

Transport Electrification On Sea and Land in Antiparos

# TESLA



"TESLA is the first step towards the total electrification of the island's transport sector, paving the way towards carbon-neutral mobility both on land and at sea"



This project is support 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.

## 늘 Transport Electrification On Sea and Land in Antiparos

ABOUT

Project Municipality of Antiparos Promoters Paros – Antiparos Ferry Cooperative



# PROJECT

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### SUPPORT - How the EU Islands Facility NESOI supports it?

- 1 Assessment of the key project sizing drivers
  - Identification of suitable technological options given existing project sizing requirements
  - Definition of the required environmental permitting procedures
  - Cost Benefit analysis and socio economic and environmental impact evaluation
- Definition of the technical, economic and financial, fiscal project inputs
- Risk analysis and identification of available mitigation strategies and Assessment of existing procurement options (e.g. tender, PPP, etc.)
- 7 Financial modelling and identification of target scenario and Identification of financing/funding options
- Action plan and identification of project monitoring procedures





🚍 TESLA

## Transport Electrification On Sea and Land in Antiparos - Interview

# **INTERVIEW WITH**

Anastasios Faroupos, Mayor, Municipality of Antiparos Ion Siotis, President of the Paros - Antiparos Ferry Cooperative

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

<u>AE</u>: This project was designed to be the first step towards the electrification of the island's transport sector, in order to pave the way for sustainable mobility both on land and at sea. The chosen technologies are commercially mature and immediately usable. <u>IS</u>: The project has also started as an effort to improve the quality of life provided to the citizens of Antiparos.

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

AE: The limited area of municipal land for the installation of the solar plant, the operation and maintenance of the proposed systems, the existence of suitable technical personnel, who will need to be trained, and the finding of suitable financial solutions for the individual interventions are the main challenges for the Municipality. IS: Another challenge is about the high cost of the electric batteries on the island, which is in the range of 650€/kWh compared to 140€/kWh for typical batteries on land, due to the increased safety requirements. This combined with the limited number of charge/discharge operations (~5000) demonstrates the requirement for strong economic incentives until the cost of batteries is reduced.

#### Q: How does the project impact citizens locally? How are they involved?

<u>IS</u>: Electrification will improve the overall quality of life for citizens. The municipality is going to provide the possibility of using electric vehicles to low-income citizens, while in the municipal parking lot they will be able to use the charging stations that will be installed.

#### Q: In your opinion, where could this project be replicated?

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<u>AE</u>: Electric vehicle charging stations can be replicated anywhere in the administrative boundaries of a Municipality in the Greek islands and throughout the country, as can the supply of municipal electric vehicles in combination with the installation of a photovoltaic station. The electrification of the ship responsible for the Paros-Antiparos connection can be replicated in any ferry connection between islands or between the mainland and islands.

#### Q: What will be done next to pursue this specific project? What are the next steps of the island?

<u>IS</u>: The implementation of this project will depend on the willingness of the central administration to provide the necessary financial support to make marine electrification on ferries (short distance) economically viable. Considering that retrofitting existing vessels to electrification has a time span of ~4 months and a cost equivalent to 25% to 30% of the construction of new vessels, emphasis should be placed on retrofitting over building new ones. <u>AE</u>: From the perspective of the Municipality, the next steps are the combination of the individual projects of the municipality in the direction of the clean energy transition.

# THE IMPACT

**ON LOCAL COMMUNITY** 



#### Local Economy

Expected increase in ecotourism activity leading to an increase in the economic activity of local businesses, consequently the job demand.

#### Social Acceptance

Expected increase in ecotourism activity, green technologies applied, the added comfort in island transport, and the provision for energy to municipality buildings will lead to increased levels of Social acceptance.

#### Local Grid

The electric vehicle charging stations will be smart controlled providing flexibility to the island's main grid.



Transport Electrification On Sea and Land in Antiparos – Technical Data

# **FOCUS ON**

## THE ELECTRIFICATION OF AN ISLAND'S TRANSPORT SECTOR

The electrification of the transport sector associated with clean electricity production is one of the technical options that can be envisaged to shift towards more sustainable transport modes.

On an island, the electrification of the transport sector encompasses land transport means (municipal vehicles and private cars), sea transport means (ferries), charging stations adapted to all transport means, and clean electricity generation means (typically PV).

The TESLA project has calculated that the Antiparos island would need 3 charging stations for the municipal fleet, 1 charging station at the port where ferries permanently installed in the ship would be charged, and 7 charging stations for private e-cars.

Another key sizing driver of the project concerns the PV capacity to be installed in a context of restricted land use and availability. According to the TESLA project a rated capacity of 550 kWp is needed to cover mobility needs and also municipality buildings ' consumption. Constraints include the presence of protected (natural and cultural) areas, land-use criteria, orientation and slope of the ground.



Schematic representation of the TESLA project on Antiparos (Icons by FREEPIX, design by NESOI)

# EXPECTED ENERGY SAVINGS

- For all the proposed interventions, the primary energy savings are estimated approximately 500 MWh/yr, and this corresponds to a reduction of 41%.
- Considering the given combined total fuel consumption avoided, and the zero-emissions energy produced from PV stations, the GHG emissions avoided are around 500 tCO2-eq/yr.



# **REPLICABILITY** IN OTHER ISLANDS

The project can be replicated in other insular areas with a neighboring counterpart like Paros-Antiparos, since the technologies in question are well suited to them and are easily replicable. One restriction would be the available electrical space of each island i.e. the available capacity for new RES plants. Also, in order for the investment plan to be successful, the replication area must be characterized by the potential of high tourism activity.



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