

# Joint Programming Platform ERA-Net Smart Energy Systems

**Status Conference** 

15.10.2020, 10:00-13:30 CEST

## Agenda



- 1. Welcome
- 2. Updates & Outlook: JPP ERA-Net Smart Energy Systems
- 3. Farewell to new endeavors: results of concluding projects
- 4. Virtual market place with ending projects
- 5. Update on Knowledge Community approach
- 6. Interactive Lunch Break
- 7. Knowledge Community Meetings





## WELCOME

Michael Hübner, Federal Ministry for Climate Action, Austria
Coordinator of JPP SES; Co-chair of SET-Plan Action 4 Implementation Working Group
Ludwig Karg, B.A.U.M., JPP ERA-Net SES Knowledge Community Management







## **ERA-Net Smart Energy Systems**



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

Goal

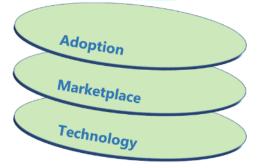
Organize the learning to enable the right technologies, market designs and customer adoption to achieve the smart energy system vision & goals of Europe

funding partners from 29 countries and regions

www.eranet-smartenergysystems.eu





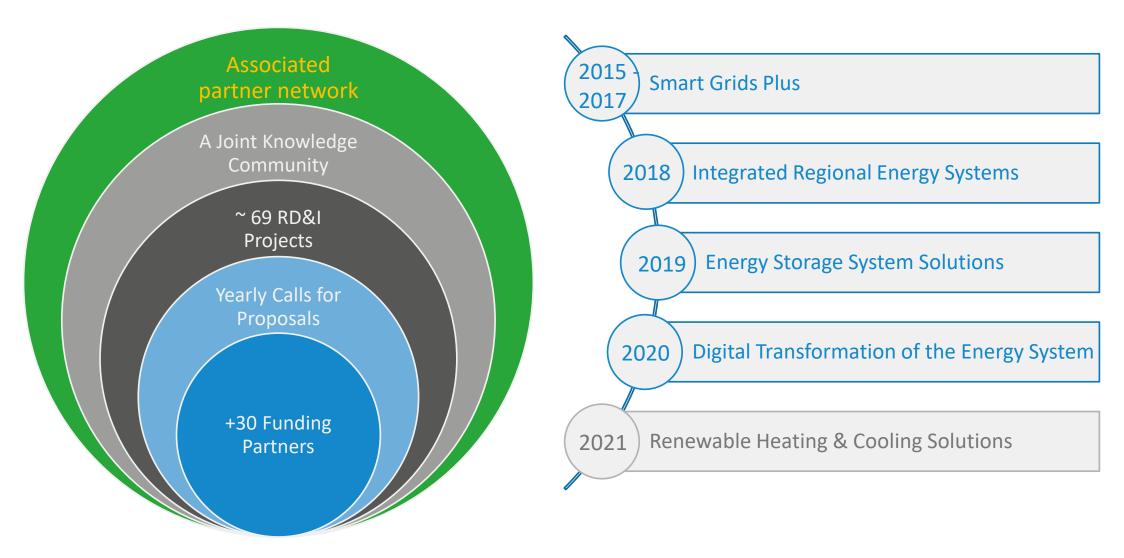




ERA-Net Smart Energy Systems has received funding from the European Union's Horizon2020 research and innovation programme under grant agreement No 646039 and No. 775970.

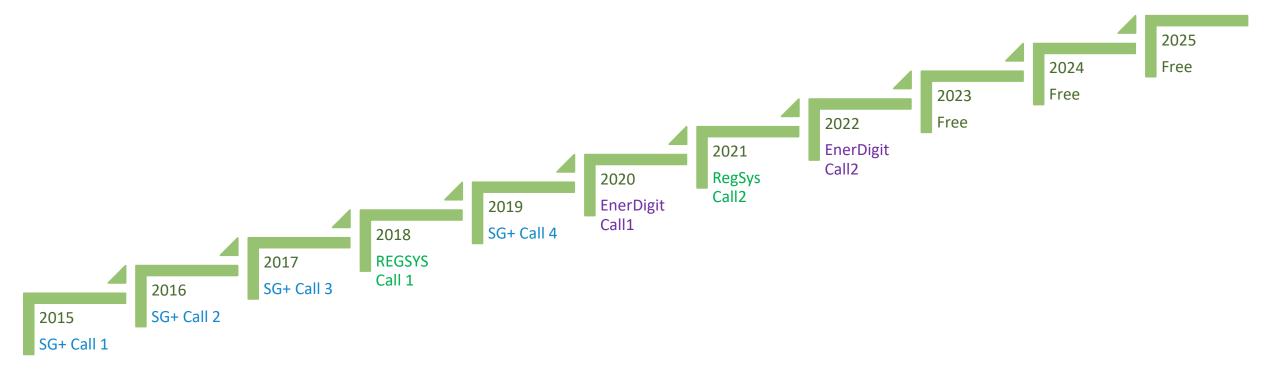
## JPP SES - Enhancing Innovation on Smart Energy Systems





