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

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

Panagiotis Ktenidis

S3P Energy: *Smart Mediterraneo*. Best practices, innovation and pilot projects in smart grid development in the Mediterranean region.

23 – 24 June 2016, Camera di Commercio di Bari.

PROJECT ID

Project Title & ID

TILOS - 646529

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

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: **~15ME**

Project Duration

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

TILOS ISLAND

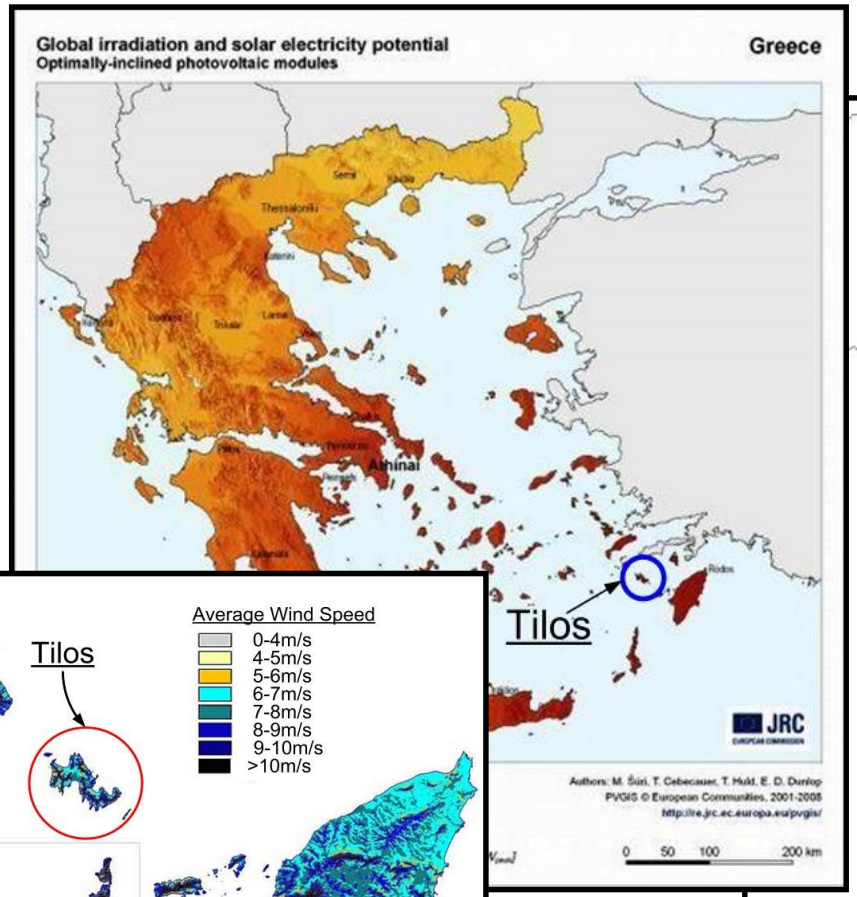
Tilos is a **far distant**, "S" shaped Greek island lying midway between **Kos and Rhodes**.

