

# North Wales Energy Strategy Strategic Action Plan

Funded and supported by:



Llywodraeth Cymru  
Welsh Government

Developed by:



Uchelgais  
Gogledd Cymru  
Ambition  
North Wales

Developed in collaboration with:



Gwasanaeth Ynni  
Energy Service

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**Abbreviations**

CCUS	Carbon Capture, Utilisation and Storage
DNO	Distribution Network Operator
ERDF	European Regional Development Fund
EV	Electric Vehicle
IHP	Innovative Housing Programme
IPCC	Intergovernmental Panel on Climate Change
LA	Local Authority
LAEP	Local Area Energy Plan
NRW	Natural Resources Wales
NZIW	Net Zero Industry Wales
OEA	Offshore Energy Alliance
ORP	Optimised Retrofit Programme
PLA	Personal Learning Account
PV	Photovoltaic

RSL	Registered Social Landlords
RSP	Regional Skills Partnership
SME	Small to medium-sized enterprises
SMR	Small Modular Reactor
SPEN	Scottish Power Energy Networks
UK	United Kingdom
ULEVTF	Ultra-Low Emissions Vehicles Transformation Fund
WGES	Welsh Government Energy Service
WHQS	Welsh Housing Quality Standard
WPD	Western Power Distribution

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## Introduction

**This document presents a Strategic Action Plan (hereafter ‘the action plan’) for North Wales. It sets out strategic actions that are required to realise the strategic priorities set out in the [North Wales Energy Strategy](#).**

## Background

The Intergovernmental Panel on Climate Change’s (IPCC’s) Sixth Assessment Report reports that we are already experiencing the widespread impacts and costs of climate change.<sup>1</sup> The IPCC’s Special Report on 1.5 states that unless global warming is limited to close to 1.5°C by 2050, the impacts of climate change will become unmanageable and irreversible for natural and human systems. There is now global acknowledgement of the latest climate science and national commitments made under the Paris Agreement recognise the climate change crisis and the need to act urgently to protect the well-being of current and future generations.<sup>2</sup> With guidance from the Climate Change Committee<sup>3</sup> and evidence published by the IPCC, Wales has recognised the urgency of this issue and, in 2021, legislated to achieve net zero emissions by 2050.

The Welsh Government’s Net Zero Wales Plan<sup>4</sup>, published in October 2021, provides a comprehensive overview of key policies and proposals across key sectors and emphasises the importance of a just transition as we move to a low carbon economy. The UK Government’s Energy Security Strategy<sup>5</sup>, published in April 2022, includes targets around increasing offshore wind deployment, solar generation, hydrogen production and a number of nuclear facilities. Delivering net zero for Wales will require coordinated efforts across many sectors and will require a Team

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<sup>1</sup> [IPCC Sixth Assessment Report](#)

<sup>2</sup> [IPCC Special Report, Global Warming of 1.5°C](#)

<sup>3</sup> [The Committee on Climate Change, Sixth Carbon Budget](#)

<sup>4</sup> [Net Zero Wales | GOV.WALES](#)

<sup>5</sup> [British energy security strategy - GOV.UK \(www.gov.uk\)](#)

Wales approach with actions at all levels including Welsh Government, UK Government, the wider public sector, Welsh businesses and industry and the Welsh public (individuals and households).

Achieving Wales' target will require substantial transformation of our energy systems and radical changes in the technologies we use to heat our homes, travel and generate electricity. Over recent months, the profile of both energy security and energy affordability have risen significantly. Ofgem recently confirmed that the energy market remains highly volatile and as a result they expect further price increases later this year<sup>6</sup>. The impact of rising energy prices on many residents, public bodies, community enterprises and businesses is significant. The cost of living crisis has underscored the need to increase supply from the lowest cost forms of energy generation, particularly where they deliver other local benefits (such as skilled jobs) or are owned or led locally. Transitioning to a modern, decarbonised energy system fit for the twenty-first century poses plenty of challenges, but it also has the potential to bring great benefits, both for the environment and for the economic and social wellbeing of our communities.

North Wales has developed a Regional Energy Strategy that outlines its strategic priorities and commitment to decarbonising the energy system to achieve Wales' net zero target. North Wales' Regional Economic Framework further supports this by recognising the intrinsic link between sustainable economic growth and net zero and states the commitment of Welsh Government and Regional Partners to prepare an action plan to deliver the North Wales Energy Strategy.<sup>7</sup>

Significant progress has also been made as part of the North Wales Growth Deal. The North Wales Low Carbon Energy Programme, for example, is one of five programmes included in the Growth Deal and aims to unlock the benefits of developing low carbon energy projects within the region, enhancing the region's status as a leading location for low carbon energy and supply chain investment.

The North Wales Energy Strategy identifies key priorities and opportunities to deliver on the region's ambition for decarbonising its energy system.

**Our vision** for North Wales is:

***Delivering maximum local economic, social, ecological and wellbeing benefits from transitioning to a net zero economy and becoming a net exporter of low carbon electricity through cross-border and regional cooperation.***

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<sup>6</sup> [Jonathan Brealey's speech at All Energy event in Glasgow](#)

<sup>7</sup> [North Wales Regional Economic Framework](#)

**Our strategic priorities** for achieving this vision are:

- 1. To harness the abundance of local low carbon resource to become a green powerhouse and diversify the energy mix.**
- 2. To become a world-leader in offshore wind and marine technologies.**
- 3. To improve the energy efficiency of the region's housing and accelerate the decarbonisation of North Wales' building stock.**
- 4. To achieve a shift to lower carbon transport.**

The development of this **action plan** is the next stage of the energy planning process and is directed at turning the above priorities into tangible actions and interventions.

During the development of the action plan, the Task and Finish Group highlighted the significant importance and contribution of the commercial and industrial sector to achieving the energy vision for the region. It was therefore agreed that an additional priority focused on the commercial and industrial sector would be included in this action plan.

- 5. Maximise the opportunities for the commercial and industrial sectors to support the energy transition and drive economic growth.**

## **Action Plan content**

The action plan presents actions generated from four thematic workshops held with a cross section of sectoral stakeholders from across the region. Workshops were held between November 2021 and January 2022 around the following themes:

1. Domestic energy
2. Power generation
3. Transport
4. Commerce and industry

The strategic actions are set out below and are mapped against the strategic priorities (see Appendix 1: for a summary). Where actions contribute across multiple priorities, they have been defined as cross-cutting actions.