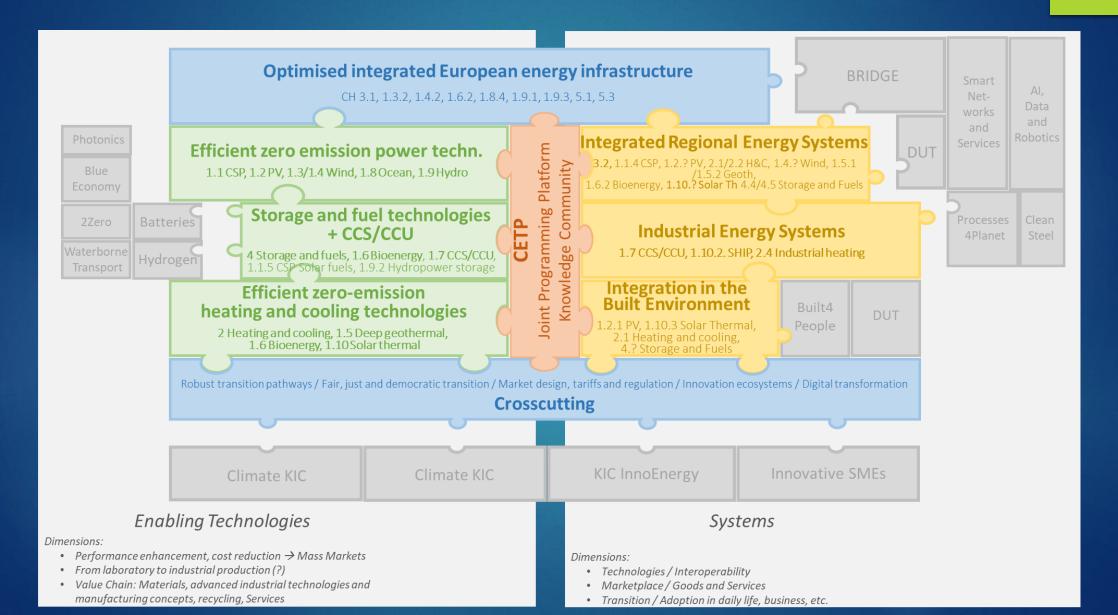
## Call- Schedule







# Clean Energy Transition Partnership (CETP) under construction





# Updates & Outlook

JPP ERA-Net Smart Energy Systems

Status Conference: Integrated Energy Systems for the Clean Energy Transition

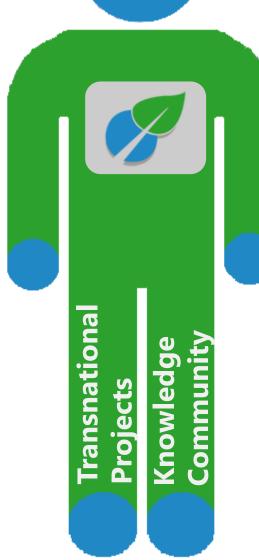


## What you should know about the initiative









- 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



## Projects funded so far



5 calls

69 projects

more than 100 Mio €

## The ERA-Net SES Knowledge Community



#### **MEMBERS**

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

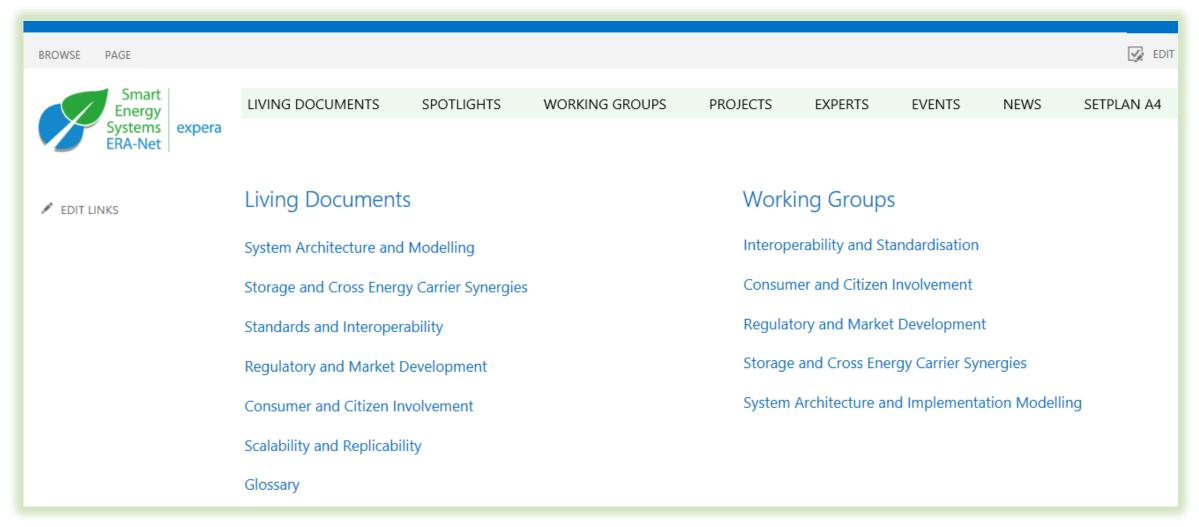
#### **TOOLS**

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



## The Knowledge Platform *expera*





www.smartgridsplus.eu



30/10/2020

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



## JPP ERA-Net SES Linking Worlds



**ETIP Working Groups SPRING** Project ETIP-Bridge-JRC project and knowledge platform Bridge SET-Plan Action 4 countries and **PANTERA** agencies EU funded **ETIP Platforms** projects **ETIP Regional Workshops ETIP TWGs EERA Joint Programmes CEER Working Groups** Smart Energy National Stakeholders **Coordination Group** MISSION Systems expera **ERA-Net** transnational **ERA-Net SES** Interreg projects national Europäische projects **Associated** Klimaschutzinitiative **Partners** practitioners Living Digital Labs **Platform Providers** 



## **Example: Taskforce on Energy Communities**















Taskforce leaders: Leen Peters, Ludwig Karg

- Crosscutting work in the framework of Bridge
- What happens in the different MSs?
  - Good and inspiring examples
  - Analysis on legal existing and upcoming framework
- Recommendations expected
  - Replicability and upscaling needs and potentials
  - Research and demonstration needs

- Working Group "Regional Matters" with Taskforce "Local Energy Communities"
- Knowledge Generation from and for JPP SES projects
- Spotlights and Policy Briefs
  - for academia
  - funding programs
  - legislation (on MS level)
  - practitioners (energy, ICT)

Join us on expera for the co-creation of knowledge >>> <a href="https://t1p.de/usr9">https://t1p.de/usr9</a>

(comment and edit living documents, participate in surveys, support creation of recommendations)



## Communicating the Platform and the Projects



- Website
- Communication material (roll-ups, leaflets etc.) describing
  - initiative
  - projects
  - knowledge platform expera
- Communication guidelines for projects





