Discussion on “measuring” electricity security of supply and potential indicators of Smart Grids

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Security of supply

"3rd Package" Electricity Directive 2009/72/EC

- *Member States shall ensure the monitoring of security of supply issues. Where Member States consider it appropriate, they may delegate that task to the regulatory authorities referred to in Article 35. Such monitoring shall, in particular, cover the balance of supply and demand on the national market, the level of expected future demand and envisaged additional capacity being planned or under construction, and the quality and level of maintenance of the networks, as well as measures to cover peak demand and to deal with shortfalls of one or more suppliers.*

  - Security of supply issues related to generation
  - Security of supply issues related to networks
  - Security of supply issues related to demand

Measuring security and quality of supply related to networks

- Performance indicators for transmission and distribution grids (and their operators) may play an important role in achieving European energy policy targets
- On 17 Dec 2009, ERGEG published its position paper on smart grids for public consultation. Consultation is open till 1 March 2010; a conclusions paper will follow in 2010
- The paper provides a list of effects and benefits which can be achieved by electricity networks of the future (including higher security and quality of supply)
- The paper also provides potential performance indicators for measuring security of supply and other effects

Effects and benefits of smart grids

- Increased sustainability
- Adequate capacity of transmission and distribution grids for “collecting” and bringing electricity to consumers
- Uniform grid connection and access for all kind of grid users
- Higher security and quality of supply
- Enhanced efficiency and better service in electricity supply and grid operation
- Effective support of trans-national electricity markets by load-flow control to alleviate loop-flows and increased interconnection capacities
- Coordinated grid development through common European, regional and local grid planning to optimise transmission grid infrastructure

Potential performance indicators

- Hosting capacity for distributed energy resources in distribution grids
- Allowable maximum injection without congestion in transmission
- Ratio of reliably available generation capacity and peak demand
- Share of electrical energy produced by renewable sources
- Duration and frequency of interruptions per customer
- Availability of network components and its impact on grid performances
- Availability of network capacity with respect to its standard value (e.g. NTC in transmission, DER hosting capacity in distribution grids)
- Ratio between interconnection capacity of one country and its demand
- Exploitation of interconnection capacity
- Impact of congestion on prices of national/regional markets
- Societal benefit/cost ratio of a proposed infrastructure investment

Questions for discussion

- 11. Do you agree that regulators should focus on outputs (i.e. the benefits of smart grids) rather than inputs?
- 12. Which effects and benefits of smartness could be added? Which effects in this list are more significant to achieving EU targets? How can medium and long-term benefits (e.g. generation diversification and sustainability) be taken into account and measured in a future regulation?
- 13. Which output measures should be in place to incentivise the performance of network companies? Which performance indicators can easily be assessed and cleansed by grid external effects? Which are suitable for European-level benchmarking and which others could suffer significant differences due to peculiar features of national/regional networks?