



Gwasanaeth Ynni  
Energy Service

# Net Zero - A Welsh perspective

Rhys Horan (Strategic Lead) – APSE Energy Summit 2023



# About the Energy Service

## Who we are

The Welsh Government Energy Service supports Wales' drive towards a prosperous zero carbon future.

We work with the **public sector** and **community enterprises** to:

- reduce energy use
- generate locally owned, renewable energy
- reduce carbon emissions

## What we do

We offer technical, commercial and procurement advice and support to help turn energy projects into reality.

## How we are funded

The Energy Service is a five-year programme funded by the Welsh Government, running from 2018 to 2023.

## Our projects

We work on:

- **regional energy planning**
- **energy efficiency**
- **renewable energy**
- **ultra low emission fleet**



## Look back



## Look forward



## Welsh Government – Context



Is the devolved government for Wales

Ambitious targets for **reducing carbon emissions** and for generating **locally owned renewable energy**.

It is committed to **maximising the wider benefits for Wales** from the transition to a zero carbon economy, ensuring a **fairer and healthier society for all**.

Legislation	Strategy	Ministerial Ambition
<b>Well-being of Future Generations (Wales) Act 2015</b>	Prosperity for All - Economic Action Plan (2017)	Net zero Public Sector by 2030
	Prosperity for All - A Low Carbon Wales (2019)	70% of Wales electricity consumption to be renewable by 2030* (consultation open)
Environment (Wales) Act 2016	Prosperity for All - A Climate Conscious Wales (2019)	1GW of electricity generated in Wales to be locally owned by 2030*
The Climate Change (Carbon Budgets) Wales Regulations 2021	Programme for Government 2021 – 2026 (2021)	All new developments to have an element of local ownership*
	<b>Net Zero Wales Carbon Budget 2 (2021-25)</b>	Additional 100 MW+ public / community sector renewable energy generation

# ‘A Just Transition’

Guiding principle – Leave no one behind

Call for evidence – 15 March

# ‘Our ambition is for the public sector to be collectively net zero by 2030’

‘The size and reach of the public sector means it has a critical leadership role to play in driving and embedding net zero across all that we do and in bringing the communities of Wales with us’.

Baseline emissions, identify  
priority sources and to monitor progress

# The Journey to net zero

## **Moving up a gear 2021–2022**

Where understanding the context and what needs to be done is vital, and where action needs to accelerate.

## **Well on our way 2022–2026**

Where there is an expectation that low carbon is becoming the norm and we are definitely on the way to a net zero Welsh public sector.

## **Achieving our goal 2026–2030**

Where choosing zero carbon has become routine, culturally embedded, and self regulating.





# Priority areas for action: emissions footprint



Buildings



Mobility and transport



Procurement

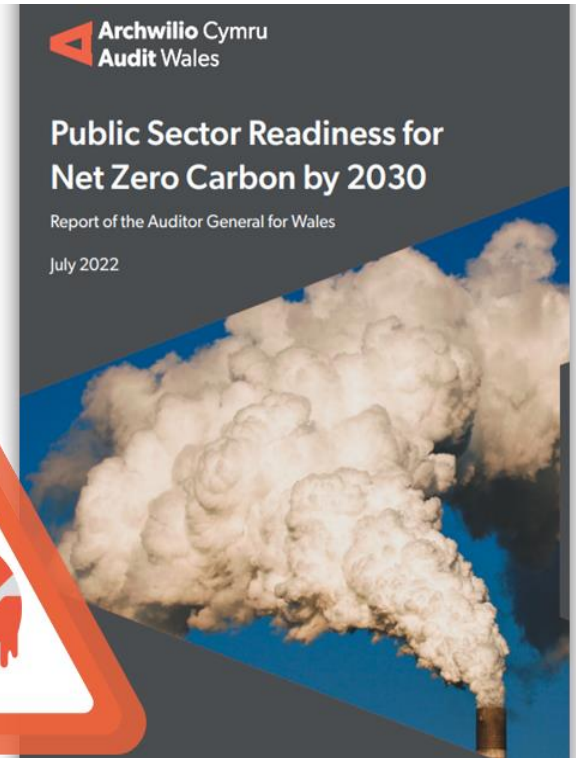


Land use

Clear **uncertainty**  
Common **barriers**  
Must **collectively** address  
Must **ramp up** activities  
Increase **collaboration**  
Place it at the **heart**

