Five ways to maximise returns on your hydro scheme

17 December 2018

By examining every aspect of your hydro scheme – from turbine efficiency to hands-off flow, your PPA and insurance – you can uncover a number of ways to increase scheme profitability, says Ian Cartwright, Chief Operating Officer at SIMEC Green Highland Renewables.

Following one of the driest summers on record, many small-scale hydro owners are thinking hard on how to maximise the long-term profitability of their assets.

Every scheme operator will of course understand the basics – keeping screens clear and reacting fast to system trips and shutdowns – and these can make a massive difference.

We calculate a one percent drop in efficiency will reduce revenue by £10,000 on a 500kW scheme. This will impact directly on the bottom line. And there are a number of other areas where owners can find significant scope to reduce cost and increase revenue.

At SIMEC Green Highland Renewables (SIMEC GHR) we currently manage more than 50 schemes, and for each one we aim to optimise returns in five key areas:

1. Maximise catchment intake
2. Maximise turbine efficiency
3. Respond quickly
4. Strike the best PPA
5. Insure at best value

To take each in turn:

Catchment intake
It makes sense to maximise the flow of water into your turbine – through ensuring your hands-off and maximum residual flows aren't diverting more water than required downstream. At SIMEC GHR we monitor the flow of all our burns using the same 'salt dilution' method utilised by SEPA. On a number of schemes, we have been able to alter the design of compensation weirs to ensure greater flow into turbines – without the need to modify CAR licences.

Turbine efficiency
Aside from the good housekeeping highlighted above, we generally spend around a year optimising each turbine installed ensuring, for example, that start and stop settings are accurate. Start too soon and a turbine can run short of water; too late and you miss a chunk of generation. We monitor all schemes centrally and compare outputs within and across catchments – so we can see if a scheme is underperforming versus its neighbours as well as target outputs, and react accordingly.

Respond quickly
Downtime equals zero revenue and it is vital to get to a faulty turbine ASAP. Many owners will rely on estate staff as a first port of call, but if it is something out of the ordinary there's the challenge of long lead times for engineers or poor spares availability. At SIMEC GHR we monitor all schemes remotely, maintain a large spares catalogue and have a core call-out team alongside a wider network of first responders – many of whom are estate staff we pay on a per-callout basis.

Power Purchase Agreements
Your PPA may be the first one you've negotiated, so how do you know you are getting the best deal? A penny shortfall on your tariff can cost up to £2000 per annum on a 500kW scheme. And are you confident your off-taker is paying you for every kWh you produce? In the last decade we have negotiated dozens of PPAs and can identify ancillary revenue opportunities (such as operating in the capacity market) to optimise returns.

Insurance
Last but not least, you want to ensure you have all the cover you need, without paying over the odds. At GHR we deal with a number of specialist brokers to secure best in market cover. Some brokers offer a 20 percent discount to third party schemes managed by SIMEC GHR.

Overall, there is no 'magic bullet' to improve your scheme – but a methodical, system-wide review can uncover multiple ways in which you can reduce cost and maximise income, all contributing to a better profit at the year's end.