Repowering markets Europe

Challenging business!

June-23-2016

Ben Voorhorst
TenneT at a glance

Europe’s first cross-border TSO

- Headquartered in Arnhem (the Netherlands) and Bayreuth (Germany)
- Fully owned by the State of the Netherlands

2,974 employees

EBIT 1.075 (EUR million)

Assets 15.4 (EUR billion)

Total grid length 22,245 km

Number of end-users 41 million

Grid availability 99.99%
The Netherlands: balancing system

Transactions
Freedom of trade between market parties

Balancing system
Rewarding everyone supporting the actual situation of the system

Price balancing power
Price of balancing power determined by market reflexing actual situation: everyone is fully exposed to it.

Actual real time information
Level of imbalance and price are realtime available.
The Netherlands: balancing price

19-06-2016

The graph shows the balancing price in EUR/MWh for the Netherlands on 19-06-2016. The x-axis represents time, ranging from 00 to 23, and the y-axis represents the balancing price in EUR/MWh, ranging from -80 to 100.

The graph includes two types of balancing price:
- Red squares: Onbalansprijs voor betrekken van TenneT (afnemen)
- Blue circles: Onbalansprijs voor leveren aan TenneT (invoeden)
## The Netherlands: balancing price

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<th>Seq. nr.</th>
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Germany: main energy transit country in Europe

Renewable Energy Act:

- Priority for renewables on the grid
- Feed-in tariff for 20 years
- Resulting in high level of investment security
Germany: development installed capacity RES

Source: Federal Ministry of Economic Affairs and Energy
Just a day in May

8 May 2016: Germany

Agora Energiewende; Current to: 10.05.2016, 09:30

- Conventional power plants
- Solar
- Wind
- Water
- Biomass
- Electricity Consumption
- Pumped hydro storage and storage water
- Natural gas
- Other
Just a day in May: RES versus electricity prices

8 May 2016: Germany

EUR 0
Challenges in Europe

- High volatility in energy markets
- Reliability of supply: wind and PV are not always there
- Business model for RES
- How we get a common supported policy for this (28 EU-members)?
If we overcome the challenges

We can, together with other MS, develop e.g. large scale offshore wind

Future North Sea Infrastructure will make Europe’s energy transition feasible and affordable
North sea development: wind
Island at Doggersbank
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TenneT is a leading European electricity transmission system operator (TSO) with its main activities in the Netherlands and Germany. With approximately 22,000 kilometres of high-voltage connections we ensure a secure supply of electricity to 41 million end-users.

Taking power further