### **Calls for Action**

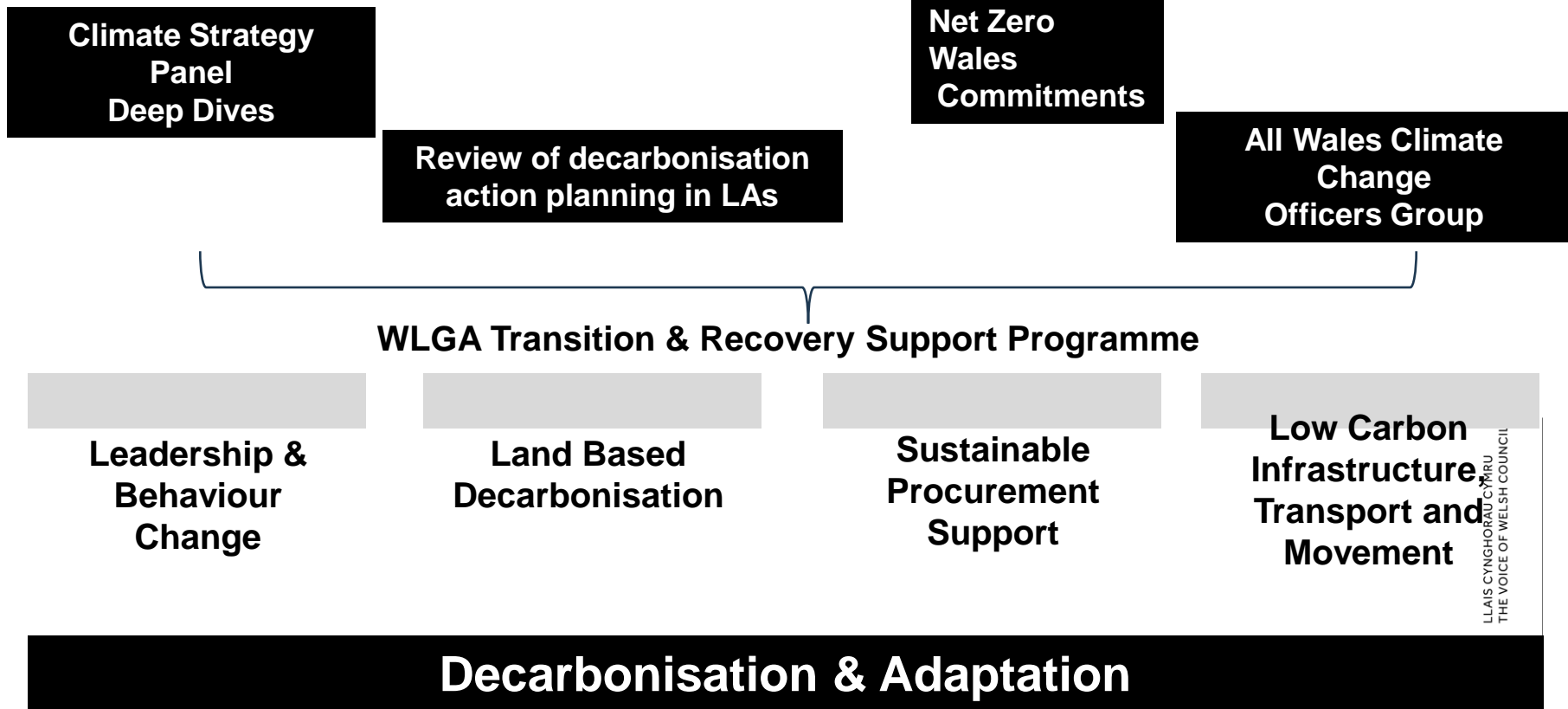
1. *Strengthen your leadership and effective collaboration*
2. *Clarify your strategic direction increase pace*
3. *Get to grips with the finances*
4. *Know your skills gaps and increase capacity*
5. *Improve data quality and monitoring*



