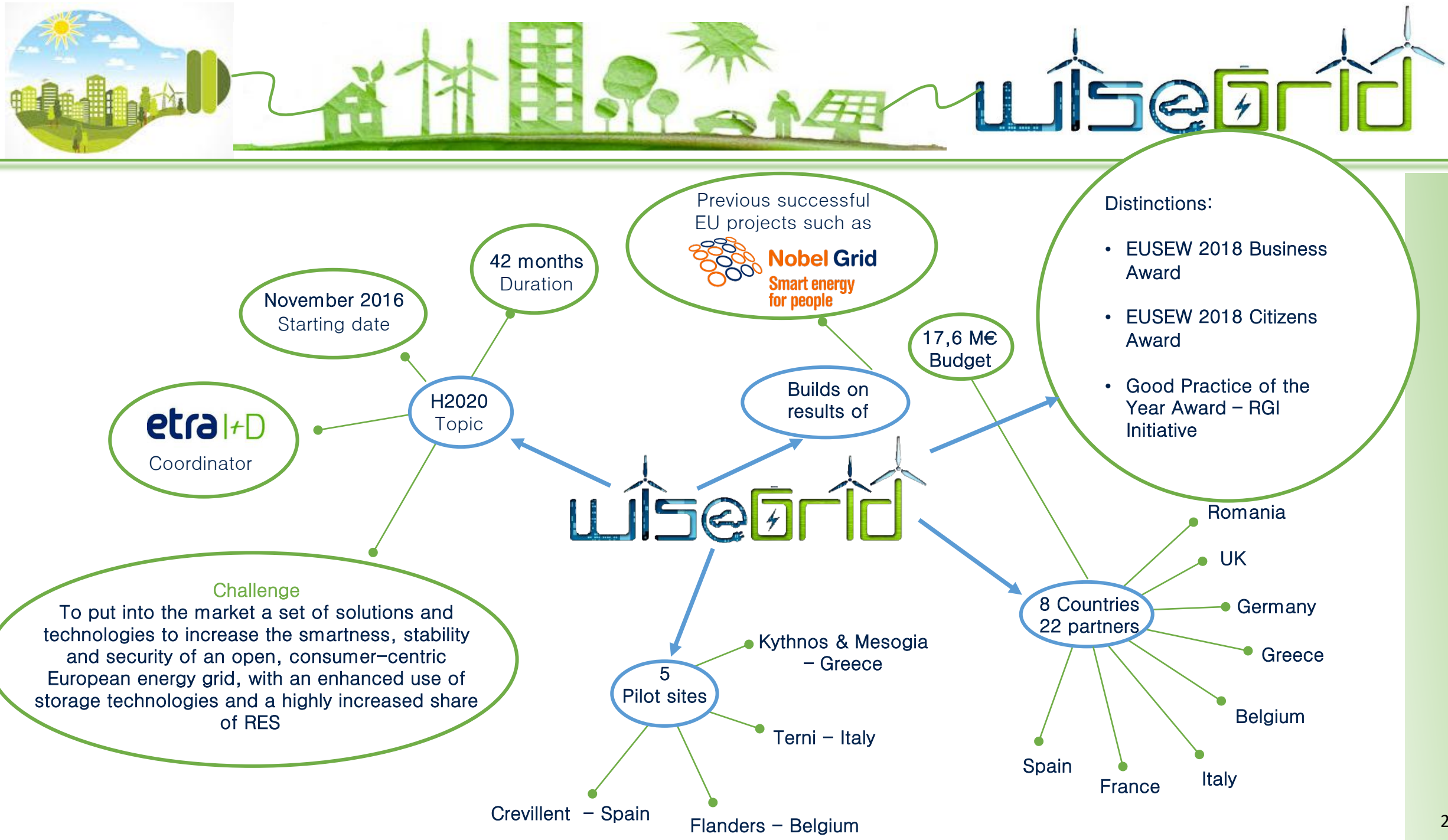
Wide scale demonstration of Integrated Solutions for European SmartGrid