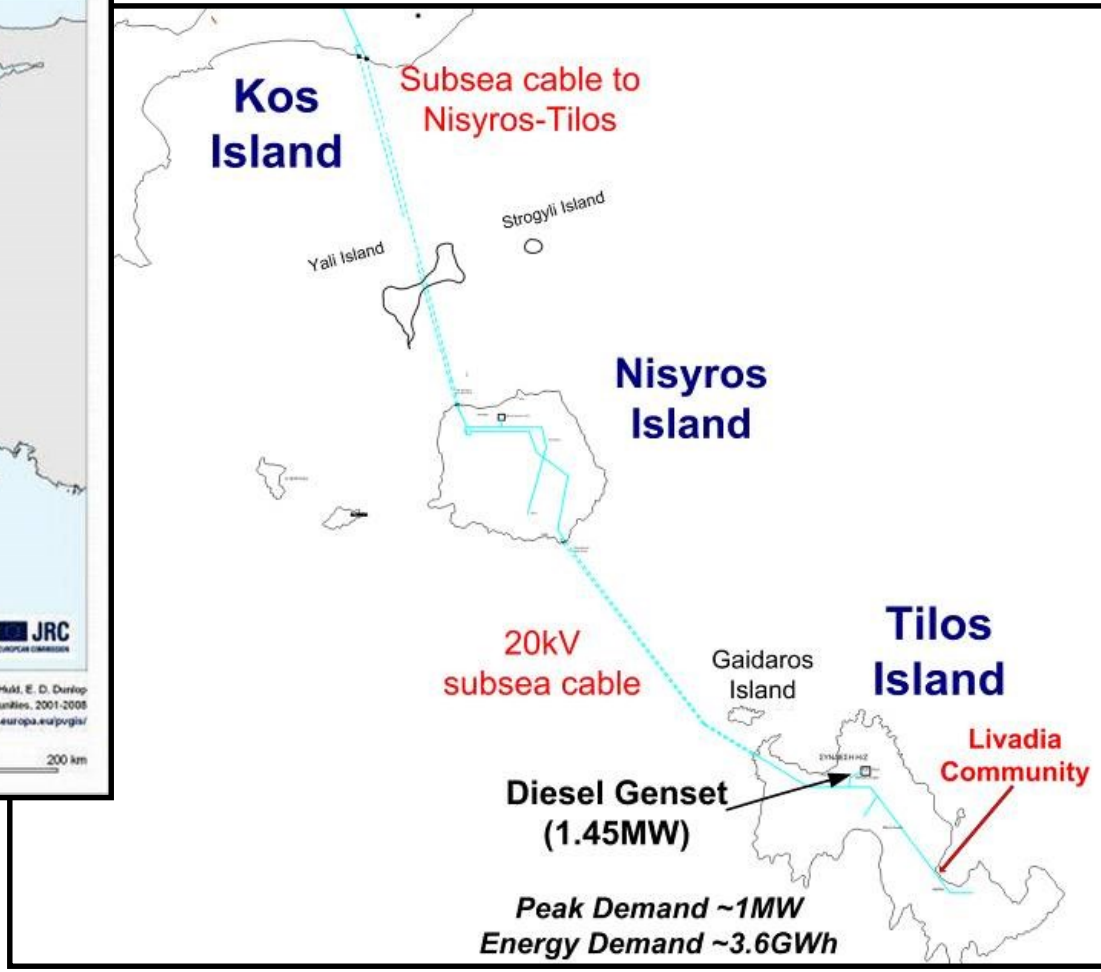
Recently known for its **kind people** and their **solidarity** towards **immigrants** crossing the Aegean in search of a better living.

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.

