IEEE ISGT Europe 2010 conference

Plenary Session 2

Regulatory aspects and market operations in smart grid environments

The European Electricity Grid Initiative: where are the expected step changes and benefits from large scale smart grid experiments?

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12 Octobre 2010

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Outline

- The European background on electricity networks
- The paradoxes
- A solution to accelerate smartening and robustness implementation in networks
- What is the expected added value of tax payer supported RD&D work ?
- What is the expected European Added value?
- An illustrative business case: electricity storage
- Conclusions

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European background on networks

- Unbundling to be completed
- European 2020 targets (output based management)
- Third Energy package
- The whole networks to become smarter and stronger
- World power technology champions ready to take the European challenges

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The paradoxes

- 27 Regulatory regimes with different review periods and ACER just born
- Investments and operations from TSOs/DSOs not reviewed according to the 2020 targets <u>even though critical enablers of the solutions</u>
- TSOs/DSOs also directly contributing to electricity savings and CO2 abatement targets
- Potential market failures arising if networks act “business as usual”?

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A solution to accelerate

- Allowing for RD&D supported by both tariffs <u>and tax payer money</u> (through hiring new RD&D staff and/or subcontracting)
- Reallocating at national level on-going RD&D efforts towards European 2020 targets
- Cooperating at EU level with EU funds injected based on expected outputs (the SET Plan on Smart Grids launched in June 2010, Madrid)
- Giving time to regulators for allowing tariffs to pay for more RD&D (Third energy package)

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The expected value of tax payer funding network RD&D

- ❑ Lower the uncertainty of new technology based development projects (new networks as well as revamping)
- ❑Prepare all the stakeholders to integrate the validated concepts in two steps
  - ✓ early experiments to learn on real life uses
  - ✓knowledge sharing for replication to address non technical barriers
- ❑Detail the technical and economical grounds of future <u>dominating concepts</u> for network planning and operations
- ❑Validate their scaling up rules based on real network implementation data
- ❑Prepare replication of experimental outputs based on an-in depth long term understanding of the networks behaviors and their users

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The expected European added value

TSOs leaning on ENTSO-E legal role (35 + players)

- Joint tools for planning (Super Grids) and operations (Regional coordination like CORESO)
- Large scale demonstrations of promising technologies (WAMS, WACS, FACTS, electricity storage,…..)
- New power market designs and regulatory impacts (OPTIMATE)

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The expected European added value

DSOs (4000+ players in Europe)

- Measure undisputable grid internal and grid external benefits of smart solutions needed to meet the 2020 targets
- Avoid duplication costs and mistakes in the scaling up and replication steps
- Appraise jointly the impacts of new technology standards (both in the ICT and power technologies, even though having different life cycles)

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The expected European added value

TSOs and DSOs

- Smart metering as an enabler of new planning and demand side management
- DSOs as ancillary service providers to TSOs
- Improved defense and restoration plans
- IT standards and data exchanges

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The business case of electricity storage

The available business options for storage:

- Generators: minimize deviations from standard generation forecasts in wind/solar
- TSOs: maximize the system security of supply and stability
- TSOs, DSOs: alternative to grid development if reinforcing the network impossible or unprofitable
- Retailers: maximize revenues by selling electricity at the maximum price when demand is high
- Regulators: incentivize storage to maximise CO_2 abatement while ensuring system security

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The business case of electricity storage

Large scale experiments needed to value storage benefits as seen by TSOs and DSOs:

- **Option 1**: Storage facilities owned only by private market operators and remunerated to contribute to system optimization **(TSO manage incentives)**
- **Option 2**: Storage facilities owned and managed by regulated operators when providing explicit system services (remunerated like any other regulated asset -CAPEX and OPEX-)
- **Option 3**: Electricity storage facilities planned and operated at any location in the supply chain using a mixed asset ownership mode (system incentives and market incentives)