# Local Government Taking Action



Team Wales approach;





# Renewable energy

## Technologies:

- Solar farms
- Wind farms
- Hydro power

## What we do

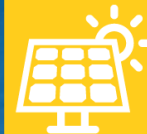
- Support renewable energy projects from concept, through business case development, to completion
- Work with community groups, public bodies and shared ownership projects
- Focus on projects worth £1.5M+ in public sector, £500k+ in community sector

## Finance

- Develop various financial models including community share offers, private wire, power purchase agreements etc
- Community energy loans via the Local Energy Loan Fund
- £7.2m invested in 2021/22

## Impact

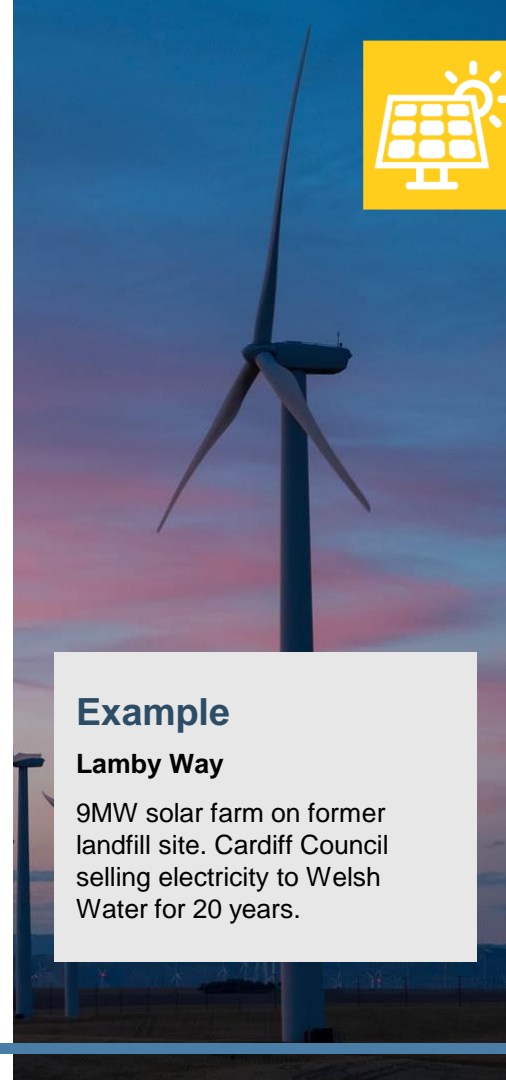
- 5 renewable energy projects across 6 organisations
- 5.4MW of new renewable energy projects



## Example

### Lamby Way

9MW solar farm on former landfill site. Cardiff Council selling electricity to Welsh Water for 20 years.





# Energy efficiency

## Technologies:

- Insulation
- Control systems
- Lighting
- Ventilation
- Low carbon heating
- Building integrated renewables
- Roof mounted solar

## What we do

- Support projects from concept, through business case development, to completion
- Encourage an 'estate-wide' approach to decarbonisation
- Analyse energy usage data and undertake site audits