Indicative timescales have been specified against actions where there is enough information available to do so. Where this is possible, the following applies:

- Short term: underway by 2023
- Medium term: underway by 2025
- Long term: underway by 2035

Lead stakeholders or “**Leads**” are suggested against each action. These are organisations considered to be best placed to take responsibility for progressing and coordinating delivery of the specified action. Stakeholders who will likely play a critical role in facilitating the action’s successful delivery are listed as “**Enablers**”. It is important to note that listed stakeholders were identified in thematic workshops and/or have been proposed because of follow-up discussions to date. It is recognised that the list of stakeholders mentioned will not be exhaustive and that there will likely be other stakeholders who will play a role in delivering each action.

The draft Action Plan includes the **funding status** of each strategic action. There are actions that require no funding or are already underway or planned through existing programmes or initiatives, whilst others will be progressed subject to the appropriate funding or resources being secured. Where necessary, further work will take place during this year to quantify the resources required to progress implementation of the various actions identified

The **progress status** action provides details on existing and/or planned activities that contribute to the delivery of each action. This has been completed based on feedback from the thematic workshops and gathering available information within the public domain.

## **Governance**

A strong and effective governance structure will be critical for facilitating a co-ordinated effort to deliver the strategic actions outlined in the action plan.

In development of both the Strategy and this action plan, strong governance through both the North Wales Economic Ambition Board and a dedicated Task and Finish Group has ensured regional oversight and direction to the work as it has developed.

The Strategy has already been endorsed by the North Wales Economic Ambition Board (March 2021) and by the Welsh Government’s Minister for Climate Change. The Action Plan will now need to be further endorsed by our democratic leaders.

Work is already underway with the Task and Finish Group to agree the most effective arrangements for the future monitoring and oversight of the action plan as we proceed into delivery. It will be important to ensure effective alignment with any existing governance arrangements to make best use of those already operating within the region.

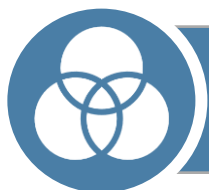
The next step for the region, with support from the Energy Service team, will be to work with stakeholders to develop the governance structure, and identify the role of key stakeholders from across the public, private and third sectors to deliver the strategic actions outlined below. This work will also include identifying areas of collaboration across government and key sectors which are vital to the achievement of each strategic priority.



## **Monitoring and Reporting**

The action plan is intended to be a 'living' document that is regularly reviewed and updated. It will be influenced by emerging local and regional plans, future local area energy planning (LAEP) and other relevant developments and research in the region.

# Strategic priorities and actions



## Cross-cutting actions

Cross-cutting actions refer to those actions that apply across multiple sectors of the energy system.

### Strategic actions

Ref	Action	Timescale	Lead(s)	Potential enabler(s)	Funding status	Progress status
A	<p><b>Ensure effective alignment between local, regional and national energy strategies, plans and initiatives.</b></p> <ul style="list-style-type: none"> <li>The transition should be led by consistent policies at a national level which filter down to regional and local levels. The development of local development plans and strategic development plans should all consider the relevant aspects of the Energy Strategy.</li> </ul>	Short term	Local Authorities	Welsh Government	No funding required	<p><i>There is already close collaboration across the regional energy strategies and Local Area Energy Plans (LAEP). A National Advisory Group and Regional Groups will be established to ensure effective alignment between existing and emerging energy planning work.</i></p>
B	<p><b>Develop Local Area Energy Plans (LAEPs) within each local authority area to support the development of a route map for decarbonisation of the energy system, taking a multi-vector, whole system approach.</b></p> <ul style="list-style-type: none"> <li>Identify local opportunities to develop energy projects, including solar PV,</li> </ul>	Short term	Local Authorities Ambition North Wales	SP Energy Networks (SPEN) Wales and West Utilities (WWU)	Funding in place	<p><i>A pilot LAEP has already been adopted in Conwy County Borough. Welsh Government have committed funding to the preparation of LAEPs across the remaining five Local Authority areas by March 2024. The development of LAEPs in North Wales will be coordinated by Ambition North Wales with technical support from the Energy Systems Catapult.</i></p>

Ref	Action	Timescale	Lead(s)	Potential enabler(s)	Funding status	Progress status
	onshore and offshore wind, nuclear, hydro and tidal energy.			Welsh Government		<i>The Energy Systems Catapult has recently released <a href="#">technical guidance</a> to support the development of LAEPs, which forms part of their appointments as technical advisors to Welsh Government.</i>
C	<p><b>Lead on developing the skills requirements identified in the Regional Skills Partnership's (RSP's) Green Skills Report and Welsh Government's Net Zero Skills Action Plan.</b></p> <ul style="list-style-type: none"> <li>• Review the current skills capabilities and capacity to deliver decarbonisation as proposed in Net Zero Wales plan.</li> <li>• Develop a strategy to raise awareness of regional capabilities (including offshore and onshore wind, marine energy, nuclear and solar PV).</li> <li>• Ensure the local supply chains are visible to developers operating within the region.</li> <li>• Provide appropriate training and education to enable people to access green jobs should be embedded across the learning cycle and opportunities for adapting existing jobs should be integrated into career pathways.</li> </ul>	Short term	Welsh Government Regional Skills Partnership	Local Authorities Bangor University / M-Sparc Glyndwr University Further Education institutions SPEN WWU	<i>Funding in place for Skills &amp; Employment Plan. Further work required to determine funding requirements</i>	<p><i>The RSP has commissioned a report into the jobs and skills required across Wales to support the transition to a green economy. The next Regional Skills and Employment Plan will include a detailed Net Zero Skills annexe which will build on findings from ongoing research from Welsh Government, RSP and the <a href="#">Optimised Retrofit Programme's (ORP) Training and Skills Group</a>. The Plan will be developed in early 2023.</i></p> <p><i>The <a href="#">Morlais Skills and Training Working Group</a> has been established to identify and provide solutions for any skills gap presented by the work opportunities from the Morlais Project.</i></p> <p><i>The <a href="#">Offshore Energy Alliance (OEA)</a> is a skills and supply chain cluster established to take advantage of the opportunities offered by offshore energy in North Wales. M-SParc has been supported with financial assistance from Welsh Government to be the accountable body.</i></p>

