

DAFNI
Network of Sustainable Greek Islands



CLEAN ENERGY
FOR EU ISLANDS

*Lessons learnt from e-mobility
projects in Greek islands*

*SHAPE: Financing e-mobility
infrastructure*

Clean Energy for EU Islands forum
18th May Rhodes Island, Greece

Petros Markopoulos, DAFNI Network



DAFNI – Network of Sustainable Greek Islands is a public interest non-profit organization of the island local and regional authorities in Greece.

It promotes **sustainable development** in Greek islands through the delivery of integrated actions in the fields of energy, water, waste and transport / mobility enabling the transition to a circular and sector-coupled local economy boosted by touristic activities.

52
Island
municipalities

4
Regional
authorities





Founding member

Promoting sustainability in European islands through local energy planning
(2010 – 2020)

Subcontractor

Activating the liaison between Pact of Islands and Covenant of Mayors for Climate and Energy
(2016 – 2020)

Coordinator

Promoting islands as ideas areas for innovative projects in the fields of energy, environment, transport and mobility
(2017 – present)

Subcontractor

Promoting the initiative in the Greek islands during the 1st Secretariat term
(2019 – 2020)

Smart Electromobility in Syros

Enfield 8000 Neorion

1973: The 1st Greek electrical vehicle is produced in Neorion of Syros



ΔΗΜΟΣ ΣΥΡΟΥ - ΕΡΜΟΥΠΟΛΗΣ
MUNICIPALITY OF SYROS - HERMIOPOULIS

ENFIELD^{NEORION}

ΑΝΑΜΕΣΑ ΣΕ ΔΥΟ ΝΗΣΙΑ

Το πρώτο
ηλεκτροκίνητο
αυτοκίνητο
εις την
Ελλάδα



ENFIELD-NEORION Co.LTD.



ΒΙΟΜΗΧΑΝΙΚΟ ΜΟΥΣΕΙΟ ΕΡΜΟΥΠΟΛΗΣ

Εγκαίνια: Παρασκευή 25 Ιουλίου 2014 στις 21:00
Διάρκεια έκθεσης: 25 Ιουλίου με 22 Αυγούστου
Ώρες λειτουργίας έκθεσης:
Δευτέρα & Τετάρτη: 10:00 - 14:00
Πέμπτη έως Κυριακή: 10:00 - 14:00 και 18:00 - 21:00
Τρίτη: Κλειστά
Είσοδος ελεύθερη

ΟΙΚΟΓΕΝΕΙΑ
ΓΙΑΝΝΗ Ν.
ΓΟΥΛΑΝΔΗ

ΕΛΛΗΝΙΚΗ ΔΗΜΟΚΡΑΤΙΑ
ΠΕΡΙΦΕΡΕΙΑ ΝΟΤΙΟΥ ΑΙΓΑΙΟΥ



ΕΛΛΗΝΙΚΗ ΔΗΜΟΚΡΑΤΙΑ
ΠΕΡΙΦΕΡΕΙΑ ΝΟΤΙΟΥ ΑΙΓΑΙΟΥ



Smart Electromobility in Syros: Vision

Syros being an administrative and commercial center of Cyclades with intense industrial and tourism activity and the birthplace of the historical first EV Enfield 8000, aspires to become an island - a model for the transition to e-mobility and sustainable transport by providing improved transportation services to residents and visitors.



Mitigation of CO2 footprint in transports within the island

- Electrification of municipal fleet
- Installation of publicly accessible EV charging stations in central areas of Syros
- Installation of solar PV stations of an aggregated capacity of 650 kWp ensuring that the energy consumed for the EV charging is produced by RES
- Establishment of an Energy Community for the management of EV charging network and public EV fleet



Technical support

- Best practices
- Business models
- Regulatory barriers and solutions
- Local policy recommendations

The joint-venture model

The municipality partners with the private sector and they share the overall control of the infrastructure. The project risks are also shared. The model remains flexible on financing of the expenditure.