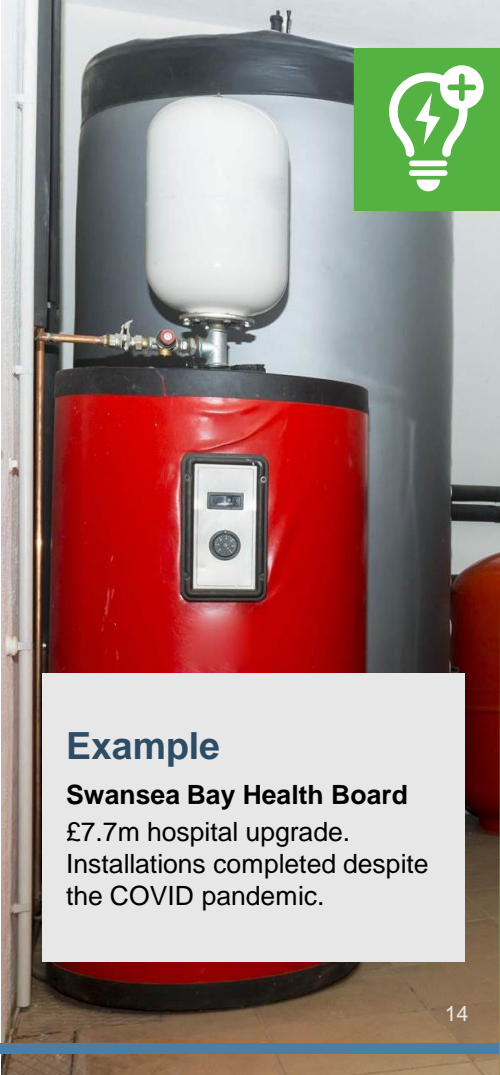
## Finance

- 0% interest loans via the Wales Funding Programme
- **£28m** committed in 2021/22

## Impact

43 energy efficiency projects across 25 organisations

Saving 183,000 tonnes of CO<sub>2</sub> over their lifetime - that's the same as burning 2,100 lorries' worth of coal



## Example

**Swansea Bay Health Board**  
£7.7m hospital upgrade.  
Installations completed despite the COVID pandemic.





# Fleet replacement

## Technologies:

- Ultra low emissions vehicles
- Charging infrastructure
- Integrated renewables
- Solar car ports

## What we do

- Analyse fleet data for public bodies
- Map pathway to net zero fleet by 2030
- Provide recommendations for reducing emissions
- Assess charging infrastructure and future-proofing requirements

## Finance

- A total of £14.6 million invested in electric vehicles and charge points
- £1.5 million of Welsh Government grant for zero emission vehicles and charge points

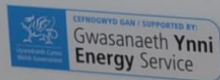
## Impact

- 30 fleet projects, staff travel and charge points reports across 15 organisations
- Saving 7,300 tonnes of CO<sub>2</sub> - that's the same as taking 3,100 cars off the road for a year.





**100%** Cerbyd trydan - Allyriadau sero  
Electric vehicle - Zero emissions



Cyngor Bwrdeistref Sirol  
**MERTHYR TUDFUL**  
**MERTHYR TYDFIL**  
County Borough Council

Zero Emission

Cyngor Bwrdeistref Sirol Merthyr Tudful yn gweithio tuag at niwtraliaeth carbon  
Merthyr Tydfil County Borough Council working towards carbon neutrality

# Local Impact and Implementation

years 1-4

(July 2018 to March 2022)

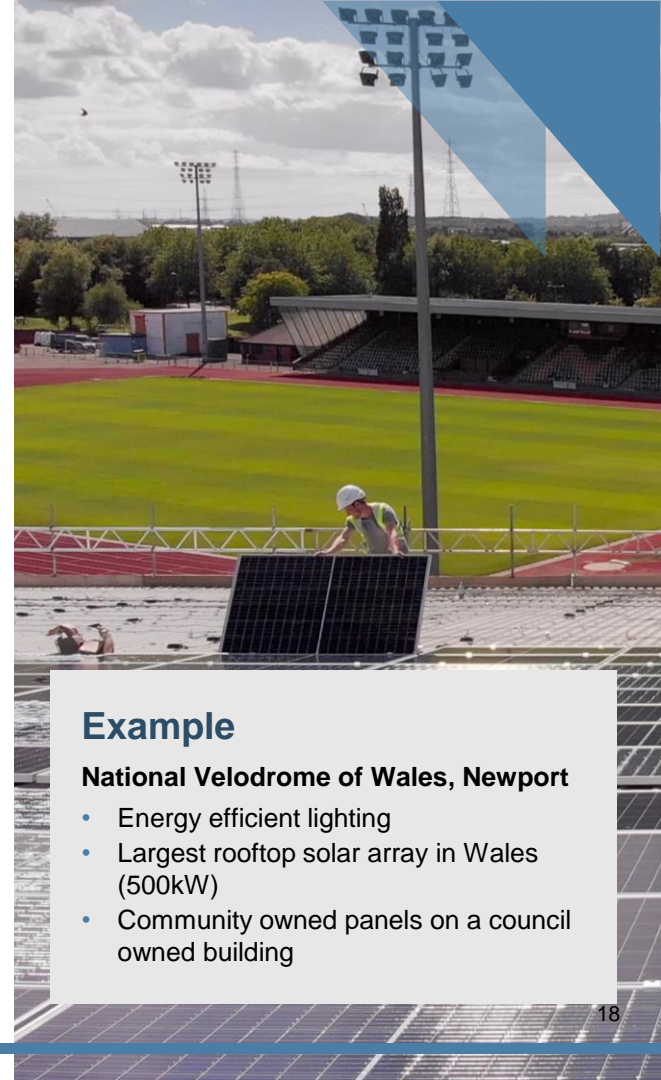
**Energy efficiency, renewable energy & ultra low emissions fleet** projects reaching **financial close**:

Carbon reduction, lifetime: **716,000 tCO<sub>2</sub>e**

Local income & savings, lifetime: **£322,000,000**

Total capital investment value: **£155,000,000**

Generation capacity: **45 MW**



## Example

### National Velodrome of Wales, Newport

- Energy efficient lighting
- Largest rooftop solar array in Wales (500kW)
- Community owned panels on a council owned building



## Strategic, project, and financial support

Our aim is help develop and implement energy projects across the public sector and communities in Wales.

**We can help at each of these stages:**

1. Opportunity identification

2. Business case

3. Financial commitment

4. Implementation

The **Wales Funding Programme** provides repayable, **interest-free** funding for energy efficiency and renewable energy projects and programmes of all sizes. Welsh Government funding administered by Salix.



# Strategic Energy Planning

Working collaboratively with City Deal and Growth Deal teams in:

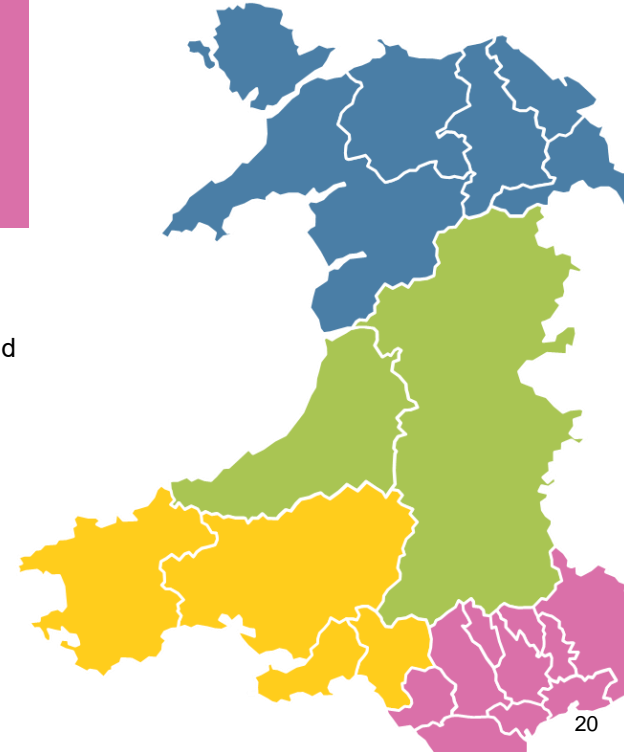
- Cardiff Capital Region
- North Wales
- Mid Wales
- South West

## What we do

- We support Wales' regions to develop and deliver **regional energy strategies** and **actions plans**
- We focus on the energy system: **power, heat and transport**
- Our **energy and economic modelling** covers **energy generation, domestic energy, commercial and industrial energy** and **transport**

## Example energy strategy

- Energy 'baseline': current energy demand and generation
- Energy system vision to 2035
- Pathway modelling
- Economic impact analysis
- Prioritised action plan



# Cardiff Capital Region Energy Strategy

## Our vision for

**2035**

*"To create the conditions for a transition to a carbon neutral economy and society in the CCR, using low carbon energy as an enabler of economic regeneration, growing our regional income whilst maintaining guardianship of our environment through a laser-focus on clean growth"*