Ref	Action	Timescale	Lead(s)	Potential enabler(s)	Funding status	Progress status
						<p><i>There is ongoing Nuclear Skills Decommissioning Skills Pipeline work with Magnox.</i></p> <p><i>Experience and learning from recent projects such as Net Zero Gwynedd around decarbonisation of housing involves a partnership between public sector and social enterprises and will inform this action.</i></p>
D	<p><b>Input to Welsh Government's consultation on the Public Behaviour Change Engagement Strategy that sets out how society can be involved in the changes individuals and communities can make to help Wales meet net zero.</b></p>	Short term	Local Authorities	<p>Educational institutions</p> <p>Bangor University</p> <p>Glyndwr University</p> <p>SPEN</p> <p>WWU</p> <p>Welsh Government</p>	No funding required	<p><i><a href="#">Net Zero Wales Carbon Budget 2</a> committed to consulting on a Public Behavioural Change Engagement Strategy during Summer 2022.</i></p>
E	<p><b>Develop a strategic approach to support the emerging hydrogen economy, taking account of proposed hydrogen projects across the region.</b></p>	Medium term	<p>Welsh Government</p> <p>Ambition North Wales</p>	<p>Industry Hydrogen Groups</p> <p>Local Authorities</p>	Funding Required	<p><i>The <a href="#">UK Hydrogen Strategy</a> has been published and the Welsh Hydrogen Pathway is expected to follow during 2022. These strategies will provide</i></p>

Ref	Action	Timescale	Lead(s)	Potential enabler(s)	Funding status	Progress status
	<p>This should:</p> <ul style="list-style-type: none"> <li>• Provide a clear vision on the role of hydrogen in the future regional energy system.</li> <li>• Consider opportunities for industrial decarbonisation, transport uses and domestic energy.</li> <li>• Support the development of the hydrogen hubs by Menter Môn in Holyhead and Ambition North Wales.</li> <li>• Explore the role of Carbon Capture, Utilisation and Storage (CCUS), especially in the context of cross border projects such as Hynet.</li> </ul>			<p>Transport for Wales</p> <p>SPEN</p> <p>WWU</p> <p>UK Government</p> <p>Bangor University</p> <p>Glyndwr University</p>		<p><i>the UK and Welsh context for a regional hydrogen strategy.</i></p> <p><i>Proposals for green hydrogen hubs are being developed by Ambition North Wales and by Menter Môn in Holyhead.</i></p> <p><i><a href="#">North Wales' Regional Economic Framework</a> sets a commitment for the region to "continue to develop a route map to understand how the opportunity for the deployment of Hydrogen across the North Wales Region can best be delivered, maximising the expertise, assets and benefits that could be derived."</i></p>
F	<p><b>Continue to explore and support opportunities for smart local energy systems in the region.</b></p> <ul style="list-style-type: none"> <li>• Explore opportunities emerging from the Welsh Government's Smart Living programme. The programme is supporting Welsh Local Authorities to issue challenges to businesses with innovative products, processes and services.</li> </ul>	Short term	Ambition North Wales	Welsh Government	<i>Funding in place</i>	<p><i>The Growth Deal's Smart Local Energy Project is considering options for how a new funding support scheme could support projects that help decarbonise the energy system in North Wales.</i></p> <p><i>Community Renewal Funding has been secured to deliver feasibility studies into Smart Local Energy Systems.</i></p>
G	<p><b>Identify a pipeline of regional energy project portfolios which maximise scope for attracting investment.</b></p>	Medium term	Local Authorities	Ambition North Wales	<i>Funding in place</i>	<p><i>The development of LAEPs in each region will help to inform a pipeline of potential energy projects.</i></p>

Ref	Action	Timescale	Lead(s)	Potential enabler(s)	Funding status	Progress status
			Welsh Government	Bangor University  Glyndwr University  UK Government		<i>The Growth Deal Smart Local Energy Project will gather information about regional projects that require funding support.</i>
H	<b>Strengthen the link between research, development and innovation and the Energy Strategy priorities.</b>	Medium term	Welsh Government  Bangor University / M-Sparc  Glyndwr University		<i>Further work required to determine funding requirements</i>	<i>Ongoing cooperation between the Universities and local authorities through the Ambition North Wales partnership and Growth Deal Programmes.  Involvement of both Universities in emerging governance around the action plan will be considered.</i>
I	<b>Continue to engage key stakeholders on the development of a long-term plan for the energy networks across the region and Wales.</b>	Ongoing	Local Authorities  Ambition North Wales  Welsh Government	WWU  SPEN	<i>Funding in place</i>	<i>The Future Grid for Wales Study is underway by Welsh Government, Energy Network Operators and Ofgem. It will be used alongside LAEPs to develop a Future Energy Plan for Wales by 2024.  This project will also inform the future requirements of the Welsh Energy Grid and contribute to the delivery of <a href="#">Future Wales: the National Plan 2040</a>, providing evidence to enable network operators to plan and build the networks that will be required for the Net Zero by 2050 target.</i>

Ref	Action	Timescale	Lead(s)	Potential enabler(s)	Funding status	Progress status
						<i>SPEN have recently published a <a href="#">Network Development Plan</a> which will help understand the extent of investment and type of infrastructure required across North Wales.</i>



1. To harness the abundance of local low carbon resource to become a green powerhouse and diversify the energy mix



2. To become a world-leader in offshore wind and marine technologies

### Strategic actions

Ref	Action	Timescale	Lead(s)	Potential enabler(s)	Funding status	Progress status
2A	Engage with Welsh Government to identify and build on opportunities that Ynni Cymru could provide to North Wales.	Medium term	Ambition North Wales Local Authorities	Welsh Government Community Energy Wales	No funding required	There is the potential for the region to feed into the thinking around Ynni Cymru through Welsh Government and <a href="#">Community Energy Wales</a> .
2B	Explore how to improve communication of available funding sources for the development and delivery of a range of low-carbon power generation projects (e.g. onshore and offshore wind, solar PV, nuclear, and tidal and marine energy).	Short term	Ambition North Wales Local Authorities	Welsh Government Energy Service	Further work required to determine funding requirements	Not started.
2C	Engage with UK Government to support the development of the Wylfa and Trawsfynydd sites for new nuclear projects: <ul style="list-style-type: none"> <li>Identify the asks e.g. site selection process for new sites and updated National Policy Statements.</li> <li>Support regional submissions into the Nuclear Enabling Fund.</li> </ul>	Short term	Local Authorities Ambition North Wales Welsh Government	UK Government Bangor University	No funding required	Nuclear power has been identified as a priority in the UK Government's Energy Security Strategy.  Bangor University hosts the <a href="#">Nuclear Futures Institute</a> , which aims to establish North Wales as a global centre in nuclear technology.



