

Remony Farm and Estate Hydro



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Remony currently has two high head hydro schemes at Acharn Burn and Remony Burn with a capacity of 360kW and 490kW respectively.

Background

Remony Farm and Estate extends to 3,082 hectares with the hill farm making up the bedrock of the business. The hill farm runs 1,750 blackface ewes and 50 suckler cows. The sheep enterprise seeks to breed ewe lambs, gimmers and shearlings for sale as breeding sheep. All other lambs are finished on the Farm and marketed between December and March. The cattle enterprise consists of two herds, both are spring calving with the offspring being sold on to James' brother who farms four miles away.

Hydro power has been fundamental to sustaining the Farm and Estate for almost 90 years with the Acharn Burn scheme. In 2013 a second scheme on the Remony Burn was developed.

Acharn Burn (360kW)

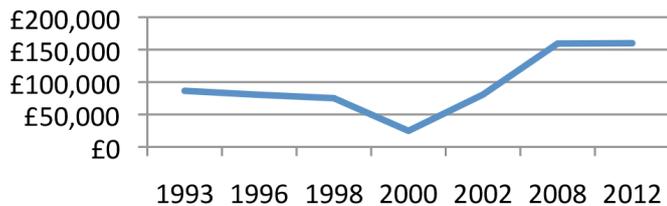
The original Acharn hydro scheme had a 30kW capacity and was built in 1925 to supply the local village and Estate house. Planning to replace the scheme began in 1982 when the penstock fractured. The scheme continued to operate until 1991 with a reduced power output of 19kW, by this point the Alternator needed replacing as did the speed regulator.

The hydro scheme was completely replaced in 1992 with a 360kW capacity and was connected to the grid in 1993. The design life of a hydro scheme is usually 40 years. However, as this scheme shows, the key components can often last far longer than this.

Summary of Acharn Hydro	
Capacity	360 kW
Head	111 m
Run	800 m
Catchment	12.5 km ²
Flow	0.35 m ³ /s
Annual generation	1 GWh
Income (average since ROCs began)	£130,000
Capital cost (inflation adjusted)	£575,000
Simple Payback	4.5 years

The Acharn Burn hydro scheme produces on average over 1 GWh (1,000,000 kWh) of electricity a year. Part of this energy production is used in the main house, cutting electricity bills to zero. However, most was sold to the grid under the Non Fossil Fuel Obligation until 1998 and since 2003, under the Renewable Obligation Order (see graph 1 overleaf).

Graph 1: Annual generated income over 20 years



The payback of a redeveloped scheme such as this is hard to determine but is in the order of four and a half years. Given that some of the existing infrastructure could be used and there has been varying water flow and payment subsidies, income has fluctuated over the years. The upgraded hydro scheme made use of existing infrastructure which helped to keep down the capital investment costs. As such the turbine, generator, inlet weir, power house and penstock had a total cost of £318,170 in 1992. In today's money a similar refurbishment would cost in the region of £575,000. The costs were also less than they could be today as SEPA and SNH requirements were less stringent.

Remony Burn (490 kW)

The Remony hydro scheme construction was overseen by Campbell of Doune and constructed by Tam Shilliday Plant hire and Groundworks in 2013. The £1.4m capital investment was funded via profits from Acharn hydro, a loan borrowed against Remony Estate (including Acharn Hydro) with the Agricultural Mortgage Corporation (AMC) and Estate funds.

The project is completely new and as such, is subject to current environmental and planning standards.

As part of this a compensation flow has to be maintained in order to maintain a healthy environment on the water course (set out in SEPA's 'guidance for developers of run-of-river hydropower schemes'). The fact that the scheme has two inlet works lead to a more complex design and consulting process.

In order to secure consent, the Remony Scheme required an ecological survey, archaeological audit

and construction method statement, as well as consultation with the local authority's Flooding Officer. Beyond the essentials required for consent James gained value for the schemes by becoming a member of Alba Energy Ltd.

ALBA Energy Ltd - Mission statement summary

Set up in 2006 with the intention of sharing information relating specifically to small scale hydro schemes. Alba currently consists of 20 members and is open to all privately owned hydro schemes.

By working together as a cooperative group they bring to the table cumulative power to influence maintenance contracts, the distribution authorities, insurance companies and ratings authorities, updating of legal and technical matters, comparative figures on Power Purchase options, and the sharing of members' experiences.

The construction period lasted 9 months with an additional 4 months of commissioning. During the first eight months of operation the scheme produced 780,000 kWh, generating an income of £132,000 and a approximate payback period of 11 years.

The project benefits from feed in tariffs (FITs) which were introduced in 2010 and have become the main support mechanism for small hydro schemes, as it provides higher levels of support. Remony hydro is locked on to an index linked rate of 15.98 p/kWh.

Summary of Remony Hydro

Capacity	490 kW
Head	157 m
Run	1160 m
Catchment 1	6.5 km ²
Catchment 2	0.5 km ²
Flow	0.38 m ³ /s
Annual generation*	0.78 GWh
Income (2014) *	£132,000
Capital cost	£1,400,000
Simple Payback	~10.6 years

*For generation between 29th May 2013 to 31st January 2014 at FIT rates for May 2013.



For nearly 90 years hydro has been fundamental to sustaining the Farm and Estate



James Duncan Miller, June 2014