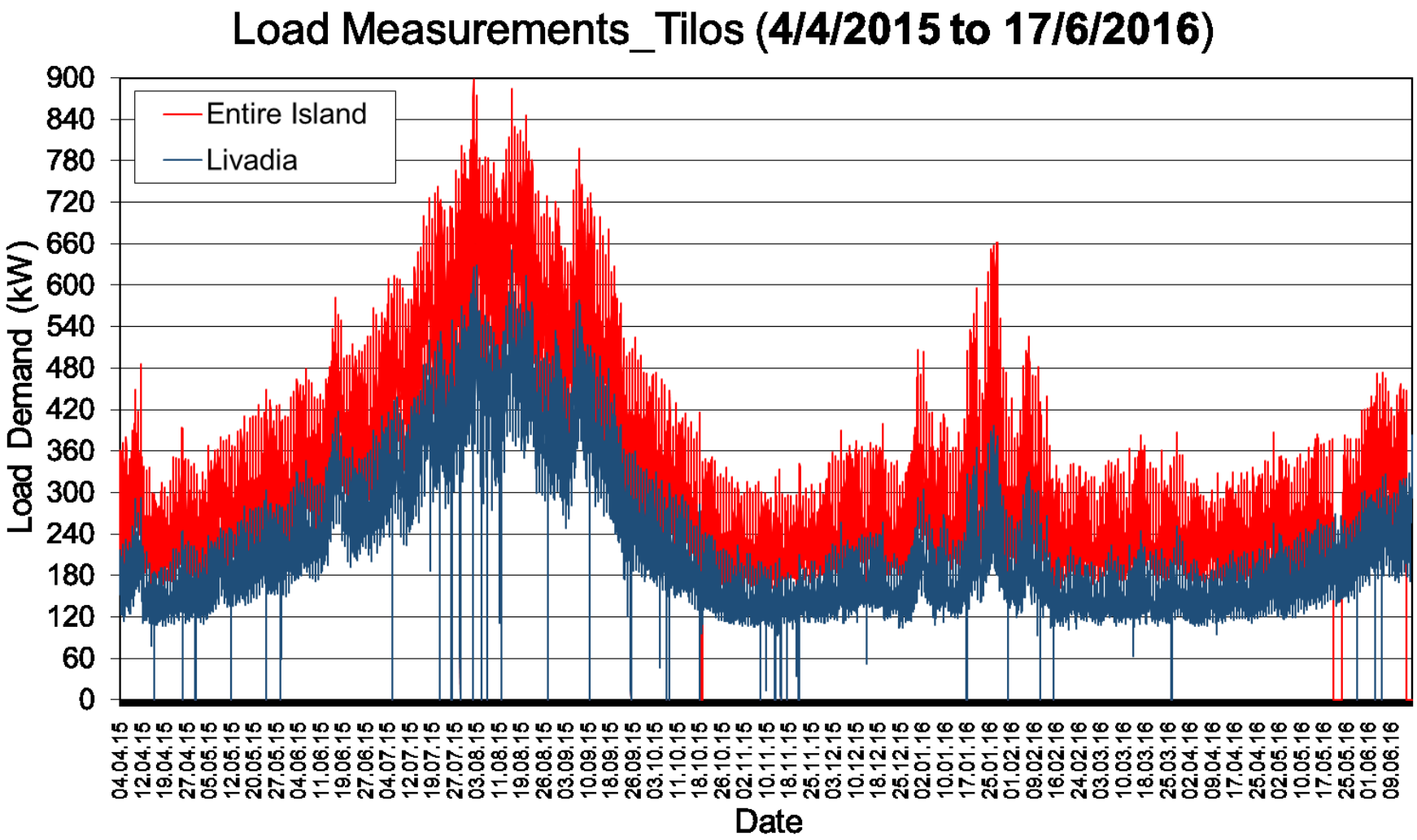
Owed to **undersea cable faults**, Tilos suffers from **quite frequent** and in many cases **long-lasting power cuts**.

TILOS ISLAND





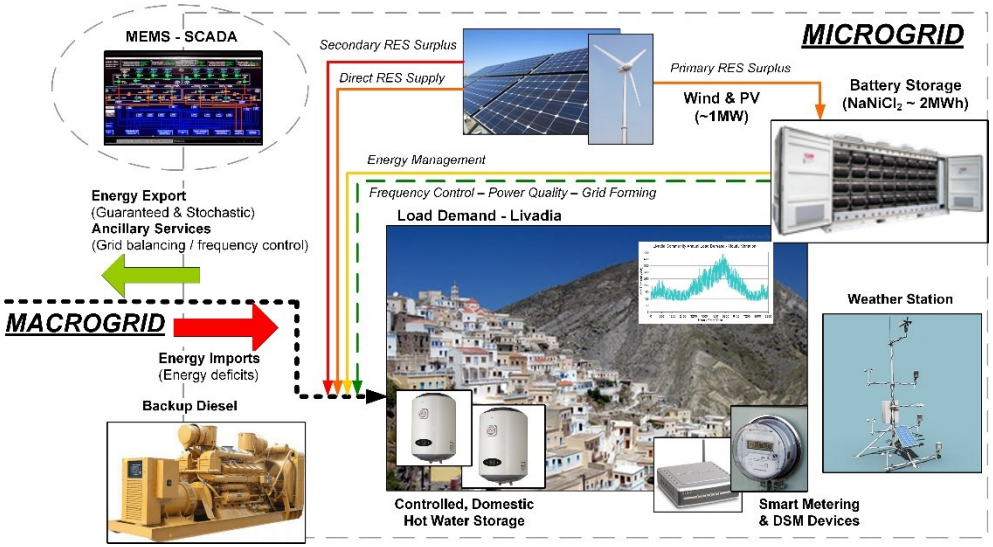
TILOS ISLAND-LOAD DEMAND



TILOS MAIN OBJECTIVE

The main objective of TILOS will be the development of a **prototype battery system** based on **$NaNiCl_2$ batteries** that will support the operation of a **smart microgrid** on the basis of multiple tasks, including:

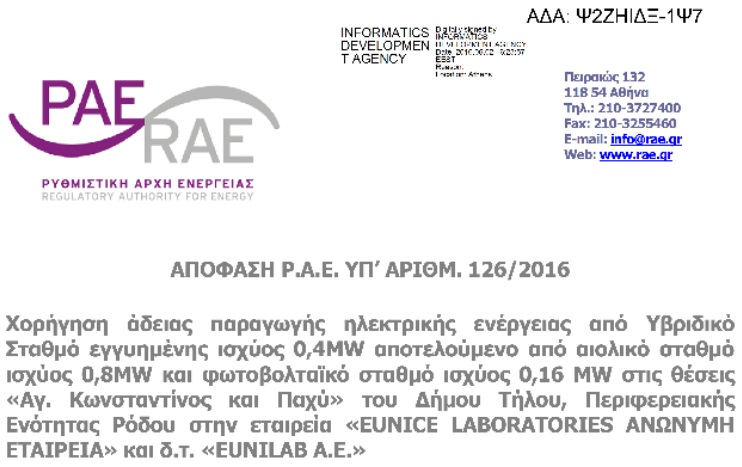
->Synergy with wind and PV power
->Microgrid energy management
->Maximization of RES penetration
->Grid stability
->Export of guaranteed energy
->Ancillary services to the main grid
->Synergy with DSM



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

PRODUCTION LICENSE JUST ISSUED!!

The **Production License** for the 1st ever Battery-based Wind-PV Hybrid Power Station in Greece issued from the **Greek Regulatory Authority for Energy (RAE)** for the TILOS hybrid power station, on May 13th, 2016.



ΑΔΑ: Ψ2ΖΗΙΔΞ-1Ψ7

INFORMATICS DEVELOPMENT AGENCY

PAE RAE
ΡΥΘΜΙΣΤΙΚΗ ΑΡΧΗ ΕΝΕΡΓΕΙΑΣ
REGULATORY AUTHORITY FOR ENERGY

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Τηλ.: 210-3727400
Fax: 210-3255460
E-mail: info@rae.gr
Web: www.rae.gr

ΑΠΟΦΑΣΗ Ρ.Α.Ε. ΥΠ' ΑΡΙΘΜ. 126/2016

Χορήγηση άδειας παραγωγής ηλεκτρικής ενέργειας από Υβριδικό Σταθμό εγγυημένης ισχύος 0,4MW αποτελούμενο από αιολικό σταθμό ισχύος 0,8MW και φωτοβολταϊκό σταθμό ισχύος 0,16 MW στις θέσεις «Αγ. Κωνσταντίνος και Παχύ» του Δήμου Τήλου, Περιφερειακής Ενότητας Ρόδου στην εταιρεία «EUNICE LABORATORIES ΑΝΩΝΥΜΗ ΕΤΑΙΡΕΙΑ» και δ.τ. «EUNILAB Α.Ε.»

The hybrid power station will comprise of **one 800kW wind turbine**, **160kW of PV power** and **2.4MWh/800kW of FIAMM technology (NaNiCl2) battery storage**.

The commissioning stage is expected to start **early 2017** and be completed in the **first semester of 2017**, followed by the project demo period.