Advantages (+)	Disadvantages (-)
<ul style="list-style-type: none"> - Project risks are split between the municipality and the charge point operator, and financing conditions are set at the beginning. 	<ul style="list-style-type: none"> - Requires direct involvement of the municipality in financing, operation and maintenance - Requires know-how from the municipality.

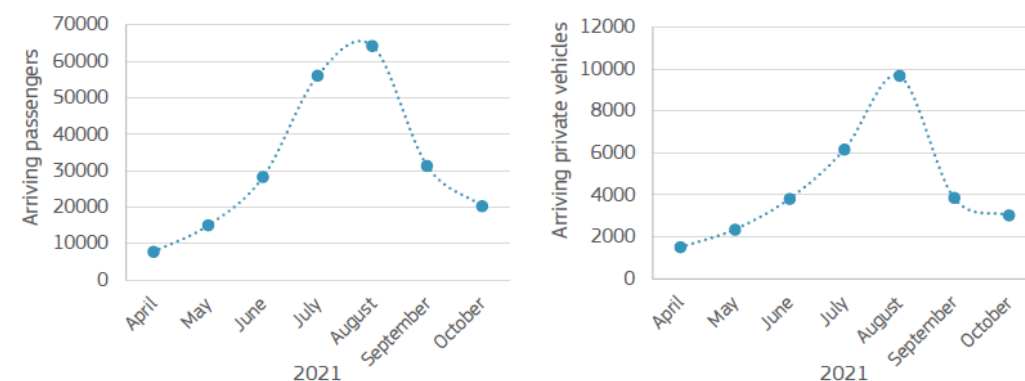
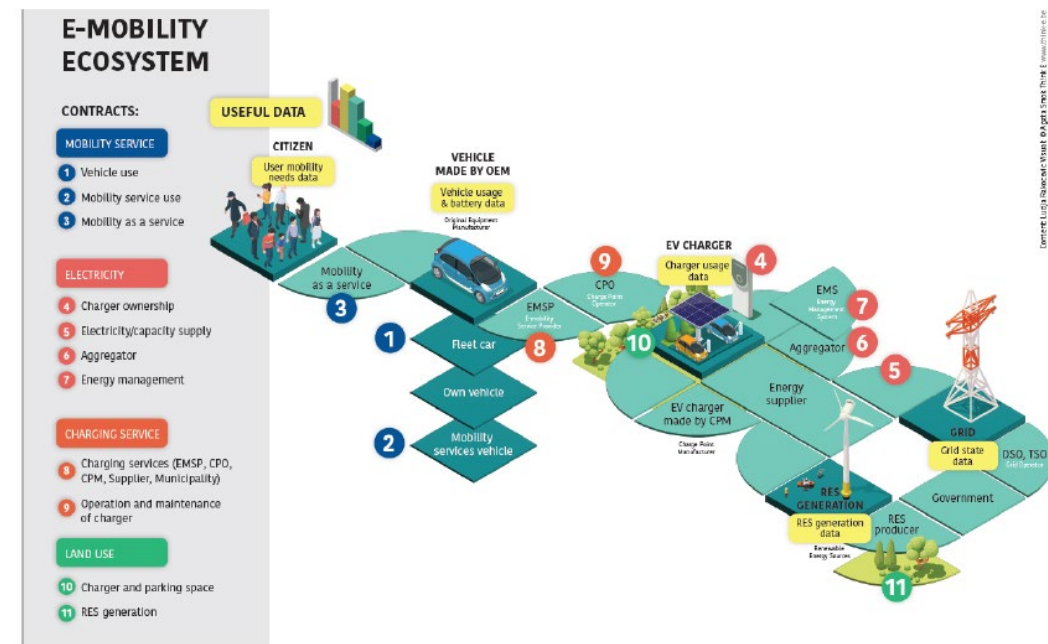
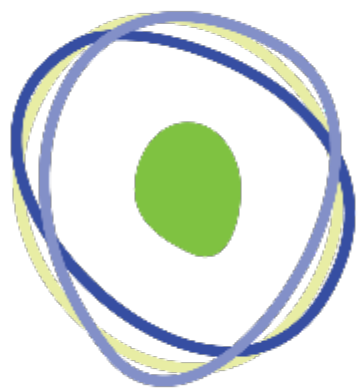


