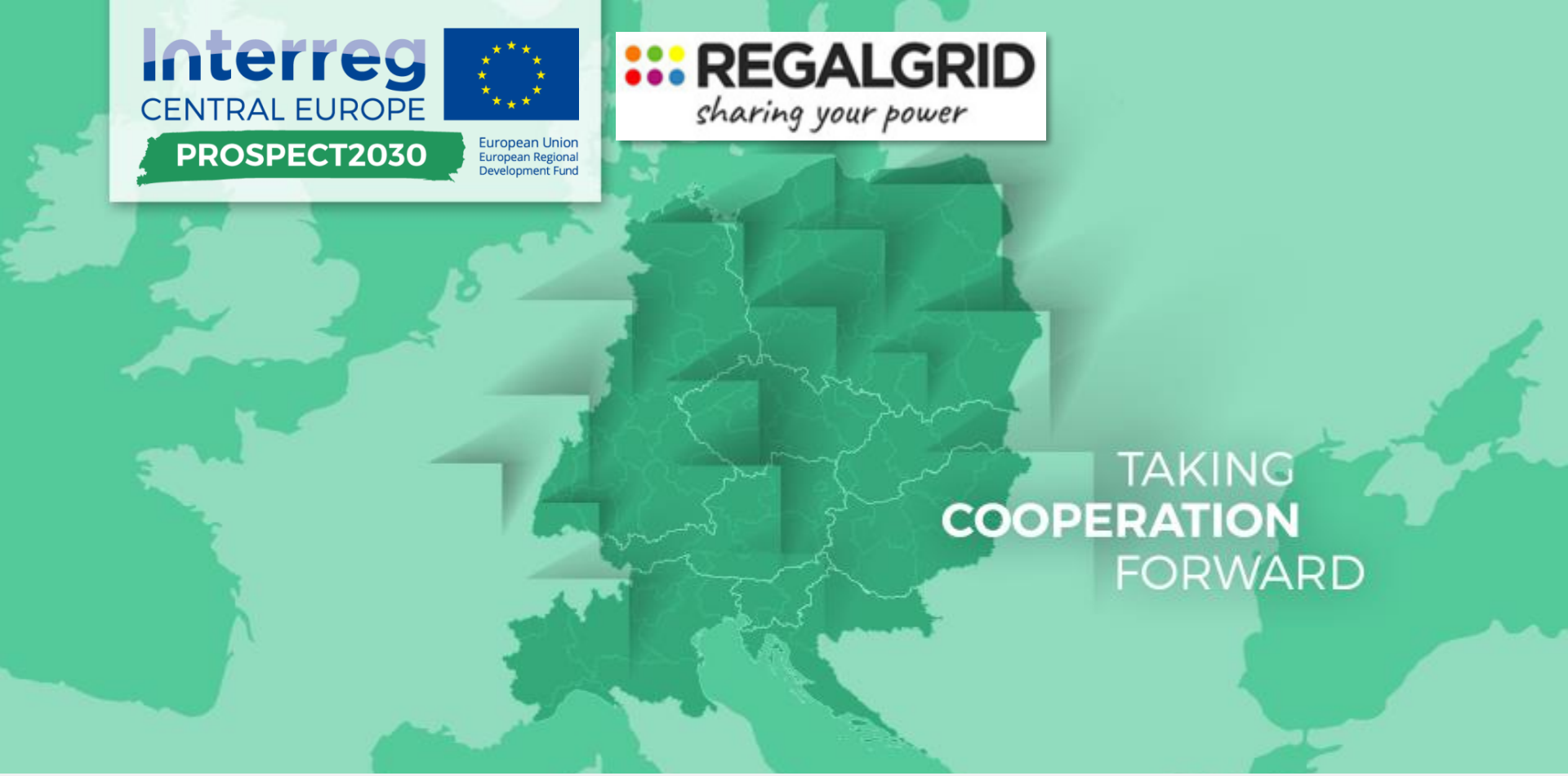

PROSPECT2030 | Friday 30th April, 2021

Regalgrid® : software-hardware architecture for real-time energy management

Walter Brandolin

REGALGRID® : REAL-TIME ENERGY MANAGEMENT ARCHITECTURE

Interreg CENTRAL EUROPE
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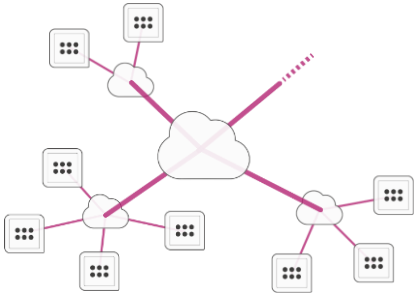
European Regional Development Fund

