Isole minori, possibili avanguardie della transizione energetica

Il ruolo dell' accumulo FIAMM ESS per la *Smart Island* di TILOS

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FIAMM
Energy Storage Solutions

Who

FIAMM

Industrial Batteries

FIAMM Industrial Batteries offers a broad range of stationary batteries, designed to guarantee uninterrupted power supply in a myriad of applications.

Starter & Mobility Power Solutions

FIAMM Starter & Mobility Power Solutions was estabilished with the aim of satisying the mobility sector's current and future energy storage requirements.

Acoustic Devices

FIAMM Acoustic Devices is the global leader in the production and supply of horns for the safety of vehicle and people.

Energy Storage

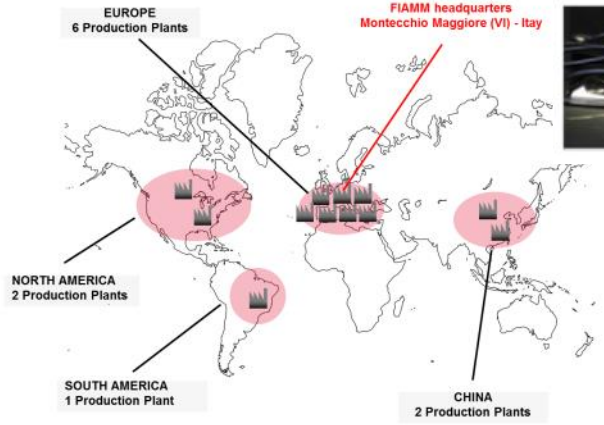
FIAMM Energy Storage is aimed to research and propose solutions for the grid optimization and for the planet's energy self-sufficiency thanks to innovative products and systems for energy storage.

Oled

Astron FIAMM, a manufacturer of innovative lighting solutions with OLED technology, has placed its experience at the service of the automotive industry, offering light as a distinguishing element among the various brands and models.

Antennas

FIAMM Antennas has been one of the main automotive antenna player in the European market for the last 25 years.



14 PRODUCTION PLANTS

3.000 EMPLOYEES

2014 Turnover 570 M€

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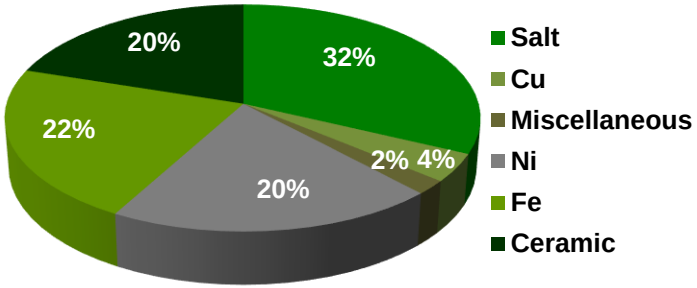
FIAMM / SoNick Technology

$$2NaCl + Ni \rightleftharpoons NiCl_2 + 2Na$$

discharged — charged cell



Performances

- ✓ Hot cell (~270°C inside)
- ✓ **Temperature Immunity** (-40 ÷ +60°C)
- ✓ Cycling Capability > 4.500 cycles (80% DOD)
- ✓ Battery energy density 100÷120Wh/kg 150-190Wh/lt
- ✓ Shelf life (> 20 years)
- ✓ No memory effect

Safety

- ✓ **Intrinsically safe**, electrochemical safety
- ✓ No gas emissions
- ✓ **No flammable materials**
- ✓ **No fire/water flood reaction**
- ✓ Industrial Process Control
- ✓ Tested in the field (EV, TLC, ESS,...)
- ✓ BMS control
- ✓ Cell/Battery Mechanical case

Zero Impact Battery

- ✓ NO dangerous materials
- ✓ **100% recyclable**
- ✓ NO pollution materials
- ✓ NO gas emissions

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Energy Storage Installation

Suitable for any place of installation:

Marine transportation

Harsh environment

Extreme temperature

Safe from phisical damage

No hazardus emissions

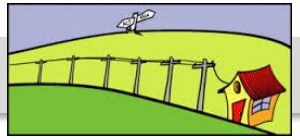
Energy Storage Market Value Chain

1 Generation

2 Grid Management

&

3 Transmission & Distribution



4 Retail ("behind the meter")
- Commercial
- Residential

5 Off- Microgrid
Micro-Grids

smart grid

6 Others (UPS, TLC,…)

Out of Scope

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What

TILOS: Smart Micro-Grid Research Project (Horizon 2020)

Project Title & ID

TILOS - 646529

Technology **I**nnovation for the **L**ocal Scale, **O**ptimum Integration of Battery Energy **S**torage

Research Call

Topic: Local / small-scale storage-LCE-08-2014

Total Score

14/15 (Excellence 4.5; Impact 5.0; Quality & Efficiency 4.5)