Figure 10. Seasonal nature of the number of passengers and private vehicles arriving to Syros in 2021



Smart & Sustainable Island- Astypalea



smart &
sustainable
island

VOLKSWAGEN
AKTIENGESELLSCHAFT



MINISTRY OF
ENVIRONMENT
& ENERGY



HELLENIC REPUBLIC
MINISTRY OF INFRASTRUCTURE
AND TRANSPORT



HELLENIC REPUBLIC
Ministry of Interior



HELLENIC REPUBLIC
MINISTRY OF
DEVELOPMENT AND INVESTMENTS



HELLENIC REPUBLIC
MINISTRY OF FOREIGN AFFAIRS



aegean islands
sustainable island communities



Smart & Sustainable Island- Astypalea

The 4 pillars

e-vehicles



Switching the existing fleet of combustion vehicles to electric ones

smart mobility



Public transportation will operate on demand, taking us wherever we wish, whenever we need

charging & energy



A hybrid energy system will replace the existing diesel generators, to feed the charging infrastructure



future option
autonomous
driving



Deployment of charging station network



Installation of 6 publicly accessible charging stations



Chora



Maltezana



Airport



Pera Gialos



Livadi



Port

Public EVs for the Police, Port Police, Civil Aviation Service, Municipality

e-vehicles





Subsidization of 40% for the purchase of EV. Beneficiaries :

- ▶ Natural persons
- ▶ Taxi Owners
- ▶ Enterprises

Public transport on-demand



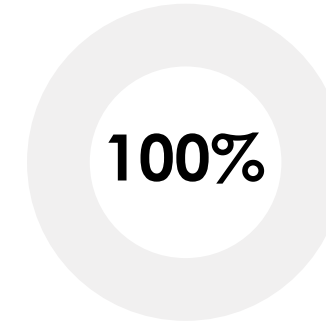
- ▶ Smart operation via application
- ▶ **Hub** for the accommodation of the electrical buses providing the on-demand mobility
- ▶ Technical support

Hybrid energy system

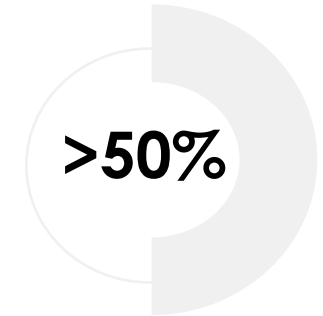
1st phase (BY 2023)



Photovoltaic
plant & battery
system

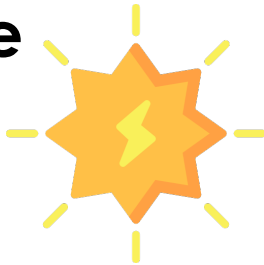


Covering EV
charging needs

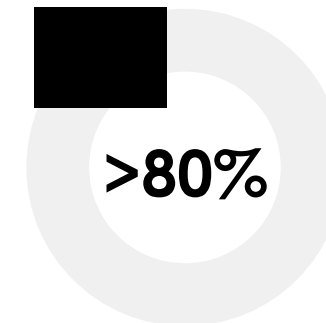


Islands
energy needs

2nd phase (BY 2026)



Hybrid system
expansion



Islands
energy needs

Energy Planning for Clean Energy Transition for Astypalea (ENERRAS)

Development of Clean Energy Transition Agenda (CETA) and Sustainable Island Mobility Plan (SIMP)

