



Smart  
Energy  
Systems  
ERA-Net

# Joint Programming Platform ERA-Net Smart Energy Systems

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Pantera Event, Sofia, July 2nd, 2019

# A multilateral network of public funders

*Joint Programming for Flourishing Innovation from Local and Regional Trials towards a Transnational Knowledge Community*

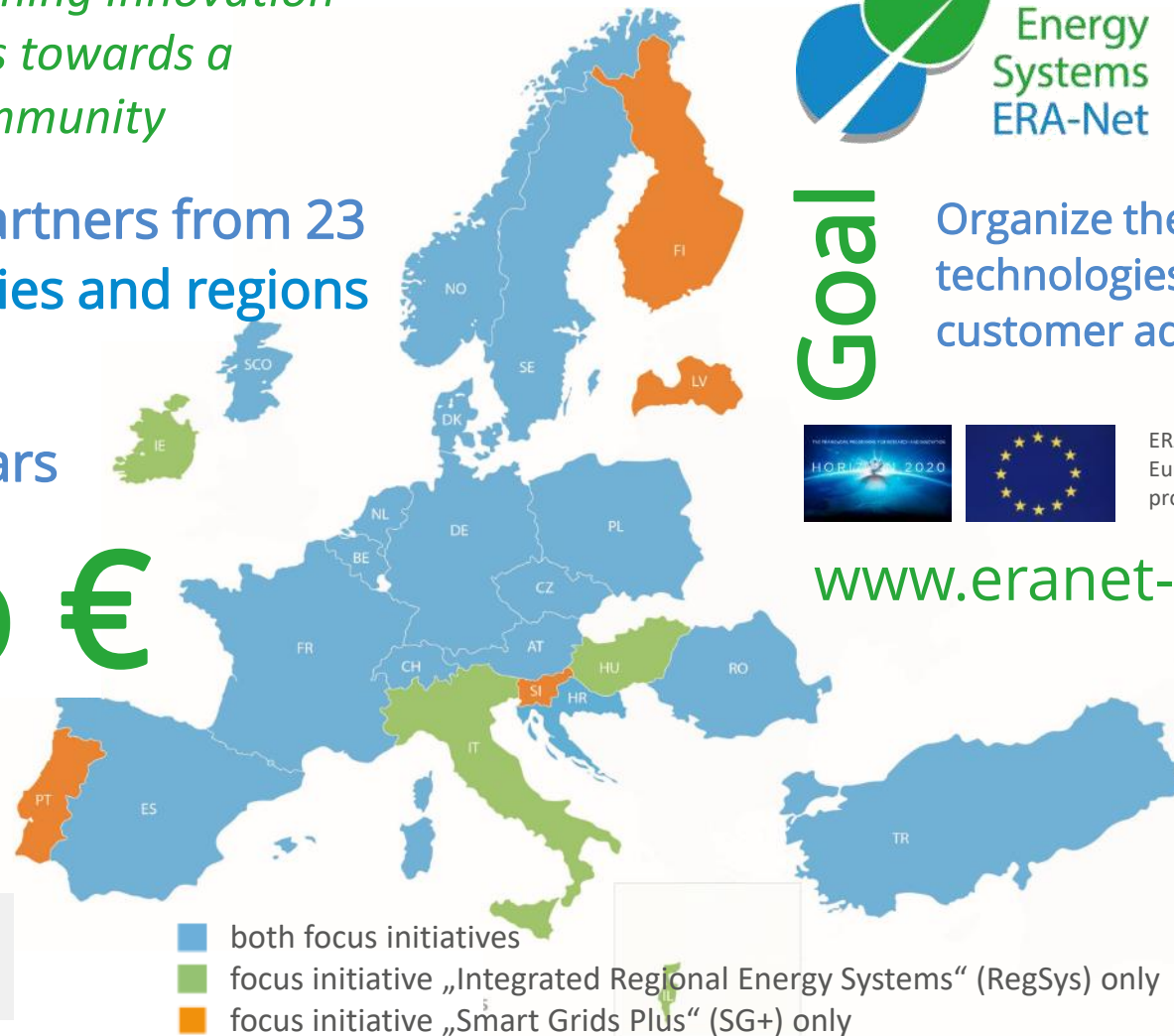
**30** Public funding partners from 23 European countries and regions

**4** joint calls in **4** years

**>100 mio €**

funding provided

Fall 2019: Joint Call on **Integrated Storage Systems** in cooperation with Mission Innovation



**Goal**

Organize the learning to enable the right technologies, market designs and customer adoption