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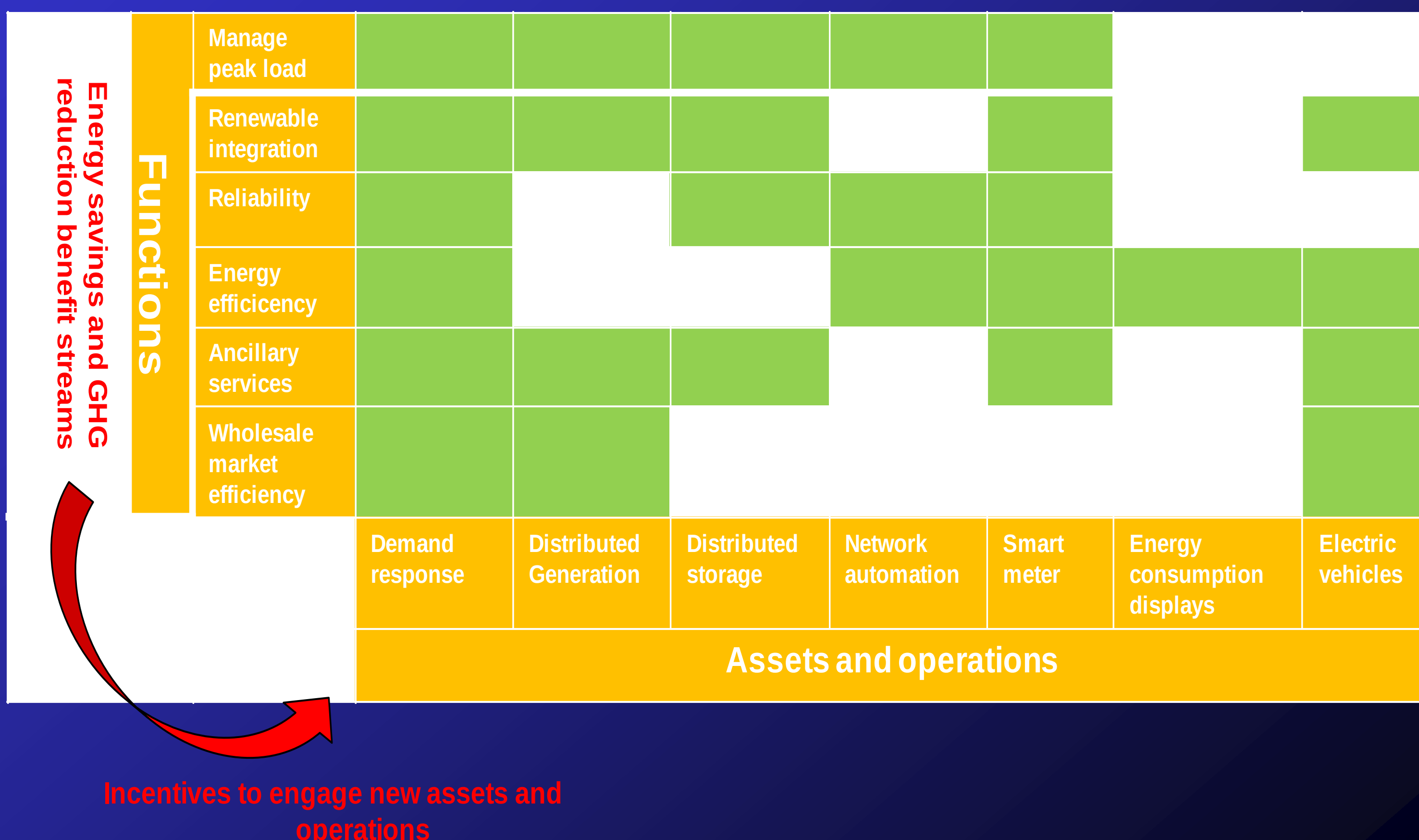
Conclusions

Assessing ex ante the expected benefits of large scale demonstrations : a complex task which requires a functional approach of network changes and benefits (EPRI, Smart Cities-Smart Grids)



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