- Company Profile
- The Problem
- Our Solution
- Architecture - How It works
- Services
- Commercial projects & trials
- Benefits & Opportunities

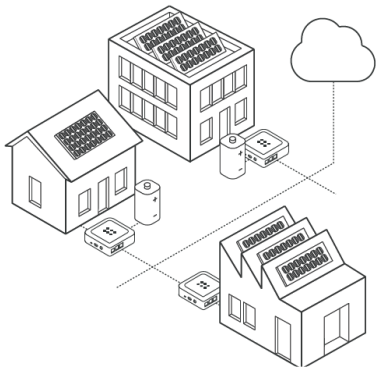
COMPANY PROFILE



Regalgrid Europe Srl is **Technology Provider** based in Treviso, founded with the aim of developing a sustainable, advanced and innovative energy distribution system.

Vision

Contribute to a «**smarter**» world, fostering the integration of renewables and allowing an intelligent energy sharing aimed at reducing energy waste



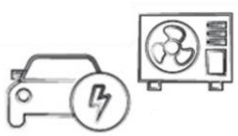
Mission

Create a Digital Energy Platform as a communication standard to allow smart integration between devices and power plants, to address the single node needs and play an active role in the grid

THE PROBLEM

Supply/ Demand Mismatch: Decentralized energy resources fail to achieve its potential

Inefficient ESSs: Existing ESSs fail to optimally harness DER output through optimized charging/ discharging



Reduced loads optimization: responsive devices synchronization is missing or is limited to behind-the-meter self-consumption increase

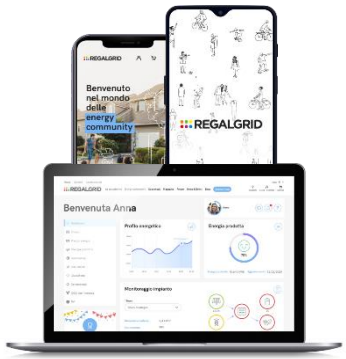
The Consequence:

- Unrealized potential in solar PV installations
- Lengthened payback period
- Less reduction in consumer energy prices
- Reduced renewable energy contribution

OUR SOLUTION

Proprietary gateway hardware and cloud-based demand management software that allows Property Managers, Embedded Network Mangers and Developers to:

- Dynamic orchestration of DER production for mixed user profiles
- Improved balance by means of real-time energy management strategies
- Complete control over aggregated ESS through hybrid inverters
- Integration of responsive loads and consumers to optimize self-consumption

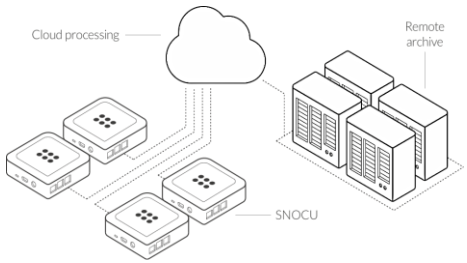


Outcome: Improved DERs management, lower grid stress, increased contribution from renewable resources, lower energy bills.

ARCHITECTURE

Real time platform, based on internationally patented technology at three levels:

