



KINETIC HYDRO

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Newsletter 4: Summer 2022

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This is the 4th in our regular updates on progress at Kinetic Hydro. We hope that you continue to find these communications interesting, but if you don't want to receive our newsletters please let us know by sending an email to info@kinetic-hydro.com.

Pitch Control System

Any free-stream turbine has to be designed not only for regular operating conditions, but also to survive, and preferably continue to operate throughout the extreme flows that occur during floods. All large wind turbines and many modern tidal stream devices achieve this using a Pitch Control System: a mechanism that allows the turbine blades to be rotated about their long axis so that they 'catch' less of the flow.

No-one has previously tried to integrate such a system into a turbine as small as ours, but we believe doing this could give us a critical competitive advantage, especially where river floods can be severe. The design that we have come up with has a number of novel features taking advantage of recent developments in consumer mechatronics. We think that these inventive steps are valuable, and so our Patent Attorney is drafting our first patent application which will be filed very soon.

We were assisted with some early development work by Arthur, a pupil from Stirling High School who's considering a career in engineering. He's also a keen kayaker who knows a thing or two about fast flowing rivers! He completed a week's work experience with us in June - thanks Arthur.



Above: Arthur Jacques and his "bread-board" pitch control system development



Rwanda and the 'Sustainable Energy for All Forum'

In May Donald had the opportunity to visit Rwanda as part of an Innovate UK trade mission. Funded by the Energy Catalyst programme the purpose of the visit was to gain understanding of the local market dynamics and to meet Rwandan businesses and other stakeholders in the Energy Access sector.

As part of the trip we visited a community scale 'pico-hydro' installation; a great example of the kind of demonstration project that we intend to plan next year. There was huge amounts of civil engineering infrastructure for this tiny (13kW) scheme and it left no doubt that we can compete on cost.

The other highlight was attending 'SE4All', the premier international convention for the Energy Access community, meeting in person for the first time since Covid. This was inspiring, and a great networking opportunity where we established contacts with potential customers and the collaborators we need to plan a pilot project (see below.)

Left: Turbine house and tail-race of pico-hydro project in rural Rwanda

All-Energy

Meanwhile in a slightly less exotic location (Glasgow), Richard was raising our industry profile by giving a talk at the 'All-Energy' conference. His presentation entitled "Completing the Circle of Hydrokinetic River Turbine Development" told the history of hydrokinetic turbines from initial trials on the Nile in the 1980's, to utility scale tidal stream devices, and how these have led to some of our design solutions.



Energy Catalyst

The Energy Catalyst is a UK funding programme specifically targeted at accelerating the innovation needed to end energy poverty – so it's right up our street! A couple of years ago it seemed to have disappeared; a silent victim of government ODA cuts. But quite abruptly it is back with applications for 'Round 9' closing in August. We have been working hard on a proposal to study the feasibility of deploying our turbines in Uganda. This project, if funded, would be a collaboration between ourselves (technology development), University of Leicester (river assessment using satellite data), Practical Action East Africa (planning a Ugandan pilot project), and the Challenges group (Commercialisation in Uganda).

The Challenges Group

We have recently joined forces with the Challenges Group to help us develop our Business Plan and improve investment appeal. They are an international business development consultancy that specializes in working with small and medium-sized enterprises, offering effective and impactful solutions. Their headquarters are right here in Edinburgh, but their primary focus is on delivering solutions for Sub-Saharan Africa, where they have 6 regional offices – including in our focus country, Uganda.