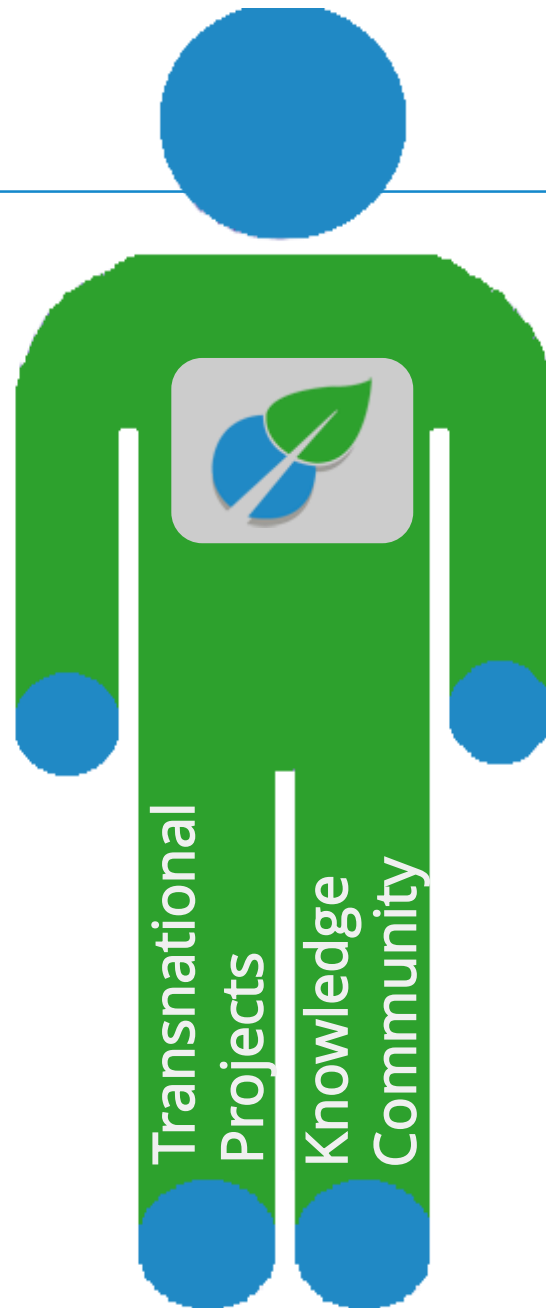


ERA-Net Smart Energy Systems has received funding from the European Union's Horizon2020 research and innovation programme under grant agreement No 64603 and No. 775970.

[www.eranet-smartenergysystems.eu](http://www.eranet-smartenergysystems.eu)

