

EEGI Member States Initiative

A pathway towards EEGI functional projects

EU-US Smart Grid assessment methodologies

7 November 2011

Basic idea and goals of the Member States Initiative

- Joint activity of committed member states in the framework of EEGI (joint forces with JRC, KPI's and labelling group)
- Bringing the 12 DSO functional projects into life
- Help relevant projects and programmes to find each other
- Bringing selected member state's projects on EU level
- Agree on process and structure to work together on development of functional demonstrators
- Bringing up proposals and coordinate with the EEGI-Team

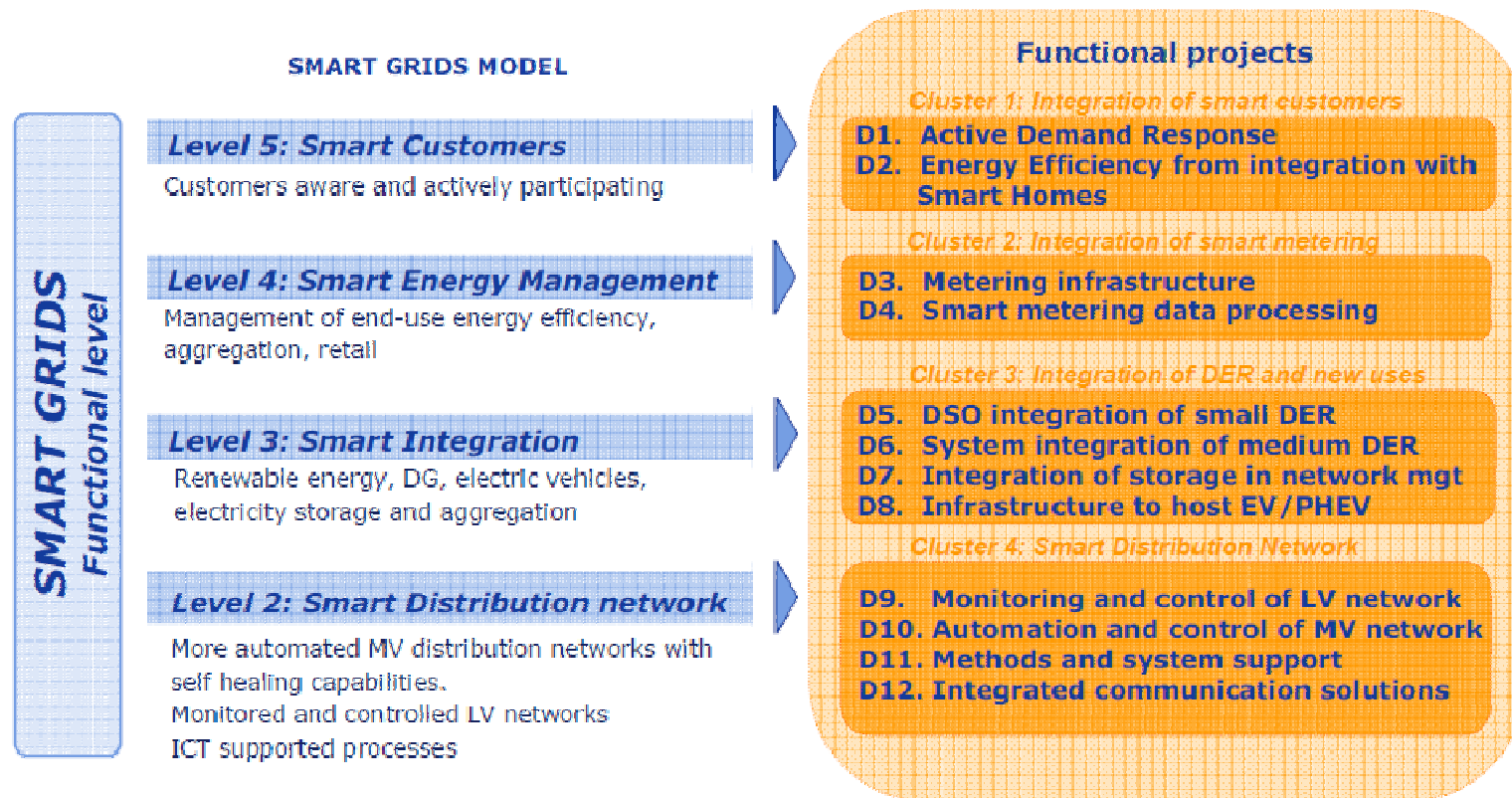
Schedule



Outcome so far

- Country snapshots of smart grids programmes in EEGI member states
- Cooperation structure of EEGI member states initiative
- Final descriptions of functional projects on basis of existing and planned projects
- Collection of smart grid project data: 274 projects from 20 countries have been submitted, building the basis for the gap analysis
- Allocation of these national projects to functional demonstrators

