SUSTAINABLE PLACES 2025

Energy Islands for a Sustainable Future:

Insights from European Research Projects

Day **3** Thurs. 10 Oct. 14.00 - 15.00 CEST

In-person Workshop

Projects

- NESOI
- NESOIplus
- Masterpiece
- SINNOGENES
- ISLET
- BRIDGE

SUSTAINABLE PLACES 2025

Agenda

14.00 Introduction
Giovanni Pica

14.05 NESOI and NESOIplus projects compared
Mario Cortese – Alessandra Montanelli
Alessandra Montanelli

14.25 Island as living LABs
Cristina Barbero
Christian Galletta
Giovanni Pica
Giorgia Spigliantini

14.45 Q&A - Conclusion
Giovanni Pica

New Energy Solutions Optimised for Islands NESOI EUROPEAN ISLANDS FACILITY

ISLET

bridge

Masterpiece

SINNOGENES

New Energy Solutions Optimised for Islands NESOI Plus EUROPEAN ISLANDS FACILITY

Island as living laboratories

Islands are places of natural beauty, rich biodiversity, and deep cultural heritage

They are also energy systems in miniature: complex, self-contained, and exposed to external pressures

Challenges

- Dependence on imported fossil fuels
- Limited infrastructure
- High energy costs
- Vulnerability to climate change

EU investments in R&D projects

Opportunities

- Geographical isolation
- Strong community identity
- Clear boundaries
- Controlled scalability

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Islands as living laboratories for the energy transition

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EU investments in R&D projects

Islands as living laboratories for the energy transition

EU Projects

NESOI
supports local authorities on islands in preparing and implementing clean energy investments

NESOI Plus
builds on NESOI's legacy and focuses on the EU's Outermost Regions

EU investments in R&D projects

ISLET
supports the creation of Renewable Energy Communities

SINNOGE.ES
designs resilient and flexible energy systems for insular territories

bridge
connects EU projects and links their outcomes to European policy

Masterpiece
empowers local governments to scale up successful pilot energy transition experiences

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New Energy Solutions Optimised for Islands

NESOI

EUROPEAN ISLANDS FACILITY

Speaker:
Mario Cortese - R2M
Alessandra Montanelli - SINLOC

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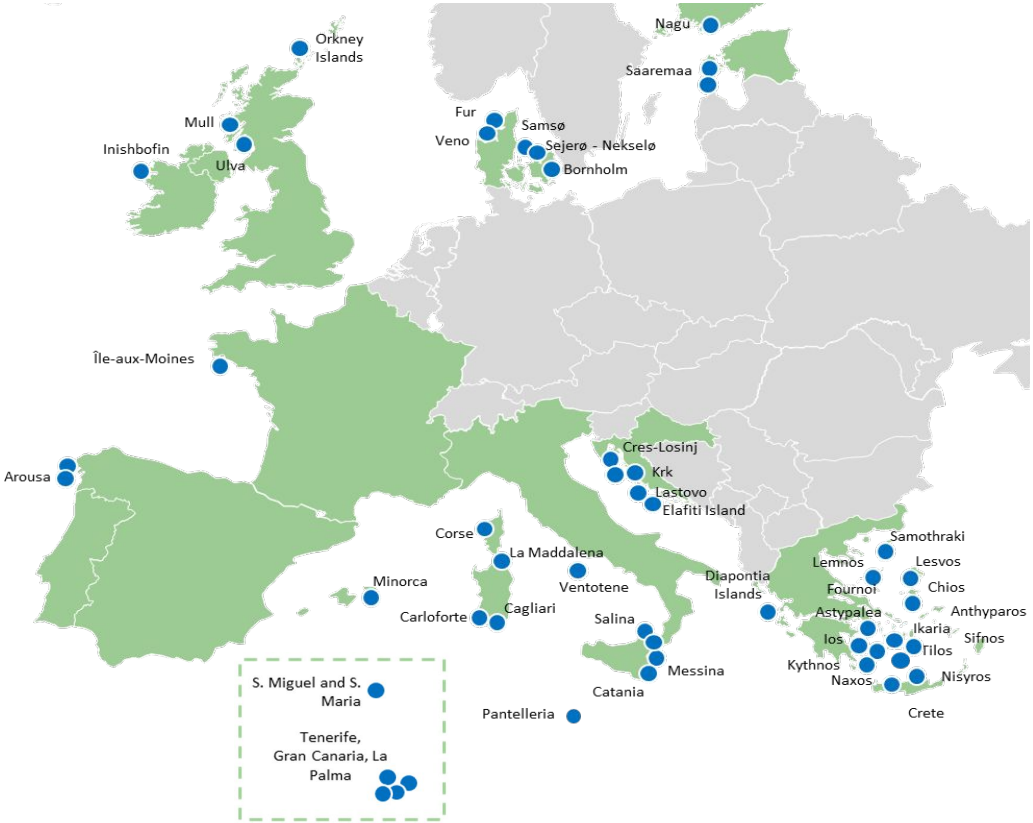
New Energy Solutions Optimised for Islands
NESOI
EUROPEAN ISLANDS FACILITY

