

Fully Integrated Model of Hydrogen Production in the Orkney Islands

Overview of Project

Systemeng is responsible for project deployment of BIG HIT (Building Innovative Green Hydrogen systems in an Isolated Territory: a pilot for Europe) in the Orkney Islands. This is a major €11 million European demonstration project, co-founded from the European Horizon 2020 programme and the Scottish Government.

The focus is on the development and implementation of a fully integrated model of hydrogen production, storage, transportation and utilisation for low carbon heat, power and transport. As part of this five years project, Dr Troncoso acts as a technical project manager to oversee the day-to-day operation and as the main UK-based subcontractor of the Aragon Foundation, the overall project coordinator. BIG HIT is one of the EU's largest ongoing hydrogen demonstration projects.



The Challenge

Islands and remote territories are unceasingly seeking new, innovative energy systems based on indigenous renewable sources, which can help them moving towards a low carbon economy while increasing their energy independence. The Orkney Islands have over 50 MW of installed wind, wave and tidal capacity that will be used to obtain the 'green' hydrogen required for BIG HIT project. However at present wind turbines are often 'curtailed', losing on average more than 30% of their annual output, with their electricity output limited by grid capacity restrictions in Orkney.

A number of challenges have to be addressed within the BIG HIT project, from the logistical and regulatory aspects for transporting hydrogen fuel between islands to the public acceptance and familiarisation with Hydrogen-based heat, power and transport solutions.

Systemeng Consultancy is leading on management, coordination and deployment tasks to successfully overcome these challenges.

The Solution

To deploy a fully renewable-based integrated energy system, built upon the Orkney Surf 'n' Turf initiative which involves generating hydrogen from excess electricity supplied from tidal turbines and onshore wind turbines.


The Shapinsay and Eday islands hold community-owned wind turbines whose excess energy will be used to produce hydrogen for the BIG HIT project. The currently curtailed capacity from the Shapinsay island wind turbine will be used to split the component elements of water (by the process of electrolysis) to produce low carbon hydrogen and oxygen using a 1 MW PEM electrolyser. Systemeng Consulting is responsible for project deployment and on-site management activities.

Value

Dr Troncoso leads the project as an experienced and recognized technical advisor and project manager in the hydrogen and fuel cell sector. The BIG HIT project has generated considerable interest as one of the wider hydrogen storage projects underway in the EU.

The project could be replicated in other islands and remote territories both within and outside the European Union.

For more information on the BIG HIT project please visit:

 <http://www.fch.europa.eu/project/building-innovative-green-hydrogen-systems-isolated-territory-pilot-europe>

