aegean energy & environment agency

THE SUPPORTING ORGANISATION FOR GREEK ISLANDS

University of Athens KEPA

BSEC 25 YEARS PROMOTING COOPERATION

BROKERAGE EVENT

Projects & Funding Opportunities on Energy and Climate Change

10th International Scientific Conference on Energy and Climate Change

WiseGRID & SMILE Projects

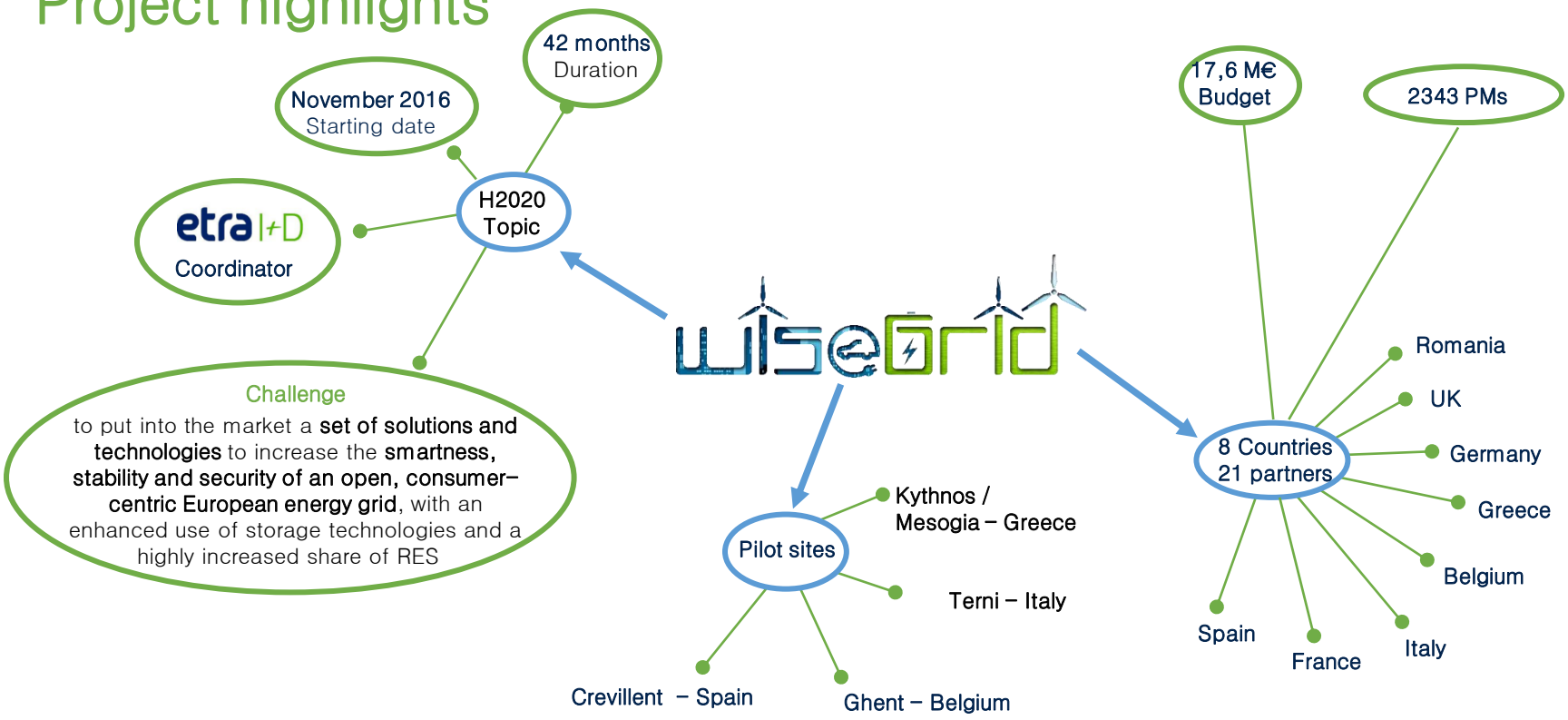
Low Carbon Economy: LCE – 02 – 2016

Demonstration of smart grid, storage and system integration technologies with increasing share of renewables: distribution system, H2020 projects

Wide scale demonstration of Integrated Solutions for European SmartGrid

This project has received funding from the European Union's Horizon 2020 research and innovation programme under the grant agreement No 731205.