						<p><i>There are advanced plans to establish a National Nuclear Thermal Hydraulics Facility in North Wales.</i></p> <p><i>The Trawsfynydd Small Modular Reactor (SMR) Project is supported through the Growth Deal's Low Carbon Energy Programme.</i></p>
2D	<b>Engage with Welsh Government to determine how increased local ownership of energy projects can be delivered in line with published guidance on local and shared ownership in Wales.</b>	Short term	<p>Ambition North Wales</p> <p>Local Authorities</p>	Welsh Government	<i>No funding required</i>	<p><i>Guidance on <a href="#">local and shared ownership</a> was published by Welsh Government in June 2022.</i></p>
2E	<b>Explore the potential of establishing an advice hub to support regional decarbonisation / low carbon energy initiatives.</b>	Medium term	<p>Welsh Government</p> <p>Local Authorities</p> <p>Ambition North Wales</p>		<p><i>Further work required to determine funding requirements</i></p>	<p><i>The most recent renewable energy deep dive recommends an easy to access advice service. Welsh Government's response is that it needs to progress consultation on the Warm Homes programme, public engagement campaign as part of net zero Wales and a national heat strategy due to be released for consultation in spring 2023 so that it can provide a clearer proposal for an advice service.</i></p> <p><i>Consultation on the next iteration of the Warm Homes Programme ended in April 2022 and is currently being reviewed.</i></p>

						<i>UK Government has recently launched their advice offering with a home energy MOT available through a new online advice service</i>
2F	<p><b>Maximise opportunities for public procurement to support the acceleration of renewable energy generation and secure local economic and social value.</b></p> <ul style="list-style-type: none"> <li>• Ensure that public procurement strengthens local supply chains / local jobs (social value).</li> <li>• Ask the supply chain to deliver against public sector carbon ambitions through procurement frameworks.</li> </ul>	Medium term	<p>Welsh Government</p> <p>Local Authorities</p> <p>Public sector bodies</p>	<p>Welsh Local Government Association</p> <p>Welsh Government Commercial Delivery</p>	<i>No funding required</i>	<i>In June 2022, the <a href="#">Social Partnership and Public Procurement Bill</a> was laid before the Senedd by Welsh Government. The socially responsible procurement duty within the bill will seek to ensure that public spending on goods, works and services is done in a way that benefits everyone and does not only focus on cost. The bill will inform the delivery of this action.</i>
2G	<p><b>Maximise opportunities for community benefits funds from large energy infrastructure projects to support local and regional decarbonisation initiatives, recognising the need to target those communities and areas most impacted by such developments.</b></p>	Medium term	<p>Welsh Government</p> <p>Local Authorities</p>		<i>Further work required to determine funding requirements</i>	<i>There are a range of large energy infrastructure projects planned across North Wales, including offshore wind, nuclear, solar and tidal.</i>
2H	<p><b>Support the region's proposed port infrastructure improvements to secure greater regional benefit from planned offshore wind and tidal energy projects.</b></p>	Short term	<p>Welsh Government</p> <p>Ambition North Wales</p>	Local Authorities	<i>Further work required to determine funding requirements</i>	<i>There is ongoing work by the Marine Energy Programme and the Growth Deal are exploring options for supporting proposed infrastructure improvements at Holyhead and Mostyn Port.</i>
2I	<p><b>Ensure the marine planning and consenting regimes are fit for purpose and support</b></p>	Short term	Welsh Government	Natural Resources	<i>No funding required</i>	<i>A Welsh Government review of consenting and supporting evidence</i>

	<b>opportunities for the sustainable growth of marine renewable energy in the region.</b>			Wales (NRW)		<i>and advice has been completed, recommendations are due to report in summer 2022.</i>
2J	<b>Engage with Welsh Government on the development of revenue support mechanisms for marine energy projects.</b>	Short term	Local Authorities Ambition North Wales		<i>No funding required</i>	<i>The Working Group that was formed to follow up the <a href="#">Renewable Energy Deep Dive Recommendations</a> is responsible for reviewing the barriers to financing renewable energy projects, and will establish connections between key stakeholders to inform this work. This is also currently being addressed through Welsh Government's Marine Energy Programme.</i>
2K	<b>Continue to explore the potential for tidal lagoon projects in North Wales.</b>	Medium to long term	Welsh Government Ambition North Wales Local Authorities	Marine Energy Wales	<i>No funding required</i>	<i>The Welsh Government's Tidal Lagoon Challenge has been launched to obtain the appetite for developing proposals. This market engagement exercise is to ascertain if there is interest in any potential competition/procurement in the future to deliver a tidal lagoon capable of generating electricity with the winner(s) possibly receiving financial support from the Welsh Government.</i>



### 3. To improve the energy efficiency of the region's housing and accelerate the decarbonisation of North Wales' building stock

NB. Actions related to commercial building stock are included under Strategic Priority 5: Maximise the opportunities for the commercial & industrial sector to support the energy transition and drive economic growth.

#### Strategic actions

Ref	Action	Timescale	Lead(s)	Potential enabler(s)	Funding status	Progress status
3A	Provide support and incentives for households to install energy efficiency measures and low-carbon heating systems, ensuring such support is targeted at those in fuel poverty and/or in most need.	Medium term	UK Government Welsh Government Local Authorities Registered Social Landlords	Ofgem	Further work required to determine funding requirements	<p><b>NB. There are a broad range of Welsh Government programmes and plans that relate to this action, including Tackling fuel poverty strategy 2021 to 2035, the <a href="#">Innovative Housing Programme (IHP)</a> and <a href="#">Optimised Retrofit Programme (ORP)</a>. There is also a commitment to publish a heat strategy for Wales in 2023. The UK Government's <a href="#">Heat and Buildings Strategy</a> will also be relevant here.</b></p> <p>With regard to Social Housing, drawing on evidence from ORP, the new <a href="#">Welsh Housing Quality Standard (WHQS) 2022</a> will focus on Fabric First principles and seek to bring all social housing as close as feasible to EPC A or equivalent within a decade.</p>

