



#### PROJECT SUMMARY:



**CLIENT**  
YnNi Teg

**PROJECT**  
576kWp Solar Farm &  
Associated Electrical  
Infrastructure.

#### THE BENEFITS:

- > Uses spare grid capacity allocated to existing wind turbine.
- > Enabled through a G100 application.
- > Works flexibly with wind turbine to maximise output throughout the year.
- > Innovative Bifacial solar panels maximise generation by capturing ground-reflected energy.
- > Solution to Wales' grid capacity restriction.

## PROJECT OVERVIEW

The UK's electricity grid, especially in Wales, faces severe capacity constraints. New renewable energy projects encounter significant delays securing grid connections, with some offered connection dates as late as 2030 or beyond. This bottleneck could be a genuine hurdle to the UK meeting its net zero targets if solutions aren't found.

The Bwlch Gwynt Solar Farm project, located in Carmarthen, has created an elegant solution to this problem by utilising the spare grid capacity of an existing wind turbine. This allows the new solar farm to generate electricity and export to the grid using a G100 setup. This

approach maximises renewable energy generation while optimising the available spare grid connection.

This £1m investment has been designed and delivered for the client, YnNi Teg, which develop sustainable community energy initiatives to drive communities towards their net zero targets whilst creating a low-cost energy future for Wales.

The project not only addresses local energy needs but also contributes to broader sustainability goals, generating enough electricity to power approximately 500 homes annually through the combined solar and wind energy systems.

## VITAL SOLUTION

We implemented a comprehensive solution, installing 860 bifacial solar PV panels, each with a generating capacity of 670Wp. We assessed our worldwide suppliers to choose the best product and specified panels which are Bloomberg Tier 1 accredited, which means they are considered financially reliable, warranting investment.

This, along with extensive modelling based on our previous installations, gives the client

certainty that the project will perform as promised.

#### Solar Array Installation

Our design specified bifacial panels which allow for increased energy capture by utilising both direct sunlight and reflected light from the ground. This advanced technology enhances the overall system efficiency, particularly in varying light conditions, ensuring optimal performance throughout





***“This innovative approach allows for energy generation, with the ability to balance outputs between solar and wind sources. For example, the system can flexibly allocate 200kW from solar and 700kW from wind, ensuring optimal utilisation of the 900kW maximum export capacity.”***

the year. This solution created increased yield, which strengthened the client's twin goals of financial stability and maximising carbon reduction.

#### **Grid Integration**

The team successfully integrated the solar farm with an existing wind turbine, sharing a grid connection through a G100 setup and extending cabling to a new shared substation. This innovative approach allows for energy generation, with the ability to balance outputs between solar and wind sources. For example, the system can flexibly allocate 200kW from solar and 700kW from wind, ensuring optimal utilisation of the 900kW maximum export capacity.

#### **Electrical Infrastructure**

Vital Energi installed a comprehensive electrical system, including string inverters, a step-up transformer, and a SCADA monitoring system for efficient operation and management. The four 125kW inverters ensure optimal DC to AC conversion, while the SCADA system provides real-time monitoring and control capabilities. This advanced infrastructure allows for precise management of the hybrid renewable energy system, maximising energy output and system reliability.

Data gathered from the solar farm is assessed, not only to

ensure the scheme is performing as expected, but to identify opportunities for improvement.

#### **Site Preparation and Security**

The project included site enabling works, establishment of security measures, and ongoing maintenance to ensure optimal performance and safety. We implemented comprehensive site security, including perimeter protection to prevent unauthorised access. The team also developed a 12-month operations and maintenance plan, encompassing regular visual inspections, vegetation management, and panel cleaning to maintain peak system efficiency.

#### **Environmental Considerations**

The ground-mounted solar farm was designed to minimise land disturbance while significantly contributing to carbon emission reduction efforts. The installation's layout was carefully planned to optimise land use, preserving the surrounding environment. By generating over 650,000kWh of clean energy annually, the project substantially reduces the community's carbon footprint, aligning with the transition to renewable energy sources and upholding the principles of the Wellbeing of Future Generations Act.

#### **Collaborative Approach**

We worked closely with landowners and stakeholders, demonstrating a solution-driven and collaborative approach throughout the project. Our extensive knowledge and experience led to improvements in the scheme, such as increasing the number of panels to maximise system generation. By creating a team of solar specialists in design, engineering and operation and maintenance, we were able to address any technical challenges, keep all parties fully informed of developments and create a solar solution that demonstrates how creative thinking can be used to overcome Wales' grid capacity restrictions.