

Formal Opening Friday 18th September 2015

by

Adrian Ramsay - Chief Executive of The Centre for Alternative Technology,

with Cllr Jon Barry, Mayor of Lancaster and guests, to celebrate completion of England's largest community owned hydro electric installation

On Friday September 18, Project Manager John Blowes welcomed over 90 guests to the formal opening.

He explained how the project started eight years ago when the then chair of Parish Council, Brian Jefferson, had the idea of building a hydro to raise funds for the parish, while generating clean, renewable energy.

Making the idea a reality had been a challenge, taking four years of work to obtain all of the necessary permissions, followed by detailed design, then construction over 12 months. The first electricity was generated in mid December 2014 and the second turbine was installed in July 2015.



John thanked his team, especially Allan Denham who oversaw the civil engineering design and construction, complementing John's electrical and mechanical expertise.

Brian Jefferson told the guests how a key part of the 2003 Parish Plan had been to improve Halton Community Centre and to introduce measures to reduce costs and carbon emissions. "What you see today is the result of that vision and ambition, as a stand alone project for Halton to generate electricity, which will not only benefit the green energy agenda, but the community directly through Halton Lune Trust." Brian thanked John Blowes and praised his skill as Project Manager, seeing the project from concept to operation. He also thanked the investors locally and nationally, and Kevin Frea who oversaw the community share offer, which raised £1.4 million.



Brian handed over to Adrian Ramsay, CEO of the Centre for Alternative Technology (CAT), who explained how delighted he was to be asked to open the Halton Lune Hydro. "It is a fantastic example of a local community coming together to create a lasting, clean energy supply," he said.

"Not only will it supply enough renewable electricity for 300 houses, but it's a scheme that is in tune with the area's industrial heritage and it will generate financial benefits for the local shareholders and the wider community.

Adrian went on say that CAT's Zero Carbon Britain research showcases how we can create a sustainable, zero carbon future for the country using the technologies already at our disposal.

“Hydro power is an important part of the range of renewable energy sources that we need. Local projects such as the Halton Lune Hydro show how communities can make a real difference in harnessing our natural resources to provide a sustainable local energy source.”

Adrian then unveiled the commemorative wall plaque and pressed a button to start one of the two turbines..



Local historian Bill Hosfield took the microphone to remind all assembled of days gone by and said how pleased he was that Halton had again returned to using hydro power.

Sparkling wine was served and Lancaster Mayor Cllr John Barry proposed a toast to the Hydro.



Guests were then able to visit the turbine house and walk around the installation in brilliant sunshine, before enjoying a buffet lunch, prepared by Halton Community Association volunteers.



Halton Lune Hydro

Hydro-electric Community Project



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Key Facts

Total Construction with Environmental works: £1.7 million ex VAT

Feasibility Studies and Pre- EA Application work came from:

- Department for Energy and Climate Change, Low Carbon Challenge Fund: £8,000
- Lancashire County Council Give-it-a-Go competition: £5,000
- EDF Green Energy Fund £4,000

Construction funding came from:

- Community shares: £1,425,535
- The Rural Carbon Challenge Fund (Department for Environment, Food and Rural Affairs), with Halton Carbon Positive : £258,800 (£303,030 with VAT)
- Lancashire District Local Strategic Partnerships: £14,200

Technical:

- Turbine: Two high efficiency underground Kaplan turbines, operating on a nominal 2m head.
- Building: Reinforced concrete structure, stone clad with local slate roof.
- Electrical Output: Nominal 160kWe at 440v and to 11KV for grid transmission.
- Generation: 1,005MW hr average and able to supply up to 300 average homes.

Community:

- Annual saving on atmospheric carbon emissions: 560 tonnes of CO₂ emissions pa.
- All profits spent on good causes in the local community, distributed via Halton Lune Trust.
- Educational benefits through tours and LCD screen.
- Six local part time jobs for fish welfare and count data analysis, hydro O&M and shareholder admin.

Environmental:

- The construction of a best practice fish pass, resting and trapping pool, as well as use of fish counting and video recording equipment.
- An elver pass to help the sadly declining numbers of young eel, navigate the weir.
- Large area turbine inlets and outlets for low velocity water flow
- Best practice fish screening with “by-wash”.



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Project Background

Construction began mid December 2013, following four years of work obtaining the many permissions and land utilisation agreements, for construction adjacent to an Area of Natural Beauty, on one of the four UK salmon and sea trout index rivers.



Excavation took place behind the old weir wall, with our admiring the ingenuity of those who built it over 100 years ago: 1" steel re-enforcing bars that must have been inserted into the bedrock using just hammers and star chisels.



We removed more than 1,500 tonnes of rock that was mostly crushed for use on roads - the test dig however indicated quite soft material so we thought the going would be relatively easy, but the rest was actually much harder rock and rather hard going.

General construction followed the pattern of excavation; expert timber shuttering with steel reinforcing mesh attached inside and with concrete then poured to produce the required shapes.

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The Lune Catchment spans a huge geographical area from above Tebay in the North, to the sea in Morecambe and out to the East including Ingletton Falls and Clapham.

The tributaries include the Keer, Rawthey, Clough, Greta, Roeburn, Conder, Cocker, Hindburn & Wenning rivers, as well as many little streams and becks.

