



>> MICALL19



**MISSION
INNOVATION**

accelerating the clean energy revolution



Smart
Energy
Systems
ERA-Net

Mission Innovation Call 19

Joint Programming Event and Multilateral Call Workshop

Vancouver, May 27, 2019

Agenda for Today

09:00 am	Plenary Session <ul style="list-style-type: none">• Opening Speeches• Governance Panel• Stakeholder Panel
11:00 am	Co-Creation and Matchmaking Workshop
03:00 pm	<ul style="list-style-type: none">• Working Meeting for Funding Partners• Bilateral Matchmaking for Stakeholders
05:00 pm	Closure of the Event



SCHÄDLER, Ingolf

Deputy Director General Innovation and Technology,
Austrian Ministry of Transport, Innovation and Technology
Austria



ANDRÉN, Robert

Director-General, Swedish Energy Agency
Sweden

Governance Panel (1)



IKKEN Badr & EL MRABET, Rachid

Institut de Recherche en Énergie Solaire et Énergies Nouvelles (IRESEN)

Morocco



BAJPAI, Sanjay

Governmental Technology Mission Division
(Energy, Water & All others)

India



VACH, Peter

Federal Ministry for Economic Affairs
and Energy

Germany



WANG, Yibo

Chinese Academy Of Science,
Ministry of Energy (tbc)

China

The Core Group

Agreement

The following countries are committed to form a core group to prepare the first multilateral call for R&D projects within the framework of Mission Innovation and are ready to advance the initiative.



Sanjay BAJPAI
Head Technology Mission Division, Energy, Water, Government of INDIA



Badr IKKEN
General Director, Institut de Recherche en Énergie Solaire et Énergies Nouvelles MOROCCO



Frank Heidrich
Deputy Director General, Federal Ministry for Economic Affairs and Energy, GERMANY



Ingolf SCHÄDLER
Deputy Director General Innovation, Austrian Ministry of Transport, Innovation and Technology

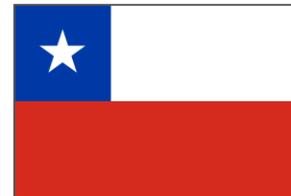


Robert ANDRÉN
Director-General, Swedish Energy Agency

Governance Panel (2)



CLARK, Morag
Scottish Enterprise, JPP Smart Energy
Systems Coordination Team
Scotland



SILVA PAREJAS, María Cristina Ministry
of Energy,
Multilateral Affairs
Chile



BAHR LJUNGDELL, Josephine
Swedish Energy Agency, International
Affairs
Sweden



VOGEL, Theresia
Climate and Energy Fund of the
Austrian Federal Government
Austria



SCHULTZ, Seth,
Urban Breakthroughs, Global Covenant
of Mayors on Science & Innovation



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First MI multilateral call for R&D proposals

Status of Discussion May 2019
Morag Clark, Scottish Enterprise
morag.clark@scotent.co.uk

Why Storage

- Renewables accounted for over 60% (\$304bn) of the \$487bn invested in global power generation in 2018
- Annual renewable power additions have increased from 22GW in 2000 to 67GW in 2008 and 177GW in 2018
- Investment in battery storage reached \$4bn in 2018, up from \$2.9bn in 2017 and approx £0.2bn in 2012
- The world needs to deploy circa 300GW of renewables every year over the decade to 2030 in order to realise the goals of the Paris Agreement



MICall19 on Storage Solutions

(Status of Discussion May 2019)

This call will support Research, Development and Demo Projects

- Electrical Storage
- Chemical Storage, incl. Hydrogen and Solar Fuels
- Thermal Storage
- Mechanical Storage

Challenges where different types of partners from different parts of society should collaborate to offer solutions to existing energy systems. Examples are, but not limited to:

- balancing output from community scale renewables projects (wind, solar, marine, geothermal) with community scale storage (e.g. batteries, hydrogen, small pumped hydro) ?
- using vehicle to grid technology to create a virtual large-scale storage service at district level which could offer a service to grid operators
- integrating thermal storage into individual buildings or district heating systems as a means of absorbing excess renewables on the grid or even a means of seasonal storage of energy at large scale
- 'First of a Kind' innovative storage systems

Requirements

- Transnational (at least two independent partners from two different countries)
- Expected TRL 5-7 (include lower TRLs?)
- Develop clearly defined integrated storage solution
- Replicable and Transferable
- Diversity
- Show critical mass
- National Criteria