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


Previous successful EU projects such as
Nobel Grid
Smart energy for people
42 months
Duration
November 2016
Starting date
H2020
Topic
etra I+D
Coordinator
Builds on results of
17,6 M€
Budget
Distinctions:
• EUSEW 2018 Business Award
• EUSEW 2018 Citizens Award
• Good Practice of the Year Award – RGI Initiative
wiseGrid
Challenge
To put into the market a set of solutions and technologies to increase the smartness, stability and security of an open, consumer-centric European energy grid, with an enhanced use of storage technologies and a highly increased share of RES
5
Pilot sites
Kythnos & Mesogia – Greece
Terni – Italy
Crevillent – Spain
Flanders – Belgium
8 Countries
22 partners
Romania
UK
Germany
Greece
Belgium
Italy
France
Spain

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

WG Cockpit

WiseHOME

WiseCORP

WG Fast V2G

WiseEVP

WiseCOOP

WG STaaS/VPP

WG RESCO

Mesogia – Greece

WG Cockpit

WiseCORP

WiseCOOP

WiseHOME

WG Cockpit

Mesogia - Greece

1. **Addressed WG strategic goal :** Smartening the distribution grid

2. **Addressed (present and future) DSO needs**
   - Visualization, monitoring of the MV and LV distribution network & high observability
   - High level of controllability
   - Effective & fast fault identification to assist grid restoration
   - Accurate demand and production forecast
   - Congestion forecast
   - Initiation of Demand Response campaigns
   - Integrated access to data (coming from different systems)

WG Cockpit

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   - Initiation of Demand Response campaigns
   - Integrated access to data (coming from different systems)

3. Higher impacts

- Grid digitization
- Improved services to the distribution grid end-users
- Higher RES penetration
- Facilitate the provision of services from other entities (e.g. en. Cooperatives)

4. Interactions

- **WiseCOOP**
- **WiseCORP**

5. Required for success

- Smart meters / metering with high granularity
- Telemonitored and tele-controlled network elements
- Pulling data from different operational systems
- Interoperable platform (handling different types of data) – **WG IOP**

Kythnos – Greece

WG Cockpit

WiseCORP

WG STaaS/VPP

WiseEVP

aegean energy agency
THE SUPPORTING ORGANISATION FOR GREEK ISLANDS

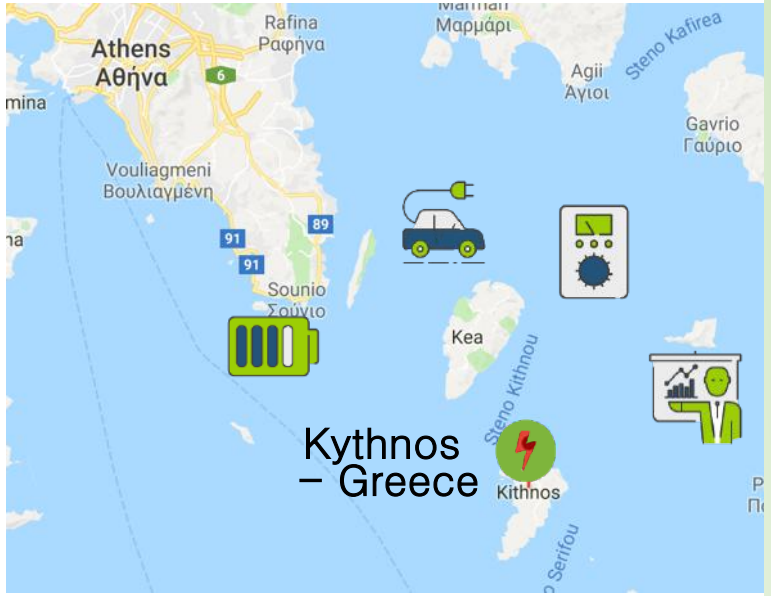
WG Cockpit – WiseCORP – WGSTaaS/VPP

Kythnos - Greece

1. **Addressed WG strategic goals :** Demand response, Smartening the distribution grid, Integration of renewable energy storage systems in the network

2. **Addressed (present and future) needs**

- Autonomous electrical system, whose infrastructure is sized to cover the peak demand of the island occurring only during a few days in August (due to tourism).
- Increase RES penetration by storing energy that cannot be absorbed when the electricity demand in the island is low
- Smooth demand and reduce loading of the thermal generators by shaving peaks
- Monitoring of the MV and LV distribution network & high observability



WG Cockpit – WiseCORP – WGSTaaS/VPP

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3. WiseCORP

to **integrate the desalination unit into the electrical system of Kythnos** with a load management concept, to **increase RES penetration** and to **reduce peak demand**

WG Cockpit – WiseCORP – WGSTaaS/VPP

Kythnos - Greece

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3. WiseCORP

4. WGSTaaS/VPP

To **control the batteries installed in five municipal buildings** in order to charge from the grid when there is energy surplus on the island coming from renewable energy production with a load management concept, to **reduce RES curtailment**.

