

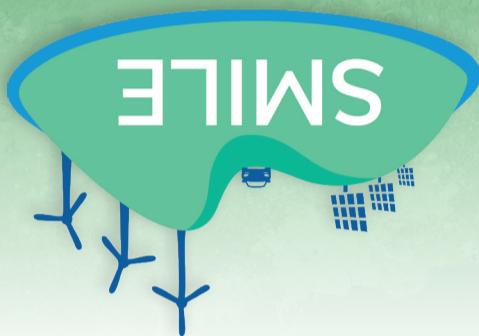


SAMSØ

ORKNEY ISLANDS

MADEIRA

Smart Island Energy system



PROJECT CONSORTIUM



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The technological solutions vary from the integration of battery technologies, power to heat, power to fuel, pumped hydro, electric vehicles, electricity stored on board of boats, aggregator approach to demand site management (DSM) to predictive algorithms.

STORAGE & ENERGY SYSTEM INTEGRATION

SMART GRID FUNCTIONALITIES

DEMAND RESPONSE

SMILE aims at demonstrating, system-wide in real-life operational conditions, a set of both technological and non-technological solutions adapted to local circumstances targeting the distribution grid to enable:

OBJECTIVES



DEMONSTRATION SITES

The three- large scale pilot projects have similar topographic characteristics but different policies, challenges, regulations and energy markets, representing the majority of the EU energy markets.

Moreover, Island communities can be more easily engaged in the real-life testing of solutions aimed at solving important challenges impacting life on the island and constitute ideal candidates for demo activities requiring societal engagement and active residents' commitment.



MADEIRA



ORKNEY ISLANDS



SAMSØ



CHALLENGE

Madiera is a total energy island which means that it is not connected to any other landmass electrically. All energy consumed on the island must therefore be generated on the island itself. This system can be difficult to balance and this issue is becoming more prominent as the amount of solar energy generation on the island is increasing.

SOLUTION

An intelligent control and automation system will be implemented in the existing grid to provide for an overall better management of the distribution network. This will also help to address the increasing strain on the grid and will facilitate significant additional solar and other renewable generation in the future.



CHALLENGE

Orkney has some of the highest recorded levels of 'fuel poverty' in the UK. Moreover, as an archipelago of islands, Orkney is highly dependent on both ferry transport and imported fuel for farming, fisheries and local road transport and there is currently no system for integrating smart charging and hydrogen production with wider network conditions.

SOLUTION

A new Demand Side Management system will be integrated with the existing smart generation grid. This will provide intelligent control and aggregation of electric heating systems in homes, businesses and council buildings, as well as EV charging points and hydrogen electrolyzers.



CHALLENGE

Samsø aims at becoming an island "free of fossil fuels by 2030" and there are several bottlenecks in its energy system which present opportunities for better management of locally generated energy. There are three different marinas in Samsø and their energy demand is very consistent as it is dominated by the demand from berthed yachts and associated tourism.

SOLUTION

SMILE will focus on one of Samsø's marinas, the marina in Ballen. In particular, the project will integrate more renewable energy at the site in the form of a solar power system on the pier.

EXPECTED IMPACTS

- Introduction of RES and DES in the energy systems
- Optimal energy management
- Scalable and replicable technological and non-technological solutions
- Stability and flexibility of the distribution grid
- Reduction of the environmental impact and carbon footprint of the whole electricity supply system
- Establishment of market opportunities for new smart grid products and services, thus stimulating companies growth and the creation of job opportunities

CONTEXT

Today Europe's energy sector is characterized by the following needs:

- flexibly, stably and reliably accommodating the increasing share of renewable as well as distributed energy generation in the energy system
- coping with the growing electricity demand resulting from the electrification of city transport and of heating and cooling
- reducing peak demand and stabilizing the electricity system

Those needs can be fulfilled thanks to smart grids, electricity networks which automatically monitor the flows of energy and are able to adjust to changes in both supply and demand accordingly.



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