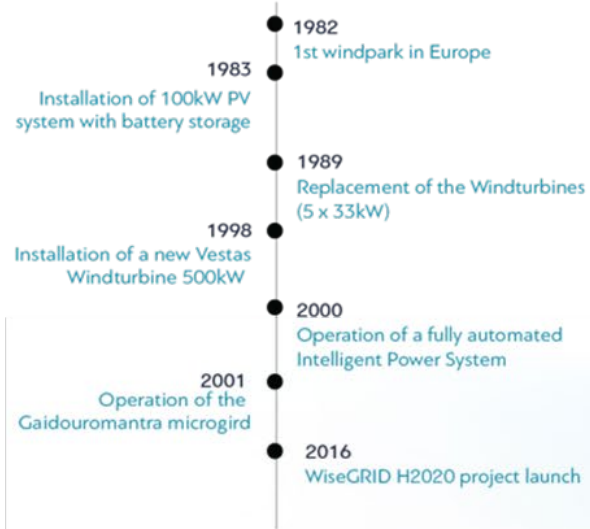
The combination of the two high level documents will act in supplementary way to the ongoing visionary project ensuring high participation of the local community in the process and maximizing local benefit.

Mobility planning on islands:

- Focus on whole island
- Tourists outnumber local population during summer
- Need for light and flexible infrastructure
- Limited external connections
- Need for light, personalized (on demand) and flexible public transport
- Focus on maritime transport

Kythnos Smart Island

KYONOS
SMARTISLAND



Kythnos Smart Island” constitutes a local development vision and strategy for the local municipality bridging the integrated, smart and efficient infrastructure management with local economic development.



The island figures

Permanent **population**: 1608

Electrical system: Non-interconnected

Peak demand: 2.7MW

Thermal station: 5.2MW total capacity

Fuel: Diesel

AVC: 212€/MWh

RES : 268 kW PV, 665 kW Wind
(out of order)

Main economic activities: tourism,
construction, farming, fishing

Project duration: 3.5years

Project budget: 8M€



Kythnos Smart Island



WATER MANAGEMENT

Demonstrate the integrated water resource management at island scale, while reducing the water production cost and water losses at the distribution system.



STREET LIGHTING

Energy upgrade and smartening of the island's street lighting network, while improving visual comfort and minimizing lighting pollution

BUILDING & PUBLIC SPACE RETROFITTING

Energy upgrade of municipal buildings into Nearly Zero Energy Buildings and sustainable regeneration of public space.



ENERGY & SMART GRIDS

Acceleration of the clean energy transition through multiple applications, such as demand side management, integration of storage in the distribution network, research on a local microgrid and extensive sector coupling.



WASTE MANAGEMENT

Demonstrate the potential to transform an island into a zero-waste area, while maximizing valorization of waste and minimizing environmental impact



