The transmission perspective

7th Annual EUROPEAN POWER SUMMIT
Session Update on the EU´s ´energy union´ project

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TenneT at a glance

Taking Power further

We connect 41 million end-users in the Netherlands and Germany.

We guarantee the stability of 22,245 kilometres of high-voltage lines.

Our leading technology drives the integration of renewable energy.

We are Europe’s first cross-border grid operator for electricity.

We maintain security of supply at an extremely high level of 99.9975%.

TenneT is a leading TSO in Europe
TenneT expects to invest at most EUR 22 billion until 2020
ENTSO-E welcomes the Energy Union project and will contribute, not least with the recommendations from the Vision Package, to get it from promise to practice. Already today, not only the TYNDP but also the RSCIs and market coupling for day-ahead trading, demonstrate the progress achieved by European TSOs.
...but the only constant is change

Drive European market integration
- to secure efficiency gains and realize stable prices
- to improve overall security of supply, better balance the grid and
- to integrate renewables

Develop a sustainable market design and steer the implementation
- to facilitate market functioning and incentivize innovation
- to enhance system flexibility
- to secure ability of TSO to balance power and relieve grid congestions

Central vs. national policy making
Proactive society
Declining prices
Increasing share of renewables
Challenges in system operation
German coal and nuclear power phase-out
Rise of distributed generation
Volatile flows

What is needed to overcome the present challenges?
achievements
current challenges
enduring barriers
European Wholesale Prices and Price Convergence
Achievements in day-ahead markets

Exp. Flow based and the resulting effect

Flow based Market Coupling went successfully live on May 21\textsuperscript{st} 2015

Flow based market coupling leads to a higher price convergence.
(Energy) Union or Disunion?

- Different system adequacy mechanisms applied
- Challenge: (explicit) participation of foreign capacities is an open issue
- SoS in Europe can only be assured through solidarity and cooperation among EU Member States.

PLEF TSO study is assessing the impact on the electricity sector of cross-border participation in system adequacy mechanisms.
From Patchwork to Teamwork

Different national rules and regulation are currently one of the biggest obstacles to cross-border system operations, next to missing infrastructure.

- TSOs are already today cooperating 24/7 (Example TSC = TSO Security Cooperation launched in 2008)

- The proposal to solve the obvious fundamental structural problems in grid planning and system operation processes by centralization within a ROC does not work.

The responsibility for system security is not divisible.
The TSO’s dilemma: The grid is not a copper plate

Commercial Cross-Border schedules vs. Physical Cross-Border Flows

2015/TWh

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Flex from Interconnectors

- The successful integration of RES into the system is highly depended on a functioning European electricity market.

Example: Easter in Germany, without the possibility of varying exports the German generation stack would have had to provide an additional 9 GW of flex.

Interconnection capacity and market coupling are powerful tools to tap cross border flex.
Preview of the year 2025

Solar eclipse and solar Feed-in Germany on March 20th

• Special test case for the power markets and power system
• Power plants had to provide the flexibility to cover these gradients, coordinated by power markets
• Without a solar eclipse, such gradients could only occur during normal operation if Germany had an installed solar capacity of 54 GW (= 2025).
What is in front of us?

i. Continuation of market integration initiatives
   - Intraday Markets
   - Balancing Markets

ii. Measures to ensure a successful energy transition
   - Improved flexibility market, Participation of (sm)all parties
     - Investigating/investing in new interconnection

iii. Future developments
   - Data and analytics
     - Energy sector coupling

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Thank you for your attention.

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TenneT ist der erste grenzüberschreitende Übertragungsnetzbetreiber für Strom in Europa. Mit rund 21.000 Kilometern an Hoch- und Höchstspannungsleitungen und 41 Millionen Endverbrauchern in den Niederlanden und in Deutschland gehören wir zu den Top 5 der Netzbetreiber in Europa. Unser Fokus richtet sich auf die Entwicklung eines nordwesteuropäischen Energiemarktes und auf die Integration erneuerbarer Energie. Taking power further
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