WG Cockpit – WiseCORP – WGSTaaS/VPP

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3. WiseCORP

4. WGSTaaS/VPP

5. Required for success

- Smart meters / metering with high granularity
- Cooperation with the DSO regarding the RES production data
- Cooperation with the municipality
- Engagement of the end-users through dedicated workshops

Flanders – Belgium

WiseCORP

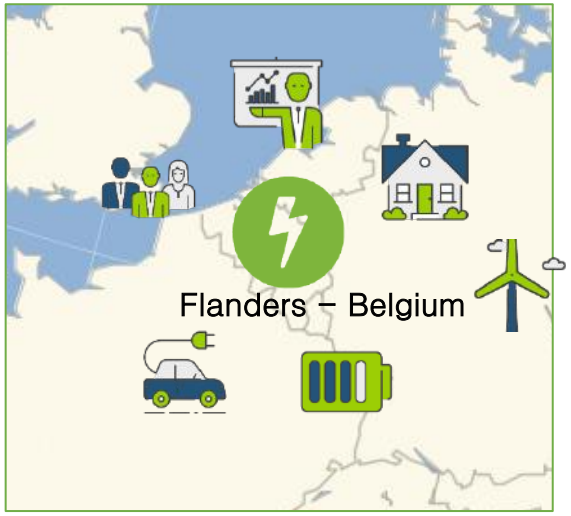
WiseCOOP

WG RESCO

WG STaaS/VPP

WiseEVP

WiseHOME



Ecopower cvba

energie ID

WiseCOOP – WiseHOME

Ghent - Flanders - Belgium

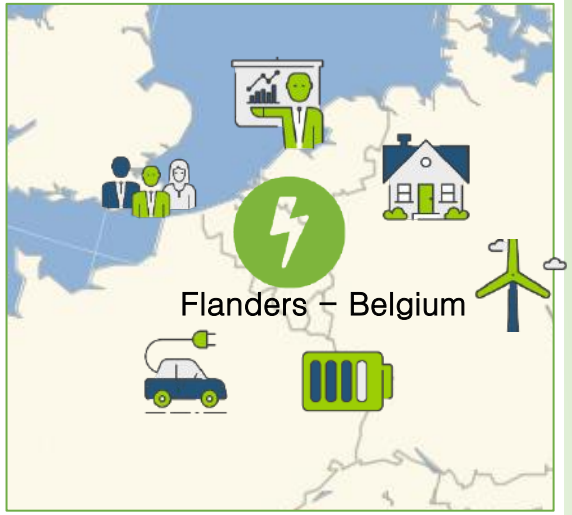
1. Addressed WG strategic goals : Demand response,
Integration of renewable energy storage systems in the network

2. Addressed (present and future) needs

- Sint-Amandsberg neighbourhood consists of heterogeneous typology of inhabitants usually with a limited income.
- Supply of 100% green electricity to the cooperative members and promotion of a rational use of energy.
- Optimization of portfolio production, prosumers and consumption.
- Optimization of the users' and the cooperative's interaction and transactions with DSOs in the most grid-efficient and cost-effective way.

3. Higher impacts

- Higher RES penetration
- Enhanced participation of the consumers and prosumers.
- Familiarization with the concept of dynamic prices.



WiseCOOP – WiseHOME

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4. WiseCOOP

- Cooperative's portfolio monitoring
- Communication with DSO and members

WiseCOOP – WiseHOME

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3. Higher impacts

- Higher RES penetration
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4. WiseCOOP

5. WiseHOME

- Monitoring of household's performance (production unit, consumption).
- Adjusting the consumption based on received notification.