Project highlights



Strategic goals

1. **Demand-response**
   - Allowing active participation, protection and empowerment of the European consumers and prosumers;
   - Sustainable business models and regulatory recommendations, based on different technologies (smart metering, smart home appliances, batteries, EVs, etc.) to create a win-win situation for both grid and consumers.

2. **Smartening the distribution grid**
   - Technologies and methods to gain advanced monitoring and awareness of variable generation,
   - integration of Virtual Power Plants and microgrids as active balancing assets,

3. **Integration of renewable energy storage systems in the network**, such as batteries or heat accumulators.
   - Optimization of the market deployment of these storage systems, manage and balance the network optimally, responding better to changes in demand and reducing at the same time losses in distribution.

4. **Smart integration of electric mobility services** for charging, providing storage capacity or to supply electricity to the grid, including the possible use of their batteries as storage systems or VPPs.

WiseGRID technological solutions → 9 products

WiseGRID technological solutions → 9 products (cont.)

1. **WG IOP (WiseGRID InterOperable Platform):** ICT platform for real time monitoring capable of **processing the heterogeneous and massive data stream** coming from the distributed energy infrastructure.

2. **WG Cockpit**: application **for DSOs or microgrids Operators** in order to control, **manage and monitor their own grid**, in order to improve flexibility, stability and security of their network, considering an increasing share of distributed renewable resources.

3. **WiseCORP:** Corporate application **for businesses, industries, ESCOs and public facilities consumers and prosumers** to become smarter energy players.

4. **WiseCOOP:** Application **for energy retailers, aggregators, local communities and cooperatives of consumers and prosumers** (and other intermediaries) to assist them in **achieving better energy deals** while relieving them from administrative procedures and cumbersome research.

WiseGRID technological solutions → 9 products (cont.)

5. **WiseHOME :** application **for individual domestic consumers and prosumers** to become active energy players.

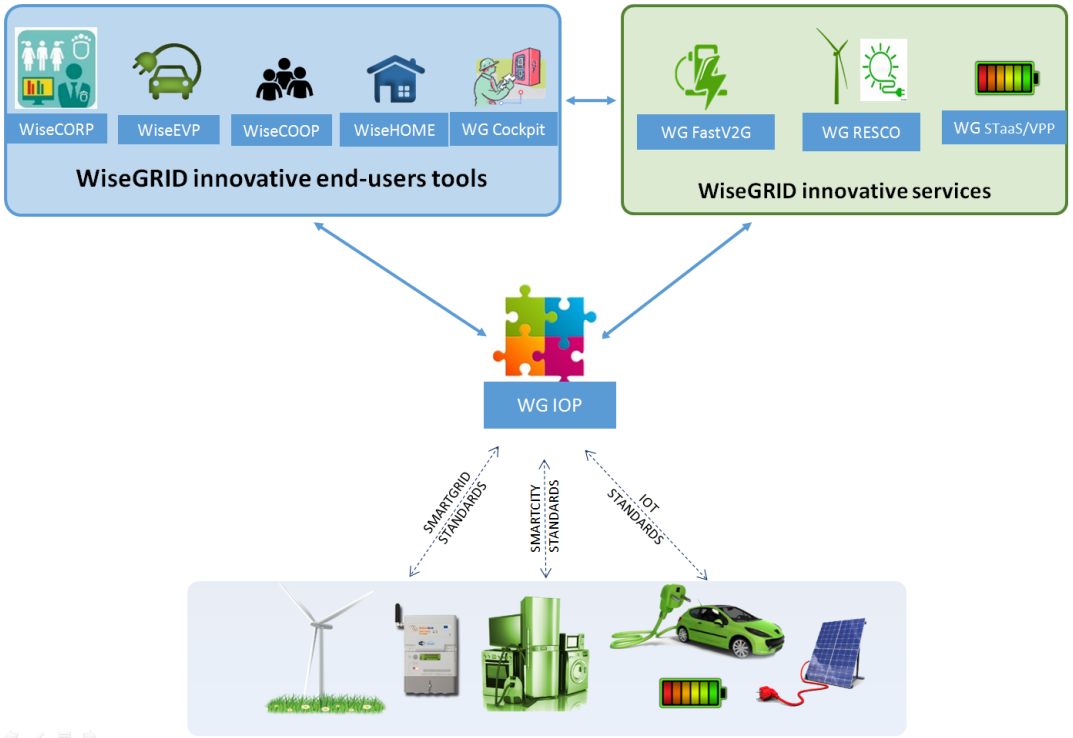
6. **WiseEVP (WiseGRID Electric Vehicle Platform):** tool **for vehicle-sharing companies and e-vehicles fleet managers** in order to optimize the activities related with smart charging and discharging of the EVs and reduce energy billing.

