Dŵr Cymru
Welsh Water

Carbon Isel

Welsh Water’s journey to net zero

31 March 2023

Ty William Morgan House, UK Government Building, Cardiff, Wales

Current carbon footprint

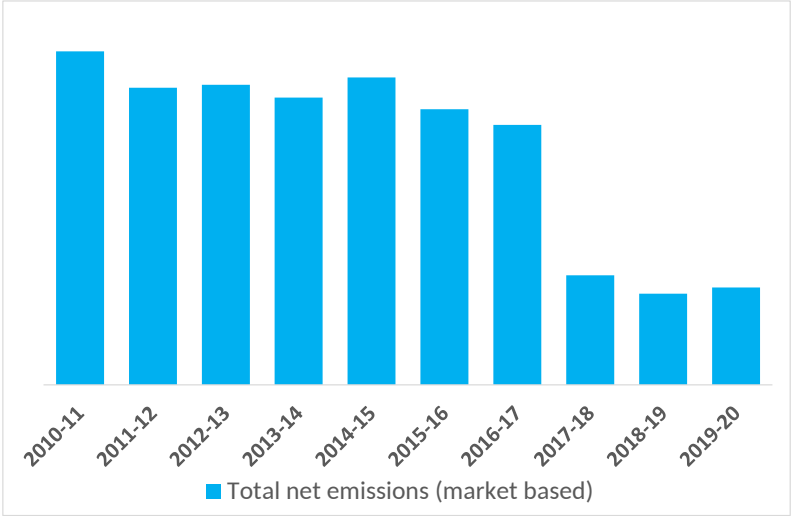
Achievements to date:

- 25% self sufficiency in electricity supply
- 100% self-sufficient in green natural gas
- 80% reduction in operational emissions
- 65% reduction in total emissions[1]

Improvements achieved through:

- Significant investment in renewable generation
- Biomethane to grid facility at Five Fords
- REGO backed electricity supply (off shore wind)

