



India
SMART GRID
Week 2015

March 02 - 06, 2015

Bangalore International Exhibition Centre
Bengaluru, India

The Grid+ project: Connecting Smart Grid initiatives in the future European electricity grid

04/03/2015

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Pieter Vingerhoets, Energyville – KU Leuven



Organiser

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India Smart Grid Forum



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Global Smart Grid Federation

Facilitate the collaboration of national and international Smart Grid organizations to conduct and foster research in the application of Smart Grid technologies

Support implementation of Smart Grid technologies by establishing itself as the global centre of competency

Foster international exchange of ideas and best practices on energy issues

Facilitate dialogue and cooperation between the public and private sectors in countries around the world

GSGF Collaborative Partners

- GSGF has established a number of collaborative relationships with global energy organizations.
 - Major Economies Forum on Energy and Climate (MEF)
 - Clean Energy Ministerial (CEM)
 - International Smart Grid Action Network (ISGAN) (co-organizing Smart Grids project award)
 - International Energy Agency (IEA)
 - Global Green Growth Forum (3GF)
 - EIT KIC InnoEnergy

The European background : SET-plan, EEGI AND GRID+

The European Strategic Energy Technology (SET) Plan

- Defines the energy technology policy for Europe.
- Promotes cost-effective low carbon technologies

The European Energy Grid Initiative (EEGI)

- Launched within SET plan
- Roadmaps: identifies priorities for future RD&D activities
- Implementation plan 2015-2017 now available at www.gridplus/eeGI

The GRID+ project

- Funded within FP7
- Launched in October 2011
- Provides operational support for the EEGI:
 - Mapping smart grid project results/investments and identifying gaps and barriers
 - Labelling existing smart grid projects
 - Promoting scalability and replicability of smart grid projects
 - Sharing the achieved expertise via a knowledge sharing platform

The Grid+ consortium



The EEGI roadmap: Transmission

Cluster	Name	Functional Objective	Full names of Functional Objectives
C1	Grid architecture	T1	Definition of scenarios for pan-European network expansion
		T2	Planning methodology for future pan-European transmission system
		T14	Towards increasing public acceptance of transmission infrastructure
C2	Power technologies	T3	Demonstration of power technology to increase network flexibility and operation means
		T4	Demonstration of novel network architectures
		T5	Interfaces for large-scale demonstration of renewable integration
C3	Network operation	T6	Innovative tools and methods to observe and control the pan-European network
		T7	Innovative tools and methods for coordinated operation with stability margin evaluation
		T8	Improved training tools and methods to ensure better coordination at the regional and pan-European levels
		T9	Innovative tools and approaches for pan-European network reliability assessment
C4	Market designs	T10	Advanced pan-European market tools for ancillary services and balancing, including active demand management
		T11	Advanced tools for capacity allocation and congestion management
		T12	Tools and market mechanisms for ensuring system adequacy and efficiency in electric systems integrating very large amounts of RES generation
C5	Asset management	T15	Developing approaches to determine and to maximize the lifetime of critical power components for existing and future networks
		T16	Development and validation of tools which optimize asset maintenance at the system level, based on quantitative cost/benefit analysis
		T17	Demonstrations of new asset management approaches at EU level

<http://www.gridplus.eu/eeqi>

The EEGI: T&D and Distribution

Cluster	Name	Functional Objective	Full names of Functional Objectives
TD	Joint TSO/DSO Activities	TD1	Increased observability of the distribution system for transmission network management and control
		TD2	The integration of demand side management at DSO level into TSO operations
		TD3	Ancillary services provided through DSOs
		TD4	Improved defense and restoration plan
		TD5	Methodologies for scaling-up and replicating

C1	Integration of smart customers	D1	Active demand for increased flexibility
		D2	Energy Efficiency from integration with Smart Homes
C2	Integration of DER and new uses	D3	DSO integration of small DER
		D4	System integration of medium DER
		D5	Integration of storage in network management
		D6	Infrastructure to host EV/PHEV
C3	Network operations	D7	Monitoring and control of LV network
		D8	Automation and control of MV network
		D9	Network management tools
		D10	Smart metering data processing
C4	Network Planning and asset management	D11	New planning approaches for distribution networks
		D12	Asset management
C5	Market design	D13	Novel approaches for market design analysis

