

Friends of Taff Bargoed

Project type: 100kW High Head Hydropower

Location: Taff Bargoed Park, Treharris, Merthyr Tydfil

Aim: To build and successfully operate a 100kW Hydropower development at the cascades of the Taff Bargoed River and use its profits to deliver community benefit through improving facilities, equipment and support for local clubs in the Taff Bargoed Park.



About the scheme

The high head Crossflow hydro turbine was successfully installed and commissioned in May 2016 after six years of development from initial feasibility, licensing, build through to commission.

The hydropower development has a capacity of 100kW and is projected to generate 480MWh per annum, equivalent to the average electricity needs of 128 average households in Wales.

The energy will be exported to the local grid and generate an income through the Feed In Tariff.

Partners

Environment Wales: provided financial support allowing Friends Of Taff Bargoed to commission the initial feasibility study.

Robert Owen Community Banking Fund: provided financial support to secure the grid connection at the site.

Welsh Government: providing development officer support and financial support in the form of development grant's and capital loan through Ynni'r Fro and Local Energy.

Hydromatch Consulting Ltd: hydropower engineers who delivered excellent commitment and work towards the project, from feasibility through to install and operational support.

Calibre Contracting Ltd: Chosen civil contractors who delivered the civil engineering aspects at the site.

What was the outcome?

After six years of development which included initial feasibility, site design, licensing (Including planning, NRW and land agreements), consultation, site investigation, tendering, capital finance and pre accreditation for the FIT, the build at the site was commissioned.

The build was completed within eight months and the 100kW hydropower system was commissioned in May 2016.

The first year of generation was during a particularly dry year where the annual rainfall was below average. During this year the site generated 330MWh, 70% of the predicted generation.

The income from the hydropower development has been sufficient to cover the operational and maintenance costs for the site but no community benefit has been distributed in the first year of operation.

The directors have chosen to build the operating reserve to ensure the financial reliability of the development is maintained and any issues that arise can be addressed going forward.

The plant has operated well during the first year as a result of the excellent design and installation, the turbine itself is proving to be a robust piece of equipment that will continue to operate for many years to come.

What was learned?

The capacity of the group is integral to the successful delivery of the project

The delivery of this project was aided by one of the directors of FOTB having a technical background in renewable energy developments. This in house expertise enabled issues that arose to be identified quickly and mitigated effectively. The accountancy and community organisation experience of other FOTB directors has also proved useful in the successful running of this scheme. The Development Officer support from the Welsh Government's Community Renewables Programme (specifically Dan McCallum) was paramount to the success of the project.

Don't underestimate the time to take a development from idea to install

The site itself is technically very straight forward as the development is on reclaimed land with limited ecological value and the park has been reclaimed and regenerated for the benefit of the local community. The watercourse is manmade therefore having limited ecological value. Obtaining the support of the council was straightforward and licensing was granted as expected. Few barriers presented themselves in terms of the development but the time required to engage, negotiate and fund the development was longer than expected.

Negotiating land agreements can be a lengthy process

The local authority decision making process can take a long time despite the fact that a potential scheme can deliver significant additional benefits to the council and the local community and the local authority . At the FOTB site there are two land owners; the Local Authority and a private land owner. Although the land agreement was in place with the private land owner within two months of starting negotiation, it took the local authority three and a half years to agree an option and lease. The local authority and the community both wanted to achieve the same outcome, however it was difficult to solidify this into a legal agreement that was both suitable for the financing of the development and guaranteed an income for the park.

Using legal representatives that have sufficient experience with the type of development and the way social enterprises work is important as aspects of the lease can impact the way you can finance the development.

There can be a time delay between the start of generation and receiving the first payment

As expected, the Feed in Tariff took in the region of six months to process before any payment was received for the generation at the site. This could have caused financial difficulties for the community organisation had their financial planning not accounted for this extended period between build and initial income.

Make sure you understand what Power Purchase Agreement (PPA) providers are offering you

The chosen PPA provider did not inform the community organisation during their initial discussions that they do not provide PPA's for development over 50kW, with this only becoming apparent after the development was installed. The community turned this issue to their advantage as further research and discussions with PPA providers resulted in them choosing Good Energy; a company with a significant PV portfolio who were happy to agree a healthy rate for the energy generated to add this hydropower system to their portfolio.

Choose contractors carefully

Once the development had been commissioned, a small leak was identified at the inlet area of the system. This was quickly picked up by the community organisation and highlighted to the civil contractors. The issue was remedied by the civil contractors in a timely manner. To resolve the issue the contractors removed the inlet pipe, which allowed them to identify faulty seals on the pipeline. A months' generation was lost while the issue on site was being resolved however, this could have been more costly if the contractors did not act accordingly or commitment or lead time issues had arisen.

Ensuring there was vigilant monitoring of the development by volunteers meant that this issue was identified quickly. A thorough tendering process meant that there was absolute confidence in the chosen contractors to deal with any issues in an efficient and timely manner.

You will need to plan in on-going volunteer time once the project is up and running

It is important to monitor the development once it is operational, whether this be training and valuing the committed volunteers or factoring costs of volunteer activity into the operational budget.

The coanda screen, though designed to be self-cleaning in normal run of river situations, can become blocked up by the long stringy algae present in lake fed rivers, resulting in a significant loss of production relative to the available flow.

This has to be continually monitored and removed by hand every time it occurs, which is usually after a low flow period. Once the algae has been removed it is fine for the high flow that follows but will return with the next low flow operating condition.

The directors now understand when the screen is likely to block and require cleaning thanks to volunteers undertaking daily monitoring of the local weather conditions specifically rainfall pattern, the flow conditions, the generation output via the remote monitoring system and onsite visual inspections. This input of volunteer time allows the directors to mitigate this problem and ensure the system is operating efficiently. During low flow, screen clearing can be daily.

Welsh Government's Local Energy service support

Support was provided through the development officer service and a £51,998.80 grant towards the legal costs incurred during the negotiations of the site.

The Development Officer support, specifically Dan McCallum, was paramount to the successful completion of the land agreement and ultimately the delivery of the project. The community group stated that they would have given up on the project if it hadn't been for the support provided through the Development Officer.

The capital costs for the development were provided for through Ynni'r Fro. This loan totalled £526,000.

About Local Energy

The Local Energy service supports the development of locally owned renewable energy schemes through development officer support, grants and loans. To find out more visit the Local Energy website.

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