Ref	Action	Timescale	Lead(s)	Potential enabler(s)	Funding status	Progress status
						<p><i>Initiatives such as the Welsh Government's <a href="#">Nest scheme</a> has provided high-quality advice and information to householders to explore and realise their energy efficiency opportunities.</i></p> <p><i>Registered social landlords will engage and work with Community Housing Cymru (CHC) to progress this action.</i></p> <p><i>Welsh Government and Clwyd Alyn Housing Association have established of a <a href="#">Zero Carbon Housing Performance Hub</a> to provide a central resource for net zero advice.</i></p> <p><i>An <a href="#">Energy Warden Scheme</a> has already trialled collaboration of North Wales social landlords and learning from such schemes should inform this action.</i></p> <p><i>The <a href="#">Boiler Upgrade Grant</a> provided through the UK Government may help property owners with upfront costs for shifting to low-carbon forms of heating.</i></p> <p><i>The <a href="#">Energy Company Obligation (ECO4)</a> will run between 2022 and 2026 and requires energy suppliers to deliver a target of energy efficiency and</i></p>

Ref	Action	Timescale	Lead(s)	Potential enabler(s)	Funding status	Progress status
						<i>heating measures to homes. ECO is focussed on low income, vulnerable and fuel poor households but with a focus on supporting the least energy efficient homes.</i>
3B	<b>Review existing and explore new potential financial mechanisms to support owner-occupiers and building owners seeking to undertake energy efficiency retrofit works.</b>	Medium term	Welsh Government Local Authorities		<i>Further work required to determine funding requirements</i>	<p><i>For the owner-occupier sector, the <a href="#">Warm Homes Programme</a> is the key delivery mechanism in this area. Since 2011, over £394m has been invested, benefitting more than 67,000 homes. Welsh Government will continue to fund the current programme until at least May 2023<sup>9</sup>.</i></p> <p><i>Consultation on the next iteration of the Warm Homes Programme<sup>8</sup> ended in April 2022, and is currently being reviewed.</i></p> <p><i>Welsh Government will be working with UK Finance, The Development Bank of Wales and sector stakeholders to consider how we can develop and trial alternative finance products to support</i></p>

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<sup>8</sup> [Improving home energy efficiency to support a \(gov.wales\)](#)

Ref	Action	Timescale	Lead(s)	Potential enabler(s)	Funding status	Progress status
						<i>owner-occupiers undertaking retrofit works<sup>9</sup>.</i>
3C	<b>Ensure PAS 2035 surveys and a clear plan for retrofit measures are prepared for individual social homes, in accordance with the Welsh Housing Quality Standard (WHQS).</b>	Medium term	Local Authorities (Stock holding) Registered Social Landlords	Welsh Government	<i>Further work required to determine funding requirements</i>	<i>As part of the WHQS, by 2023 a PAS 2035 survey (the Publicly Available Specification that lays out a consistent assessment for energy retrofit measures) and a clear plan for individual homes will be required.<sup>10</sup></i>
3D	<b>Review current support provision to tenants and landlords in the private-rented sector to ensure minimum energy efficiency standards are met. Review enforcement provisions to ensure minimum statutory standards within the sector are achieved.</b>	Medium term	UK Government Welsh Government Local Authorities		<i>Further work required to determine funding requirements</i>	<i>The UK Government has completed a consultation on proposals to increase the minimum standard required for any property to be rented in the private-rented sector (PRS) to EPC C or above.<sup>11</sup> Current indications are that a formal response, followed by revised regulations will be published toward the end of 2022. Pending outcome of review, Welsh Government will review the support package available to landlords joining PRS Leasing Scheme</i>

<sup>9</sup> [Net Zero Wales Carbon Budget 2 \(2021 to 2025\) | GOV.WALES](#)

<sup>10</sup> [Welsh Housing Quality Standard: draft \(gov.wales\)](#)

<sup>11</sup> [Improving the energy performance of privately rented homes - GOV.UK \(www.gov.uk\)](#)

Ref	Action	Timescale	Lead(s)	Potential enabler(s)	Funding status	Progress status
						<i>to ensure it also supports fabric first improvements.</i>
3E	<b>Keep Permitted Development Rights under review in Wales, to further support domestic renewable energy installations for householders and housing developers.</b>	Short term	Welsh Government		<i>No funding required</i>	<i>This is ongoing as permitted development rights are under regular review.</i>





## 4. Achieve a shift to lower-carbon transport

**NB.** A number of actions around reducing demand through active travel and increased use of sustainable public transport are included within **Llwybr Newydd – Wales Transport Strategy 2021**<sup>12</sup> which presents the vision for how the transport system can help deliver on the priorities for Wales and put Wales on a pathway to creating a more prosperous, green, and equal society. The strategy makes a commitment to deliver a significant reduction in greenhouse gas emissions from transport by reducing demand, supporting low-carbon services and infrastructure and through modal shift and includes three headline priorities for the next five years. Priority 1: Bring services to people to reduce the need to travel; Priority 2: Allow people and goods to move easily from door to door by accessible, sustainable and efficient transport services and infrastructure; Priority 3: Encourage people to make the change to more sustainable transport. On this basis, such actions are not replicated below.

### Strategic actions

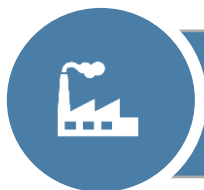
Ref	Action	Timeframe	Lead(s)	Potential enabler(s)	Funding status	Progress status
4A	Ensure alignment between Regional Transport Plans, the Energy Strategy and emerging Local Area Energy Plans.	Medium to long term	Welsh Government North Wales Corporate Joint Committee	Transport for Wales	No funding required	Regional transport plans will identify local interventions to provide an accessible, sustainable and efficient transport system, as set out in the Wales Transport Strategy.  Corporate Joint Committees (CJCs) will develop regional transport plans. These will be aligned with <a href="#">Future Wales - the National Plan 2040</a> and the emerging strategic development plans.

<sup>12</sup> [Llwybr Newydd: the Wales transport strategy 2021 | GOV.WALES](#)

Ref	Action	Timeframe	Lead(s)	Potential enabler(s)	Funding status	Progress status
						<i>The <a href="#">Wales Transport Strategy</a> commits to ensuring a joined-up approach to infrastructure investment decisions across Welsh Government and in regional energy planning.</i>
4B	<p><b>Explore financial incentives across all vehicle types, including public services vehicles, commercial and industrial fleets and private vehicles, to achieve an increase in uptake of zero emissions vehicles.</b></p> <ul style="list-style-type: none"> <li>• Engage with UK Government on progress made on a UK-wide development of a national scrappage scheme for older vehicles, supporting circular economy models</li> <li>• Explore options to make zero-emission vehicles more affordable for citizens</li> <li>• Explore options for alternative ownership models for public services vehicles.</li> </ul>	Medium term	UK Government Welsh Government	Transport for Wales Local Authorities	<i>Further work required to determine funding requirements</i>	<i>The <a href="#">Wales Transport Strategy</a> commits to reducing the cost of sustainable travel through initiatives such as scrappage schemes for older vehicles, grants towards the cost of electric bikes, and by extending concessionary travel schemes to those who most need it.</i>
4C	<p><b>Collaborate on opportunities to decarbonise the public sector fleet, public service vehicles, and commercial and industrial fleets and the co-ordination of associated infrastructure design and development across local authority boundaries.</b></p>	Medium term	Local Authorities	Ambition North Wales Welsh Government	<i>No funding required</i>	<i>Many North Wales public bodies have participated in recent fleet reviews and are preparing fleet transition plans. A number of local authorities have already installed public electric vehicle charging alongside provision for fleet vehicles.</i>