NESOI Facility as a Reference Practice

Impact



NESOI Key Numbers

2 open calls
166 applications

54 selected projects

70 islands in 12 EU countries

424 ktCO2/yr
GHG emission savings

6.2+ M€
Technical assistance

455+ M€
Mobilized investments

CWA Exploitation strategy

OSS NESOI Platform

1,900+ followers and
500+ registered users

3 Short Study Tours,
234 E-learning contents
29 webinars

NESOI in the EU standardization system
Our drivers

- A NESOI promoted CWA (a publicly recognized reference practice) to establish a standardized methodology to assist the islands

✔ NESOI developed a **structured** and organized system and method to assist islands ETP.
✔ **Broad** geographical and technological coverage: 54 projects (86 islands)
✔ General **successful** support proved by positive feedbacks from our beneficiaries

- Partners promoting and leading CWA works:

NESOI in the EU standardization system

What is a CEN Workshop Agreement (CWA)?

- A process promoted by CEN to publish and formalize a **reference practice** within a specific domain
- A CWA advantageous for addressing **dynamic and rapidly evolving fields** within the European market.
- A CWA offers a **flexible and efficient way to develop specifications** or guidelines within the European standardization system.
- A CWA allows **to address industry needs rapidly**, fostering innovation and adaptation to new methodologies, processes and technologies.
- A CWA provides a more agile framework for industry stakeholders **to create consensus-driven** documents that can be easily updated or revised as needed.

Standardized Approach for the Management of Technical Assistance Platform and Cascade Funding Mechanism (CWA 18270, September 2025)

Scope

The NESOI-Promoted CEN Workshop Agreement defines procedures for the management of technical/financial/legal support to energy transition projects implemented through a cascade funding approach. This includes procedures for the selection of projects to be supported, standardization of technical/financial/legal assistance menus for energy transition projects, procedures for the management of cascade funding initiatives and methodology to assess replication and boost islands' empowerment .

STANDARDIZED PROCEDURES

1. Management of Open calls

2. Management of the Technical Assistance

3. Management of the Cascade funding

The Final CWA was published on 11 Sep. 2025. Available on CEN website and on ALL National Standardization Bodies websites Europe-wide

Useful Links

Direct Download here!
https://www.cencenelec.eu/media/CEN-CENELEC/CWAs/RI/2025/cwa_18270_2025.pdf

On CEN-CENELEC Official Download Page it is currently listed as the 2nd most recent CWA published in Europe
https://www.cencenelec.eu/get-involved/research-and-innovation/horizon-europe-projects/cwa-download-area/

2025-06-25 Final Public Consultation Announcement
https://www.cencenelec.eu/news-events/news/2025/workshop/2025-06-06_nesoi/

2024-05-29 Kick off Announcement
https://www.cencenelec.eu/news-events/news/2024/workshop/2024-05-29-nesoi/

CEN WORKSHOP AGREEMENT

CWA 18270

September 2025

ICS 27.010; 03.100.70

English version

Standardized Approach for the Management of Technical Assistance Platform and Cascade Funding Mechanism

This CEN Workshop Agreement has been drafted and approved by a Workshop of representatives of interested parties, the constitution of which is indicated in the foreword of this Workshop Agreement.

