

# Smart Energy Research beyond S3C



## Moderation

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## Panelists



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RSE



**Rob Kool**  
International Energy Agency

# What we'll discuss



Going beyond S3C: How far have we come?  
Where do we want to go from here?

# The S3C Key Challenges 2013



**Identifying and  
targeting different  
user groups**

**Added value of  
smart energy value  
for consumers**

**Effective incentives  
and pricing  
mechanisms**

**Effective feedback  
for consumers**

**Communication  
channels,  
information and  
marketing  
techniques**

**Cooperation  
between  
stakeholders**

**Bottom-up projects  
initiated by  
consumers**

**New market  
structures and the  
role of end-users in  
these**

**Up-scaling and  
replicating solutions**

# Where we are in 2015



Amsterdam Smart City and St. Gallen Co-Creation – „what you always wanted from your utility“

Identifying and targeting different user groups

Added value of smart energy value for consumers

Effective incentives and pricing mechanisms

LINEAR – Segmentation Tool and Guideline

Effective feedback for consumers

Communication channels, information and marketing techniques

InovGrid, Stakeholder Analysis „starting from a new point to define the project“

Cooperation between stakeholders

Feedback Collaboration with SPEU

Bottom-up projects initiated by consumers

New market structures and the role of end-users in these

Up-scaling and replicating solutions

Working on Product Development with mainova

# ADVANCED

Active Demand Value ANd  
Consumers Experience Discovery



# ADVANCED

Stella Di Carlo (Enel)



# ADVANCED: the identity card

## EC FP7 research project

Empowering smart consumers to participate in active demand and electricity supply system efficiency



Target Matrix  
definition

KPI

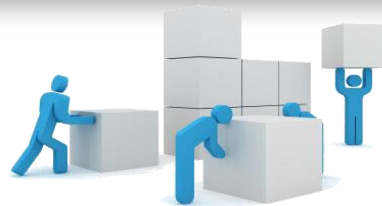
Qualitative &  
quantitative  
surveys

AD Potential  
studies

Communication  
strategies



Kick off  
December 2012

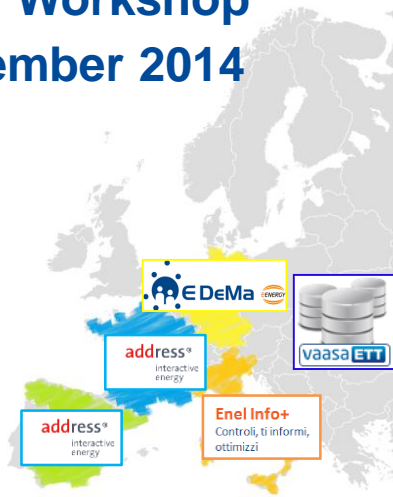


Final Workshop  
November 2014

10 EU Partners  
+  
4 Demo Sites



ADVANCED



# Results



## How to assess and tune an AD program

- Know what to measure, choose the proper way
  - The ADVANCED target matrix : 250 variables to scaling up and replicate AD projects
  - Standard measurement instruments to compare easily different pilots



## How to recruit and engage consumers in AD program

COSTS & BENEFITS

BEING PART OF  
WIDER INITIATIVES

OPPORTUNITY,  
NEED, DESIRE

BELIEFS



## Actions and communication strategies to make AD happen

✓ Improve information about energy

✓ Send consistent messages

✓ Make your offers modular to adapt them in most markets

✓ Provide consumers with proofs of guarantees



## Which is the AD potential on the Electrical system

AD potential in Europe is substantial and could be increased by removing major barriers



ADVANCED

Thank you very much

*advancedfp7.org*



ADVANCED

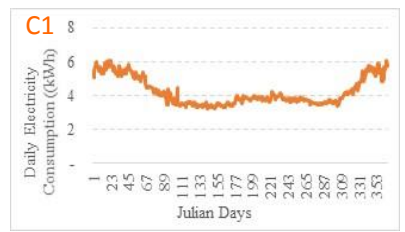


# ENERGY & CLIMATE

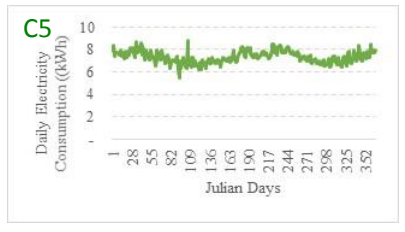
low-carbon sustainable energy: integrated energy systems modelling |  
 scenarios | smart meters data analysis | consumers' groups | energy-water nexus |

