

Case Study: 15kW Turgo Hydropower Scheme

Location: Nebo, Betws y Coed, Wales

Installed: November, 2011

Total Fall (Gross Head): 30m

Design Flow: 78 litres/second

Turbine Type: 4 nozzle Turgo, Direct Drive

Generator: 15kW Induction, 8-pole, Single Phase

Penstock: 680m of 355mm HPPE Pipe



The layout of the Powerhouse



The weir and fish-pass

This site will give an estimated annual Energy Production of 72 MWh, enough to supply 18 typical UK homes, and saving around 38 tonnes of Carbon Dioxide from being released into the atmosphere each year. The electricity is used by the customer, with excess exported to the National Grid, providing an alternative revenue stream for the farmer worth around £17,000 / year. This is index-linked so that it will increase each year in line with inflation, and the scheme should pay for itself in 5-6 years.

This scheme uses a combination of relatively low head and high flow to achieve the desired power output, but can still use the turgo design of turbine. The weir is located in a large stream, and a fish-pass was required. The powerhouse was remote from the customer's property, but an agreement was reached to connect to the grid at a neighbouring property. A new import/export meter was installed at the neighbour's farm house to monitor power production.



The intake site prior to construction of the weir