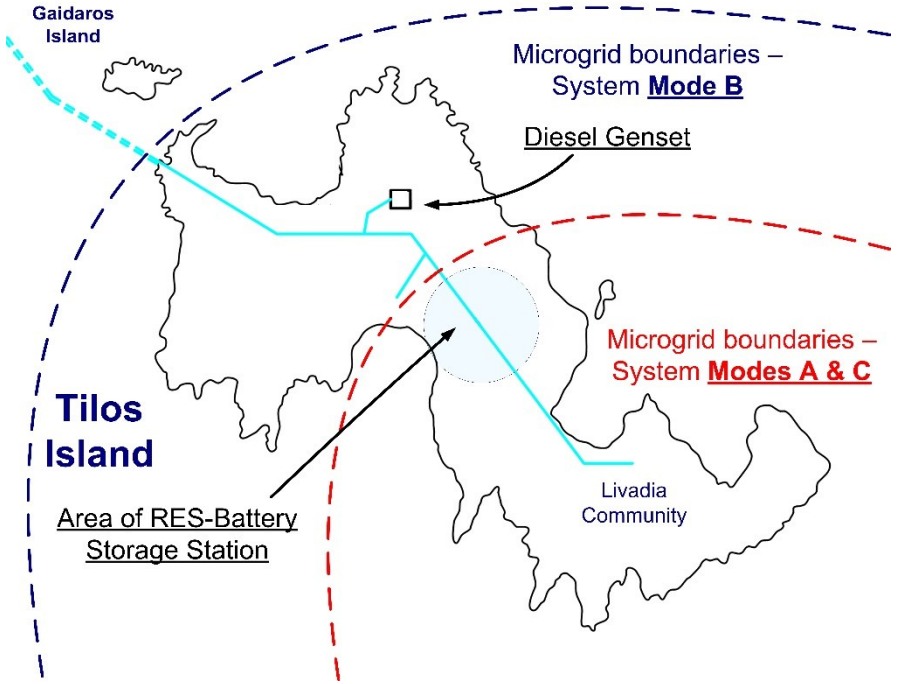
TILOS OBJECTIVES

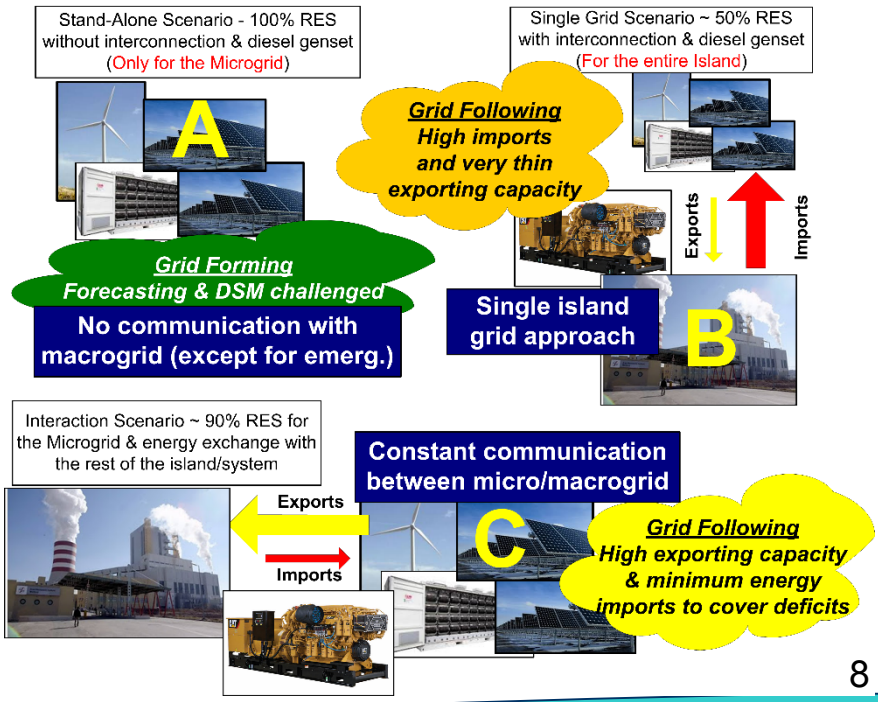
Following the development of the system, the demonstration phase will include **three different test modes** of operation;

A: Stand-alone microgrid-100% self sufficient;

B: Increased energy autonomy levels (~75%) allowing for cable imports;