## Our priorities

**Energy efficiency and heat**

**Electricity and flexibility**

**Decarbonise transport**

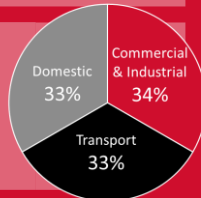
**Grow business and jobs**

**Coordination, planning, regional support and ownership of the plan**

## Our baseline energy assessment

- We consume **36%** of total energy consumed in Wales
- We host **22%** of Wales' renewable energy capacity
- 90%** of homes are connected to the gas network and **0.2%** use a biomass boiler or heat pump
- We have **709 MW** of renewable energy installed in the region, of which **31%** is locally owned
- Our total energy consumption fell by **22%** between 2005 and 2013 and greenhouse gas emissions from our energy system fell by **35%** between 2005 and 2017
- Commercial and industrial electricity consumption constitutes **55%** of all electricity consumption

- Transport is dominated by private car use with **0.3%** of cars pure electric
- Our sectoral energy demand split:



### Domestic

- 42,000 homes insulated
- 140,000 heat pumps installed
- 154,000 homes improved to EPC band D, C and B
- 112,000 homes moved from fossil fuelled to low carbon heating
- No new gas connections from 2025

### Commercial & industrial

- 13% energy demand reduction
- Switch to alternative fuels and electrification of heating
- Behind the meter generation

### Renewable electricity

- Sufficient flexibility, storage and network infrastructure upgrades
- Equivalent of 50% of total energy consumption generated from regional renewables
- 532MW onshore wind
- 830MW solar PV

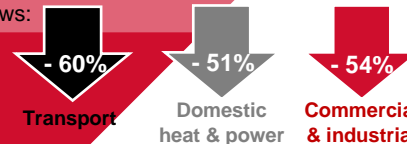
### Road transport

- 64% of vehicles electric by 2035
- 20% reduction in private vehicle mileage
- 3,300 gas and hydrogen HGVs and 1,000 hydrogen taxis
- Increase in public transport and active travel

## Energy vision modelling assumptions

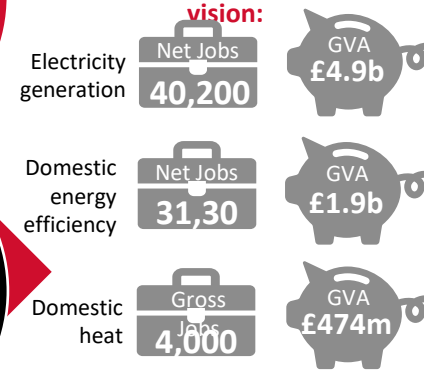
## Achieving our energy vision

To be on track for net zero by 2050, we need to reduce emissions from our energy system by **55% by 2035**. Energy modelling achieves this reduction split by sector as follows:



Our energy vision is also supportive of the ambitions of the Wellbeing of Future Generations (Wales) Act 2015.

## Estimated economic impacts of achieving our energy vision:



**£8.6 billion spend required** to achieve our energy vision

Not all of the jobs will be held by Cardiff Capital Region residents; some jobs will be held by persons outside of the region


The additional jobs associated with this vision will require strengthening and building new skills within the region


# North Wales Energy Strategy


## Our vision for 2035


*"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"*

## Our priorities

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

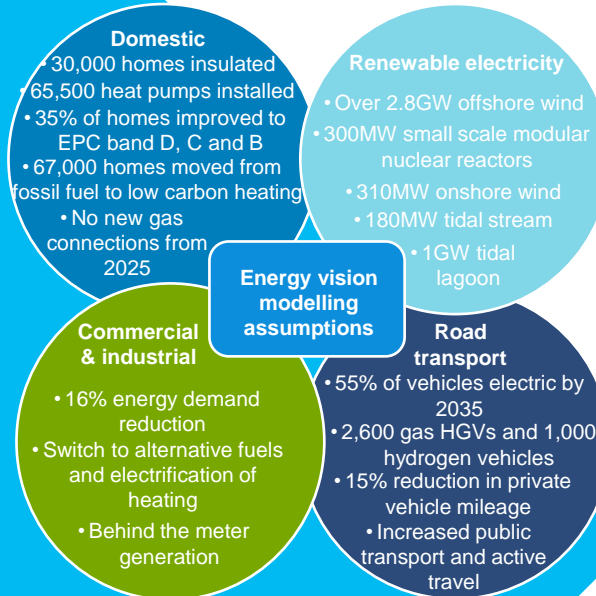
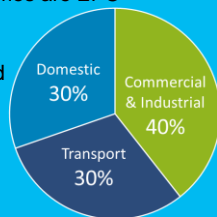
To become a world-leader in offshore wind and marine technologies 