Timelines for Submission of RDD Proposals

- | | |
|---------------------------|----------------------|
| • Call Opens | 18/09/2019 |
| • Matchmaking events | 18/09/19 to 31/12/19 |
| • Expressions of Interest | 13/11/2019 |
| • Proposal Deadline | 22/01/2020 |
| • Funding Decision | 05/05/2020 |
| • Project Start Deadline | 15/12/2020 |

- **Preparation phase:** finalisation of Call Text with all committed funding partners
 - Sign Expression of Interest (EoI) no later than 14 June 2019
 - Commit participation incl. funding commitment: **end July 2019** (sign MoU)
- **Proposal phase**
 - Call launch 18 September 2019
 - registration of interest for project consortia (simple form: title of project, short project idea description, preliminary project consortium, indicative budget)
 - advisory period where all funding partners answer questions from their stakeholders
 - funding partner coordination meeting beginning of December
- **Evaluation phase**
- **Project implementation phase**
 - Projects to be presented at MI#5 in Chile

MICall19 Committed Countries and Preliminary Funding Commitments

Country/ region	Funding (€) [min., preliminary]	Funding Organisation	Acronym
Austria	2 000 000	Austrian Research Promotion Agency	FFG
China		Ministry of Science and Technology	MoST
Denmark		Danish Energy agency	IFD
Finland		Business Finland	
Belgium - Flanders	1 000 000	Flanders Innovation and Entrepreneurship	VLAIO
Belgium - Wallonia	500 000	Public Service of Wallonia	SPW
Germany	2 000 000	Forschungszentrum Jülich GmbH	PtJ
Israel		Ministry of Energy	MOE
India		Ministry of Science and Technology	
Morocco		Research Fund in Solar Energy and New Energies	IRESEN
Nordic region	600 000	Nordic Energy Research	NER
Poland	600 000	NCBR	NCBR
Romania	500 000	Research, Development and Innovation Funding	UEFISCDI
Scotland	2 000 000	Scottish Enterprise	SCOTENT
Sweden	2 000 000	Swedish Energy Agency	SWEA
Switzerland		Federal Office of Energy	BFE
Sum	12 500 000		



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Smart
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Joint Programming Platform Smart Energy Systems

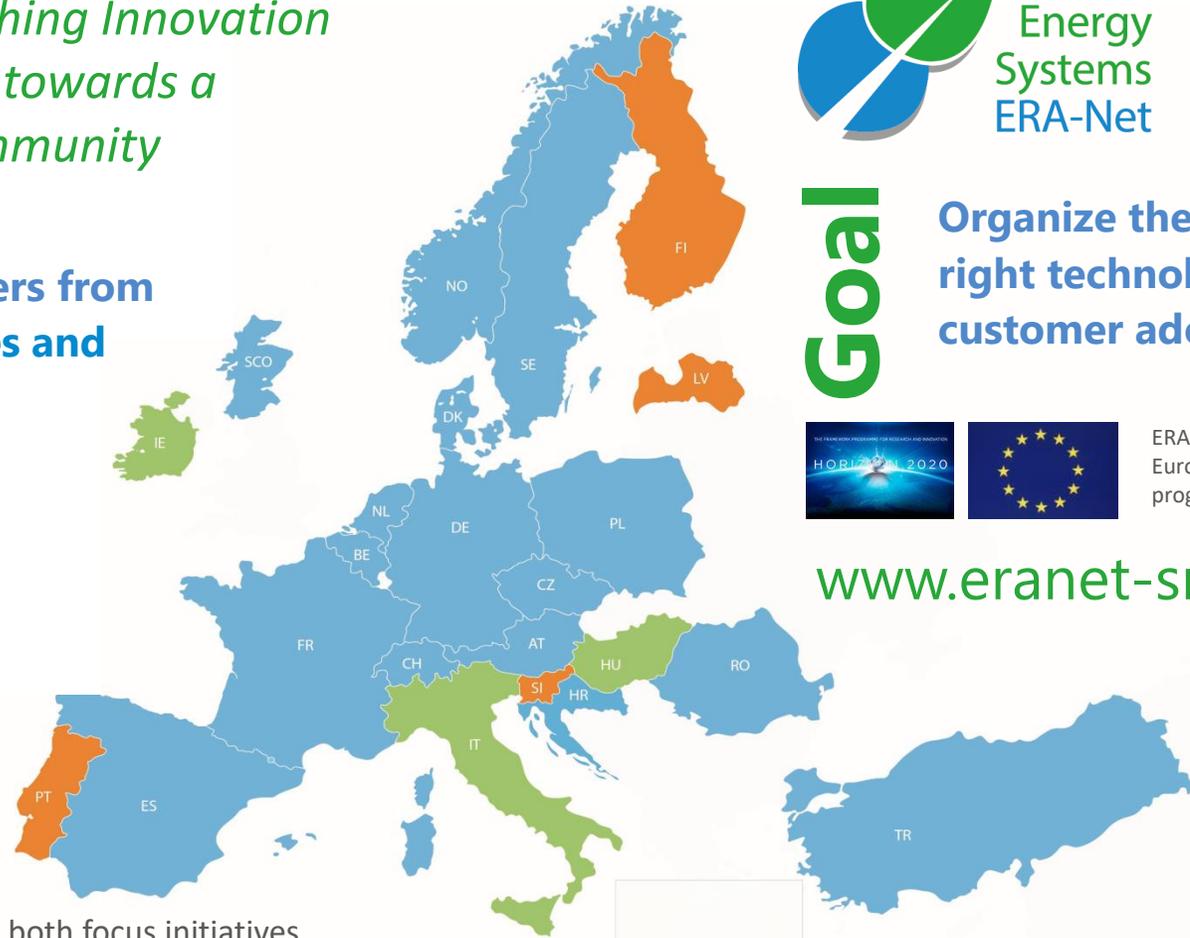
A Multilateral Initiative of Countries and Regions