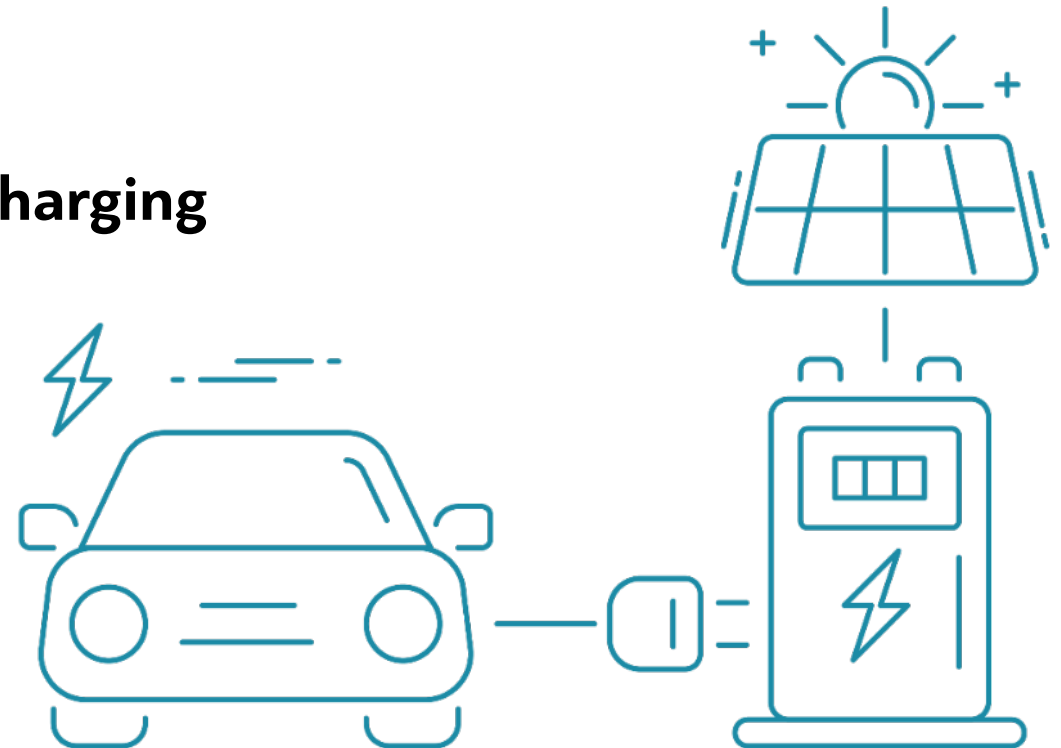
TRANSPORT & MOBILITY

Decarbonize the island's transport sector through the uptake of electromobility on land and sea transportation.

The project puts Kythnos at the forefront of technological innovation in the field of green, smart and sustainable mobility, activating synergies between transport and energy.

Intervention areas

- 1. Adoption of electromobility**
- 2. Upgrades of port infrastructure**
- 3. Installation of solar PV station for green charging**



- 1. Upgrade of municipal fleet**
- 2. Installation of EV charging stations**
- 3. Installation of electrical bikes stations in the marinas**
- 4. Installation of municipal fleet and charging stations operation system**
- 5. Installation of solar PV station for green charging**

Electromobility

Workshop of participatory planning, July 2019



Electromobility

Publication of «Catalogue for EVs covering the Municipalities needs»



Ecocar Pickup



ΧΑΡΑΚΤΗΡΙΣΤΙΚΑ

Βάρος	609kg	
Μήκος	3.15m	
Ύψος	1.57m	
Πλάτος	1.29m	
Μεταξόνιο	2.30m	
Οφέλιμο φορτίο	300kg	
Εργασία σε κλίση	20%	
Επιβάτες	2	
Ταχύτητα	80km/h	
Μέγιστη Ισχύς	7.50 kW	
Τύπος μπαταρίας	Μολιβδίου	Λιθίου
Ισχύς μπαταρίας	7.2 kWh	9.2 kWh
Χρόνος φόρτισης	5 - 7 h	
Αυτονομία	150 km	300 km
Ανταρσίαση	ECO/SUN	
Ενδεικτικό κόστος	10,310 €	14,000 €

ΠΕΡΙΣΣΟΤΕΡΑ

Peugeot e-2008 SUV



ΧΑΡΑΚΤΗΡΙΣΤΙΚΑ

Βάρος	1235kg
Μήκος	4.30m
Ύψος	1.53m
Πλάτος	1.77m
Μεταξόνιο	2.56m
Επιβάτες	5
Κιβώτιο	Αυτόματο
Ταχύτητα	150km/h
Μέγιστη Ισχύς	100 kW (136 PS)
Μπαταρία	50 kWh (λίαντρον Λιθίου)
Χρόνος φόρτισης	7h - 15m
Αυτονομία	250km
Ανταρσίαση	Peugeot Hellas
Ενδεικτικό κόστος	38,500 €

