System adequacy from a European perspective

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Switzerland is an integral part of the Continental European system.
ENTSO-E: Implementing the 3rd Energy Package

European Network Codes

Markets

Market data
Transparency
Platform

Maps
Current and future grid

Specific data sets
TYNDP, outlooks

Statistics
monthly, yearly

REGIONS

Mid-term Adequacy
Forecast @ a glance
The Energy Transition: A European challenge solved regionally

27% renewables by 2030 = +/- 45% for the power system

CHALLENGES

- System stability & inertia
- Growing interconnections
- Changing power flows & congestions
- Unlocking prosumer flexibility together with DSOs
- New Digital Orchestration
Different (types of) regions, but **ONE** system:
Importance for Switzerland to participate in all processes

**PLANNING**
Regional planning used in the EU 10-year network development process
TYNDP used as basis for the EU Projects of Common Interest

**MARKETS**
Internal Energy Market developed voluntary & regionally
EU guideline on capacity allocation & congestion management

**OPERATIONS**
Regional security coordinators created on a voluntary basis
Registered in the EU system operation guideline

*Importance for Switzerland to participate in all processes*
The benefits of market integration: the need for Switzerland to be included in all markets

**DAY-AHEAD MARKETS**
- 1500 TWh traded on exchanges, 60% market share
- 1 B€ in social welfare, yearly

**SPOT-VOLUME GROWTH**
2008-2016
Spot-volume growth (TWh/yr). EPEX and NordPool combined

**INTRADAY MARKETS**
- 120 TWh traded 2016
- New European platform 2018
- Next steps: real-time auctions

**BALANCING MARKETS**
- Several European projects ongoing
- 3B€ in operational cost savings, yearly
Realizing the potential of regional cooperation for Switzerland and the EU: still lots to do!

Energy markets to mirror physics

- Switzerland to be included in day-ahead and intraday markets
- Bidding zone delimitation to reflect physical congestions

Integrating balancing markets

- All four balancing markets are to be operational by 2022
The benefits of regional coordination

- CORESO (2008)
- TSC (2008)
- SCC (2016)
- Nordic RSC (2016)
- Baltic RSC (2016)

Started voluntarily in 2008

Extended voluntarily in all Europe as of 2015

Mandatory through EU Network Codes since 2017
Realizing critical grid investments for sustainable security of supply

Drivers behind grid investments

- RES integration
- Phase-out of thermal
- System stability and security of supply

Integration of storage
- Thermal mothballing
- Power flows
Complementing National Security of Supply outlook with Pan European

COMMON DEFINITIONS & CONCEPTS

THE ROLE OF INTERCONNECTIONS

STATE-OF-THE-ART PROBABILISTIC MODELS

Highest standards for calculating risks
Add value & consistency to national/regional studies
Increased accuracy through use of multiple tools
Shows benefits of solidarity/links between countries
Assessing resource adequacy risks in different timeframes

Mid-Term Resource Adequacy
- Several years
- Several months
- Mid-Term regional sensitivity
- Optional

Seasonal Outlook
- 1 year
- Several months
- Seasonal regional sensitivity
- Optional

Short-Term Adequacy
- 1 week
- 1 day
- Intra-week regional adequacy
- when risk detected

Pan European

Regional*

*Regional/national studies focus on detailed modelling of a region while:
- keeping large European geographical perimeter,
- retaining a global pan-European probabilistic methodology
The Low-Carbon Scenario for 2025
Switzerland and the EU need each other to meet successfully the energy transition challenges

Need to adjust the resource mix in case an “accelerated carbon phase-out” takes place
THANK YOU FOR YOUR ATTENTION

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