themselves.

Local authorities across the NW are engaging homeowners not eligible for grant funding through emerging 'able-to-pay' and 'willing-to-pay' schemes, which help with energy bills and support energy efficiency upgrades (see also RETROFIT, PAGE 232121). One-stop shops for retrofit consumer advice are also arising. For example, Your Home Better is a one-stop shop for retrofit in the Greater Manchester area. It connects the able-to-pay market to retrofit contractors who meet the government's quality standard (PAS:2035).

The NWNZH has piloted seven Local Energy Advice Demonstrator (LEAD) projects across the NW. Each project tests methods of providing in-person energy advice, supporting understanding of barriers for retrofit and finding solutions to improve uptake. While many projects are developing methods to support advice to vulnerable populations, some projects seek to address barriers for landlords in retrofit and provide advice for willing-to-pay customers working on home improvement projects.

SCALING UP – LOCAL ACTIONS

1. **Climate literacy:** Advocacy from senior leaders, coupled with education and support for councillors and frontline staff, will help local government to be proactive, have difficult conversations, and make decisions with climate action at the fore.

2. **Community net zero pathways:** Local government can support active local communities' ambitions to act on the climate agenda and enable less active communities to engage and participate. Views of wider communities should be considered to ensure that places benefit from investment in new energy infrastructure.

3. **National campaigns made local:** Local government can amplify national campaigns by leveraging trusted local voices and tailoring messages to reflect community priorities – promoting behaviour change, cultural shifts, and the transition from fossil fuels to low-carbon alternatives – in ways that deliver the most significant benefits, especially for households in fuel poverty.

4. **Community energy investment:** Local government can drive local investment in energy efficiency through 'willing-to-pay' schemes and consumer advice, while also delivering upgrades and low-carbon heating via the Warm Homes: Local Grant.

5. **Public consultation:** Interventions in housing, energy networks and transport that will impact individuals' daily lives should be communicated in advance and consulted upon where the impact is significant. Decisions and policies should be linked to opportunity and quality of life.

SCALING UP – REGIONAL COLLABORATION

1. **Informing public opinion:** Sharing knowledge on climate risk, the need for change, and the benefits of climate action (e.g., health, and finance) can create a local citizenry that advocates for and embraces change. This can be supported through regional playbooks that provide factual information that helps dispel myths.

ECONOMIC FACTORS:

A3. BUSINESS SUPPORT

POLICY AND TRENDS

Larger businesses must measure and report on their carbon emissions. Recent legislation on business accounting practices now requires reporting on Environmental and Social Governance (ESG) at the boardroom level.

Small and Medium Enterprises (SMEs) do not need to report on environmental impacts. However, there are now incentives for those involved in or looking to access supply chain opportunities to provide this information. For SMEs, most business support projects focus on the benefits of action, including efficient processes, reducing costs, meeting customer expectations, attracting good staff, supply chain requirements and accessing new markets.

The UK Climate Business Climate Hub highlights that research shows 90% of SMEs are keen to tackle climate change but find it difficult to know how or where to start to find the right solutions to reduce their carbon footprint.[52]

The ECIU reports that the low-carbon tech sector has grown at 8% or more since 2008 and grew globally at 10% last year. In the most recent stats of 2021, exporting of such tech grew 67% against a market standard of 6%.[0]

IN DELIVERY

There are 840 large businesses (>250 employees) registered in the NW. Over 143,300 SMEs are based in the NW of England, of which 62% are micro-businesses employing less than four people.[53]

Local Growth Hubs are private sector partnerships led by local business boards and funded by the Department of Business and Trade. They support and improve business performance by enabling businesses to build their capacity and capability. [54]

Local programmes for business support in the NW include access to university facilities, academic expertise, commercialisation, grants, energy and waste audits, measuring carbon and implementing reduction plans.

Several schemes across the NW offer energy efficiency/net zero support for commercial businesses. Three examples include:

- RedCAT, the Lancashire Centre for Alternative Technologies, was established by the East Lancashire Chamber of Commerce to accelerate the commercialisation of low-carbon technologies. It provides financial support, facilitates R&D and fosters partnerships across regional and national bodies. Its network includes leading organisations such as Global Energy Systems, Fern Innovation and Emerson and Renwick.

- Cumbria LEP's targeted support has helped businesses transition towards cleaner energy. In 2021, free energy advice contributed to installing a 50 kW solar PV system and increased interest across the business community.[0] Building on this, 2022 Innovation and Decarbonisation grants supported projects like Burlington Stone's 300 kW solar array, generating 275,000 kWh annually.[0] The initiative highlights how practical support and strategic funding can accelerate low-carbon investment.

- Greater Manchester supports businesses through its Bee Net Zero programme[55] and GM Green Economy programme.

SCALING UP – LOCAL ACTIONS

1. **Environmental and social governance:** As reporting on ESG at the boardroom level becomes common practice, there is an opportunity to bring businesses together at the local level to share good practice.
2. **Net zero business practices:** Businesses will need to evolve by adopting sustainable practices, ranging from raising awareness of the benefits of net zero, to actively engaging employees in driving change, and implementing practical steps such as planning, taking action and securing finance.
3. **Business energy advice services:** Local programmes can help SMEs lower their energy use and cut costs on energy bills. Funding for advice to understand energy efficiency and low-carbon energy solutions can be aligned with capital funding and finance to implement measures.
4. **Building local supply chains for net zero advice:** Establish and promote locally based businesses that provide energy and environmental advice, making them visible and accessible to the wider business community.
5. **Seek to grow the low-carbon tech sector through targeted business support:** As part of business support, programmes building on strong track record.

SCALING UP – REGIONAL COLLABORATION

1. **Regional and national best practice:** Identifying and adopting best practices for areas looking to improve their offer and rolling out support in areas where low-carbon business support is currently lacking will ensure immediate scaling-up possibilities. Initiatives such as GMCA's 'Green Economy' and 'Energy Innovation Agency' are notable schemes.
2. **Regional collaboration on business support:** There is existing expertise and experience across the NW, with a broad range of support spread across many programmes. Developing collaborative programmes or subregional centres for support could simplify the landscape for service providers and businesses seeking support.

ECONOMIC FACTORS:

A4. GREEN FINANCE

POLICY AND TRENDS

The UK's transition to a net zero economy relies heavily on green finance. The Climate Change Committee (CCC) estimates that an average annual investment of £26 billion is needed between 2025 and 2050 to reach their Balanced Pathway: an emissions reduction pathway from 2025 to net zero by 2050.[56]

The UK government has laid out a comprehensive framework for green finance, focusing on mobilising investment in sustainable and resilient growth. For green finance to be effective, public sector funds must work alongside private investors, forming partnerships to scale up investment in clean development.

Backed by HM Treasury, the National Wealth Fund (NWF) has a budget of £27.8 billion to mobilise private investment in large-scale infrastructure projects through equity investments, loans and guarantees.[57] This includes £5.8 billion for carbon capture, green hydrogen, gigafactories, ports and green steel and £4 billion for local authority lending.

Great British Energy and Great British Energy – Nuclear are set to invest over £8.3 billion during this Parliament, including £4 billion in financial transaction capacity.

New regulatory frameworks, like Solvency UK, are being introduced in 2025 to create a more streamlined and flexible regulatory framework for insurance firms and pension funds, supporting competitiveness and growth. This change will open up greater opportunities for investment in clean energy, infrastructure, and a wider range of net zero projects.

IN DELIVERY

Over £200 billion of planned spending will support the NW to achieve net zero by 2040.[58] The investment pipelines for private development in different sectors are shown on p.36.

Metro Mayors and Combined Authorities are using powers and strategic funding to invest in the net zero transition:

Greater Manchester's Combined Authority (GMCA)'s commitment to becoming carbon-neutral by 2038 has been supported by a local green finance strategy, which includes investment in renewable energy, energy efficiency, and green transport. GMCA has partnered with the NWF to fund clean infrastructure projects, using both public and private sector capital. GMCA is part of the Local Net Zero Accelerator Programme to maximise private leverage into the estimated £64 billion of investment needed to reach net zero.[59]

The **Liverpool City Region**, under the leadership of Metro Mayor Steve Rotheram, is investing in green infrastructure projects, including sustainable transport and energy-efficient buildings. The region has used its devolved powers to introduce green finance initiatives such as low-carbon loans and green bonds to attract private capital to fund decarbonisation projects. The Liverpool City Region Combined Authority collaborates with national partners to secure investment funding that supports its green ambitions.

Cumbria, Cheshire and Warrington and **Lancashire** have recognised the importance of clean energy infrastructure and green finance in achieving their net-zero goals. For instance, Cumbria's energy transition projects, including offshore wind, could benefit from devolution by providing local control over finance mechanisms and enabling direct partnerships with private investors. Lancashire County Council has outlined its green finance approach, aiming to leverage private sector funding to decarbonise its infrastructure and energy systems.

The North West Net Zero Hub supports local authorities in developing investment cases and advancing projects toward investor readiness.

SCALING UP – LOCAL ACTIONS

1. **Stimulating private investment:** The private sector must be encouraged to participate in delivering net-zero projects. Combined authorities can support by understanding investor needs and aligning local interventions to fill gaps in the market.

2. **Build a project pipeline:** Sub-regions should continue to identify and build a pipeline of low-carbon projects that meet investor criteria, such as those aggregated by the NW Net Zero Hub.

3. **Engaging pension funds and insurers:** There is potential to work closely with Local Authority Pension Funds (LAPFF) and invest in regional green projects, ensuring that capital remains within the local economy while contributing to the national net-zero agenda. This localised focus can help unlock private sector financing for projects that might otherwise struggle to attract attention from larger, more distant investors. There is also the opportunity to partner with the Border to Coast Partnerships to align net-zero plans with local investment opportunities.

4. **Create an Investment Readiness Fund**: To increase the viability of local green projects, an Investment Readiness Fund (IRF) could be set up to support the development of business plans and project presentations for investors.

SCALING UP – REGIONAL COLLABORATION

1. **A NW investment tracker**: A regional investment framework can act as a prospectus to attract more private capital.

2. **Green Bonds** or **Green Finance Funds:** At the regional level, green bonds (particularly local climate bonds) or green finance funds could allow local authorities to raise capital to fund sustainable development projects. These could support renewable energy infrastructure, building retrofits or low-carbon transport systems, aligning with the local government's decarbonisation targets.

A5. SPATIAL PLANNING

POLICY AND TRENDS

The UK government's December 2024 update to the National Planning Policy Framework (NPPF) incorporates the 2050 net zero target, strengthens support for onshore wind and renewables, adjusts green belt land policies and reinstates housing targets to help deliver 1.5 million new homes. [60]

In line with NPPF changes, the UK government has announced that onshore wind projects above 100 MW in England will be reintroduced into the Nationally Significant Infrastructure Projects (NSIP) regime from spring 2025.[61] Onshore solar projects above 100 MW, data centres, laboratories, gigafactories and water projects will also be considered through the NSIP.

Amendments to the existing permitted development right for air source heat pumps for homes will align with the Warm Homes Plan and support uptake.[62]

The Devolution White Paper (Dec 2024) introduced a new mandatory mechanism for all areas in England, with or without a Strategic Authority, to produce a regional Spatial Development Strategy aligned with Local Growth Plans. They must also align these and any local area energy plans with Regional Energy Strategic Plans (RESPs; see B1: Energy Networks). [63]

The UK government's 10 Year Affordable Homes Programme will provide £39 billion investment for social and affordable housing and an additional £16 billion of public finance to leverage private investment and help build 500,000 new homes through finance provided by the National Housing Bank, managed by Homes England.[64]

Expected in Autumn 2025, the Future Homes Standard will strengthen alignment with net zero targets by requiring new homes to feature higher levels of insulation, enhanced ventilation, and low-carbon heating systems. The proposals also emphasise the need to develop and connect to heat networks for larger master-planned developments.

IN DELIVERY

Spatial planning strategies and frameworks can support integrating net zero infrastructure and local targets into the planning system.

The Liverpool City Region Spatial Development Strategy: A statutory planning document that will set out a framework for building and development across the LCR to 2040, covering housing, economy and infrastructure.[65]

The Greater Manchester Infrastructure Framework 2040 sets out key issues and priorities for the region's physical infrastructure.[66] It is a precursor document to the GMIS (Greater Manchester Infrastructure Strategy), which will address the key trends and impacts on infrastructure networks and create a vision for infrastructure for 2040.

Lancashire 2050: A collaborative, strategic framework for the county. This framework sets out eight priorities to create a shared vision for local authorities to align with in their own organisational plans.[67]

Cheshire and Warrington: The Sustainable and Inclusive Economic Strategy is out for consultation to be finalised by summer 2025.[68]

SCALING UP – LOCAL ACTIONS

Changes to the NPPF and recommendations in the Devolution White Paper can support existing activities across the NW, including:

1. **Develop next zero-compliant plans:** Local authorities can embed net zero compliance into Local Plans by setting standards for low-carbon development, supporting clean energy projects, safeguarding renewable sites and restricting high-carbon infrastructure. Plans can also prioritise infrastructure like public transport and EV charging, while encouraging community-led low-carbon initiatives.

2. **Promote onshore wind and solar opportunities:** Local authorities can align local and strategic plans to changes in consenting thresholds for onshore wind and solar PV. Strategic plans can unlock renewable energy opportunities, including community ownership.

3. **Collaborate and analyse opportunities spatially:** Spatial mapping, including using GIS (Geographic Information Systems), can support decision-making and collaboration of multiple inputs into strategic plans, e.g., energy and housing, integration of solar and wind opportunities, highlighting new development, and grid constraints.

4. **Promote net zero solutions on brownfield sites:** Local authorities can call for the early adoption of net zero standards on brownfield sites for new housing development ahead of the Future Homes Standard coming into effect, highlighting the need to avoid domestic retrofit in the future.

SCALING UP – REGIONAL COLLABORATION

1. **Convene wider stakeholders:** The government will publish additional guidance alongside the NPPF. Regional meetings to raise awareness can convene and engage with community, third sector, business and citizen organisations in the strategic planning processes.

ECONOMIC FACTORS:

A6. WORKFORCE & SKILLS

POLICY AND TRENDS

Alongside the Clean Energy 2030 Action Plan, an assessment of the clean energy skills challenge was published, and the Office for Clean Energy Jobs has been set up. [69] The report states that it is estimated that one in five jobs will experience a shift in demand for skills linked to net zero.

Many jobs must be reskilled to accommodate the transition from carbon-intensive industries to clean energy sectors. Significant growth areas are low-carbon energy, Carbon Capture, Use, and Storage (CCUS), hydrogen and transport (e.g. EV manufacturing).

Some key challenges to address the skills shortage cut across all clean energy sectors and include the increasing competition for qualified workers, raising awareness of green skills opportunities to young learners, promoting equality and diversity in new clean energy sectors, shortages in upskilling due to an ageing workforce and barriers to accessing training for those that seek out green skills courses.

