

SMOSOLARPROCESS



CRES-LOŠINJ

“The project will allow Cres and Mali Lošinj to decrease their waste management costs by 50% and to cover 16% of their electricity consumption.”



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

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.

 **From municipal waste to clean Hydrogen on Cres-Lošinj Archipelago in Croatia**

ABOUT THE PROJECT

**Project
Promoter**

ACTIVE • SOLERA

Active Solera

Stakeholders Active Solera Komunalne usluge Cres Losinj NumSMOTechnologie
Croatian Hydrogen association National and local authorities

 **Country Croatia**

 **Sector Waste management**

 **PROJECT VALUE 9 M€**

DESCRIPTION

Municipal solid waste on Cres-Lošinj Archipelago are currently being transferred to the nearest waste processing facility on the mainland. Within this project, a SMO pilot site will be built on the Croatian Island of Cres. SMO is an energy-autonomous waste processor using exclusively solar energy to transform waste into hydrogen.

AIM OF THE PROJECT

The SMOSolar project will leverage financial and technical support to prepare permitting and authorization procedures, prior to pilot plant construction.

FUTURE STEPS

The project, involving NESOI and the Clean Hydrogen Partnership, has secured funds for construction until the end of 2024. Construction will begin immediately, lasting until the end of 2024 and spring 2025. The next phase requires closing the financial structure until the end of construction.

HOW THE EU ISLANDS FACILITY NESOI SUPPORTS THE PROJECT

- 1 Analysis of comprehensiveness and compliance with current regulation of the permitting procedures
- 2 Identification and analysis of existing litigations/appeals and evaluation of the associated risks
- 3 Analysis of the soundness and coherence with market practices
- 4 Detailed permitting and authorizations procedures, expected budget, relevant subcontractors
- 5 Listing of condition precedents for successive project implementation steps
- 6 Eligibility and feasibility study for carbon certification
- 7 Screening of EU opportunities or private financing
- 8 CAPEX consolidation study and identification of relevant service providers for construction phase
- 9 Action plan and project identification of monitoring procedures



One SMO unit
(SMO Solar Process homepage
www.smosolarprocess.com)





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From municipal waste to clean Hydrogen on Cres-Lošinj Archipelago in Croatia - Interview



INTERVIEW WITH Ivana Chaux Jukic, Active Solera

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

A: The project by Active Solera aims to solve waste disposal and energy production issues on Croatian islands by using non-recyclable waste for hydrogen production. The technology allows for storage and production at any time, reducing waste disposal costs and providing clean electricity. The project is based on long-term contracts with Cres and Lošinj, forming a strategic partnership rather than a PPP. Similar technologies are being developed in other countries.

Q: What are the challenges of the project?

A: The project involved contacting the NESOI commission and program during documentation development and permits acquisition. The regulatory framework was synergistic with NESOI's program, providing technical support for documentation preparation. The project faced challenges in an undefined framework, but gained knowledge on similar projects. The plant was the first to undergo an environmental impact assessment, and its location is an old waste dump, a transshipment station for the Cres-Lošinj archipelago.

Q: How does the project affect the local population and environment?

A: The implementation of technology on the island of Lošinj could significantly improve the environment and quality of life for islanders. The solution would prevent air pollution caused by waste transported during summer, reduce waste processing costs, and increase utility service prices. The solution could indirectly create new jobs in the energy sector and tourism, as it promotes solutions like charging stations for electric cars, hydrogen-powered public transport, and maritime transport.

Q: What are your next steps towards clean energy transition?

A: The Clean Hydrogen Partnership and the Croatian Ministry of Economy and Sustainable Development have secured funding for a project to build a hydrogen plant. The project, which is a strategic one, is expected to receive national funds and EU funds. The pilot project on Cres is 2 MW, with potential for projects ranging from 10-20 MW. Future projects in Croatia include island development and hydrogen implementation.

Q: Within your views, where could this project be replicated?

A: Waste to hydrogen technology is adaptable and can be developed in various locations, including smaller cities and larger cities.

THE IMPACT ON LOCAL COMMUNITY



1 Local Environmental Conditions

By transforming municipal solid waste into energy and products with economic added value, the project will drastically reduce landfilling and contribute to improve local environment on the Archipelago and the mainland.

2 Social Acceptance and Impact

Citizens will be consulted when preparing the plant construction on Cres Island, to ensure social acceptance of the project. Therefore, we will organize information-meetings on the Archipelago, together with the Island Development Agency of Cres (OTRA) which is at the origin of a local citizen's cooperative.



FOCUS ON WASTE-TO-HYDROGEN SOLUTION

Cres-Lošinj is the largest archipelago in the Adriatic sea. Currently, the municipal solid waste on Cres-Lošinj Archipelago is being transferred to the nearest waste processing facility on the mainland, Marišćina by ferry.

NumSMOTechnologie is a French company which has been developing SMO technology since 2009. SMO is an energy-autonomous Waste-to-Hydrogen processor using solar thermal energy to transform carbon-based waste into hydrogen, energy and solid carbon. One SMO unit is projected to turn 40 tons of waste into 2.5 tons of hydrogen and 15 tons carbon daily.

SMO units operate in two steps: solar thermolysis and gasification. First, a thermolysis reactor turns granulated and dried waste into (bio)char with high carbon content, then a plasma gasification reactor is used to get hydrogen while carbon is stored as solid carbon black.

One SMO prototype was built in Morocco in 2016, which serves for R&D purpose. However, some of the technological aspects are in early development stages.



SMO unit converts waste to hydrogen and solid carbon using solar energy

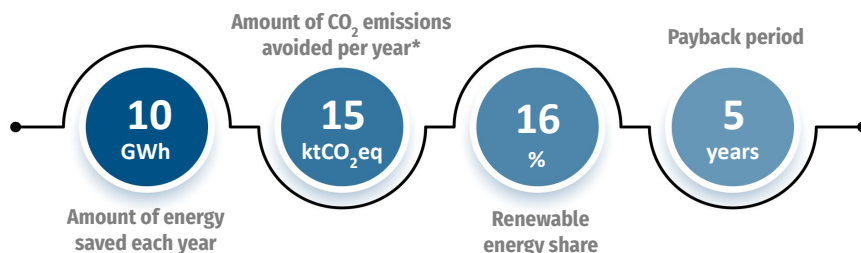


One SMO unit (SMO Solar Process homepage www.smosolarprocess.com)

EXPECTED ENERGY SAVINGS

The planned SMO pilot plant will transform 9000 tons of solid waste into 700 tons of clean hydrogen annually, which is then converted into 10 GWh of electricity. Solid carbon black is produced as a by-product.

KEY NUMBERS OF THE PROJECT



* Avoidances are related to the reduction of waste landfilling and incineration, as well as to the primary energy savings. Storage is achieved in the form of carbon black.

REPLICABILITY IN OTHER ISLANDS

This project can be replicated on every location with adequate Solar irradiation and with sufficient waste input and energy needs, ensuring a market for plant's products (hydrogen, electricity, carbon black). Replication is already planned in the Croatian island Dugi Otok and cities of Zagreb, Zadar and Split.

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