

# A Feasibility Study for the Wetherby Hydropower Project

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JBA trust

The potential for hydropower on the River Wharfe at Wetherby was originally identified by the Wetherby & District University of the Third Age (U3A). This MSc project aimed to reappraise the technical and financial feasibility of the scheme.



**Figure 1.** The site on the River Wharfe, Wetherby, West Yorkshire.

Photo: Jessica Scrimshaw



## Technical Feasibility

The project examined the energy generation of four possible scenarios (Table 1). This compared the energy generation of installing one vs. two Archimedes screw turbines, and the Environment Agency permitting a 40% take of flow above the hands off flow, vs. 100% take above the hands off flow (HOF).

The potential energy generation from the scheme is 145 - 325MWh/year (Table 1).

**Table 1.** Energy generation potential for different scenarios

Scenario	Turbines	Take above HOF (%)	Max power (Kw)	Gross energy (MWh/year)
1A	1	40	40	145
1B	1	100	52	224
2A	2	40	50	178
2B	2	100	82	325

## Financial feasibility

The cost of a scheme with one turbine is estimated at ~£1.4 million. A scheme with two turbines is estimated at £2 million.

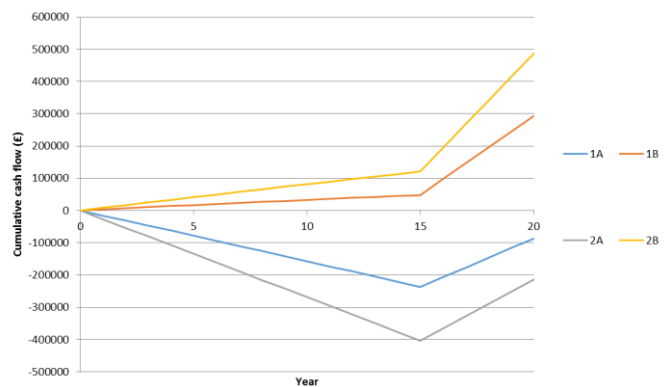
Two funding scenarios examined a combination of interest-free and loan funding (Figure 2) or only interest-free funding (Figure 3), for each of the scenarios shown in Table 1.

Jessica's MSc found the potential for hydropower generation on the site, although the extent of this depends on the proportion of flow to the turbine, above the hands off flow.

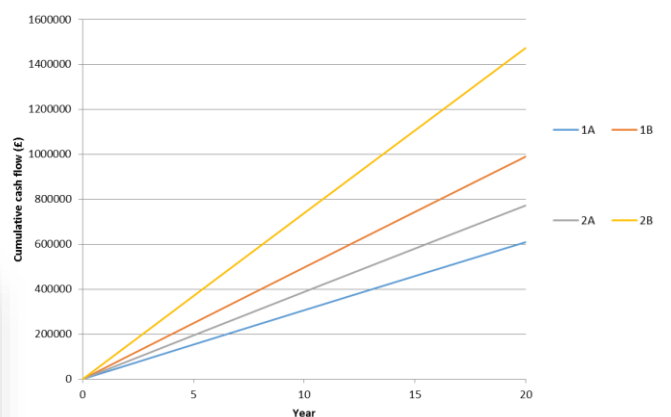
This project found that a scheme would deliver maximum financial benefit if 100% take above the hands off flow was permitted, and two turbines were installed, using 100% interest free funding.

Financial viability is highly sensitive to changes in regulation, costs and revenue sources and further work to carry out detailed feasibility is recommended.

The research described here is based on a study completed by Jessica Scrimshaw for her MSc in Sustainability (Environmental Consultancy and Project Management) the University of Leeds. Jessica's work was supported by her supervisor Dr Paul Upham and Jon Whitmore at JBA Consulting's Saltaire office.



**Figure 2.** Cumulative cash flow of the project over a 20 year lifespan, for a funding scenario comprised of 70% interest-free sources and 30% loan funded.



**Figure 3.** Cumulative cash flow of the project a 20 year lifespan, for a funding scenario comprised of 100% interest free funding