- **Unravelling electricity consumption profiles in households**
  - combining smart meters and door-to-door surveys [265 households: 10 consumption clusters for Évora city]

Annual electricity consumption profiles by cluster (2011-2014 average)



**U profile (soft): Fuel Poverty**  
 Small houses (< 90m<sup>2</sup>)  
 Single glazing, rented houses  
 2 pax/house, > 65 years old,  
 low education level  
 Average income < 750€ monthly



**Flat profile: Standard comfort**  
 Rural recent houses (120 m<sup>2</sup>)  
 Single and double glazing  
 2,8 pax/house, <50 years old  
 Full-time workers  
 Medium income: [751-1500€]



**U profile (sharp): 'Fat' households**  
 Predominantly urban areas  
 3 pax/house, 80% > 750€ monthly  
 63% with at least a graduation  
 Highest penetration of space heating  
 equipment (89%)



**W profile: 'Fat' households**  
 Rural very recent houses (>160 m<sup>2</sup>)  
 Double glazing  
 4 pax/house; 60% with 18-49 years old  
 50% with income > 2500€  
 Medium-high class

- **S3C challenge - Understanding the target group(s):**
  - Self-production (prosumers – smart grids)
  - DSOs, energy retailers and ESCOs (e.g. peak demand management, dynamic tariffs, energy services)
  - Public policy (tailored instruments towards energy efficiency and effective reduction of energy consumption)

# ENERGY & CLIMATE

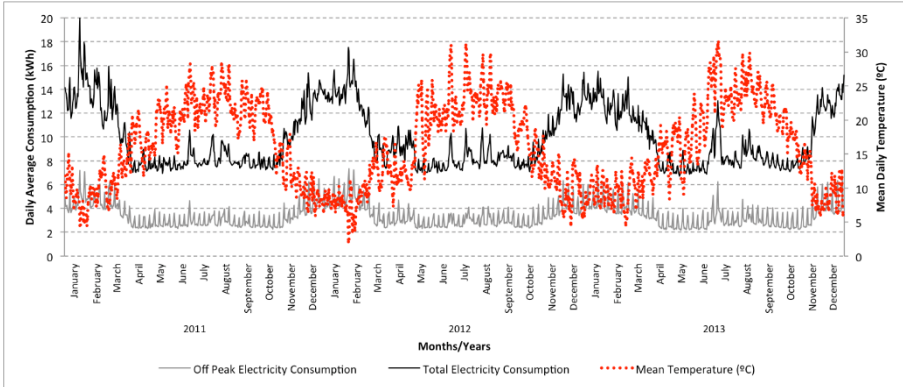
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Universidade NOVA de Lisboa  
Júlia Seixas, mjs@fct.unl.pt

- **Potential of households self-consumption from PV production [250 households in Évora city]**
  - Off-peak consumption as a proxy for the minimum base load of electricity consumption
  - PV potential based on daily off peak consumption [no clusters distinction]

Daily average electricity consumption (off-peak and total)



Off-peak around 35% of total daily electricity consumption

90% of daily off-peak lower than 6kWh  
70% of daily off-peak lower than 4 kWh

Simulation of commercially available PV panels (1 panel of 300Wp. & 6 panels of 225Wp.) to secure the minimum base load of electricity consumption:

✦ **19GWh per annum** from a total installed power of 12.7MW [22% of total electricity consumption in households]

- S3C challenge - New market structures:
  - Off-grid consumption, shared-economy based market models



## Relating the activities of RVO and IEA DSM to S3C

<b>Challenge</b>	<b>Solved?</b>	<b>To Do</b>
Understanding the target group(s)	The DSM Monster book	Link it to mainstreaming.
Cooperation between stakeholders	Only marginal (Results EGRD workshops).	Legislation, „language“ courses
Products & services	IEA publications	New roadmaps
New market structures	EGRD workshop: Will a smarter grid lead to smarter end users?	Create open sourcenetwork
Scalability / replicability	The Role of Storage in Energy System Flexibility (EGRD)	Standards & barrier removal