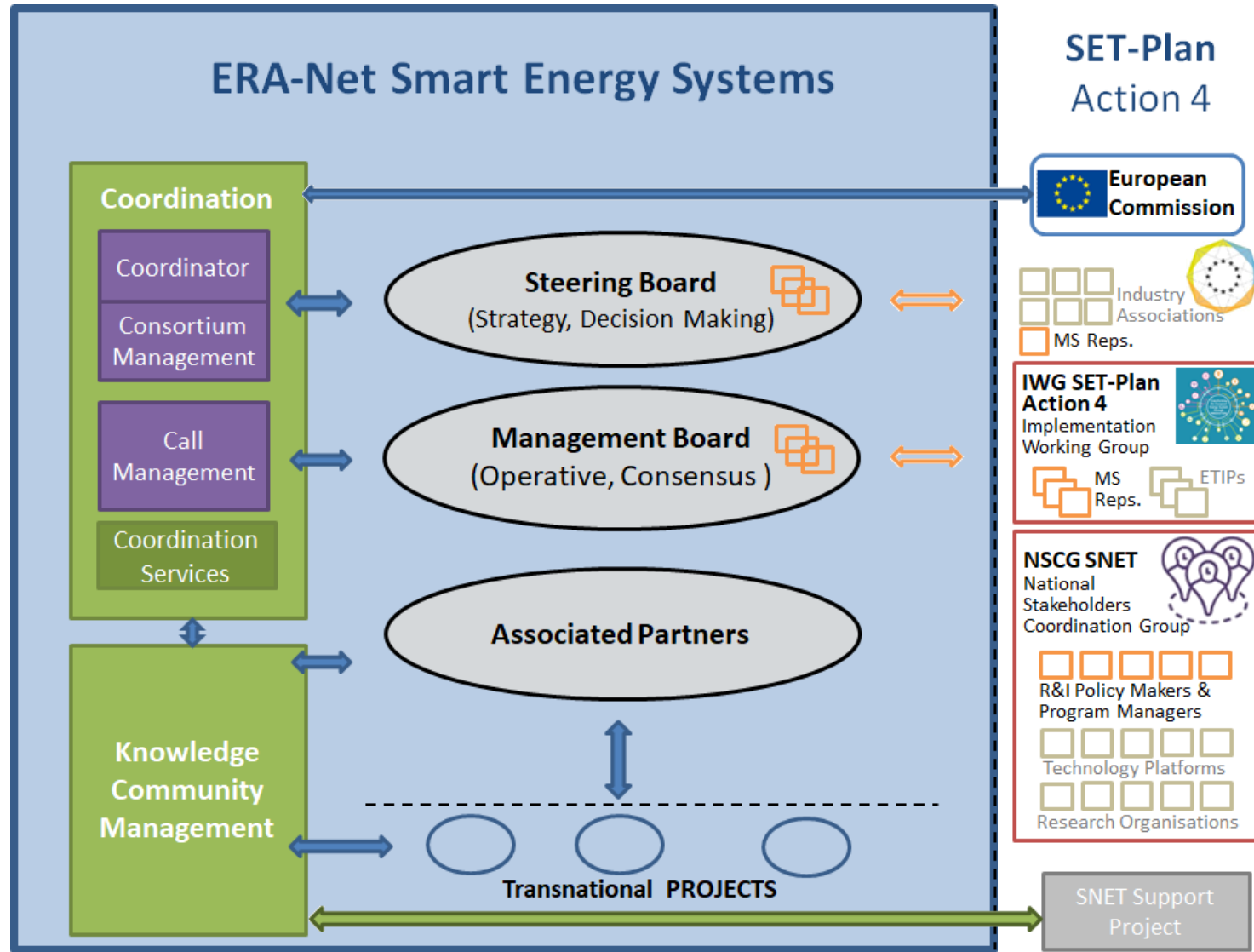


# Walking on two Legs

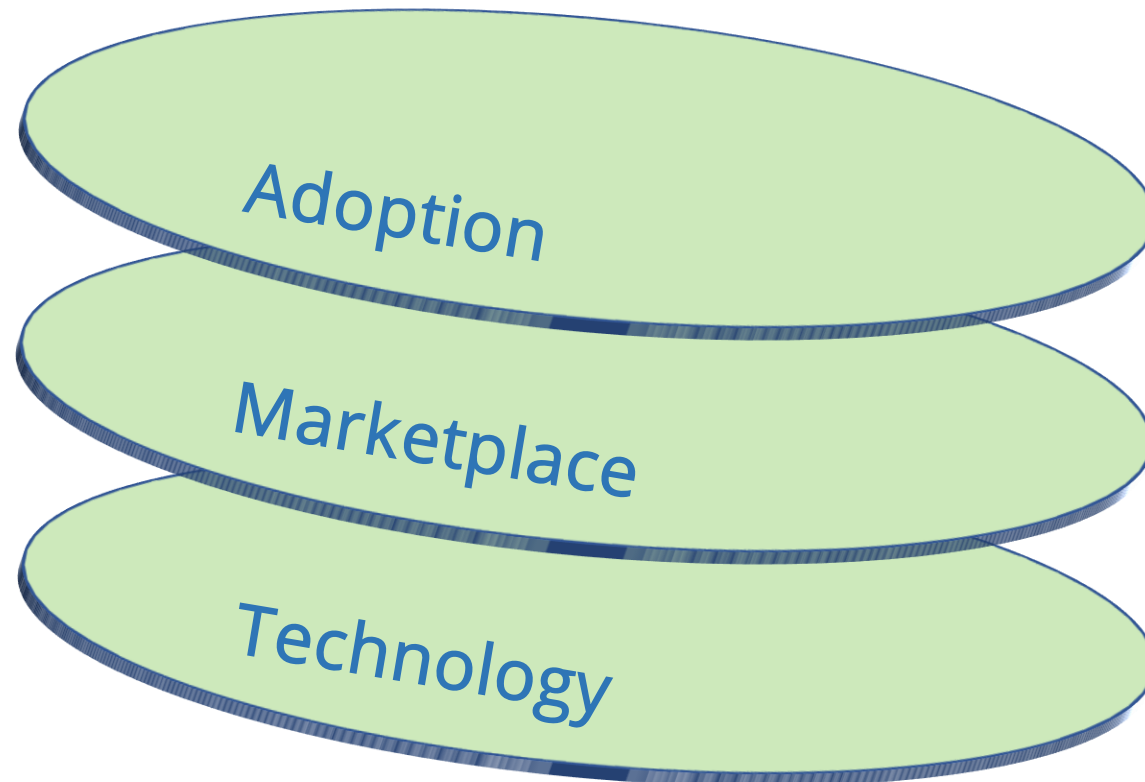


- Transnational Projects
  - national funding with EU top-up funds
  - selected in ERA-Net Calls
  - communication and evaluation by Support Team
- Knowledge Community
  - from and for the ERA-Net SG+ projects
  - national and international experts
  - unique networking and knowledge base

# Cooperation Structure



# General Principle 1: The three Layer Research Model



# General Principle 2: Three Dimensions of Integration

## cross sectoral integration:

- transport
- industry and trade
- municipal infrastructure
- agriculture
- ...

## local and regional development:

- governance
- planning
- innovation system
- SMEs and startups
- transnational knowledge base
- ...

## smart energy system:

- renewable energy
- distributed generation
- cross carrier synergies
- automation ...

## Smart Grids Plus

(Start 2015)

- 3 multilateral calls
- > 30 projects
- > 80 mio € funds

## Integrated Regional Energy Systems

(Start 2018)

- Extended scope – sector coupling
- Involvement of Associated Partners
- First multilateral call May 2018 (> 30 mio € funds)

## Storage Systems

(Start 2019)

- Electrical, chemical, thermal, mechanical
- Multilateral call Autumn 2019
- Together with Mission Innovation (MIGCall19)


## Digitalisation

(Start 2019)


- tbd
- First multilateral call 2020



# It's not a game ...



**CESEPS**  
Co-Evolution of Smart Energy Products and Services

SG+ Joint Call 15 

**Demand-oriented design of smart energy products and services for local energy grids and markets**

Cluster

**Grid Design**


Topics

residential grids, demand-oriented grid design, users' energy behavior, local energy generation and trading, demand side management, e-mobility, forecasting, renewables, co-evolution of products and services

Results Technology Market Adoption

- T** Network modeling methodology for AC and DC with EV, demand side management, customer safety and storage
- T** Tools for sustainability and energy-efficiency rating of smart grid pilots
- T** Co-simulation framework combining real and simulated elements
- M** Specifications and implementation guidelines for the development of products and services
- M** Medium and long term scenarios for local smart grids
- A** Catalogue of user demands for smart energy products and services
- A** Overview on required changes in energy practices and related barriers

Runtime 2016-2019 TRL 3 → 7



**Transnational cloud for interconnection of demonstration facilities for smart grid lab research & development**

Cluster

**Resilience**


Topics

smart sockets, grid resilience, ancillary services, risk and benefit analysis, converter interoperability, energy management, validation of grid lab results, grid lab cooperation, renewables, distributed energy resources, AC/DC hybrid grids

Results Technology Market Adoption

- T** Transnational cloud platform for smart grid labs with data, methodologies, test results and catalogue of resources
- T** List of parameters and requirements for converter interoperability
- T** Comprehensive map of ancillary services including technical evaluation
- M** Method for evaluation of risks and benefits of providing ancillary services by prosumers
- M** Market design for many participants on supply and demand side and renewables integration
- A** Catalogue of recommended grid stability
- A** Catalogue of recommended strategies

Runtime 2016-2019



**Grid-Friends**

**Energy management system with demand response for grid-friendly quasi-autarkic energy cooperatives**

Cluster

**Local Energy Communities and Microgrids**


Topics

demand response, forecasting algorithms, cooperative models, decentralized coordination, energy management system, renewables, user preferences

Results Technology Market Adoption

- T** Control algorithms for energy services with distributed storage units (batteries, heat buffer, EV)
- T** Licensable software for distributed sector-coupled energy management system and community management system
- T** Forecasting algorithms for PV generation, load and heat demand
- M** Cooperative business models for microgrids
- M** Characterisation of the market actor "microgrid manager"
- A** Decision model for eliciting user preferences