The formal process followed by the Workshop in the development of this Workshop Agreement has been endorsed by the National Members of CEN but neither the National Members of CEN nor the CEN-CENELEC Management Centre can be held accountable for the technical content of this CEN Workshop Agreement or possible conflicts with standards or legislation.

This CEN Workshop Agreement can in no way be held as being an official standard developed by CEN and its Members.

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EUROPEAN COMMITTEE FOR STANDARDIZATION
COMITÉ EUROPÉEN DE NORMALISATION
EUROPÄISCHES KOMITEE FÜR NORMUNG

CEN-CENELEC Management Centre: Rue de la Science 23, B-1040 Brussels

Ref. No.:CWA 18270:2025 E

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New Energy Solutions Optimised for Islands

NESOI Plus

EUROPEAN ISLANDS FACILITY

Speaker:
Alessandra Montanelli - SINLOC

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New Energy Solutions Optimised for Islands
NESOI Plus
EUROPEAN ISLANDS FACILITY

At a glance

OSS	ENERGY COMMUNITIES	OUTERMOST REGIONS	INVESTMENT PIPELINES

What's next

- 2 open calls (in Apr26 and Feb27)
- New One-Stop-Shop for islands
- SST and capacity building

EU Projects

EU investments in R&D projects

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Masterpiece

Speaker:
Cristina Barbero - Municipality of Berchidda

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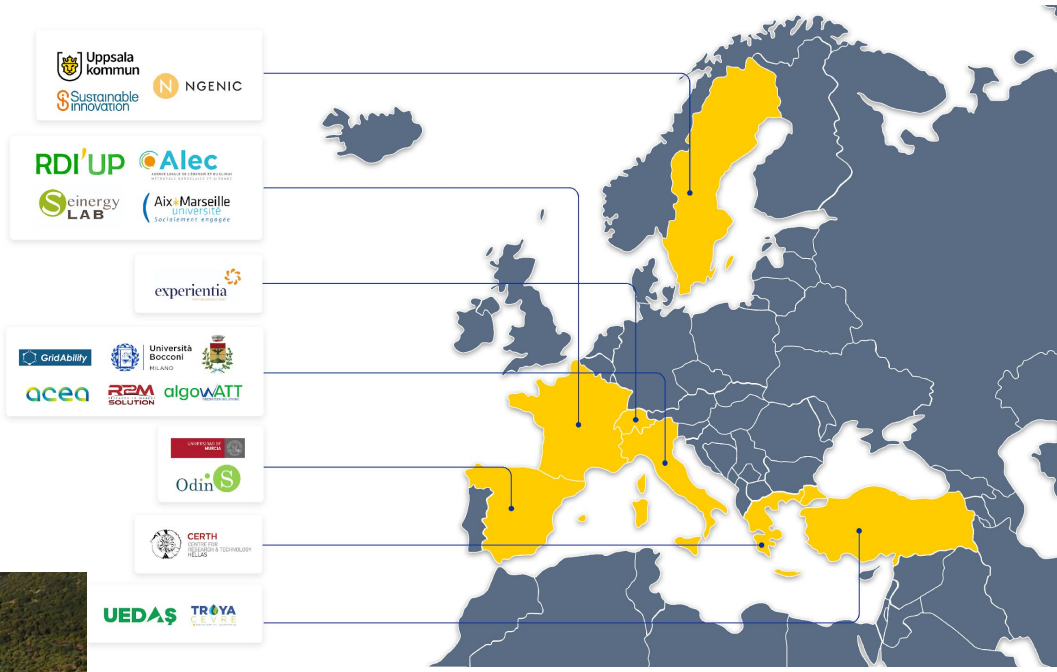
Masterpiece

Consortium formed by 19 participants. (2023-2026)

MASTERPIECE wants to build a modular platform to help with the creation and operation of energy communities.
The platform will contain social and technological innovations



