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Siting and design

Cuileig, Scotland

Overview

Cuileig is the first hydropower scheme to be built in Scotland in almost 40 years. It is situated on the Cuileig burn in the Scottish Highlands near Ullapool. It was first identified as having potential in the 1960s however it was not until the Scottish Renewables Obligation (SRO) came into effect that there was increased impetus to proceed. The SRO requires that a certain proportion of electricity provided by suppliers comes from renewable energy.

As the scheme is sited within a scenic area, a decision was taken to keep visual impacts to a minimum. This was a major factor in developing the design as well as the final siting of the scheme while still allowing efficient operation.

Dam Name

Scheme operator
Scottish and Southern Energy

Size of scheme (MW)
3 MW

Country
Scotland

Catchment area
52 km²

River
Cuileig burn

Effective reservoir capacity
Run of river

Construction years
February 2001 - March 2002

Reservoir size
Run of river

Details

Siting and design

The Cuileig hydropower scheme in north-west Scotland has an intake weir on the Cuileig burn, leading water through a buried penstock pipeline to a partly underground turbine house just upstream from the River Droma.

The main potential environmental impacts considered within the design were:

- Visual
- Fish and river ecology
- Bryophytes in the gorge
- Forestry
- Animal and bird life
- Pollution during construction

To minimise these impacts, the location and design of each component were carefully considered.

The pipeline and power station are both buried structures, while the intake structure is located unobtrusively. Although burying the powerstation increased capital costs, it maximised the available head. The exposed concrete faces of the partially buried turbine house are faced with locally won stone. The penstock pipeline is 1.2 m in diameter and 2.7 km long and is made from glass re-inforced plastic. It was routed to minimise environmental impact and a significant length was incorporated into the existing main road corridor. This also facilitated ease of construction. The siting of the scheme has particular advantages with proximity to overhead power lines.

Cordial relations with statutory authorities and on site visits were helpful in developing agreed mitigation measures. The lack of any national designations protecting landscape or ecology also eased the approvals process.

Fish passage was not thought to be an issue due to the situation of the waterfalls immediately upstream and downstream. Environmental flows were determined at an early stage of the project.

The Cuileig hydro scheme is predicted to be a commercial success.

Other Aspects

Resource use

Following the 1997 Kyoto summit the United Kingdom government, and subsequently the Scottish government after devolution, made commitments to reduce greenhouse gas emissions. In Scotland these received expression as the Scottish Renewables Obligation (SRO).

The SRO requires that a certain proportion of electricity provided by suppliers comes from renewable energy. This is achieved by compensating electricity suppliers for buying more expensive electricity from renewable generators. This funds for this are raised through a levy introduced on electricity bills to all consumers.

The Scottish Government awarded a contract for Cuileig under the Scottish Renewables Obligation. This scheme will make a contribution to the Government's target of 18% of Scotland's electricity from renewable sources by 2010.

Further Information

<http://www.scotland.gov.uk/library5/environment/srfe.pdf>

Cuileig – a benchmark for future hydropower schemes
Civil engineering 156, August 2003, pp 124-129

http://www.miller.co.uk/news_article.asp?ID=66&division=developments

http://www.highlandlightandpower.co.uk/energy_climate.html