Runtime 2016-2019 TRL 4 → 6



**Market platform for local load shaping**

Cluster

**Local Energy Communities and Microgrids**

Topics

tariff design, dynamic market needs, grid capacity, simulation, load shifting

Results Technology Market Adoption

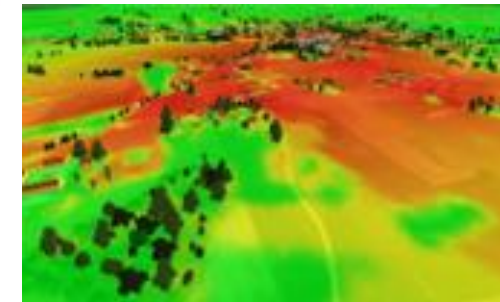
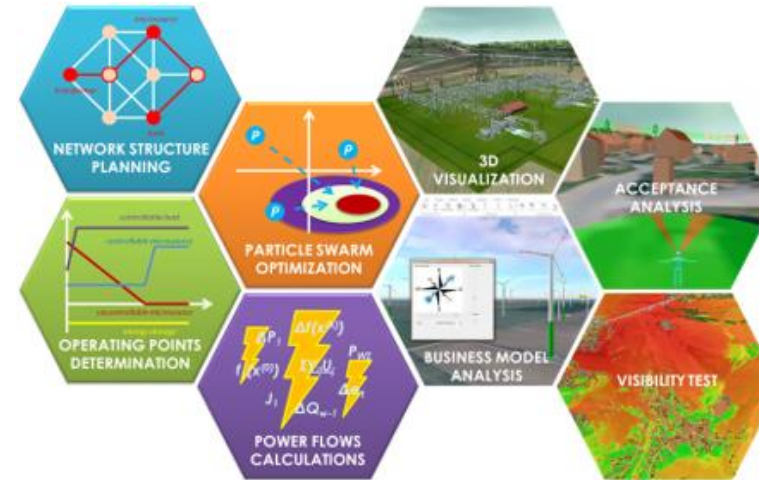
- T** Platform for efficient management and on market signals
- T** Shaving flexibility for grid-

Runtime 2016-2019 TRL 4 → 6

- topics
- results
- runtime
- TRL reached
- project consortium
- partners for further development

## Results (TRL 8)

- Control algorithm for microgrid operation
- Interactive design tool for multi-criterial planning of energy infrastructure in net zero energy villages (considering technical and economic factors and social acceptance) using virtual reality and artificial intelligence



Runtime: 2016-2019



- Mobility/EV (3): *EVA, REDAP, EVCHIP*
- Energy Storage (1): *KE:TTLE*
- Smart Grids (3): *ZEHTC, MultiportGrid, ANM4L*
- Cooling/Heating (4): *DISTRHEAT, Flexi-Sync, HEATflex, EPC2SES*
- Biology/chemistry (2): *PIGergy, AGRO-SOFC*
- IT/Digitalisation/Modelling (3): *SuperP2G, BEYOND, DiGriFlex*
- Framework/Market design/City planning (8): *SONDER, R2EC, FlexSUS, HONOR, SIES2022, TOP-UP, REgions, CLUE*