Project Budget

EU Funding: ~**11M€** - Total Grant: ~**15M€**

Project Duration

Duration of 4 years - Start Date: 1/2/2015

TILOS Island

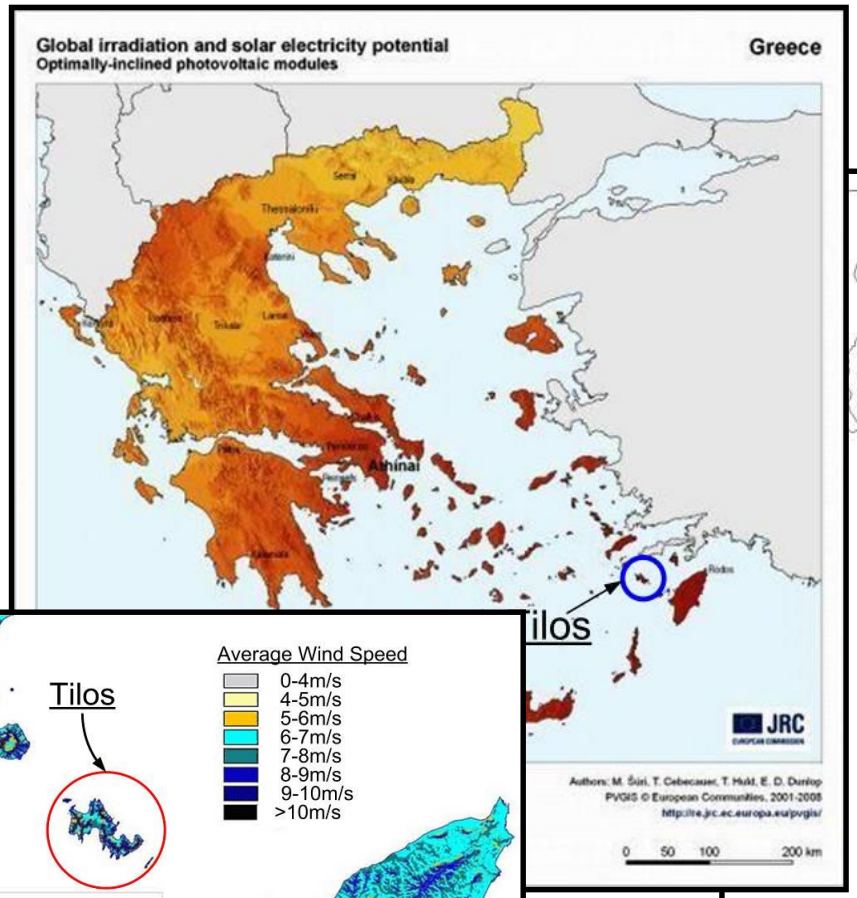
Tilos is a **far distant**, “S” shaped Greek island lying midway between **Kos and Rhodes**.

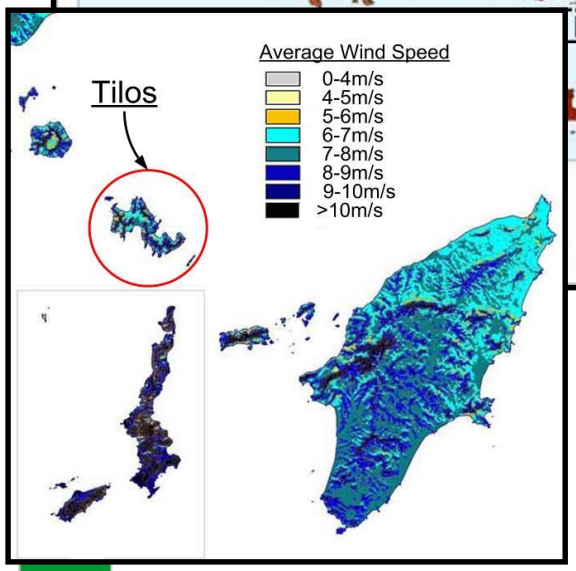
Recently known for its **kind people** and their **solidarity** towards **immigrants** crossing the Aegean in search of a better living.

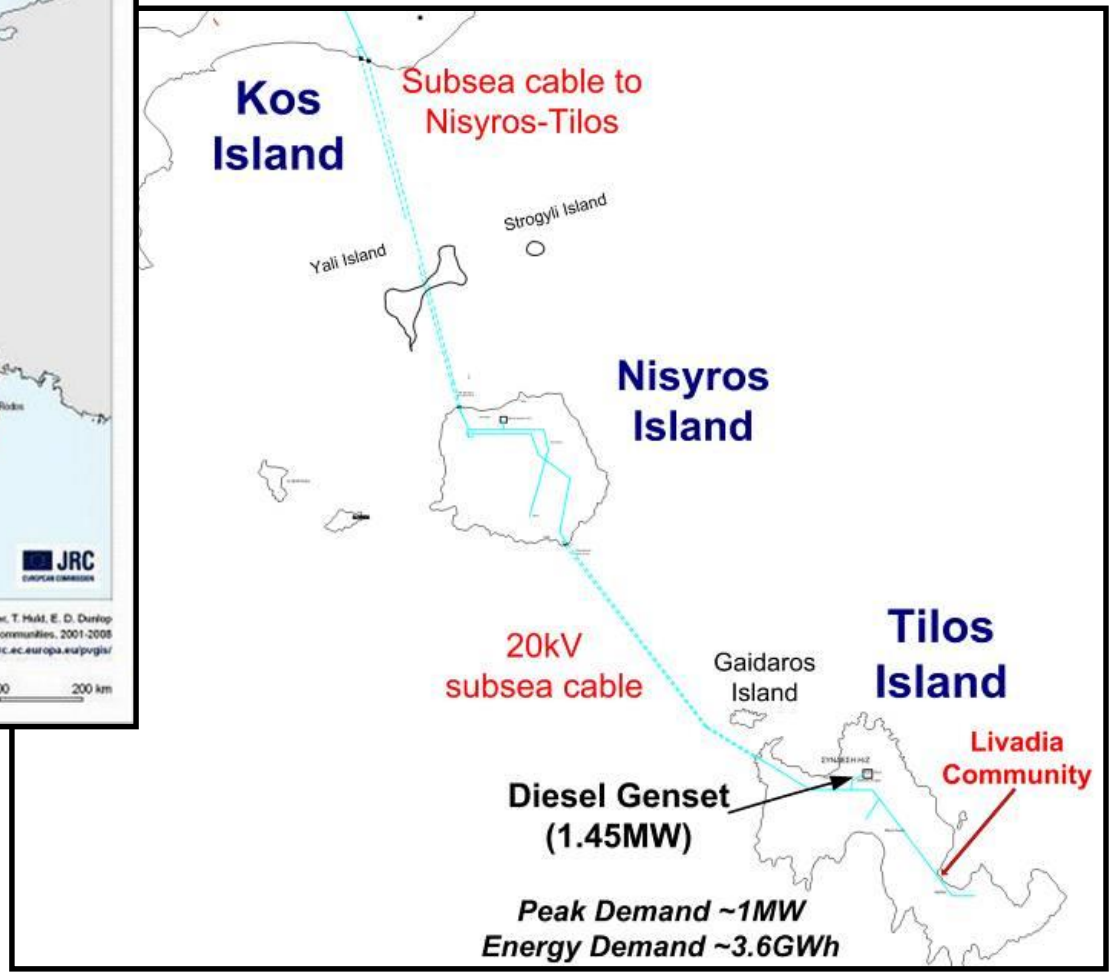
The local population of Tilos, **~500 islanders**, covers its electricity needs through a **poor interconnection** to the host island of **Kos**, where a **diesel-oil power station** is operated.