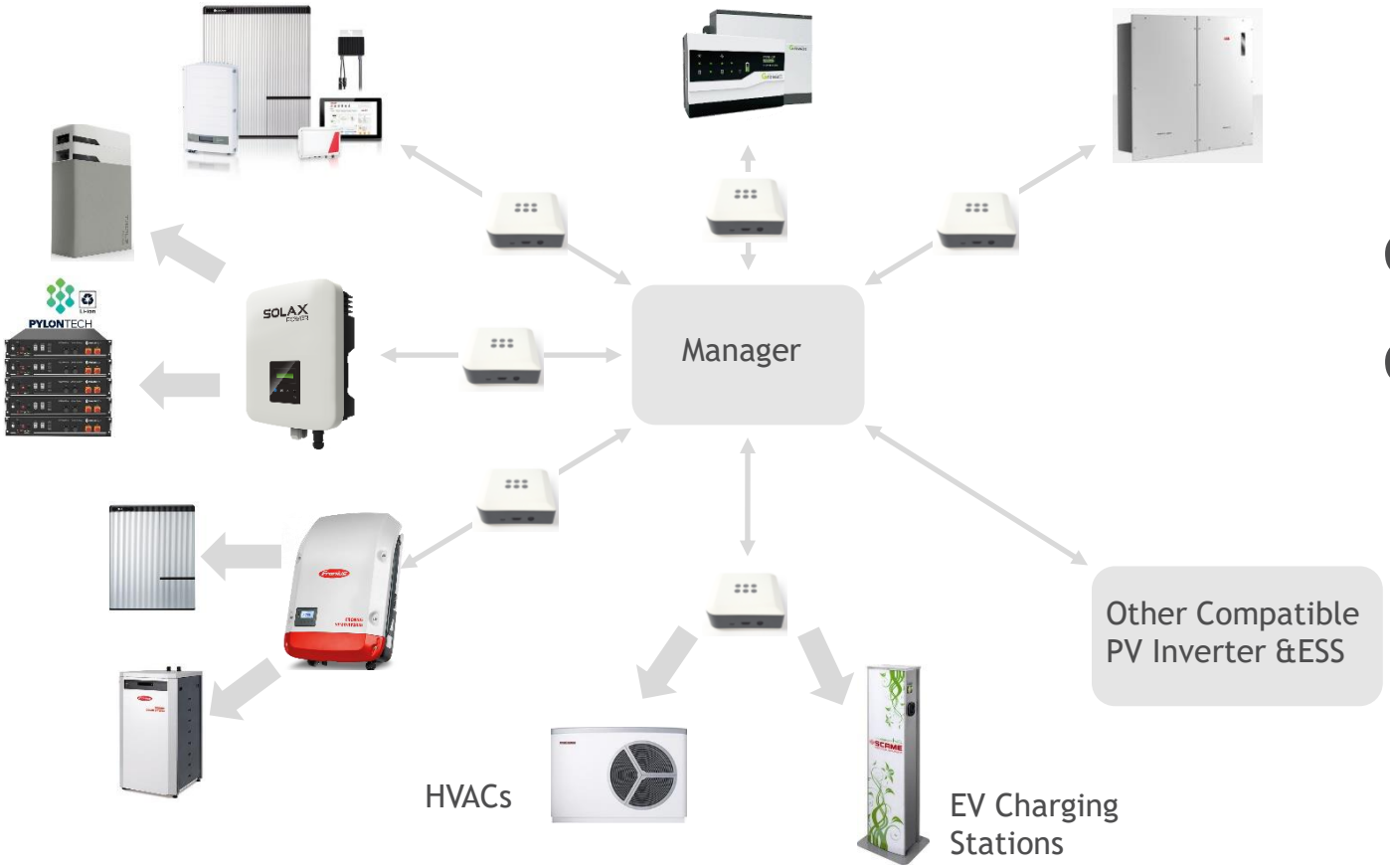
- **Local (SNOCU)**
  Gateway for household device connection
- **Cloud**
  Information hub for active device management
- **Remote**
  Storage, diagnostics and energy data analysis



Smart NOde Control Unit (SNOCU)

- SNOCU communicates with electronic devices in the household, collects information and provides active controls
- SNOCU connects based on multiple communication protocols (Wireless, LAN, serial)
- SNOCU feeds all information and commands to the CLOUD infrastructure

