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RESEARCH

- **Title:** Renewable energy – hydrogen coupled power system
- **Description:**

Climate change is one of the most relevant problems our society is currently facing. In order to reduce CO₂ emissions, different renewable energy sources are appointed as solutions, but their intermittency force to use power systems based on fossil fuels. Hydrogen is an energy vector that allows to store energy surplus coming from renewable sources and convert it back to electricity by using fuel cells.

This research aims to design and install a completely off grid system for stationary application based on renewable sources (solar radiation and wind) and couple them with hydrogen-based technologies for long term storage (seasonal storage) and with batteries for short term storage. Hydrogen will be obtained by water electrolysis and then converted into electricity with a proton exchange membrane fuel cell (PEMFC). The system will be installed in a social public household to fight energy poverty.

Since the system is completely off grid and islanded, CO₂ emissions associated to energy production will be eliminated.

- **Publications:** there are not publications available yet.
- **Congress contributions:** there are not Congress contributions yet.
- **R&D Projects:**

Title: Interreg Sudoe Energy Push.

Participant entities: Department of Chemical and Biomolecular Engineering (University of Cantabria), GESVICAN, CTL, ALEC, TIPEE, CETENMA, AVRA, Engineering Faculty (University of Porto), ADENE, CARBONE.

Duration, since 01/09/2019 to 31/08/2022.

Main researcher: Alfredo Ortiz Sainz de Aja.

Number of participants: 2.