2668 inhabitants

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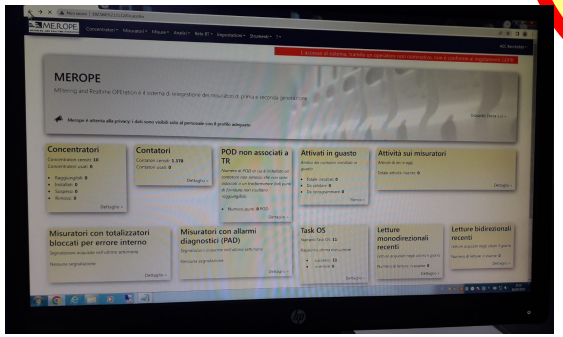
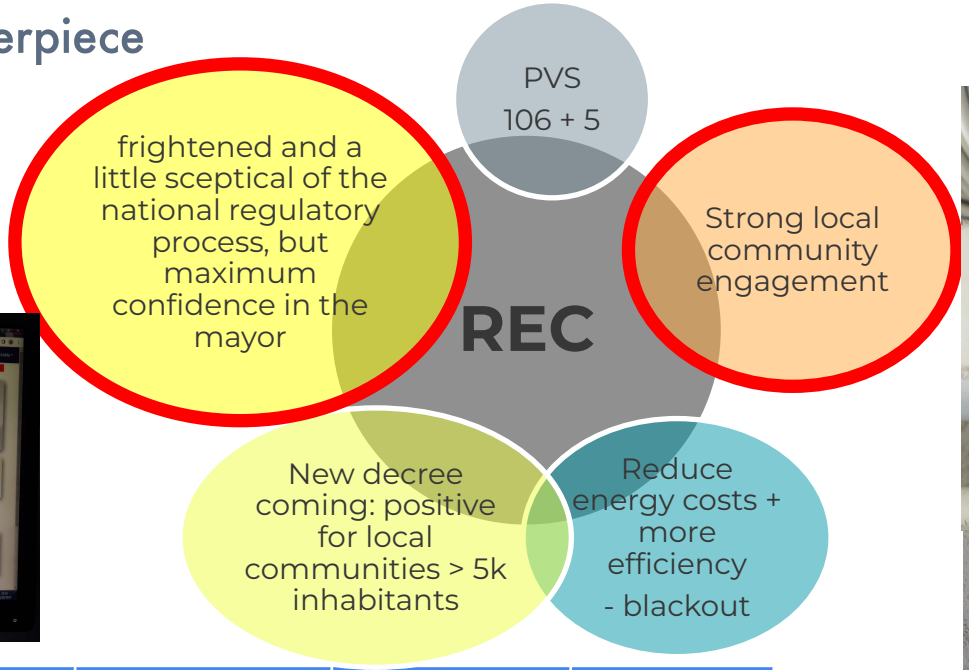
Masterpiece





Gender	Degree	Diploma	Secondary School	Primary School	Alphapets
Male	57	271	435	324	77
Female	84	305	492	356	158
Tot	141	576	987	680	235

- Last official census 2011 – www.istat.it

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Masterpiece

Present

Future Plans

2025	2026	2027

Current goals

- > REC's members
- > Energy optimization
- > Community engagement

Project final goals

- Contact local community/citizens
- Public events to share common vision/goals
- foster a sense of community

Project results

- Dissemination& Communication via social media
- > REC's members
- Dissemination& Communication via social media

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SINNOGENES

Speaker:
Giovanni Pica – RINA Consulting

Objectives, key concepts and workflow

Objectives

SINNOGENES aims to facilitate the **large-scale integration of innovative energy storage technologies** into European energy systems, developing the **SINNO toolkit:** a set of digital tools, business models, and technological solutions for storage

Key concepts:

- ✔ SINNOGENES is **not a storage-only project**
- ✔ SINNOGENES does **not** follow a linear “first generation, then storage” approach.
- ✔ It’s a **system-level integration** of generation, storage, and control.