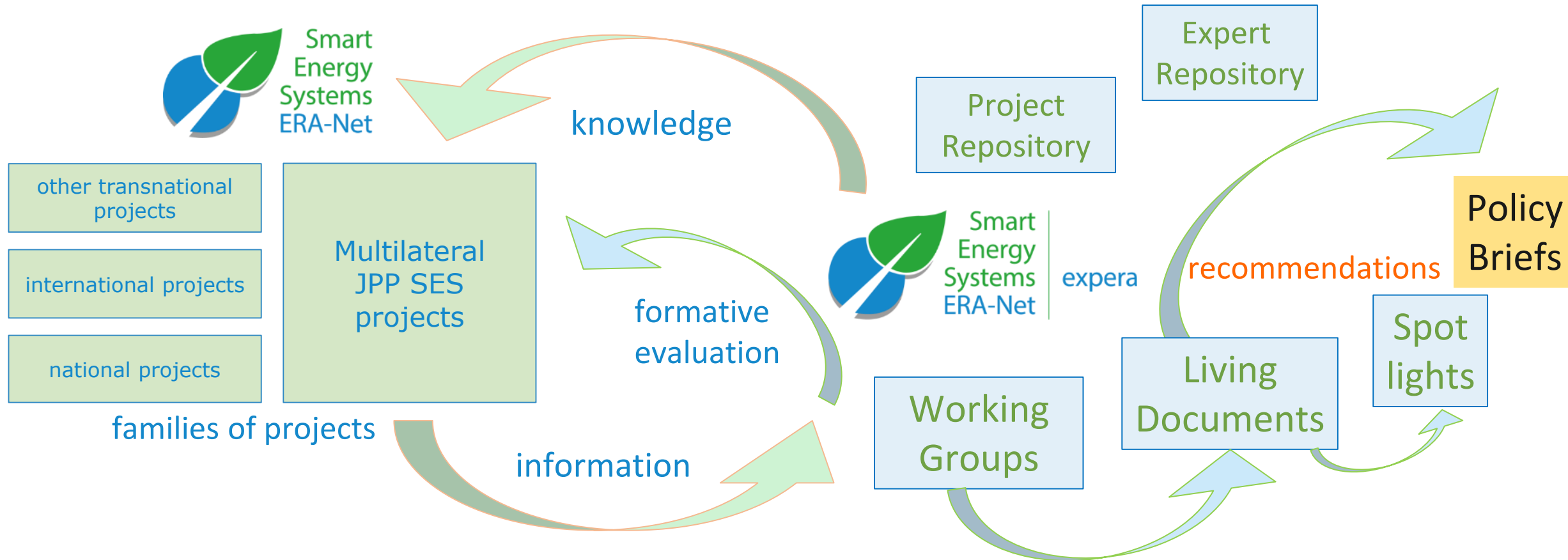


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# The Knowledge Community

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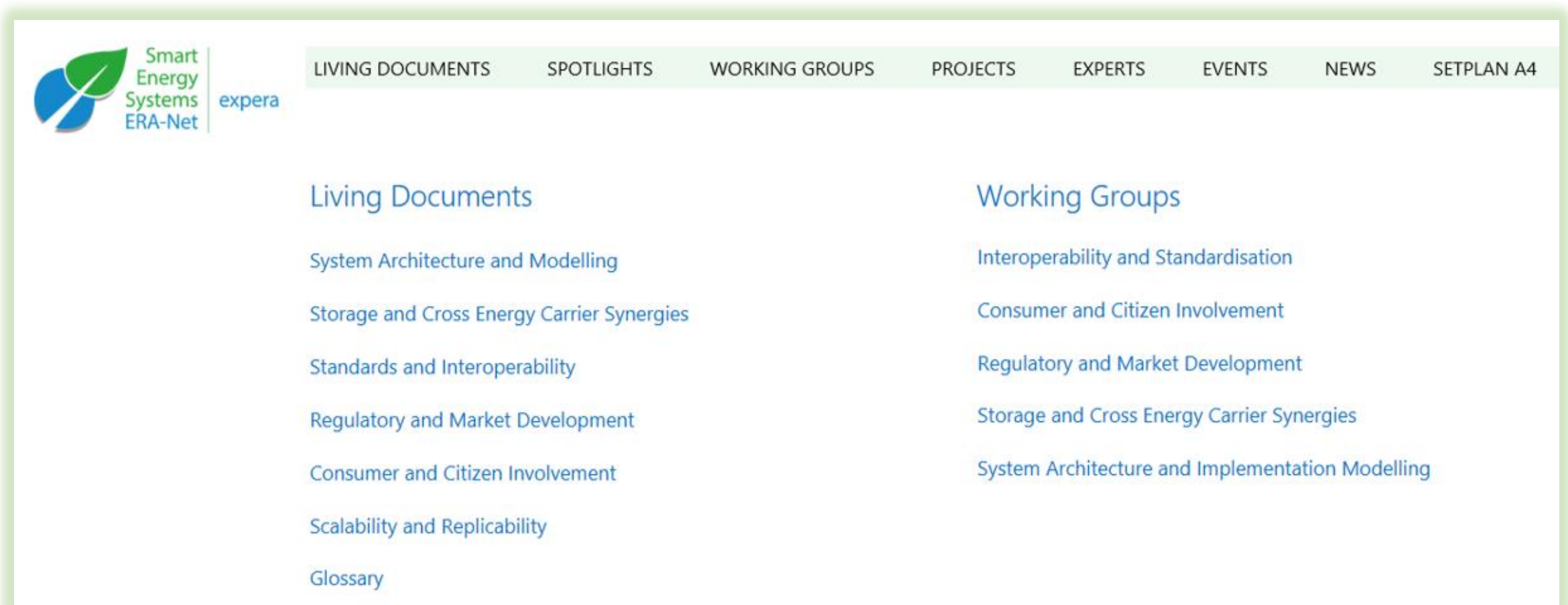
# Managing Projects' Knowledge



# ERA-Net SES: Extending SG+ Working Groups

System Architecture and Modelling	(regional data stores, ...)
Storage and Cross Energy Carrier Synergies	(heat & cold, CH4, H2, ...)
Interoperability and Standardisation	(needs, links to standards organizations)
Regulatory and Market Development	(regional marketplaces, ...)
Consumer and Citizen Involvement	(citizens, regional stakeholders,...)
Regional Matters (innovation, technology-transfer, new formats, regional investment ...)	

**Local Energy Communities**



The screenshot shows the expera website interface. On the left is the Smart Energy Systems ERA-Net logo and the word 'expera'. A horizontal navigation bar contains the following menu items: LIVING DOCUMENTS, SPOTLIGHTS, WORKING GROUPS, PROJECTS, EXPERTS, EVENTS, NEWS, and SETPLAN A4. Below the navigation bar, the 'LIVING DOCUMENTS' section is expanded, listing: System Architecture and Modelling, Storage and Cross Energy Carrier Synergies, Standards and Interoperability, Regulatory and Market Development, Consumer and Citizen Involvement, Scalability and Replicability, and Glossary. The 'WORKING GROUPS' section is also expanded, listing: Interoperability and Standardisation, Consumer and Citizen Involvement, Regulatory and Market Development, Storage and Cross Energy Carrier Synergies, and System Architecture and Implementation Modelling.

Register for expera: [www.smartgridsplus.eu](http://www.smartgridsplus.eu)

BROWSE PAGE



[go to Reporting Site Overview](#)  EDIT LINKS

## Reporting Site Overview


 EDIT LINKS

[Projects Reporting page](#)

(if you have multiple projects, please use "Select" column and a button  to switch between projects)

### Projects

[+ new item](#) or [edit this list](#)

✓	Select	Acronym	Title
		DEMO	DEMO PROJECT
		CERA-SG	Cost-Efficient Data Collection for Smart Grid and Revenue Assurance
		Callia	Callia - Open Inter-DSO electricity markets for RES integration
		ReFlex	Replicability Concept for Flexible Smart Grids
		GridFriends	Demand response for grid-friendly quasi-autarkic energy cooperatives
		MIDAS	Multi-input Intelligent Distribution Automation System

- budget plan & use
- achievements & deviations
- contributions & results
- people & documents

