



# Hydro Nation Water Innovation Service Securing the Next Step for Proterra Energy's Innovative Micro Hydro Power Technology

## The Hydro Nation Water Innovation Service

The Hydro Nation Water Innovation Service (HNWIS), established by the Scottish Government through Scottish Enterprise and Highlands and Islands Enterprise, identifies innovative Scottish companies, particularly SMEs, and supports them along the innovation path from concept to commercialisation. The partnership, HNWIS, of AECOM, WRc and UK Water Ltd is delivering a three-year programme.

Further information on the service can be found at [www.hnwis.scot/](http://www.hnwis.scot/)

## A Proactive Company

Proterra Energy Ltd. was founded in 2012 by Neil and Terry Stebbings (brothers), to design and install micro hydro schemes in Scotland, with a focus on schemes up to 100kW in size. Since 2012 68 projects have been carried out, including

- Installation of 12 schemes ranging in size from 200W up to 1000kW, 10 of which were from feasibility stage through to detailed design, installation and commissioning.
- Input on other schemes providing technical support for Environmental licencing, including 2 schemes on Loch Lyon at 396kW and 713kW and two assessments for large schemes in Wester Ross of 380kW and 820kW.

Small scale hydro power systems are one of the most efficient and cost effective types of renewable energy available. Efficiencies are in the region of 70% to 80%, and with good load

factors they can provide a predictable source of power generation.

Hydro systems have been used for electricity generation in Scotland for many years. The layout of hills and glens and the levels of annual rainfall, especially in the West make it a viable landscape for hydro power. By passing this moving water through a turbine the water energy is converted into rotational energy turning a shaft in a generator. The generator then converts this rotational energy into electricity. The electricity is then passed back through electrical cables into a nearby consumer unit or to the electricity distribution network through a metering system.

Further information can be found at [www.proterra-energy.com](http://www.proterra-energy.com)

## Micro Hydro Power Goes Mobile

Proterra Energy Ltd. wish to continue to build existing operations designing and installing micro hydro schemes, but also to diversify into other products and markets through the design and development of innovative value added hydro system products. One such development is a concept for a small mobile hydro system that contains all of the elements found in a typical hydro scheme including the intake, the penstock, the turbine and control system and innovatively, an electrical storage and distribution system that allows power to be used locally, directly from the unit.



**HydroTrailer™ arrangement - up to 4kW**

The HydroTrailer is designed for where there is no mains power. The technology is in effect a replacement for a diesel generator with a maximum draw of 2kW. There is a significant international export potential for this technology, specific areas where this technology fits are South / South East Asia, Africa and South America.

### How HNWIS is helping Proterra Energy at Home and Abroad

Working with Proterra Energy HNWIS produced a market research report encompassing the social, economic, geographical and technological factors that would influence the number of HydroTrailers that could theoretically be sold in the discussed areas. The research found that there was high demand for micro hydro technology and detailed potential barriers to adoption in developing countries as well as

opportunities in the market that HydroTrailer could exploit.

The HNWIS report provided independent evidence and sufficient confidence to HIE to award Proterra funding to further develop the HydroTrailer to proven concept

*“HNWIS is pleased to be working closely with Proterra Energy. We see this success as a great example of how the innovation service can support Scottish companies within the Hydro Nation agenda”*

Dr Leo Carswell, HNWIS

### Outcomes

With the HNWIS support and funding received Proterra Energy can progress the HydroTrailer to tested concept stage. HNWIS’s involvement in investigating micro hydro power opportunities with utilities has raised Proterra Energy’s profile.

*“The market research report from HNWIS helped us secure funding to take our project to the next level, de-risking the process, an important factor for a small company”*

Terry Stebbings, Proterra Energy

