Expected impacts

Decarbonization

Faster decarbonization enabled by reduction of fossil fuel consumption, increased efficiency, better RES integration, and waste valorisation.

Enhanced stability of the grid

Increased network stability & security of energy supply thanks to long-term storage, smart integration of energy sources across different energy vectors, and reduction of energy waste.

Large-scale uptake

The high flexibility and modularity of the system and the integration of several technologies will facilitate the replicability on energy islands with similar needs.

The islands

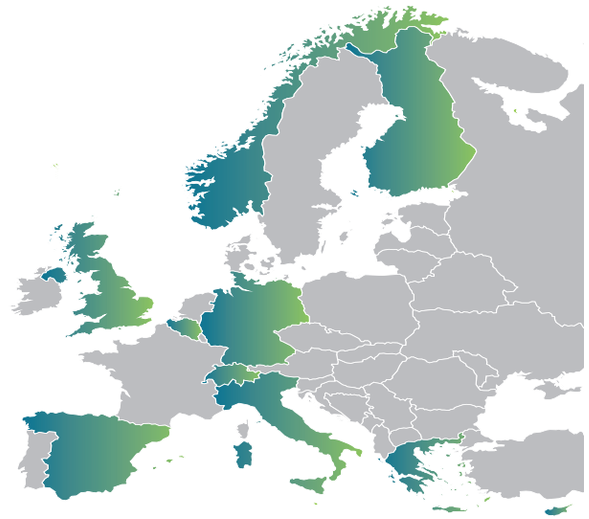
Demo island

The ROBINSON EMS and the developed technologies will be demonstrated on **Eigerøy – Norway**.

Follower islands

ROBINSON's flexibility and modularity enables replication on other islands. **Crete** – **Greece** – and the **Western Isles** – **United Kingdom**, will further investigate the proposed solution to adapt it to their needs for future replicability.

The Consortium



Robinson

Smart integRation Of local energy sources and innovative storage for flexiBle, secure and cost-efficIent eNergy Supply ON industrialized islands

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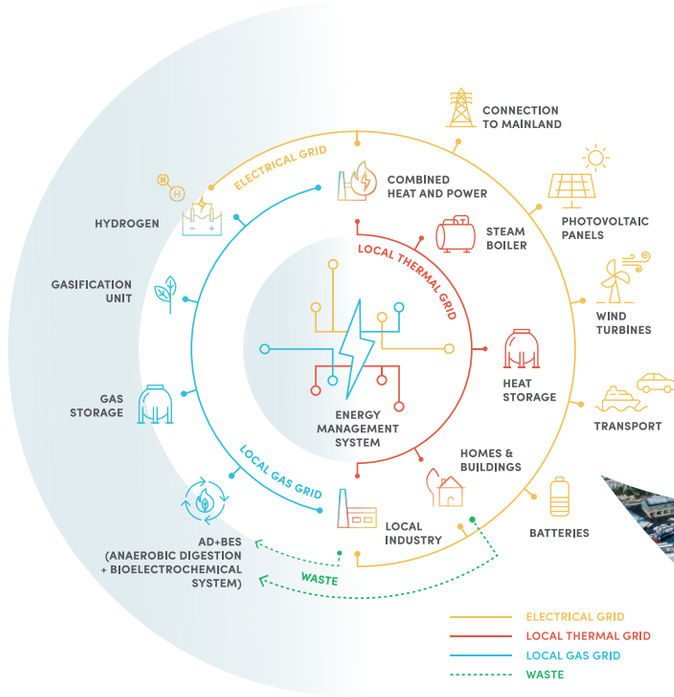
Concept

A clean, secure and cost-effective supply of energy is often challenging for islands. ROBINSON aims to help decarbonize islands through developing an intelligent, flexible and modular Energy Management System (EMS), better integration of Renewable Energy Sources (RES), biomass and wastewater valorisation, industrial symbiosis, and the optimisation and validation of innovative technologies (e.g. anaerobic digester, energy storage via hydrogen, Combined Heat and Power (CHP), wind turbines).

Thanks to its EMS, ROBINSON couples locally available energy sources, electrical and thermal networks and innovative energy and storage technologies. This ensures a reliable, cost-efficient and resilient energy supply. It reduces dependency on the mainland and decreases use of fossil fuels.



Main objectives

- Develop and validate a modular and flexible Energy Management System integrating different energy vectors
- Optimise, validate and integrate innovative technologies for energy & heat production, and for long-term energy storage
- Positive impact on human health and on the environment
- Demonstrate large-scale applicability and replicability of the ROBINSON's system
- Cost-competitive when benchmarked against potential alternative technologies

Technological development

ROBINSON's technologies

Development, adaptation and demonstration of different technologies are key pillars of ROBINSON.

The **Energy Management System** will integrate the existing system with new installed distributed technologies and end-users across different energy vectors (electricity, heat and gas).

The **Anaerobic Digestion + Bio Electrochemical System** will efficiently treat wastewater from Eigerøy island's fish industry and convert its organic matter into biomethane.

The **Combined Heat and Power system** will consist of an advanced gas turbine with a combustion kit upgraded to burn hydrogen and syngas.

The **innovative wind turbine** will be more efficient and socially acceptable.

Hydrogen will be the key energy storage vector: it will be produced by a Polymer Electrolyte Membrane (PEM) electrolyser with the surplus renewable electricity and used when the energy demand peaks.