# ISGAN

## International Smart Grid Action Network

A focus on activities about consumer engagement and empowerment

Michele de Nigris  
ISGAN - Chair

### International Smart Grid Action Network (ISGAN)

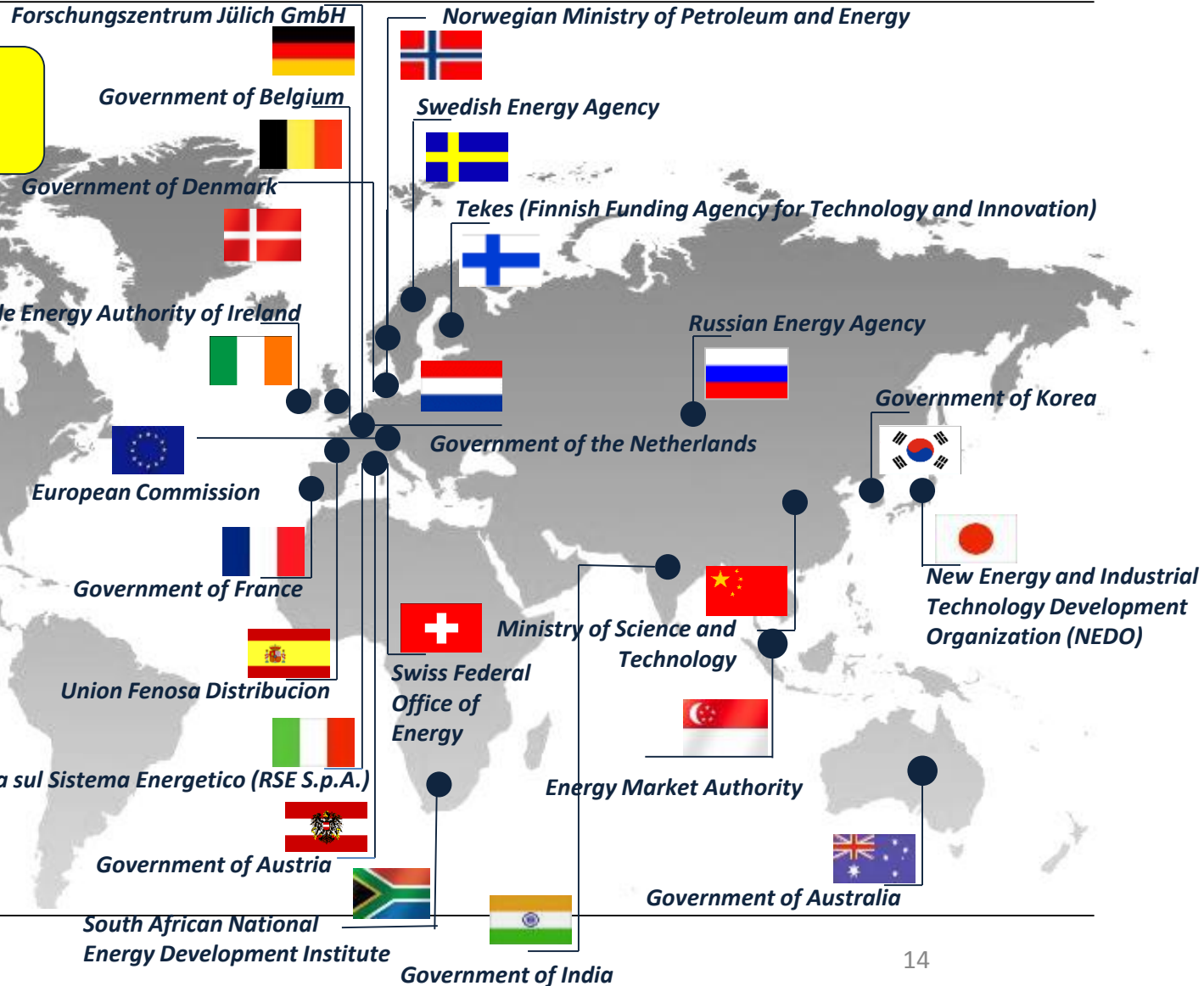
‘Strategic platform to support high-level government attention and action for the accelerated development and deployment of smarter, cleaner electricity grids around the world’



- An initiative of the Clean Energy Ministerial (CEM)
- Organized as the Implementing Agreement for a Co-Operative Programme on Smart Grids (ISGAN)

*The CEM is the only multilateral forum dedicated to the advancement of clean energy technologies and related policies. ISGAN is the **only global government-to-government forum on smart grids***

**24 Countries and European Commission**



## Catalogue Priorities and Projects

- Motivating drivers and technology priorities for smart grids
- Inventory of key projects
- Lessons learned

## Qualitative and Quantitative Analyses

- Internationally-comparable case studies; casebooks
- Methodologies for benefits & costs, grid “smartness”
- Integrated tools

## Technical Cooperation

- Assess T&D needs
- Evaluate smart grid concepts & technologies
- Laboratory and test beds network