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

To achieve a shift to lower carbon transport 

## Our baseline energy assessment

- We consume **23%** of total energy consumed in Wales
- We host **37%** of Wales' renewable energy capacity
- 0.7%** of our homes use a biomass boiler or heat pump
- We have **1,183 MW** of renewable energy installed in the region, of which **8%** is locally owned
- Our total energy consumption fell by **5%** between 2005 and 2017 and the greenhouse gas emissions from our energy system fell by **28%**
- Commercial and industrial electricity consumption constitutes **71%** of all electricity consumption in the region
- Transport is dominated by private car use with **0.1%** of cars pure electric
- 36%** of our homes are EPC band E, F or G
- Our sectoral energy demand split:



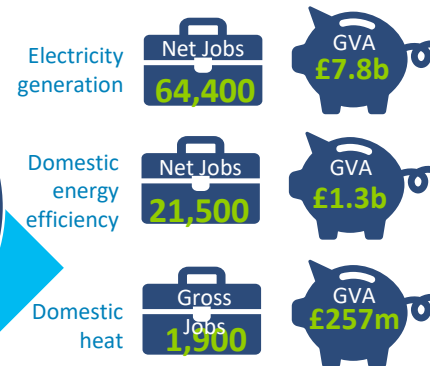
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## Estimated economic impacts of achieving our energy vision:



**£15 billion spend required** to achieve our energy vision

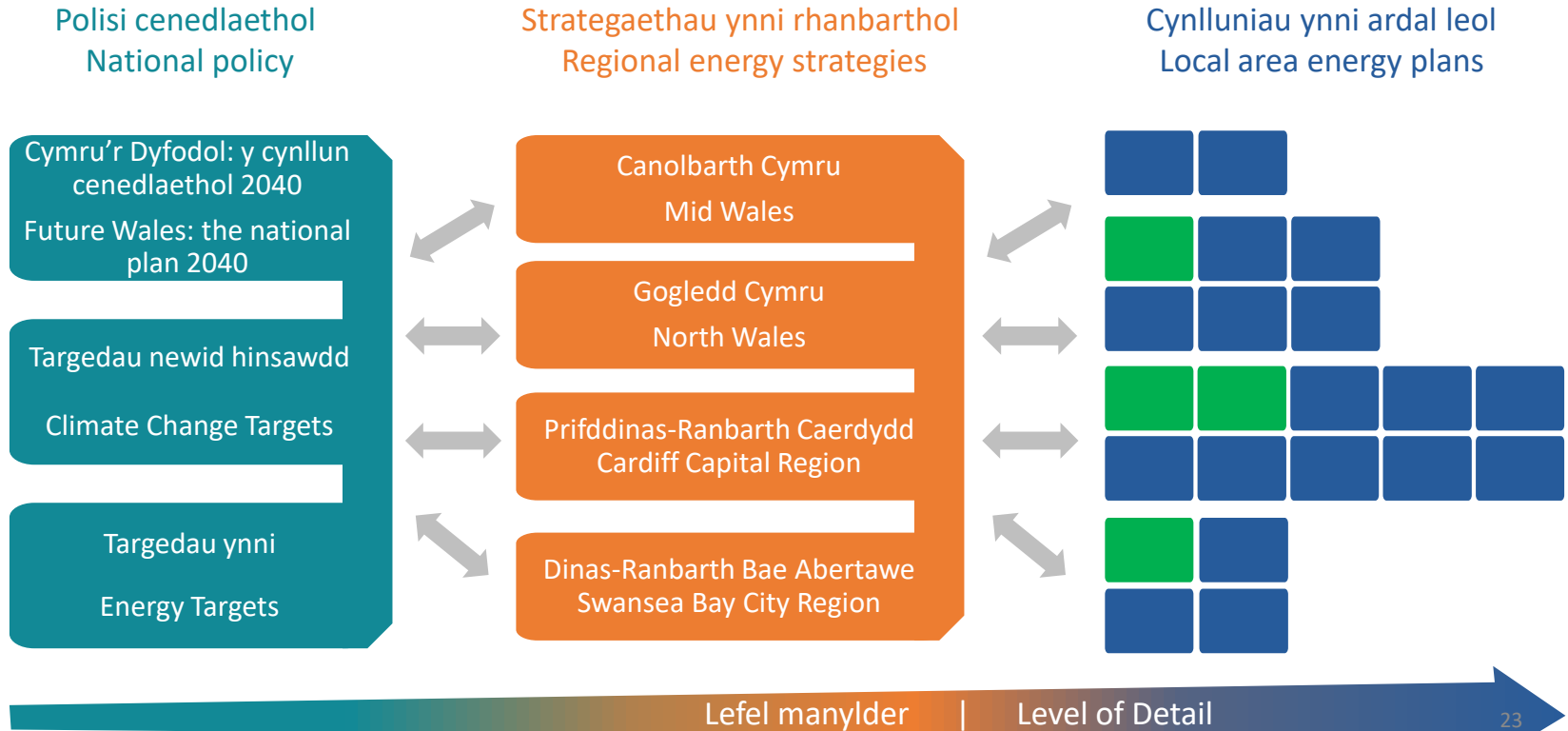
Not all of the jobs will be held by North Wales residents; some jobs will be held by persons outside of the region

