NESOI
EU ISLANDS FACILITY

Sustainable Actions
for Viable Energy

SAVE

CRETE

“ Smart grid and V2G concepts are introduced for the first time in Crete and the current passive consumers are turned into active prosumers ”

This project is supported by the EU Islands Facility NESOI.
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SAVE

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 Actions for Viable Energy

ABOUT
THE PROJECT

Project Promoter Minoan Energy Community, Region of Crete, Minoan Pediadas Municipality

Stakeholders Municipality of Minoa Pediadas, Regional Authority of Crete, Aeolian Land S.A.

Country Greece | **Sector** Energy Community | **PROJECT VALUE** 3,200,000 €

DESCRIPTION

- Electricity from Crete's wind parks' electricity will be absorbed by decentralized storage devices, including vehicle-to-grid (V2G), and injected back to the grid during peak demand periods, replacing thermal generators' production.

AIM OF THE PROJECT

Two sports facilities owned and operated by the municipality will be involved as prosumers in the smart grid. The stored electricity, combined with electricity production from PV, will lead to annual compensation of their electricity consumption, resulting to zero-energy facilities, together with their energy performance upgrade.

FUTURE STEPS

Expect PM hardware for the smart grid. The study of the gym is expected to be completed soon and in June the study for the swimming pool. The project is on schedule.

HOW THE EU ISLANDS FACILITY NESOI
SUPPORTS THE PROJECT

1. Assessment of the key project sizing drivers
2. Identification of suitable technological options given existing project sizing requirements
3. Definition of the required environmental permitting procedures and Capacity building; contractual and regulatory analysis
4. Cost Benefit analysis and socio economic and environmental impact evaluation
5. Definition of the technical, economic and financial, fiscal project inputs
6. Risk analysis, identification of available mitigation strategies and Action plan and identification of project monitoring procedures
7. Assessment of existing procurement options
8. Financial modelling and identification of target scenario and Identification of financing/funding options
9. Setting up of planning frameworks for the elaboration of the DEASP and Design for sports facilities, tender documents and application for funding

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Sustainable Actions For Viable Energy - Interview

INTERVIEW WITH

Dimitris Katsaprakakis

Minoan Energy Community / Hellenic Mediterranean University

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

A: The project was designed to gain knowledge for the creation of smart grids for decentralized energy, through assistance from NESOI in terms of simulation and implementation. The goal is also to deliver to the Municipality a plan with integrated actions to manage the (high) energy consumption of sport facilities.

Q: What were the challenges? How does NESOI help overcome them?

A: The institutional framework for smart grids is one of the biggest challenges. The rejection of wind energy is one of the main motivations for the project – even though the problem was addressed, temporarily, through the connection of Crete with the mainland, last year. However, storage technologies will be needed. NESOI will contribute to this, through the creation of technical infrastructure. For example, in Arkalochori, the swimming pool is closed during winter due to heating costs. Such an infrastructure in the Municipality will be a model of energy education for the local community through the elimination of energy costs.

Q: What are your next steps towards clean energy transition, beyond this project?

A: The energy community has a lot of different projects. We are developing photovoltaic energy on the island and have plans to develop large-scale wind farms. We are also working on the links between energy and agriculture: design of a large pumped storage facility, in combination with irrigation; production of biogas from livestock, agricultural and municipal organic waste, which could meet Crete' heat needs and replace the existing diesel-based heat production facilities, if combined with smart district heating networks.
In terms of citizens' engagement, we are working on the design of a 2-year training program on renewable energy for the local community, including farmers, tourism professionals and schools. Finally, we are working on institutional aspects together with other energy communities (from Sifnos, Karditsa, Halki) and environmental NGOs, to form a more favorable institutional framework, also considering energy poverty issues.

