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Study on interaction and dependencies of Balancing Markets,
Intraday Trade and Automatically Activated Reserves

Balancing workshop – 15 May 2009

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Conclusions of the study

Short term recommendations

- **Proceed with cross-border balancing implementation!**
- **Prerequisites for cross-border balancing**

Cross-border capacity must be reserved for *security insurance* services

> e.g. primary control in UCTE

It is not recommended to reserve capacity for *real-time energy delivering* services

> e.g. secondary or tertiary control in UCTE

Harmonisation of technical characteristics of balancing services

> e.g. activation time & time to full activation

Harmonisation of gate closure times

Long term recommendations

- **Real-time energy prices should be market-based**

Imbalances settled at price *fully* reflecting costs of delivering energy in real-time

- **Increase situational awareness**

Information exchange allowing full picture of the power system state

Increased situational awareness of system operators

Coordinated and integrated security analysis

- **Efficient transfer capacity calculation and allocation schemes**

Tackling interdependencies of power flows in meshed interconnected grid

Topics of today's discussion

- **Model for cross-border balancing**
- **Market design for balancing**
- **Interconnection capacity**
- **Implementation issues**

Model for cross-border balancing

- **TSO-TSO approach supported**

TSO is responsible for system security

TSO has overview of the system state (<> individual market participants)

Short term nature of real-time balancing

- **Implementations possible:**

TSO-TSO real-time energy trading

- > Procurement using energy payments
- > Exchange of real time energy delivering services (excess services only or common merit order)

TSO-TSO real-time reserve trading

- > Procurement using capacity payments
- > Security insurance and real time energy delivering services

Market design for balancing (1)

- **Kinds of services to be exchanged**

Security insurance services (e.g. primary in UCTE)

- > Procured preferably by **capacity payments** only, costs socialized among **all grid users**

Real-time energy delivering services (e.g. secondary or tertiary in UCTE)

- > Procured preferably by **energy payments** only, costs charged to **imbalanced BRPs**
- > **Real time prices** should reflect **real time costs**

- **Care needed when implementing the scheme**

Geographical distribution of **security insurance services**

Adjustments of cross-border schedules close to real time following exchange of **real-time energy delivering services**

Market design for balancing (2)

- **Pricing**

Widely held view that **marginal pricing** is economically more correct and will lead to more efficient allocation of resources than other pricing schemes

Ensuring consistency between day-ahead markets and balancing markets

Less market power issues expected if Pan-European cross-border balancing

- > Less arguments for average or pay-as-bid pricing

- **Imbalance settlement**

Imbalances settled according to **costs incurred in real-time**

- > No artificial penalties and other non-market based components

Modified single price system with additive component

- > $+ MP_{u/d} + \text{component}_{cap}$ if short, $- MP_{u/d} + \text{component}_{cap}$ if long

Interconnection capacity

- **Cross-border capacity **must be reserved** for security insurance services**

Receiving reserves capability ensured by N-1 margins

Sending more reserves implies increasing TRM

> If cross-border capacity reserved, reservation should be market based??

- **Cross-border capacity reservation **not recommended** for real-time energy delivering services**

No cross-border capacity reservation, no charges

Implementation issues (1)

- **Proceed with cross-border balancing implementation!**

No need to harmonize everything *before* – only the minimum requirements

Harmonize balancing market designs in a later stage

- **Lack of harmonization & centralization already creates distortions**

Due to wholesale trade increasingly across borders

- **Cross-border initiatives have proven to trigger harmonization rather than requiring it from the start**

E.g. TLC & Nordic cross-border balancing initiative

Roadmap to cross-border balancing

- **PHASE 1** - implementation with minimum prerequisites

Possibly limited to “excess” services only

Harmonization of technical characteristics of balancing services

- > activation time
- > time to full activation

Harmonization of gate closure times

Technical requirements:

- > C-b capacity reservation for security insurance services
- > Increased scope of monitored events in N-1 analysis
- > Sufficient amount of locally available energy delivering reserves
- > Adaptation of AGC control scheme where necessary

Roadmap to cross-border balancing

- **PHASE 2** - harmonisation of remuneration for services

Extending the exchanged services to a common merit order

Harmonization of remuneration for the exchanged services

> i.e. capacity and/or energy payment

Roadmap to cross-border balancing

- **PHASE 3 - harmonization of imbalance settlement**

Optimization of the initial cross-border balancing implementation

Eliminate distorting effects of insufficiently harmonized imbalance settlements on day-ahead/intra-day trade

Real time energy price should be *market based*

Integration of grid security management, with good info on power system state

- > identification of necessary and most efficient control actions
- > knowing effects of different actions on the power system as a whole
- > coordinated and integrated security analyses
- > Improved cross-border transfer capacity calculation and allocation schemes

To summarize...

- **Proceed with implementation of cross-border balancing**

On regional bases

Taking care of system security aspects

Fulfilling minimal harmonization requirements

- **Long run recommendations**

Harmonization of real-time market designs

- > Market based real time prices fully reflecting all costs of real-time balancing

Integration of system security management

- > Coordinated & integrated security analysis

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