Offshore Energies UK (OEUK) and RenewableUK, with support from the UK and Scottish governments, have launched the Energy Skills Passport – a digital platform designed to help workers transition across the UK's energy sector by recognising transferable skills between oil, gas and renewable industries.[70]

IN DELIVERY

DESNZ's Office of Clean Energy Jobs is funding Regional Skills Pilots to support access into clean energy careers. As one of four selected regions, Cheshire is leading a North West Skills Mapping Plan through Enterprise Cheshire and Warrington and Cheshire West and Chester Council. The project will identify clean energy workforce needs, align training with employer demand and help businesses secure talent required to stay competitive, supporting high-quality, future-proof job pathways and reinforcing the NW's role in industrial transformation. Initial findings are due mid-2025.[71]

The government funds Green Skills Bootcamps around the NW, including in Cheshire and Warrington, Liverpool City Region and Greater Manchester. These free, flexible courses allow people to build sector-specific skills, with training in low-carbon technologies.

In 2024, the Hub produced a North West Retrofit Skills Plan. This highlights the need for a skilled retrofit workforce across the region. The Plan evidenced the current supply chain challenge and provided five priority areas for action, including upskilling the existing workforce, growing the future workforce, increasing diversity in the workforce, building capability on the demand side and developing training capacity. The work also piloted projects with NW colleges to support the study. Similarly, Cosy Homes in Lancashire (CHiL – Blackpool Council) uses its retrofit grant funds to support local businesses in upskilling to provide retrofit services for its own programmes.

The Public Sector Low-carbon Skills Fund provides grants for public sector bodies to access skills and expertise to unlock heat decarbonisation on their estate. To date, organisations in the NW have received over £8 million from the skills fund, equating to 10% of the total fund.[72]

Local Skills Improvement Plans (LSIP) shape skills and training provision for the local economy and can include priorities on green skills. To respond to the LSIP's priorities, Local Skills Improvement Funding (LSIF) has been awarded to NW local authorities.

Construction and servicing of marine energy infrastructure offer high-value jobs. Bibby Liverpool City Region will construct a first-in-class electric Commissioning Service Operation Vessel (eCSOV), positioning the region at the forefront of the offshore wind walk-to-work market. This project will not only support skilled employment but also drive progress toward net zero in the maritime sector.

SCALING UP – LOCAL ACTIONS

1. **Local skills improvement plans:** Updated plans should reflect the region's implications of the Clean Energy 2030 Action Plan and the national assessment of clean energy skills challenges. Net Zero policy and delivery functions can support engagement with local supply chains to help Local Skills Improvement Plans teams prioritise relevant skills in evolving these plans.

2. **Securing training through local grant programmes**: Projects delivering net zero outcomes and relying on grant funding should seek to maximise the social value by ensuring that procurement supports green skills training of the local workforce. This should be embedded in social values frameworks, and good practice and outcomes can be shared.

SCALING UP – REGIONAL COLLABORATION

1. **A NW clean energy jobs plan:** The Hub can convene NW Skills representatives to consider the priorities for Clean Energy Jobs across the NW. The Hub can commission research in 2025 to identify the current strengths and specialisms across the region, alongside gaps in providing the clean energy workforce. This can build on the joint working established for retrofit skills and industrial decarbonisation workforce transition plans.

2. **Interventions for retrofit:** The region can seek to work with the Office of Clean Energy Jobs and the Department of Energy to implement priority actions in the NW Retrofit Skills Plan.

3. **Workforce for industrial decarbonisation:** The NW can reindustrialise with new and renewed industries. Working with the Net Zero North West industry group, the region can seek to translate the pilot findings of the Regional Skills Plan to the wider region and to other clean energy sectors .

B. KEY SECTORS

This section highlights important sectors in our built and natural environment and the work ongoing to decarbonise them. Sectors include:

- **B1- THE ENERGY SYSTEM**
- **B2- HOME RETROFIT**
- **B3- BUILDINGS**
- **B4- INDUSTRY**
- **B4- TRANSPORT**
- **B5- MAJOR INFRASTRUCTURE**

KEY SECTORS:

B1. THE ENERGY SYSTEM

POLICY AND TRENDS

The Clean Power 2030 Action Plan aims to rapidly decarbonise the electricity supply, and a Great Grid Upgrade is underway, which will invest billions of pounds into the transmission network over the next decade.

The new energy system architect, the National Energy System Operator (NESO), will act as an independent body to advise the government on areas of priority for investment to help accelerate Great Britain's energy transition.

The NESO is establishing a function focusing on local requirements, which will be articulated in a Regional Energy Strategic Plan (RESP), including one for the NW. RESPs will create a clear plan for the energy system and the upgrades needed to reach net zero.

Connections Reforms, part of the Clean Power 2030 Action Plan, will organise grid connection queues at the transmission and distribution levels, aiming to bring forward projects ready to connect.

The 10-Year Infrastructure Strategy proposes faster grid connections through a new "connections accelerator service" and a package of regulatory and planning reforms designed to unlock development.

IN DELIVERY

Evidence has been provided to the NESO of the need for urgent investment in the Mersey Ring and other parts of the Electricity Transmission Network in the NW, with concerns that current timescales will not support regional decarbonisation targets.[73]

Local input to ENWL has supported the case for reinforcement of the Cumbria distribution ring, enabled by transmission upgrades at the Harker substation.

The NW Industrial Cluster can begin decarbonising through Hynet, a first-of-a-kind dedicated hydrogen supply and storage network connected to industrial consumers and a carbon capture network.

Developers will also have further opportunities to bid in auctions for dynamic system operation, flexible grid services and smart micro-grids.

Greater Manchester local authorities and Lancaster City Council have published LAEPs for their regions, with other areas building capacity to develop plans.

The NWNZH is undertaking work on behalf of all Hubs to develop an approach for local authorities to procure LAEPs and other spatial and temporal advice.

The NWNZH is also preparing work to enable local government in England to be ready for RESPs in 2025 by supporting them in gathering the most significant information and data needed for this process.

By the end of 2024, 66% of electricity meters across the UK were smart or advanced across both domestic and non-domestic sectors.[74] In the NW uptake lags, with only 55% of customers in Electricity North West's distribution area having a smart meter installed.[75] While DESNZ estimates that smart meters can cut average household electricity use by 3% and gas use by 2.2%, the national rollout has lost momentum, with installations falling 15% in 2023 from their 2018 peak. [76]

SCALING UP – LOCAL ACTIONS

1. **Build local government capacity to evidence grid needs:** Upper tier authorities will have an ongoing role to evidence growth in electricity demand from major developments and net zero programmes so they can provide information on a periodic basis to DNOs and NESO.

2. **Establish local energy planning processes:** Areas of the NW can develop LAEPs or Local Net Zero Plans to be ready to highlight their investment needs to the RESP, with the hub developing tools to support them.

3. **Identify large-scale renewable sites:** Sites appropriate for large-scale renewable generation and energy storage can be identified to create an investable pipeline of projects.

4. **Identify public sites**: Local authorities can identify sites for public sector investment in distributed generation, electric vehicle charging and low-carbon heat projects, and work with the energy networks to determine available capacity.

5. **Distributed storage and flexibility:** Areas can develop the evidence base for investment in distributed storage and local flexibility.

SCALING UP – REGIONAL COLLABORATION

1. **Create consistent data and information:** The NW can collaborate to deliver consistent input to NESO on the development of the RESP, including coordinating and consolidating the necessary data to support it.

2. **Engage with NESO, DNOs and National Grid Energy Transmission (NGET):** The NW can highlight the need for investment in the transmission network to unlock major developments and infrastructure projects.

KEY SECTORS:

B2. RETROFIT

POLICY AND TRENDS

As part of the Warm Homes Plan, the UK government has committed £13.2 billion to household energy efficiency measures, heat pumps and other low-carbon technologies, such as solar PV and batteries. With an aim to help cut household energy bills by up to £600, the funding supports fuel poverty schemes and other schemes such as the Boiler Upgrade Scheme (BUS).[77] Warm Homes: Local Grant and Warm Homes: Social Housing Fund programmes have commenced in April 2025 and are three-year programmes.

The Domestic Minimum Energy Efficiency Standard (MEES) sets a minimum energy efficiency level for private rented properties. By 2030, landlords will be required to advertise properties at EPC C or better unless exempt. Support for landlords is anticipated to help enable this.

The Energy Company Obligation (ECO) legally obliges larger energy suppliers to deliver energy efficiency measures to eligible households. The current scheme, ECO4, is worth £4 billion and includes local authorities as key partners for identifying and channelling support in their areas. The Great British Insulation Scheme (GBIS) provides further support to households already eligible for ECO4 while expanding support to many of those not able to receive help under existing government schemes.

NHS National Institute for Health and Care Excellence (NICE) recognises that poorly insulated homes impact residents' health and well-being, and retrofitting can reduce reliance on health services.[78]

IN DELIVERY

The NW has 16% of England's fuel-poor homes despite 13% of the population.[79] Around half of households earn under £30,000 a year. Approximately 88% of homes across the NW are on the gas grid[80] and will need a low-carbon heating system.[81] Across the NW, the proportion of all households that are EPC A-C has increased from 10% in 2008 to 45% in 2020.

GMCA has published Retrofit GM, a programme focused on improving the energy efficiency of homes and buildings in the area to support its 2038 carbon-neutral target. The programme has focused on boosting the skills pipeline, improving access to funding and finance and speeding up delivery. GMCA's Integrated Settlement also contains an Outcomes Framework 2025- 2026 pillar focusing on retrofit.[82]

LCRCA has been awarded funding for the Local Authority Retrofit Accelerator (LARA) through MCS Foundation to produce a local retrofit strategy.[83] Cheshire and Warrington completed a Home Decarbonisation Review in 2024.[84]

Blackpool Council runs Cosy Homes in Lancashire (CHiL) for local authorities across Lancashire, building a strong local supply chain through only working with local businesses.

The NW has a strong regional delivery model for local authority retrofit, with subregional consortia operating throughout. Since 2020, the NW has been awarded £480 million to Warm Homes, LAD, HUG and SHDF grant programmes. The NW spent 25-30% of the national programme in LAD2, with strong delivery by LCRCA and CHiL.

The NWNZH has supported NW procurement routes for retrofit, including the Procure Plus DPS in 2021. In 2025, GMCA will launch the Go Neutral Housing Retrofit Framework. Local procurement options can allow more of the local supply chain to enter large programmes and allow contractors to better link with training and apprenticeships.

Local government recognises the need to support private investment in retrofit through 'able-to-pay' schemes such as Your Home Better (GMCA) and Solar Together programmes in LCR and Cheshire & Warrington. (See RESIDENTS & COMMUNITIES, PAGE 1414).

SCALING UP – LOCAL ACTIONS

1. **Creating local place-based retrofit strategies:** Local government can create local strategies for domestic retrofit uptake. These strategies can consider grant funds, retrofit advice, skills and 'willing-to-pay' schemes.

2. **Preparing for devolution:** The English Devolution White Paper signals plans to devolve retrofit funding to combined authorities**.** GMCA will lead in 2025 with funding as part of the Trailblazer Devolution deal, with a further commitment for funding to LCRCA by 2028. Local authorities can learn from trailblazer deals and create plans for the devolution of retrofit funds.

3. **Support 'willing-to-pay' uptake of retrofit:** The BUS provides grants to households for heat pumps. Between 2022 and 2024, the scheme has supported nearly 3,000 properties in the NW.[85] Local government can support uptake across the region by educating residents and promoting what is available. Local government can support solar power, battery storage and heat pump bulk-buy schemes advertised to 'willing-to-pay' households.

4. **Improve health outcomes:** Two Public Health Intervention Responsive Studies Team (PHIRST) health studies are underway in the NW, evaluating health benefits of retrofit programmes in LCRCA and CHiL. Local authorities can work with the NHS to refer vulnerable households across schemes and promote outcomes to residents.

SCALING UP – REGIONAL COLLABORATION

1. **Foster regional collaboration** between subregional NW programmes to share best practice.

2. **Create data-driven evidence to drive uptake,** including archetyping and mapping to target funding and identifying the best approach for different localities and house types.

3. **Integrate skills and training with retrofit delivery:** Local authorities can support skills and training initiatives linked to retrofit programmes to address local supply chain capacity.

KEY SECTORS:

B3. NON-DOMESTIC BUILDINGS

POLICY AND TRENDS

The 10-Year Infrastructure Strategy recognises the importance of decarbonising heat in buildings. It is recognised that the public sector should lead by example in implementing heat decarbonisation. The previous government set a 2035 target to reduce carbon emissions from its estate by 75%.

The Public Sector Decarbonisation Scheme (PSDS) 2021-2026 will invest £1.4 billion in the public estate to reduce emissions, with the UK government's 2025 Spending Review reiterating strong commitments to decarbonisation. The 10-Year Infrastructure Strategy now points to public-private partnerships as a means to deliver heat decarbonisation projects. Heat pumps are envisaged as the chief technology for decarbonising buildings. Heat networks are recognised as a solution for heat for commercial buildings in zones of high demand. There will be a consultation on the use of hydrogen for heat at the end of 2025.

Commercial Buildings owned by large undertakings are subject to the Energy Savings Opportunity Scheme (ESOS).[86] This requires senior management to identify opportunities to improve their buildings' energy performance. Landlords renting properties must comply with MEES, with a 2030 target for properties marketed to new tenants to be EPC band C or better.

IN DELIVERY

In the NW, the public sector includes over 1,070 organisations, with approximately 51% in local government and administration, 43% in education and 3% in health and blue light services.[87] To decarbonise the public estate in the NW, up to £12.5 billion in investment will be required, which can support local jobs and business growth.

Since 2020, nearly £312 million of PSDS funding has been awarded to the public sector in the NW, of which £166 million has been awarded to local government and nearly £46 million to the NHS.[88] Greater Manchester Combined Authority was awarded £78 million in the first round of PSDS funding in 2021.

Liverpool City Region Combined Authority is leading a sub-regional consortium to deliver a public building investment programme, combining £35.8 million of national grant funding for heat decarbonisation, matched with local funds and loans, alongside a multi-million rooftop solar programme.[89]

Cheshire West and Chester Council has improved its leisure centres by installing low-carbon heating and LED lighting. In Cheshire East, heat pumps have been implemented in leisure centres in Northwich and Salt Ayre, demonstrating that heat pumps can operate in challenging sites.

In Cumbria, Eden District Council decarbonised the Town Hall building, and Lancashire district councils have assessed the business case for electrifying crematoria and are seeking to implement the first projects.

Over 530,000 private sector business premises in the NW will need to be decarbonised. Commercial buildings in the NW with roofs larger than 2,800 m^2 would be suitable for medium-sized solar panel arrays; these roofs could host an estimated 4 GW of solar.[0]

Incentivising investment in decarbonising heat in commercial buildings will rely on market mechanisms. Digital solutions to better manage demand and shift use away from peaks can help secure better energy tariffs and revenues from grid flexibility markets. Local energy markets which share power between buildings have the potential to avoid grid charges.

Display Energy Certificates (DEC) for public buildings indicate that the region will require approximately 1600 MW of installed low-carbon heating to replace natural gas heating. To contribute to public sector decarbonisation in aggregate across the NW by 2040 (as shown in Annex One), replacing 10% of natural gas heating systems by 2030 would entail the installation of 160 MW of low-carbon heat solutions and 425 GWh of heat captured from the environment from heat pumps or secondary heat sources.[0]

SCALING UP – LOCAL ACTIONS

1. **Align investment and plan for change:** Investment can be timed with estate management plans for renovation and retrofit, and the renewal of building energy services over the next 15 years. Authorities should develop heat decarbonisation and solar power plans for their estates. A portfolio approach can be developed, which may be supported by the NWF or private finance providers.