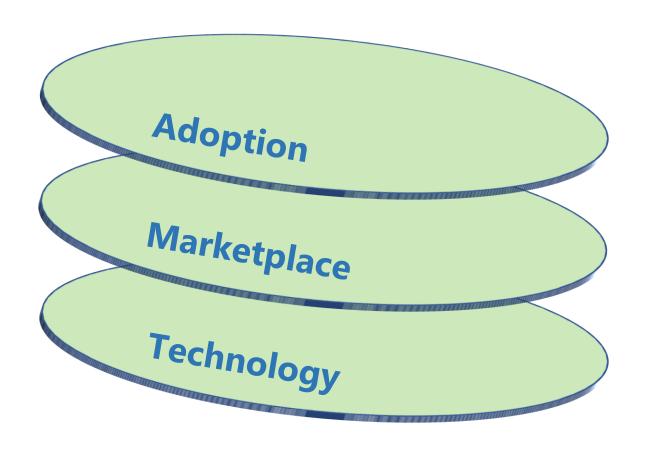
Smart Energy Systems



# Looking back

## Three Layer Research Model





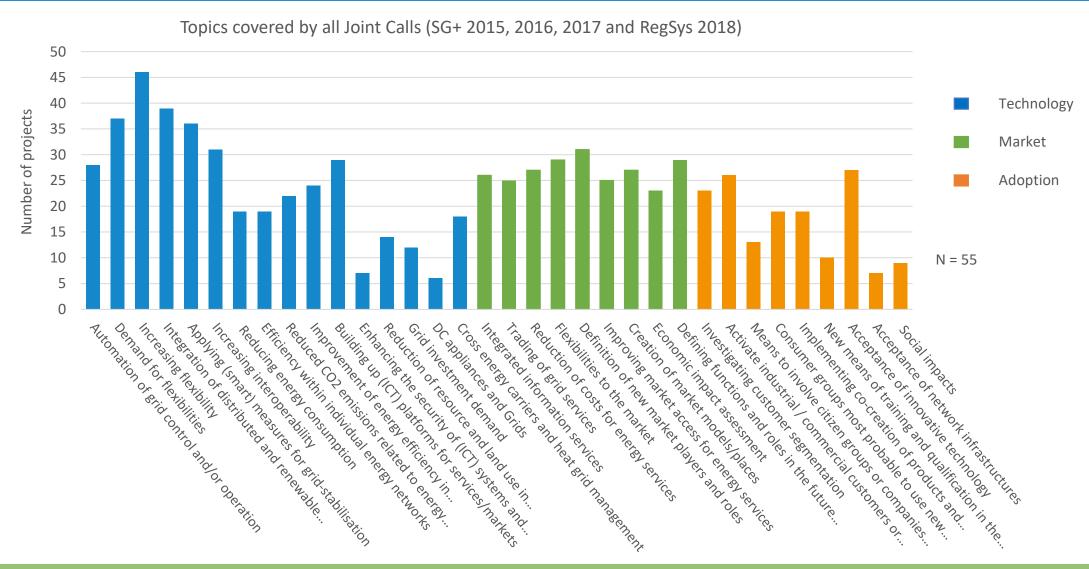






# Distribution of topics tackled in layers SG+ Joint Call 2015, 2016, 2017 and RegSys Joint Call 2018

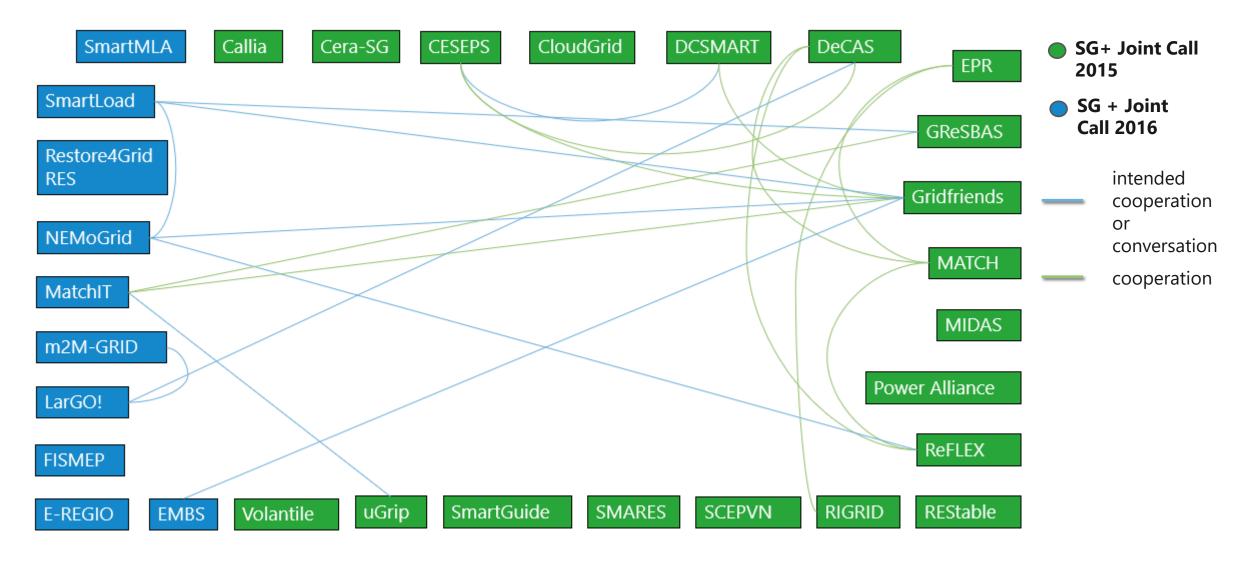




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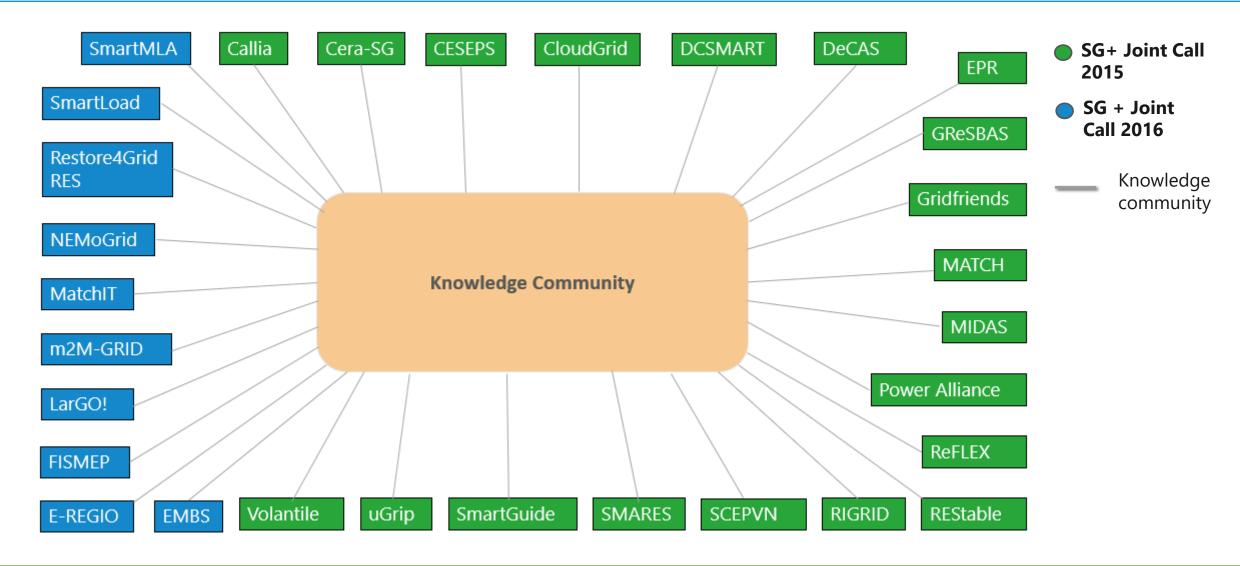
## Cooperation between projects