Phase 1 Pre-development

- ✔ Analysis of flexibility requirements for market compliance.
- ✔ Design of the SINNO energy toolkit architecture (generation and storage)
- ✔ Focus on interoperability, data exchange, and IT integration

Phase 2 Development

- ✔ Development of individual tools for:
  i) Storage technologies (batteries, flywheels, hydro-pumped, thermal)
  ii) Generation systems (PV, wind, hydrogen electrolysis, geothermal)

Phase 3 Demonstration

- ✔ Real-world pilots in six demo sites
  Ikaria: wind + hydro-pumped storage
- ✔ Geneva: PV + hydrogen + battery
- ✔ Soria/Huesca: geothermal + thermal storage + electric grid

Phase 4 Valorization

- ✔ Scalability and replicability analysis of storage technologies.
- ✔ Impact assessment: environmental, economic, social.
- ✔ Cross-sector integration: mobility, industrial, residential

Focus on insular systems

WP5: Transport & Insular Systems

Develops tools for integrating energy storage into smart grids, focusing on flexibility management, monitoring, and control

T5.3 Demonstration in Ikaria, Greece

Conducts the demonstration activities, from the setup of the digital twin (integrating the tool to the existing system operators' tools and systems) to the demonstration of the use cases in the pilot

T5.2 Tools for virtualized investment planning for operators valorising hydro-pumped storage

Generate the digital twin of a hydro-pumped storage plant, along with the connected power system

T5.1 Tools for management of transport fleets and synergy with the energy networks

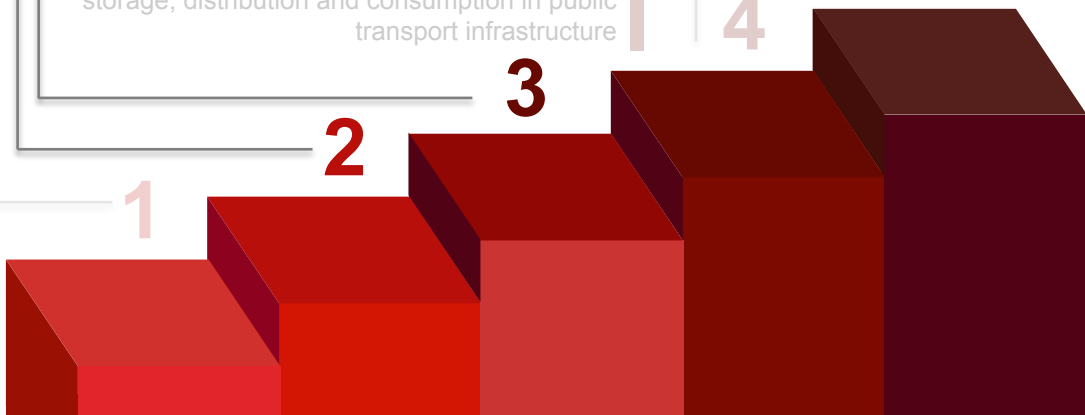
Establishes AI-powered transport services considering the energy storage and consumption requirements and the synergy with the corresponding energy network

T5.5 Evaluation and Impact Assessment

Assesses the technical, economic, and environmental impact of smart grid storage solutions demonstrated in WP5.

T5.4 Demonstration in Geneva, Switzerland

aims to assess energy forecasting services for storage, distribution and consumption in public transport infrastructure



Tool development

T5.2 Tools for virtualized investment planning for operators valorising hydro-pumped storage

Generate the digital twin of a hydro-pumped storage plant, along with the connected power system

A digital twin is like a “digital replica” of the real electrical grid: a virtual model that represents the current state and operation of the network

The digital model is connected to the data and software currently used by operators to monitor and control the grid

Data will be collected from smart meters and network control devices installed at medium and high voltage levels. They monitor the status of lines, transformers, and plants

Based on this comprehensive dataset, the digital twin platform will generate a variety of detailed scenarios, used to perform targeted feasibility studies

T5.3 Demonstration in Ikaria, Greece

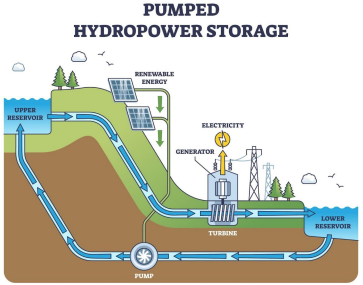
Conducts the demonstration activities, from the setup of the digital twin (integrating the tool to the existing system operators’ tools and systems) to the demonstration of the use cases in the pilot

The SINNO toolkit implemented

Digital Twin:
A virtual replica of Ikaria’s power system

Day-Ahead Optimizer:
calculates the best energy mix for the next day

Forecasting Tool:
Uses AI to predict wind energy production to improve grid stability



