'TILOS,

Technology Innovation for the Local Scale, Optimum Integration of Battery Energy Storage

Technology Innovation for the Local Scale
Optimum Integration of Battery Energy Storage

Horizon 2020 · Low Carbon Energy · Local / small-scale storage
LCE-08-2014

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Project in a Nutshell

The main objective of the TILOS project is to maximise the use of clean (renewable) energy sources in covering **the electricity needs** of Tilos island.

In this context, a new **prototype hybrid system for electricity production and storage** consisting of a medium-scale wind turbine of 800kW, a small-scale photovoltaic park of 160kW and a battery storage system of 2.4MWh useful energy capacity, will be developed and operated on Tilos.

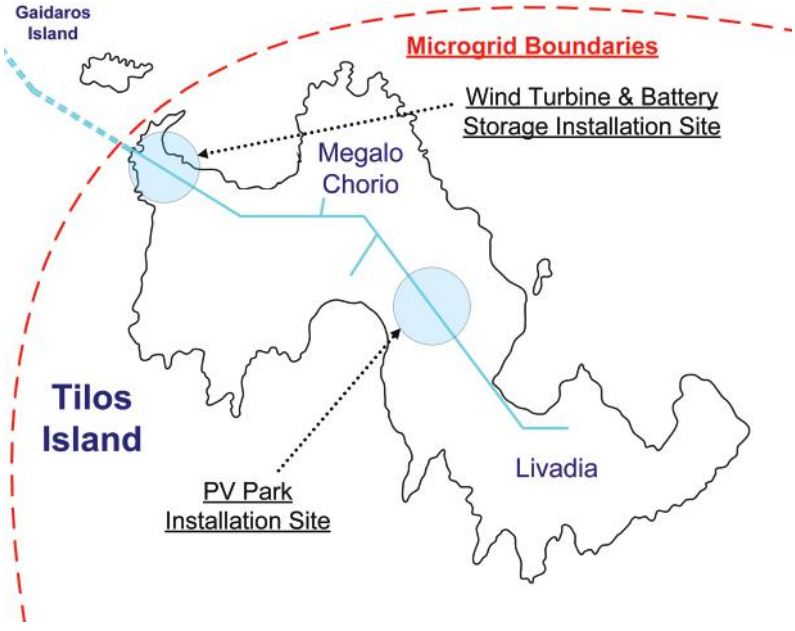
The green light for its operation was given on May 13, 2016. It was then that the production license for the hybrid power station of Tilos was issued from the Greek Regulatory Authority for Energy (RAE), making it the first power station of its kind that will operate in Greece, and among the first in Europe.

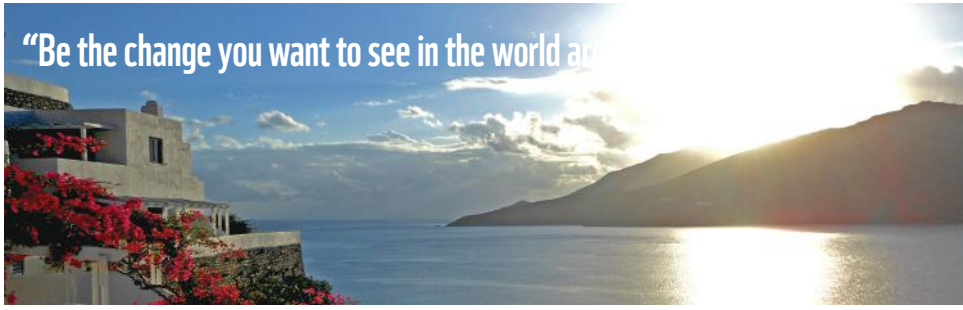
Apart from the hybrid power station, **smart meters** and **demand side management devices** will also be installed in the residential sector and other, central loads of Tilos island.

Moreover, a **smart energy management system** coordinating the operation of the various components will also be developed to achieve the highest possible electricity autonomy and balance between intermittent RES electricity production and electricity demand, with the support also of battery storage and demand side management.

The TILOS project focuses on island regions which constitute high priority areas. Apart from Tilos, other participating islands include **Pellworm** (Germany), **La Graciosa** (Portugal) and **Corsica** (France). The overall idea is to create a special platform that will enable technological know-how transfer between islands, by also exploiting the experience gained from the smart grid system of Pellworm, and that will designate new opportunities for the development of similar systems in other islands.

This revolutionary project for Europe will set the foundations for **the future development and replication** of similar hybrid systems in island regions and remote communities facing energy-related problems.





Welcome to **Tilos**! A special, "S" shaped Greek island, located in the south-eastern **Aegean Sea**, part of the Dodecanese group of islands, lying midway between Kos and Rhodes. The island's history begins after it broke off from the coast of Asia. During the years of its existence, the island was inhabited by several different nations and was influenced by multiple civilizations. Apart from its **natural beauty**, the variety of its landscape and the "grand bleu" of the Aegean Sea that surrounds it, Tilos has to show important medieval castles, a Byzantine monastery, many small picturesque churches and a village that is declared a cultural monument.

Tilos however is also known for its innovative and pioneering practices. It may be the Greek island most committed to sustainable development, having adopted a series of green policies which led the European Economic and Social Committee to characterise it a model of environmental management. In the near future, Tilos is planning to develop a recycling unit, an ecological village of 50 summer residences, a processing center for biological, agricultural and livestock farming products etc.

Up until now, the electricity needs of the local population of Tilos, ~500 islanders, are covered through an undersea interconnection with the island of Kos, where a diesel-oil power station is operated. That means that until today the annual electricity consumption of Tilos, close to 3GWh, is covered entirely on the basis of oil imports.

What we -as a team- together with the people of Tilos aspire to accomplish, is to make this small and remote island a **blue-print** for **smart microgrids** facilitating **increased participation of renewable energy** in the local energy mix through the optimum utilisation of **energy storage.**

The participation of the local inhabitants in this project will contribute towards the protection of the environment, the reduction of the island carbon footprint, the fight against climate change and the development of sustainable energy models aiming at achieving increased energy autonomy.

The innovative nature of the project doesn't end at its technical characteristics, as it will be the first to be realized in the Mediterranean and it will be used as a prototype for its implementation to other Greek islands. The project was also presented as the milestone project of Greece in the field of RES during the historic 2015 United Nations Climate Change Conference, COP 21, held in Paris.

It's a team effort

TILOS is an innovative, European R&D project, which ranked first among 80 competing projects under the European funding Programme Horizon 2020. The project is led by the Laboratory of Soft Energy Applications and Environmental Protection of the Piraeus University of Applied Sciences (former TEI of Piraeus).

Despite that TILOS carries a national identity, the project is also multinational involving a total of 13 European partners.

The partners originate from 7 different countries across the European continent (Greece, Germany, France, United Kingdom, Sweden, Italy, Spain).

From Greece, apart from the Piraeus University of Applied Sciences, involved in the project are also HEDNO (the Hellenic Electricity Distribution Network Operator), the widely known environmental NGO WWF-Greece and the private company Eunice, with significant experience in the field of renewable energy sources, in the Greek and the European energy market.

Industrial / Commercial Partners

1. FIAMM Energy Storage Solutions SRL (IT)
2. Younicos AG (DE)
3. EUNICE Laboratories SA (EL)
4. EUROSOL P&M GmbH (DE)

Research / Academic Partners

5. Commissariat à l' Energie Atomique et aux Energies Alternatives (FR)
6. Instituto Tecnológico de Canarias S.A. (ES)
7. Piraeus University of Applied Sciences (former TEI of Piraeus) (EL)
8. University of East Anglia – Business School (UK)
9. Universite de Corse (FR)
10. Rheinisch-Westfaelische Technische Hochschule Aachen (DE)
11. Kungliga Technica Hogskolan (SE)

Distribution System Operators (DSOs)

12. Hellenic Electricity Distribution Network Operator S.A. (EL)

NGOs

13. World Wide Fund for Nature – Greece (EL)

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Project Coordinator:
Piraeus University of Applied Sciences (former TEI of Piraeus)

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Project Duration: 4 years

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