# Families of Projects - linking countries and regions



- Living Labs
- Demo Regions
- RDD Projects

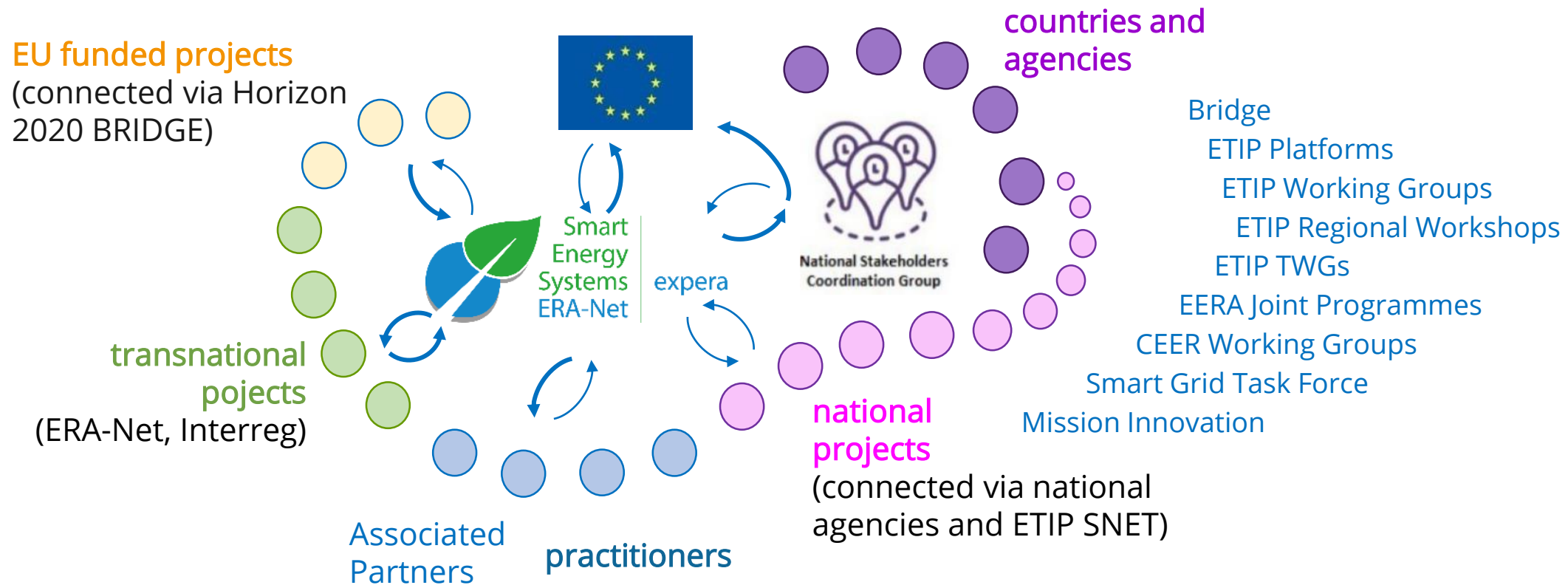


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# Advancing the Joint Programming Platform

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# ERA-Net SES Linking Worlds



# Joint Programming Platform: Co-Creation ...

## ... on programme level

- joint scoping
- joint monitoring
- advisory phase for projects
- joint use of platforms
  - horizontal platforms
  - vertical platforms

## ... on project level

- involving other RDI initiatives
- involving utilities and associations
- involving suppliers of utilities
- involving consumer associations
- etc.

# From Smart Grids to Integrated Energy Systems



## Focus Initiative Smart Grids Plus

- 3 transnational calls
- > 30 projects
- > 80 mio EUR funds

## Focus Initiative Integrated Regional Energy Systems

- Extended scope
- Involvement of Associated Partners
- MI19 call fall 2019 (integrated storage systems)

## Focus Initiative ???

## Knowledge Community

- Working Groups
- Knowledge Platform
- Spotlights & Policy Briefs



expera

# Associated Partner Programme

Joining forces with different kinds of non-funded cooperation partners to ...

- jointly foster development of technology and business solutions
- make sure that projects meet real needs of energy efficiency and energy transition processes
- link local and regional level to overall energy system
- connect to business domains way beyond the energy sector
- give RDD consortia confidence that their results will be adopted.

Involvement of Associated Partners does not only improve the quality of the funded RDD projects but also increase their overall impact.

# Associated Partners (April 2019)



# Impressions from 1<sup>st</sup> joint ASP meeting (Malmö, May 23, 2018)



# A new Challenge: Citizen Energy Communities

P8\_TA-PROV(2019)0226 - Common rules for the internal market for electricity (March 28, 2019)

- “... may engage in generation, distribution, supply, consumption, aggregation, energy storage, energy efficiency services or charging services for electric vehicles or provide other energy services to its members or shareholders”
- “Electricity sharing without being in direct physical proximity to the generating installation and without being behind a single metering point.”
- “... any form of entity, for example that of an association, a cooperative, a partnership, a non-profit organisation or a small or medium-sized enterprise.”
- “Directive empowers Member States to allow citizen energy communities to become ... closed distribution system operators”.

# Focus Initiatives

## Smart Grids Plus

(Start 2015)

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- > 30 projects
- > 80 mio € funds

## Integrated Regional Energy Systems

(Start 2018)

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- First multilateral call May 2018 (> 30 mio EUR funds)

## Storage Systems

(Start 2019)

