

Case Study

Remote Microgrid Based Refuelling System for Major Aerospace Company

Overview of Project

Dr Troncoso led as Project Manager with a leading aerospace company to develop a remote microgrid for low carbon energy and refuelling applications. This ground breaking project required Systemeng to lead on an extensive range of project tasks including:

- ▣ Communications with main client, all project partners and sub-contractors
- ▣ Supervision of design, construction of facilities and commissioning
- ▣ Test programmes
- ▣ Permits, certification and management of all personnel
- ▣ Supervision of systems, engineering, design, integration and test programmes



The Challenge

Aerospace companies are constantly looking for new ways to increase efficiency and reduce overheads and, with fuel playing a major part in their operating costs, any technology that can assist with this proves to be of interest. Hydrogen-powered fuel cells can dramatically improve fuel efficiency, particularly for Unmanned Aerial Systems (UAS).

However one of the main challenges lies in the on-site availability of zero or low carbon hydrogen, particularly for remote off-grid applications. Systemeng Consultancy worked with a major aerospace company to develop a prototype of a remote microgrid-based hydrogen refuelling system for UAS to counter this challenge.

The Solution

An off-grid battery and hydrogen-based nanogrid was developed based on concentrated photovoltaic (CPV) panels.

The system comprised of a CPV array, an electrolyser, hydrogen compressor and stores, a battery bank and associated power electronics, along with the control and energy management system.

Systemeng also led on the study of optimal microgrid configurations and the development

of a system simulation tool to optimise the reliability and efficiency of the system.

A bespoke power electronics and automated control system was also developed followed by electrical integration and a feasibility study to deploy a containerised transportable zero-carbon refueling solution.

Value

Leading as a trusted Project Manager Dr Troncoso was able to offer expertise in the areas of both project management and technical knowledge – two skills that are rarely found in this sector as a balanced combination. The pilot project generated a huge amount of interest both internally and externally and created a long and lasting impact within the organisation.

Commercialisation of the project is expected within the next 5 years which can lead to significant long term cost savings for the organisation and will catapult their technical capabilities light-years ahead of its competitors.

For more information on the micro-grid project please visit

▣ www.microgridinnovation.com/enrique-troncoso-abstract.htm

▣ www.sciencedirect.com/science/article/pii/S0360319913027894

About Us

Systemeng Consulting is a strategic and technical consultancy, run by Dr Enrique Troncoso, offering support and advice to public and private entities around technology and product development in the Cleantech sector.

Utilising 15 years of experience in the development of low carbon technologies across the energy, transport and aerospace sectors, Dr Troncoso specifically offers technology assessments and feasibility analysis, technical due diligence, techno-economic work streams, project management services and strategic alignment of product and business development across the energy storage, renewables, low carbon technologies and alternative fuel sectors.



Why Systemeng

- ◆ **The reassurance of dealing with a professional and experienced consultancy** that can meet client needs whilst being sensitive and responsive to them
- ◆ **A track record of forward thinking and innovation management** backed up by expert evaluation and thought leadership
- ◆ **A premium and influential provider**, offering a personable approach with a track record of long standing industry and client relationships
- ◆ **A solid understanding of the sectors we operate in** and the technologies within them.
- ◆ **Perfectly situated to capitalise on its ability to advise innovative companies** on their business envelopment and subsequent growth across these sectors
- ◆ **The certainty of leading edge, high quality, in house delivery** - on time, on budget and on brief.

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