## Knowledge Sharing by Design

- Translate complex data/info to inform decision making
- Outreach & education (e.g., discussion papers, webinars, workshops)

*Where possible, common contextual information, metrics, KPIs*

**Smart Grid  
Technologies**  
*generation, transmission, distribution,  
storage, supply, load*

**Socio-economic hardware**

**„Smart“  
Institutional  
Structures**

*sectoral, corporate,  
public, civil*

**Smart Grid  
Transition**

**Smart Cities,  
Service Orientation**  
*producing, moving, living, ....*

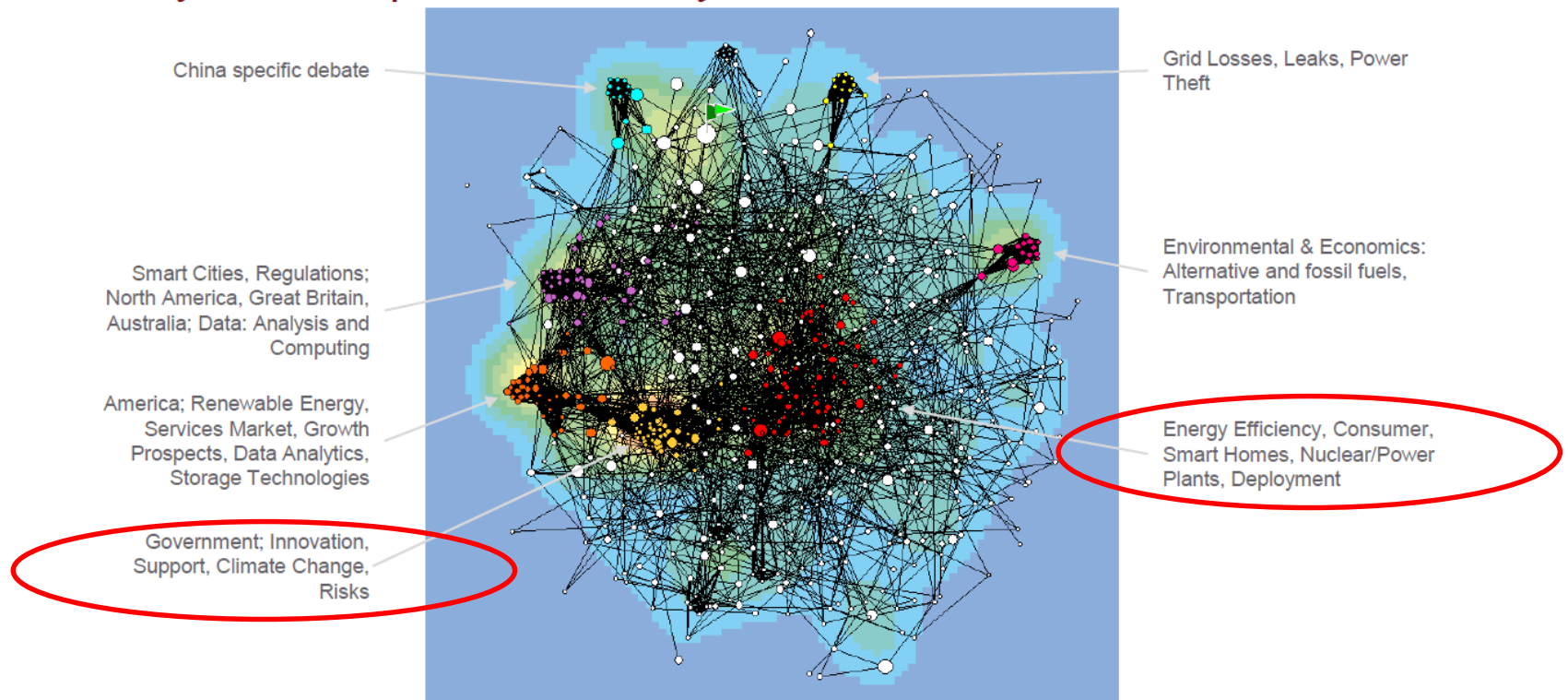
**Socio-economic software**

**„Smart“  
Governance  
Processes**

*anticipating, adapting, agile acting*



## Keyword Map – Preliminary Results



Grouping of keywords on their common appearance in discussions (minimum 6 times); Circle: keyword, the size corresponds to the number of discussions; Edges: Jaccard index of co-frequencies; Background: density map of bibliographically coupled publications, cos-weighted moving average filter  $pw=c(x,y) \times p(x,y)$ ; Timespan of analysis: 03 2014 to 03 2015; Retrieval date: 03 2015; Total number of discussions: 3.812  
Number of nodes: 605; Number of edges: 12.385 (3.500 visible)