Lessons learned and challenges

The SINNO toolkit implemented

Digital Twin:
A virtual replica of Ikaria's power system

Day-Ahead Optimizer:
calculates the best energy mix for the next day

Forecasting Tool:
Uses AI to predict wind energy production to improve grid stability

Lessons learned

- ✔ Digital twins are powerful tools for planning when validated with real data.
- ✔ AI-based forecasting significantly improves accuracy
- ✔ Hydro-pumped storage effectiveness depends on system constraints
- ✔ Curtailment must be minimized to ensure economic and environmental efficiency

Challenges Encountered

- ✔ Safety Grid Requirements limited the achievable RES penetration.
- ✔ Computational complexity and performance
- ✔ Data availability and granularity
- ✔ Modeling interconnections

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ISLET

Speaker:
Christian Galletta - FEDARENE

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ISLET

ISLET focuses on developing Renewable Energy Communities (RECs) on small Mediterranean islands, by empowering local authorities to create a favourable environment for RECs and collaborate with citizens.

In pills

Coordinator: Istituto sull'Inquinamento Atmosferico, Consiglio Nazionale delle Ricerche

GRAD CRES

ASTYPALEA #AEGEANENERGYSPRING

Comune di Procida

LEGAMBIENTE

island movement

ENERGI AKADEMIET

DAFNI Network of Sustainable Greek Islands

MIEMA Malta Intelligent Energy Management Agency

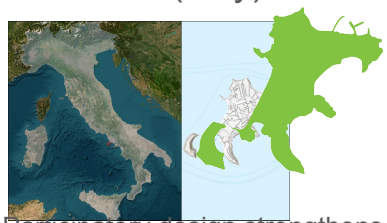
ΟΙΚΟΝΟΜΙΚΟ ΠΑΝΕΠΙΣΤΗΜΙΟ ΑΘΗΝΩΝ ATHENS UNIVERSITY OF ECONOMICS AND BUSINESS

FEDARENE

- **7 Renewable Energy Communities (RECs)** (3 in pilot islands and 4 in test islands).
- **30 replication islands**.
- **30 local authorities representatives and staff** trained on the regulatory framework, funding possibilities, and formal steps to take to build a REC.
- Improvement of knowledge on RECs for 70 small islands local authorities.
- **At least 500 citizens (180 families)** involved in 3 pilot islands and 4 test islands.
- **5 help desks** at EU level to support local authorities in the development of RECs also after the project end

Pilot islands – Lessons learnt

Procida (Italy)



- ❑ Participatory design strengthens legitimacy
- ❑ Local facilitators build trust and overcome barriers
- ❑ Strategic alignment with Sustainable Energy Action Plans (SEAPs) and EU policy adds leverage
- ❑ Visible implementation builds momentum

Astypalea (Greece)

- ❑ The strong local authority relationships were essential
- ❑ Conflict management and member differentiation are key
- ❑ One-to-one engagement builds trust
- ❑ Complex procedures require extra time

Cres (Croatia)

- ❑ Legal National frameworks are misaligned and unclear
- ❑ Cooperatives face unjust exclusion
- ❑ Infrastructure ownership is a bottleneck
- ❑ Persistence and clear communication are critical

Takeaways

- Make REC tangibles with pilot scale actions (e,g, a PV plant on a school)
- Local trust and facilitation are critical
- National REC laws are fragmented, leading to admin complexities
- RECs can serve as living testbeds for policy reform