ARCHITECTURE

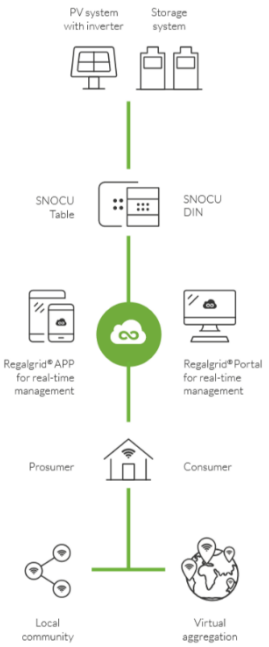


One Device

One Platform

HOW IT WORKS

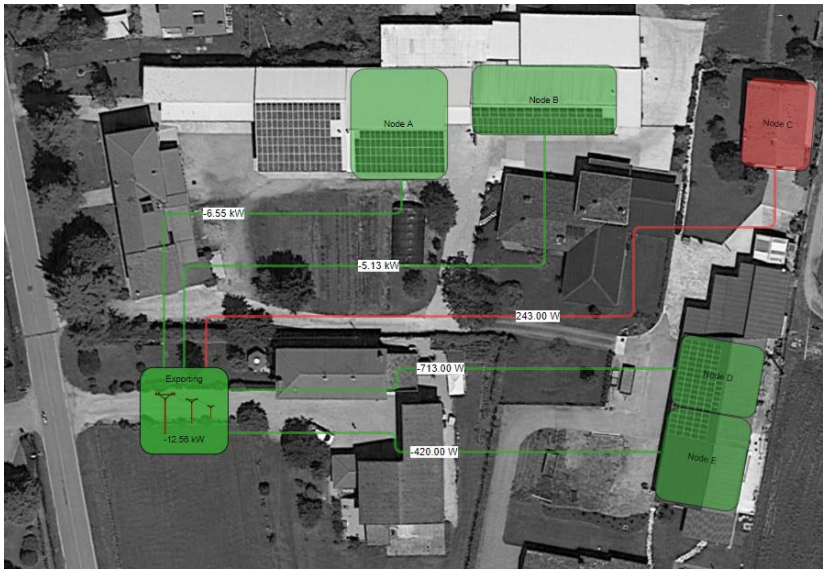
- **Software:** Cloud based algorithmic optimization and P2P platform
- **Hardware:** SNOCU gateway - DER, ESS and smart device integrator

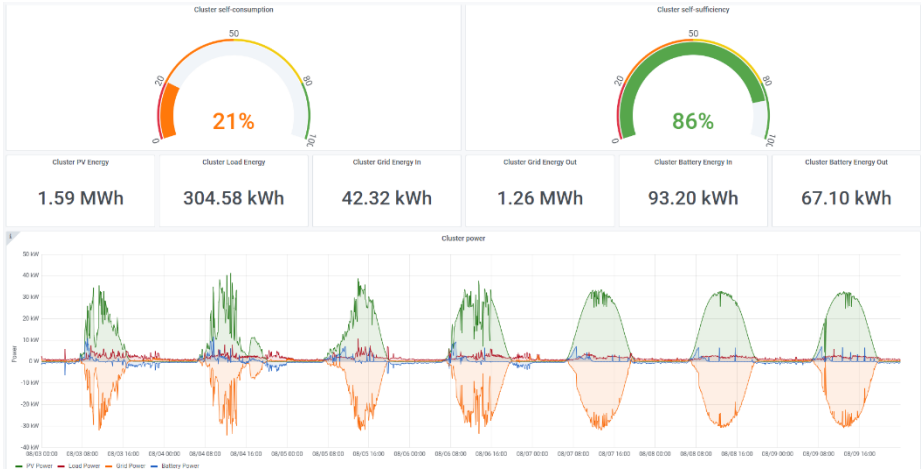


- Real-time data sampling of consumption, DER production, export to grid and ESS charging-discharging control
- Dynamic energy fleet management and energy assets control to match cluster target
- Proprietary control platform able to communicate with third parts through protocols or APIs