Ref	Action	Timeframe	Lead(s)	Potential enabler(s)	Funding status	Progress status
4D	<b>Work together to deliver the most appropriate electric vehicle public charging infrastructure across the region, aligning with national work being undertaken through Transport for Wales.</b>	Short to medium term	Local Authorities Welsh Government	Transport for Wales SPEN	<i>Further work required to determine funding requirements</i>	<i>There has been a roll-out of electric vehicle charging points via Welsh Government funding and SPEN Green Recovery Investment. The <a href="#">Electric Vehicle Charging Strategy</a> outlines Welsh Government's vision for electric vehicle charging in Wales, and the <a href="#">Wales Transport Strategy</a> commits to delivering this by 2040.</i>
4E	<b>Review the funding period and the length of contracts associated with the Local Transport Fund.</b>	Short term	Welsh Government Local Authorities		<i>No funding required</i>	<i>Not started.</i>
4F	<b>Support greater awareness raising of UK Government funding for development of electric vehicle charging infrastructure such as the on-street residential charging scheme.</b>	Short term	Welsh Government	Local Authorities Welsh Local Government Association	<i>No funding required</i>	<i>The Welsh Government and the Welsh Local Government Association (WLGA) have been engaging with local authorities around the availability and accessing of such funding.</i>
4G	<b>Continue to support organisations such as local community car clubs to deliver community-oriented, low-carbon transport infrastructure and services.</b>	Short to medium term	Welsh Government Local Authorities		<i>Further work required to determine funding requirements</i>	<i>The <a href="#">Wales Transport Strategy</a> commits to moving away from individual vehicle ownership to shared solutions, including car-sharing and car clubs. The growth of such models and services is identified as a priority to be delivered within the next five years. Funding such as the <a href="#">Welsh Government Ultra-Low Emissions</a></i>

Ref	Action	Timeframe	Lead(s)	Potential enabler(s)	Funding status	Progress status
						<i>Vehicle Transformation Fund (ULEVTF) will be used to kick-start such initiatives.</i>
4H	<b>Explore options for investment in a rail freight facility at Holyhead Port as part of the development of the multi-modal logistics and freight plan.</b>	Medium term	Welsh Government	Host Local Authority	<i>Further work required to determine funding requirements</i>	<p><i>The Welsh Government is working with the UK Government, the sector and other partners on a Logistics and Freight Plan for Wales.</i></p> <p><i>The <a href="#">Wales Transport Strategy</a> commits to integrating freight and logistics into wider transport and land-use planning policy, including co-location of manufacturing, energy, leisure and tourism with ports and freight hubs. Recognising ports and maritime transport as a key facet of wider policy on freight and logistics is identified as a priority.</i></p>
4I	<b>Review existing activities and approaches to decarbonising heavy goods vehicles (HGVs) across the UK, Ireland and Europe and how this could impact Regional Transport Plans.</b>	Short term	Welsh Government	Ambition North Wales	<i>Further work required to determine funding requirements</i>	<p><i>The Welsh Government has committed to supporting the sector to trial new technologies, using financial incentives available from the UK Government. These technologies will seek to align with emerging opportunities to produce clean energy, such as the proposed Hydrogen Hub at Holyhead.</i></p>



## 5. Maximise the opportunities for the commercial & industrial sector to support the energy transition and drive economic growth

### Strategic actions

Ref	Action	Timeframe	Lead(s)	Potential enabler(s)	Funding status	Progress status
5A	<p><b>Establish a North Wales Industrial &amp; Commercial Sector Group focused on supporting the decarbonisation of the commercial and industrial sector.</b> Part of the Group's role will be to:</p> <ul style="list-style-type: none"> <li>- Engage with Net Zero Industry Wales and other relevant organisations to better understand emissions hotspots and the level of commercial and industrial decarbonisation required in North Wales, to meet Wales' national net zero target.</li> <li>- Monitor and analyse the progress of ongoing decarbonisation projects within the commercial and industrial sectors to ensure that projected savings achieve the level of decarbonisation required to meet net zero.</li> </ul>	Short term	North Wales Mersey Dee Business Council	Welsh Government Deeside Decarbonisation Forum SPEN	Further work required to determine funding requirements	<p><i>The Business Council runs the regional Net Zero North Wales network for businesses.</i></p> <p><i>The Deeside Decarbonisation Forum has been established to bring together businesses in the Deeside area to help accelerate decarbonisation activity.</i></p> <p><i>The Welsh Government has established Net Zero Industry Wales (NZIW) to work with the South Wales Industrial Cluster initially with a view to extending to the whole of Wales where and when support is required. NZIW will also work in close collaboration with the UK's other leading industrial clusters to ensure Wales has access to best practice.</i></p> <p><i>Welsh Government has established <a href="#">Net Zero Industry Wales (NZIW)</a>, which will work with an existing group of 40 business and academic</i></p>

Ref	Action	Timeframe	Lead(s)	Potential enabler(s)	Funding status	Progress status
						<i>partners operating within a wide range of energy-intensive industries to help them achieve Net Zero. NZIW will also support close collaboration with the UK's other industrial clusters to ensure Wales has access to best practice.</i>
5B	<b>Understand the role that micro-grids and other innovative solutions can play in existing industrial clusters such as those in Deeside and Wrexham.</b>	Medium term	Welsh Government	Host Local Authorities SPEN	<i>Further work required to determine funding requirements</i>	<i>The Future Grid for Wales study is underway and involves Welsh Government, Energy Network Operators and Ofgem.</i>
5C	<b>Explore development of support mechanisms for small to medium-sized enterprises (SMEs) to encourage uptake of energy efficiency improvements to commercial buildings.</b> <ul style="list-style-type: none"> <li>•Set up a 'one-stop-shop' for advice to support smaller businesses in the net zero transition. This should align with any existing initiatives from Business Wales.</li> </ul>	Medium term	Business Wales		<i>Further work required to determine funding requirements</i>	<i>Business Wales have launched the net zero carbon start-up grant in February 2022.</i>  <i>Business Wales also run the Green Growth Pledge, that helps Welsh businesses take pro-active steps towards improving their sustainability.</i>  <i>As part of the UN-supported <a href="#">Race to Zero campaign</a>, the UK Government set-up the <a href="#">UK Business Climate Hub</a>, a one-stop-shop for advice on actions that SMEs can take to measure and manage emissions.</i>