#### Smart Energy Systems ERA-Net

## Cooperation between projects via Knowledge Community

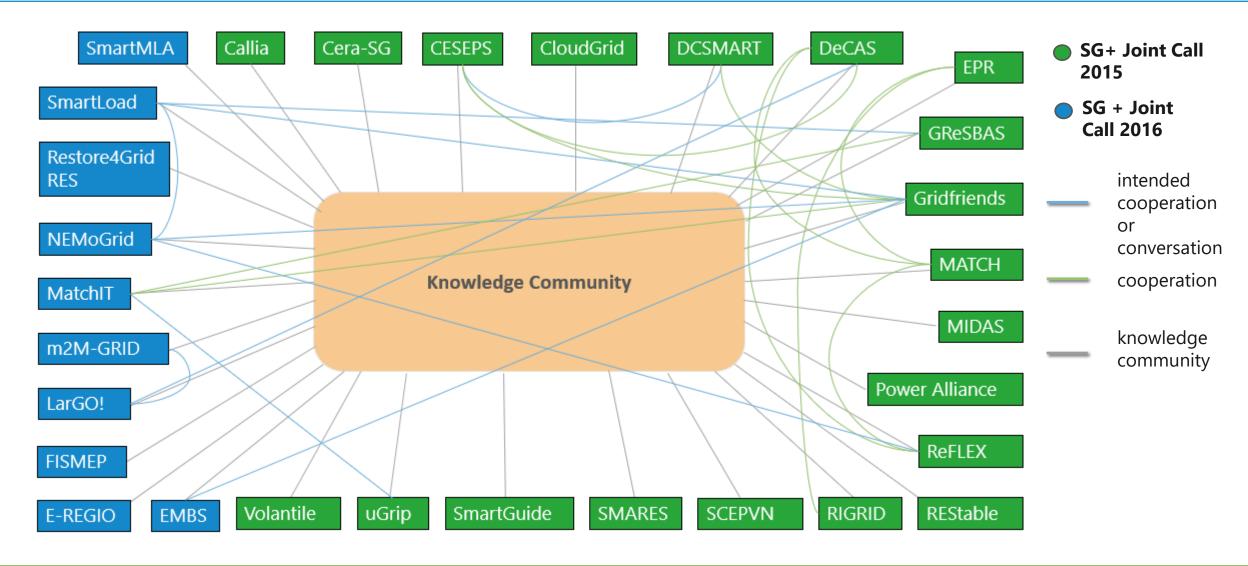




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#### Smart Energy Systems ERA-Net

## Cooperation between projects via Knowledge Community



15/10/2020





# The Brochure

https://eranetsmartenergysystems.eu/global/images/c ms/Content/Projects/EraNetSES\_ProjectB rochure\_JointCalls201516.pdf



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## The Brochure



## Projects' Key Exploitable Results

**Interactive Energy and Infrastructure** 

#### **RIGRID Result**

[RIGRID VR-tool is a modular application for technical and socio-economic planning and operation of new emerging energy infrastructures in rural areas. Technical solutions of microgrid structures can be visualized using Virtual Reality, tool. Thus several scenarios can be tested to find optimal placement of PV, wind, storage, lines, cables. Active participation of citizens in the planning process increase acceptance of new infrastructure and accelerates investigated

#### **Partners for Further Development and Uptake**

- Rural regions/ municipalities
- Energy clusters/ cooperatives
- Engineering/ design offices
- RES investors/ Energy system operators

Transnational cloud for interconnection of demonstration

facilities for smart grid lah research & development facilities for smart grid lab research & development Topics smart sockets, grid resilience, ancillary services, risk and benefit analysis, converter interoperability, energy management, validation of gr TOPICS smart sockets, grid resilience, ancillary services, risk and benefit lab results, grid lab cooperation, renewables, distributed energy resources, analysis, converter interoperability, energy management, validation of grid AC/DC hybrid grids

AC/DC hybrid grids

AC/DC hybrid grids

AC/DC hybrid grids

AC/DC hybrid grids RESULTS: Technology, Market, Adoption Transnational cloud platform for smart grid labs with data, methodologies test results and catalogue of resources Transnational cloud platform for smart grid labs with datries of resources List of parameters and requirements fo converter interoperability Comprehensive map of ancillary services including technical Method for evaluation of risks and benefits of providing ancillary • Market design for many participants on supply and demand side and Catalogue of recommended actions for safeguarding grid stability (Potential) • Catalogue of recommended system management strategies providers of ancillary services Experts in regulatory issues relevant for

Cluster: Resilience **Systems ERA-Net** Project Duration: 2016 -2019 Contact: michael.calder@no.abb.com Budget: Total: € 2,300,000. Funding: € 1,900,000. Partners: NTNU (Norway), Chalmers (Sweden), ZHAW (Switzerland), IPE (Latvia) http://www.eranet-cloudgrid.eu/ Partners for Further Development ancillary services Experts in payment community of schemes and incentives for ancillary Developers of converters Grid operators Developers and planners of market Technological Readyness Level

**Smart** 

Energy

**More Information** 

https://www.youtube.com/watch?v=DQKcRqpyKk8

https://www.researchgate.net/publication/325988031 Multi-Criteria Planning



Village

#### Farewell ...





### 2016

**SmartLoad** (DE, CH)

FISMEP (DE, RO, SE)

m2M-GRID (FR, SE, NL)

LarGo! (AT, DE, SE)

NEMoGrid (CH, DE, SE)

MatchIT (SE, NL)

**E-REGIO** (NO, SE, NL)

RestoreGrid4RES (AT, DE)

EMBS (AT, DE)





# Looking forward

**Status Conference: Integrated Energy Systems for the Clean Energy Transition** 

## Projects selected for MICall19



Find our MICall19 projects on our website <u>here</u>

ADHERE; New STEPS; USC - Flex Store; I-Greta; MOBISUB; H2 CoopStorage; CrossChargePoint; DEVISE; AISTOR; IFAISTOS; MESH4U; Power-2-Transport; HED-LiS; BIO-NRG-STORE

### New opportunities











## Participating countries & regions









Call procedure timings							
<b>Proposal phase</b>	Call opens	Q4 2020					
	Compulsory registration of interest deadline	Q1 2021					
	Full proposal submission deadline	Q2 2021					
	Project selection	Q2-Q4 2021					
<b>Project phase</b>	Project start date	Q4 2021					