Owed to **undersea cable faults**, Tilos suffers from **quite frequent** and in many cases **long-lasting black-outs**.

TILOS Island







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TILOS project goals

Main goal of the project:

Design an energy storage system based on **FIAMM SoNick $NaNiCl_2$ batteries** (2x20ft containers, ~ 3MWh) that will support the operation of a **smart microgrid** on the basis of multiple tasks, including:

->Synergy with wind (300 kW) and PV (700 kWp) power

->Microgrid energy management

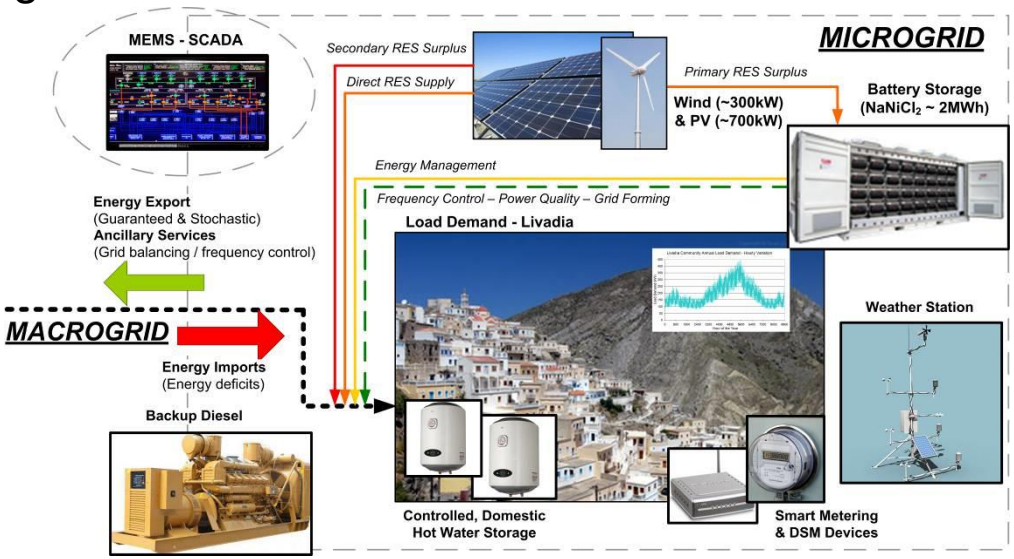
->Maximization of RES penetration

->Grid stability

->Export of guaranteed energy

->Ancillary services to the main grid

->Synergy with DSM



The battery will support both **stand-alone and grid-connected** operation, while proving its i**nteroperability** with the rest of microgrid components, such as **smart meters, demand side management devices and distributed, residential heat storage**

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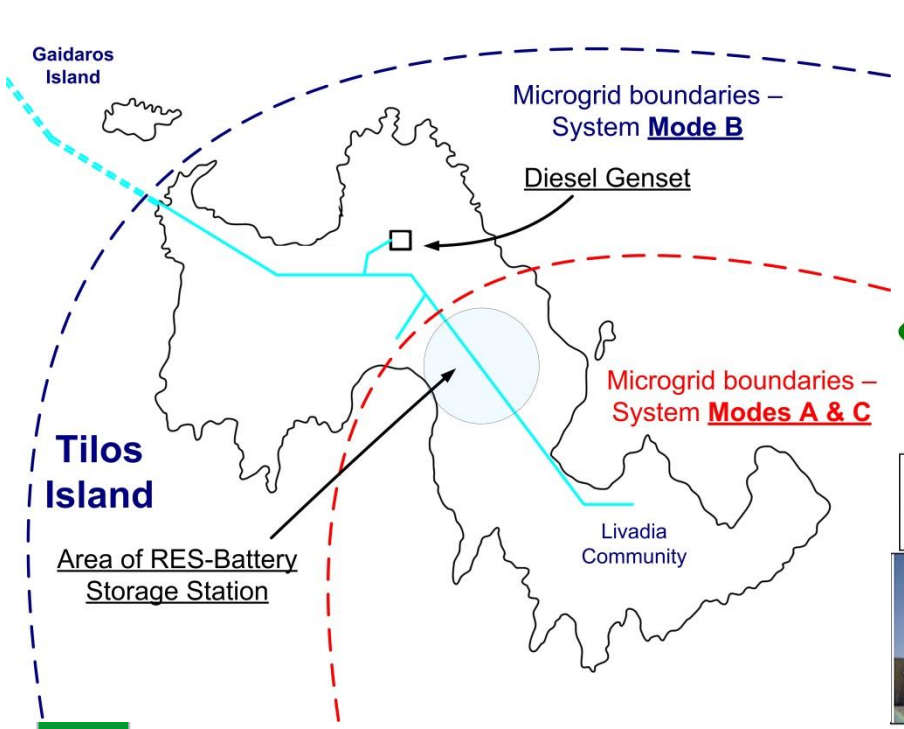
TILOS project goals

