



Annual Report

Welsh Government
Energy Service
2021-22



Gwasanaeth Ynni
Energy Service

Brynwhillach solar farm,
Morriston Hospital

Welsh Government Energy Service: Our impact

The Welsh Government has ambitious targets for reducing greenhouse gas emissions and generating locally owned, renewable energy to help deliver a stronger, fairer, greener Wales.

The Welsh Government Energy Service supports the public sector and community enterprises to work towards these ambitions and a [Net Zero Wales](#) by 2050.

We helped to accelerate carbon reduction projects by providing technical, commercial, and procurement advice to public sector organisations and community enterprises across Wales, and did this despite the ongoing impacts of the COVID-19 pandemic.

“Since 2018, the Welsh Government Energy Service programme has been making an impact right across Wales.

This includes working with the public sector and community enterprises to reduce energy use, generate locally owned, renewable energy and lower carbon emissions.

We need a Team Wales approach to tackling climate change, one where we all work together and play our part. So, it's great to see the wide range of support that's been provided over the past year, helping us to reach our ambition of a Net Zero Wales by 2050.”

Julie James MS, Minister for Climate Change

Overall impact* July 2018 – March 2022

Impacts

We have supported the public sector and community enterprises in Wales to secure investment of £155 million to develop energy efficiency, renewable energy and zero emission vehicle projects:

- Saving **716,000 tonnes of CO₂** from being emitted – that's the same as taking 300,000 cars off the road for a year
- Generating **£322 million** in local income and savings
- And committing to **45MW of new renewable energy capacity** in Wales – that's enough electricity to power 13,300 typical Welsh homes, over half of the homes in Merthyr Tydfil

Projects

We have supported **242** projects to reach financial close across all **22** local authority areas.

Financial close occurs when all the project and financing agreements have been signed and all conditions on those agreements have been met.



64

solar
power



4

wind
power



68

energy
efficiency



13

low carbon
heat



3

hydro
power



33

efficient
street
lighting



56

fleet
decarbonisation



1

storage

Our achievements in 2021-22

"We get to support and see the real change happening across Wales now"

"For me, the best thing about working with the Energy Service is that we get to support and see the real change happening across Wales now – community-owned wind turbines, solar panels on schools, energy efficiency in hospitals, electric waste trucks – as well as being part of the longer-term planning for a net zero future at a regional and national scale."

Poppy Potter, Head of the Energy Service



Our impact this year

In 2021-22, we supported the installation of **£59.6 million** of energy efficiency, renewable energy and fleet projects, including **17MW of renewable electricity**.

Local contractors and installers were used to complete the work where possible, helping grow the local economy in Wales as it recovers from the COVID-19 pandemic.

Hear the stories of the people behind the projects: *tap below to watch our annual report video.*



Who we've supported in 2021-22**



Llywodraeth Cymru
Welsh Government

22

local authorities

10

health boards
and trusts

6

universities

3

national parks

3

fire and rescue
services

4

colleges

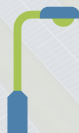
22

community
enterprises

5

other

We also helped secure **£16 million** in interest-free loans and grants from the Wales Funding Programme for:



LED street
lighting



Energy efficiency
for buildings



Renewable
energy



providing
£123 million

in savings and income for public sector
organisations and community enterprises
over the lifetime of these projects.

The projects we have supported will save

253,000 tonnes of CO₂

the same amount of CO₂ that **400 square
kilometres of trees** absorb in a year.
That's **three times** the size of Cardiff.



Workstreams



Regional energy planning

A Wales-wide approach for our four regions

We collaborate with partners across the public, private and community sectors to build actionable energy strategies that encourage sustainable growth, reduce fuel poverty and support Welsh Government's Net Zero ambitions in every corner of Wales.

Working across all four regions, these strategies are founded on core principles and defined priorities which give each area ownership of their respective visions for 2035.

These strategies address climate change and economic recovery from the COVID-19 pandemic, while also aiming to deliver social, ecological and wellbeing benefits to the regions.

Core principles and visions

Learn more about each region's core principles and a summary of their vision:

Mid Wales Energy Strategy

"To achieve a net zero-carbon energy system that delivers social and economic benefits, eliminates fuel poverty..."

- Leadership in decarbonisation
- Delivering additional social and economic benefits to the community
- Enabling Mid Wales to play an important role in broader Welsh and UK decarbonisation
- Developing innovation

Cardiff Capital Region Energy Strategy

"...maintaining guardianship of our environment through a laser-focus on clean growth."

- Act as an enabler to a sustainable regional economy
- Contribute wider benefits to the region
- Decarbonise the energy system to meet national targets as a minimum

North Wales Energy Strategy

"Delivering maximum local economic, social, ecological and wellbeing benefits from transitioning to a net zero economy..."

- Become a leader in low carbon energy generation
- Collaborate
- A whole-systems multi sector view
- Embracing a net zero carbon economy
- Future proofing and innovation

South West Wales Energy Strategy

"Harnessing the region's low carbon energy potential to deliver a prosperous and equitable net zero carbon economy..."

- Harness the region's natural assets (on and off-shore) to maximise renewable generation
- Share the benefits of the low carbon transition equitably
- Create a structure to ensure the vision is translated into action



Overview of impacts

Estimated economic impacts of achieving the combined energy visions***

	Electricity generation	Domestic energy efficiency	Domestic heat
Gross jobs – direct jobs related to a specific project or intervention			7,625
Net jobs reflect the net impact of the job gains alongside the job losses associated with transitioning from one technology to another	133,000	64,100	
Gross Value Add (GVA) – the amount that individual businesses, industries or sectors contribute to the economy	£16bn	£3.87bn	£1.03bn

Shared priorities

- Improving energy efficiency
- Decarbonising transport
- Regional coordination
- Harnessing natural resources
- Growing businesses and jobs
- Supporting the net zero ambitions of Welsh Government and the Wellbeing of Future Generations (Wales) Act 2015.

Investment

£30.1 billion spend required to achieve the energy vision for the four regions.

Collaboration

Sixteen thematic workshops were held across the four regions to explore, define and build strategic action plans, supported by experience from the Energy Service and regional experts.

“The Welsh Government Energy Service have provided excellent support to the North Wales region in delivering key pieces of work relating to decarbonising the energy system. They have facilitated the delivery and adoption of the North Wales Regional Energy Strategy and effectively coordinated the ongoing development of the Action Plan. They have also provided valuable expert input to the North Wales Growth Deal’s Low Carbon Energy Programme, helping to develop projects that

will enhance North Wales’ status as a leading location for low carbon energy, as well as creating jobs and making carbon savings. The Energy Service have also proactively established and managed the North Wales Public Sector Decarbonisation Advisory Group, which has added significant value by allowing public sector bodies from across North Wales to collaborate and share best practice.”

**Henry Aron, Programme Manager,
Ambition North Wales**



Energy efficiency

Doing more to use less energy

We worked with public bodies across Wales to help meet Welsh Government's ambitions for a net zero public sector by 2030. The energy efficiency projects we supported during 2021-22 ranged from LED streetlamp installations to low-carbon heat solutions, helping Wales do more while using less.

Impacts of the energy efficiency projects reaching financial close in 2021-22

Number of projects

43 energy efficiency projects across 25 organisations



Investment

A total of £28 million invested

Total carbon savings

Saving 183,000 tonnes of CO₂ over their lifetime – that's the same as burning 2,100 lorries' worth of coal



Re:fit Cymru

Providing guaranteed energy and cost savings for public buildings and assets



Case study: Isle of Anglesey County Council

As part of their Energy Efficiency Strategy 2017-2022, Isle of Anglesey County Council used Re:fit Cymru to install energy conservation measures across 31 buildings, including schools, leisure centres and council buildings. The Energy Service helped the Council determine what technologies they needed, and provided advice on funding and procurement options, as well as more technical aspects.

Case study: Amlwch Leisure Centre is now heated using air source heat pumps. A 50kWp solar PV array was also installed on the Centre's roof generating clean electricity for the building. Not only is the building heated by the heat pumps, but the swimming pool as well, helping local people enjoy exercise in a greener way.

Measures

- 752kWp of solar PV
- 4,800 LED Lights
- 1,050 metres of pipework insulation
- 700kW air source heat pumps

Impacts

- 31 sites upgraded
- Saving 892 tonnes of CO₂ every year
- 3,411MWh of energy savings annually
- Reducing bills by £261,000 annually
- 2 new local jobs created



Solar array on a school, Anglesey

"The Re:fit Cymru programme and Welsh Government Energy Service have been instrumental in accelerating our net zero carbon objectives and we are now progressing the Phase 2 works in partnership with our selected service provider, Asset Plus."

Rhys Griffith, Principal Surveyor, Isle of Anglesey County Council



Case study: Aberystwyth University

Aberystwyth University has also benefitted from the Re:fit Cymru programme with energy efficiency upgrades on the Penglais Campus helping them progress towards their 2030 net zero ambitions.

The Energy Service provided technical and commercial support to advise the University on the measures most suitable for their needs.

With LED lighting now illuminating sports pitches and laboratories plus a range of other energy saving measures, the University is now starting to see the results of its decarbonisation strategy.

Work has also begun on the installation of a new solar array on university-owned land at FFerm Penglais. The £2.9m investment will provide up to 25 per cent of the annual electricity needs of the Penglais Campus and reduce the University's carbon emissions by just over 500 tonnes annually, and up to 12,000 tonnes over its anticipated 25-year working life.

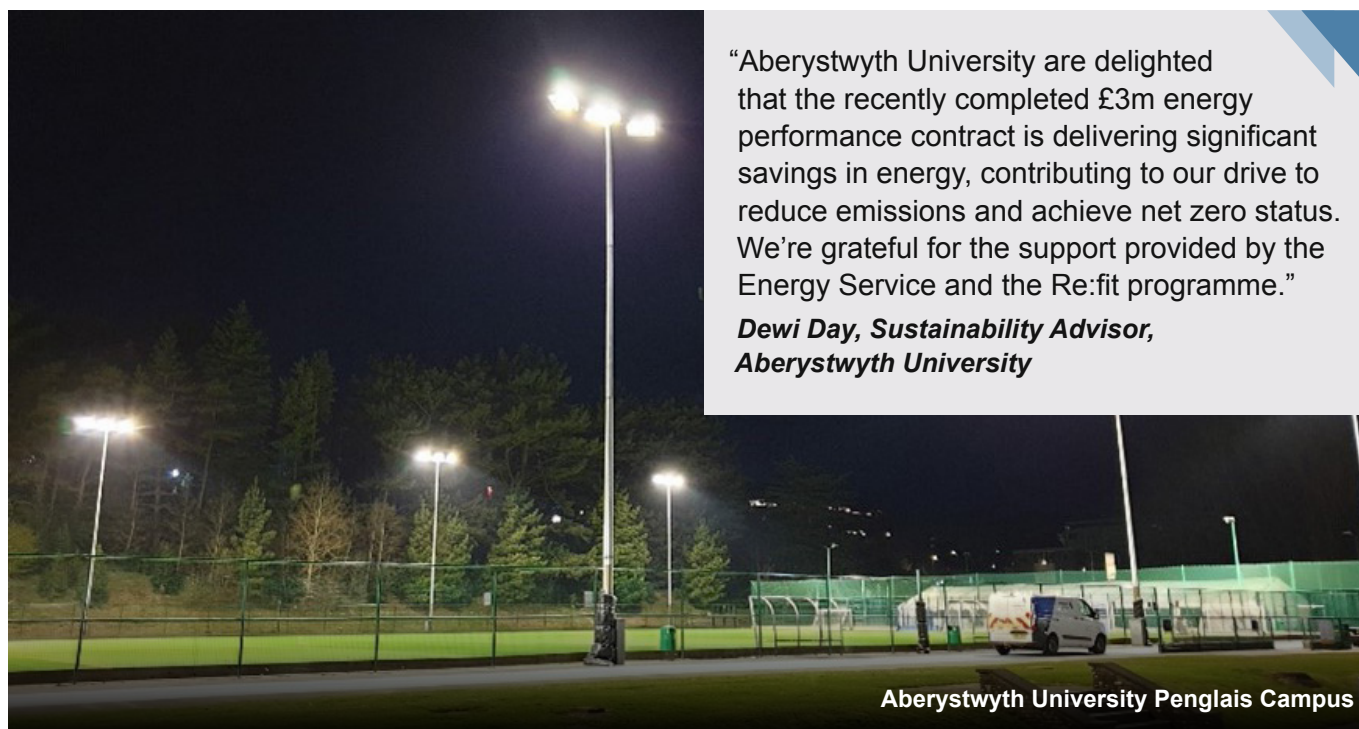
Measures

Energy efficiency upgrades to:

- Heating
- Ventilation
- Air conditioning
- Building controls
- Lighting

Impacts

- Over 12,000 tonnes of CO₂ savings over project lifetime, that's the same emissions 14,000 domestic solar panel systems save every year.
- £3.2 million invested, including £1.8 million through the Wales Funding Programme and £1.1 million through a Higher Education Funding Council for Wales Decarbonisation Grant
- £4.2 million savings across project lifetime
- Majority of work sub-contracted to local contractors



"Aberystwyth University are delighted that the recently completed £3m energy performance contract is delivering significant savings in energy, contributing to our drive to reduce emissions and achieve net zero status. We're grateful for the support provided by the Energy Service and the Re:fit programme."

**Dewi Day, Sustainability Advisor,
Aberystwyth University**

Aberystwyth University Penglais Campus



Renewable energy

A natural switch

Our support for renewable energy projects in Wales extends from the concept stage through to financial close and completion, providing help each step of the way to harness Wales' natural resources and turn public sector and community enterprises' ideas into reality.

Impacts of the renewable energy projects reaching financial close in 2021-22

Number of projects

5 renewable energy projects across 6 organisations



Total energy generation and carbon savings

5.4 MW of new renewable energy projects, saving 28,000 tonnes of CO₂ over their lifetime



That's the same as flying from Cardiff to Sydney 8,000 times

Another 6.2 MW of solar energy capacity was installed on public buildings as part of the energy efficiency workstream



Case study: Ripple Energy

Ripple Energy is the UK's first consumer-owned wind turbine, with over 900 people sharing ownership and benefiting from cheaper energy. The 2.5MW Graig Fatha turbine, located in Rhondda Cynon Taf, is also helping Ripple's community benefit fund to support people who are in fuel poverty in the surrounding area.

Impacts

- £165,000 community benefit fund in first year
- 42,000 tonnes of CO₂ savings over project lifetime
- 6,700MWh of energy generated annually
- £1.1 million grant invested by Welsh Government



Graig Fatha wind turbine, Pontyclun

"Graig Fatha is the UK's first ever consumer-owned wind farm. This means that the people who own it get supplied with low cost green electricity that it generates and as a result they get savings off their electricity bill for its 25 year lifetime. The project aligned really well with Welsh Government's aim to support locally owned renewable energy in Wales and deliver community benefits as well."

Sarah Merrick, CEO, Ripple Energy



Case study: Bro Dyfi Community Renewables

Bro Dyfi Community Renewables (BDCR) is a community benefit society which generates and supplies renewable energy to the local area by harnessing local resources.

Having successfully operated two wind turbines for over a decade, BDCR is in the process of expanding its generation capacity by installing a 300kW solar array located in Machynlleth to complement the turbines by providing an alternative source of power when wind is scarce. The project is optimising the use of the existing grid-connection and helping inform how to integrate wind and solar generators on grid-constrained sites.

The Energy Service has provided BDCR with technical guidance and grant funding, alongside supporting Local Energy Fund Loan and Local Energy Grant applications to the Development Bank of Wales and Welsh Government respectively.

Community benefits

Local renewable energy projects like BDCR's make a real difference to the community.

Profits generated by existing wind turbines have already supported:

- **Dyfi Community Energy Fund**, which offers grants to local groups for energy efficiency measures and climate education to help reduce CO₂ emissions in the Dyfi Valley.
- **CAMAD**, a local volunteering group who used the fund to help with costs of delivering prescriptions and shopping for vulnerable people.
- **Heart Mind Body Support**, who tackle social isolation and loneliness, primarily through online wellbeing activities.
- **Ysgol Bro Hyddgen**, by purchasing seven Chromebook laptops for pupils who had no access to a computer at home.
- **Food Justice for All**, an initiative providing free food to those who need it most every week from the Braich Goch in Corris.

Impacts

- Estimated 280MWh of extra renewable energy generation each year
- Saving almost 845 tonnes of CO₂ over the project's lifetime
- Temporary and part-time local jobs created during the design, construction and operational phases
- £250,000 of grant and loan funding from Energy Service, Welsh Government and Development Bank of Wales
- Financial surplus will benefit other local community projects
- Plans for renewable energy via direct wire to help power the Centre for Alternative Technology

"We're grateful for the Energy Service's support in helping us explore expanding our energy generation capacity. As a community-focused organisation, we see first-hand the benefits that projects like ours can deliver for local people. The additional capacity will help us produce more power and put more of our profits towards supporting community groups helping those who need it most."

Bro Dyfi Community Renewables committee



Bro Dyfi wind turbine, Machynlleth



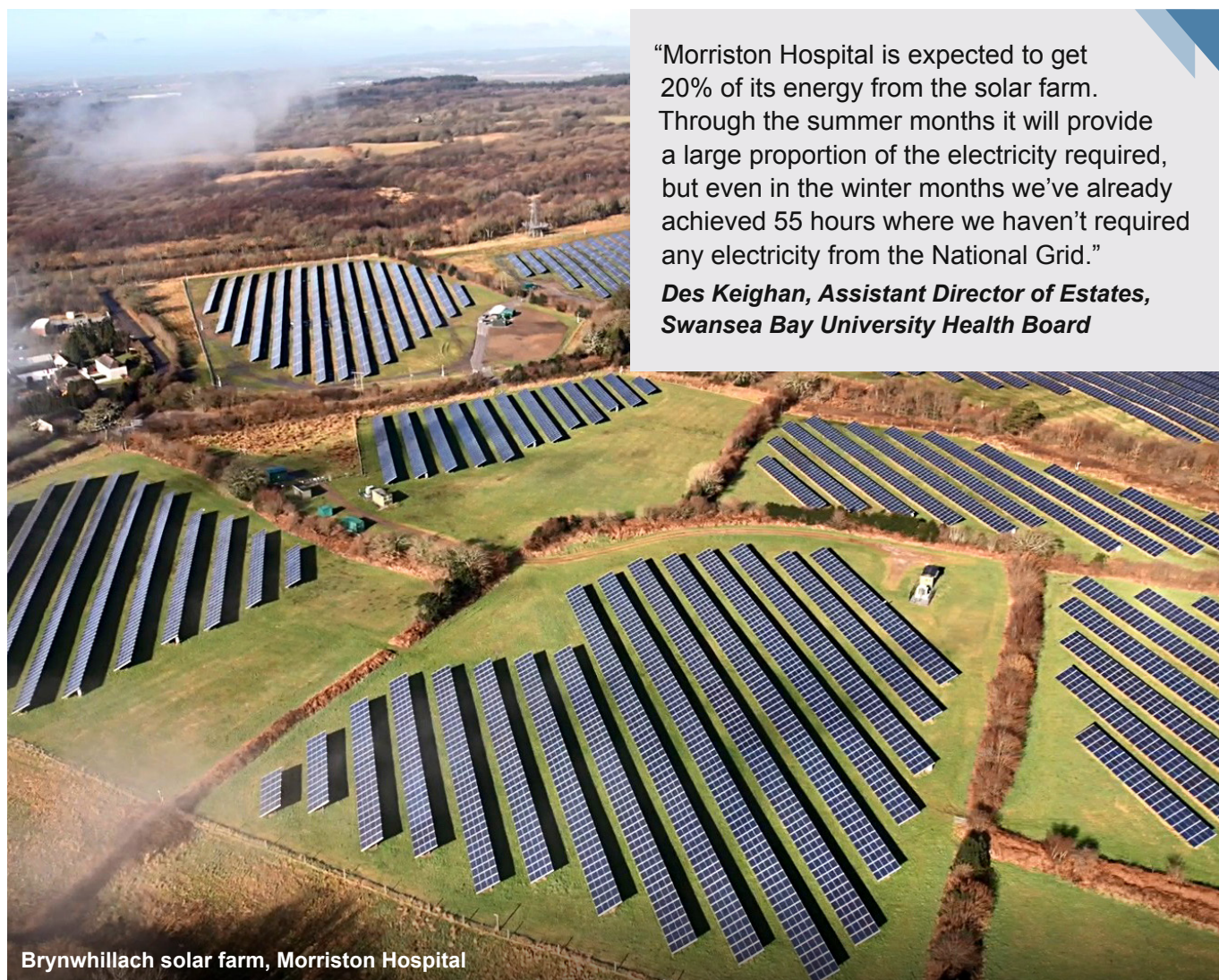
Case study: Swansea Bay University Health Board

Swansea Bay University Health Board is home to the first hospital-owned solar farm in the UK. The 4MW installation has 10,000 panels which are expected to generate enough power to cover a fifth of Morriston Hospital's electricity consumption every year.

Since going live in October 2021, the solar farm outperformed expectations, leading to surplus electricity being exported to the electricity grid, generating an additional income for the hospital.

Impacts

- 4MW solar farm with 10,000 solar panels
- Saving 1,000 tonnes of CO₂ annually
- £500,000 in annual savings
- 30,000kWh surplus generated in first four months which was sold back to the energy grid



“Morriston Hospital is expected to get 20% of its energy from the solar farm. Through the summer months it will provide a large proportion of the electricity required, but even in the winter months we’ve already achieved 55 hours where we haven’t required any electricity from the National Grid.”

**Des Keighan, Assistant Director of Estates,
Swansea Bay University Health Board**

Brynwhillach solar farm, Morriston Hospital



Vehicle fleet

Driving towards decarbonisation

Our work accelerating the transition to a zero emission vehicle fleet helps the organisations we work with map out their route to decarbonisation. From funding for electric vehicles to advice on appropriate charging infrastructure, we are helping set Wales on the road to zero carbon travel.

Impacts of the fleet projects reaching financial close in 2021-22

Number of projects

30 fleet projects, staff travel and charge point reports across 15 organisations



Investment

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



Total carbon savings

Saving 7,300 tonnes of CO₂
That's the same as taking 3,100 cars off the road for a year



Case study: Newport City Council

We're supporting Newport City Council's transition to a net zero fleet by providing technical and financial support for electric vehicles and charge points. As well as helping the drive to a carbon neutral public sector, it's making a real difference to those behind the wheel.

Electric vehicles are much more efficient than their petrol/diesel equivalents. Typically, fleets will see a 70-75% reduction in primary energy use when transitioning to zero emission vehicles and an average reduction in carbon emissions of 80%.

The drivers appreciate the new technology, praising their quietness and cleanliness, as well as recognising the role they play in tackling the climate emergency.

Impacts

- 4 x 50kW rapid chargers plus 12 x fast chargers across 9 sites
- £840,000 of funding for electric waste trucks and electric vans plus £315,000 for charge points



Newport City Council depot

"The Energy Service have been key to enabling Newport City Council to accelerate our transition to an all-electric fleet as we work towards our carbon neutral 2030 target. They have provided technical support, grants for a range of charging infrastructure and gap-funding for new cars and vans. The rounded package of support has been invaluable to our fleet decarbonisation."

Ross Cudlipp, Carbon Reduction Manager, Newport City Council



Case study: Denbighshire County Council

We developed fleet reports for Denbighshire County Council, which is now implementing the recommendations on the road to a net zero fleet by 2030 by installing charge points, upgrading grid connections, and introducing electric vehicles.

Leading the way is Fflecsi, a pioneering demand responsive public transport system introduced by the Council and Transport for Wales, connecting Ruthin and surrounding villages and hamlets. The Energy Service provided grant support for the county's first purchase of this model of electric bus, helping introduce a flexible bus service to many people in Ruthin for the first time.

Impacts

- 32 rapid charge points across 15 sites
- Supports Fflecsi, a pioneering demand responsive public transport scheme
- £104,000 grant for Cityline zero emission bus with rooftop solar panels – the first of this model operating in the country

“Denbighshire County Council worked closely with the Energy Service fleet team to secure funding for new electric vehicle charging infrastructure at key sites across the county. We also secured funding through the service for a first-of-its-kind electric bus, operating an innovative demand responsive service, conveying residents in a zero emission and sustainable way”

Martin Griffiths, Fleet Mobility Officer, Denbighshire County Borough Council



Denbighshire County Council Fflecsi bus



Brynwhillach solar farm,
Morriston Hospital

Find out more about how the Welsh Government Energy Service can help your community enterprise or public sector organisation:

Website: [Click here](#)

Email: [@energyservice.wales](mailto:enquiries@energyservice.wales)



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[welsh-government-energy-service](#)



Gwasanaeth Ynni
Energy Service

Calculation details

A small proportion (~3.4%) of the projects that secured investment in this period did not go on to be built. Of the £155M worth of projects we have supported, £5.34M worth of projects have been discontinued after securing finance, for various reasons. For projects that had secured finance from the Wales Funding Programme, these released funds have been used to finance other decarbonisation projects.

Carbon savings have been calculated using the current carbon conversion factors provided by the Department for Business, Energy & Industrial Strategy (BEIS) and multiplied by the estimated economic life of a project. This is known as the 'persistence factor methodology'. Some of the figures for Isle of Anglesey County Council, Aberystwyth University and Swansea Bay University Health Board case studies were provided by the organisations.

* The lifetime savings are an estimate of total financial energy savings over the operational life of the project.

** Projects progressed in 2021-22, including early stage engagements up to installation.

*** It is not possible to specify exactly where the various types of jobs will be located, geographically. Some jobs – such as manufacturing solar panels – are currently likely to be located outside the region – and others – such as installation and maintenance jobs are more likely to be locally based.