NESOI
EU ISLANDS FACILITY

Sustainable Estonian Islands

SEI

SAAREMAA -HIIUMAA

“Rather than just focusing on part-problems such as energy or waste, the process takes into account the entire system and network dynamics. Because economic, ecological, and social aspects influence each other, taking all aspects along in the analysis helps in making long-lasting strategies.”

This project is supported by the EU Islands Facility NESOI.
NESOI has received funding from the European Union’s Horizon 2020 research and innovation programme under grant agreement N°864266

NESOI
EU ISLANDS FACILITY

SEI

The European Islands Facility NESOI aims to unlock the potential of EU islands to become the locomotives of European Energy Transition. To do so, NESOI aims to mobilize more than €100 million of investment in sustainable energy projects to give EU islands the opportunity to implement energy technologies and innovative approaches, in a cost-competitive way. NESOI has selected 56 such projects across the European Union and provide them with financial resources and technical support.

Sustainable Estonian Islands

ABOUT
THE PROJECT

Project Promoter Saare and Hiiumaa Development Centers

Stakeholders Municipalities; Transmission and Distribution System Operators; Ferry and airline carriers

Country Estonia | **Sector** Investment Plan | **PROJECT VALUE** 1,500,000 €

DESCRIPTION
- Estonian islands would like to develop an investment plan outlining all major assets, and a realistic roadmap in time towards a sustainable island community.
- The project includes an overview of feasible solutions to climate change, economic developments, and ecological issues, and a vision on island developments on topics based on local resources.

AIM OF THE PROJECT
The aim is to bridge gaps between sectors to accelerate the frontier of sustainability and create realistic and feasible energy utilization concepts.

FUTURE STEPS
- Implementation of new-generation wind turbines
- Integration of wave energy in offshore fish-farms
- Use of Estonian best wind and solar potential
- Launch of electric bicycles network
- Applications leading to energy-independent islands

HOW THE EU ISLANDS FACILITY NESOI
SUPPORTS THE PROJECT

1. Assessment of the key project sizing drivers
2. Stakeholder engagement and co-design workshop
3. Identification of suitable technological options given existing project sizing requirements
4. High level analysis on selected technologies/projects + regulatory framework
5. High level analysis of expected impacts
6. Definition of the technical, economic and financial, fiscal project inputs and Assessment of existing procurement
7. Risk analysis and identification of available mitigation strategies
8. Financial modelling and identification of target scenario and Identification of financing/funding options
9. Action plan and identification of project monitoring procedures

INTERVIEW WITH

Rander Süld, Energex Energy Experts

Q: How was the project initially designed? Why choosing this specific technology / sector?

A: Estonian islands expressed the need to develop an investment plan outlining all major assets. The project was initiated with the aim to develop a holistic roadmap towards a sustainable island community, considering the energy needs, networks and local resources for generation, and putting forward concrete project propositions.

Q: What are the challenges of the project? How does NESOI help overcome them?

A: The main challenge consists in getting the data from the municipalities and the different bodies involved, which is doable but takes time. NESOI partners help in putting together all these data and identifying realistic solutions, both form the technical and from the financial points of views. Some of the most promising technology that we have identified given the Estonian islands' specificities are offshore wind and hydrogen.

Q: How are citizens and stakeholders at local level involved in the project?

A: We have organized local meetings with citizens, where municipalities and energy producers has also participated. We expect that local companies would be strongly involved if an offshore windfarm and a hydrogen valley were developed.

Q: What are the next steps of the project?

A: On the generation side, we plan to analyze the potential of hydrogen production, uses and business cases. We are also studying the development of wind generation, which heavily depends on the transmission grid's capacities which are currently limited. Waste, for instance from cattle, can also be a relevant energy source to be exploited. On the consumption side, some projects are being analyzed, ranging from relamping to e-mobility. Most of them should be pursued.

THE IMPACT

ON LOCAL COMMUNITY

1. **Local Economy**
   New sustainable business opportunities based on local resources are being explored. Businesses are being encouraged to adopt new energy-efficient solutions and technologies to increase their competitiveness.

2. **Social Acceptance**
   As a result of the action, energy consumption and energy prices of the residents will be reduced.
   The goal is also to reduce opposition towards renewable energy projects. As a result of the action, the communities will be more involved in the energy transition, a sense of ownership will be created, and opposition reduced.

New Energy Solutions Optimised for Islands
NESOI
EUROPEAN ISLANDS FACILITY

SEI

Sustainable Estonian Islands – Technical Data

FOCUS ON
INVESTMENT PLAN FOR SUSTAINABLE GROWTH

Realizing the accelerated decarbonization and electrification of European territories would require intense investments in capital-intensive low-carbon power technologies. These investments must ensure a long-term sustainable development.

The Saare Development Center and Hiiumaa Development Center want to fix the trajectory of the Estonian islands towards sustainability. Their aim is to select integrated innovative ideas to bridge the gap between sectors and built a sustainable future for the islands.

An offshore windfarm associated with H2 generation could be the two main elements of the next energy system. The electrification of the energy supply would allow to turn public transport (buses and ferries) carbon neutral by 2030 and decrease the importation of fossil fuels. It could also impact positively the level of service at port and enhanced aquaculture activities.

The calculation of the ROI of each investment is very dependent of hypotheses such as the cost of electricity and the capacity of hydrogen production. Nevertheless, virtuous interactions between domains of activities like the green energy and the blue economy strengthen the economical case.

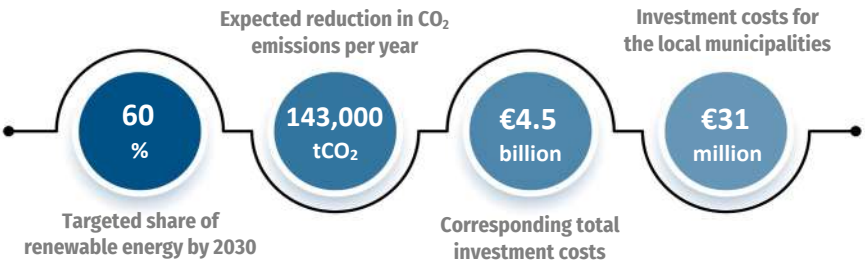
Prior to taking final decisions, it is very important to understand the financial resources and streams associated with each technological solutions, establishing business models for each project. An investment plan considering different mid- and long-term economic scenarios will capture the financial risk and obtain a larger stakeholder adoption.

Alternative to the Baltic Offshore Grid concept, involving the Estonian islands of Saaremaa and Hiiumaa.
Improving the islands' grid connections is essential to develop offshore wind in Estonia.

EXPECTED
ENERGY SAVINGS

The total energy consumption on the islands in 2018 was 929 GWh with the consumption of electricity and fuels both for heating and transport. When including the energy consumed by ferries and planes, the total energy consumption exceeded 1 TWh. The consumption of energy on the islands resulted in 310 $ktCO_2$ emissions and when including ferries and aviation, there was a total of nearly 330 $ktCO_2$ emissions. The overall vision for the islands is to become Smart and Green. Strategic objectives have been set to achieve that vision which include the reduction of carbon dioxide emissions by 40% by 2030 compared to 2018, achieving a 60% share of renewable energy in final energy consumption by 2030, and switching to 100% renewable energy and low carbon fuels in the municipal sector by 2030. By 2050 the islands intend to become energy independent.

KEY NUMBERS
OF THE PROJECT



REPLICABILITY
IN OTHER ISLANDS

The solutions proposed can be replicated anywhere, no specific location is eligible.

NESOI contact:
Elif Celik, elif.celik@eon.com.

NESOI has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement N°864266