## Top 50 Keywords

	Keyword	Discussions	% of total
1	smart meters	179	4,7%
2	renewable energy	96	2,5%
3	Europe	94	2,5%
4	industry	84	2,2%
5	World Trade Webcast	83	2,2%
6	Customers	76	2,0%
7	energy efficiency	73	1,9%
8	2015	72	1,9%
9	consumer	69	1,8%
10	challenges	67	1,8%
11	China	65	1,7%
12	solar	64	1,7%
13	demand response technology	63	1,7%
14	companies	62	1,6%
15	investment	61	1,6%
16	electricity	60	1,6%
17	Greentech Media	60	1,6%
18	India	59	1,5%
19	EU	58	1,5%
20	IoT (Internet of Things)	55	1,4%
21	Women	55	1,4%
22	Innovation	53	1,4%
23	energy storage	52	1,4%
24	SGIP	52	1,4%
25	oil	51	1,3%

	Keyword	Discussions	% of total
26	support	50	1,3%
27	electric vehicle	48	1,3%
28	impact	47	1,2%
29	wind	47	1,2%
30	government	46	1,2%
31	License	46	1,2%
32	California	45	1,2%
33	WEBINAR	45	1,2%
34	Efficiency	43	1,1%
35	change	43	1,1%
36	cities	43	1,1%
37	resources	42	1,1%
38	2020	41	1,1%
39	growth	41	1,1%
40	economy	40	1,0%
41	Smart Cities	40	1,0%
42	United States	40	1,0%
43	regulations	39	1,0%
44	transmission	39	1,0%
45	General Electric GE	39	1,0%
46	FierceSmartGrid	39	1,0%
47	natural gas	38	1,0%
48	solar energy	38	1,0%
49	Microgrids	38	1,0%
50	economics	37	1,0%

List of top 50 keywords, sorted descending by number of discussions they occur in; total number of discussions: 3.812



*In 2014, launched the inaugural **Award of Excellence** competition to showcase leadership and innovation in smart grids projects around the world.*

## Winner (1)

- Entergy New Orleans "SmartView" AMI Pilot (USA)



## Honorable Mention (1)

- EcoGrid : Consumer Engagement in the future power system (Denmark)



## Finalists (8)

- PowerMatching City (Netherlands)
- Inovgrid (Portugal)
- LINEAR - Local Intelligent Networks for Energy Active Regions (Belgium)
- Borrego Springs Microgrid Demonstration (USA)
- NICE Grid the French Demonstrator of GRID4EU (France)
- Pacific Gas & Electric's Green Button (USA)
- Share! (Japan)
- Advanced Building-Scale Smart Grid Demonstration at Mesa del Sol (USA)



- ISGAN Website : <http://www.iea-iscan.org>
- ISGAN Secretariat Email: [iscan@smartgrid.or.kr](mailto:iscan@smartgrid.or.kr)



