

GRID+ Interaction workshop

Configuring the systems, transforming the networks

Experiences and future challenges on innovative planning and asset management strategies for the Smart Grids deployment.

Wednesday, 9th April 2014

IBERDROLA Building

Avda Manoteras, 20, 28050 Madrid, Spain

Agenda

9:00 – 9:15 Registration

9:15 – 9:30 Welcome and introduction
Jesús Varela, IBERDROLA

9:30 - 10:00 The role of GRID+ and EEGI – Mapping and Gap Analysis
Ilaria Losa, RSE (GRID+ Coordinating entity)

10:00 -12:30 Interaction session on “Novel approaches to asset management”
Project presentations by project representatives

Moderators: *Mr. Eivind Solvang (Adjunct Associate Professor in Norwegian University of Science and Technology (NTNU), Department of Electric Power Engineering and Senior Research Scientist in SINTEF Energy Research) & Peter Verboven (Business Development, Energyville - VITO) - GRID+ Members*

Participants: *Project representatives*

(Coffee break around 10:45-11:00)

12:30 – 13:45 *Networking lunch*

13:45 – 16:00 Interaction session on “New Planning approaches for distribution networks”
Project presentations by project representatives

Moderators: *Dr. Rainer Bacher, Managing Director of Bacher Energy Ltd, & Wolfgang Hribernik (Head of Business Unit Electric Energy Systems, AIT) - GRID+ Members*

Participants: *Project representatives*

16:00 – 16:15 Closing comments and next steps

Brief description of the workshop

This interaction event targets projects framed within the Cluster 4 of the EEGI Roadmap: “Network Planning & Asset Management”.

The objectives of the workshop are:

- Raise awareness of the activities within the EEGI and promote experience exchange,
- Determine commonalities and identify potential synergies and relevant topics for further cooperation, focusing in already achieved results
- Find out which result could be transferred to other regions
- Improve the performance of individual projects by fostering the networking between project managers

The agenda foresees **two thematic sessions on Network Planning & Asset Management** consisting of an interaction session for discussion of the relevant topics.

The interactions sessions will consist of a presentation of the projects participating, followed by a common discussion moderated by a member of the GRID+ Consortium. The session will focus on the different functionalities of the cluster. More information on this cluster is provided below in this document. In addition to the discussions, some basic **framing questions** will be provided to be used as a starting point in the panel and breakout discussions. These framing questions will be further defined taking into account the input provided by the questionnaires fulfilled by the participants before the workshop and during the registration process.

These sessions are intended to give all participants a chance to share experiences and learn from their peers. The aim is to have a wide-ranging discussion of the lessons learned in projects, with a focus on best practices, major challenges, and notable stories. During the workshop, a GRID+ person will give support to the moderators and will take notes for completing the final report of the workshop.

Description of Cluster 4

Network Planning & Asset Management

Electricity distribution systems are complex, with hundreds of thousands of individual components, each having differing characteristics, ages and interdependencies. This network continuously balances supply and demand, subject to the variances of weather, temperature, customer behaviours and random events.

Any deferral of capital expenditure or stage development may appear attractive economically, but not necessarily technically attractive, where 'early intervention' may appear logical

Investments in power distribution systems constitute a significant part of the electric network expenses. This is why efficient planning tools are needed to allow planners to reduce costs. In recent years, a lot of mathematical models and algorithms have been developed. A good review of classical models and issues and a recent overview can be found in the open literature, some of them emphasising selection and application of optimisation methods for distribution design. A distribution system consists of a number of medium voltage/ low-voltage (MV/LV) substations, with a radial network (loops are only possible for backup) fulfilling technical constraints (voltage drops and equipment capacity) and quality of supply limits, to feed the load demands. The most common issue in distribution planning is the reinforcement of a system for growing load demand. However, it is also needed to design a system to meet load demand in new areas without existing facilities. This planning is often called "green field" planning, because the planner starts with nothing (a green field).

Moreover, there is a real need to make DSOs more confident about the distributed generation capability in order to influence future network investments (how the installed capacity for DG could be taken into account for network sizing?). Simultaneously, new loads are growing up such as the charging infrastructure for electrical vehicles, the influence of which needs to be carefully studied, especially regarding their impact on peak demand and network sizing. Therefore, policies and methods for network maintenance, renewal and reinforcement should be revisited and improved. Simultaneously, a better understanding of asset ageing mechanisms should be developed to better specify what kind of survey or sensors or tools should be put in place to face smartly the end of life of the different network components. For new assets, standardisation should be developed in order to manage efficiently the difference of life time of the intelligent and the core electro technical parts.

✓ **Objectives:**

- Develop new planning methodologies able to account for new network architecture
- Develop and share knowledge on ageing process in order to better understand and specify the needs for smart devices and tools enabling an efficient management of the network components' maintenance and lifetime
- Develop and experiment new asset management methodologies, sensors and software tools based on this knowledge and field test them
- Develop and experiment new algorithms for load forecasting, based on quasi-real-time system data
- Define upgrade policies for the ITC components which comply both with existing and future assets
- Introduce asset management methodologies that address both hardware and software issues



With the support of:



✓ **Expected outcomes:**

- Methodologies, sensors and software for asset management
- Requirements for proper upgrade implementation of IT systems in ageing infrastructures

✓ **Expected impacts:**

- Optimized CAPEX and OPEX to make the network more flexible
- Increased reliability at optimal costs