Gap Analysis: TSO and joint TSO-DSO level

- On-going and recently finished Smart Grid projects
- Sources of input were e.g. ENTSO-E reports, ERA-net reports, JRC database

DOMAIN	T1	T2	T3	T4	T5	T6	T7	T8	T9	T10	T11	T12	T13	TD1	TD2	TD3	TD4	TD5
Hardware			Red	Yellow	Red	Yellow	Yellow								Red			
Software tools	Orange	Orange	Red	Orange	Orange	Orange	Red	Orange	Orange	Yellow	Orange	Orange	Orange	Orange	Orange	Orange	Red	Red
System integration	Red	Orange	Red	Yellow	Orange	Orange	Orange	Orange	Orange	Yellow	Orange	Orange	Orange	Orange	Red	Red	Red	Red
Market des.		Red									Red	Red	Red		Red	Red		
CBA	Orange		Red	Orange	Orange	Orange				Orange	Red	Orange	Orange		Red	Red		
Grid services regulation	Red		Red			Orange		Yellow		Red	Red	Orange	Red	Red	Red	Red	Red	
Stakeholder. involvement	Red		Red			Yellow			Orange	Orange	Red	Orange	Orange	Red	Orange	Orange	Orange	
System reliability	Red	Red	Red	Orange	Red	Red	Red	Red		Red	Red	Orange	Orange	Orange	Red	Orange	Red	

