



Highview Power Storage hopes top industry award will help put UK energy storage industry on the map.

UK energy storage technology development company Highview Power Storage has won both the Award for Energy and Environment and the Grand Prix Prize (across all categories) at this year's prestigious The Engineer Technology and Innovation Awards.

Now in their fifth year, these awards, presented at the Royal Society on Friday, celebrate collaborative engineering projects that have, or are likely to have, a significant impact on the sectors they are active in.

With energy storage estimated to be worth more than \$100bn globally over the next decade and expected to generate more than 100,000 new jobs, Highview hopes that the award will help demonstrate that the UK has a real opportunity to win market share in this key worldwide growth sector.

Energy storage is seen as the key enabling technology for the low carbon grid. With our dash for green electricity, the deployment of wind farms has already outstripped the ability of many Grids throughout the world to integrate this uncontrollable source of energy. It is now agreed that electricity grids need long duration, large scale energy storage to support the deployment of renewable but intermittent generation; capturing and time-shift wrong time energy. In fact in China alone they predict they need 60GWs of storage this decade alone, while the UK estimates it needs to double the size of its reserve.

While batteries are viable for small scale energy balancing, the problem is that historically pumped hydro is the solution for large-scale storage; but as demand rapidly increases the geographic constraints of pumped hydro – and its needs for billions of litres of water – are making it unfeasible in many instances.

Highview Power Storage has developed (patents granted) and built a pilot plant of a novel energy storage system which uses liquid air as the storage medium. Critically, the system can be scaled to 100MWs/GWhs of storage, similar to medium scale pumped hydro. Liquid air can easily be stored in the same low pressure tanks as used by the LNG industry - it is hundreds of times more energy dense than water (therefore taking up far less space) - and the process does not need large mountains or lakes.

Highview's fully operation pilot plant, which was part-funded by a £1.1M grant from the UK Government's Department of Energy and Climate Change, is connected to the Grid and complies with all the regulations and inspections, just like any other commercial generator. The system has more than 150 hours of operational time which is equivalent to two years of UK STOR usage demand. The plant is currently being operated for seasonal TRIAD management (a UK specific low load factor peaking service). Collaboration partners for the project were University of Leeds, SSE (Scottish & Southern Energy) and BOC/Linde.

Toby Peters one of Highview's founders and developers of the technology (working with a team from University of Leeds), says, "whereas many companies were focusing on fast response but relatively small scale battery technologies, we started out five years ago to develop a system which could deliver affordable, long duration, large scale energy storage. We identified this as the big gap in the market and today we are now seeing urgent demand for a large scale solution which can be deployed where pumped hydro is not viable.



Talking about the Awards he added, “ To date the UK has not been recognised as a hub for energy storage, but in fact we have a number of great technologies in development both at Universities and by commercial technology developers. This award will hopefully help demonstrate abroad - but also within our home market - that we can deliver good, relevant technology in what is predicted to be one of the fastest growing manufacturing and engineering sectors of this decade. With the right support, energy storage could not just help the transition to a green grid but also generate major revenue and jobs for the UK economy as well.”

In America, energy storage is a key pillar of both its low carbon and stimulus programme with more than \$200M allocated to energy storage projects from 2011 to 2015; while there is both new legislation to require energy storage on the Grid as well as tax incentives to support deployment.

Unlike many new technologies which often need massive supply chain investment, all the components for large scale plants are from mature supply chains so do not require investment in manufacturing/factories. Says Highview CEO and utility-sector veteran Gareth Brett, “utilities are necessarily conservative and slow to adopt new technology until reliability is rigorously proved over many hours of operation. While our process is novel, all the components are mature and from global suppliers. We do not need to prove that the turbines or compressors can run for 20 years or can be scaled to tens or even hundreds of MWs: they are already in operation.”

With the pilot plant operational, Highview is now looking to move to deployment of a full-scale commercial reference plant with appropriate partners. As Highview CEO Gareth Brett, adds, “We have a strong technology lead in this massive sector of the storage market, but we do not intend to try to become be a manufacturer when we have global supply chains already established for the components populated by major firms with whom we can work. Our role is around the IP and knowledge about how to design and optimize the system for specific market applications.”

Brett has confirmed that the company is in discussions around deploying a first multi-MW plant with potential partners and customers in the UK as well as abroad. Last month senior delegates from some of China’s regional and provincial power grid companies travelled to London to visit the pilot plant while earlier this month, Gareth himself visited South Africa.

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3



Highview's 300kW/2.5MWh CES plant at SSE's Slough Heat and Power plant, UK. The project has been supported by the UK Govt's Dept. of Energy and Climate Change (DECC).