ΠΕΡΙΣΣΟΤΕΡΑ

Electromobility

Purchase of EVs



Electromobility

Purchase of EVs



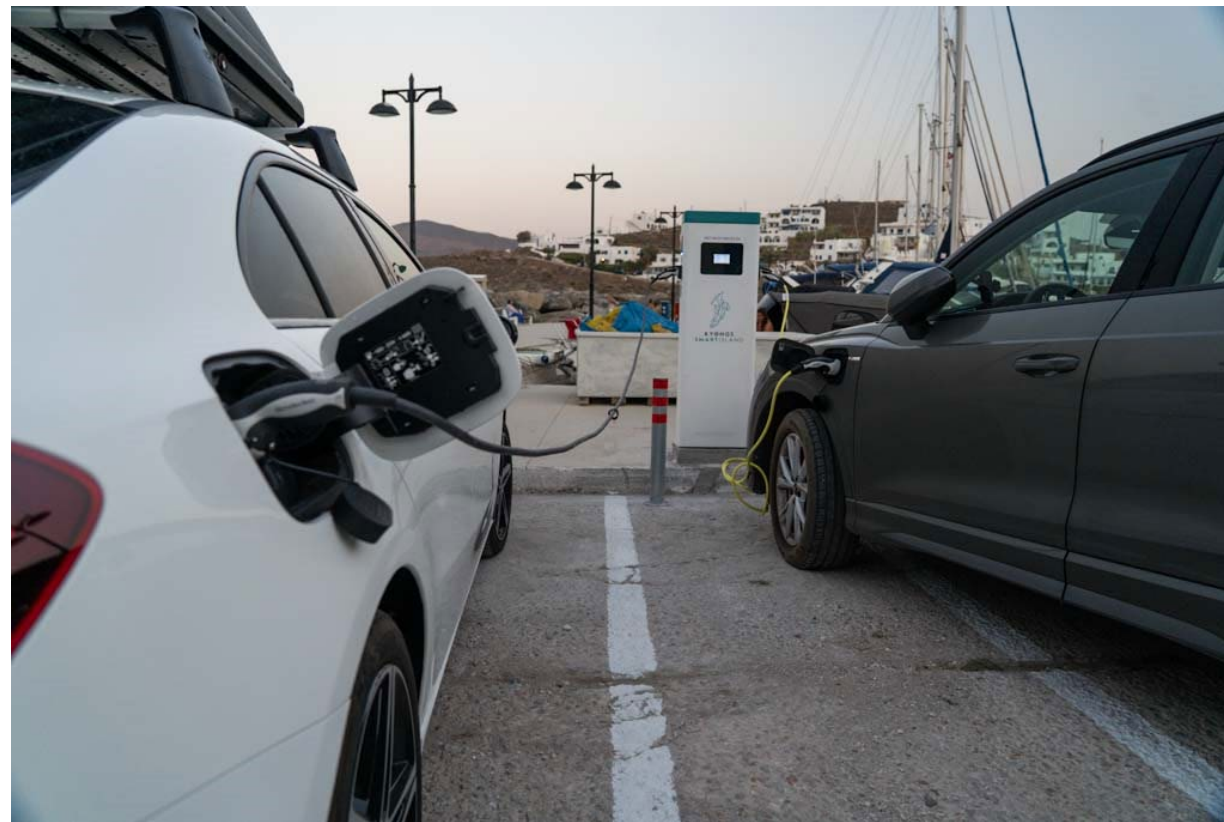
Electromobility

Installation of 4 publicly available EV charging stations



Electromobility

Installation of 4 publicly accessible charging stations for EVs



Upgrade of port infrastructures in Loutra and Merichas

1. Stations of shared electrical bikes
2. Replacement of pillars
3. Energy, operational and aesthetic street lighting upgrade
4. Installation of charging station for electric boats



Installation of solar PV station for green charging



Key challenges

Technical

- Limited **grid capacity** – close cooperation with DSO is necessary / innovation is required
- Resilience to **extreme conditions** as a design parameter
- Challenging cabling and grounding works
- Need to designate the EV charging spots

Key challenges

Socioeconomic

- Local businesses (rent-a-car, gas stations) are heavily affected creating the need for a **just transition** approach
- **Seasonality** creates the need for cooperation between municipality and tourism sector
- Traditional architecture creates the need for **aesthetic adaptation of charging infrastructure**
- Opportunity for a unique **island branding**

TESLA: Transport Electrification on Sea and Land in Antiparos

Island: Antiparos

Beneficiaries: Municipality of Antiparos| Paros – Antiparos Ferry Cooperative

What is the project about?

- The proposal concerns the propulsion system electrification of 1 of the 4 ferries operating the Paros-Antiparos ferry connection.
- On land, EV charging stations installation and the partial electrification of Antiparos municipal fleet will take place.
- In order to ensure that the energy demand of the electrified sea and land transportation will be covered by clean energy production, PV stations will be installed in suitable locations.

