

Case Study: 90kW Turgo Hydropower Scheme

Location: Bont Ddu, Barmouth, North Wales

Installed: December 2013

Total Fall (Gross Head): 54m

Design Flow: 234 litres/second

Turbine Type: 4 jet Turgo, Direct Drive

Generator: 90kW Induction, 8-pole, Three Phase

Penstock: 567m of 450mm HPPE Pipe



The powerhouse during construction showing the 'pigging' route. It is due to be clad in stone.



The intake weir which uses a coanda screen



The layout of the powerhouse

There is a history of hydropower at this site. There was originally an oak weir used to divert water along a leat to a goldmine where it was used to power the mine's machinery. We have used an oak weir for part of the construction in a very similar way to how it was originally. Water from the intake passes along a low pressure pipe situated in the old leat to a forebay tank where the higher pressure penstock feeds the turbine. The scheme will produce 300 MWh per year, enough to supply 75 typical UK homes, and saving around 157 tonnes of carbon dioxide from being released into the atmosphere each year. The scheme provides an alternative revenue stream for the farmer worth around £68,000 / year. This is index-linked so that it will increase each year in line with inflation, and the scheme should pay for itself in 3-4 years.