SUSTAINABLE PLACES 2025

bridge

Speaker:
Giorgia Spigliantini – RINA Consulting

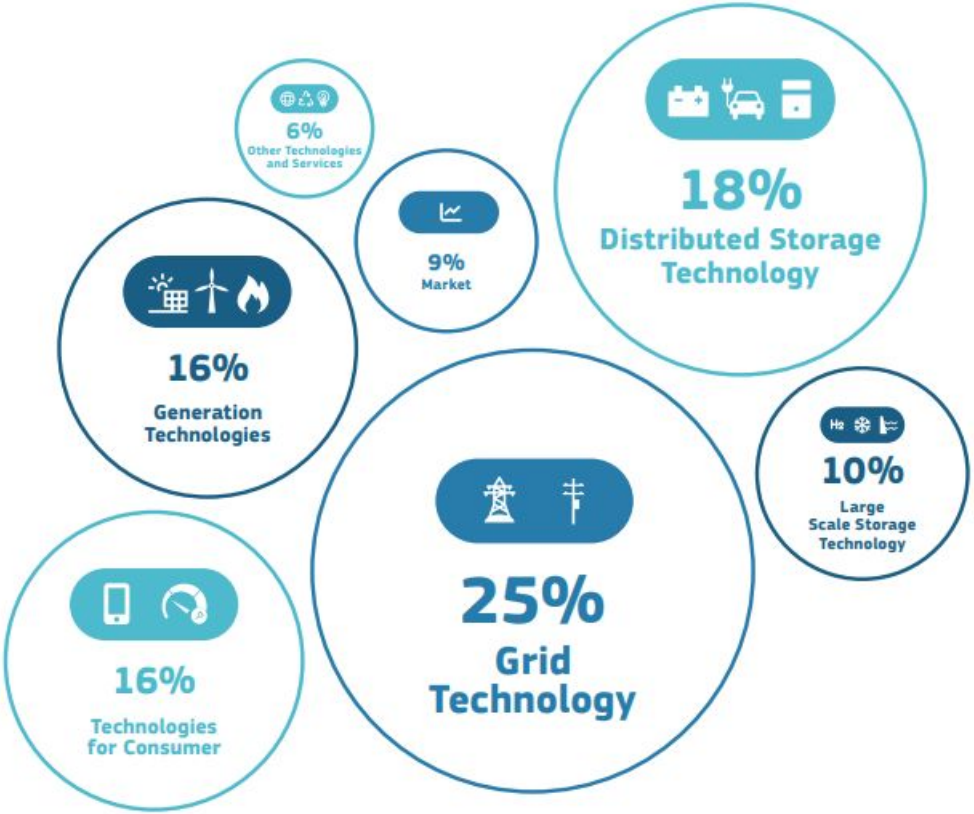
Introduction to the BRIDGE initiative

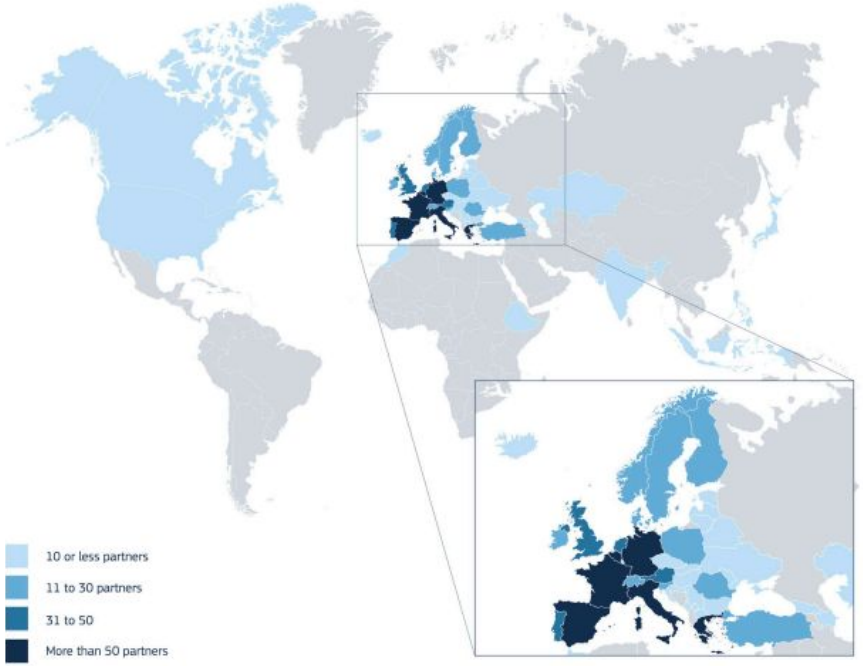
1. Sharing of best practices and lessons learned
2. Support for the resolution of challenges
3. Support in the uptake of results
4. Generation of new project ideas
5. Networking with key energy actors
6. Knowledge sharing

BRIDGE is the European Commission initiative which unites Horizon 2020 and Horizon Europe (funded between 2014 and 2024) **Smart Grids**, **Energy Storage**, **Islands**, **and Digitalisation Projects**.