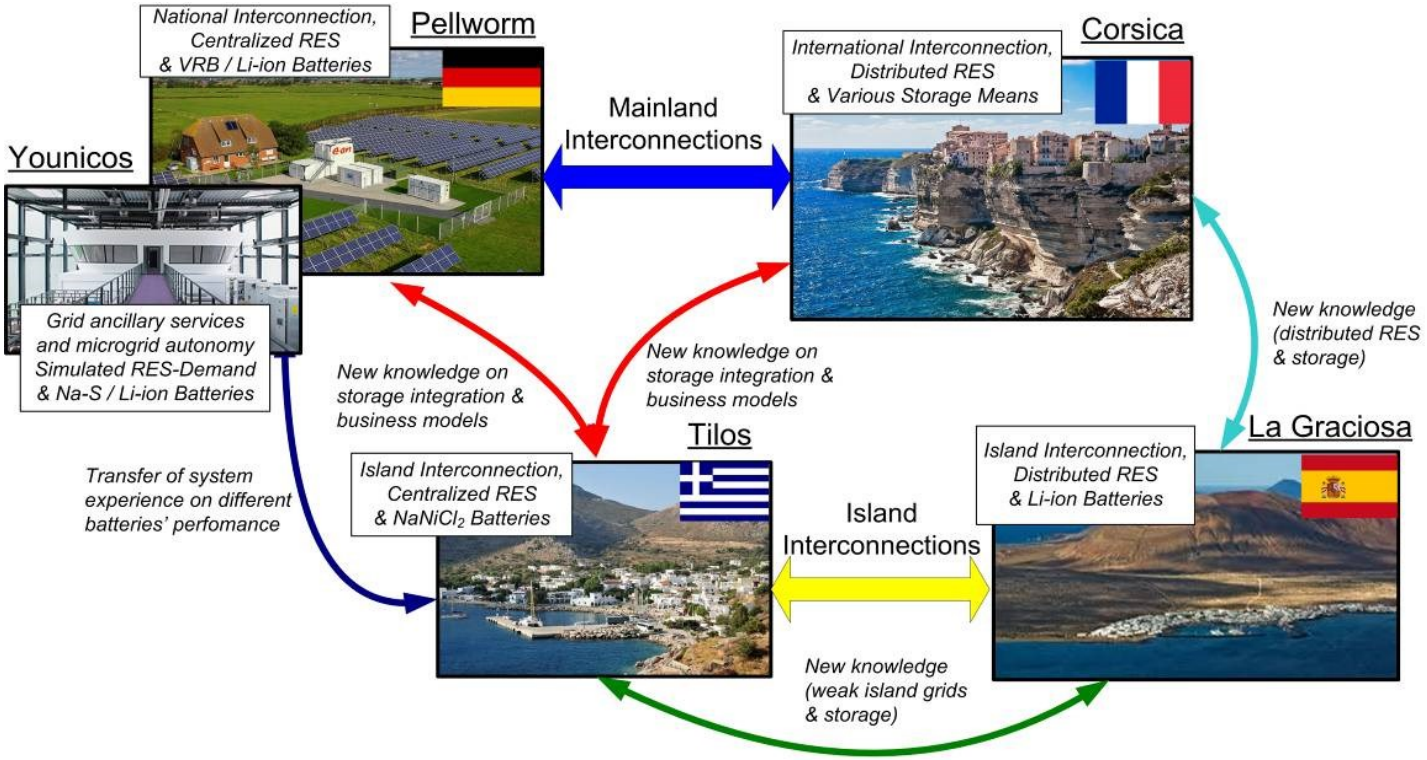
C: Energy exchange through the sea cable under market terms