Gap Analysis: DSO level

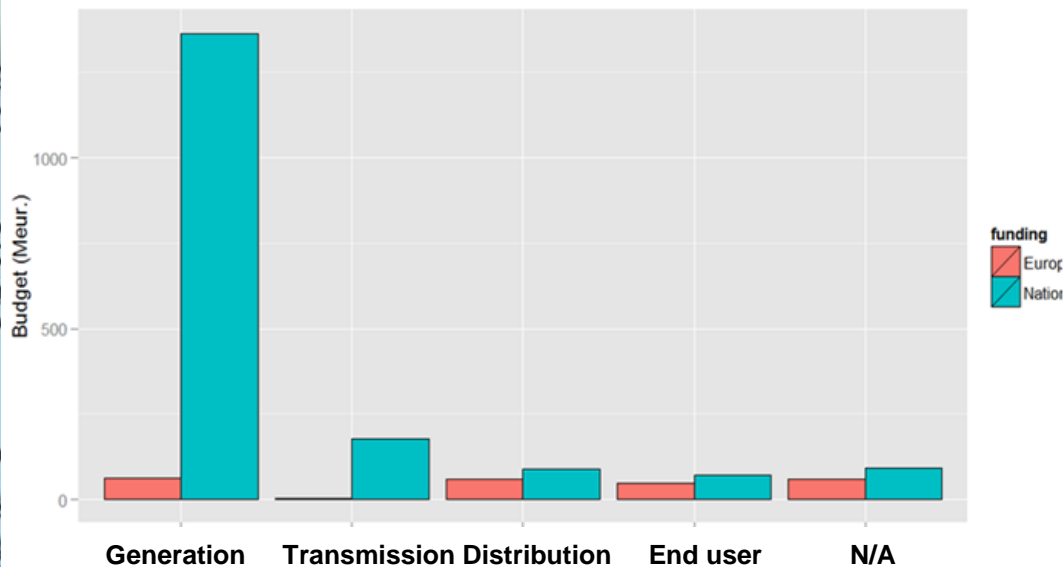
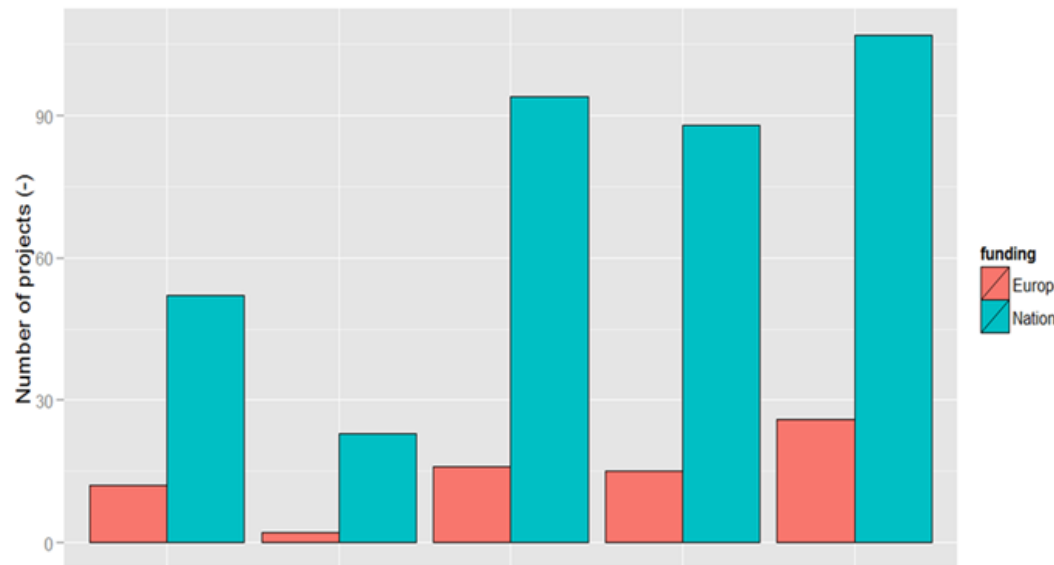
	D1	D2	D3	D4	D5	D6	D7	D8	D9	D10	D11	D12
Hardware	Yellow	Orange	Yellow	Orange	Orange	Yellow	Red	Orange	Red	Red	Orange	Orange
Software tools	Orange	Orange	Yellow	Orange	Orange	Orange	Red	Orange	Orange	Red	Orange	Orange
Technology integration	Orange	Orange	Yellow	Green	Orange	Orange	Red	Red	Red	Orange	Orange	Orange
Interoperab.&standard	Orange	Orange	Orange	Orange	Red	Orange	Red	Red	Red	Orange	Red	Orange
Market Design	Orange	Red	Yellow	Red	Red	Orange	Red	Orange	Orange	Orange	Red	Red
business scenario	Red	Red	Yellow	Orange	Red	Orange	Red	Orange	Orange	Orange	Red	Red
Custom. involvement	Yellow	Yellow	Yellow	Orange	Orange	Green	Red	Orange	Orange	Green	Orange	Green
privacy/data security	Orange	Orange	Red	Red	Orange	Green	Red	Orange	Red	White	Orange	Orange
Improved planning	White	White	White	White	Red	Orange	Red	Red	White	Orange	Orange	Red

[I. Losa, M. De Nigris, T. VU Van, I. Herold, W. Hribernik, "Analysis of the on-going Research and demonstration Efforts on Smart Grids in Europe," in CIREN, Stockholm, 2013](#)

