



The challenges of the Energy Transition for the Islands of Greece

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**SUSTAINABLE ENERGY SOLUTIONS FOR ISLANDS AND REMOTE AREAS:
FRONTRUNNERS FOR THE ENERGY TRANSITION IN THE EURO-MEDITERRANEAN
REGION**



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Two main
challenges of the
Energy Transition
for the Greek
Islands

Interconnections of Non Interconnected Islands

Intelligent and Energy Islands

Electricity system of Greek islands

Current situation

- There are almost 6.000 islands in Greek Seas most of them in Aegean and most of them inhabited.
- The electricity market of NII consists of thirty-two (32) autonomous systems. Some of them consist of several islands (islands' clusters), where in charge of the operation and management of the relevant Markets and networks is the Hellenic Electricity Distribution Network Operator (HEDNO S.A.)
- The size (peak demand)
 - Nineteen (19) "small" autonomous systems with peak demand up to 10 MW.
 - Eleven (11) "average size" autonomous systems with peak demand from 10 MW to 100 MW.
 - Two (2) "large" autonomous systems with peak demand exceeding 100 MW, i.e. Crete (with peak demand over 600 MW) and Rhodes (peak demand~ 200 MW).
- Oversizing of power plants / pollution from oil / black outs during summer periods / expensive electricity systems

Energy Mix / Electricity Cost

80 % oil – 20% res ~ 250 € /MWh

Investments of more than 3 billion euros will be required which will be covered primarily by European funds and private investment and secondarily by the system usage fees (consumers), which in any case will directly take advantage of net economic benefits due to the reduction of Service of General Interest charges.

Interconnection Plan

- Completion of the 1st phase of the interconnection of the Cyclades: interconnection of Paros (including Naxos, Antiparos, Ios, Sikinos, Folegandros), Syros, Mykonos.
- Within the period 2020-2030, the majority of the Aegean islands will be interconnected, starting from the interconnection of Crete with the mainland

Responsible authority Operator of the Hellenic Electricity Transmission System, (ADMIE)

Benefits from the Interconnection of islands

- More reliable supply with more economic fuel mix
- Avoidance of charges of Services of General Interest in electricity bills connected to the more expensive electricity production, because of the use of imported fuel oil.
- This will result in annual savings of SGI charges of 400-450 million. €.
- Reduction of energy dependency by 3%, as by the end of the decade will not be consumed annually over 900 thousand tonnes of oil for the production of electricity in the islands
- Similarly, significant reduction of greenhouse gas emissions
- Exploitation of RES potential in the islands in a more economic way,
- Provision of the same quality of electricity and services to the citizens of the country,
- Compliance with the requirements of environmental legislation.

For the islands that is expected to remain non interconnected, at least for a long time, the target is a large reduction in the use of oil for electricity production through the installation of modern RES units in combination with storage technologies through either private investments or through pilot projects

Technologies

Electrification of naval and road transportations

Installation of charging stations using RES

Energy Storage

Renewable Energy Sources (wind, pv, geothermal)

Energy Efficiency

Energy storage

Microgrids / Demand response systems

Pilot projects

The project for the conversion of Agios Efstratios to "Green Island",

The project of the "Smart Islands" (Kastelorizo, Astypalea , Symi)

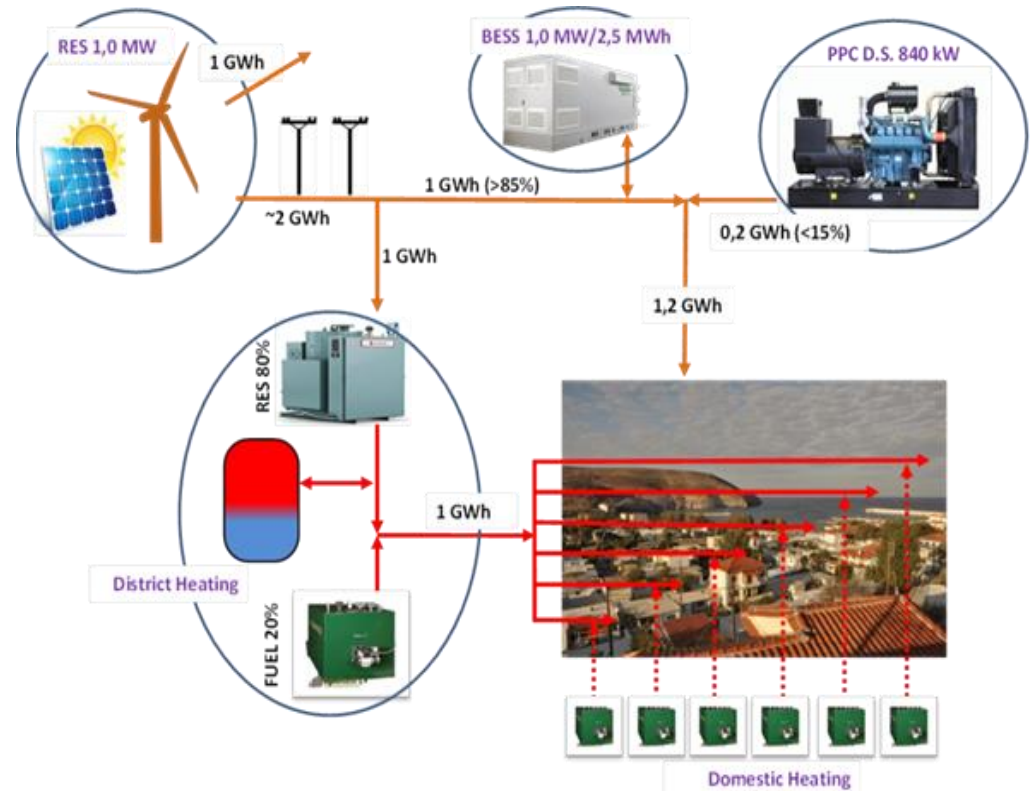
The hybrid RES station already in operation on the island of Tilos

The Kythnos smart island project

The wind + water pumping and storage project in Ikaria.

The country is actively involved in the new EU initiative "Clean Energy for EU Islands", along with 13 other Member States.

- **RES Hybrid System**
- 1,0 MW RES power plant, WT 800-900 kW, PV 150-250 kW
- BESS 1 MW/2,5 MWh
- Grid interconnection infrastructure
- **District Heating (D.H.)**
- D.H. plant (electricity-to-heat units + back up thermal unit)
- Insulated hot water storage tanks
- Distribution network and consumer substations
- **Demonstration of RES charged electrical vehicles**
- **Upgrading the energy efficiency of all municipal buildings**
- **Results**
- High RES penetration (>80%) in the electricity system
- Yearly reduction of GHG equal to 1,25 kt CO₂eq



Thank you for your attention

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