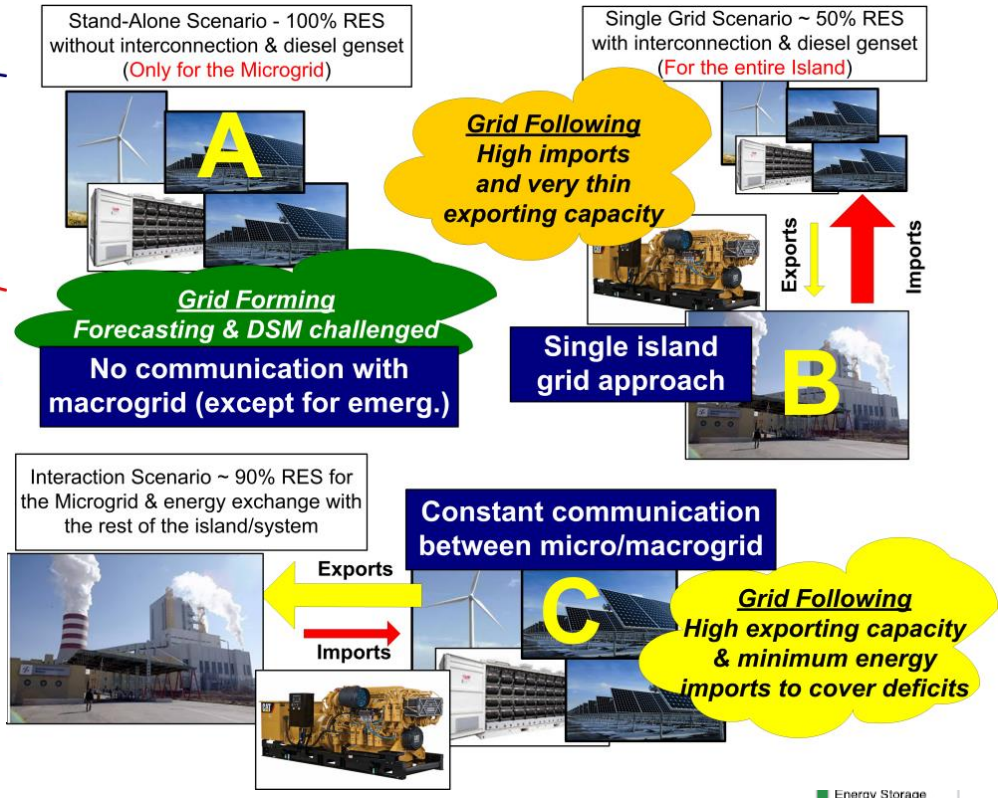
Following the development of the system, the demonstration phase will include **three different test modes** of operation;

A: Stand-alone microgrid ;

B: Increased RES penetration for entire island in parallel with the host grid (Kos);