2. **Create business advice programmes:** Heating solutions for commercial buildings are sector-specific. Locally devolved funding for business energy advice and industrial energy innovation funds could support feasibility studies. This would help more energy-intensive businesses assess their options.

SCALING UP – REGIONAL COLLABORATION

1. **Identify opportunities for renewables and flexible power**: The Clean Power 2030 Action Plan calls for a fivefold growth in flexibility services to store power and heat. There is an opportunity to engage with public estates and commercial businesses to implement flexibility projects and generate revenues while making savings from costs avoided on DNO reserved capacity charges.

2. **Promote lessons learnt and best practices:** Those engaged in decarbonising public buildings can apply lessons to commercial buildings, which will build the local supply chains for assessors, designers and installers. For example, the investment case for the electrification of crematoria has been assessed for Lancashire and is widely applicable to crematoria across the region.

KEY SECTORS:

B4. INDUSTRY

POLICY AND TRENDS

In the 2025 UK government's Modern Industrial Strategy, eight priority sectors – collectively known as the "IS-8" – are identified. One of these is Clean Energy Industries, where business investment is projected to at least double to over £30 billion. In turn, the Clean Energy Industries Sector Plan signals a focus on frontier clean energy industries that have the greatest growth potential for the UK.[90] The NW is identified as a clean energy industry cluster with wind (onshore and offshore), CCUS, hydrogen, fission and fusion as frontier opportunities.

The Industrial Decarbonisation Strategy 2021 called for decarbonisation of industry to be anchored through investment in Net Zero Clusters, aiming for the first Net Zero Clusters by 2040. The 10-Year Infrastructure Strategy allocates £9.4 billion to Carbon Capture, Usage and Storage (CCUS) over the Spending Review period.[91]

British Industrial Competitiveness Scheme, set to launch in 2027, will reduce energy costs for 7,000 electricity-intensive businesses while maintaining the green levies that underpin the clean energy transition.

While the UK's seven major industrial clusters have been the primary focus of research and planning – such as in UKRI's *Enabling Net Zero* strategy – smaller, local industrial clusters have also received support through funding initiatives like the Local Industrial Decarbonisation Plans competition. Industrial Energy Transformation Fund[92] has previously committed £500 million to process efficiency with a further £163 million announced in the 2024 budget.[93]

IN DELIVERY

Net Zero North West is an industry group that advocates for joint action to implement place-based and sectoral decarbonisation plans and sponsors the Net Zero North West Industrial Cluster Plan.

The National Industrial Cluster Plan 2024, published by UK Research and Innovation (UKRI), was informed by the Net Zero North West Industrial Cluster Plan, which sets out how Hynet and others can anchor the wider decarbonisation of Industry in the NW.

Hynet is a track-one industrial cluster and portfolio of projects that has attracted £33 million of Innovation funding and a final investment decision of £2 billion, with expected £6 billion investment over the next 5-10 years. [94] Hynet is taking a phased approach with partners such as ENI, EET, Encyclis, Viridor and Heidelberg bringing forward investments. EETs Hydrogen Production Plant 2 can expand hydrogen production and provide opportunities for hydrogen to the city regions and for dispatchable power.[95]

Hydrogen projects around the NW have received significant government support. Grenian Hydrogen's St Helens project, HyNet's Hydrogen Production Plant HPP2 and Carlton Power's Trafford Green Hydrogen have all gained funding support through DESNZ's Net Zero Hydrogen Fund. Additionally, the Grenian Hydrogen St Helens and Trafford Green Hydrogen projects – alongside Carlton Power's Barrow Green Hydrogen project – have been successful in the UK government's Hydrogen Allocation Round.

Cadent, the gas network operator, has a wider hydrogen vision for the region. (see RESOURCES AND FUELS, page 32).

There are ambitious plans to develop Morcombe Net Zero for carbon storage of emissions from the Peaks Cluster.[96]

The NW is home to internationally significant investment in CCUS at Tata Steel at Northwich, as well as trials for the use of hydrogen in glass manufacturing at Glass Futures in St Helens. Bioenergy with Carbon Capture is an opportunity highlighted in the NW Cluster Plan.

SCALING UP – LOCAL ACTIONS

1. **Local industrial clusters** in the NW, with the support of local authorities, should commit resources to identify priority shared infrastructure and investment needs to enable decarbonisation. Industrial clusters and local industrial cluster plans can recognise the need for enabling infrastructure to share heat and power between buildings, as well as hydrogen and captured carbon. The NWNZH has identified the key industrial sites in the NW, where shared infrastructure will be needed.

2. **Supporting decarbonisation of industrial processes:** Local government in the NW is working with Net Zero North West and other industrial representative bodies to make a case for a coordinated programme to decarbonise industrial processes, leveraging the funding available through Industrial Energy Transformation Funds.

SCALING UP – REGIONAL COLLABORATION

1. **Build an evidence base:** Net Zero North West will operate with an expanded membership from 2025 and will seek to build the evidence base for investment in industrial decarbonisation, so that this can be shared with local government and energy network planners.

2. **Collaboration on enabling infrastructure.** The interdependence of infrastructure investment in CCUS, hydrogen and grid upgrades poses a strategic risk for the NW industry. It must align its investments in premises and processes with the timing of these critical energy supply developments.

KEY SECTORS:

B5. TRANSPORT

POLICY AND TRENDS

Accelerating the modal shift to active travel and public transport is the first strategic priority in the government's transport decarbonisation plan. The Spending Review has allocated £616 million to Active Travel England for the period 2026–2030, to support local authorities in developing and maintaining walking and cycling infrastructure.

NW city regions now have more devolved powers and funding to deliver integrated public and active transport networks, with more promised. Bus franchising powers will be rolled out to all local areas from 2025 onwards.

The second priority is decarbonising road transport, including the phase-out of all non-zero-emission vehicle types, from motorbikes to HGVs, by 2040.

The freight system will be decarbonised by investing in electrified railways to free up space for more rail freight and decarbonising road freight through mass-scale demonstrators like Zero Emission Road Freight (ZERF) trials.

In September 2023, the UK government announced that it had reached its target of funding at least 4,000 zero-emission buses, with more than 5,400 funded across the UK since 2020.[97] Rail policy states that the system will be net zero by 2050, with diesel-only trains removed by 2040 through electrification and battery trains. [98]

The government is trialling Clean Air Zones (CAZs) within urban areas to improve air quality, especially in areas with high levels of emissions from cars, trucks and buses.

IN DELIVERY

All five areas of the NW have developed Local Cycling and Walking Infrastructure Plans (LCWIPs). As part of the City Region Sustainable Transport Settlement (CRSTS), GM and LCR have received a total of £1.7bn to deliver integrated public and active transport networks.[99] Greater Manchester will next receive a £2.5 billion funding boost to unlock the UK's first fully integrated, zero-emission public transport network.[4]

As of January 2025, the NW has the second-fewest public EV chargers, with 66 per 100,000 – below the UK average of 109. NW local authorities have been allocated £51 million of Local Electric Vehicle Infrastructure Fund (LEVI) to expand local charging networks, with £5.5 million of investment currently in delivery.[100]

Transport for the North has led nationally on the creation of a Sub-national Transport Body Electric Vehicle Charging Infrastructure Framework, and has published the electric vehicle visualiser to help enable geographic planning.[101]

The Transport for the North Strategic Transport Plan emphasises the importance of rail electrification in reducing emissions from both passenger and freight services. The Transpennine Route Upgrade supports this by electrifying a major east–west line, while the Railway Industry Association promotes replacing older diesel units with battery-electric trains. However, despite recommendations, some network operators in the North are simultaneously investing in new diesel-electric trains alongside battery-electric units, indicating a continued reliance on diesel technology.

The NW has received £45 million in Zero Emission Bus Regional Areas (ZEBRA) funding to decarbonise bus fleets. As bus franchising powers are rolled out, all areas will be able to specify emissions standards for local bus fleets.

Public fleets providing waste collection and other services are ensuring that a rising percentage of vehicles are electric or otherwise low-emission, but council budgets, depot layouts and power supply constraints are slowing down uptake and impacting council net-zero targets.

SCALING UP – LOCAL ACTIONS

1. **Local electric vehicle infrastructure:** Local government has a crucial role in delivering LEVI projects to create local charging networks and must work with DNOs to identify the best sites to minimise grid impacts.
2. **Public fleet depot upgrades:** Long-term plans for electrical upgrades to depots for public sector fleets are vital to ensure they can continue to attract LEVI and other funding, while working with DNOs to mitigate grid impacts.
3. **Promoting active travel:** Collaboration between local areas and Active Travel England should ensure new active travel infrastructure is continuous, joined up, inclusive, and of high quality to support the shift to active travel.
4. **Dig once for net zero infrastructure:** Spatial planners can best use new bus franchising powers by sharing best practice and promoting parallel road and electrical infrastructure works.

SCALING UP – REGIONAL COLLABORATION

1. **Rail electrification through innovation:** Rail operators should explore opportunities to electrify rail through trackside batteries. A trackside battery is proposed for Eden Project Morecambe, to be supplied by local solar and off-peak electricity. This could also power EV charging and a proposed heat network in a heavily grid-constrained area.
2. **Modal shift to rail:** Expedite the delivery of Northern Powerhouse Rail, the Manchester to Liverpool railway and the new line to the West Midlands. These will shift intercity passenger traffic to electric trains and free up capacity on existing lines for commuter services and freight.
3. **Electrification of transport hubs:** The NW region should consider the need for multimodal transport decarbonisation hubs where grid reinforcement can support fast charging networks and alternative fuels.
4. **Community EV Charging Infrastructure:** Rural communities can act for themselves to benefit from shared ownership of charging infrastructure and operating car-pools. NW examples, such as Charge My Street, can be scaled up.

KEY SECTORS:

B6. MAJOR INFRASTRUCTURE

NATIONAL AND NORTH WEST POLICY & TRENDS

The UK government has an ambition for Great Britain to be supplied with Clean Power by 2030. The NESO has advised on a pathway to meet this ambition (CP2030).[102] The transmission network is undergoing a Great Grid Upgrade to ensure that power from offshore wind and other major energy supply infrastructure can be transmitted to demand areas across GB.

National Grid Electricity Transmission (NGET) is proposing to upgrade the Grid in Cumbria. NGET has identified the need to upgrade the Mersey Ring in its long-term plans, but is requesting further evidence that this needs to be accelerated for investment to occur before 2038.

Approximately 2.7 GW of offshore wind land onshore in the NW and North Wales.[103] Projects under development at Morgan and Mona will add an additional 3 GW. The Offshore Energy Alliance represents the interests of the offshore energy supply chain cluster for North Wales and North Wales.

Community investment is a core element of Project Collette, a proposed 1.2 GW offshore wind farm off the Cumbrian coast with a potential value of £3.33 billion.[0] As a pioneering part of a community-owned initiative, it will empower the local community to have a say in how a portion of the profits is used.

OFFSHORE WIND

The Regulated Asset Base (RAB) and Contracts for Difference (CfD) models fund clean energy projects like wind and solar. The RAB model has been effective for infrastructure such as gas and power networks, and there is potential for CfD funding to support projects in the Clean Power 2030 Action Plan. To date, 2.7 GW of offshore wind capacity is operational along the NW coast in the Irish Sea, with around one-third of that capacity supported by a CfD.[104]

Project name	Capacity (MW)	Operational
North Hoyle	60	2003
Barrow	90	2006
Burbo Bank	90	2007
Rhyl Flats	90	2009
Walney (Phase 1 & Phase 2)	367	2010
Ormonde	150	2012
West of Duddon Sands	389	2014
Gywnt y Môr	576	2015
Burbo Bank Extension*	258	2017
Walney Extension 3 & 4*	659	2018

***projects supported by a CfD**

Although the most recent offshore wind project in the Irish Sea became operational in 2018, multiple new projects are currently in the pipeline. These include Morgan and Mona wind farms (1.5 GW each) developed by BP and EnBW, and Morecambe wind farm (480 MW) by Flotation Energy and Grupo Cobra. Awel y Mor (>350 MW), being developed by a consortium led by RWE, has already received development consent.[105] These projects must obtain relevant licenses and consent before a CfD application can be submitted.

Great British Energy will invest £300 million to develop Offshore Wind Supply Chains in the UK.[106] The Crown Estate has pledged £400 million to support new infrastructure, including ports, supply chain manufacturing, and research and testing facilities.

TIDAL RANGE POWER

Mersey Tidal Power is the most advanced Tidal Range project in the UK, now in the public consultation phase. The British Hydro Association has provided data on potential schemes in the NW.[0] A scheme has also been proposed for the Duddon Estuary in Cumbria.

Project	Est. Cap. Ex. (£ billion)	GW
Mersey Tidal Power	3.5	0.7
Natural Energy Wyre (Fleetwood)	0.15	0.1
Northern Tidal Power Gateway (Morecombe)	8.5	7.8

LARGE-SCALE ONSHORE GENERATION

To date, 1.3 GW of onshore low-carbon generation is connected in the NW, including 345 MW of solar PV, 511 MW of onshore wind, and 21 MW of hydropower.[107] Of this capacity, three onshore renewable energy projects, all solar farms, have received a CfD.[108]

Project name	Capacity (MW)	CfD Round
Moss Lane Solar Farm	25	AR4
Lawns Solar Farm	20	AR5
Moorside Solar Farm	20	AR5

As of May 2025, 9.5 GW of onshore projects hold an accepted grid connection offer, with three solar farms (all >50 MW) progressing through their pre-application and pre-examination planning stages and an onshore wind farm under development.[109]

Grid connections reform, implemented in 2025 by the NESO, will mean that only projects ready and aligned with the Clean Power 2030 ambition will retain their place in the connection queue. This will ensure that grid capacity is allocated to projects most likely to be delivered in support of the government's clean power target.

NUCLEAR POWER

The 10-Year Infrastructure Strategy provides £14.2 billion for Sizewell C and over £2.5 billion to enable one of Europe's first Small Modular Reactor programmes. Rolls-Royce SMR has been selected as a preferred bidder to partner with Great British Energy – Nuclear.[0]

The civil nuclear sector has the largest economic impact on the North West of England. The industry supported around 1.6% of all regional output in 2024, contributing £4.2 billion to the North West's GVA in the same year.[110]

The Heysham 1 nuclear power plant will be operational until 2027, following a one-year life extension from EDF.[111] There is the opportunity for siting next-generation nuclear generation at sites on the NW coast.

The region's nuclear activities are largely dominated by ongoing decommissioning and waste management processes at Sellafield (the UK's largest nuclear site), as well as operations at the two Heysham plants. It also includes multiple fuel fabrication facilities, such as Urenco in Chester and Springfields in Lancashire, the Low Level Waste Repository, and four of the National Nuclear Laboratory's (NNL) six UK sites. Additionally, the Office of Nuclear Regulation is headquartered in Merseyside.[112]

The National Nuclear Laboratories headquarters is based in Birchwood Park, which also hosts organisations such as Amentum, Rolls-Royce SMR, Cavendish Nuclear and others – together forming a prominent cluster for nuclear science, engineering, R&D and supply chain activities

The University of Manchester hosts the Dalton Cumbrian Facility on the West Lakes Science Park near Whitehaven, as well as significant research at the University's Royce facility in Manchester. These institutions are driving innovation in the nuclear energy sector and have been recognised as key supply chain companies by the Northern Nuclear Alliance.