Join now the Matchmaking for Joint Call 2020 (MICall20): <a href="https://jpp-ses-matchmaking-micall20.eranet.b2match.io/">https://jpp-ses-matchmaking-micall20.eranet.b2match.io/</a>







Projects are expected to address key challenges and opportunities relating to the main objectives such as:

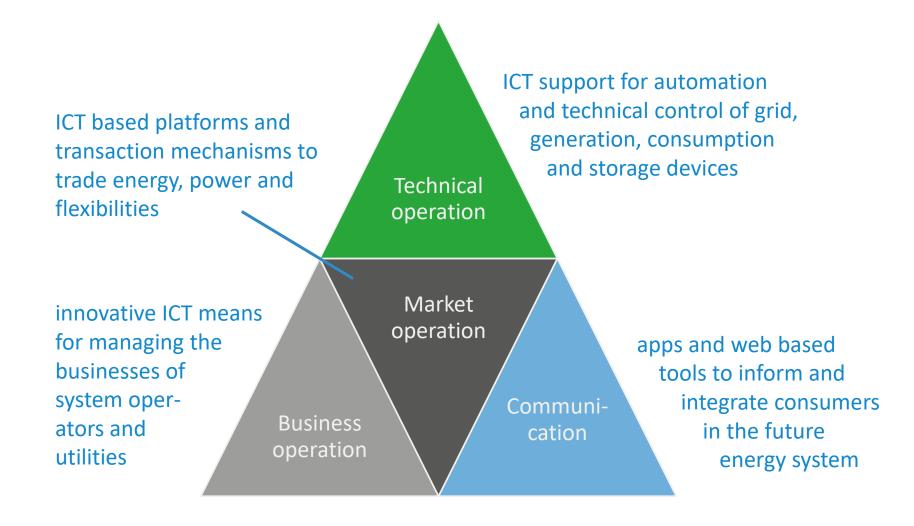
Social sustainability

Energy and ICT infrastructure

Energy marketplaces, business models and communication

## Dimensions for deploying digitalisation in the energy system





## The supporting eco-system for projects



### **Living Labs**

user-centred and open innovation ecosystems often operating in a territorial context, integrating concurrent research and innovation processes (co-creation), potentially relying on a public-private-people partnership.

### **Digital Platform Providers**

ICT partners that provide source code, software as a service, executable packages with interfaces or field installations to be used by JPP SES projects for free or against service charge



# Contact the Joint Programming Platform



#### **Office ERA-Net Smart Energy Systems**

office@eranet-smartenergysystems.eu

#### **Call Management**

callmanagement@eranet-smartenergysystems.eu

#### **Knowledge Community**

knowledgecommunity@eranet-smartenergysystems.eu

#### Coordination

**Austrian Ministry for Transport, Innovation and Technology** 

Coordinator: Michael Hübner





# Farewell to new endeavors

Results of concluding projects

# Agenda



- 1) Hear about remarkable results of
  - A) RestoreGRID4RES
  - B) EMBS
  - C) FISMEP
  - D) RELflex
  - E) SMART-MLA

2) Afterwards:

Meet the projects in their booths on a virtual market to discuss the results



# RestoreGRID4RES

Results of concluding projects

**Status Conference: Integrated Energy Systems for the Clean Energy Transition** 

## **Project Outline: Results**



#### Results

# **Technology**

#### Modelling artificial LV- and MV-grid models

- Residual load models for restoration process studies
- Restoration tools coping high shares of renewables

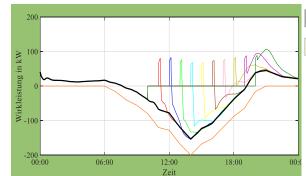
# Market

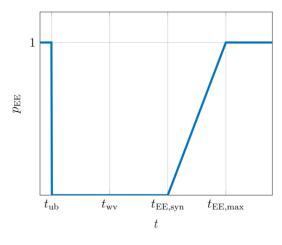
 Specification and implementation guidelines for restoration tools

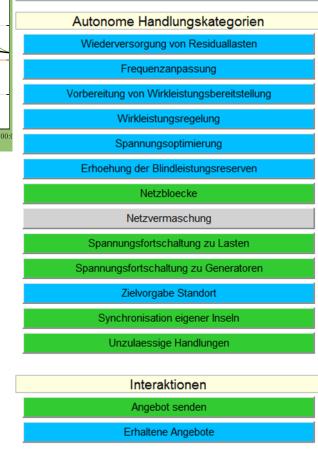
• Design of future grid restoration strategies

# Adoption

 Overview on grid restoration challenges coping high shares of renewables







KNG (3)





# **Energy Management Building Set**

#demand response #interoperability #energy cooperatives

Runtime: August 2017 – June 2020

## **Project Outline: Results**



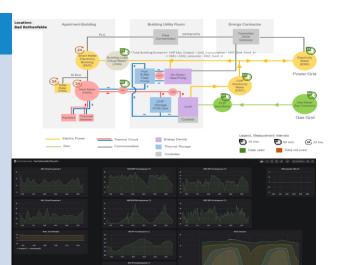
#### **Results**

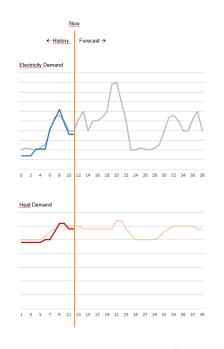
**Technology** 

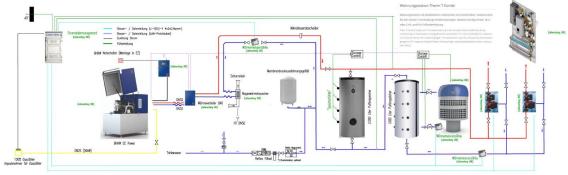
Market

Adoption

- ICT Architecture in an heterogeneous multivendor system
- Energy monitoring and controlling architecture
- Forecast tool to optimize the provision of thermal and electric energy
- Automated control application for local optimization based on different data sets (price, weather, consumption)
- Optimizing KWKG benefits
- Sensitivity analysis for CO2 pricing, e.g.: EEG
   Umlage
- EMBS Prototype installation at partner side
- EMBS Backend installation (Security, Firewall, Backup)











# **FISMEP**FIWARE for Smart Energy Platform

#FIWARE # Cloud # Smart Energy Platform

Runtime: December 2017 - November 2020

**FIWARE** for Smart Energy Platform

## **Project Outline: Results**



#### Results

Technology

 Design and implementation of service restoration in MV network

- Distributed architecture and semantic included platform
- District Heating Energy Management (CESO)
- ERO app for the residents energy usage