## Appendix 1: Strategic Priority Mapping

The table below maps each strategic action to relevant strategic priorities that are outlined in the Energy Strategy. For ease of reference, strategic priorities are abbreviated using the numeric reference:

1. To harness the abundance of local low carbon resource to become a green powerhouse and diversify the energy mix.
2. To become a world leader in offshore wind and marine technologies.
3. To improve the energy efficiency of the region's housing and accelerate the decarbonisation of North Wales' building stock
4. To achieve a shift to lower carbon transport.
5. Maximise the opportunities for the commercial and industrial sector to support the energy transition and drive economic growth.

Strategic action	Action ref	Strategic Priority Reference				
		1	2	3	4	5
<p><b>Ensure effective alignment between local, regional and national energy strategies, plans and initiatives.</b></p> <ul style="list-style-type: none"> <li>• The transition should be led by consistent policies at a national level which filter down to regional and local levels. The development of local development plans and strategic development plans should all consider the relevant aspects of the Energy Strategy.</li> </ul>	<b>A</b>	+	+	+	+	+
<p><b>Develop Local Area Energy Plans (LAEPs) within each local authority area to support the development of a route map for decarbonisation of the energy system, taking a multi-vector, whole system approach.</b></p> <ul style="list-style-type: none"> <li>• Identify local opportunities to develop energy projects, including solar PV, onshore and offshore wind, nuclear, hydro and tidal energy.</li> </ul>	<b>B</b>	+	+	+	+	+
<p><b>Lead on developing the skills requirements identified in the Regional Skills Partnership's (RSP's) Green Skills Report and Welsh Government's Net Zero Skills Action Plan.</b></p> <ul style="list-style-type: none"> <li>• Review the current skills capabilities and capacity to deliver decarbonisation as proposed in Net Zero Wales plan.</li> </ul>	<b>C</b>	+	+	+	+	+

		Strategic Priority Reference				
<ul style="list-style-type: none"> <li>•Develop a strategy to raise awareness of regional capabilities (including offshore and onshore wind, marine energy, nuclear and solar PV).</li> <li>•Ensuring the local supply chains are visible to developers operating within the region.</li> <li>•Provide appropriate training and education to enable people to access green jobs should be embedded across the learning cycle and opportunities for adapting existing jobs should be integrated into career pathways.</li> </ul>						
<b>Input to Welsh Government’s consultation on the Public Behaviour Change Engagement Strategy that sets out how society can be involved in the changes individuals and communities can make to help Wales meet net zero.</b>	<b>D</b>	+		+	+	
<p><b>Develop a regional hydrogen route map to support the emerging hydrogen economy, taking account of proposed hydrogen projects across the region.</b></p> <p>The route map should:</p> <ul style="list-style-type: none"> <li>•Provide a clear vision on the role of hydrogen in the future regional energy system.</li> <li>•Consider opportunities for industrial decarbonisation, transport uses and domestic energy.</li> <li>•Support the development of the hydrogen hubs by Menter Môn in Holyhead and Ambition North Wales.</li> <li>•Explore the role of Carbon Capture, Utilisation and Storage (CCUS), especially in the context of cross border projects such as Hynet.</li> </ul>	<b>E</b>	+	+	+	+	+
<p><b>Continue to explore and support opportunities for smart local energy systems in the region.</b></p> <ul style="list-style-type: none"> <li>•Explore opportunities associated emerging from the Welsh Government’s Smart Living programme. The programme is supporting Welsh Local Authorities to issue challenges to businesses with innovative products, processes and services.</li> </ul>	<b>F</b>	+	+	+	+	+
<b>Identify a pipeline of regional energy project portfolios which maximise scope for attracting investment.</b>	<b>G</b>	+	+	+	+	+
<b>Strengthen the link between research, development and innovation and the Energy Strategy priorities.</b>	<b>H</b>	+	+	+	+	+



		Strategic Priority Reference				
<b>Continue to engage key stakeholders on the development of a long-term plan for the energy networks across the region and Wales.</b>	I	+	+	+	+	+
<b>Engage with Welsh Government to identify and build on opportunities that Ynni Cymru could provide to North Wales.</b>	2A	+	+			
<b>Explore how to improve communication of available funding sources for the development and delivery of a range of low-carbon power generation projects (e.g. onshore and offshore wind, solar PV, nuclear, and tidal and marine energy).</b>	2B	+	+			
<b>Engage with UK Government to support the development of the Wylfa and Trawsfynydd sites for new nuclear projects:</b>  <ul style="list-style-type: none"> <li>• Identify the asks e.g. site selection process for new sites and updated National Policy Statements.</li> <li>• Support regional submissions into the Nuclear Enabling Fund.</li> </ul>	2C	+				
<b>Engage with Welsh Government to determine how increased local ownership of energy projects can be delivered in line with proposed guidance on local and shared ownership in Wales.</b>	2D	+	+			
<b>Explore the potential of establishing an advice hub to support regional decarbonisation / low carbon energy initiatives.</b>	2E	+	+	+	+	+
<b>Maximise opportunities for public procurement to support the acceleration of renewable energy generation and secure local economic and social value.</b>  <ul style="list-style-type: none"> <li>• Ensure that public procurement strengthens local supply chains / local jobs (social value).</li> <li>• Ask the supply chain to deliver against public sector carbon ambitions through procurement frameworks.</li> </ul>	2F	+	+			+

