

CASE STUDY ARDVORLICH



KEY STATISTICS

Gross Head: 236m

Net Head at Design Flow: 218.6m

Flow: 0.4 m³/s

Turbine type: 600 P316_TJ Pelton

Speed: 1,000 rpm

Output power: 716kW

Average Annual Energy Production: 2,400 MWh

Load Factor: 38%

The Ardvorlich Estate is located along the south shores of Loch Earn, Perthshire, Scotland, approximately 70 miles from Glasgow. The catchment area which supplies the hydro scheme extends to the south of the Loch between Ben Vorlich and Ben Our.

Three intakes are used in order to capture three burns and hence maximize the catchment area used. The three intakes are all located at 351m AOD. Coanda style screens are used on each intake in order to prevent debris entering the system and to benefit from their low-maintenance, self-cleaning properties.

A 2.7km pipe transfers water from the intakes to the turbine house which is situated close to the main Ardvorlich residence at 115m AOD. This provides a Gross Head of 236m. The pipeline uses both HDPE (High Density Polyethylene) and GRP (Glass Reinforced Plastic) in order to benefit from the respective properties of these two materials.

The turbine used in this scheme was chosen to be a Gilkes Twin Jet Pelton operating at a design flow of 0.4 m³/s (400 l/s) and a speed of 1,000rpm. This turbine is an impulse turbine which is optimized for high-head applications and provides high efficiency across the full range of flows.

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Using this turbine it is possible to produce 716kW of power. The scheme is grid connected and all power produced is exported. The average annual energy production (“AAEP”) is 2,400MWh and the scheme is amongst the first in the country to benefit from the UK Feed In Tariff (“FITs”) subsidy mechanism.

The lead consultants on the scheme were Hydroplan and main civil contractors were DA MacDonald of Lochgilphead. The scheme secured approx 10 local jobs during its 18 month design and construction phase and the income from the scheme will contribute to the ongoing upkeep of the Ardvorlich Estate.

Along with providing the Electrical & Mechanical (“E&M”) equipment Gilkes, via their financing subsidiary, Gilkes Energy, provided a financing package. The package reduced the initial funding requirement from the Estate and is linked to actual electricity generation. Gilkes and the Estate are therefore long-term financial partners and share the risks and rewards of the project.

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