# Market

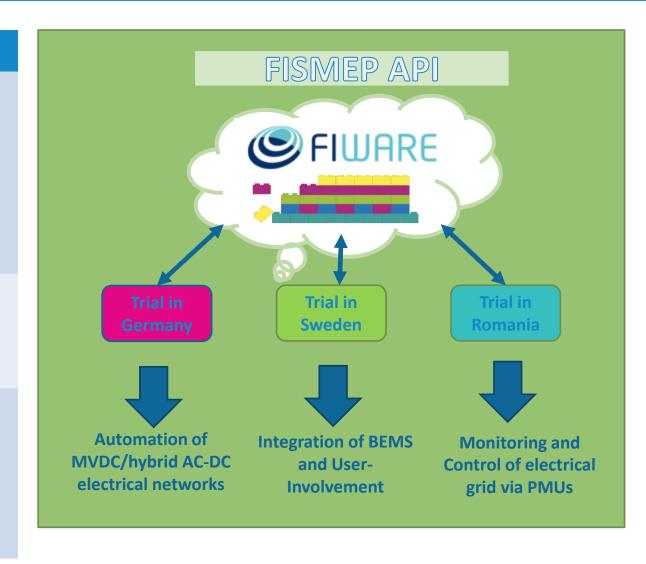
Innovative SOA platform as open source

Test sites dimension is suitable for platform complex testing

# Adoption

 Use case evaluation with standards like SAREF and other ontologies

- Customers are engaged to test flexibility
- Supporting new business models for e.g. customer involvement







# RELflex - Renewable Energy and Load Flexibility in Industry

**#Load and RES Flexibility # SMEs- small industry # DSM/DSR in EMS** 

## **Project Outline: Results**





#### (Expected) Result(s)

**Technology** 

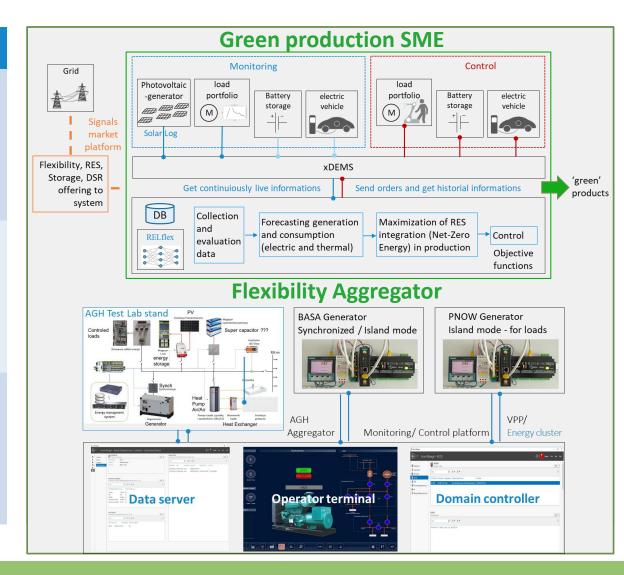
- HW and SW solution for flexibility in SMEs with RES and reserve energy sources
- xDEMS with DSM/DSR functions
- Net-Zero-Energy-Factory

Market

- ICT communication interfaces and
- business interfaces to
- flexibility platforms, energy trading

Adoption

- Net-Zero-Energy-Factory
- 'green' products
- flexibility acceptance by employees → load follows generation

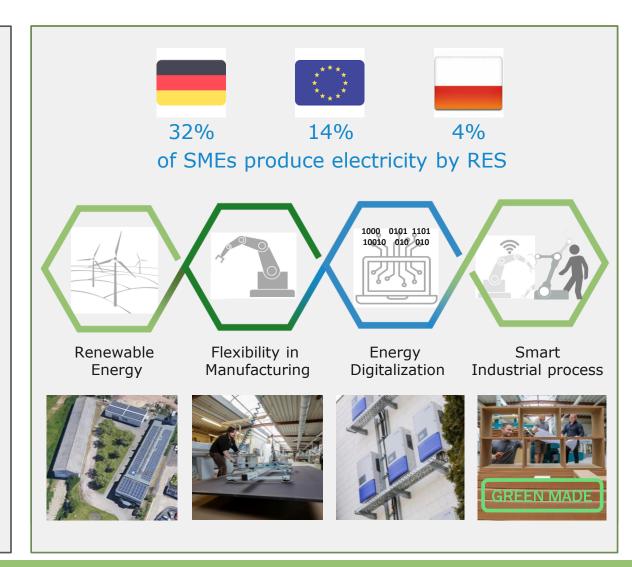


## **Project Outline: Implementation**





- flexibility of energy-relevant industry processes at SMEs via dynamic management of controllable loads, RES generation and storage
- aggregate reserve generation units in a virtual flexibility plant for offering DSR services to the system operator
- level of integration for flexibility, Flexgraphs
- analysis of market architectures to offer flexibility information and services
- acceptance among stakeholders, operators, customers incl. their preferences, participation and interest for flexibility offer





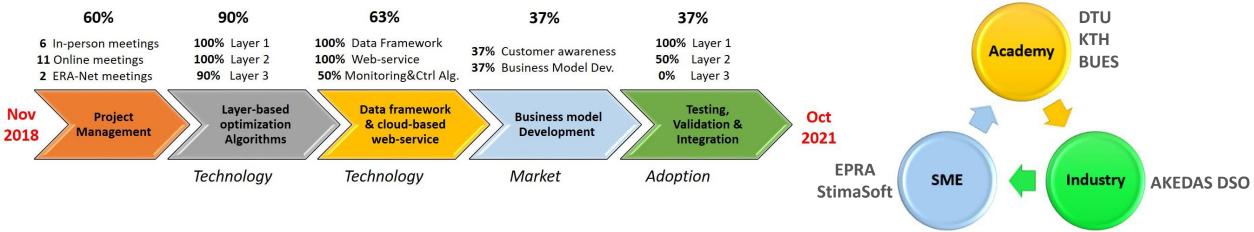
Multi-layer Aggregator Solutions to Facilitate Optimum Demand Response and Grid Flexibility (SMART-MLA)

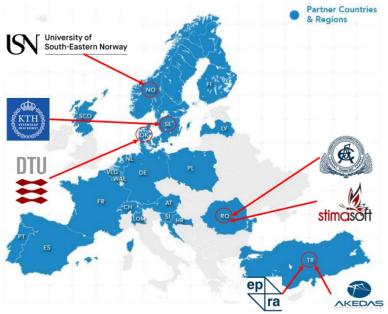
Aggregator, Demand Response, Flexibility

http://smart-mla.stimasoft.com

# **Project Outline**







Layer 3: Aggregation in Wholesale Electricity Markets – AWEM (Monitor / Optimize / Control / Bidding / Market Clearing / Settlement)

