



S M A R T G R I D S

Strategic Research Agenda Working Group 1: Network Assets

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1st General Assembly of the European Technology Platform SmartGrids
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Network Assets

Objectives

- Integration of numerous (small-scale) generators
- Coexistence of global & local power systems
- Customer in control & service differentiation
- Power Flow steering & balancing solutions
- Mature markets & regulation

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Bulk power transmission

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Physical electricity exchanges 2004 *

Off-shore wind power

DC Cables

Strengthen connections

Control equipment

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Distribution web emerges

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Central power plant

Storage

Offices

Micro-turbines

Industrial plants

Wind turbines

Virtual power plant

Higher current, lower voltage devices

Smart power electronic converters

Mini- and micro turbines

Issues:

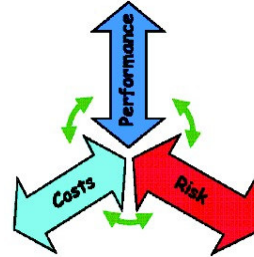
- Dispersed
- Power Quality
- Renewables
- Flexibility
- Control

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Scope: New Balance

- ❑ (ageing) Network assets: fit-for future?
- ❑ Public demand of “green power”.
- ❑ Many small scale generators (intermittent nature).
- ❑ More connectivity.
- ❑ Power flow in all directions.
- ❑ New technologies available.
- ❑ Clients: no more “one size fits all”.



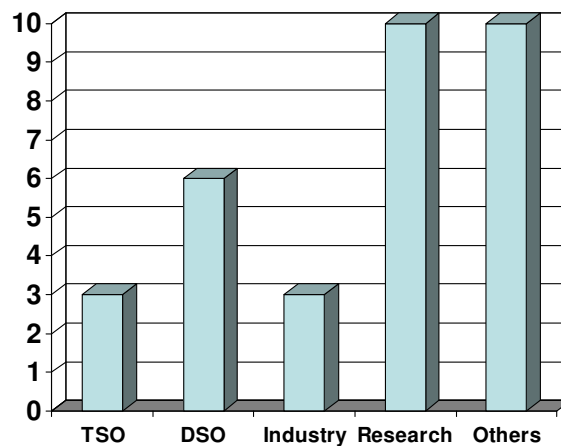
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Composition of the Group

Countries:

- (9) DE
- (4) ES
- (3) UK, BE
- (2) NL, FI
- (1) AT, SE,
SI, IT, NO,
RO,FR,
CY, CH



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Research Topics

| TOPIC | ->2015 | 2020+ |
|---------------------------------|--------|-------|
| Pan-European Network | ▶▶ | ▶▶ |
| Network Asset Management | ▶▶ | |
| Customer Integration | ▶▶ | |
| The NEW distribution network | ▶▶ | ▶▶ |
| Multiple Energy Carrier Systems | ▶▶ | ▶▶ |

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Pan European Network

Situation (what to achieve and why)

- Establish a reliable and stable backbone
- Connect local (smart) grids

Problem (what has to be resolved)

- Local congestion & uniform data exchange
- (new) organisations and responsibilities

Solution and Implementation

- Blueprint for a future power system

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Network Asset management

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Situation (what to achieve and why)

- Cope with new demands (load & generation)
- Needed investments

Problem (what has to be resolved)

- Examine & assess age and renewal profiles
- New: identify synergies and incremental costs

Solution and Implementation

- Advanced methods/models/tools

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Customer integration

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Situation (what to achieve and why)

- Customer in the centre of the SmartGrid
- Automated without loss of convenience

Problem (what has to be resolved)

- Horizontal & vertical communication
- Real time price signals & DSM/DR incentives

Solution and Implementation

- Plug and play equipment (reliable & secure)

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The NEW distribution network

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Situation (what to achieve and why)

- Give access to DG and RES technologies
- Lower costs throughout power delivery chain

Problem (what has to be resolved)

- Derive optimized functionality for equipment
- Standardised “software”

Solution and Implementation

- New technical design methods and tools

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Multiple energy carrier systems

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Situation (what to achieve and why)

- Transition path (possible hydrogen?)
- Chances for merging different technologies

Problem (what has to be resolved)

- Integral (energy) models and (technical) methods to interconnect different infrastructures

Solution and Implementation

- Models that justify investments and strategies

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Thank you for your attention!

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