C: Almost stand-alone microgrid and smart interaction with the host grid

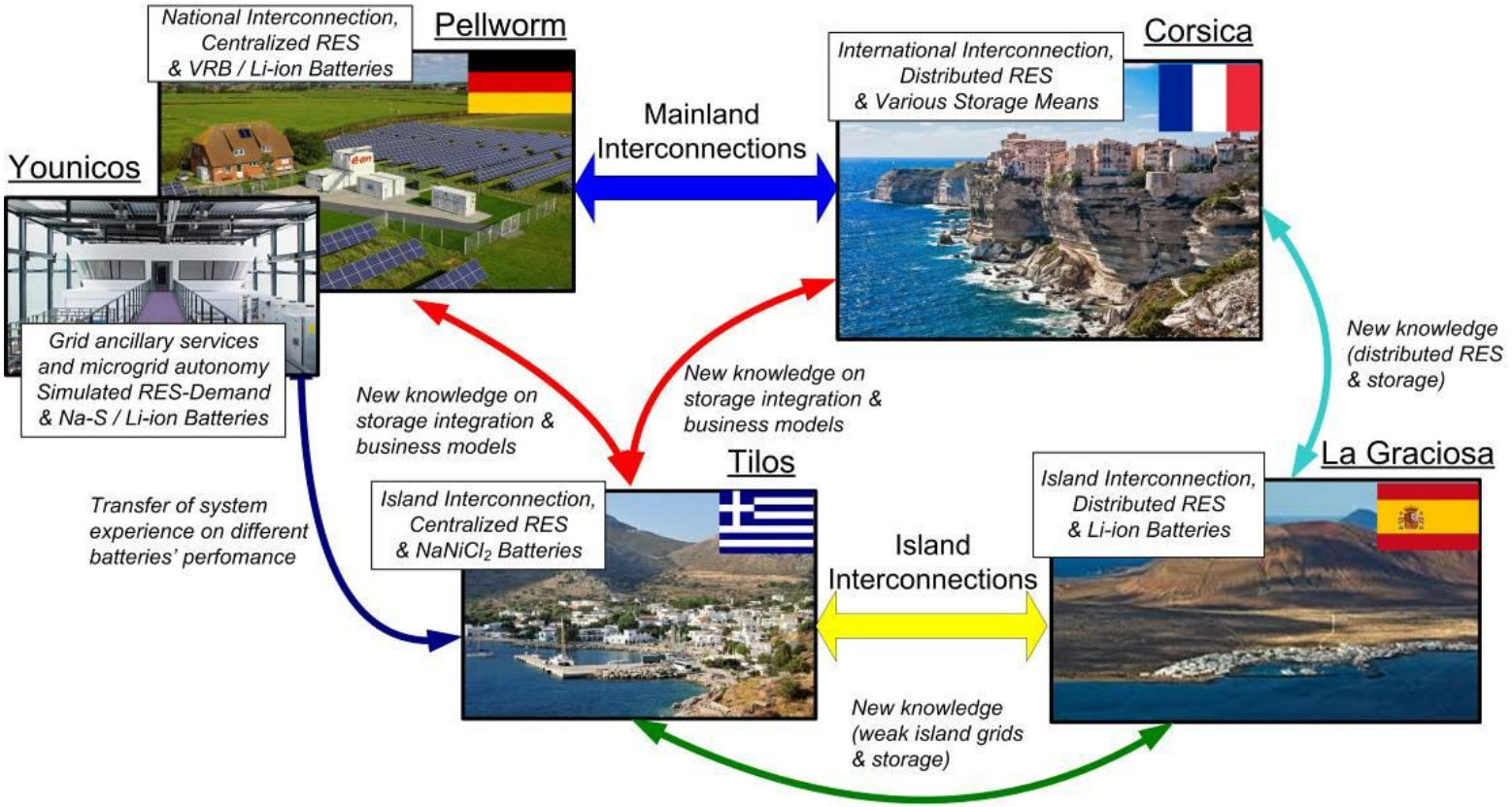




TILOS project goals

To ensure **replication** of the **developed energy solution**, a **coherent island platform** will be created and **new case studies** will be examined, including:

- **Corsica** (UCPP)
- **La Graciosa** (ITC)
- **Pellworm** (SHNG)



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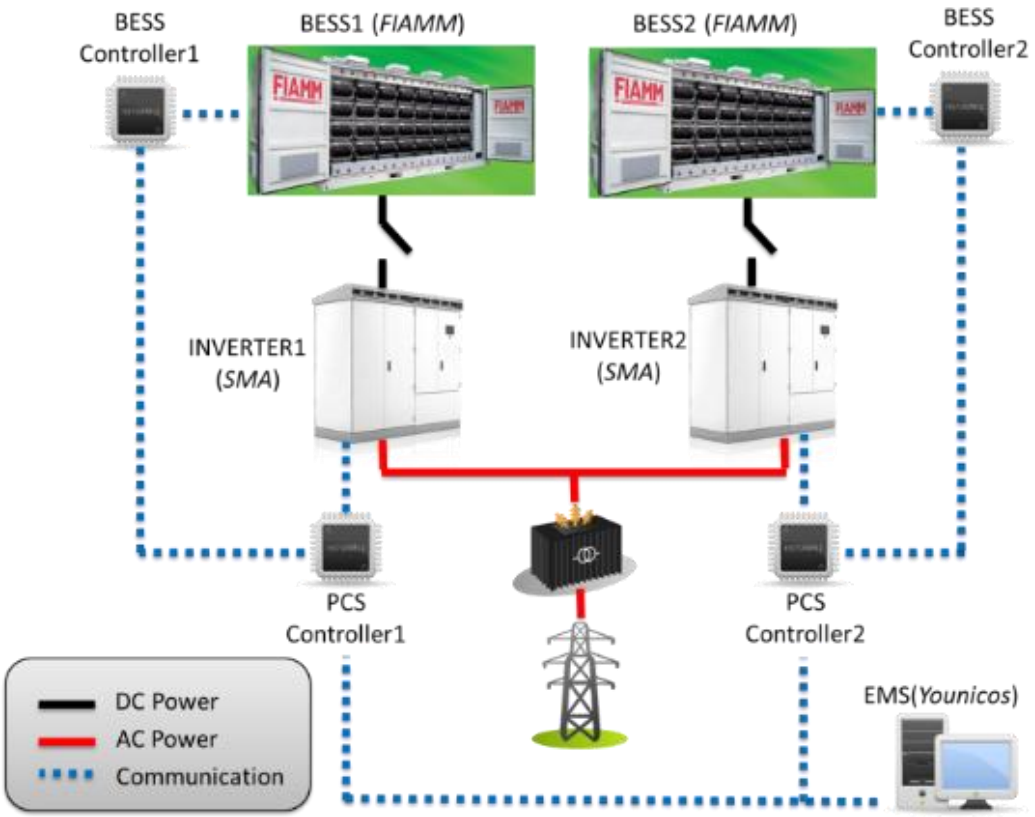
TILOS Progress so far – Battery System Specifications

In the meantime, battery system specifications have also been provided by FIAMM, contributing to the determination of the final system configuration and layout. The two battery storage containers to be employed feature storage capacity of ~3MWh and will be coupled with 2x500kW inverters. The proposed system configuration satisfies the requirements of the existing regulation framework concerning the design and operation of hybrid power plants in the Greek Aegean islands.