BATTERY ENERGY STORAGE SYSTEMS

According to the government's CP30 plans, c.30 GW of battery energy storage systems (BESS) are needed across distribution and transmission networks by 2030 to balance the power grid. Just over 1 GW is needed in ENWL and SPEN distribution network licence areas. In the NW, at least 5.8 GW are in planning, of which 420 MW are under construction.[0]

Large-scale battery energy storage systems are attracting investment around the NW. Varco Energy's 57 MW facility in Liverpool began full commercial operation in April 2025,[113] while Pulse Clean Energy's 42 MW system in Manchester has been operational since March 2025.[114] Looking ahead, Statera Energy, in partnership with Carlton Power, is developing a 680 MW BESS near Manchester, scheduled for energisation in 2026.[115]

OTHER APPLICATIONS

CP30 modelling highlights the need for low-carbon dispatchable power. This includes technologies such as hydrogen and CCUS, in addition to battery storage. As part of the NZNW Cluster Plan, Uniper concluded that the NW has a significant opportunity for the deployment of dispatchable low-carbon power generation – in particular, hydrogen.[116]

CP30 modelling also highlights the need for long-duration storage, which could include hydrogen CCGT. Sites in the NW exist that are well situated to connect to the transmission system.

Cheshire and Lancashire have geographic potential for hydrogen storage in salt caverns, which is the cheapest way to store hydrogen at scale, another option for LDES.

Major infrastructure projects, industrial production, CCUS, BESS and bioenergy with carbon capture and storage (BECCS) schemes all present opportunities for capturing heat to feed into the heat network zones that will emerge in urban centres and industrial parks (see HEAT, page 3030).

One example is Evero's two BECCS projects, which aim to demonstrate the removal of greenhouse gases from biomass after passing the deliverability assessment in October 2024.

SCALING UP – REGIONAL COLLABORATION

1. **Engaging with industry bodies to understand investment opportunities and associated workforce needs:** Collaborating with industry bodies, such as Net Zero North West, the Offshore Energy Alliance and the North West Nuclear Arc, can help unlock £50 billion in low-carbon investment opportunities and help align workforce planning with the NW's net zero ambitions.
2. **Clean Power 2030 for the NW:** Local government and business must work collectively to provide evidence to NESO and DNOs to ensure that transmission and distribution power networks are upgraded to coincide with short-term investment plans.
3. **Looking beyond 2030:** The region needs to gather evidence of the growth of electrical demand for heat and transport, as well as longer-term plans for major generation projects, to understand the future demand for electricity in the region. This can include mapping the opportunity for large-scale power generation and storage.
4. **Co-investment in major infrastructure:** A regional investment prospectus can highlight the opportunity for community, local government and pension fund investment in NW major infrastructure projects, including co-investing with GB Energy.

C. CROSS-CUTTING THEMES

This section describes issues that cut across every sector of net zero that need to be thought about across the board. Cross-cutting themes include:

- C1- **INNOVATION**
- C2- **RENEWABLES**
- C3- **HEAT**
- C4- **ENVIRONMENT**
- C5- **RESOURCES & FUELS**

CROSS-CUTTING:

C1. INNOVATION

POLICY AND TRENDS

This includes £500 million for the new R&D Missions Accelerator Programme – expected to leverage £1.5 billion in private investment – and at least £1 billion to scale up ARIA, the UK's high-risk, high-reward research agency. The strategy also signals significant additional funding to ensure the clean energy mission delivers growth across the UK.

The Net Zero Research and Innovation Framework outlines key net zero research and innovation challenges for the UK over the next 10 years. [117] A delivery framework for 2026-29 will be published soon.

The Local Innovation Partnerships Fund will focus research investment on local priorities and will provide up to £500 million.[118]

Innovate UK and UKRI lead in operationalising this strategy alongside other partners, including universities and other research organisations, charities, research translation organisations such as Catapults, public sector research establishments, and research and innovation institutes.

In the Modern Industrial Strategy, the UK government introduced £4 billion in scale-up funding through the British Business Bank, including the capacity to take equity stakes of up to £60 million, enhancing support for clean-tech companies and emerging green innovators.

IN DELIVERY

UKRI innovation funding invested in the NW was £671 million in 2022, 9% of the national total.[119]

World-leading academic research takes place in the NW of England. Universities in the NW have expertise relevant to the net zero agenda in the following areas but not limited to: Climate Science (Tyndal), Oceanography (University of Liverpool), Hydrogen (Man Met, Chester), Solar Power and Battery Storage (Sterling, Uol), Environmental Management (Lancashire), Material Science (LJMU), Internet of Things (Salford), Building Energy (Salford).

Academic institutions in the NW are educating the workforce to be ready for high-value jobs in services that will support the economy's transition, including business schools, financial services and marketing. Universities seek to collaborate with local government on innovation in governance and policy (such as the Heseltine Institute).

Innovate UK has funded Net Zero Living programmes in the NW that tackle non-technical barriers to locally driven decarbonisation. [120] Liverpool City Council, Rossendale and Blackpool are all running programmes. Greater Manchester Combined Authority has the Net Zero Accelerator.

Lancashire is home to the RedCAT programme, which provides a pathway of financial, and research and development (R&D) support to accelerate the commercialisation of low-carbon technologies. This fund has recently supported the expansion of a heat pump manufacturer.

Enterprise Cumbria has supported industry with the Innovating for Success programme, which has developed low-carbon plans for businesses and stimulated private investment in on-site solar power and plant and equipment upgrades.

Greater Manchester's Energy Innovation Agency identified local firms with innovations and seeks to create a roadmap for deployment and overcome market barriers.

SCALING UP – LOCAL ACTIONS

1. **Innovation support to SMEs:** Local programmes supporting SMEs can drive innovation on net zero by linking SMEs with academic researchers, enabling firms to access new markets, supporting certifications of products and services to recognised standards.
2. **Harnessing world-class research to local challenges:** Local government and business can work with academic institutions to focus research on place-based net zero solutions.
3. **Innovations in place and communities:** Communities are well-placed to develop innovative solutions, including models for funding and scaling up through community energy investment.
4. **Commercialisation of innovation:** The NW was the frontrunner in the industrial revolution and remains a centre for energy industry innovation. Devolved funding for business support and innovation can support the growth of low-carbon sector businesses and provide avenues for the commercialising of market-ready solutions. This will enable businesses to enter global supply chains and boost regional GVA.

SCALING UP – REGIONAL COLLABORATION

1. **Attract national innovation funding to the region** by recognising that the NW is at the forefront of decarbonisation and its strengths in innovation. At a national level, recognising national net zero targets as well as the pace of technological innovation, the UK's plan for growth focuses on infrastructure, skills and innovation.

   Collaboration for innovation: NW institutions can work collaboratively to create an innovation culture. Bringing together the whole ecosystem of businesses, government, R&D-performing organisations, finance providers, funders, international partners and others to support private sector innovation by making the most of the UK's research, development and innovation system.

CROSS-CUTTING:

C2. RENEWABLES

POLICY AND TRENDS

The UK government aims to install 8 GW of local and community-owned renewable energy through the Local Power Plan, supported through grants and low-cost community energy loans.[121]

The Modern Industrial Strategy commits to working closely with GB Energy to channel investment into community and utility-scale renewable projects, mobilise private capital into net zero infrastructure, and introduce targeted support for SMEs and clusters in disadvantaged regions. Further to this, GB Energy has announced £180 million of funding for renewables in 2025 to be installed in schools and hospitals, in which mayors will receive discretion over the funds to develop priority projects. The first wave of Local Power funding will invest £39 million in the NW.

The UK government has updated planning guidance to encourage the development of onshore wind projects and will revise the National Planning Policy Framework (NPPF) to encourage other large-scale power projects.

The Office of Gas and Electricity Markets (Ofgem) has changed the rules for connecting renewable schemes so that developers do not bear all the cost of reinforcement to enable connection to the power network.

Private wire and virtual power purchase agreements linking generation to energy users can improve the investment case for schemes. Local government and community projects in England have implemented these approaches.

IN DELIVERY

The NW Net Zero Hub is growing its capacity to map wind, solar, heat and grid constraints on behalf of local government. The Hub provides resources to local authorities to develop the business case for solar schemes on public buildings and solar car ports in public parking.

Local authorities across the NW have invested in ground-mounted solar schemes that supply power to their organisations through private wire or energy contracts. Other NW local authorities have identified sites.

Liverpool City Region, Greater Manchester, and Cheshire and Warrington have promoted group buying schemes for reduced-cost solar power for the able-to-pay residential market.

There is a £80 million GB Energy fund for 200 schools to receive solar panels across the UK, with 46 of these schools identified in the NW. Linked to this fund is the ambition to align contractors to work with FE colleges to promote careers in renewables.

GMCA has developed Powering our School to support schools in designing and purchasing solar systems, with the option for low-cost loans.[122] GMCA has also done work on engagement for low-carbon measures with “Your Home Better”.

Public sector decarbonisation programmes have installed solar as part of heat decarbonisation schemes. Low-cost loans have enabled grant funding to be matched.

The NWNZH, through its community energy fund, has supported communities in developing proposals for hydropower, heat pumps, and solar schemes, several of which have already been implemented.

Cumbria has potential for pumped hydro at Ullswater, the cheapest long-duration energy storage (LDES) method with co-benefits for flood risk reduction. British Hydro Association recommends that there is an opportunity for 13 MW of additional hydropower in the NW.[0]

SCALING UP – LOCAL ACTIONS

1. **Securing community benefits:** The UK government is consulting on mandating community benefits for new, larger renewable schemes in England. Communities and local government can aim to go beyond securing a share of revenues and seek to invest in new and existing privately owned schemes and attract private finance to public schemes.

2. **Connecting communities and local government:** Collaborations between community groups and public sector organisations can secure mutual benefits.

3. **Scaling up privately owned renewable generation:** Local government can support private businesses in identifying opportunities to invest in decentralised renewable power and heat projects. A NW council has pioneered public investment in solar power on the roofs of commercial premises.

SCALING UP – REGIONAL COLLABORATION

1. **Targeting 500 GW of publicly owned renewable generation before 2030:** In support of the GB Energy Local Power Plan, the NW can identify opportunities for solar power on public roofs, solar carports on parking sites and ground-mounted schemes on publicly owned land.

2. **Targeting 500 GW of publicly owned renewable heat before 2030:** The NW can recognise the free environmental thermal energy recovered through heat pumps as part of a local power plan for the NW, linking public building heat decarbonisation schemes with local power interventions.

3. **Scaling up community energy schemes:** The NW can grow the community energy sector through the community energy fund and wider support for the sector to mature. Project Collette represents a pioneering route to community ownership of offshore wind.

CROSS-CUTTING:

C3. HEAT

POLICY AND TRENDS

Heat electrification is key to domestic decarbonisation, and heat pumps will likely replace gas boilers to provide heat to most buildings in the UK. The supply chain must be expanded so that the industry can deliver 600,000 installations annually into domestic properties by 2028.[123] UK climate budgets require at least one in 10 households to have a heat pump or other low-carbon heating by 2030.[124]

The government has confirmed funding to grow the UK's heat pump manufacturing supply chains by amending the permitted development rights for heat pumps in the Warm Homes Plan.[125]

The Energy Act 2023 introduced heat zoning of high-density areas and gave local governments powers to implement heat zones where district heat networks are the optimal choice. [126] Green heat networks will rely on low-carbon technologies, waste heat from industry and utilities networks, heat that can be captured from the natural environment, and secondary sources of heat from the built environment.

Through the Heat Network Transformation Programme (HNTP), over half a billion pounds of funding is available to local authorities and other public sector organisations to anchor heat networks that will attract private delivery partners for zones.

IN DELIVERY

The Boiler Upgrade Scheme (BUS) provides grants to homes for installing heat pumps, and although wider demand is growing, less than 4,000 vouchers were redeemed in the NW as of March 2025.[127]

Lancashire County Council has funded small and medium enterprises to replace fossil systems with heat pumps. The Public Sector Decarbonisation Scheme (PSDS) has also been used to implement heat pumps in leisure centres, town halls and NHS estates. This funding aims to mainstream the implementation of heat pumps in commercial buildings.

As part of its Retrofit Skills Strategy, the NW Net Zero Hub has supported colleagues in the NW in investing in curriculum, teaching assets and facilities to engage trainers and students in the future of low-carbon heating solutions.

GMCA has partnered with a heat pump manufacturer to secure economies of scale in purchasing systems as part of large-scale retrofit programmes.

LCRCA and GMCA are part of advanced heat zoning pilots demonstrating heat networks' economic advantages in parts of urban and industrial areas. This aims to catalyse local government and private investments in district heating anchor schemes and provides a blueprint for delivering heat networks at scale. The Greater Manchester Heat Network Vision cites an ambition of decarbonising 36% of heat demand to be met by 2038 through heat networks, unlocking over £5 billion of investment.[128]

In Cheshire, Handforth Garden Village makes the case for building heat networks into new developments from the beginning of the project, ensuring that this key infrastructure can future-proof homes against the requirement of future retrofit and reducing the upfront capital investment of a heat network.

SCALING UP – LOCAL ACTIONS

1. **Growing the heat pump installation supply chain:** Local authorities can support their local low-carbon heat solutions installers by funding their upskilling through devolved skills funding and allowing them to participate in nationally funded programmes.
2. **Implementing heat network zones:** Zoning policy is likely to be implemented by the end of 2025; local authorities should continue to develop local evidence for heat network zones using national heat zoning data and support consultation with communities and businesses as part of local area energy plans.
3. **Supporting the heat transition in low-income households:** Local authorities can support low-income households by ensuring heat master planning is implemented into local strategic planning/investment plans. This can help identify potentially vulnerable households as part of area-based schemes.

SCALING UP – REGIONAL COLLABORATION

1. **Archetypes for heat solutions:** The NW has a wide range of housing stock, much of it historic and hard to treat. Further work is needed to understand the suitability of heat pumps to a proportion of the NW housing stock, where space and power grid constraints must be considered and where alternative solutions might be more viable.
2. **Understanding the role of heat storage:** Identifying where there are opportunities for heat storage via thermal batteries and shallow geothermal stores could unlock low-temperature heat networks and communal heat pumps in hard-to-retrofit and rural areas.
3. **Secondary heat:** Further work is needed to understand the availability of environmental, waste, and urban secondary heat sources so that heat decarbonisation plans can make the most of them. Creating partnerships in heat network zones with owners of industrial heat, data centres, sewage works, canals, and rivers will lower the cost of heat for consumers and make schemes attractive to investors.

CROSS-CUTTING:

C4. ENVIRONMENT

POLICY AND TRENDS

The Spending Review 2025 includes plans to invest more than £2.7 billion a year in sustainable farming and nature's recovery until 2029. This settlement also commits £4.2 billion over three years to 2029 to build and maintain flood defences, protecting communities across England from the dangers of flooding.

Biodiversity Net Gain (BNG) under the Environment Act (2021) is now in force and mandates that all new developments achieve a minimum of 10% net gain for biodiversity compared to pre-development levels. Developers can fund off-site BNG investment in activities to be managed and preserved for at least 30 years. The regulation incentivises investment in BNG within local authority areas.