Layer 2: Community Aggregator with Control (Monitor / Optimize / Control/ Settlement)

Layer 1: Community Aggregator (DR Optimization only / No Control)



# **Project Outline: Results**



# **Technology**

# Market

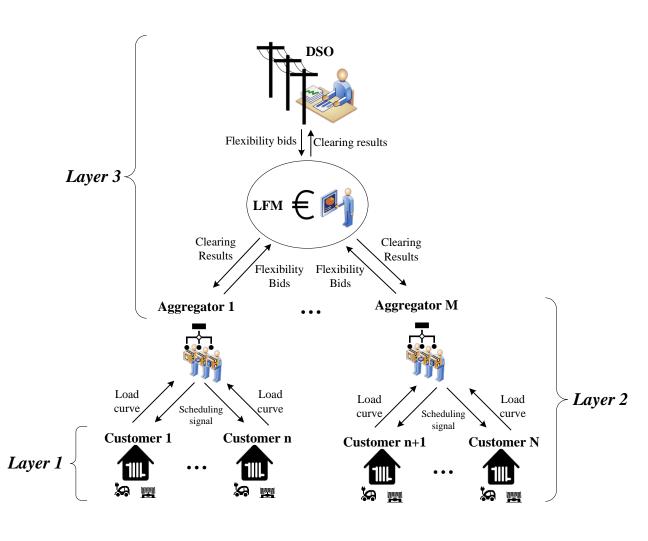
# Adoption

#### (Expected) Result(s)

- Optimization algorithms: Layer 1, 2, and 3
- Forecasting algorithms: Demand, renewable generation
- Data framework: Database design
- Monitoring and Control algorithm: IoT
- Cloud-based web-service application tool
- Settlement mechanisms design and development
- Business model development
- Web-service application
- Smart phone application
- Stockholder meetings

#### So far:

- ✓ 13 SCI paper
- √ 13 Conf. paper <a href="https://smart-mla.stimasoft.com/">https://smart-mla.stimasoft.com/</a>

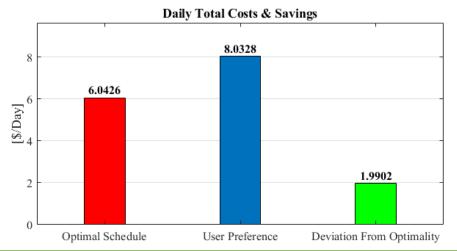


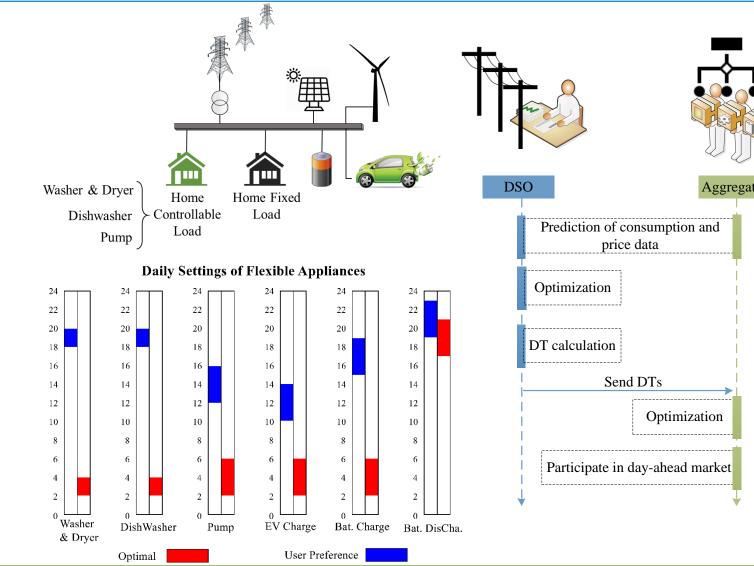
# Relation of the project to the session's topic



#### Flexibility and Market

- Three layers of flexibility
  - Consumer/Prosumer level
  - Aggregator level
  - DSO level
- Dynamic Tariff for Demand Response
- Local Flexibility Market









# Virtual market place





### Getting to the booths on the Virtual Market Place

#### The next 45 minutes: Join a virtual market place booths with the presented projects:

Booth A)	RestoreGRID4RES	support: Ludwig Karg,	
Booth B)	EMBS	support : Laura Börner	
Booth C)	FISMEP	support: Dorothea Brockhoff	
Booth D)	RELflex	support: Julia Chenut	
Booth E)	SMART-MLA	support: Franziska Wirth	

At 11:40 CEST we will bring you back to the main room for the next agenda points



15/10/2020



# Knowledge Community Meeting

## **ERA-Net SES: Working Groups and Taskforces**





System Architecture and Modelling (regional data stores, ...)

Storage and Cross Energy Carrier Synergies (heat & cold, CH4, H2, ...)

Interoperability and Standardisation (linking to IEC, IEEE, ...)

Regulatory and Market Development (regional marketplaces, ...)

Consumer and Citizen Involvement (citizens, regional stakeholders,...)

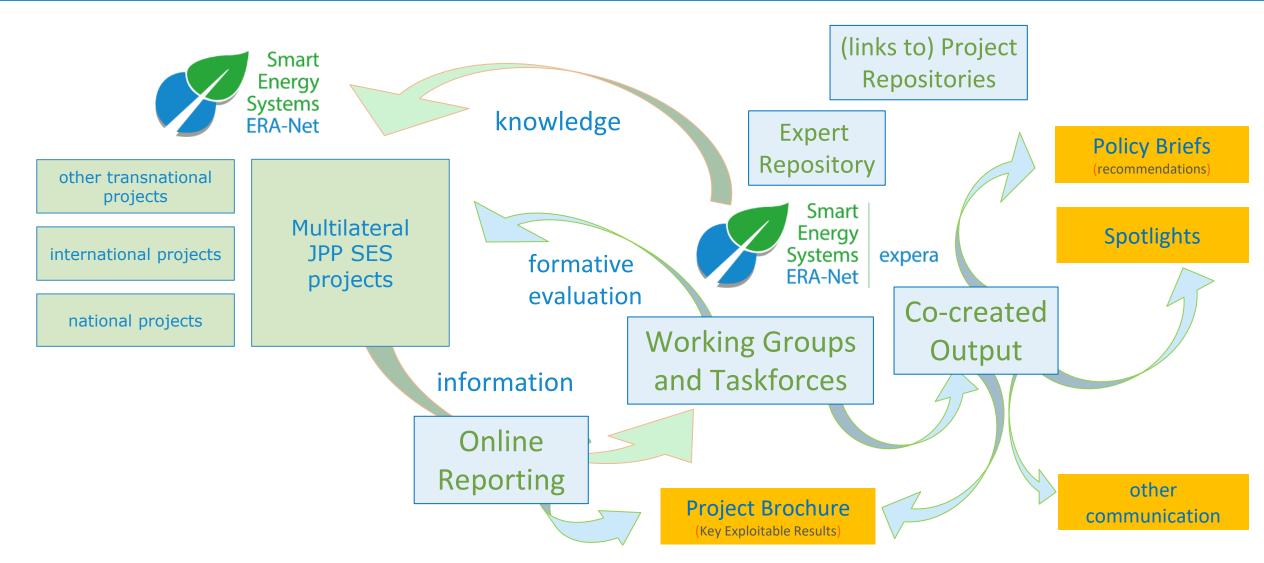
Regional Matters (innovation, technology-transfer, new formats, regional investment ...)