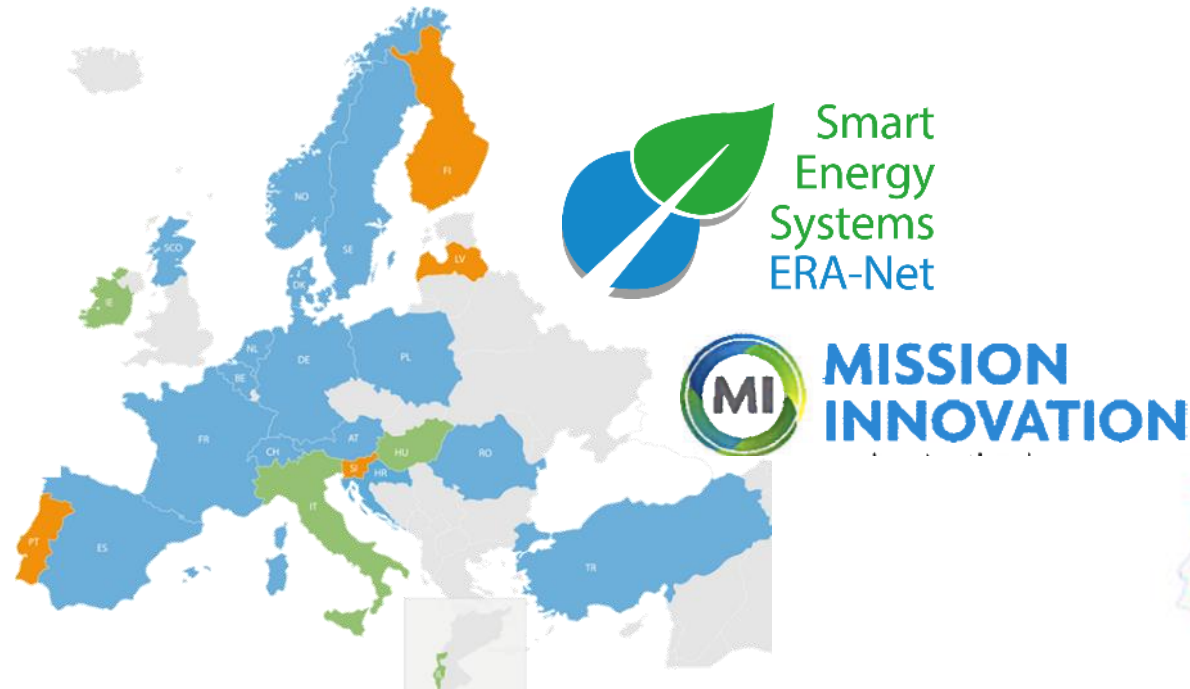
- tbd
- **Multilateral call with Mission Innovation, Autumn 2019**

## Digitalisation

(Start 2019)

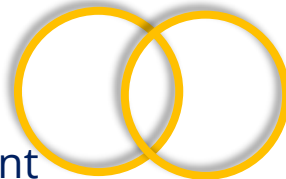
- tbd
- First multilateral call 2020

# ERA-Net Smart Energy Systems and SET-Plan



## Joint Programming Initiative

- growing number of focus initiatives
- wide spread community with excellent infrastructure for knowledge management
- co-creation on project and programme level

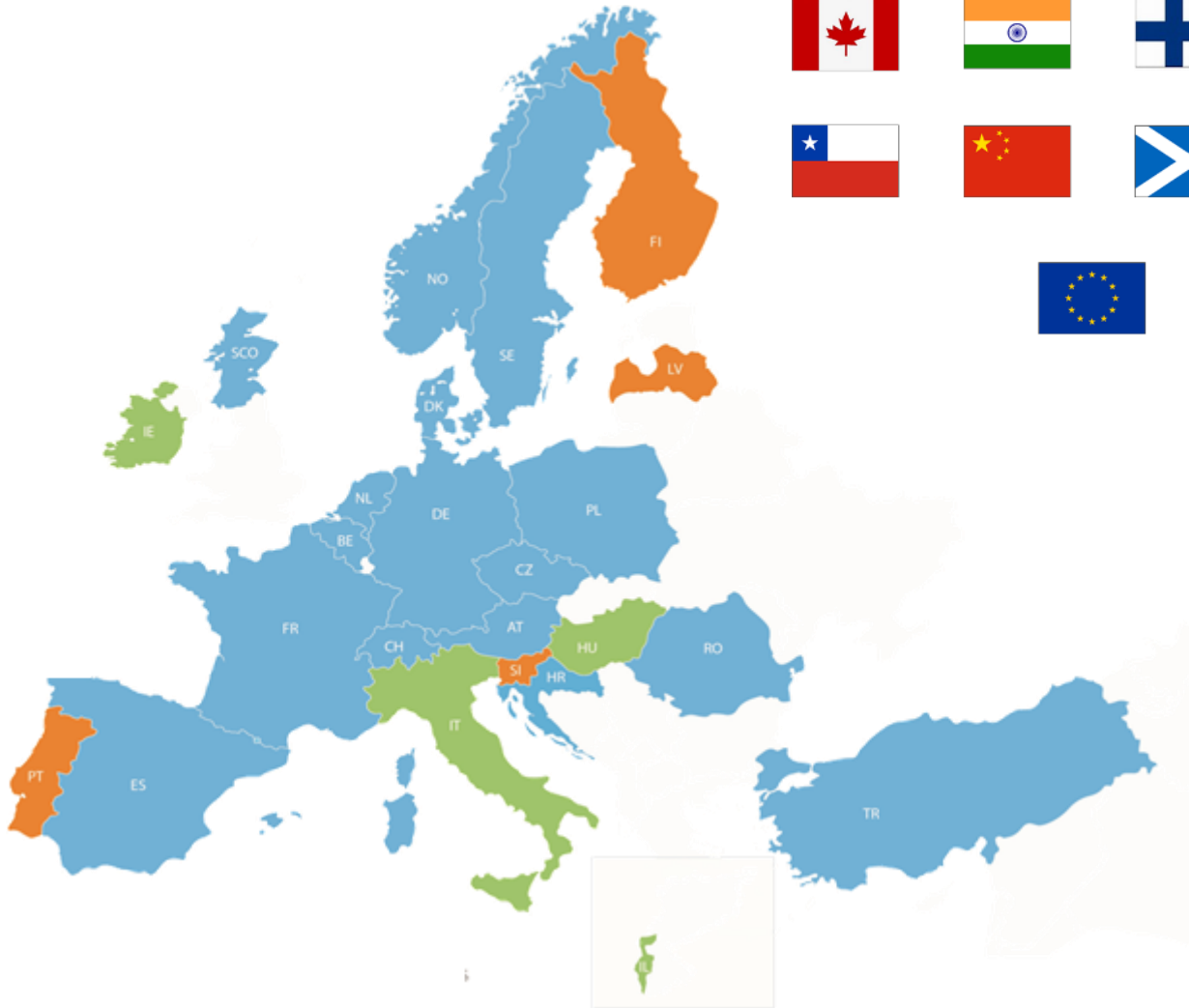


## Working Group IWG A4 on Smart Energy Systems

Chairs: Michael Hübner (bmvit), Michele de Nigris (RSE)