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Storage investments mapping

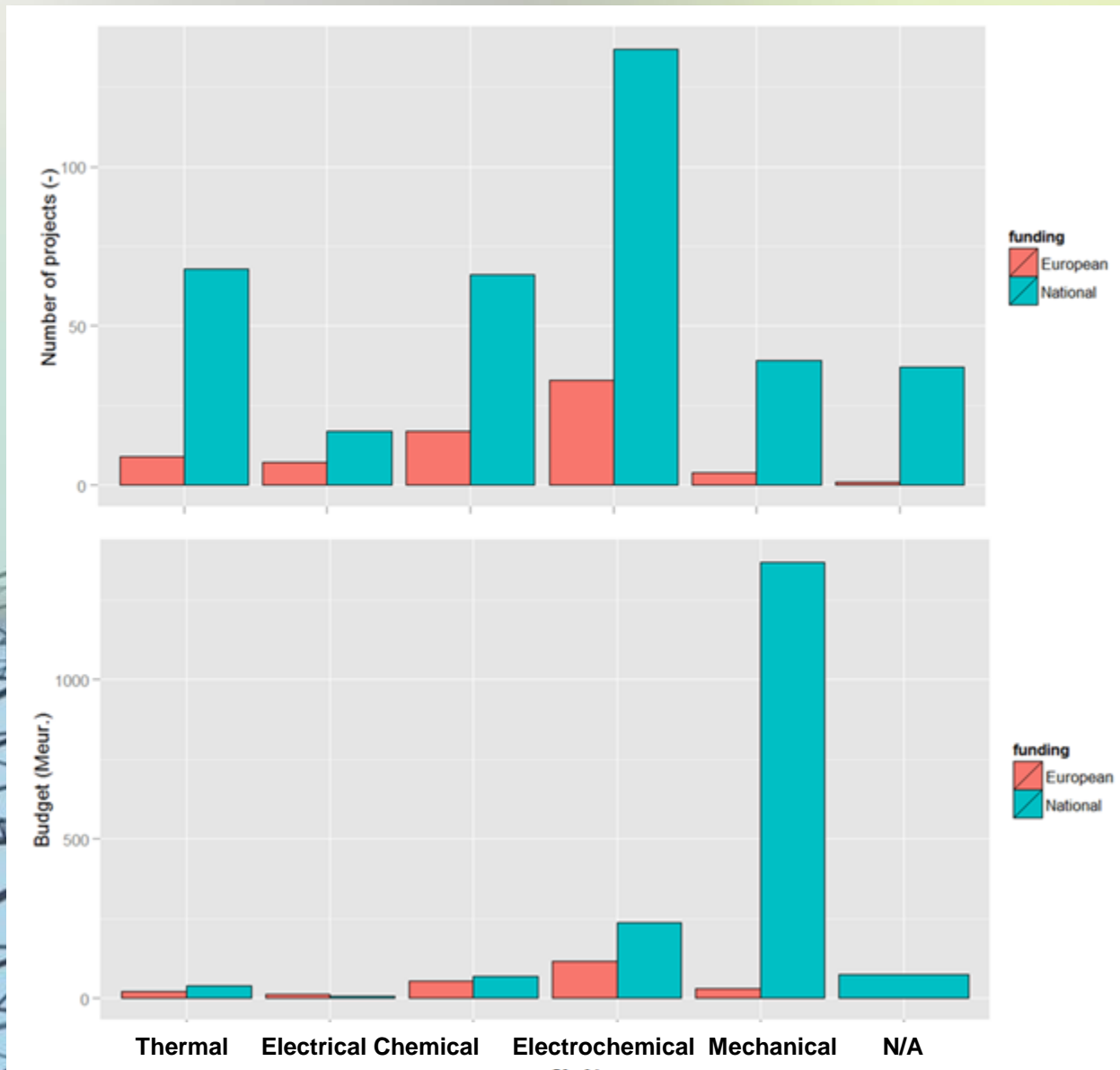


- ✓ R&I investments in storage
- ✓ 14 different member states

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Storage mapping per technology in Europe