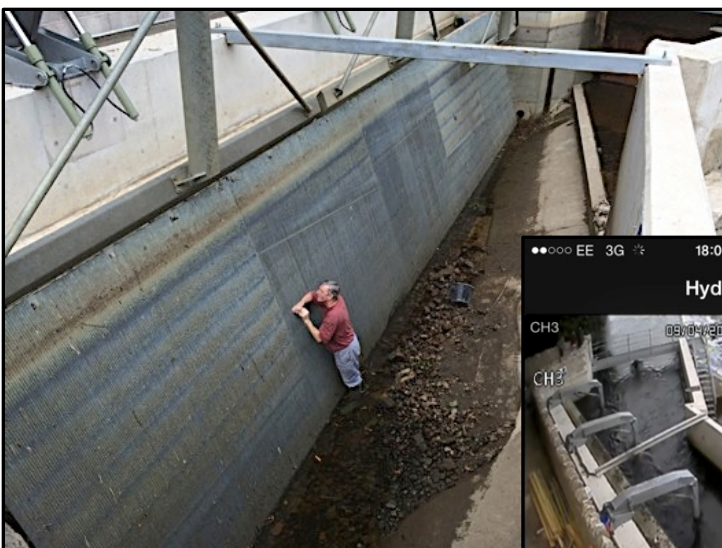
This means that rainfall produces an average river flow of $36\text{m}^3/\text{s}$.

When this photograph was taken in October 2014 the flow was $320\text{m}^3/\text{s}$, although it can go up to $700\text{m}^3/\text{s}$, so the hydro building is designed to deal with this associated high river level.

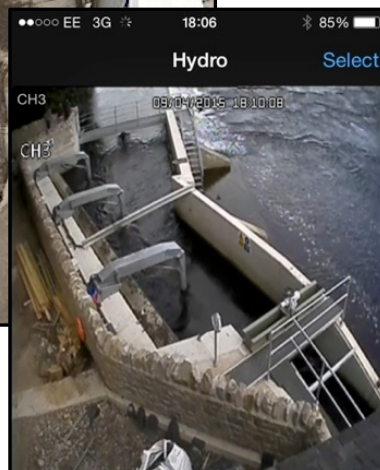
The Environment Agency licence allows up to $12\text{m}^3/\text{s}$ to be used for the hydro project and with $4.74\text{m}^3/\text{s}$ always having to be left for the fish passes on both sides of the river. The turbines automatically adjust their blade angle, based on river height and take more or less water to ensure this reserve flow is maintained.

Being next to an Area of Outstanding Natural Beauty, our concrete hydro building had to “blend in”, so we have created the appearance of an old barn, with natural stone cladding, oak doors and local slate roof.

Congratulations here go to Richard and Mark Dawson, local stonemasons, for the adjacent walls and especially the hydro building.



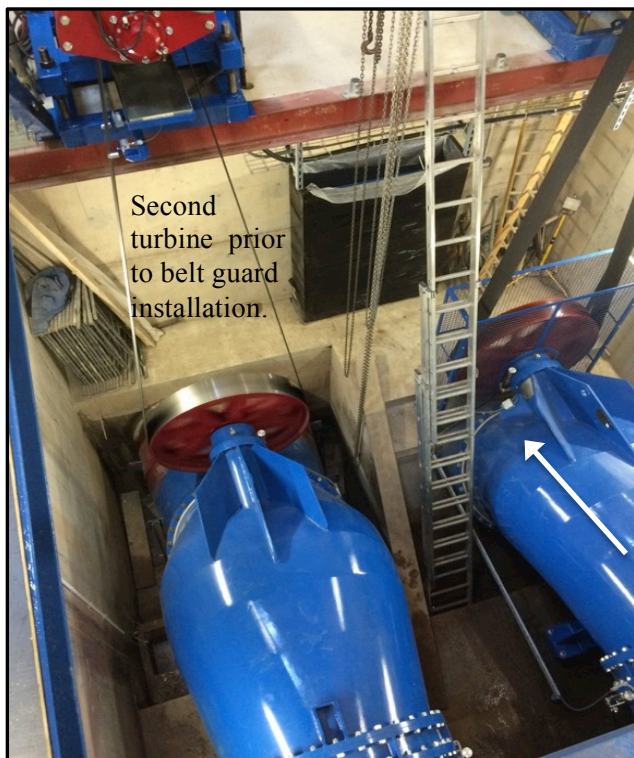
The photograph to the left shows the large area (low velocity) fish screens of the turbine inlet, with water passing along them at a relatively high velocity (by wash), so that fish are not in any way pressed against the metal bars. The three “wiper blades” rake leaves into a flowing stream (launder channel) that takes them back to the river.



The site has good CCTV coverage, with live access on the computer or mobile phones of the management team and used by the member acting each day as “Duty Officer”, each day.

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River water (flowing in the direction of the arrow) turns that which is similar to a ship's propeller, located on the same shaft as the drive wheel that drives the generator via a belt. This is similar to power transmission in the old mills – and the belt not falling off owing to the pulley having a convex profile.

The first turbine has been in operation since December 2014 and is on target to generate the predicted income of £164,000 a year. The 2nd turbine, installed in July 2015, plays “second fiddle” to the first, which receives a higher Feed In Tariff. This bias arrangement is achieved by settings within the turbine control system. Together, they are predicted to bring in a total of £240,000pa in an average rainfall year and thus cover the various commitments for the £1.7M project

Revenue started flowing on 25 August 2015, when the first (December 14 to end June 15) Feed in Tariff (FITs) payment came in. We shall now receive FITs payments quarterly, alongside lesser monthly amounts from selling electricity to the National Grid, via our partners Lancaster Cohousing.



Young Albert here, never did like heights



A fun photograph, carrying the caption, “We really do look after our investors”

The turbines have control of the weir in low river flows, which means that the area below the weir tends to have a constant flow and depth in the summer - that is much enjoyed by wildlife, including ducks.

Our thanks to Andy Aitchison and
Anna Rose for the opening day
photographs.