Local nature recovery strategies are to identify where biodiversity funding from new development can be used to improve natural assets elsewhere in the geography.

As part of the National Peatland Strategy and the England Peat Action Plan, the UK government aims to restore at least 35,000 hectares of peatland by 2050 as part of climate and biodiversity goals. Damaged peat is a major source of UK Carbon Emissions. Peat restoration can sequester carbon and improve habitats. The ambition is to invest £200 million over 20 years.

Cheshire and Warrington's Sustainable and Inclusive Growth Economic Strategy (Consultation)[129] makes the link between economic growth and action on the environment, recommending 30% of land and sea to be connected and protected for nature's recovery by 2030.

IN DELIVERY

Local authorities in the NW have published local nature recovery strategies to support the delivery of the 25-year Environment Plan and the Environment Act 2021. These strategies provide a legal foundation for integrating nature-based Solutions (NbS) into local and regional planning.

Several local nature recovery strategies exist in the NW. GMCA's Local Nature Recovery Strategy focuses on urban greening, river valley restoration and enhancing biodiversity in dense urban areas. A key project is the expansion of the Greater Manchester Nature Recovery Network. Cheshire and Warrington's Nature Recovery Strategy consultation has recently closed, with results published in Autumn 2025.[130]

The Northern Forest Initiative is a collaborative tree planting initiative across Cheshire, Lancashire and Cumbria, supporting cooling, carbon sequestration and biodiversity enhancement. The Northern Forest & Community Forest Partnerships generate Woodland Carbon Units under the Woodland Carbon Code, and also support private sector commitments to carbon neutrality. In Cheshire and Merseyside, expanding the Mersey Forest is one of England's most significant urban forest initiatives. Mersey Forest leads the National DEFRA Trees for Climate programme.

The focus in Lancashire and South Cumbria is peatland restoration, woodland expansion, and wetland recovery. They also support biodiversity improvements in coastal and river catchments like the Ribble Estuary and marine and coastal biodiversity enhancements through partnerships like the Cumbria Coastal Strategy.

The Great North Bog represents over 90% of the upland peat in England and provides drinking water to 15 million properties.[131] Peatlands in the NW cover approximately 65,000 hectares. The NW has a key role in achieving the peat restoration target. The challenge is immense, as an estimated 80% of NW peatlands are degraded due to historical drainage, overgrazing, and peat extraction. Restored peatlands in the NW are eligible for carbon credits through the Peatland Code.[0] Projects in Cumbria and Lancashire are generating verified carbon credits by rewetting degraded peat.

SCALING UP – LOCAL ACTIONS

1. **Environmental awareness:** There is an opportunity through climate literacy to highlight the biodiversity and ecological crisis alongside the climate crisis. Resources can be focused at a local and community level, including primary and secondary schools.
2. **Financing nature recovery:** Emerging funding mechanisms should be identified and promoted to unlock green finance initiatives, particularly focused on nature recovery via nature-based solutions. Greater agri-focused green finance should be communicated to the farming community and estates to achieve sustainable agricultural practices.
3. **Corporate social responsibility (CSR) in support of the environment:** Private sector organisations can be encouraged to invest within their local environment to promote greater health and wellbeing benefits. CSR can be enacted throughout an organisation's operations and supply chains.
4. **The future of land use:** The UK government is consulting on land use and to scale up nature-based solutions – competing land use priorities must be better understood**,** such as balancing agriculture, development and conservation goals and the trade-offs.
5. **Community co-design:** Particularly in our rural areas, interventions require landowners to support solutions. Co-designing solutions with communities can create local ownership and accountability.

SCALING UP – REGIONAL COLLABORATION

1. **Attracting scaled investment:** Nature North has published a strategic investment plan for nature recovery in the North of England to promote nature recovery at scale. By 2040, Nature North's Strategy aims to increase biodiversity across key habitats by 30% and deliver tangible economic benefits, such as job creation and enhanced tourism revenue.

CROSS-CUTTING:

C5. RESOURCES AND FUELS

LAND USE

About 10% of the land in the North West is developed, with an additional 5% designated as residential gardens. Nearly 50% of the region is agricultural, while woodland covers just under 10%, and rough grassland and natural areas make up over 20%.

Undeveloped land in the NW has the potential to host large-scale solar and wind infrastructure, but several factors constrict this potential.

Solar and wind farms must be sufficiently far from developed land. Large parts of the NW are designated Areas of Outstanding Natural Beauty. High-grade agricultural land is not generally suitable for energy installations, but lower-grade agricultural land has been used for this purpose.

Research by Regen suggests that over 510,000 ha of land may be suitable for ground-mounted solar. (ANNEX ONE)

Proximity to the electricity grid is another significant factor which further constrains the opportunity. There is the potential to invest ahead of need in the grid to unlock areas of land for renewables.

Agrivoltaics has the benefits of co-location of renewables and agricultural crops, grazing and greenhouses. Lancaster University conducts world-class research on this topic and is building a demonstrator on the University's land adjacent to the M6. [132,133]

TRANSIT OF FUELS

The NW supplies approximately 40% to 50% of the UK's natural gas used for heating buildings and industrial processes, making it a key player in the UK's energy security.

Natural gas imports into the UK are a geopolitical issue. UK ports may develop increased capacity to import liquid natural gas and ammonia as a store of methane. There are considerable upstream emissions associated with global methane production that are not fully accounted for in the evaluation of the carbon impact of blue hydrogen production.

Drax has a significant presence in Liverpool through a biomass import terminal and a logistics agreement with Peel Ports. This allows Drax to import biomass fuel to power the Drax Power Station through the Port of Liverpool. Additionally, Drax has a contract with DB Cargo UK for the rail transport of biomass.

BIOMASS

The previous UK government published the Biomass Strategy in 2023.[134] This strategy sets out the role sustainable biomass can play in reaching net zero. The UK was one of the first countries to develop and use sustainability criteria for biomass across various sectors.

The strategy sets out that biomass uses that can produce negative emissions (i.e. those that capture and store CO2) should be prioritised in the long term to support the UK's net zero target. Biomass could still play a role in hard-to-decarbonise sectors that may not be able to universally deploy BECCS but have limited alternatives. However, relative demand is expected to be lower than BECCS usage.

The Northern Forest Initiative is a collaborative tree planting across Cheshire, Lancashire and Cumbria that supports cooling, carbon sequestration and biodiversity enhancement.

The Northern Forest & Community Forest Partnerships generate Woodland Carbon Units under the Woodland Carbon Code. The initiative also supports private sector commitments to carbon neutrality. In Cheshire and Merseyside, expanding the Mersey Forest is one of the largest urban forest initiatives in England.

BIOMETHANE

Cadent, the gas network operator for the NW, promotes biomethane as a potential direct replacement fuel for the existing gas infrastructure.[135] Cadent is exploring biomethane opportunities across the NW to help the UK reach its target of 30-40 TWh of biomethane production by 2050.

Enterprise Cheshire and Warrington has worked with local farmers to research the use of agricultural slurry for anaerobic digestion (AD).

The North West is home to around 1,500 dairy farms. Investing in AD systems that capture methane from cow slurry, along with gas upgraders to convert biogas into biomethane, offers a cost-effective way to produce renewable gas for industrial use or injection into the gas grid.

MARINE & AVIATION

National carbon emissions are allocated to each sub-region of the UK based on point of use. However, these statistics do not include emissions from the marine and aviation sectors and some very large industrial production sites. Local government can support national decarbonisation efforts by considering ways these emissions can be mitigated alongside others. The maritime sector is expected to reach net zero by 2050. Port Infrastructure will need to decarbonise, including shore power and facilities for hydrogen and ammonia.

A Green Shipping Corridor has been proposed between Liverpool and Belfast, making the NW a hub for research and innovation in maritime decarbonisation.

The Net Zero Strategy targets UK domestic aviation to reach net zero by 2040, with the rest of the industry reaching net zero by 2050. This is particularly important in the NW, with Manchester and Liverpool airports covering 22.7 million passengers, 21% of the UK's. The UK government is funding Sustainable Aviation Fuel research and production through the Advanced Fuels Fund. Fulcrum NorthPoint in Cheshire was awarded Green Skies Funding in 2022 for a direct link for sustainable fuels from Fulcrum and EET to Manchester Airport to open in 2027.[136]

HYDROGEN

Cadent published a North West Regional Hydrogen Vision in 2024, which states that industry will require nearly 50 TWh of low-carbon hydrogen production per annum by 2050, with a third of the region's current industrial energy demand forecast for a fuel switch to hydrogen. [137]

The NW is currently home to 18% of the UK's planned hydrogen production projects. This includes HyNet, which is a track one industrial cluster.[0]

HyNet aims to reduce emissions by one million tonnes of carbon dioxide a year.[138] The first phases of HyNet are estimated to create 6,000 local jobs and generate £17 billion in value for the local economy.

Spending Review 2025 confirmed £500 million for hydrogen infrastructure to enable the development of the first regional hydrogen transport network and store.[139] This includes funding for Merseyside alongside Teesside and Humber, with investment subject to an agreement with the UK government on the business case.

For Hynet, this would deliver Phase 1 and extend the Network to Carrington, part of the Phase 2 programme. Phase 3 in the mid-2030s would extend supply beyond Carrington and further into Greater Manchester, north as far as Preston and south into North Wales. The expanded network would facilitate the transportation of 35 TWh/yr of hydrogen to users, displacing 7.6 MT of CO2 each year by 2035.

Hydrogen may have other applications in the NW in transport, the built environment and the marine sectors. Twenty hydrogen buses have been trialled in Liverpool. Additionally, the UK government will make a decision on hydrogen for heating in 2026.

WATER INFRASTRUCTURE

Water utilities infrastructure is responsible for around 2% of national energy use. United Utilities (UU) is the regulated water and wastewater operator for all parts of the NW.

UU hosts electricity-generating assets on its land and purchases renewable electricity to meet the remaining requirements.[140] SEIT owns the renewable assets, and the portfolio includes over 60 MW of solar power, some floating on reservoirs, and some wind and hydro power. In 2022, assets sited on UU land generated 210 GWh of electricity, more than a quarter of their total electricity consumption.

Further solar could be constructed on 1, 000 hectares of land. UU previously considered developing a 10 MW wind farm at Denshaw Moor, but the project was cancelled[141].

UU's sustainability strategy 2024 highlights that 70% of their scope 1 emissions are associated with wastewater and sludge. [142] The company has a medium-term plan to optimise the wastewater process to reduce greenhouse gases and to implement advanced digestion of 60% of sludge processing in the short term. UU's processes capture biogas, which is either sold or used in Combined Heat and Power to drive the water purification process.

Sewage will play an important role in district heating as a source of low-cost, abstracted heat. Greater Manchester Combined Authority is pioneering a contractual arrangement with United Utilities to provide secondary heat from sewers into Heat Zones.

UU has innovated in the NW with a first-of-its-kind biogas-to-hydrogen pilot.[143] This project with Levidian demonstrates that an electro-magnetic wave process can create hydrogen to mix with gas to produce low-carbon blended gas for use in onsite generators, with carbon captured in the form of graphene, a material with an economic value and the potential to make the process revenue-positive. The company states there is a potential for UK sewage water to produce a very substantial 75,000 tonnes of hydrogen per year.

SCALING UP – REGIONAL COLLABORATION

1. **Mapping opportunities for solar and wind:** Building on previous work to screen land for solar and wind, local government in the NW should seek to work with NESO to understand where potential sites for solar and wind are currently constrained and identify how and where constraints might be overcome to meet Clean Power 2030 targets and future regional renewable generation requirements.
2. **Industrial byproducts for aviation fuel:** Several applications have been submitted by NW-based consortia into the Sustainable Aviation Fuels Competition. Sites in the NW can be co-located with industry so that industrial byproducts, including carbon dioxide, can be used as a fuel stock. A coordinated approach across the NW could make the most of the potential investment.
3. **Sustainable biomass:** Woodland in the NW is managed as a resource that can sequester carbon. It is also a potential source of sustainable biomass. Sustainable biomass is a limited resource, and a strategy to align regional demand with supply could determine if there is any export potential.
4. **Low-carbon hydrogen:** Building on work to understand the likely demand for green hydrogen in the Liverpool City Region, and the potential offered by a hydrogen supply networks connecting industrial sites, local government in the NW should work with NESO to develop a coordinated plan for the import and regional production of feedstocks and the production of low-carbon hydrogen, making the best use of waste streams and natural resources and seeking to avoiding importing of upstream carbon emissions from overseas production.
5. **Water management for energy and industry:** UU plans to invest in renewables and deploy its innovation budget to develop carbon sequestration solutions. Water is a scarce resource, and there will be increased demands on water use for industry in the NW – including where it is used to produce green hydrogen. UU is an important partner to be involved in whole system energy planning.

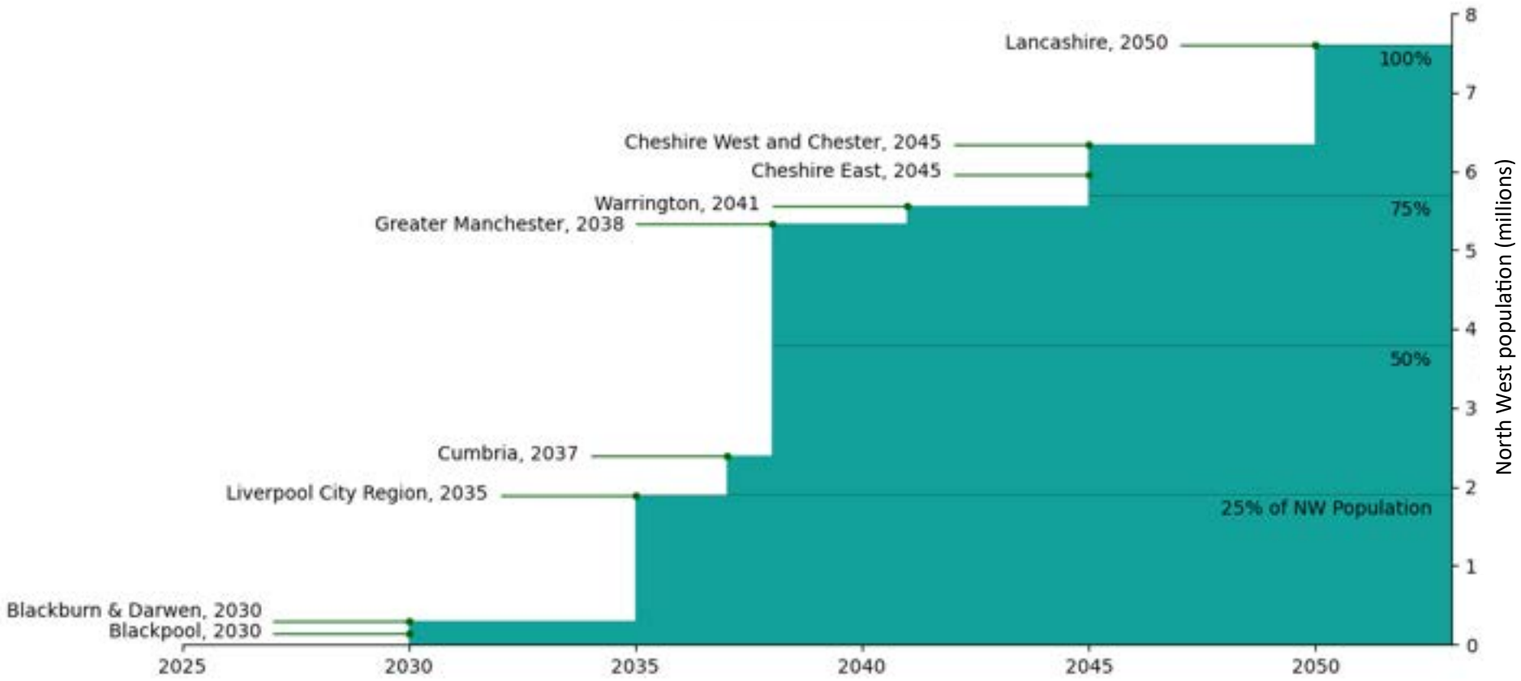
NORTH WEST

LOCAL POWER PLAN

ANNEXES

A1.1 NORTH WEST AGGREGATED NET ZERO TARGETS

How net zero commitments are set to unfold across the North West



In the North West, 35 councils have declared climate emergencies, developed carbon reduction plans and, in most cases, set net zero targets for their whole geography *ahead* of the national 2050 target set in the UK Climate Act.