[1]total emissions = operational + embedded

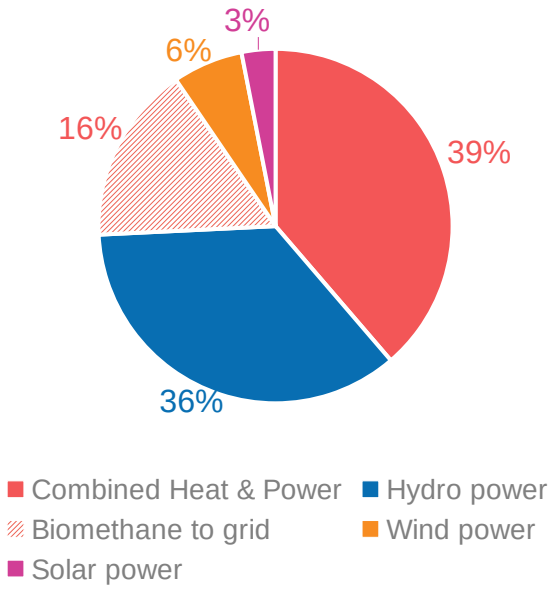


230 kton pa

-65%

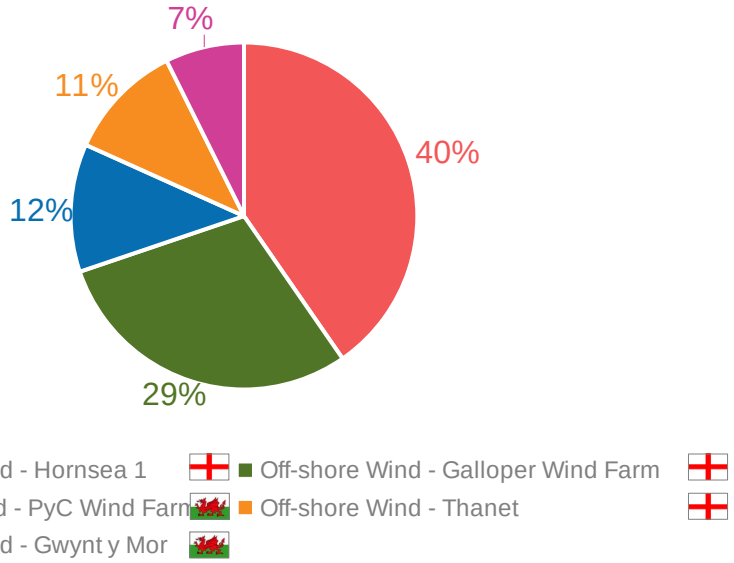
versus 2010-11 baseline

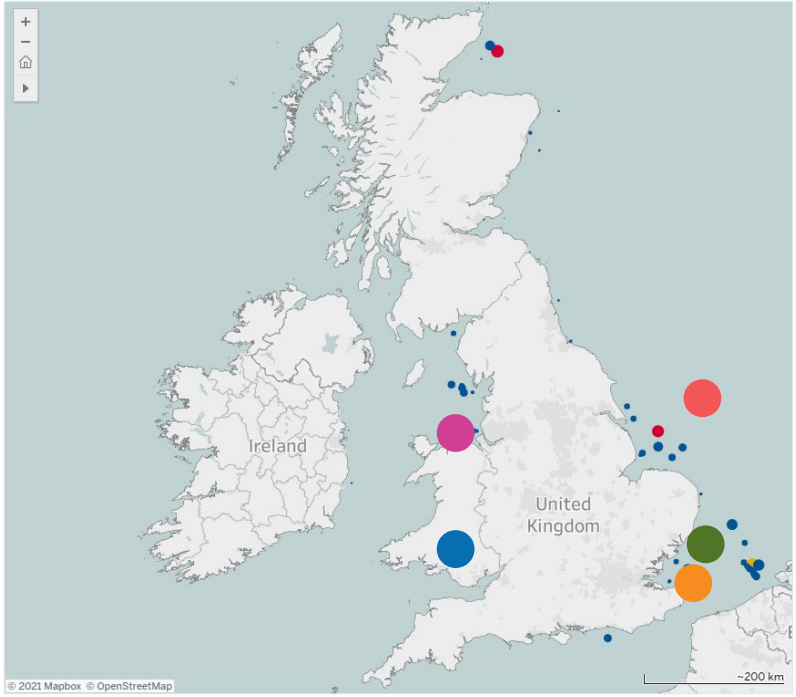
Renewable energy generation 2019-2020



Source of remaining electricity supply 2019-2020

Renewable Energy Guarantee of Origin backed

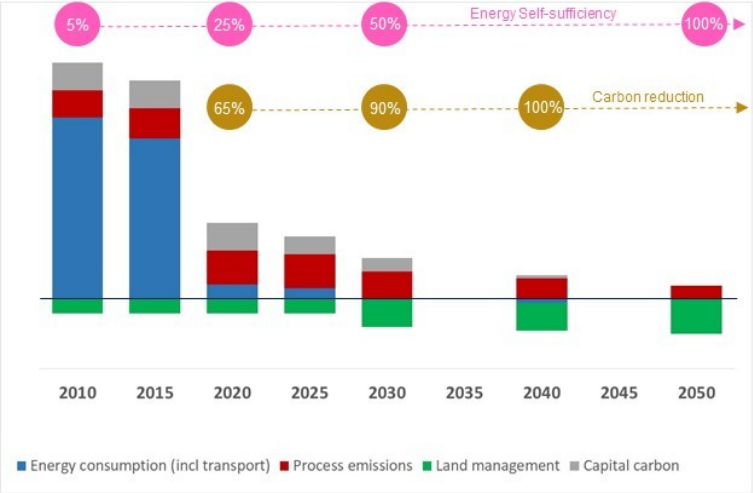




Carbon strategy

Our targets:

- 35% energy self sufficiency by 2025
- 90% reduction in total carbon emissions by 2030
- Carbon neutrality by 2040
- 100% energy self-sufficiency by 2050



