

Section Sciences et Ingénierie de l'environnement Design Project 2021 (semestre de printemps)

Proposition n°3

Technology study of miniaturized SOFC system as an eco-friendly solution for remote applications

Partenaire externe

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Taille de l'entreprise : (nbre de collaborateurs) : 5

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Descriptif du projet

At INERGIO, we have the mission to deliver clean lightweight and efficient electricity wherever is needed. Fuel cells are direct electrochemical devices that convert the chemical energy of fuel to electricity. Depending the fuel cell technology the chemical fuel can range from pure hydrogen to methanol, natural gas and liquid butane/propane. At INERGIO, we have taken a unique approach to miniaturize Solid Oxide Fuel Cell, a fuel flexible technology, to deliver eco-friendly and reliable power. A technology that allows the use of high energy density and commercially accessible liquid butane (camping gas) to deliver a clean energy and easily switch to hydrogen as soon as the infrastructure is ready to deliver completely green energy. The use of the technology for off-grid and remote applications (e.g. Environmental stations, Polar studies,...) can potentially reduce the large negative footprint of Solar panel installations, the harmful emission of diesel generators and frequent replacement of batteries.

Objectif et buts

To successfully introduce and implement the technology as environmentally friendly technology there several questions that are needed to be addressed.

- First is the overall system reliability under harsh weather conditions to ensure uninterrupted operation. The goal is to study the system performance using climatic

test chambers to analyze the impact of the temperature, humidity, and O₂ concentration.

- Second is the investigation of the system exhaust as function of operating conditions, and the type of the fuel. The objective is to bring enough technical proofs to position our technology in comparison to generally accepted green technologies such as batteries.
- Finally, a life cycle assessment has to be performed to measure the environmental impacts at all the stages of the life-cycle of the product from raw materials to distribution and recycling.

Descriptif taches

- Design and assembly of a measurement setup to investigate the system performance under challenging operating conditions
- Design of an experiment and setup to investigate the composition of system exhaust and introduce a practical method to reduce or eliminate the CO₂ emission
- Perform and develop a life cycle assessment to demonstrate and assess the cumulative potential environmental impact across product manufacturing and usage

Divers

The project will give you the opportunity to join a growing and awards winning startup, where everyone can see an immediate impact of their work.