The additional jobs associated with this vision will require strengthening and building new skills within the region

\* all figures shown are approximate values

# Cynllunio ar gyfer system ynni carbon isel sy'n fwy integredig

## Planning for a more integrated low carbon energy system



# North Wales The Projects:



## Canolfan Ragoriaeth Ynni Carbon Isel (Egni) | Low Carbon Energy Centre of Excellence (Egni)

Cynllun Twf | Growth Deal: £4m



## Datgarboneiddio Trafnidiaeth (Hydrogen) | Hydrogen Hub

Cynllun Twf | Growth Deal £11.4m



## Trawsfynydd

Cynllun Twf | Growth Deal: £20m



## Cydnerth (Morlais)

Cynllun Twf | Growth Deal: £9m



## Ynni Lleol Blaengar | Smart Local Energy

Cynllun Twf | Growth Deal: £25m







## The Renewable Energy Developer programme

### **Programme for Government commitment:**

- Expand renewable energy generation by public bodies and community groups in Wales by over 100MW by 2026.

### **Net Zero Wales commitment:**

- Establish a Welsh Government or public energy developer to accelerate the delivery of renewables.

**Julie James MS, Minister for Climate Change**



Llywodraeth Cymru  
Welsh Government

## The Co-operation Agreement

2021

**Net zero energy company** – Work towards the creation of Ynni Cymru, a publicly-owned energy company for Wales, to expand community-owned renewable energy generation.



## Closing ABC Remarks

- **Ambition**
- **Affordability (and the energy trilemma)**
- **Behaviour change**
- **Business Cases**
- **Coordination**
- **Collaboration**
- **Capital**
- **Commitment**



Dydd Gwyl Dewi Sant Hapus / Happy St David's Day

[Source: Visit Wales](#)



## Useful links and contact details

<https://gov.wales/public-sector-net-zero-reporting-guide>

<https://www.publicsectornetzero.org/>

<https://gov.wales/net-zero-carbon-status-2030-public-sector-route-map>

[Regional energy strategy: mid Wales | GOV.WALES](#)

### Find out more online:

[gov.wales/energy-service-public-sector-and-community-groups](https://gov.wales/energy-service-public-sector-and-community-groups)

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