WiseCOOP – WiseHOME

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4. WiseCOOP

5. WiseHOME

6. Required for success

- Smart meters / metering with high granularity
- Citizens participation enhanced through dedicated workshops and collaboration with other local projects
- Data protection

Crevillent – Spain

WG Cockpit

WiseCORP

WiseCOOP

WiseEVP

WiseHOME

WG Fast V2G

ENERCOOP

WiseCORP & WiseEVP – WG Fast V2G

Crevillent - Spain

1. **Addressed WG strategic goals :** Demand response, Integration of renewable energy storage systems in the network, Smart integration of electric mobility services

2. **Addressed needs**
   - Monitoring of the energy usage at the company's premises and its optimization.
   - Reduction of the company's energy cost.
   - Flexibility services using controllable loads offered to the DSO
   - Integration of e-mobility in the network
   - Better control of the EVs charging session both in favor of the user and the network

3. Higher impacts

- Higher RES penetration
- Enhanced participation of consumers and prosumers.
- Enhancement of e-mobility.

WiseCORP & WiseEVP – WG Fast V2G

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3. Higher impacts

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- Enhanced participation of consumers and prosumers.
- Enhancement of e-mobility.

4. WiseCORP

- Usage of brightness and temperature sensors, and smart meters to monitor and control the HVAC and lighting electric system.
- Inclusion of batteries
- Participation in DR campaigns triggered by the DSO or a cooperative.

WiseCORP & WiseEVP – WG Fast V2G

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- Enhancement of e-mobility.

4. WiseCORP

5. WiseEVP ⟷ **WG Fast V2G**
- Managing the installed charging stations.
- Monitoring their status, charging profiles.
- Offering booking options.
- Offering different charging options.
- Offering services to the network (charging and discharging)

WiseCORP & WiseEVP – WG Fast V2G

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- Enhancement of e-mobility.

4. WiseCORP

5. WiseEVP

WG Fast V2G

6. Required for success

- Smart meters / metering with high granularity
- Building management system
- Citizens participation (as EV users and as facilities managers)
- Data protection

Terni – Italy

WG Cockpit

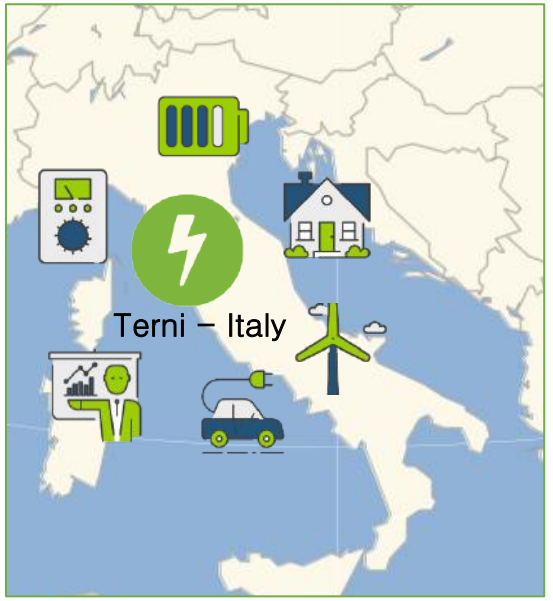
WG RESCO

WiseCORP

WG STaaS/VPP

WiseEVP

WiseHOME



ASM Terni S.p.A.

WG Cockpit – WGSTaaS/VPP & WG RESCO

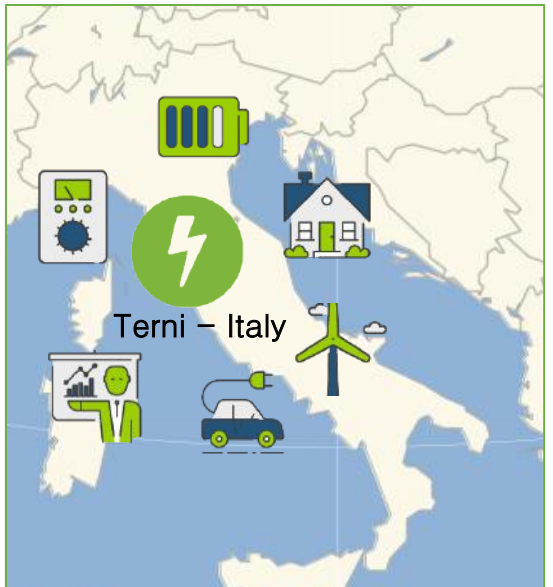
Terni - Italy

1. **Addressed WG strategic goals :** Demand response, Smartening the distribution grid, Integration of renewable energy storage systems in the network