SERVICES

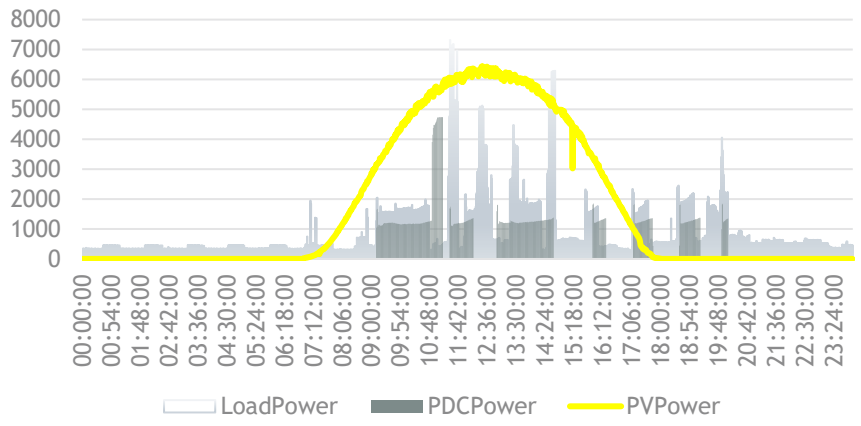
Real-time PV monitoring and ESS control





Communication with responsive loads for self-consumption optimization

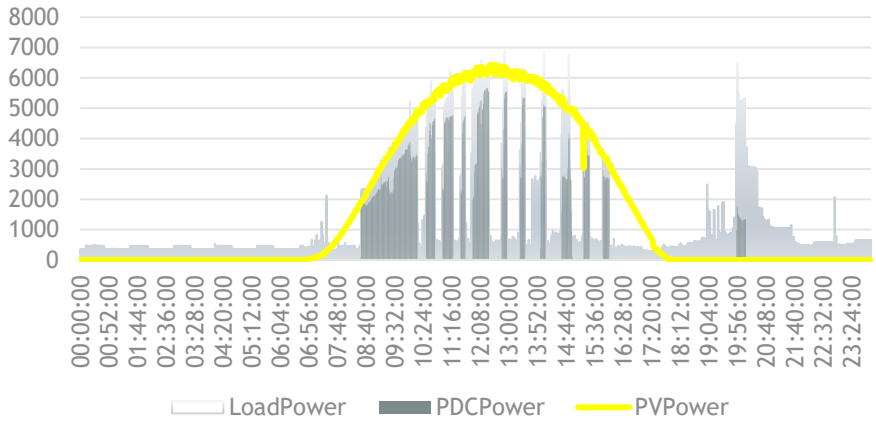
Heat Pumps std. functioning



Reduced self-consumption contribution

Limited optimization

Heat Pumps supported by Regalgrid Platform®

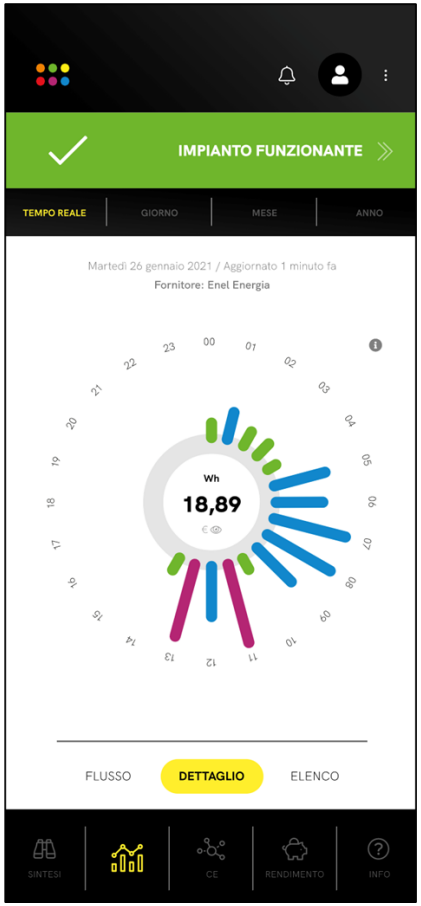


Improved self-consumption contribution

Maximum optimization

SERVICES

Regalgrid App



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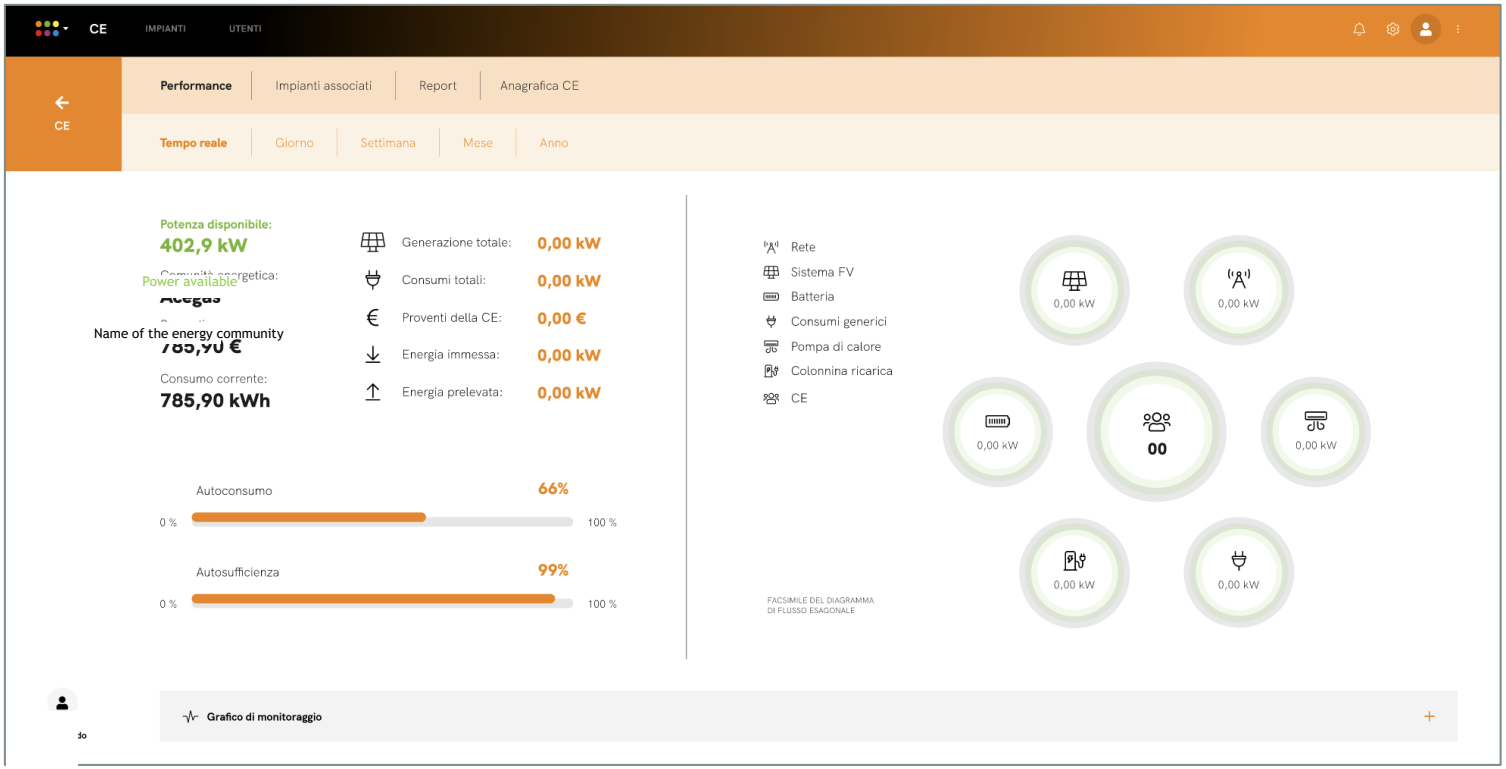
Regalgrid Web Portal



COMMERCIAL PROJECTS & TRIALS

Existing Market: One-to-Many energy sharing scheme

Public administration

Location: Serrenti (Sardinia)

PV Peak power: 20 kWp (existing system)

Total storage: 38 kWh (new component)

Nodes: 2 (only one with PV, single storage for both buildings)

Project goals:

- Self-consumption rate increase from 53% to 86%
- Self-sufficiency rate increase from 31% to 51%

Services provided by Regalgrid:

- Energy demand/ supply monitoring and ESS management
- Future improvements: other public buildings will join the project shortly.

COMMERCIAL PROJECTS & TRIALS

Existing Market: Many-to-Many energy sharing scheme

Public Lightning

Location: Verona (Veneto)

PV Peak power: 15 kWp (existing system)

Total storage: 36 kWh (existing component)

Nodes: 3

Project goals:

- Storage performance optimization
- Self-consumption rate increase from 50% to 70%
- Demonstrate effectiveness of intelligent energy management

Services provided by Regalgrid:

- PV production and loads monitoring
- Power balancing of 3 nodes

COMMERCIAL PROJECTS & TRIALS

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Existing Market: One-to-Many energy sharing scheme

Apartment Complex Aggregation

Location: Switzerland

Peak power: 30 kWp

Total storage: 43 kWh

Nodes: 13

Project goals:

- Increase the self-consumption rate
- Increase storage system performance
- Provide consumption data for billing purposes

Services provided by Regalgrid:

- Energy demand/ supply monitoring and ESS management
- DER aggregation and energy sharing between apartments

COMMERCIAL PROJECTS & TRIALS

Existing Market: Embedded Network

Energy Community (H-Farm)

