SUN -based Smart battery and Hydrogen Integrated Novel Energy-concept - SUNSHINE

This project studies the technical and economic feasibility of "hybrid" energy storage (battery and hydrogen) at a solar farm (possibly extended with additional wind power) with the aim of creating added value for the electricity produced. The valorisation is based on electricity grid support services, the provision of a more predictable injection profile, the avoidance of wind turbine shutdown in case of overproduction and the sale of hydrogen for e.g. zero-emission transport applications.

Concrete targets and criteria:

- This feasibility study
- A follow-up research, development and demonstration project on a relevant scale.
- A full-scale solution and demonstration for the specific location.

The goal of the project is to investigate all relevant factors needed to design and realize a full-scale implementation of hybrid energy storage at Terranova Solar:

- The optimal design for battery/hydrogen storage for the given capacity of solar or wind energy
- The methodology to optimise the supply, demand and storage of electricity and hydrogen.
- The valorisation trajectories and the general business case of the installation.

The aim of the feasibility study is to answer the following fundamental questions:

- What is the optimal configuration of such a concept?
- What does the business case look like and what are the most promising routes?
- How can we valorize the hydrogen?
- What are the technical, economic and regulatory barriers to this project?