

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

SMALL SCALE WIND ENERGY PROJECT

Site: Eeragh Lighthouse Ireland

Starting-up date: 1996

1. AIM OF THE PROJECT

The objective of the project was to power the marine navigation light and associated systems at Eeragh Lighthouse using a 2.2 kW wind generator.

2. DESCRIPTION

Eeragh Lighthouse is situated on the most western of the Aran Islands, which lie in a Northwest/Southeast direction across Galway Bay. The small island is mainly rock and is exposed to prevailing westerly winds averaging 7 m/sec. It is unfeasible to install utility mains power at the location.

The navigation light, which comprises two 12V, 36W Quartz Halogen Lamps in series, is powered by a 24V battery charged by a 2.2 kW wind generator.

The turbine, supplied by Proven Engineering in Scotland, features a 3-blade, 3.4 m diameter rotor coupled directly to a 3-phase a.c. generator. The unit is mounted on an existing 9 m mast at the site.

All steel parts of the turbine are heavily galvanised for maximum protection against corrosion. At wind speeds of about 12 m/sec, the self-regulating turbine blades automatically maintain power output within the design limits. This allows power to be delivered even in gale conditions.

Three phase a.c. supply is rectified to give a d.c. output for battery charging. The battery is a 24V, 1,020Ahr. unit comprising two banks of 20 Nickel Cadmium cells type LB510P. Monitoring and backup of the wind generator battery is provided by a number of other batteries, which are powered by a conventional 6 kW diesel generator.

3. OWNER

The wind battery charger is owned by the Commissioners of Irish Lights, who presently operate two further 2.2 kW systems at other sites and plan to install a third in 1997/98.

4. INVESTMENT AND FINANCING

The capital costs for the generator, battery, cabling etc. totalled in the region of IR£15,000. Use was made of existing mast infrastructure and ducting at the site. The installation costs were approximately IR£5,000.

Due to the inaccessibility of the location, helicopter transportation was required - at a cost of IR£2,000 - bringing the total costs of the installation to the region of IR£22,000.

The wind generator has provided financial savings through reduced diesel requirements and consequent reductions in expensive shipping operations necessary for station refuelling.

5. RESULTS (ENERGY DETAILS)

Annual energy production from the turbine is estimated at 1,900kWhr., based on figures for the first three months of 1996. Of this, about 35% is used to charge the battery. The remainder is transformed through dump load resistors into heat, which is used to condition the lighthouse tower.

6. ENVIRONMENTAL IMPACT

With the reduced running hours of the diesel generator and a reduction in the number of times the station has to be refuelled, there are undoubtable reductions in emission levels and consumption of fossil fuels.

7. USERS

The system is ideally suited for heating and lighting requirements in isolated locations at uneconomic distances for connection to the electricity distribution network. It also has applications as a back up to utility power lines subject to failure.

8. MAIN MANUFACTURERS AND SERVICE SUPPLIERS

Wind Turbine & Charge Control Cabinet Proven Engineering Products, Moorfield Industrial Estate, Kilmarnock, KA2 OBA, Scotland

Tel: +44 563 43020 Fax: +44 563 39119

Battery Supplier

Erskine Systems Ltd., Salter Road, Eastfield Industrial Estate, Scarborough, North Yorkshire, England
Yol 1 3DU. Tel: +44 1723 583511 Fax: +44 1723 581231

Installation and Mast Manufacture

Commissioners of Irish Lights, 16 Lower Pembroke Street, Dublin 2, Ireland.
Tel +353 1 6624525 Fax +353 1 6618094

9. MORE INFORMATION

Commissioners of Irish Lights, Dublin.

Irish Energy Centre,
Renewable Energy Information Office,
Shinagh House, Bandon, County Cork.

Tel +353 23 42193 Fax +353 23 41304
email renewables@reio.ie
Web <http://www.irish-energy.ie>

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