Its objective is to **create a structured view of cross-cutting issues encountered in demonstration projects**, discuss solutions to overcome obstacles to innovation, share knowledge and deliver recommendations to facilitate the energy transition.

Partners involved in BRIDGE projects





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bridge Technologies tackled by BRIDGE Projects

Technologies for Consumers

Demand response, smart appliances, smart metering, heating/cooling peak load management

Grid Technologies

HVDC, HVAC, multi-terminal (MT), protections, HVDC breaker, grid inertia, network management, monitoring and control tools1, micro-grid, semiconductor devices and power converters

Large- scale storage technologies, in general connected at transmission level

Power to gas (P2G), compressed air energy storage (CAES), hydro storage, and molten salt storage

Small-scale storage technologies, in general connected at distribution level

Battery energy storage systems (BESS), flywheel energy storage, pumped hydro storage, thermal energy storage (TES), hydrogen energy storage, compressed air energy storage (CAES)

Generation technologies

Wind turbines, photovoltaic (PV), solar thermal, biogas, tidal energy, micro-generation, floating offshore wind, floating offshore PV, Ocean thermal energy conversion (OTEC)

Market

Infrastructure costs, electricity market, ancillary services, other market services

Other technologies and services

Recycling demonstration plant for EoL windmill blades, Ultra-High-Strength - concrete precast components, innovative materials, Life Cycle Assessment (LCA), energy system modelling

BRIDGE Working Groups

BRIDGE enables projects to **share knowledge continuously and speak with a single voice** when delivering conclusions and recommendations for future project result utilization through **four working groups (WGs)**

Regulation

Regulation, established with the aim of fostering knowledge sharing among projects addressing the different regulatory aspects in the energy domain: it structures its activities by focusing on various regulatory aspects in the energy sector to identify best practices to overcome them and making suitable recommendations

Business Models

Business Model, established with the aim to define a common framework for describing and evaluating business models, identify and assess existing and innovative models from project demonstrations or use cases, and develop standardised processes and effective mapping to enable comparison of different approaches to Smart Grids

Data Management

Data Management, cover a wide range of aspects ranging from the technical means for exchanging and processing data between interested stakeholders, to the definition of rules for exchange, including cybersecurity issues and responsibility distribution in data handling

Consumer and Citizen engagement

Consumer and Citizen Engagement, established with the aim of creating a structured cross-cutting understanding of the role and methodologies of engagement in European R&I projects towards better understanding, triggering, and leveraging the action of consumers and citizens in the energy landscape

Islands in BRIDGE project

Type of Island	Proiect	Short description	WG
Phisical Island	IANOS	Decarbonisation and smartification of island energy systems through renewable integration, flexibility services, and community engagement.	BM, DM, REG, CCE
	ISLANDER	Deployment of renewables, storage, electric vehicles, and district heating to create a smart and resilient energy system on Borkum Island.	CCE
	MAESHA	Development of smart grids and energy communities to enhance flexibility and decarbonisation in non-interconnected territories.	BM, DM, REG
	RE-EMPOWERED	Multi-vector microgrid solutions for island decarbonisation, integrating renewables, storage, and advanced control systems.	BM, DM, REG, CCE
	VPP4ISLANDS	Design and implementation of Virtual Power Plants to enable intelligent energy management and flexibility on islands.	DM, REG, CCE
	SMHYLES	Hybrid energy storage systems to improve resilience and reliability of isolated island grids.	BM
	ROBINSON	Local integration of hydrogen and biomass technologies to decarbonise industrial activities on islands.	N/A

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Q&A

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Summary and next steps

Each project brings a different piece of the puzzle

Planning and investment support

Policy alignment and standardization

Community empowerment

Technical resilience and digital tools

Next steps:

- Strengthen collaboration
- Engage municipalities and citizens
- Contribute to standards and policy
- Keep the conversation going

Thank you for your attention!