The average target year across the North West, weighted by population, is 2040.

The median target year is 2038, meaning that – based on current commitments – at least half of the region's population is expected to be living in areas which have reached net zero by this point.

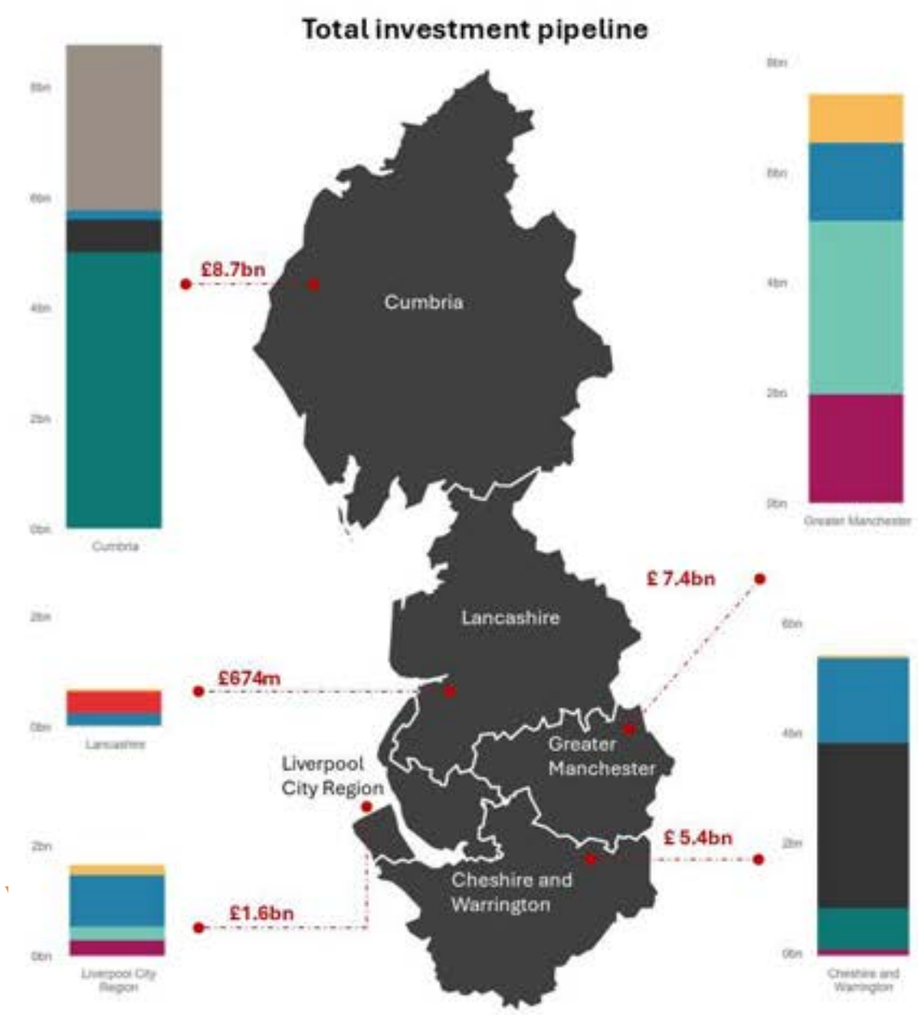
If current net zero targets are achieved, by 2038, over 70% of the North West's population will be in areas that have reached net zero.

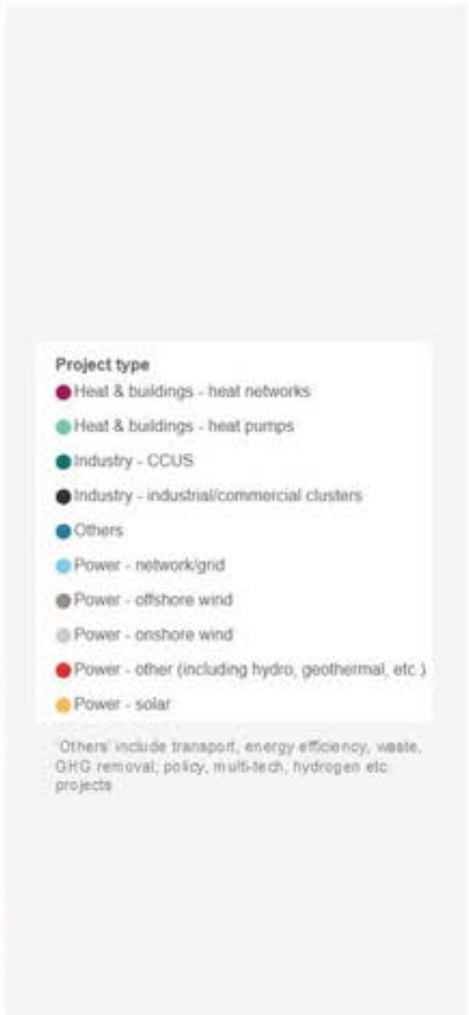
A1.2 NORTH WEST NET ZERO HUB INVESTMENT PIPELINE

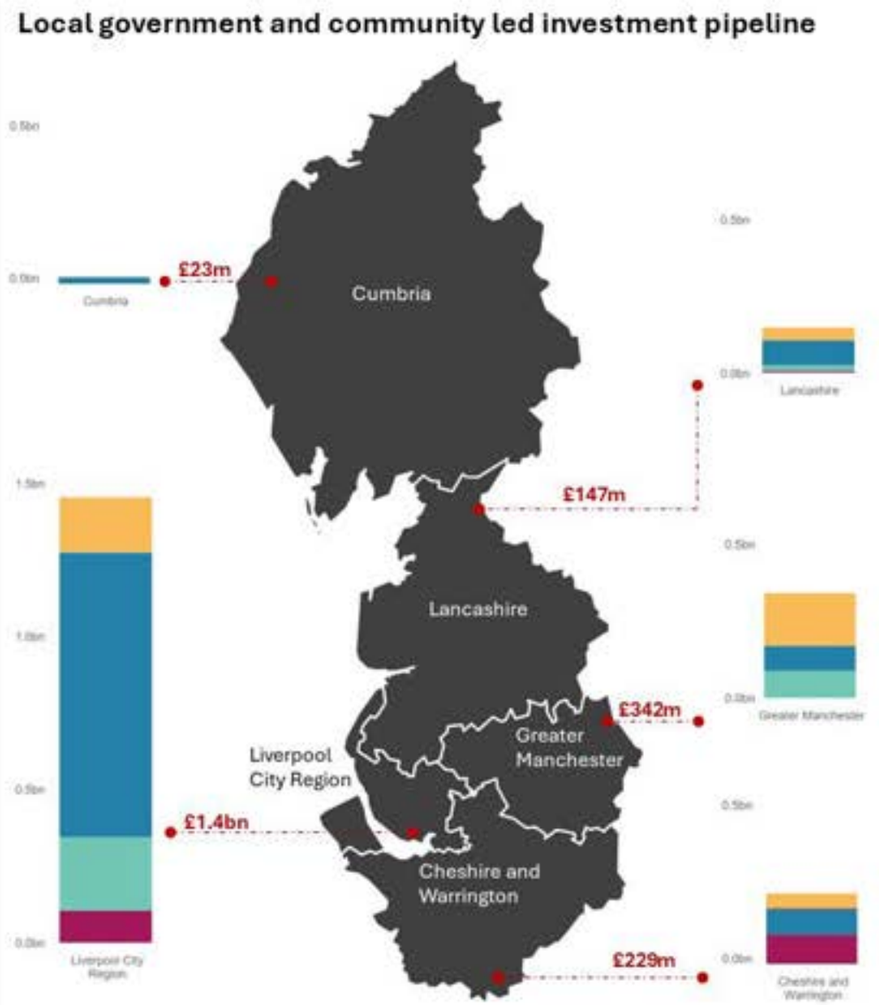
LOCAL GOVERNMENT & COMMUNITY LED NET ZERO INVESTMENT PIPELINE

As part of its technical and investment support programme, the North West Net Zero Hub monitors a pipeline of projects in development across all five subregions of the North West. The **total investment pipeline** tracked by the Hub is approximately £24 billion. Of this, around £2.2 billion represents **local government and community-led projects** – either developed directly by local authorities or in partnership with private sector partners.

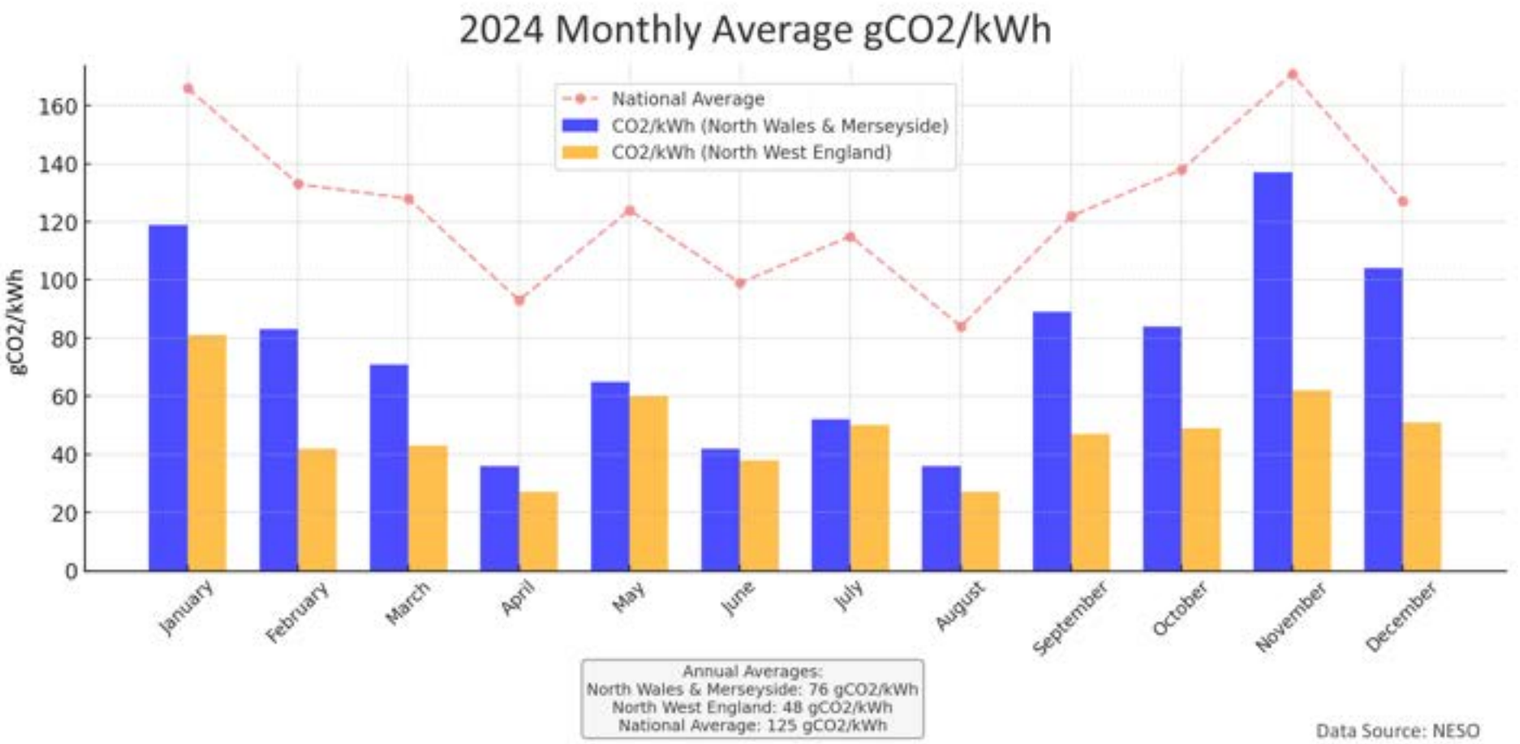
Additionally, the Hub actively supports over 30 active community-led energy projects seeking to raise investment from local communities for community-owned assets. The pipeline of live and well-developed projects has a capital value of £23 million.







A1.3 NORTH WEST OF ENGLAND GRID CARBON FACTOR



NORTH WEST OF ENGLAND GRID CARBON FACTOR

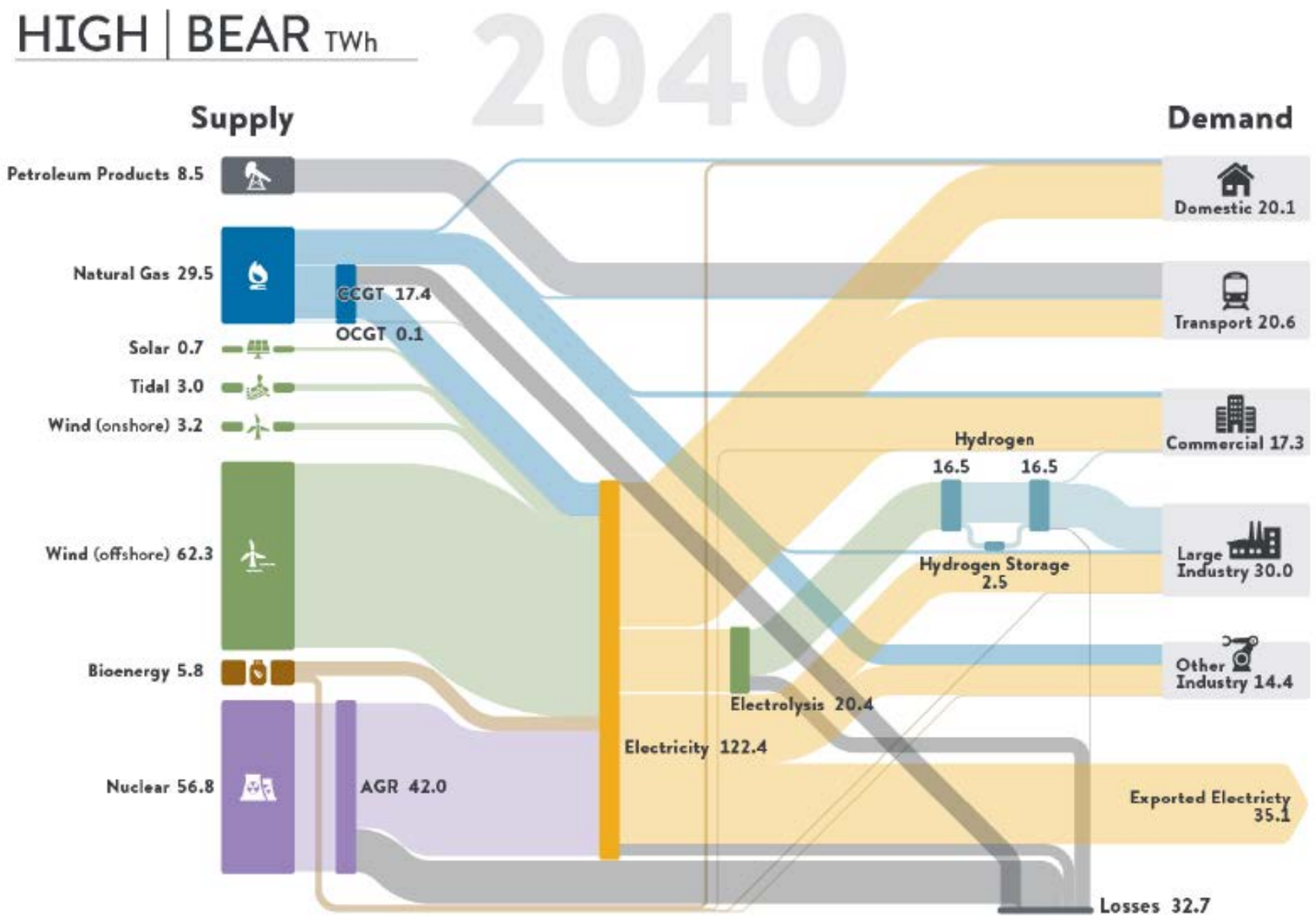
Research commissioned by the Net Zero Hub considered the grid carbon emission factor for the North West of England.