- 2 flagship initiatives
- 1 Crosscutting Initiative
- involvement of member states

# ERA-Net Smart Energy Systems goes global



## Good reasons to participate in ERA-Net SES

- get into relationships with existing family of European and worldwide RDI
- participate in a well defined co-programming initiative of >30 funding agencies
- access latest knowledge and proven solutions on expera knowledge platform
- avoid duplicating efforts and the clash with reality
- get contacts to “need owners” who want to take up project results
- liaise with growing group of Associated Partners that support project consortia
- use dissemination and exploitation channels for national RDD projects

# Contact the Joint Programming Platform

Office ERA-Net Smart Energy Systems  
[office@eranet-smartenergysystems.eu](mailto:office@eranet-smartenergysystems.eu)

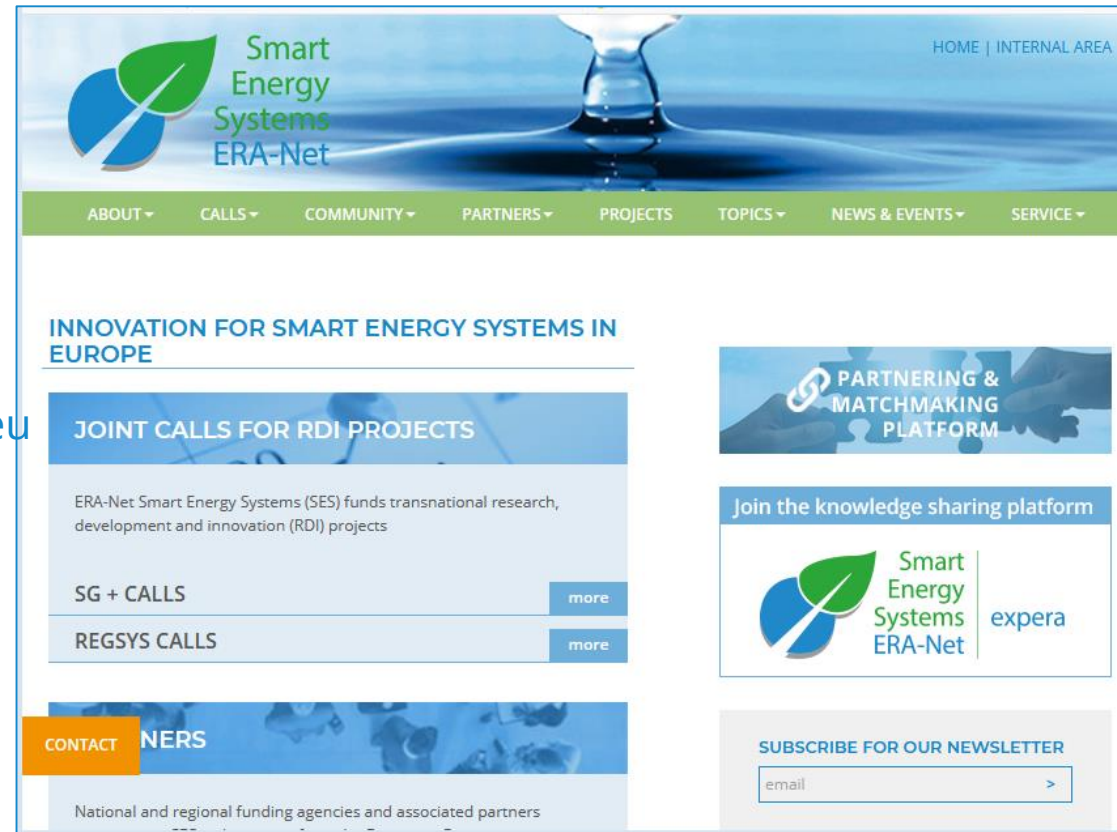
Call Management  
[callmanagement@eranet-smartenergysystems.eu](mailto:callmanagement@eranet-smartenergysystems.eu)

Knowledge Community  
[knowledgecommunity@eranet-smartenergysystems.eu](mailto:knowledgecommunity@eranet-smartenergysystems.eu)

## Coordination

Austrian Ministry for Transport, Innovation and  
Technology

Coordinator: Michael Hübner



The screenshot shows the homepage of the Smart Energy Systems ERA-Net website. The header features the logo and navigation menu. The main content area includes a section for 'INNOVATION FOR SMART ENERGY SYSTEMS IN EUROPE' with a 'JOINT CALLS FOR RDI PROJECTS' announcement. A sidebar on the right contains a 'PARTNERING & MATCHMAKING PLATFORM' link, a 'Join the knowledge sharing platform' section with the 'expira' logo, and a 'SUBSCRIBE FOR OUR NEWSLETTER' form.



[knowledge-community@eranet-smartgridsplus.eu](mailto:knowledge-community@eranet-smartgridsplus.eu)

[L.Karg@baumgroup.de](mailto:L.Karg@baumgroup.de)

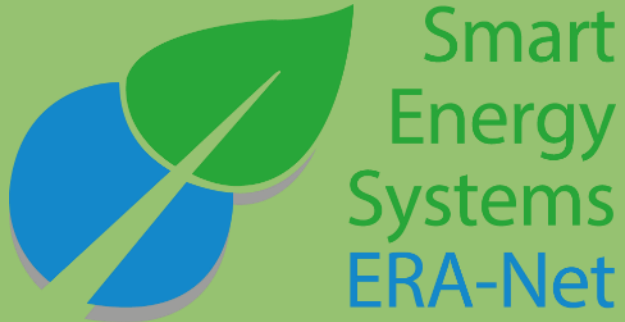


[www.baumgroup.de](http://www.baumgroup.de)

**Ludwig Karg**

B.A.U.M. Consult München / Berlin

# Funding Partners



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