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

Austria, Croatia, Denmark, Finland, Flanders, France, Germany, Hungary, Ireland, Israel, Italy, Latvia, Lombardy, Norway, Poland, Portugal, Romania, Scotland, Slovenia, Spain, Sweden, Switzerland, The Netherlands, Turkey, Wallonia



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



Features of the Joint Programming Platform



The joint programming platform on Smart Energy Systems is providing a sustainable collaboration mechanism for funding programs, in order to finance multilateral RDI projects, creating a supportive innovation ecosystem linked to an accelerating impact network

Supporting Multilateral RDI Projects

The funding partners of JPP SES jointly provide financial support to transnational research, development and innovation (RDI) projects.

Hosting Families of Projects

The multilateral projects with their partners from industry, network and infrastructure providers, research and academia as well as regions and cities are dealing with technology, market and adoption aspects. Within the Knowledge Community they team up with other transnational and international projects.

Building a Knowledge Community

Experts from different projects are organised in working groups and working on the tailor-made digital cooperation platform expera.

Establishing Partnership and Collaboration Mechanisms

Public funding partners from national and sub-national level are working together in a sustainable and supportive framework. They are teaming up with associated partners from regional business and government, from the start-up and SME sector, with additional funders and financiers as well as providers of digital platforms in order to build bridges in the whole innovation chain.

www.eranet-smartenergysystems.eu



More than funding of R&D projects: The Impact Network Approach

Research and Development
(R&D)

Demonstration (RDD)

Innovation (RDI)
including Implementation, Real Life Tests,
Living Labs, etc.

Time to Market

Associated Partner Concept

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

Categories of Associated Partners

- Regional development authorities
- Business development
- (Non RDD) funding institutions or programmes
- Enablers for software solutions

Roles of Associated Partners

- Provide outreach
- Shape calls
- Shape projects
- Co-finance

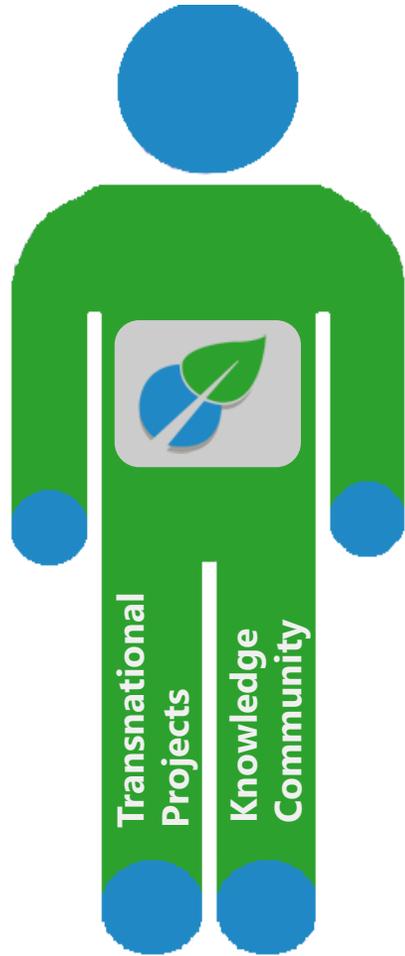
Benefits

- Help defining the research scopes
- Improve the quality of the funded RDD projects and increase their overall impact
- Assist with dissemination and transfer