Functional projects according to the EEGI Roadmap



- Functional projects shall be implemented by local demonstration projects and related research projects

Descriptions of functional projects

D5 Integration of small renewable in the distribution network

Main/general objective:

The main objective of the project is to demonstrate, if **low voltage (LV) network hosting capacity** for small scale distributed energy resources (SDER) can be economically increased by monitoring and control of small scale distributed energy resources as well as by enhanced network planning and operation strategies. It will bring related solutions from "small pilot stage" to a maturity level sufficient for full deployment.

This functional project needs a set of local, national demonstration projects to cover different conditions needed for a comprehensive test of solutions. The conditions include different generation technologies (e.g. solar, micro CHP, Wind) as well as different network topologies (e.g. rural/urban) as well as cultural and climatic conditions (e.g. north/south). It is estimated that for this functional project the number of local projects, that will be needed to cover the different conditions all over Europe should be 4 – 6, considering that a single local project will cover different conditions.

Objectives and Benefits:

- Increase the low voltage grid hosting capacity for small scale distributed generation resources mainly based on renewable energy resources (e.g. PV)
- Better monitoring of LV network operating conditions
- Optimization of the utilization of existing LV network assets
- Increase/Maintain the network availability/power quality in presence of high penetration of small scale DER
- Reduction in SDER cut-off due to congestion (power curtailment)
- Cost reduction for medium scale DER integration
- Enable increased participation of grid users in network operation/ energy markets
- Reduction in network losses
- Interaction of LV distribution networks with high share of small scale DER with medium voltage networks
- Containment of costs compared with a "business as usual" approach (network reinforcement)
- Open new business opportunities related to "ancillary services" (e.g. voltage control, reactive power provision) for the low voltage network
- Create new business opportunities for equipment manufacturers
- Give a technological leading position to European equipment manufacturers
- Reduction of CO₂, direct and indirect

D5 Integration of small renewable in the distribution network	
Component	<ul style="list-style-type: none"> • "Grid friendly" behaviour of PV inverters (ancillary services like e.g. reactive and active power control, frequency control, harmonics filtering) • Improved network assets (e.g. distribution transformers with on load tap changing) • Network monitoring systems and related communication infrastructure supporting small scale DER integration in low voltage networks • Interfacing with new generation of controlled power converters for small production units and loads
Network	<ul style="list-style-type: none"> • Better exploitation of the existing low voltage infrastructure in order to increase hosting capacity for small scale DER • Monitoring of LV networks (e.g. smart meter as monitoring device) • Voltage control and congestion management in LV network by reactive and active power management • Generation-load balancing • Improved power quality (reduction of voltage unbalance, flicker and harmonics) • Grid losses reduction by SDER • Intelligent LV network planning for an optimal integration of small scale DER • ICT infrastructure in low voltage networks for monitoring and control of SDER
Market/Models	<ul style="list-style-type: none"> • Reducing costs of SDER integration - cost benefit analysis • Necessary incentives/market mechanisms (e.g. for ancillary services) • New market rules necessary for successful deployment of small scale DER • Coordination between technical grid control and market based power balancing (e.g. technical virtual power plant vs. market based virtual power plant) • Real-time markets and customer behaviour • Market design for all involved stakeholders and interaction: Equipment manufacturers, ICT and system architecture companies, retailers, generators, consumers and prosumers on LV-level, DSOs, regulators
Customer Acceptance	<ul style="list-style-type: none"> • Enabling and encouraging stronger and more direct involvement of consumers in their energy usage and management, while ensuring non discrimination • Testing demand response mechanisms in low voltage networks • Explore how new tariffs can alter customer behaviour • Integration of home automation systems in network management for demand side management and demand response purpose
Framework	<ul style="list-style-type: none"> • New frameworks for network interconnection, interconnection standards • Investigation of mandatory requirements for SDER vs. remunerated ancillary services • Device and system level interoperability (e.g. communication interfaces) • Standardisation based on IEC 61850 and 61970/61968 (CIM) • What regulatory changes would be needed (for project execution and deployment)? • European and national (local demonstrator) energy policies and energy strategies • Recommendations and solutions to remove barriers considering economic, regulatory, societal and cultural aspects

