TILOS - THE FIRST ISLAND

POWERED BY RENEWABLE ENERGY IN GREECE

The island of Tilos, in the Dodecanese archipelago of Greece, is fully self-sufficient for its energy needs thanks to a strong investment in renewables.

Being the first of all Mediterranean islands to power itself through green energy, namely wind and solar power, in June 2017 Tilos won two awards for its innovative concept at the prestigious European Union Sustainable Energy Week. TILOS project competed in both *Energy Islands* and *Citizens Awards* categories. The first award was granted by an expert committee and the second was a result of an open, public vote among 12 European projects. The public's participation was extraordinary and Tilos project earned half of the total votes. The awards were granted by the EU Commissioner for Climate Action and Energy.

The Tilos Project consists in a hybrid system working with batteries that are recharged by an 800-kilowatt wind turbine and a photovoltaic solar park. The innovation lies in a prototype battery system that improves storage of the excess energy generated by the wind turbines and the photovoltaic. This battery keeps the grid powered during sunny and windy conditions, releasing the required energy during periods of heavy demand (tourist season where demands increase dramatically) and of lower production such as at night-time. The new microgrid also interacts with the main electricity network.

Tilos is a small Greek island, just 65 square kilometers, with a population of 500 people. In the past Tilos was dependent on the island of Kos for its electricity, to which it is connected with an underwater cable and was suffering from regular, lengthy power outages due to shortcomings with the undersea cables. When severe outages occurred, emergency diesel generators were used, which were increasing the island's carbon footprint significantly. Outages had serious consequences for business owners and residents alike, with hotel owners experiencing failures with essential appliances and spoiled food. As the island's main revenue comes from tourism, with an average of 13,000 visitors a year, power outages affecting businesses had serious effects on livelihoods.

The Dodecanese island of Tilos is a nature reserve of an extraordinary biodiversity, with more than 150 species of resident and migratory birds, over 650 plant varieties and a

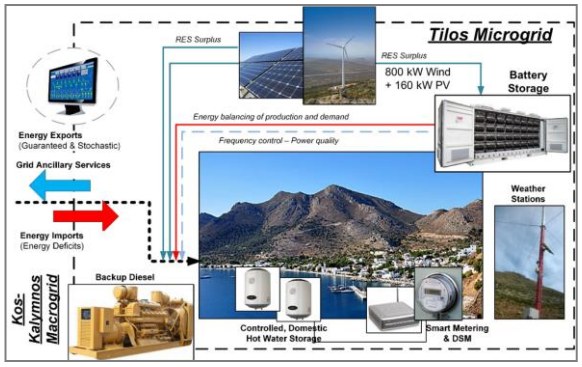
network of underground springs that feed five wetlands. Since 2006, the island has been declared a natural park and is registered in the European Network for the Protection of the Environment Natura 2000.

To enhance this island's great natural potential and improve the quality of life of the inhabitants, Tilos decided to set up a new energy paradigm, with a project aiming at covering at the maximum possible level the energy demand of the island, through an innovative hybrid energy production and storage system, exclusively powered by renewable energy sources. In early June 2017 the first installation of a medium-scale solar park and a wind turbine was completed, while on January 2018 the battery storage system that supports the electricity demand during cloudy weather or weak-wind situations, has been also installed.

The TILOS project was funded by *Horizon 2020*, the European Union financial and innovation program, gaining during the evaluation phase the biggest score among 80 competing projects. The project is led by the research team of Soft Energy Applications & Environmental Protection Laboratory (Piraeus University of Applied Sciences PUAS), together with the Hellenic Electricity Distribution Network Operator (HEDNO), Eunice, a pioneer company in renewable energy projects in Greece and WWF Greece, who assured active involvement of local people organizing public consultation sessions.

Local authorities are working to enhance the social and environmental benefits of the project generating additional funding to install solar-powered street lighting, introduce electric bicycles and motorbikes for municipal staff, and charging stations for electric cars.

For islands in general, dependence on fossil fuels can involve high transportation costs. The smart, island micro-grid system, based on renewable energy and batteries implemented in Tilos could become an example for other islands that are not connected to the main gird, providing a viable alternative from polluting and expensive oil-based solutions.



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