Associated Partners (March 2019)



More than funding of R&D projects: The Knowledge Community



MEMBERS

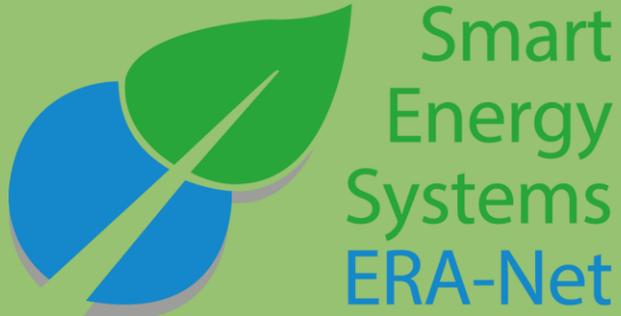
- ERA-Net SES projects
- National and transnational projects
- International RDD projects
- Smart Grids practitioners
- Agenda setters & policy makers

TOOLS

- Living Documents
- Working Groups
- Project Profiling (“Evaluation”)
- Expert Repository
- Spotlights and Policy Briefs

Register for expera: <https://www.eranet-smartenergysystems.eu/Community/Digital Knowledge Sharing Platform>

Funding Partners



This initiative has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreements no. 646039 and no. 775970.



Governance Panel



IKKEN Badr & EL MRABET, Rachid
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Énergies Nouvelles (IRESEN)
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Federal Ministry for Economic Affairs
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Sweden



VOGEL, Theresia
Climate and Energy Fund of the
Austrian Federal Government
Austria



SCHULTZ, Seth,
Urban Breakthroughs, Global Covenant
of Mayors on Science & Innovation

Stakeholder Panel



MADKOUR, Yehia
LEED AP BD+C
Canada



SEGERSTAM Jan
Empower IM Oy
Finland



MÄKINEN, Tuula
C3E exco-member
Vice President Smart Energy and Transport Solutions, VTT
Finnish Finland



Jonas Eklind
CEO and president Azelio AB
Sweden



HOLTER, Christian
Solid GmbH
Austria



ANDRÉN, Robert,
Director-General, Swedish Energy Agency
Sweden



Matchmaking and Interaction Workshop

- goals
 - identify about global (research) needs
 - get ideas for projects and possibly build kernels of consortia
- workflow
 - learn about Joint Program Platform ERA-Net SES and successful projects
 - meet potential partners and outline projects
- results
 - project ideas, formally formulated
 - groups to jointly follow up
- steps after this workshop
 - meet potential partners in room MR 218 today at 3 pm
 - follow up on matchmaking platform

Dividing the crowd ...

- **IC1- Smart Grids** (chair: Lucciano Martini, RSE Italy and Yibo Wang, Chinese Academy Of Science, co-moderator: Helfried Brunner, Austrian Institute of Technology)
- **IC2 – Offgrid Solutions** (chair: tbd, co-moderator: Laura Boerner, JPP SES Knowledge Community)
- **IC5 – Converting Sunlight** (chair: Peter Vach, Policy Officer, Federal Ministry for Economic Affairs and Energy, co-moderator: Rachid El Mrabet, IRESEN - Morocco)
- **IC6- Clean Energy Materials** (chair: Hermann Tribukait (tbc); co-moderator: Morag Clark, Scottish Enterprise)
- **IC7- Heating and Cooling of Buildings** (chair: Emina Pasic, Swedish Energy Agency (tbc), Sweden; co-moderator: Hemma Bieser, avantsmart)
- **IC8- Renewable and clean hydrogen** (chair: Geert Tjarks, NOW GmbH; co-moderator: Elvira Lutter, Austrian Climate and Energy Fund)

It's not a game ...