Grid carbon emissions vary in time depending on the mix of electricity sources feeding into the network. These are most often reported as an annual average national carbon factor, but more granular data is available from the NESO, aligned with Distribution Network Operator (DNO) Licence Areas.

The NW is connected via the transmission network to offshore wind in Scotland and the Irish Sea, with several landing points along its coastline. As a result, the region's monthly average carbon emissions from grid electricity are often significantly lower than the UK average – at times, by as much as 70% in 2024.[0]

However, the carbon intensity of electricity remains a matter of national, rather than regional, significance.

A1.4 NORTH WEST 2040 ENERGY SCENARIO



The NW2024 'High | Bear' scenario is a 'high efficiency, low hydrogen' scenario, following the NG FED Consumer Transformation assumptions for demand reductions. This scenario assumes strong efficiency improvements and major offshore wind expansion, leading to surplus electricity. The region is highly electrified, with low natural gas demand and excess electricity used for green hydrogen and export.

NORTH WEST OF ENGLAND 2040 FUEL MIX AND ENERGY DEMAND SCENARIO

Research commissioned by the Net Zero Hub in 2022 considered future scenarios for the mix of energy supply and energy demand in 2040.

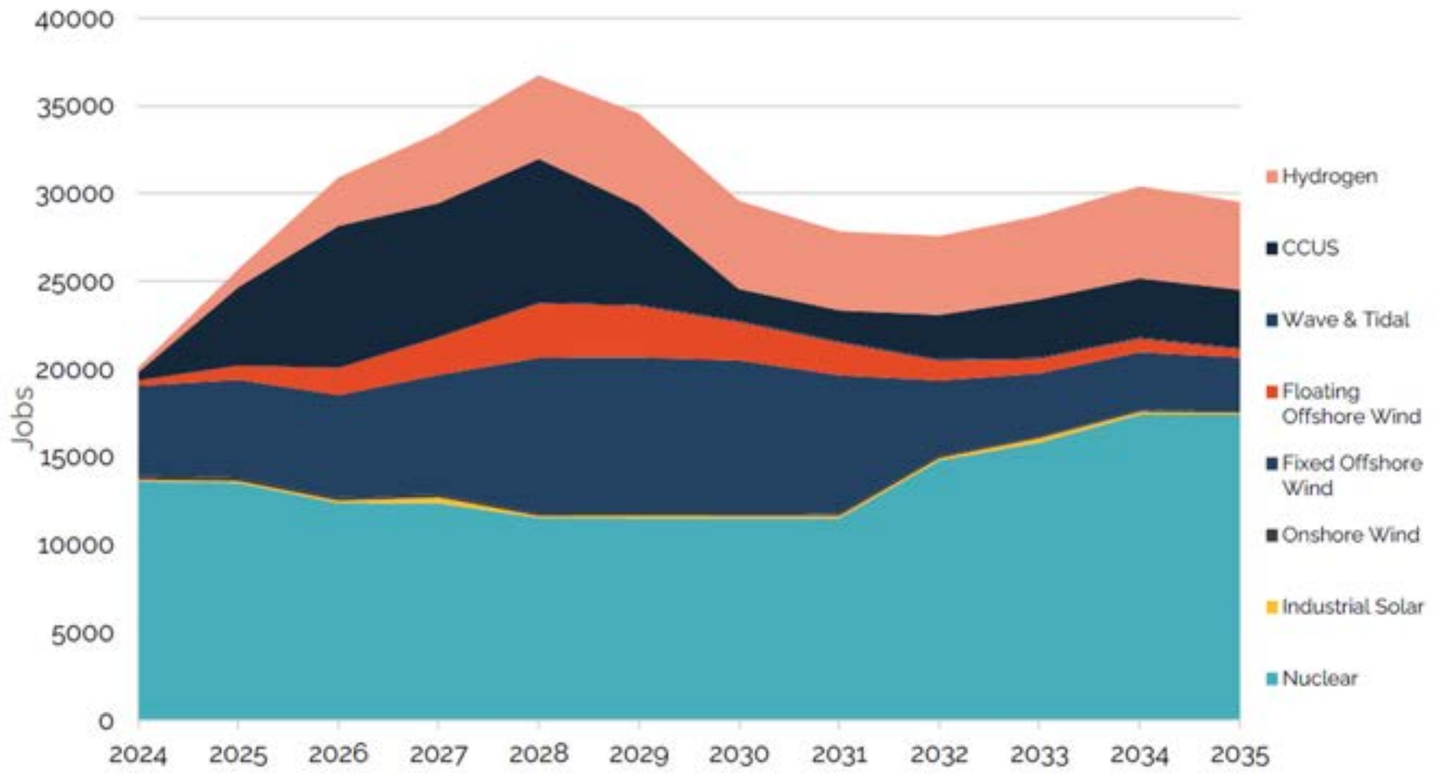
Uncertainty means that future scenarios are based on broad assumptions, and several of these have changed since the work was undertaken and the Clean Power 2030 Action Plan has been published.

The chart shown has been extracted from the report to show a potential scenario for 2040.

It is a scenario in which significant energy efficiency savings have been achieved across all demand sectors and electricity satisfies the majority of demand.

This chart is provided for illustrative purposes only of a scenario under which the NW would be energy self-sufficient.

A1.5 NORTH WEST WORKFORCE DEMAND TO 2035



Source: Available on request

WORKFORCE DEMAND NW TO 2035

Research undertaken by Enterprise Cheshire and Warrington with funding from the Office for Clean Energy Jobs via the North West Net Zero Hub, considered the coming peak in workforce demand.

There is work evidences a rapidly approaching peak in demand for workforce to construct clean power projects onshore and offshore, and for CCUS and hydrogen infrastructure. This work evidences a rapidly approaching peak in demand for workforce to construct clean power projects onshore and offshore, and for CCUS and hydrogen infrastructure. 35,000 full time roles may be required in 2028 up from a base in 2024 of 20,000 remains as predominantly in the nuclear sector which will also need to grow.

A1.6 SUB-REGIONAL DATA

Energy consumption by sector and fuel type

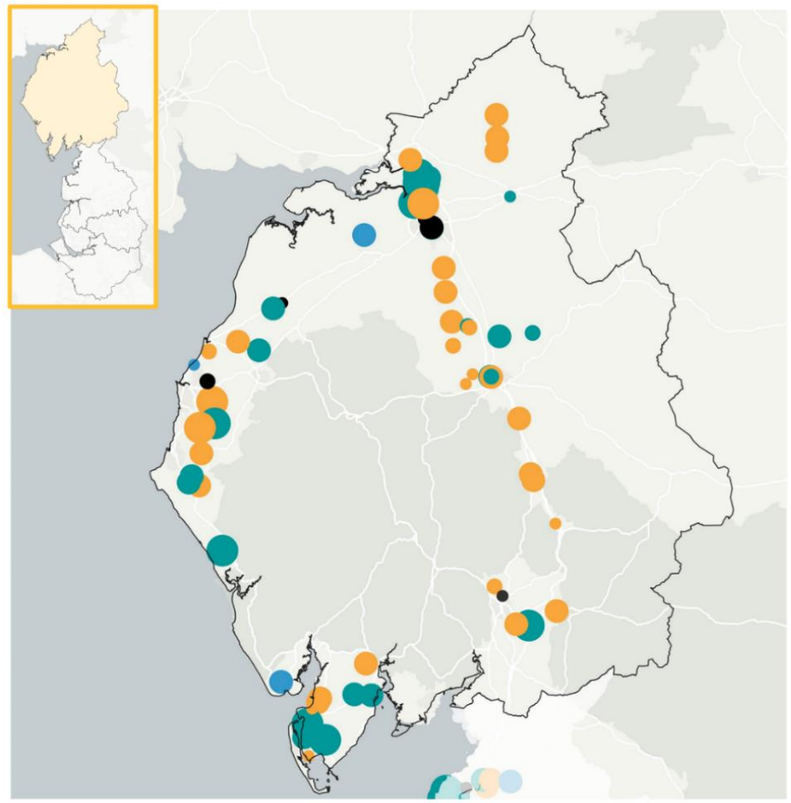
Other Fuel Categories not covered in the graphs

Fuel Type	Sum of Value in GWh
Bioenergy and wastes: Industrial and Commercial	2,740
Gas: Industrial, Commercial and other	2,512
Electricity: Industrial, Commercial and other	1,573
Petroleum: Public sector	29
Coal: Public sector	1
Total	**6,855**

*The column lengths in these charts can **only be compared within each sector**, not across different sectors.

Generation and storage baseline and pipeline capacities

(MW)	Battery storage	Fossil fuels	Hydropower	Solar PV	Onshore wind	Offshore wind	Other renewables
Baseline	61	286	10	65	217	611	24
Planning granted	1,219	-	-	31	1	-	-
Grid contracted	943	39	-	999	57	-	-



Pipeline Capacity

Technology

- Onshore wind
- Solar PV
- Battery storage
- Other renewables

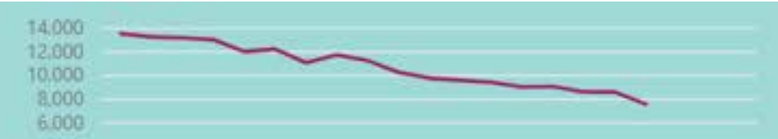
1 MW — >50 MW

*Size denotes scale

Note: only sites of 1 MW or above have been mapped

Pipeline capacities from DNO Embedded Capacity Registers and the Renewable Energy Planning Database

Cheshire and Warrington



GHG Emissions (2022)
(kt CO2e)
7,504

Energy Consumption (2022)
(GWh)
33,156

Energy consumption by sector and fuel type

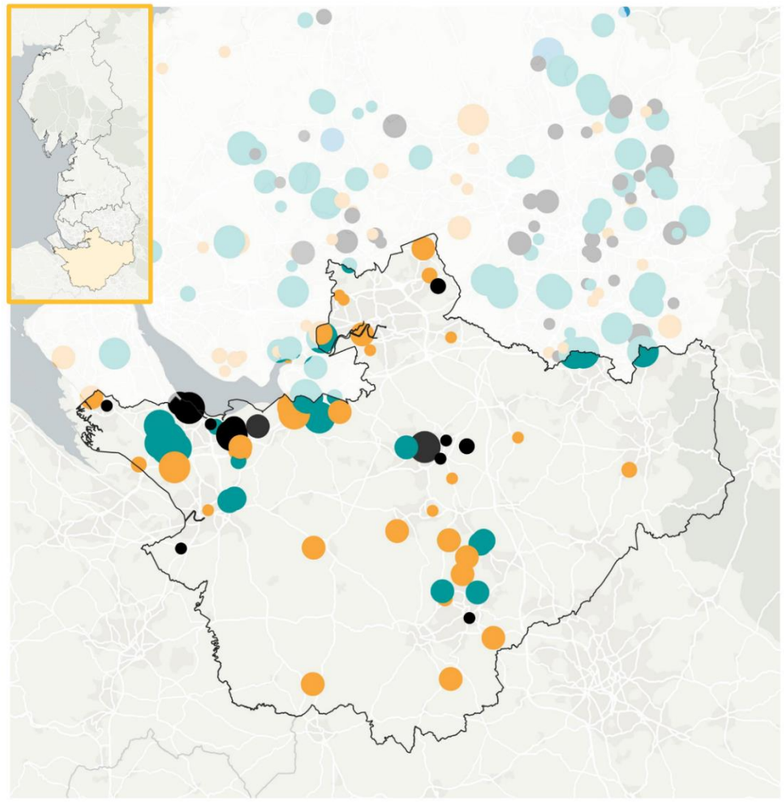
*The column lengths in these charts can **only be compared within each sector**, not across different sectors.