ISGAN Executive Committee

Johannesburg – March 2015



# **FROM LOCAL TRIALS TOWARDS A EUROPEAN KNOWLEDGE COMMUNITY**

I

S3C Final Conference, Berlin, 23 September 2015

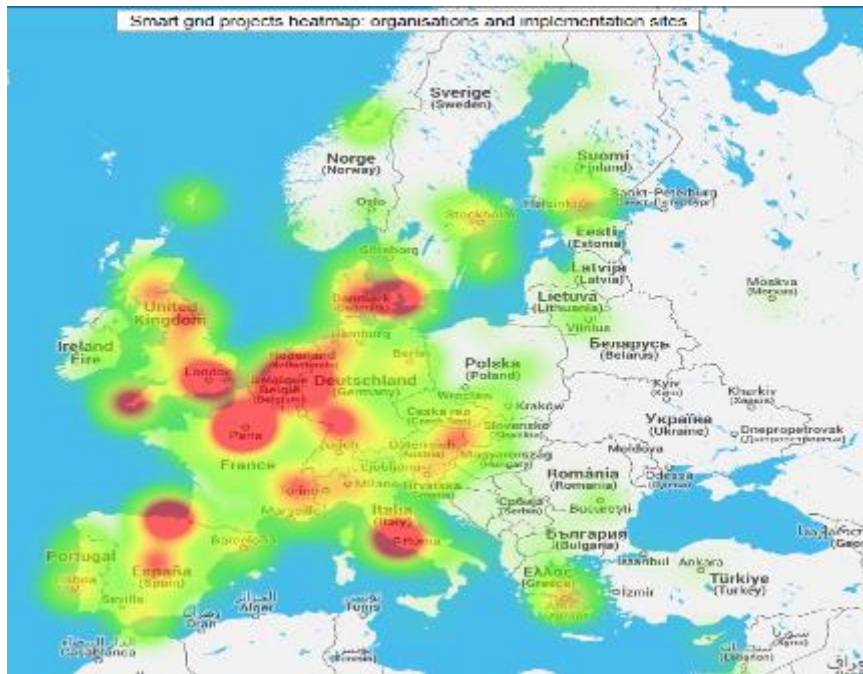
Michael Hübner

## ERA-NET SMART GRIDS PLUS ...

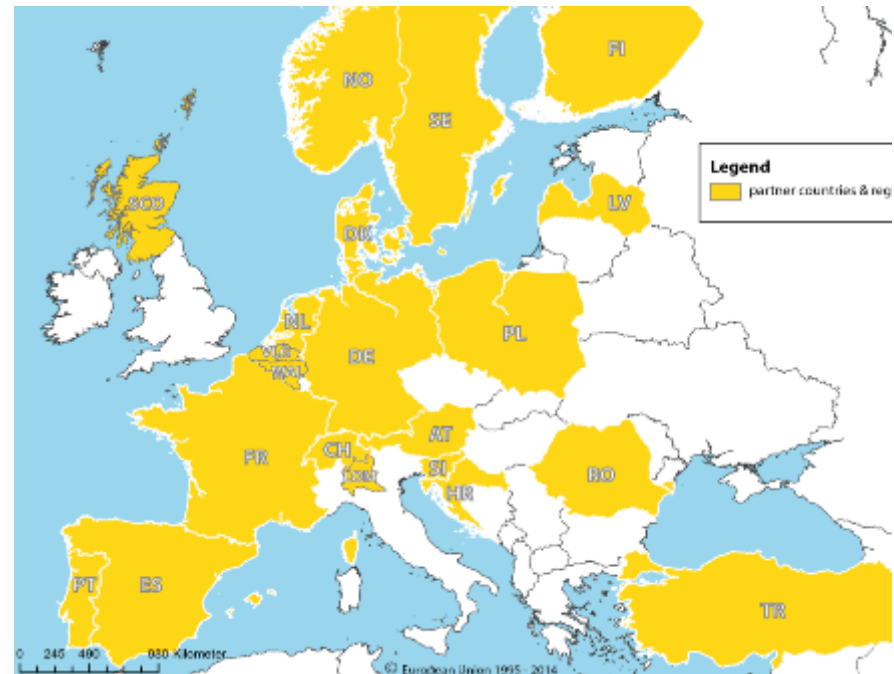
- is a **network of RDD funding programs**- 23 partners from 21 European countries/regions
- will **promote applied research, piloting and demonstration** in the field of smart grids, with a focus on (comparative) **validation, scaling-up and replication**, integrating the layers “technology”, “marketplace” and “adoption”
- will **build on the already existing, national and regional key pilots, demo projects and facilities as well as the related investments by industry and the public (>2.500 Mio € )**, by facilitating deep knowledge sharing in new transnational RDD projects and taking the next step in Smart Grids development while building on the existing demos.
- will establish a **sustainable cooperation structure between national Smart Grids programmes**, contribute to **joint programming** in the framework of the SET-Plan, **organise the learning** between projects, between programs and **from the European SET-Plan level down to the regional and local level**