CESEPS
Co-Evolution of Smart Energy Products and Services

SG+ Joint Call 15 Smart Energy Systems ERA-Net

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

CloudGrid

SG+ Joint Call 15 Smart Energy Systems ERA-Net

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 to 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 recom grid stability
- A** Catalogue of recom strategies

Runtime 2016-2019

Grid-Friends

SG+ Joint Call 15 Smart Energy Systems ERA-Net

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

eli

SG+ Joint Call 15 Smart Energy Systems ERA-Net

Object and automated cooperators on national and integration of local

Cluster

TSO Interface

Topics

ed markets, inter-DSO, DSO grid management, flexibility models, stakeholders

Results Technology Market Adoption

- T** Architecture for using flexible (respecting grid requirements) for lean interface between software and software agents for clearing algorithms, flexible control
- T** Communication technology, nated grid operation from catalogue of roles of actors in local
- M** Proposal for a regulatory framework for congestion management
- M** Actor business models for incentives and constraints of
- T** Framework for regional trading integrating flexibility providers and catering to stakeholder needs
- A** Evaluation tool for scenario evaluation

Runtime 2016-2019 TRL 3 → 6

SG+ Joint Call 15 Smart Energy Systems ERA-Net

Market platform for local load shaping

Cluster

Topics

market design, dynamic market needs, grid capacity, simulation, simulation

Results Technology Market Adoption

- T** Platform for efficient management on market signals
- T** Shaving flexibility for grid-load shaping
- T** Support options and simulation

25 Min

Clusters of former Era-Net SES calls:

- Grid Design
- Grid Management
- TSO / DSO Interface
- Resilience
- Local Energy Communities and Interfaces



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





CESEPS
Co-Evolution of Smart Energy Products and Services



www.ceseeps.eu



WAGENINGEN
UNIVERSITY & RESEARCH



eseia
european sustainable energy
innovation alliance



Universiteit Utrecht



TU Delft



AIT
AUSTRIAN INSTITUTE
OF TECHNOLOGY



DNV GL



TU
Graz

UNIVERSITY OF TWENTE.

Partners for Further Development

- Planners and operators of local microgrids
- Research community around user needs and behaviour
- Research and development community around demand side management
- Developers of AC and DC network models
- Designers of products and services for local grids



H2020



ERA-Net SES receives funding from the EU H2020 Research & Innovation Programme.



Grid Management






Flexibility market platform for regional load shaping

Cluster

Grid Management

Topics

flexibility, market platform, tariff design, dynamic market & grid signals, stakeholder needs, grid capacity, simulation, peak shaving, load shaping

Results Technology Market Adoption

- T** Hard- and software platform for efficient management of grid capacity based on market signals
- T** Aggregation of peak shaving flexibility for grid-optimized regional load shaping
- T** Catalogue of grid support options and simulation models for flexible loads
- M** Pilot business model with defined processes and stakeholder incentives
- M** Pricing model sensitive to demanded security of supply
- A** Simulation platform for visualizing complex systems
- A** Catalogue of stakeholder preferences for use and provision of flexible loads (incl. industry and commerce)

Runtime

2016-2019

TRL

2 — 6





www.t1p.de/8ul4



xamax
ALPIQ



Lucerne University of Applied Sciences and Arts
HOCHSCHULE LUZERN





STW Stadtwerke Crailsheim





n|w Fachhochschule Nordwestschweiz

Partners for Further Development

- Distribution grid planners and operators
- Developers of market platforms for flexibility
- Designers of business models for flexibility
- Developers of software and solutions for peak shaving
- Providers of flexibility
- Developers of solutions for complex systems
- Research and development community around grid capacity





ERA-Net SES receives funding from the EU H2020 Research & Innovation Programme.