		Strategic Priority Reference				
<b>Maximise opportunities for community benefits funds from large energy infrastructure projects to support local and regional decarbonisation initiatives, recognising the need to target those communities and areas most impacted by such developments.</b>	<b>2G</b>	+	+			
<b>Support the region's proposed port infrastructure improvements to secure greater regional benefit from planned offshore wind and tidal energy projects.</b>	<b>2H</b>	+	+			
<b>Engage with the marine consenting review by Welsh Government and identify the implications for regional projects.</b>	<b>2I</b>	+	+			
<b>Engage with Welsh Government on the development of revenue support mechanisms for marine energy projects.</b>	<b>2J</b>	+	+			
<b>Continue to explore the potential for tidal lagoon projects in North Wales.</b>	<b>2K</b>	+	+			
<b>Provide support and incentives for households to install energy efficiency measures and low-carbon heating systems, ensuring such support is targeted at those in fuel poverty and/or in most need.</b>	<b>3A</b>			+		
<b>Review existing and explore new potential financial mechanisms to support owner-occupiers and building owners seeking to undertake energy efficiency retrofit works.</b>	<b>3B</b>			+		
<b>Ensure PAS 2035 surveys and a clear plan for retrofit measures are prepared for individual social homes, in accordance with the Welsh Housing Quality Standard (WHQS).</b>	<b>3C</b>			+		
<b>Review current support provision to tenants and landlords in the private-rented sector to ensure minimum energy efficiency standards are met. Review enforcement provisions to ensure minimum statutory standards within the sector are achieved.</b>	<b>3D</b>			+		

		Strategic Priority Reference				
<b>Keep Permitted Development Rights under review in Wales, to further support domestic renewable energy installations for householders and housing developers.</b>	<b>3E</b>			+		
<b>Ensure alignment between Regional Transport Plans, the Energy Strategy and emerging Local Area Energy Plans.</b>	<b>4A</b>				+	
<p><b>Explore financial incentives across all vehicle types, including public services vehicles, commercial and industrial fleets and private vehicles, to achieve an increase in uptake of zero emissions vehicles.</b></p> <ul style="list-style-type: none"> <li>• Engage with UK Government on progress made on a UK-wide development of a national scrappage scheme for older vehicles, supporting circular economy models.</li> <li>• Explore options to make zero-emission vehicles more affordable for citizens.</li> <li>• Explore options for alternative ownership models for public services vehicles.</li> </ul>	<b>4B</b>				+	
<b>Collaborate on opportunities to decarbonise the public sector fleet, public service vehicles, and commercial and industrial fleets and the co-ordination of associated infrastructure design and development across local authority boundaries.</b>	<b>4C</b>				+	
<b>Work together to deliver the most appropriate electric vehicle public charging infrastructure across the region, aligning with national work being undertaken through Transport for Wales.</b>	<b>4D</b>				+	
<b>Review the funding period and the length of contracts associated with the Local Transport Fund.</b>	<b>4E</b>				+	
<b>Support greater awareness raising of UK Government funding for development of electric vehicle charging infrastructure such as the on-street residential charging scheme.</b>	<b>4F</b>				+	
<b>Continue to support organisations such as local community car clubs to deliver community-oriented, low-carbon transport infrastructure and services.</b>	<b>4G</b>				+	

		Strategic Priority Reference				
<b>Explore options for investment in a rail freight facility at Holyhead Port as part of the development of the multi-modal logistics and freight plan.</b>	<b>4H</b>				+	
<b>Review existing activities and approaches to decarbonising heavy goods vehicles (HGVs) across the UK, Ireland and Europe and how this could impact Regional Transport Plans.</b>	<b>4I</b>				+	
<b>Establish a North Wales Industrial Sector Group focused on decarbonising the commercial and industrial sectors.</b>	<b>5A</b>					+
<b>Understand the role that micro-grids and other innovative solutions can play in existing industrial clusters such as those in Deeside and Wrexham.</b>	<b>5B</b>	+				+
<b>Explore development of support mechanisms for small to medium-sized enterprises (SMEs) to encourage uptake of energy efficiency improvements to commercial buildings.</b>  <ul style="list-style-type: none"> <li>•Set up a 'one-stop-shop' for advice to support smaller businesses in the net zero transition. This should align with any existing initiatives from Business Wales.</li> </ul>	<b>5C</b>			+		+

## Appendix 2: Actions categorised by lead stakeholder

Lead	Strategic priority	Actions
Local Authorities	Cross-cutting	A, B, D, G, I
	1&2	2A, 2B, 2C, 2D, 2E, 2F, 2I, 2J, 2K
	3	3A, 3B, 3C, 3D
	4	4C, 4D, 4E, 4G
Welsh Government	Cross-cutting	C, E, G, H, I
	1&2	2C, 2E, 2F, 2G, 2H, 2I, 2K
	3	3A, 3B, 3D, 3E
	4	4A, 4B, 4D, 4E, 4F, 4G, 4H, 4I
	5	5B
Ambition North Wales	Cross-cutting	B, E, F, I
	1&2	2A, 2B, 2C, 2D, 2E, 2H, 2J, 2K
Regional Skills Partnership	Cross-cutting	C
UK Government	3	3A, 3D

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	4	4B
Bangor University / M-Sparc	Cross-cutting	H
Glyndwr University	Cross-cutting	H
Registered Social Landlords	3	3C
Business Wales	5	5C
North Wales Corporate Joint Committees	4	4A
North Wales Mersey Dee Business Council	5	5A
Public sector bodies	1&2	2F
Energy Service	1&2	2B

## Appendix 3: Challenges identified by stakeholders

During the workshop, participants were asked what the immediate challenges were associated with delivering against each of the strategic priorities outlined in the Regional Energy Strategy. These have been summarised below. It is important to note that this feedback is subject to contributions in the workshop and as such might not reflect all challenges that exist.

### **(1) To harness the abundance of local low carbon resource to become a green powerhouse and diversify the energy mix + (2) To become a world leader in offshore wind and marine technologies**

- The required supporting infrastructure must be developed quickly.
- More investment is required to scale up the necessary technologies.
- Public opposition to large scale infrastructure projects.
- It can be difficult for small projects to be financially viable without subsidies.
- Significant constraints to grid infrastructure.

### **(3) To improve the energy efficiency of the region's housing and accelerate the decarbonization of North Wales' building stock**

- There needs to be more incentives for households to make changes.
- Many homes are not on the gas grid so require alternative solutions.
- There is a regional skills gap, e.g. heat pump providers.
- Low-carbon measures often require high upfront costs for households.
- Most of the housing sector is privately-owned.
- There is a lack of clear communication around the benefits of behaviour change for households.

### **(4) To achieve a shift to lower carbon transport**

- There needs to be an increase in supporting infrastructure, e.g. EV charging, bike and pedestrian paths.
- Availability of new low-carbon vehicles is limited, it can take up to six months for delivery.
- The cost of low-carbon vehicles can be prohibitive.
- There is uncertainty around the policy direction.
- There is a lack of reliable and affordable public transport services.