Location: Roncade

Peak power: 33 kWp

Total storage: 50 kWh

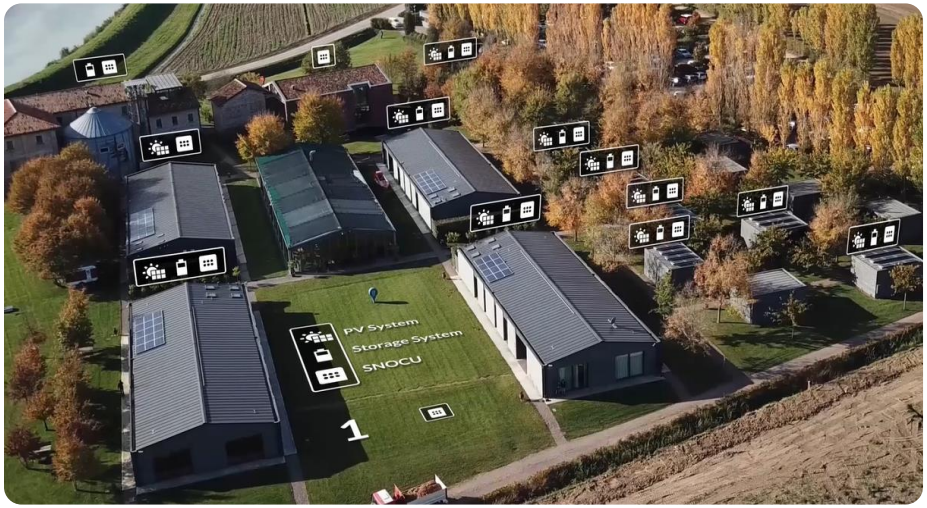
Nodes: 13

Project goals:

- Create the first 'energy community' in Italy
- Increase the self-consumption rate
- Increase the performance of storage systems

Services provided by Regalgrid:

- Energy demand/ supply monitoring and ESS management
- Peer-to-peer energy sharing to increase self-consumption



COMMERCIAL PROJECTS & TRIALS

Existing Market: One-to-Many energy sharing scheme

Virtual Energy Community

Location: Bolzano

Peak power: 57 kWp

Total storage: 38 kWh

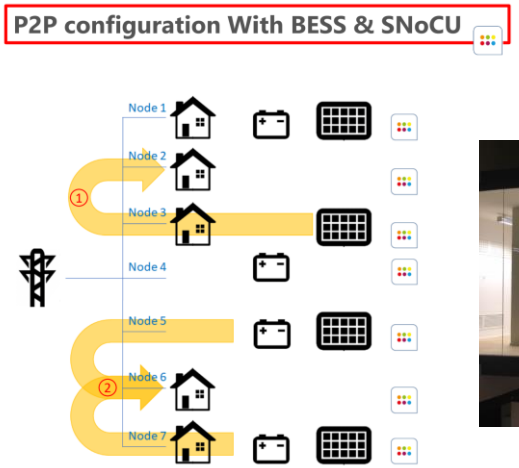
Virtual Nodes: 7

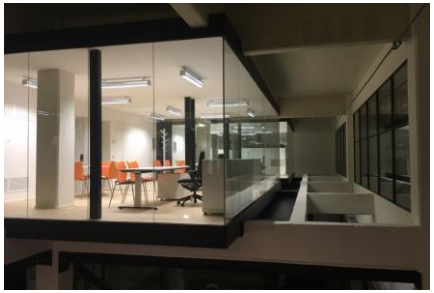
Project goals:

- Smart energy management in an office tower
- Increase self-consumption rate, independence from the grid and performance of all storage systems
- Increase awareness about smart energy management

Services provided by Regalgrid:

- Energy demand/supply monitoring & ESS management
- Peer-to-peer energy sharing to increase self-consumption





BENEFITS & OPPORTUNITIES

Consumers & Prosumers	Raise awareness and improve behaviour
Energy Communities	Increase optimisation and control to maximise benefits
Developers & Property Managers	Use of innovative technologic solutions
Local Governments	Adopt policies for a smarter use of energy
Network	Deeper integration with renewables

REGALGRID® : REAL-TIME ENERGY MANAGEMENT ARCHITECTURE

THANKS!

REGALGRID
sharing your power

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