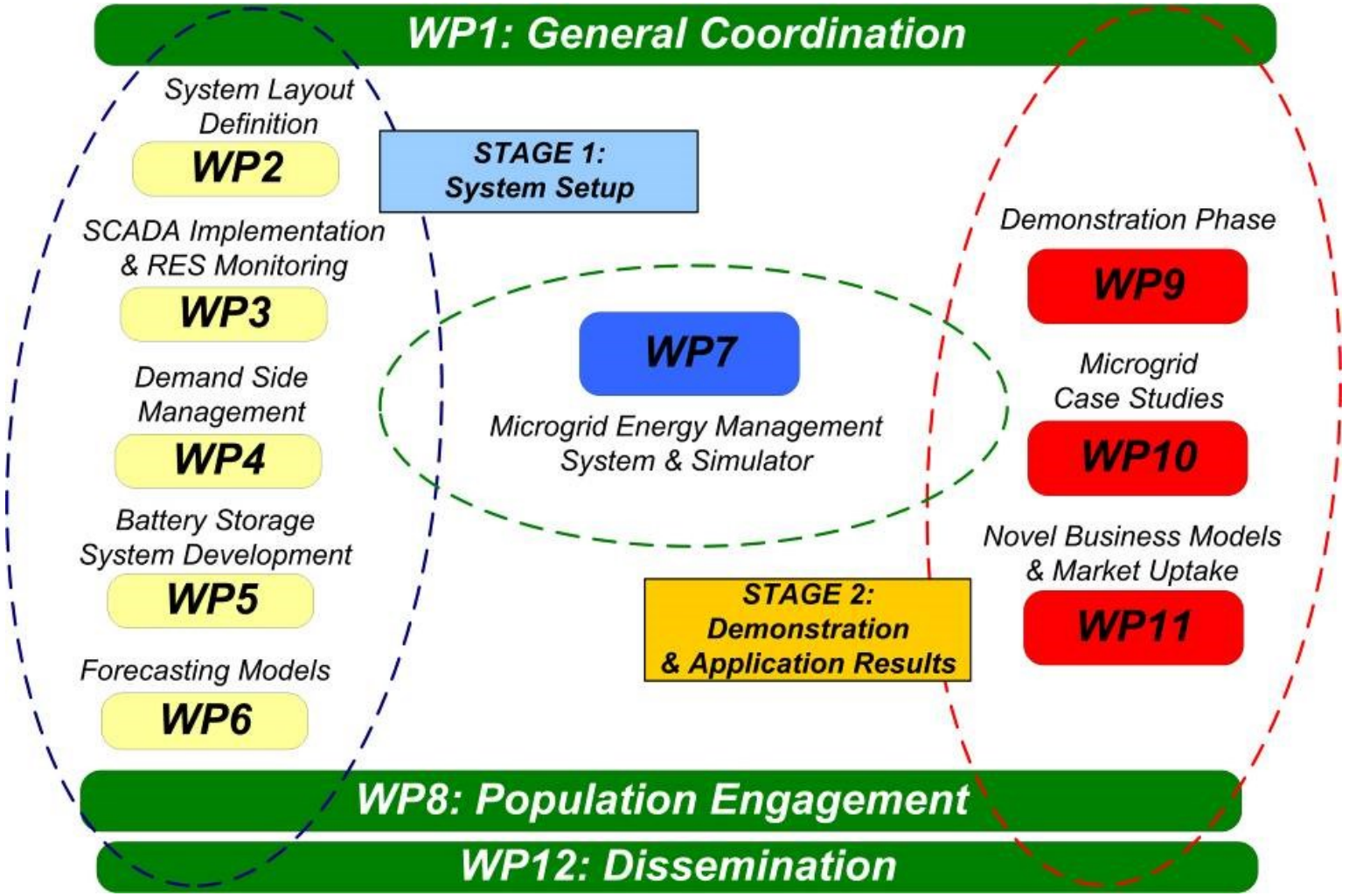


TILOS OBJECTIVES

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) and **Pellworm** (SHNG) as well as other island regions of different characteristics



PROJECT STRUCTURE



PROJECT CONSORTIUM

INDUSTRIAL PARTNERS	
1	FIAMM Energy Storage Solutions SRL (IT)
2	SMA Solar Technology AG (DE)
3	Younicos AG (DE)
4	EUNICE Laboratories SA (EL)
5	EUROSOL P&M GmbH (DE)
ACADEMIC / RESEARCH PARTNERS	
1	Commissariat à l' Energie Atomique et aux Energies Alternatives (FR)
2	Instituto Tecnológico de Canarias S.A. (ES)
3	Technological Educational Institute of Piraeus (EL) - **Coordinator**
4	University of East Anglia – Business School (UK)
5	Universite de Corse (FR)
6	Rheinisch-Westfaelische Technische Hochschule Aachen (DE)
7	Kungliga Technica Hogskolan (SE)
DISTRIBUTION SYSTEM OPERATORS	
1	Hellenic Electricity Distribution Network Operator S.A. (EL)
2	Schleswig-Holstein Netz AG / E.ON (DE)
NON GOVERNMENTAL ORGANIZATIONS	
/	World Wide Fund for Nature – Greece (EL)

PROJECT CONSORTIUM

Bridge

- **Bridge Data Management Group**
- **Bridge Business Models Group**
- **Bridge Regulations Group**
- **Bridge Customer Engagement Group**

bridge HORIZON 2020

http://horizon2020-story.eu/bridge/

European Commission

Thank You for Your Attention

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http://www.tiloshorizon.eu/