7. **WG FastV2G:** **EV charging station** that will make possible to **use EV as dynamic distributed storage devices,** feeding electricity stored in their batteries back into the system when needed (fast V2G supply).

8. **WG STaaS/VPP (WiseGRID energy STorage as a Service/Virtual Power Plants):** service by which **consumers/prosumers** (be them households or corporate) **can easily offer to the market their unused storage capacity.**

9. **WG RESCO (WiseGRID Renewable Energy Service COmpany):** tool for enabling the **provision of energy to the consumers from RES** making possible that the **household/businesses serviced do not own and maintain th**e generation equipment.

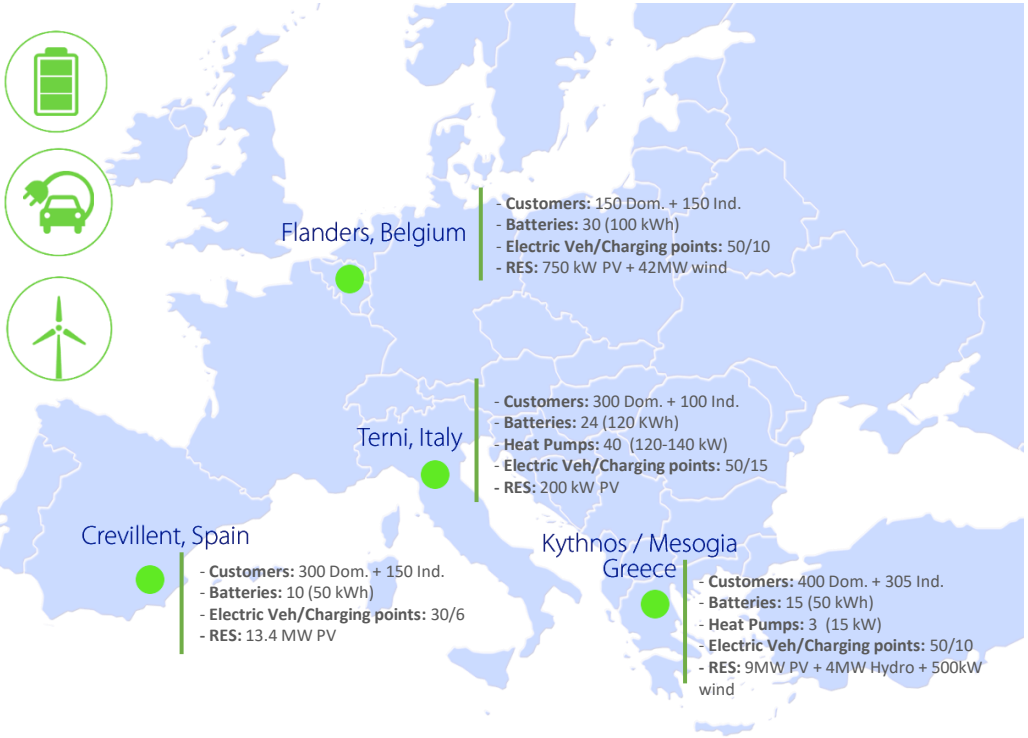
WiseGRID technological solutions



Demonstrators

WiseGRID integrated solution will be demonstrated and evaluated under **real life conditions in 4 large scale demonstrators** –in Belgium, Italy, Spain and Greece- under different technical, climatological, regulatory, legislative and social conditions.