THE IMPACT

ON LOCAL COMMUNITY

1 Local Economy

The smart grid operation has also a direct impact on the reduction of the electricity production specific cost, especially during peak demand periods. Cheap energy for sports facilities will enable the municipality to drop the monthly fees and make them affordable to more users. In addition, thanks to the project, passive consumers are made active, and learn how to manage energy and how to use it to generate additional revenues.

2 Social Acceptance

The configuration of two zero-energy sports facilities will have a direct impact on their large number of users, both athletes and spectators, especially of young ages. All these will contribute to the configuration of positive social acceptance in the community on energy transition and the relevant technologies.

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Sustainable Actions For Viable Energy – Technical Data

FOCUS ON
THE VEHICLE-TO-GRID CONCEPT

Crete is nowadays equipped with significant electricity production capacities from wind.

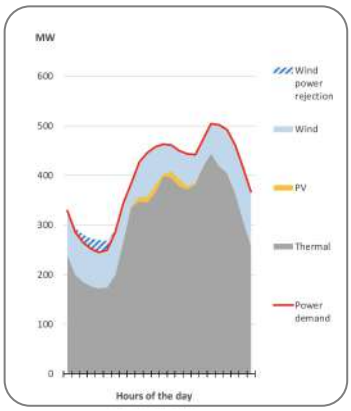
During low-consumption hours (typically at night), the electricity system cannot always accommodate 100% of the wind generation, leading to partly curtailing this clean electricity production.

The concept of the SAVE project consists in storing, instead of curtailing, this clean electricity from wind thanks to decentralized storage devices, including electric vehicles (EVs).

The clean electricity is stored at night in the EVs and is reinjected in the electricity grid during peak hours: this is the vehicle-to-grid (V2G) concept.

EV owners participating in the mechanism (residents, industrial, commercial stakeholders and municipal facilities) are financially compensated by the grid operator for such a service.

A triple economic benefit is ensured for the wind parks' owners, the prosumers (EV owners) and the grid operator.

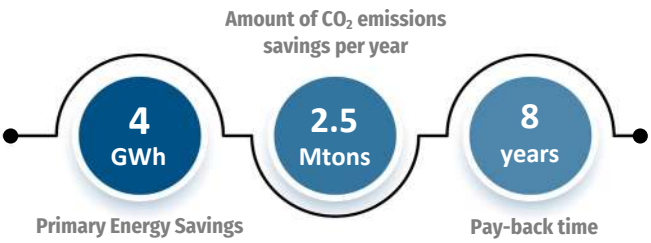


Electricity production and consumption during a typical winter day in Crete. Wind production is curtailed at night.
Data source: Minoan Energy Community. Design by NESOI

EXPECTED
ENERGY SAVINGS

The annual primary saving through the electricity and diesel oil consumption drop is achieved: Through the smart grid operation with 200 prosumers involved: 1,693,600 kWh. From the swimming pools heating: 2,074,768 kWh. From the Indoor Sports Hall lighting and hot water production: 84,780kWh. Through the installation of LED flood lights in the outdoor football and tennis courts: 24,810 kWh. In total: 3,877,958 kWh.
The annual CO_2 emission reduction through the electricity and diesel oil consumption drop is achieved: From the smart grid with 200 prosumers involved: 1,674,970 tons. From the introduced measures in the swimming pools heating: 784.175 tons. Regarding the Indoor Sports Hall: 61.550 tn. From the electricity saving for the outdoor lighting of the Municipal Sport Centre: 24,5 tons. In total, 2,520,720 tons of CO_2 emission are saved annually.

KEY NUMBERS
OF THE PROJECT



REPLICABILITY
IN OTHER ISLANDS

The proposed smart grid is highly scalable and replicable, for all insular or remote grids with considerable renewable energy rejection. Sports facilities constitute large and consuming facilities. The proposed energy performance upgrade can constitute a pilot project. The proposed project shows the way for effective and rational energy transition, starting from energy saving and ending to advanced, demand-side energy management.

CERTH
CENTRE FOR RESEARCH & TECHNOLOGY HELLAS

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