5/10/2020

# Improved Knowledge Community Working Approach







15/10/2020

## Relating JPP SES projects to the rest of the RDI world







#### working groups

- select reference documents
- decide topics for discussion
- discuss and conclude

#### reference documents

- studies
- reports
- directives

### expera

#### discussion documents

- insights from projects
- results wrt to reference
- derived conclusions

Spotlights



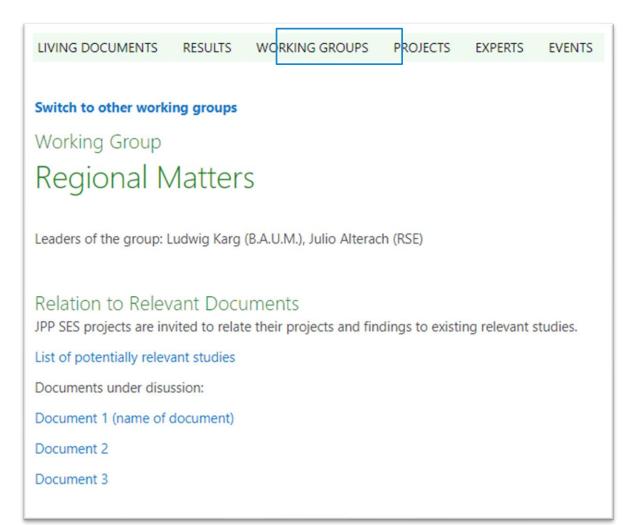




### The Discussion Documents (1)



- Collaboration Documents in Working Group Spaces on expera
  - > link to reference document
  - selected topics for referencing>>> reference per project
  - > conclusions
- adjacent discussion fora



### The Discussion Documents (2)



- longlist for reference documents
  - proposals by projects and experts
  - proposals by support team
- voting and selection process
- max. 3 reference documents at a time

#### List of relevant documents

Working Group: RegioM

title	ETIP RHC 2050 vision for 100% renewable heating and cooling in Europe			
publisher/author	ETIP RHC (Renewable Heating and Cooling) year 2019			
topics				
link	https://www.rhc-platform.org/content/uploads/2019/10/RHC-VISION-2050-WEB.pdf			
relevance	<ul> <li>Chapter 4 "100% RE Buildings"</li> <li>Exploiting existing infrastructures to facilitate the RHC transition</li> <li>The large variety of H&amp;C technologies can provide optimal solutions for any context</li> </ul>			
	<ul> <li>Sector coupling and energy storage are key elements enabling 100% RE in buildings</li> </ul>			
	<ul> <li>System solutions and consumer participation</li> </ul>			
	Drivers for further RHC market uptake			
interested				

 $_{\tiny{\scriptsize{\scriptsize{\scriptsize{\scriptsize{1}}}}}}$  template for new entry

title	<full title=""></full>		
publisher/author		year	
tonics	<keywords content="" for=""></keywords>		



### An example



Key Point of Reference Document X: Mice in Germany are white.

Project A: We can support this finding. Additionally, they usually have red eyes. In our investigations, vitamin D supplements of 1mg/g of weight have shown to prolong life of these white, red-eyed mice by about 6 months.

Project B: We cannot confirm this. In the Bavarian alps, we found brown mice. Brown mice seem to be larger and have significantly longer life expectations.

#### Conclusion:

ERA-Net SES projects found that there are white and brown mice in Germany. While Brown mice have a longer life expectancy in general, white mice live longer with vitamin D supplements. It is important to consider the brown mice for an integrated perspective.



# Contributing to the Working Group



- Register for expera <a href="http://www.smartgridsplus.eu">http://www.smartgridsplus.eu</a>
- Register as member of the Woking Group on expera or by writing to <u>knowledgecommunity@eranet-smartenergysystems.eu</u>
- Review list of reference documents and relate them to your project:
  - Which documents seem most relevant to you?
  - Do you know of further documents which could be related to?
  - What is your perspective on the key points of these documents?
    Based on the experiences made in your project: do you (dis)agree? Why?



# Interactive Lunch Break

#### Selection



#### The next 60 minutes: Join a virtual lunch booth with:



**Booth A)** Gantner Instruments monitors and controls data with fast edge devices for various energy applications - be it PV, EV, battery energy storage, wind or thermal power. By doing so, Gantner enables advanced smart energy services



**Booth B)** Join our logarithmo lunch bar with good jazz to discuss your digital ideas and the technological platform for making them real! We provide the flexible data and digital service platform for a variety of Smart Energy and AI use cases in Europe – we are happy to discuss the fit for your ideas bilaterally



**Booth C)** Novel REAL-TIME bi-directional wireless PowerQualityAnalyzer & IoT Platform with Business Intelligence & Machine Learning features based solution having outstanding cost-value ratio for all segments



Booth D) Get to know the ERA-Net SES Knowledge Community Team

At 13:00 CEST we will bring you back to the main room for the next agenda points



5/10/2020



# Knowledge Community Meeting





ERA-Net SES Working Group Meetings from 13:00 – max. 14:00 – You will be allocated based on your registration

- 1 WG Consumer and Citizen Involvement Moderators: Dorothea Brockhoff & Laura Börner
- **2 WG Regional Matters** Moderators: Julio Alterach & Franziska Wirth
- **3 WG Regulatory and Market Development** Moderators: Iva Gianinoni
- 4 WG Storage and Cross Energy Carrier Synergies Moderators: Minna Näsman
- 5 WG System Architecture & Implementation Modelling and Interoperability & Standardisation Moderators: Ludwig Karg

# Funding Partners





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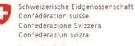


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