Demonstration sites will involve more than **1700 users, 60 batteries** –totalling more than 300KWh of installed capacity-, **50 heat pumps** –totalling more than 160kWh of installed capacity-, **180 EV, 40 charging stations and more than 70MWh of RES** –PV, Wind Turbines and Hydro-.



Demonstrators

Electric cooperative Crevillent, Spain

RES cooperative Flanders, Belgium

Public DSO Terni, Italy

National DSO Greece

WiseGRID partners

For more info:
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SMILE

SMART ISLAND ENERGY SYSTEMS

Overview of the project and objectives

SMILE overall objective

Horizon 2020
European Union Funding
for Research & Innovation

- The SMILE project aiming to demonstrate, system-wide in real-life operational conditions, a set of both **technological and non-technological solutions** adapted to local circumstances targeting the **distribution grid** to enable:
  - **Demand response**
  - **Smart grid functionalities**
  - **Storage and energy system integration**

- **3 large-scale pilot** projects in **3 regions** with **similar topographic characteristics** but different **policies, regulations and energy markets**

SMILE scope and main goals

Horizon 2020
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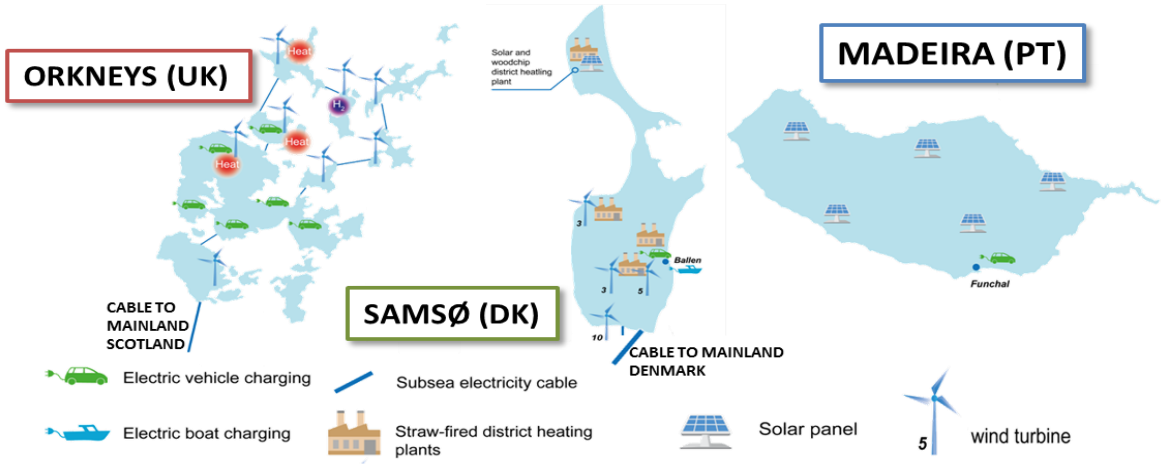
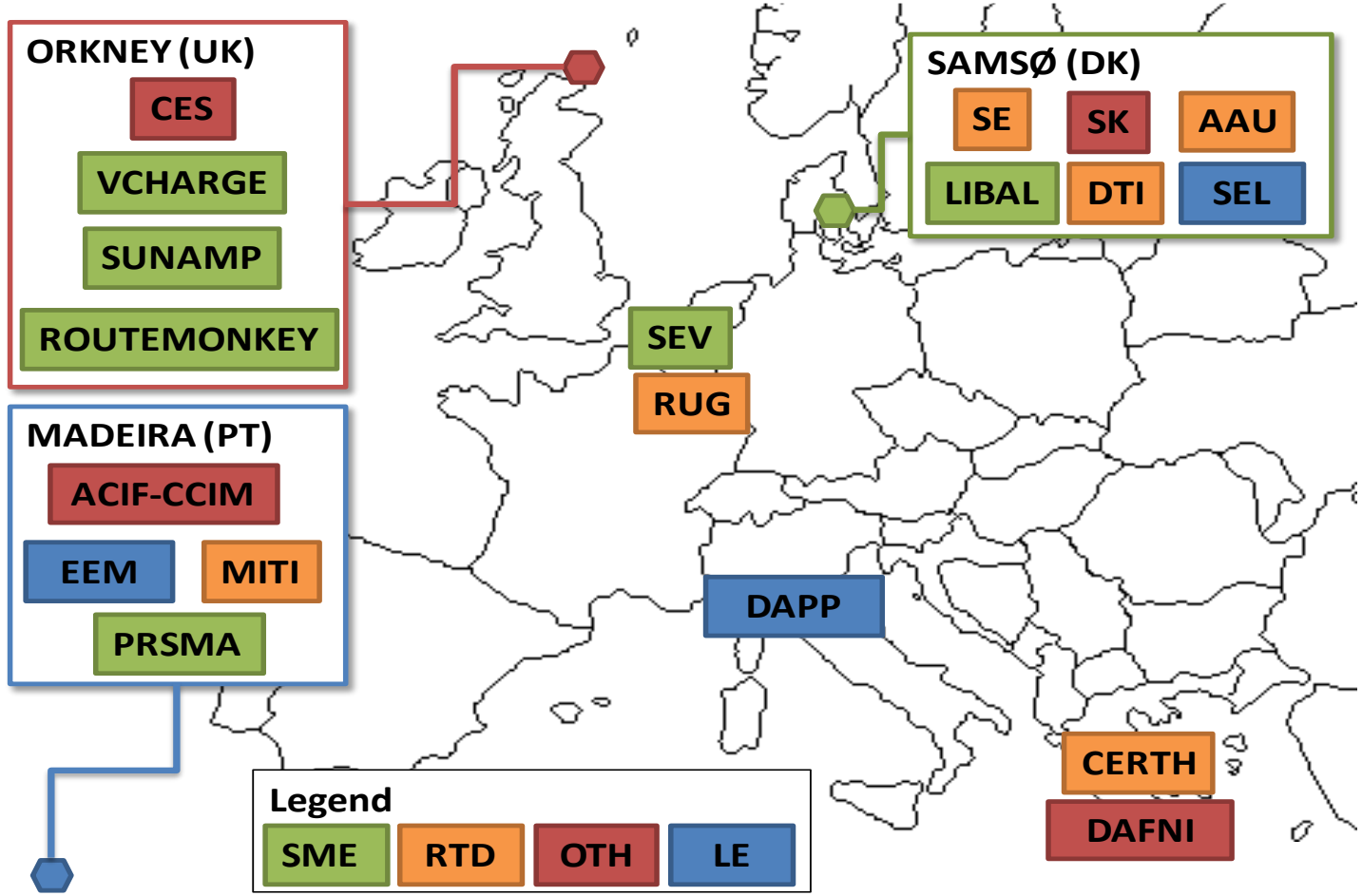
- Demonstrate 9 innovative technological solutions in large-scale smart grid demonstration projects in 3 islands:
  - Orkneys (UK)
  - Samsø (DK)
  - Madeira (PT).