Other Fuel Categories not covered in the graphs

Fuel Type	Sum of Value in GWh
Coal: Public sector	2
Petroleum: Public sector	49
Bioenergy and wastes: Industrial and Commercial	307
Electricity: Industrial, Commercial and other	2,746
Gas: Industrial, Commercial and other	3,552
Total	**6,656**

Generation and storage baseline and pipeline capacities

(MW)	Battery storage	Fossil fuels	Hydropower	Solar PV	Onshore wind	Other renewables
Baseline	40	440	0.1	32	53	112
Planning granted	465	-	-	75	-	-
Grid contracted	1,050	246	-	650	-	117



Pipeline capacities from DNO Embedded Capacity Registers and the Renewable Energy Planning Database

Pipeline Capacity

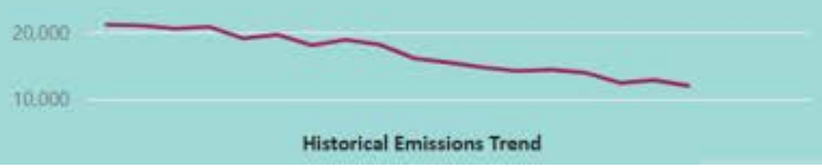
Technology

- Onshore wind
- Solar PV
- Battery storage
- Other renewables

1 MW — >50 MW
*Size denotes scale

Note: only sites of 1 MW or above have been mapped

Greater Manchester



GHG Emissions (2022)
(kt CO2e)
11,930

Energy Consumption (2022)
(GWh)
50,090

Energy consumption by sector and fuel type

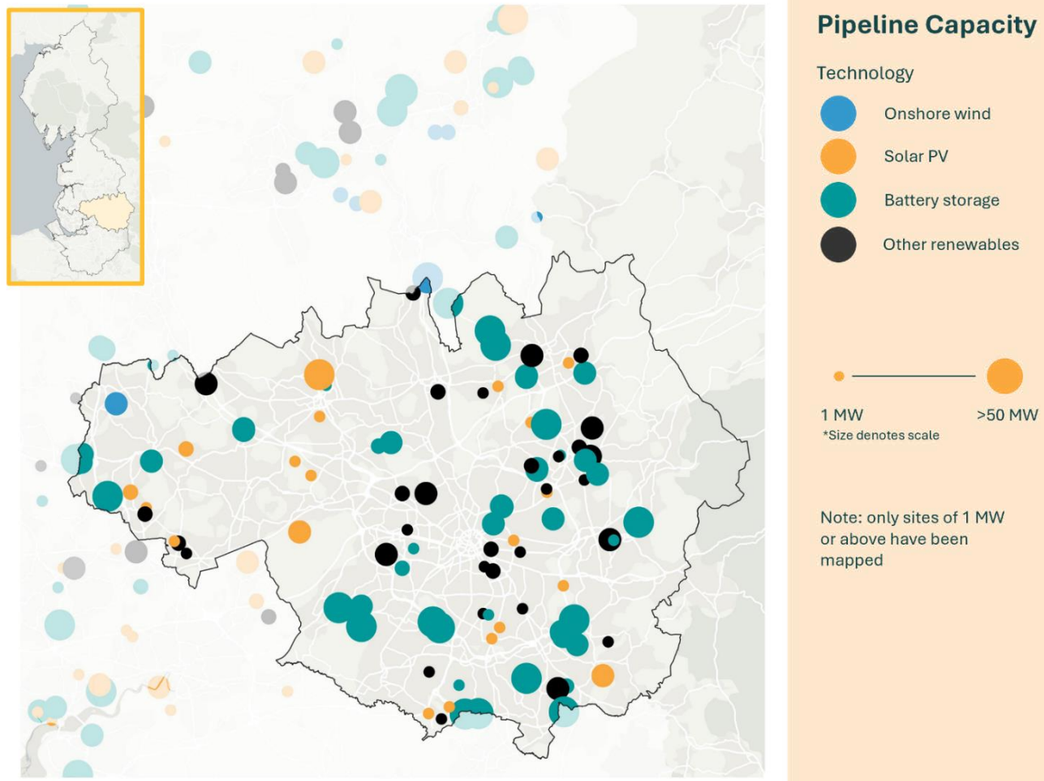
*The column lengths in these charts can **only be compared within each sector**, not across different sectors.

Other Fuel Categories not covered in the graphs

Fuel Type	Sum of Value in GWh
Gas: Industrial, Commercial and other	7,458
Electricity: Industrial, Commercial and other	6,099
Bioenergy and wastes: Industrial and Commercial	1,185
Petroleum: Public sector	169
Coal: Public sector	6
Total	**14,917**

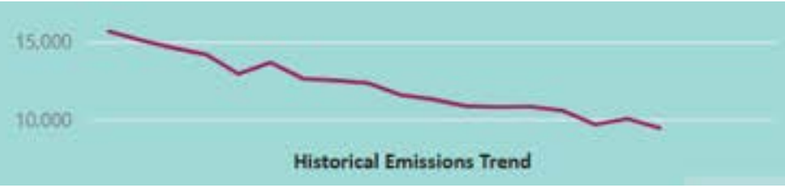
Generation and storage baseline and pipeline capacities

(MW)	Battery storage	Fossil fuels	Hydropower	Solar PV	Onshore wind	Other renewables
Baseline	156	477	2.5	73	39	64
Planning granted	1,850	-	-	19	-	-
Grid contracted	610	246	0.75	167	10	2.5



Pipeline capacities from DNO Embedded Capacity Registers and the Renewable Energy Planning Database

Lancashire



GHG Emissions (2022)

(kt CO2e)

9,415

Energy Consumption (2022)

(GWh)

32,445

Energy consumption by sector and fuel type

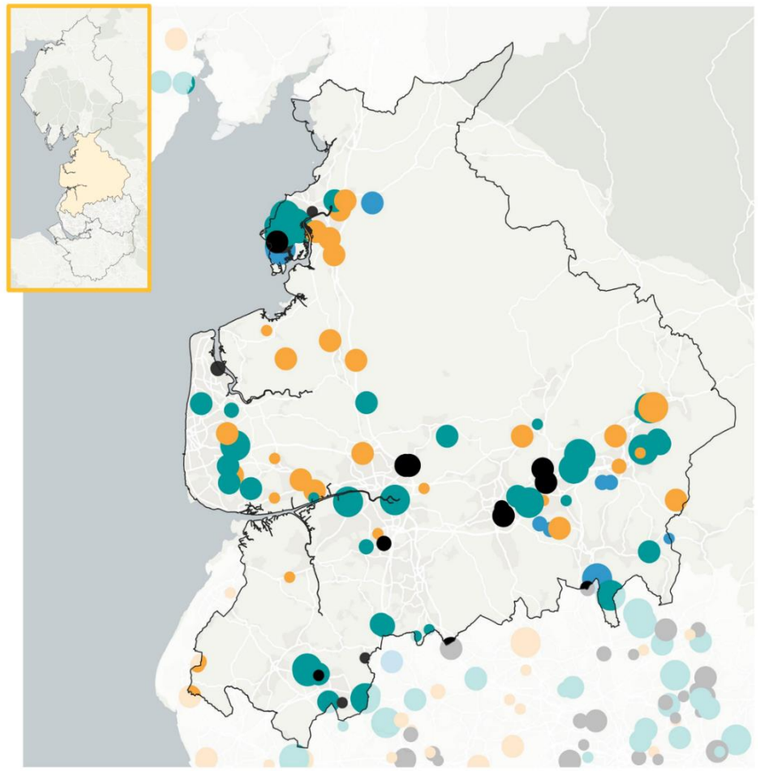
Other major Fuel Categories not covered in the graphs

Fuel Type	Sum of Value in GWh
Gas: Industrial, Commercial and other	4,797
Electricity: Industrial, Commercial and other	3,560
Bioenergy and wastes: Industrial and Commercial	1,236
Petroleum: Public sector	90
Coal: Public sector	4
Total	**9,686**

*The column lengths in these charts can **only be compared within each sector**, not across different sectors.

Generation and storage baseline and pipeline capacities

(MW)	Battery storage	Fossil fuels	Hydropower	Solar PV	Onshore wind	Other renewables
Baseline	185	435	1.4	96	182	45
Planning granted	1,681	-	-	86	8.2	-
Grid contracted	1,550	195	-	345	393	54



Pipeline Capacity

Technology

- Onshore wind
- Solar PV
- Battery storage
- Other renewables

1 MW — >50 MW

*Size denotes scale

Note: only sites of 1 MW or above have been mapped

Pipeline capacities from DNO Embedded Capacity Registers and the Renewable Energy Planning Database

Energy consumption by sector and fuel type

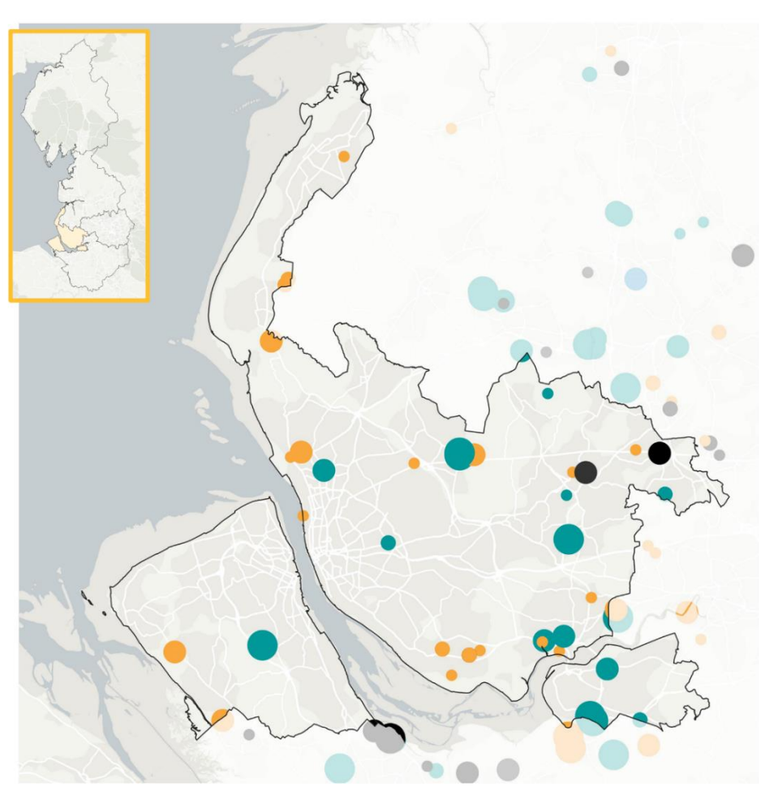
Other major Fuel Categories not covered in the graphs

Fuel Type	Sum of Value in GWh
Petroleum: Public sector	91
Gas: Industrial, Commercial and other	5,741
Electricity: Industrial, Commercial and other	3,107
Coal: Public sector	3
Bioenergy and wastes: Industrial and Commercial	578
Total	**9,520**

*The column lengths in these charts can **only be compared within each sector**, not across different sectors.

Generation and storage baseline and pipeline capacities

(MW)	Battery storage	Fossil fuels	Solar PV	Onshore wind	Offshore wind	Other renewables
Baseline	44	311	10	19	90	165
Planning granted	144.5	-	17	-	-	-
Grid contracted	263	29	106	-	-	11



Pipeline capacities from DNO Embedded Capacity Registers and the Renewable Energy Planning Database

A2. GLOSSARY OF TERMS

Advanced heat zones: Designated areas where heat networks are the most efficient and cost-effective solution for decarbonising heat supply.

Battery Energy Storage Systems (BESS): Infrastructure that stores electricity for later use, helping to balance supply and demand on the grid.

Boiler Upgrade Scheme (BUS): The UK government grant scheme provides upfront capital grants of up to £7,500 to encourage property owners to replace fossil fuel heating with more efficient, low-carbon heating systems, including heat pumps and biomass boilers.

Carbon Capture, Utilisation and Storage (CCUS): A suite of technologies that capture CO_2 emissions from industrial processes or power generation, either storing it underground or using it in other processes.

Clean Power 2030 (CP30): A UK government strategy to decarbonise the power sector by 2030 through investment in renewables, grid upgrades, and flexibility.

Community Energy Fund (CEF): Now succeeded by the Great British Energy Community Fund (GBECF): A funding mechanism to support community-led renewable energy projects.

Contracts for Difference (CfD): A government mechanism that guarantees a fixed price for electricity generated from low-carbon sources, reducing investor risk.

Devolution White Paper: A UK government policy document outlining plans to devolve powers and funding to local and regional authorities.

Display Energy Certificate (DEC): A certificate showing the energy performance of a public building, required for buildings over a certain size.

Energy Company Obligation (ECO): A government scheme requiring energy suppliers to deliver energy efficiency improvements to homes, particularly for vulnerable households.

National Energy System Operator (NESO): The new independent body responsible for planning and operating GB's energy system, including regional strategic plans.

Fuel poverty: A condition where a household cannot afford to heat its home to an adequate standard due to low income and high energy costs.

Green Skills Bootcamps: Government-funded training programmes to equip workers with skills for green jobs, such as heat pump installation or EV maintenance.

Great Grid Upgrade: A national infrastructure programme to expand and modernise GB's electricity transmission network.

Heat Network Transformation Programme (HNTP): A government initiative to support the development of low-carbon district heating systems.

Local Area Energy Plans (LAEPs): Strategic plans developed by local authorities to map out energy demand, supply, and infrastructure needs to support net zero.

Local Electric Vehicle Infrastructure (LEVI): A government fund to support local authorities' rollout of public EV charging infrastructure.

Local Growth Plans (LGPs): Strategic documents developed by local authorities to guide economic development, including clean energy and net zero priorities.

Local Skills Improvement Plans (LSIPs): Regional plans that align training provision with employer needs, including green skills for the net zero transition.

National Wealth Fund (NWF): A UK government fund designed to mobilise private investment in clean infrastructure through equity, loans, and guarantees.

Net Zero North West (NZNW): A regional industry-led coalition supporting industrial decarbonisation and clean energy investment in the NW.

Offshore Energy Alliance: A regional partnership promoting offshore wind and marine energy development in the Irish Sea and North Wales.

Permitted Development Rights (PDR): Planning rules that allow certain types of development, such as heat pumps or solar panels, without full planning permission.

Public Sector Decarbonisation Scheme (PSDS): A government grant programme to support public sector bodies in reducing carbon emissions from their estates.

Regional Energy Strategic Plans (RESPs): Strategic plans developed by NESO in collaboration with local authorities to guide regional energy system investment.

Smart meter: A digital device that records energy consumption in real time and communicates with the energy supplier for accurate billing and monitoring.

Social Housing Decarbonisation Fund (SHDF): A government fund to improve the energy efficiency of social housing stock.

Warm Homes Plan: A UK government initiative to improve energy efficiency and reduce heating costs in homes, particularly for low-income households.

ANNEXES

A3. EVIDENCE BASE

This section outlines key documents, policies and strategies supporting this report's information.

GOVERNMENT POLICY AND STRATEGY

Making Britain a Clean Energy Super Power Mission
GOV.UK

Clean Power 2030
National Energy System Operator | 2024

Clean Power 2030 Action Plan
Department for Energy Security & Net Zero | 2024

Spending Review
HM Treasury | 2025

10 Year Infrastructure Strategy
GOV.UK | 2025

PREVIOUS GOVERNMENTS

Net Zero Strategy and Heat in Buildings Strategy
GOV.UK | 2021

Transport Decarbonisation Plan
Department for Transport | 2021

Green Finance Strategy
GOV.UK | 2023

25 Year Environnent Plan, 2023
GOV.UK | 2023

SECTOR TRENDS

CCC 7th CARBON BUDGET
Climate Change Committee | 2025

CCC 2024 Progress Report to Parliament
Climate Change Committee | 2024

DESNZ Public Attitude Tracker
Department for Energy Security & Net Zero | 2024

Modern Industrial Strategy
Department for Business & Trade | 2025

Clean Energy Sector Plan
GOV.UK | 2025

Enabling net zero: a plan for UK industrial cluster decarbonisation
UK Research and Innovation | 2023

Improving transport connectivity in the North West
House of Commons | 2025

NORTH WEST EVIDENCE BASE

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North West Regional Development Agency | 2010

North West 2040 Energy Scenarios
North West Net Zero Hub | 2022 – available on request

North West Green Energy Taskforce Report
The Green Britain Foundation | 2023

The Great North Clean Energy Report
The Great North

SUB-REGIONAL EVIDENCE BASE

Towards a Sustainable and Inclusive Cheshire and Warrington
Cheshire and Warrington Sustainable and Inclusive Growth Commission | 2022

Cumbria: Leading the Way to Net Zero
Enterprising Cumbria | 2025

Greater Manchester Five Year Environment Plan
Greater Manchester Combined Authority | 2025

Lancashire Energy Strategy
Lancashire Enterprise Partnership | 2018

Liverpool City Region Five Year Climate Action Plan, LCR Combined Authority
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