# ERA-NET SMART GRIDS PLUS PARTNER COUNTRIES AND REGIONS

JRC Smart Grid Projects Heat Map

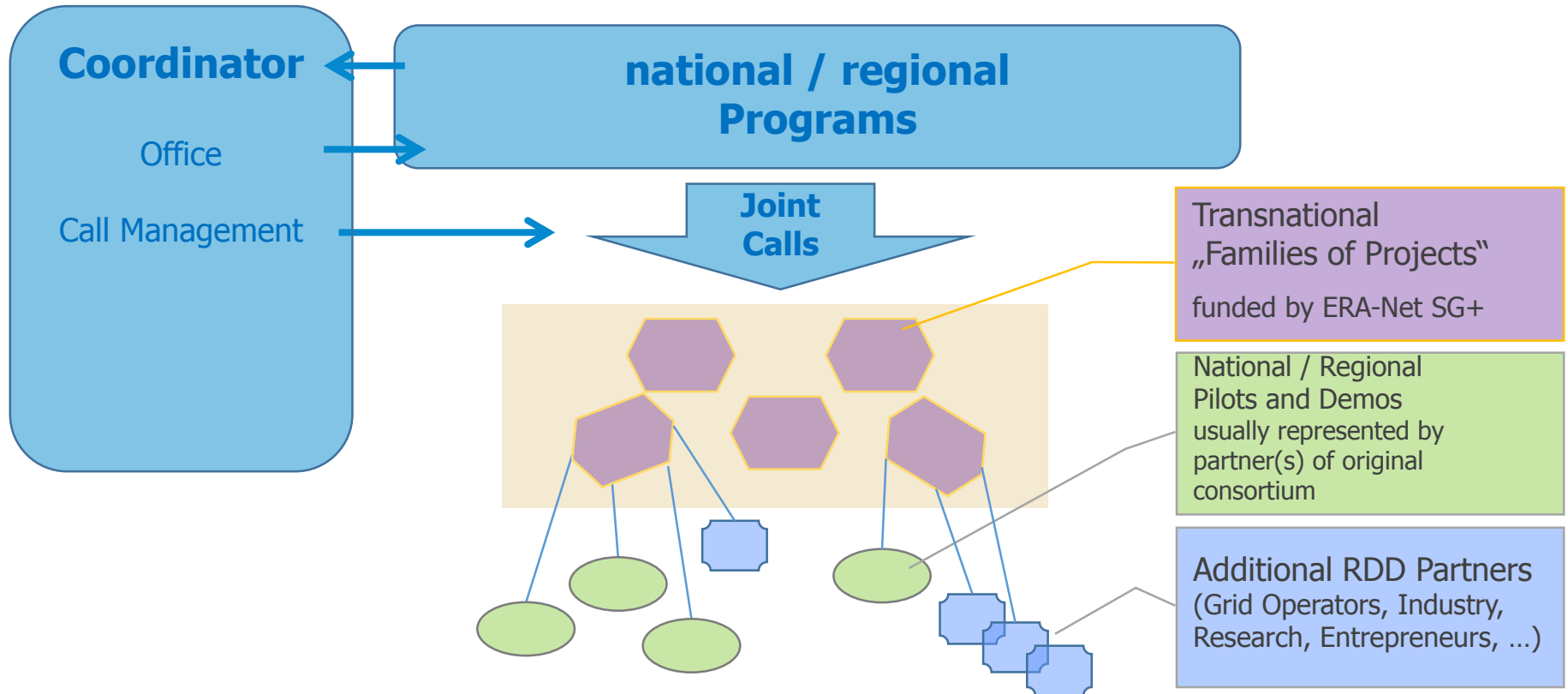


ERA-Net SG+ Geographical Coverage

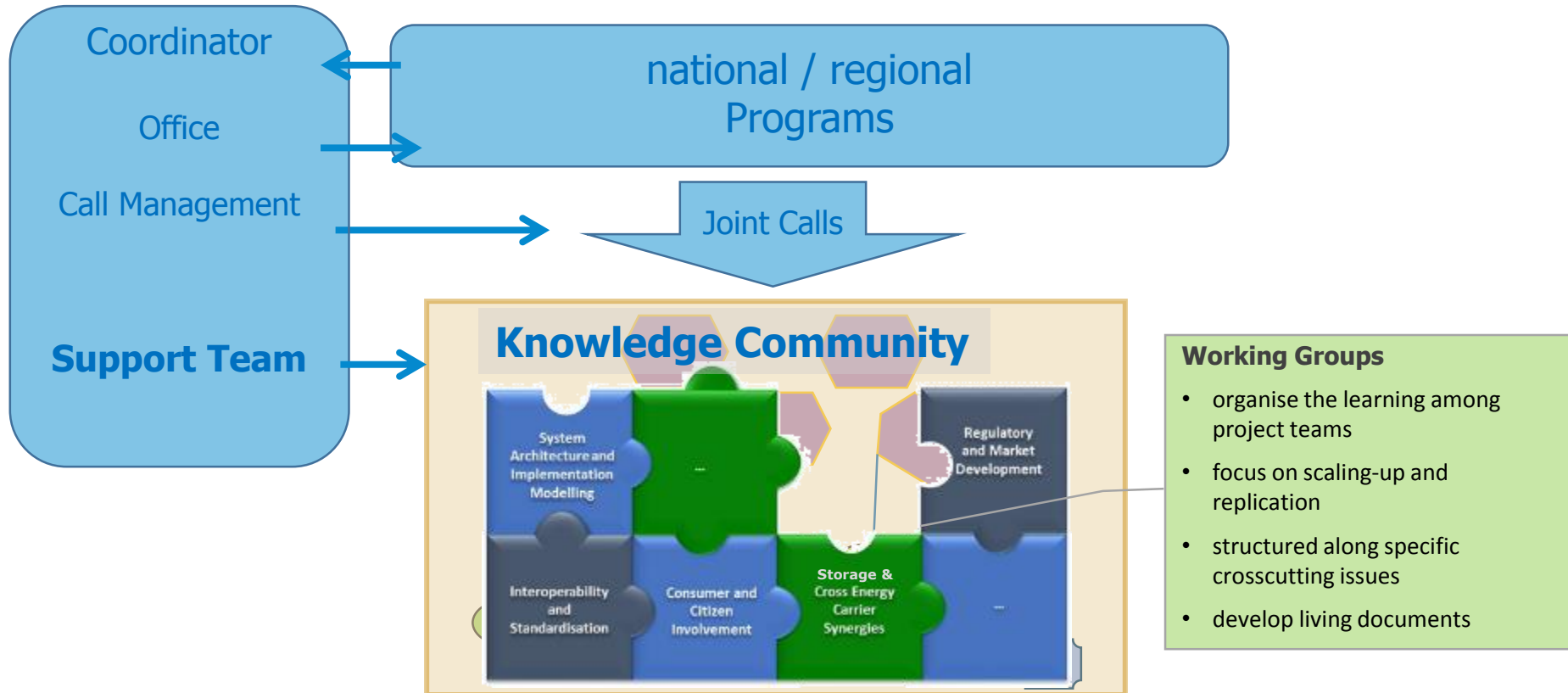




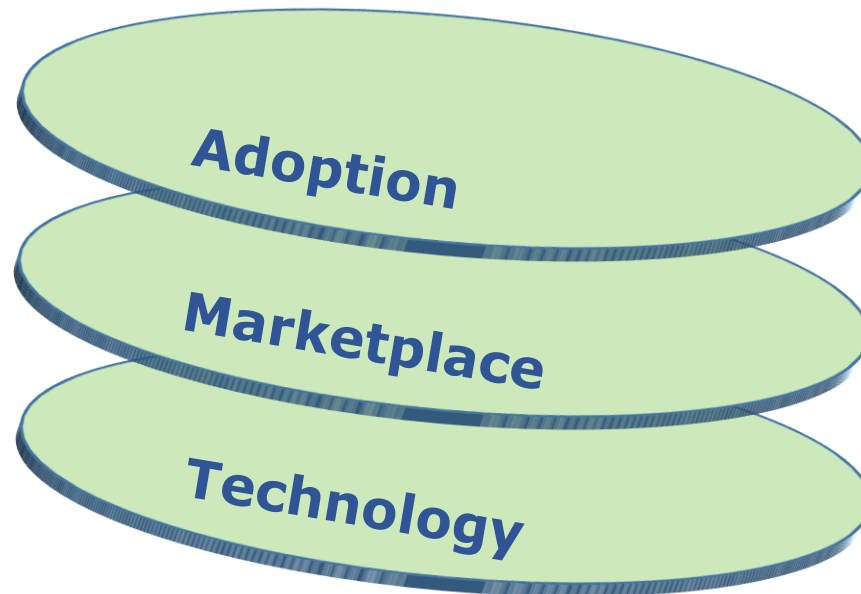
# COOPERATION STRUCTURE: LEVEL 1: PROGRAMMES & PROJECTS



# COOPERATION STRUCTURE: LEVEL 2: KNOWLEDGE COMMUNITY



## THREE LAYER RESEARCH MODEL



## LINKS AND RESOURCES

- **Website** [www.eranet-smartgridsplus.eu](http://www.eranet-smartgridsplus.eu) (Newsletter !)
- **Call Information**  
<http://www.eranet-smartgridsplus.eu/research-calls/>
- **National Contact Points**  
<http://www.eranet-smartgridsplus.eu/contact/>
- **“Smart Grids Demo Snapshots”**, collection containing 34 key-demonstration projects from 18 participating countries and regions ([www.eranet-smartgridsplus.eu](http://www.eranet-smartgridsplus.eu))
- **Matchmaking Platform** where potential project partners can present themselves and organise b2b meetings (<http://www.b2match.eu/smartgridsplus>).

# FUNDING PARTNERS



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**THANK YOU FOR YOUR ATTENTION**

**Michael Hübner**

Coordinator ERA-Net Smart Grids Plus

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