- Integration of battery technology
- Power to heat
- Power to fuel
- Pumped hydro
- EVs / Electricity stored on vessels
- Aggregator approach to DSM

Geographic distribution

- 19 partners from 6 different European Countries



Overall Concept

Horizon 2020
European Union Funding
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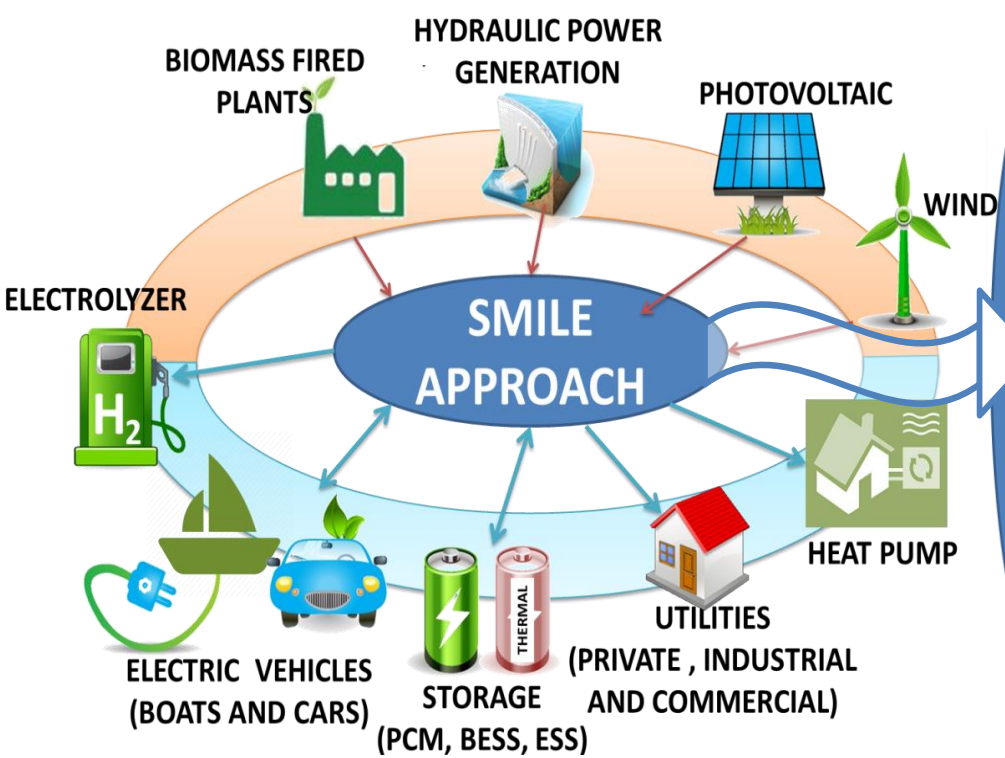

SMILE APPROACH

Cross-functional control and automation framework

- Plug&Play scalable software solutions
- Cyber security measures
- Fault identification mechanisms and reconfiguration

DEMAND SIDE MANAGEMENT

- Predictive algorithms for demand-response
- Predictive algorithms for integration of grid users from transport
- Energy management algorithms and aggregation tools

Why island locations?

- Island communities can be **more easily engaged** in the real-life testing of solutions with measurable impact

- The 3 selected case studies:
  - Characterised by high shares of RES
  - Intend to demonstrate **stable grid operation** in the context of the **adoption of energy storage solutions** and/or the connection between the electricity network and other energy networks
  - Intend to demonstrate smart **integration of grid users** from transport and mobility.

Why island locations?

Horizon 2020
European Union Funding
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- Each pilot brings:
  - Specific set of challenges
  - Technology options
  - Energy market conditions

- The sites are therefore **effectively representative of the majority of the EU energy** markets and offer excellent demonstration settings which will deliver **maximum impact in terms of replicability**.

Replication

- Each case study is **representative of an important energy challenge common to several** locations in Europe, on islands as well on mainland.
- **Orkney Islands and Samsø are electrically connected to the mainland network** and can therefore be representative of **smart grids located on the mainland as well**
- **Madeira is the only case of a total energy island**, not connected to the mainland network.
- Mutual learning approaches
- Replication (DAFNI/Greek islands)

Communication

Horizon 2020
European Union Funding
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For more info

Webpage: http://www.h2020smile.eu

Social Media: