



TILOS

Newsletter 2



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



***TILOS FIGHTING CLIMATE CHANGE!!!***

This is probably one of the strongest messages that TILOS wants to spread. Many island regions around the globe are particularly vulnerable to the adverse effects of climate change, already suffering from extreme weather events. To combat the causes of climate change, TILOS will develop a RES-based storage and DSM solution, applicable to numerous islands worldwide.

**General Info & Latest News**

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# TILOS



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



**Tilos, the "S" shaped Greek island, located at the south-eastern part of the Aegean Sea.**

TILOS is a European Innovation Project. The project's main goal is to demonstrate the potential of local / small-scale battery storage to serve a multi-purpose role within an island micro-grid that also interacts with a main electricity network. Among others, the project aims to achieve large-scale RES penetration and storage assets' value maximization through the optimum integration of a hybrid RES (wind and PV) power station together with advanced batteries, distributed, domestic heat storage, smart metering and DSM, all together comprising elements of a smart microgrid.

Project objectives will be accomplished through the development and operation of this integrated, smart micro-grid on the island of Tilos. Tilos belongs to the island complex of Dodecanese, on the south-eastern part of the Aegean Sea, and is interconnected with the host grid of Kos and Kalymnos islands through a sea-cable.

TILOS project started on the 1<sup>st</sup> of February 2015, under the call for Competitive Low-Carbon Energy, H2020-LCE-2014-3 and its duration is 48 months. The project has received funding from the European Union's Horizon 2020 research and innovation programme under Grant Agreement No 646529, with its total budget reaching 15M€.



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The views expressed in this publication do not necessarily reflect the views of the European Commission

## 1. TILOS goes International

### TILOS@COP21 !!

The 21<sup>st</sup> UNFCCC<sup>1</sup> Conference of Parties took place in December 2015 and has been hailed as a historic success leading to an agreement for climate change mitigation among ~200 countries.



TILOS has been among a few flagship projects for the EU Representation in COP21 and the project's poster decorated the EU Pavilion which has been visited by thousands of attendees. Dr K. Chalvatzis (UEA) participated in COP21 as representative of TILOS. The Paris Agreement will have a positive impact for worldwide innovation in the energy sector and the TILOS project will be best placed to reap the benefits of the new developments.

## TILOS @ Stuttgart and Lisbon!



On October 12-14 the TILOS project was presented in the conference "World of Energy Solutions" by P. Ktenidis, TEIP. Furthermore, the TILOS project was presented in the 3<sup>rd</sup> Joint Conference of the European projects IREENGRID, SINGULAR and SUSTAINABLE in Caparica (Lisbon).

Top 3 Announced Solar + Storage Installations							SOLARPLAZA
Project Name	Country	Technology Type	Power (MW/MWh)	Equity Owner	Technical provider(s)	Status	Main Use Case
A. 30 MW SK Innovation BESS	DE	Lithium-ion Battery	30/7	Sowmy-Anhalt, Germany	SK Innovation	Announced	Renewables Capacity Firming
B. Tilos Project	GR	Sodium-nickel-chloride Battery	2/3	EU	FIAMM Energy Storage Solutions SRL, SMA Solar Technology AG, EUNICE Laboratories SA	Announced	Distribution Upgrade Deferral
C. Corsica Langa Project	FR	Lithium-ion Battery	2/1.3	Langa Group	Saft, Schneider Electric	Announced	Renewables Energy Time Shift

## TILOS is TOP 3 in Europe!

At the "Greening the Islands" conference that was held in Malta, TILOS was recognized as one of the top three, most innovative projects. Furthermore, in an information brochure by Solar Plaza International, the TILOS project is listed second in the top three announced solar and storage installations, along with two Li-ion battery storage projects implemented in Germany and France (Corsica island).



## 2. 6M Meeting on Tilos Island, Sep. 5-6, 2015

The 6M TILOS meeting was held on the island of Tilos. There, the members of the consortium had the opportunity to visit the two installation sites of the system components; PV station with battery storage, and the wind turbine, and appreciate the warm welcome of the local people. At the same time, the 1<sup>st</sup> TILOS workshop also took place on the island, communicating the project aims and objectives to the local island authorities and engaging the local population in a productive discussion with the members of the consortium.



### 3. Project Progress

- Demand side management**

Eurosol P&M GmbH joined TILOS consortium after the Grant Agreement Amendment, replacing Open Energi. Eurosol took over leadership of WP4 and started with the design and engineering of a new approach for the integrated DSM system, including smart metering, energy monitors and DSM panels as well as communication with the central SCADA of the microgrid. Furthermore, strategies related to electric appliances safety, especially after possible power-cuts were considered, in order to provide the local community with another added value.

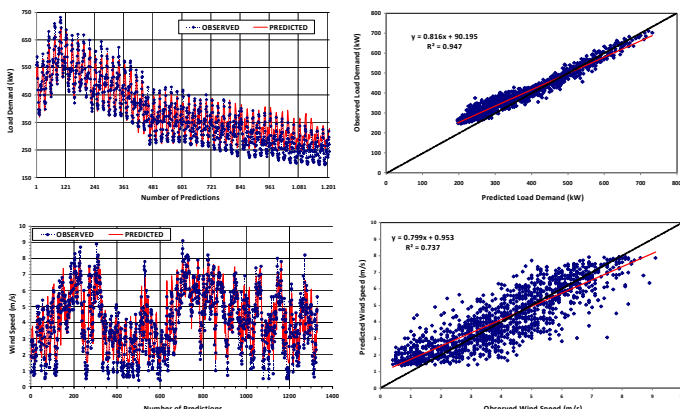
- SCADA system development**

The communication protocol for all system unit connections to the SCADA server has been determined and finalized, while the interface description for most of the system units has been delivered to Younicos from the partners involved. According to the current plan, partners will proceed with the shipping and commissioning of the SCADA control room container before the end of the July 2016, executing also a first communication test between points of interest and the SCADA.



- Weather and demand forecasting**

Based on measured data of local load demand, wind speed and solar radiation, preliminary forecasting models have been developed for Tilos island, with the use of Artificial Neural Networks. These models are now further improved so as to extend the time horizon of prognosis to several hours ahead and increase reliability to the highest possible level.



- Battery system development**

FIAMM has provided two battery packs ST523 with their electronic control units to CEA. The tests to be performed on the two batteries include initial characterization, calculation of the energy capacities and efficiency at different power rates, impact of the different environmental and internal battery temperatures, identification and tuning of the state-of-energy parameters.



- Population engagement & surveys**

During the period November-December 2015, a survey was conducted on the island of Tilos to assess local energy trends and features of the islanders and also introduce smart metering and DSM. Three types of questionnaires were distributed including residential buildings, buildings of professional use and personal behavioral aspects and attitudes, incorporating also input from a similar survey conducted in the past in Pellworm island. 226 questionnaires were filled in total by Tilos' residents, giving measurable indications on many aspects of the current energy status of the island.



- Hybrid power station permits**

After the official evaluation feedback received by the Regulatory Authority for Energy, we are now closer than ever to the issuance of the hybrid station production license. Final adjustments are being made at the moment so as to align with the Authority's requests and proceed smoothly with the procurement and installation of the wind turbine and PVs of the station.



## 4. Project Partners - Consortium

The consortium involves 15 partners from seven countries in Europe: Greece, Italy, France, UK, Spain, Germany and Sweden. Because of this geographical spread, the project will reflect to different markets, strategies and policies across Europe.



### Coordinator

TILOS project is coordinated by the Piraeus University of Applied Sciences (TEIP), Greece

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### Project Partners

Piraeus University of Applied Sciences (TEIP)

<http://teipir.gr/>; <http://sealab.gr/>

RWTH Aachen University (RWTH)

<https://www2.isea.rwth-aachen.de/de>

Commissariat à l'énergie atomique et aux énergies alternatives (CEA)

<http://www.cea.fr/>

Eunice Energy Group (EUNICE)

<http://www.eunice-group.com/>

EUROSOL P&M Gmb (EUROSOL)

<http://www.eurosol.eu/>

FIAMM Energy Storage (FIAMM)

<http://www.fiamm.com/>

Hellenic Electricity Distribution Network Operator S.A. (HEDNO)

<http://www.deddie.gr/>

Instituto Tecnológico de Canarias SA (ITC)

<http://www.itccanarias.org/>

Kungliga Tekniska Högskolan (KTH)

<https://www.kth.se/>

Schleswig-Holstein Netz AG (SHNG) – EON Technologies (EON)

<https://www.sh-netz.com>, <https://www.eon.com/>

SMA Solar Technology AG (SMA)

<http://www.sma.de/>

University of Corsica Pascal Paoli (UCPP)

<http://spe.univ-corse.fr/>

University of East Anglia (UEA)

<https://www.uea.ac.uk/>

World Wide Fund for Nature (WWF)

<http://www.wwf.gr/>

Younicos (YOUNICOS)

<http://www.younicos.com/>

### Related news and conferences:

**REM2016 Renewable Energy Integration with Mini/Microgrid** to be held in Maldives on April 17-19, 2016. Island renewable energy systems is one of focused topic. The conference includes both academic paper sessions and open forum with all stakeholders such as decisions makers, project developers, investors, and end users. An Applied Energy Symposium organized by Asian Development Bank and Applied Energy Innovation Institute. See more info at <http://www.applied-energy.org/rem2016/>

**IRES Conference** (scientific conference series on International Renewable Energy Storage) The IRES conference series has become the leading place for discussion on the solutions to the pressing issues facing energy storage by drawing together one of largest gatherings of scientific and economic experts around the world. <http://www.eurosolar.de/en/index.php/ires-conference-series/ires2016/conference-program>

**The Journal of Energy Storage**, focusing on all aspects of energy storage, Editor-in-Chief: Prof. Dr. Dirk Uwe Sauer from RWTH Aachen University. <http://www.journals.elsevier.com/journal-of-energy-storage/>

**Monetizing solar + energy storage in EU** taking place in Milan, Italy, March 3, 2016. A unique and high-level conference focusing on business models and financing structures in the grid-connected Solar and Energy Storage industry in Europe. <http://monetisingstorage.com/#monetising-solar-storage-eu>

### Kraftwerk Batterie 2016

The Battery Conference 2016 in Münster/Germany on April, 25-27, is the meeting of point of international battery experts and companies. <http://battery-power.eu/cr3ativconfcategory/kraftwerk-batterie-2016/>