

RENEWABLE ENERGY BEST PRACTICE CASE STUDY
IRISH ENERGY CENTRE, RENEWABLE ENERGY INFORMATION OFFICE

ANARGET HYDROPOWER SITE

Site: Anarget, County Donegal

Starting-up date: 1996

1. AIM OF THE PROJECT

The aim of the project is to demonstrate the advantages of using standardised design techniques for mega-watt-sized remote hydropower projects involving induction generators. When completed, the project will also use advanced control techniques for availing of the storage capacity of small reservoirs.

2. DESCRIPTION

The hydropower station is located in an area with high but sporadic average annual rainfall.

The first phase of the project, which consists of two nameplate rated 402 kW generators, came into operation in late 1996. For this phase of the development, the head is approximately 110 m and the design flow is about 1,000 l/s.

A 600 mm nominal diameter GRP penstock is used to convey the water from the intake to two identical Turgo water turbines. Two identical induction generators are directly coupled to these water turbines without the use of gearboxes.

The completed project will consist of several water turbines totalling 2,100 kW, and, in order to minimise spillage losses and maximise peak-time generation tariffs, it will include a small reservoir.

3. OWNER

The development is owned by a private Irish company.

4. INVESTMENT AND FINANCING

The total estimated cost of the entire project is approximately IR£1,800,000. Up to IR£541,000 of this will be provided by a THERMIE grant. The balance will be provided from private funds.

Electricity is sold to the state utility, ESB, at a rate of IR£0.0667 / kWh for peak time generation and IR£0.026 / kWh for all other times. Both of these rates are index linked to the Irish consumer price index until 31 December, 2010.

A payback period of just under 10 years is expected for the overall project.

5. RESULTS (ENERGY DETAILS)

Initial monthly outputs of over 200,000 kWh have been recorded for phase 1 of the project. This figure is expected to increase significantly when the small storage reservoir comes into operation as very high spillage rates have been recorded to date.

6. ENVIRONMENTAL IMPACT

By displacing the need to burn fossil fuels, it is expected that the completed project will reduce carbon dioxide emissions by up to 5,000 tonnes per annum. There is minimum visual intrusion and fisheries disturbance at the site.

7. USERS

The state utility, ESB, is the sole user of electricity produced. There is replica potential at all small hydro sites in the power range of 300 kW - 3,000 kW, particularly for high-head projects without significant reservoir storage. There is also potential for retrofitting the control technology at existing project sites.

8. MAIN MANUFACTURERS AND SERVICE SUPPLIERS

Design and Supply of Control System. Energy Control Systems Ltd., Cranford Hall, Stillorgan Road, Donnybrook, Dublin 4.

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Supply of Water Turbines.

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9. MORE INFORMATION

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- Anarget Hydropower Site
- Solar Water Heating for a Family Home
- Landfill Gas Utilisation Project, Dublin
- Restoration of Cahir Mills
- Kenmare Hydropower Station
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