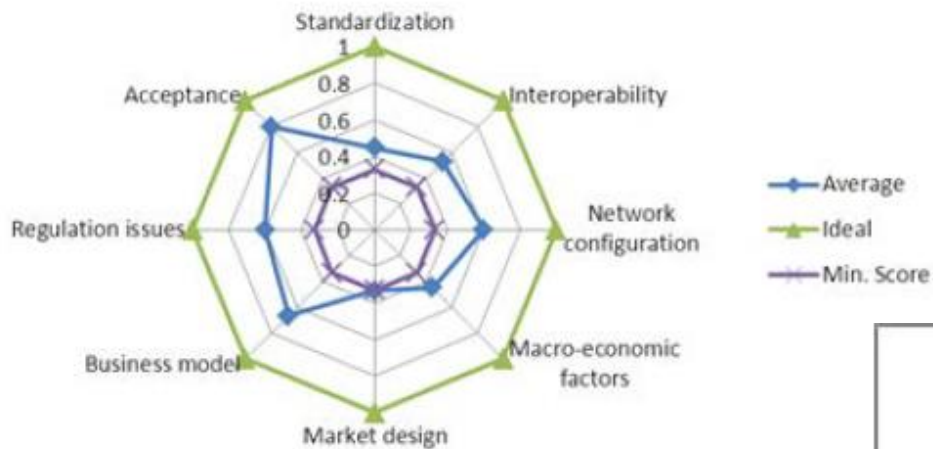


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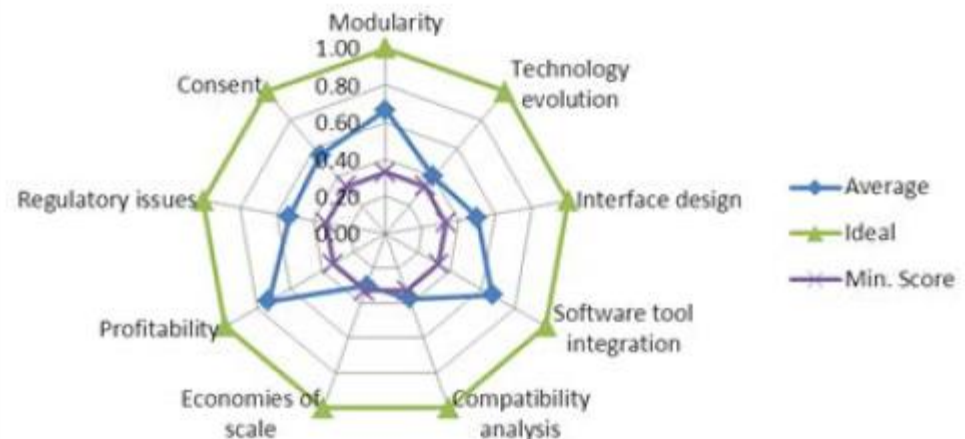
Scalability & Replicability of Smart Grid projects

Replicability



- ✓ Questionnaire with ongoing smart grid demonstration projects
- ✓ Tool to assess replicability and scalability of start-up demonstration projects

Scalability



Smart grid projects labelling procedure



- ✓ Fully in line with the EEGI objectives
- ✓ Scalability and Replicability
- ✓ Large-scale demonstrations (~15M€)

Project name	Type	Funding	label
Twenties	Transmission	European	core
Grid4EU	Distribution	European	core
Inovgrid	Distribution	European	core
Umbrella	Transmission	European	core
Optimate	Transmission	European	core
iTesla	Transmission	European	core
e-Highway2050	Transmission	European	core
SGSM	Distribution	National	core
PRICE	Distribution	National	core
Garpur	Transmission	European	core
Linear	Distribution	National	core

<http://www.gridplus.eu/eeqi/eeqi-project-labelling-started>

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Knowledge sharing platform

The screenshot displays the GRID INNOVATION online website. At the top left is the logo, which consists of a blue grid icon followed by the text "GRID INNOVATION online" and the tagline "Your gateway to state-of-the-art knowledge on smart grids". To the right of the logo is a search bar with a text input field, a dropdown menu set to "In All", and a magnifying glass icon. Below the search bar is a navigation bar with links for "Home", "About us", "Access Articles", "Submit articles", and a "Login" button with a lock icon. A LinkedIn icon is also present in the top right corner. The main content area features a collage of images related to smart grids, including solar panels, power lines, colorful cables, a wind turbine, and an electric vehicle. Below the collage are three large blue boxes with white icons and text. The first box has a lightbulb icon and is titled "Innovation library", with the text "I am looking for innovative smart grid results and projects". The second box has an icon of a lightbulb inside a screen with people below it, titled "Submit and share knowledge", with the text "I am looking for promoting my smart grid projects and results". The third box has an icon of a group of people with arrows, titled "Join the GridInnovation community", with the text "I want to join the GridInnovation community". Above this third box is a small white box with the text "Not registered? Go to the registration form" and "Already registered? click to login".

GRID INNOVATION online
Your gateway to state-of-the-art knowledge on smart grids

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In

Home | About us | Access Articles | Submit articles | Login

Innovation library
I am looking for innovative smart grid results and projects

Submit and share knowledge
I am looking for promoting my smart grid projects and results

Join the GridInnovation community
I want to join the GridInnovation community

Not registered? Go to the registration form
Already registered? click to login

Screenshot of <http://www.gridinnovation-on-line.eu/>

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Thank you!