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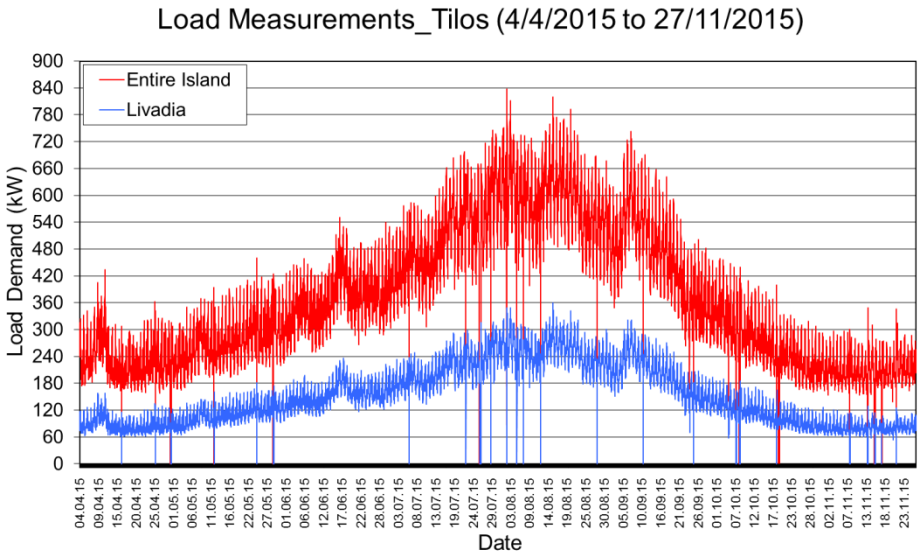
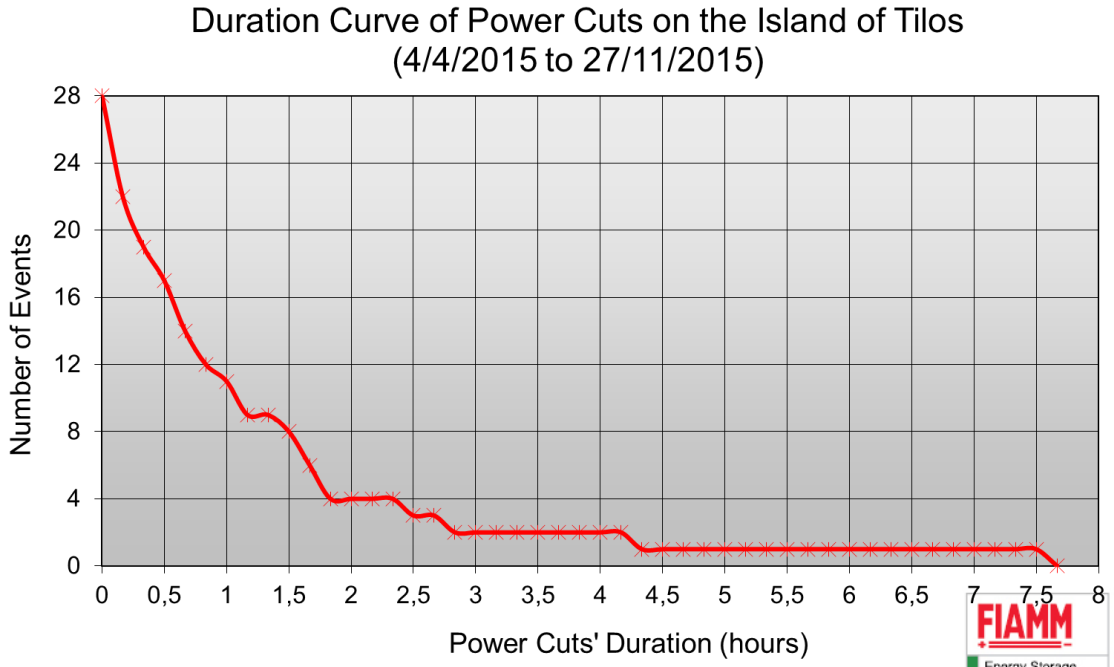
TILOS Load Demand