TSO/DSO Interface



SG+ Joint Call 15



Direct and automated cooperative market for grid operators on national and transnational level for integration of local flexibility

Cluster

TSO/DSO Interface

Topics

automated markets, inter-DSO, DSO/TSO, system architecture, grid management, flexibility, storage systems, business models, stakeholders

Results Technology Market Adoption

- T** System architecture for using flexibility close to the origin (respecting grid requirements)
- T** Design for lean interface between DSO and TSO
- T** Hardware and software agents for automated local market clearing algorithms, flexibility clustering and load control
- T** PLC communication technology and cascade for automated grid operation from market to energy asset
- M** Catalogue of roles of actors in local balancing and trading
- M** Proposal for a regulatory framework and market enabling congestion management and local balancing
- M** Multi-actor business models for flexibility and balancing incl. incentives and constraints of stakeholders
- M** Market framework for regional trading integrating flexibility providers and catering to stakeholder needs
- A** Simulation tool for scenario evaluation

Runtime 2016-2019

TRL 3 — 6



Smart Energy Systems ERA-Net

www.callia.info/en/






BOĞAZICI ELEKTRİK DAĞITIM









International Solar Energy Research Center Konstanz









TECHNISCHE UNIVERSITÄT WIEN (Vienna) Austria





Partners for Further Development

- Operators and experts of local markets
- Research and development community around reactive power procurement scenarios
- Aggregators and grid planners and operators
- Designers and providers of energy market places
- Experts for flexibility in transmission grids
- Developers and adopters of innovative technology for grid planning and operation
- Research community around (automated) cascaded flexibility management and communication
- Research community around energy market stakeholders




ERA-Net SES receives funding from the EU H2020 Research & Innovation Programme.







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 fo 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 actions for safeguarding grid stability
- A** Catalogue of recommended system management strategies

Runtime
2016-2019

TRL
2
←
4




www.eranet-cloudgrid.eu/



NTNU
Knowledge for a better world



zhaw



CHALMERS
UNIVERSITY OF TECHNOLOGY





FETI

Partners for Further Development

- Operators and users of grid labs
- Research and development community of ancillary services
- (Potential) providers of ancillary services
- Experts in regulatory issues relevant for ancillary services
- Experts in payment schemes and incentives for ancillary services
- Developers of converters
- Grid operators
- Developers and planners of market models





ERA-Net SES receives funding from the EU H2020 Research & Innovation Programme.



Local Energy Communities

SG+ Joint Call 15

 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

 Grid-Friends



www.grid-friends.com



Partners for Further Development

- Research and development community around forecasting algorithms; multi-sector, multi-vendor energy management systems; distributed flexibility aggregation and exchange; user preferences for energy products
- Providers of solutions for microgrids eager to test interoperability
- Developers of energy management systems
- Distribution and micro-grid operators
- Energy community pilots
- Established and emerging energy cooperatives

  ERA-Net SES receives funding from the EU H2020 Research & Innovation Programme. 





- The x-storage:
power2x solutions for cross energy carrier, local & regional energy systems
- Storage to stabilize the grids:
solutions for the most effective utilization of renewables
- Buildings as a storage:
from addon thermal storage technology to integrated solutions
- Innovative storage technologies:
first of a kind storage system for the energy transition
- The mobile storage:
large scale virtual storage provided by electric vehicles
- Other <can be defined by participants>

Clusters for MICall19 Co-Creation Session

Cluster

The x-storage:

Power2x for cross energy carrier, local and regional energy systems

Cluster

Storage to stabilize the grids:

Solutions for the most effective utilization of renewables

Cluster

Innovative storage technologies:

First of a kind storage systems for the energy transition

Cluster

Buildings as a storage:

From addon thermal storage technology to integrated solutions

Cluster

The mobile storage:

Large scale virtual storage provided by electric vehicles

Cluster

What's left to be said



HUEBNER, Michael

Austrian Ministry of Transport, Innovation and Technology
Head of ERA-Net Smart Energy Systems Coordination Team
Austria



KARG, Ludwig

B.A.U.M. München / Berlin,
Head of ERA-Net Smart Energy Systems Knowledge Community
Germany

Agenda for Today

09:00 am	Plenary Session <ul style="list-style-type: none">• Governance Panel• Stakeholder Panel
11:00 am	Co-Creation and Matchmaking Workshop
03:00 pm	<ul style="list-style-type: none">• Working Meeting for Funding Partners• Bilateral Matchmaking for Stakeholders room MR 218
05:00 pm	Closure of the Event

Tuesday and Wednesday: booth C 1400

SES Funding Partners

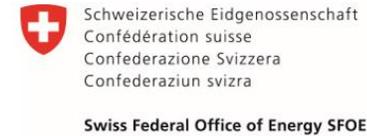
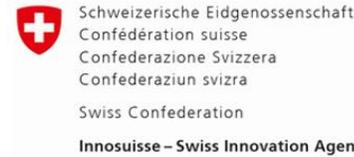
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Together Strong