2. **Addressed needs**
   - Local voltage regulation at substations during RES production
   - Facilitate Renewable Energy Service Company's activity

3. Higher impacts

- Higher RES penetration and distributed generation capacity
- Facilitate citizens choice to be supplied using RES



WG Cockpit – WGSTaaS/VPP & WG RESCO

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3. Higher impacts

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4. WG STaaS/VPP

Employ energy storage systems in order to absorb the extra power produced by RES.

WG Cockpit – WGSTaaS/VPP & WG RESCO

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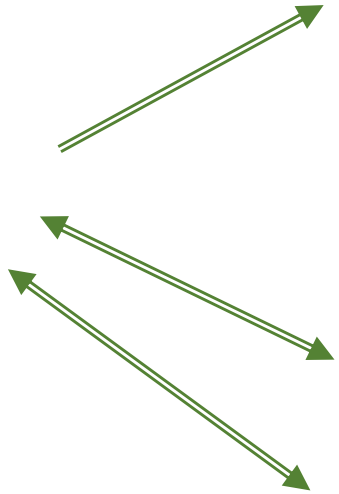

3. Higher impacts

- Higher RES penetration and distributed generation capacity
- Facilitate citizens choice to be supplied using RES

4. WG STaaS/VPP

5. WG RESCO

Facilitate RESCO and citizens interested in installing PV on their rooftops (with/without addition of batteries).

WG Cockpit – WGSTaaS/VPP & WG RESCO

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   - Facilitate citizens choice to be supplied using RES

4. **WG STaaS/VPP**

5. **WG RESCO**

6. **Required for success**
   - Smart meters / metering with high granularity
   - Equipment for remote control of storage systems
   - Citizens participation

WiseGRID partners

Thank you!

For more info:
Webpage: www.wisegrid.eu

Stamatia Gkiala Fikari
Email: S.Gkiala@deddie.gr

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

4. WiseCOOP

- Monitoring and visualisation of portfolio's characteristics (consumption, production, geographical spread)
- Tariff information
- Analytics (cooperative, individual, group level)
- Contracts management
- Energy trade information (source of energy –renewable or not-)
- Communication with DSO to respond to DR campaign
- Communication with the end-user to send notifications

5. WiseHOME

- Monitoring of household's consumed, produced and stored energy
- Energy cost information
- Receiving notifications from the cooperative
- Collective reports

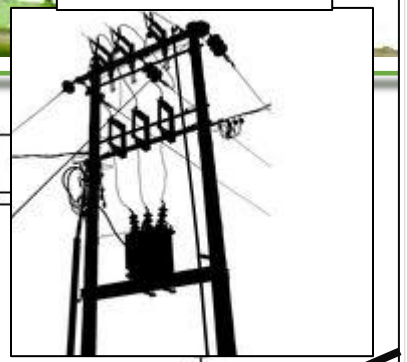
7. Voltage is reduced

3. Voltage at the Transformer is near to the limit

O

an example

Distribution network



6. Power output at the substation is smoothed by the battery

2. Power is directly injected in the LV network

5. PV production increases as foreseen

1. PV is producing, an increasing is foreseen

Storage

RES

4. The Cockpit requests flexibility to the market

5. WG RESCO

- A customer makes available the roof of his/her home for the installation and maintenance of some photovoltaic panels in order to allow the production of green energy to be sold on the market.
- Renewable Energy Service Company (RESCO) and customer make a contract including RESCO to pay a fee to the customer to use the roof of his/her house and then sell all or part of the energy produced to the market.

- Manage different typology of contracts to Business and Household customers
- Monitoring energy consumption and production
- Forecasting energy consumption and production to identify the energy surplus available to be sold in the market
- Asset maintenance
- Direct communication between customer and RESCO