Several power cuts recorded throughout the year



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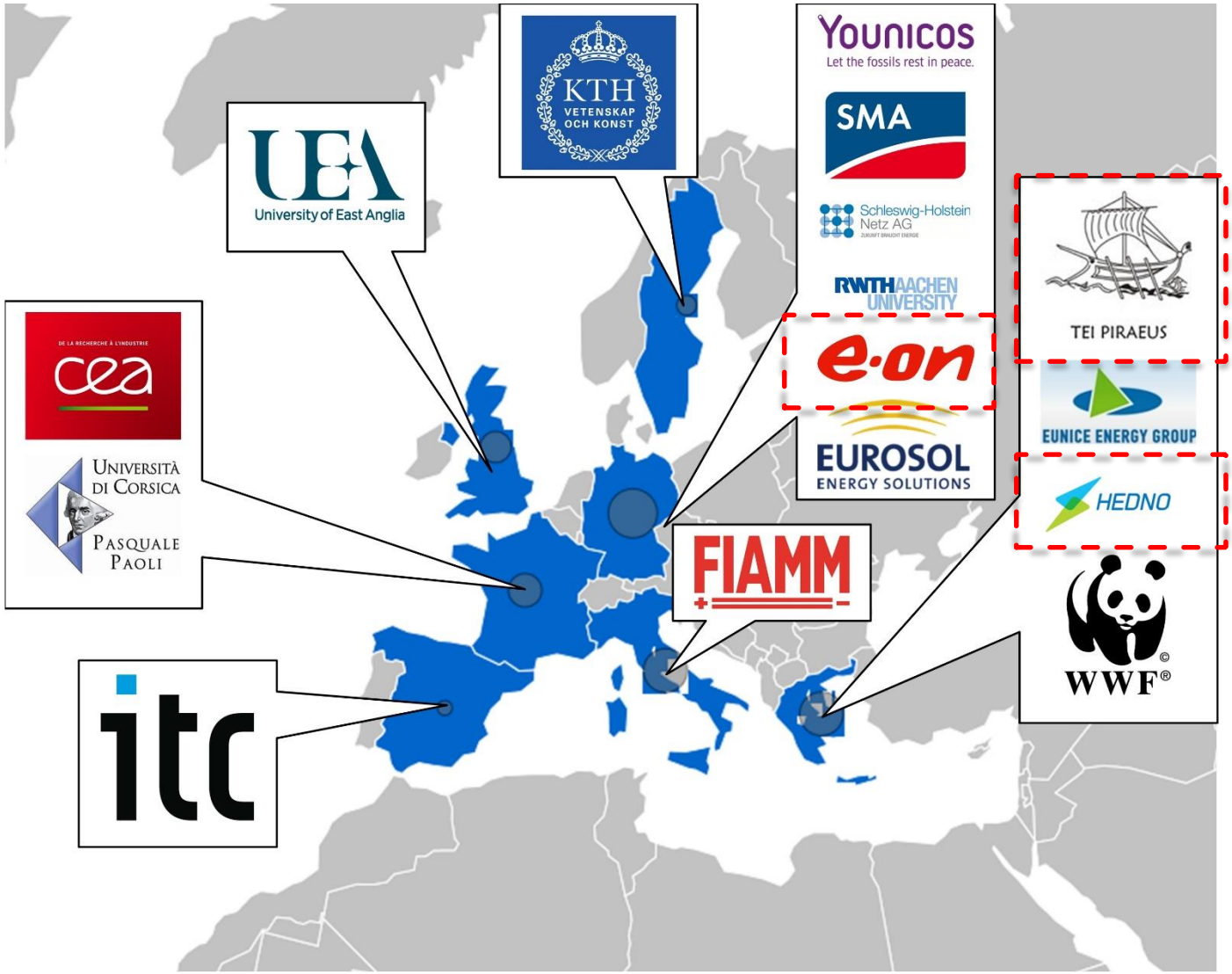
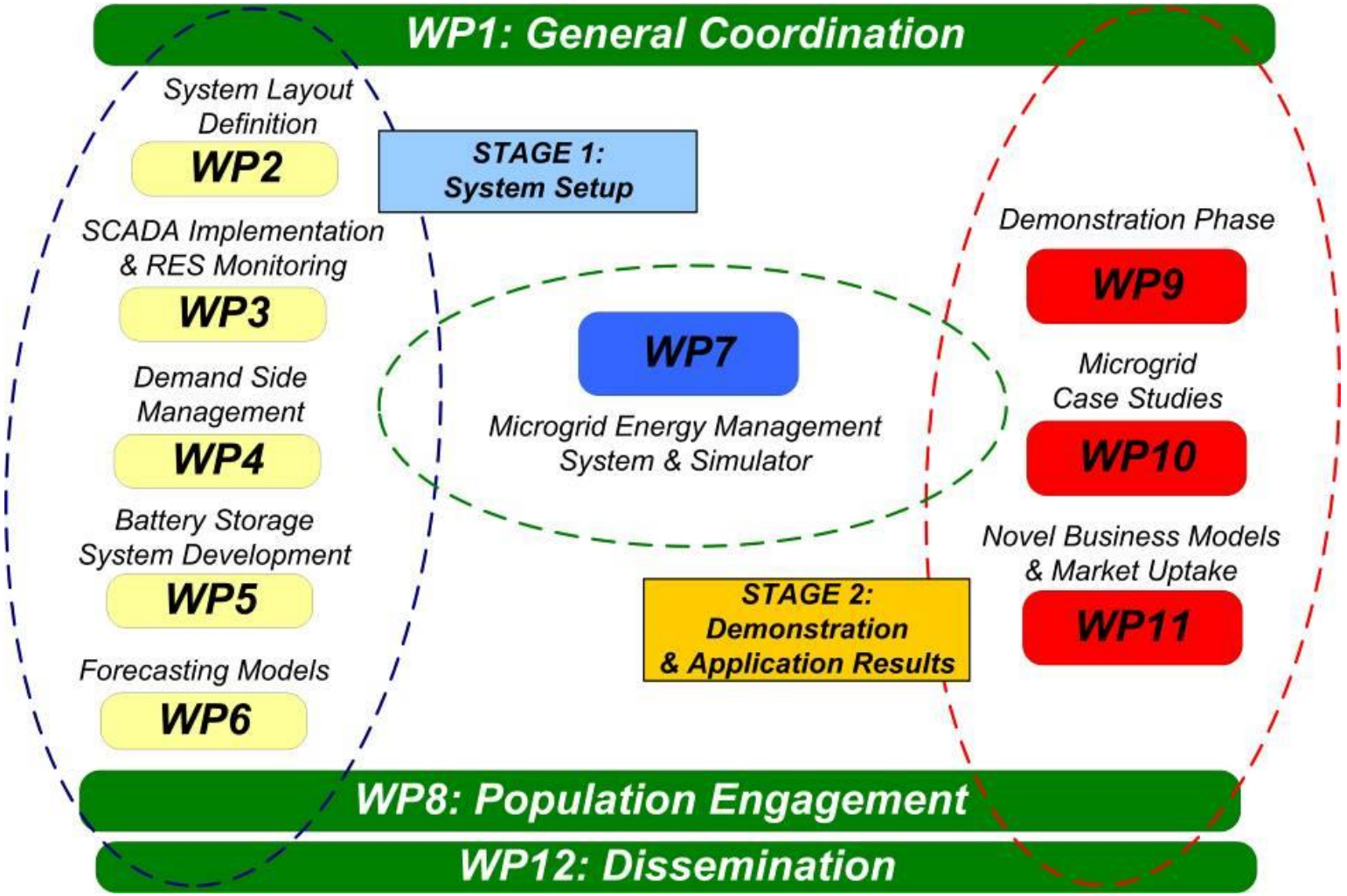
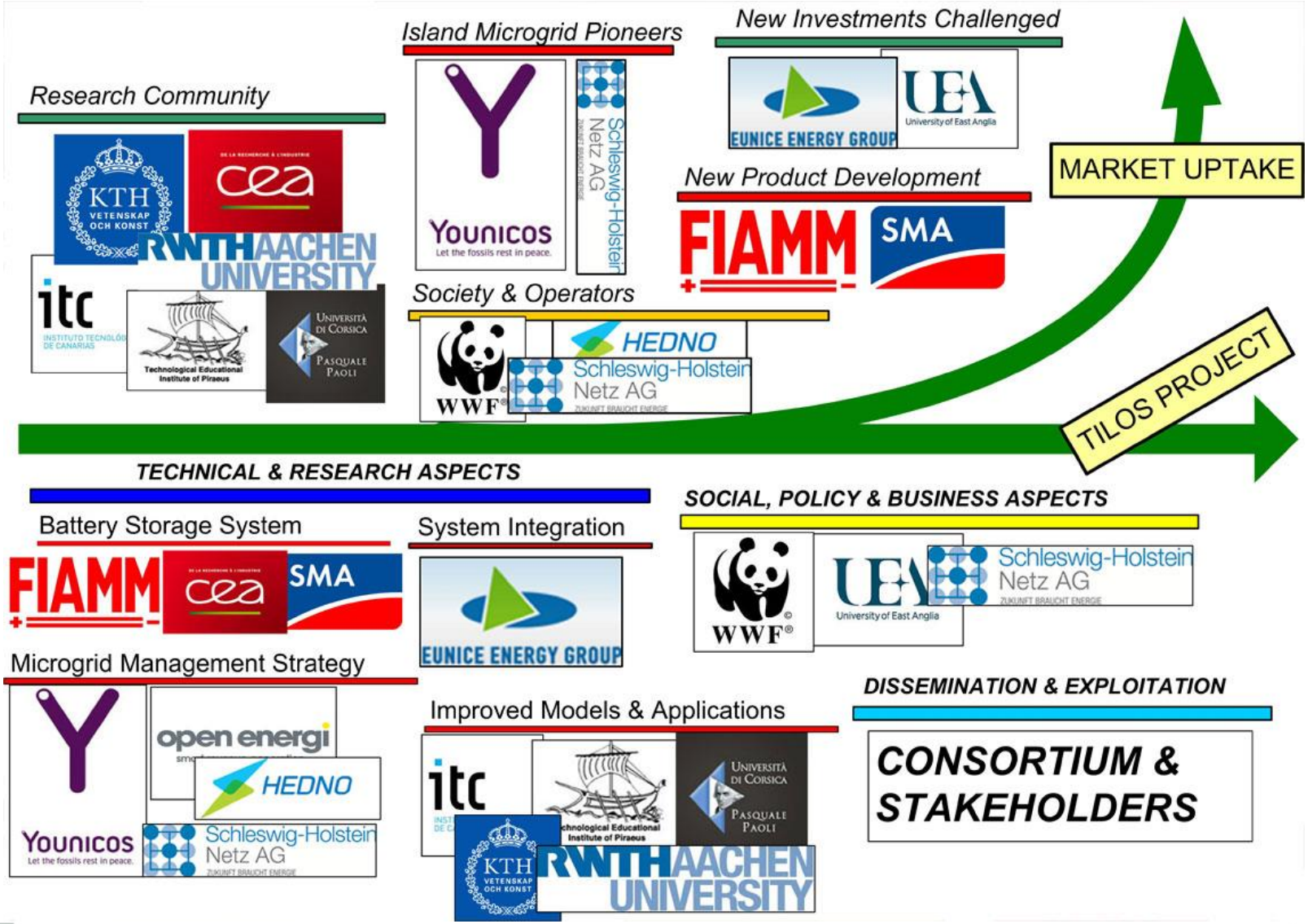
TILOS Project Consortium



TILOS Work Packages overall structure



TILOS roadmap to market uptake



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How

Strength of the project

Preliminary project discussion started in 2012

Multi-national and Multi-cultural partnership:

- Partners from 7 different countries
- Wide range of competences

Direct involvement of the DSOs (HEDNO + EON)

Ability to attract private investments:

- EPC PV (~ 1.000.000 €)
- DSO (at project conclusion)

Challenges

Over the project…

Actual Greek and European regoulatory framework is not pushing yet the renewable development on the islands:

•Standard European «island» framework is possible

New challenges for sunstainable turism development:

• Thanks to WWF, TILOS has a great population involvement

Now is time for Italy to play a leading role:

• Italian minor islands not connected to the main grid

Thanks for Your Attention

http://www.tiloshorizon.eu/