



CASE STUDY
15632

Brecon Power STOR

Infrastructure Balance of Plant (eBoP)



Brecon Power STOR

Brecon Short-Term Operating Reserve (STOR) plant is a 21MW gas peaking generation platform which began exporting power to the grid in November 2018. The site consists of fourteen 1.5MW generators which are capable of supplying electricity to the grid at short notice. As a trusted NERS accredited company with over 40 years' experience, Powersystems were appointed to assume the responsibility for the electrical and mechanical Balance of Plant.

The site is located in Brecon, mid-Wales and was constructed in partnership with Jones Bros Civil Engineering on behalf of the client, Quinbrook Infrastructure Partners. Brecon STOR adds gas-peaking generation to their extensive worldwide investment portfolio that includes renewable and low carbon technologies.

The site connects onto Western Power Distribution's 33kV electricity network and Powersystems have connected 100MW of generating STOR projects to the grid over the years. Our engineers have the much-needed experience of working with every Distribution Network Operator across the UK on STOR projects, helping customers connect this type of project up and down the country, exporting to the grid at both 11kV and 33kV.



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The need for STOR:

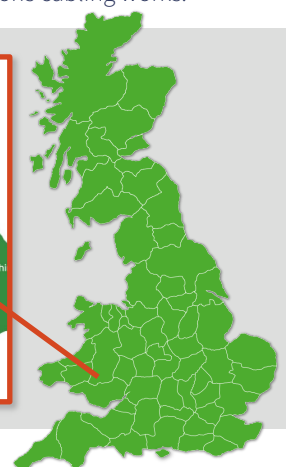
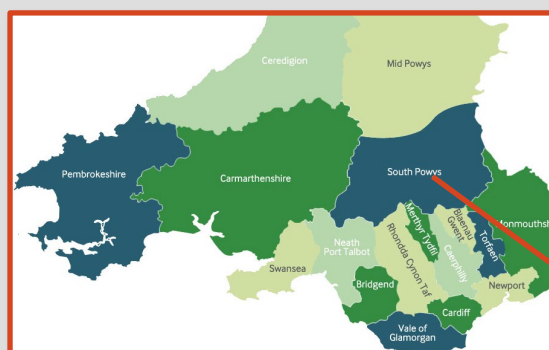
As the UK's electricity network continues to move away from large-scale carbon emitting sources towards alternative renewable generation, it faces new challenges. The intermittent nature of renewable sources such as wind power make it impossible for the grid to accurately predict how much energy they will have at their disposal at any one time, or how long they will need it for.

Brecon Short Term Operating Reserve (STOR) plant is one of many STOR sites across the UK that give the grid the extra flexibility it needs to meet peak demands at short notice and ensure smooth and efficient operation.

Scope of works:

The major items of electrical plant that Powersystems designed, supplied, installed, and commissioned were:

- ▶ 7 x 3.5 MVA 33 kV/0.4 kV transformers and associated bunds
- ▶ Gas supply connections to 14 x 1.5 MW Clarke Energy generators via HDPE and stainless pipework
- ▶ Boilers and hot water pump & distribution system, including Insulated flow and return pipework
- ▶ Cabling for the control and protection panels for the complete system
- ▶ Compound and sub-station earth system installation and testing
- ▶ All necessary building fit-out works comprising Lighting and small power with intruder, CCTV and fire alarm systems
- ▶ Within the Brecon power site, the installation of 33 kV power, low voltage, control, signal and communications cabling works.



33
kV

11
kV



How Powersystems helped:

Powersystems engineers were involved with a design that maximises the generation capacity on the small amount of land available whilst also adding cost-effectiveness for the customer.

Instead of connecting each of the fourteen 1.5MW Clarke generators to their own 33/0.4MW transformer, valuable space on site was saved by using three-winding transformers shared between pairs of generators instead. This halved the number of step-up transformers needed to 7.

Through condensing the site layout, Powersystems were able to save the customer on some of their largest expenditures – the amount of underground utilities needed to support the site. This included reducing the length of gas and hot water pipework as well as the onsite underground cabling.

Noise considerations were also at the forefront of the design with consideration for the site's surrounding neighbours a high priority. Studies were conducted to assess the impact of noise and measures were put into place to reduce this. The noise of the generators was primarily reduced by fitting engine silencers to the equipment.

In order to secure preferable tariff arrangements between the customer and the National Grid, an energisation date was set for December 2018. To achieve this, Powersystems engineers worked with the customer to push non-critical aspects of the project back beyond this date. This resulted in the customer being able to export power at the set target date to avoid costly penalties.

Environmental Benefits:

- ▶ Low carbon power platform
- ▶ Flexible peak power generation



Project facts and figures:

- ▶ Total installed capacity: 21 MW
- ▶ Number of generators: 14
- ▶ Generator capacity: 1.5 MW
- ▶ Connection voltage: 33 kV
- ▶ Fast start response time: 60 seconds
- ▶ Length of onsite 33 kV cabling: 1.75 km
- ▶ Length of onsite 400 V cabling: 3.0 km
- ▶ Used pre-insulated pipework with compression joint technology to significantly reduce installation timescales (no onsite welds, pre-insulated)
- ▶ Low-carbon technology producing 60% less CO₂ emissions than coal or oil
- ▶ Powersystems are a Lloyd's registered (NERS) approved independent connection provider (ICP)

Economic benefits:

- ▶ The Brecon power STOR plant fulfils an increasingly important means for the National Grid to maintain stability in light of the country's increased reliance upon the generation of energy of energy from less predictable renewable resources

Result:

- ▶ Began exporting electricity to the national grid in November 2018



For more information

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