Key improvement activities:

- Encouraging our customers to use less water
- Measure & control N_2O emissions WWTW's
- Prioritise biogas to decarbonise heat & transport
- Replace fleet with vehicles that utilise low carbon fuels and/or electricity
- Apply the carbon mitigation hierarchy within capital program
- Increase carbon sequestration of our land to offset remaining emissions

Carbon strategy workstreams

Electricity | Fossil fuel | Transport | Process | Investment | Land

Carbon emissions associated with electricity consumption & generation

2030

50% self sufficiency – net zero electricity supply (incl. losses, market based)

- Encouraging our customers to use less water to decrease energy use
- Encourage large scale wind farm development on DCWW land
- Procure 100% renewable electricity, generated in Wales (REGO[1] backed)

[1] REGO = Renewable Electricity Guarantee of Origin

Carbon strategy workstreams

Electricity | **Fossil fuel** | Transport | Process | Investment | Land

Carbon emissions associated heating systems and standby generation

2030

Net zero heating & stand-by generation (market based)

- Expand green gas production (biomethane, hydrogen) & retain RGGO / RTFC[1]
- Replace heating systems with air source heat pumps or switch to renewable alternative fuels (biomethane, Bio-LPG, etc.)

[1] RGGO = Renewable Gas Guarantee of Origin; RTFC = Renewable Transport Fuel Certificate

Carbon strategy workstreams

Electricity | Fossil fuel | **Transport** | Process | Investment | Land

Carbon emissions associated with company owned vehicles, logistics & travel (scope 1&3)

2030

50% reduction compared to 2019-2020, remaining covered by REGO or RTFC's

- Reduce miles travelled by fleet & staff by utilising IT technology
- Accelerated uptake of hydrogen & electric powered vehicles
- Installation of EV charging points across Welsh Water sites, to encourage uptake

Carbon strategy workstreams

Electricity | Fossil fuel | Transport | **Process** | Investment | Land

Carbon emissions associated with waste water treatment & sludge disposal (CH_4, N_2O)

2030

40% reduction compared to baseline

- Online measurement & advanced process control to minimise N_2O emissions
- Demonstrate anaerobic waste water treatment process following pilot
- Investigate wastewater treatment using “waste” oxygen from hydrogen production

Carbon strategy workstreams

Electricity | Fossil fuel | Transport | Process | **Investment** | Land

Carbon emissions associated with the capital investment program (concrete, steel, etc.)

2030

50% reduction in embedded emissions associated with the capital program

- Minimise new concrete & steel structures and re-use existing where possible
- Increase use of low carbon alternatives & maximise use of nature based solutions
- Use natural capital accounting tools to select the right long term solution

Carbon strategy workstreams

Electricity | Fossil fuel | Transport | Process | Investment | **Land**

Increase carbon removed from the atmosphere and enhance bio-diversity

2030

100% increase in carbon flux from our land holdings, to offset remaining emissions

- Raised bog & wetland restoration
- Improve carbon flux woodlands by tree planting and active management
- Collaborate with NRW to maximise flux on leased DCWW land

Conclusions

The significant carbon reduction achieved year to date driven by investment in renewable electricity generation & procuring REGO-backed electricity

Sewage derived biogas can play a significant role in decarbonising heat & transport in the UK, alongside electrical equivalents (heat pumps and electric vehicles)

Lack of infrastructure (EV charging & hydrogen) and availability of suitable vehicles on the open market, prevent large scale fleet conversion to low carbon technologies

With the electricity & gas infrastructure continuing to decarbonise, carbon management in the water industry will be increasingly focussed on controlling & reducing process emissions

To meet the future challenges and improve environmental performance, there is a need to move away from traditional solutions and collaborate with 3rd parties to get the best long term outcome

There will be a ongoing need to maximise the carbon sequestration potential of our land holdings to offset the remaining carbon emissions that are too costly to abate