Cooperation Structure – Network of Experts

EEGI Member states representatives

- Nominate National Key Experts
- Ensure commitment to the process

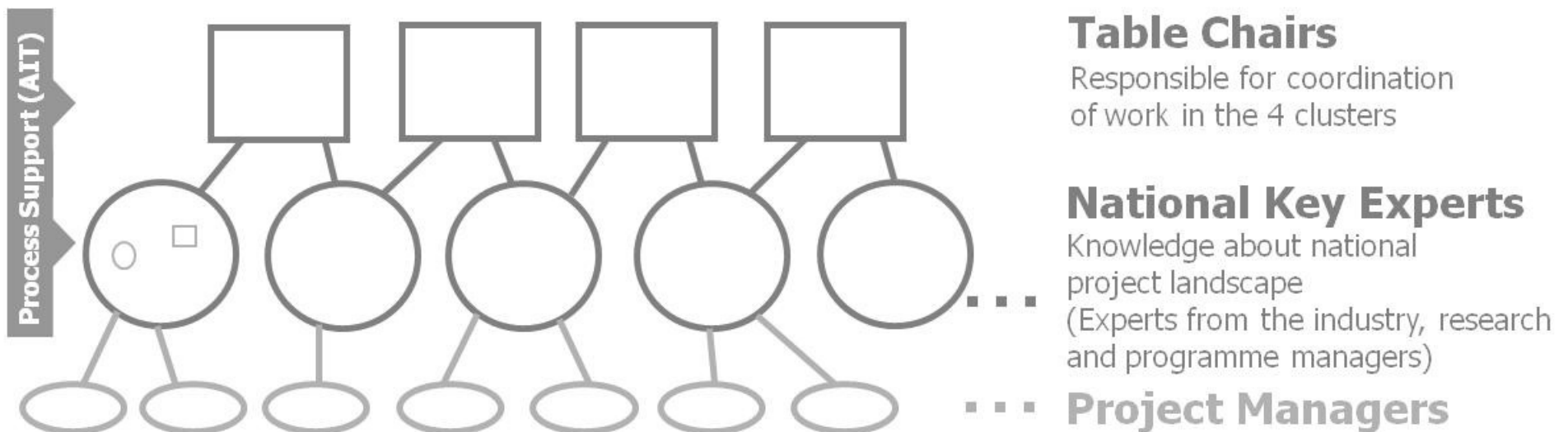


Table Chairs

Cluster	Table Chair	Deputy
1 Integration of Smart Customers	Peter Verboven (Vito, BE)	Ludwig Karg (B.A.U.M., DE)
2 Integration of Smart Metering	Angel Diaz Gallo (Tecnalia, ES)	Joao Pecas Lopes (INESC Porto, PT) Michele De Nigris (RSE, IT)
3 Integration of DER and new uses	Wolfgang Hribernik (AIT, AT)	John Christie (DECC, UK)
4 Smart Distribution Network	Igor Papič (Univ. Ljubljana, SI)	Kari Koivuranta (Fortum, FI)

Links to other EEGI initiatives

- Labelling group: project label approval by EEGI team according to size, eligibility, network fitting and technical fitting criteria
- Key Performance Indicators (KPI team): monitoring tool to evaluate the progress of the EEGI implementation plan in terms of cost effectiveness
- ENTSO-E: 30 ongoing transmission and distribution-transmission coordination projects have been identified and analysed; gap analysis will be migrated into GRID+

Next steps within the initiative

- Analysis of project reallocation
Responsibility: Table chairs and deputies
- → Detailed overview about pilot projects
→ Necessary for European and national calls
- Gap analysis
Responsibility: Table chairs and deputies
- Recommendations for European and national programming
Responsibility: Table chairs and deputies

How to continue in 2012 and after...

- Establishing constant reporting of national projects, primarily the progress of pilot/demonstration projects
- Continuation of information exchange and international cooperation
- Workshops at regular intervals (twice a year)
- Use existing national commitment
- Needs for funding to be discussed

Wolfgang Hribernik
Helfried Brunner
Irmgard Herold

wolfgang.hribernik@ait.ac.at

helfried.brunner@ait.ac.at

irmgard.herold@ait.ac.at