

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

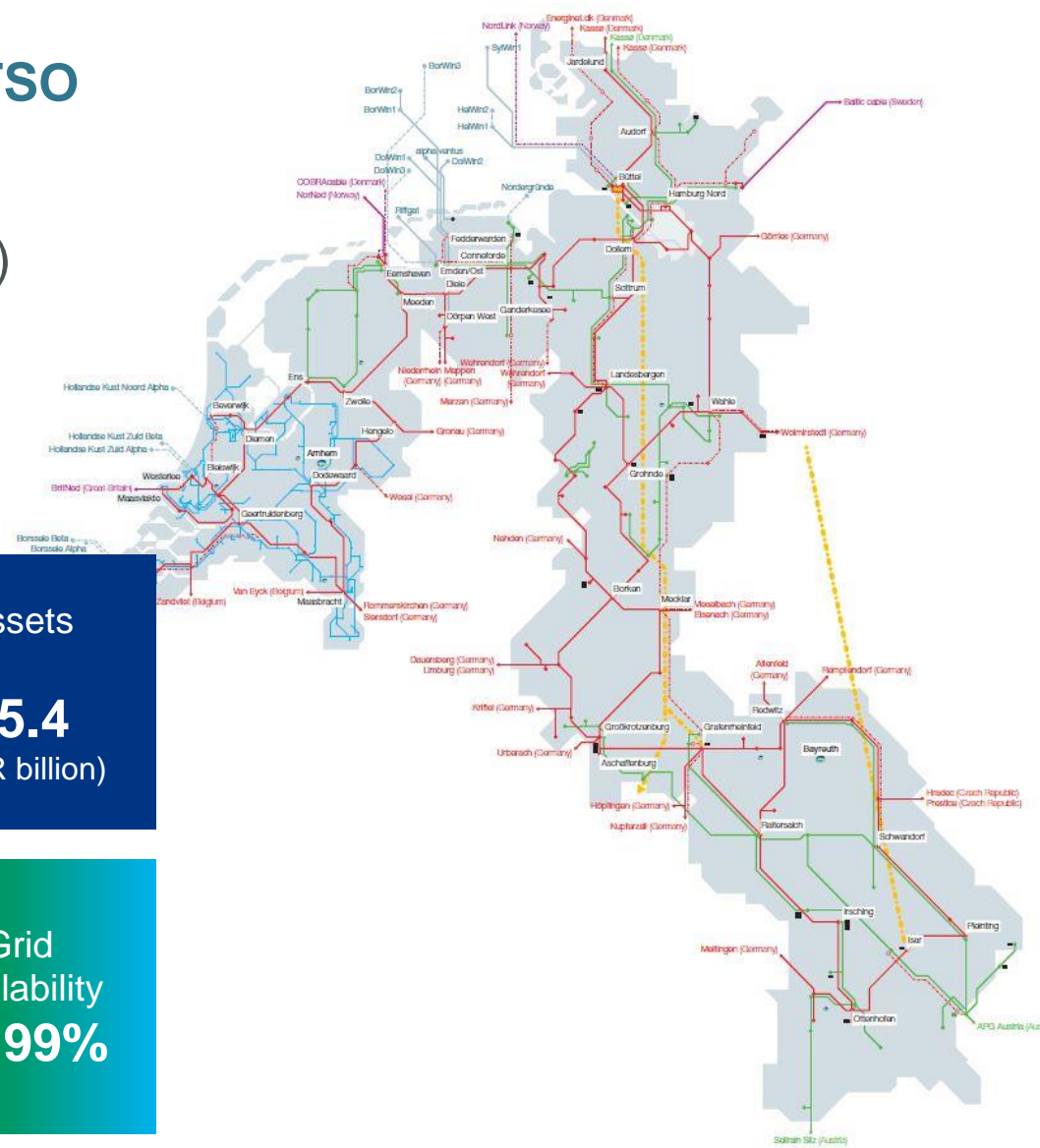
EBIT
1.075
(EUR million)

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.

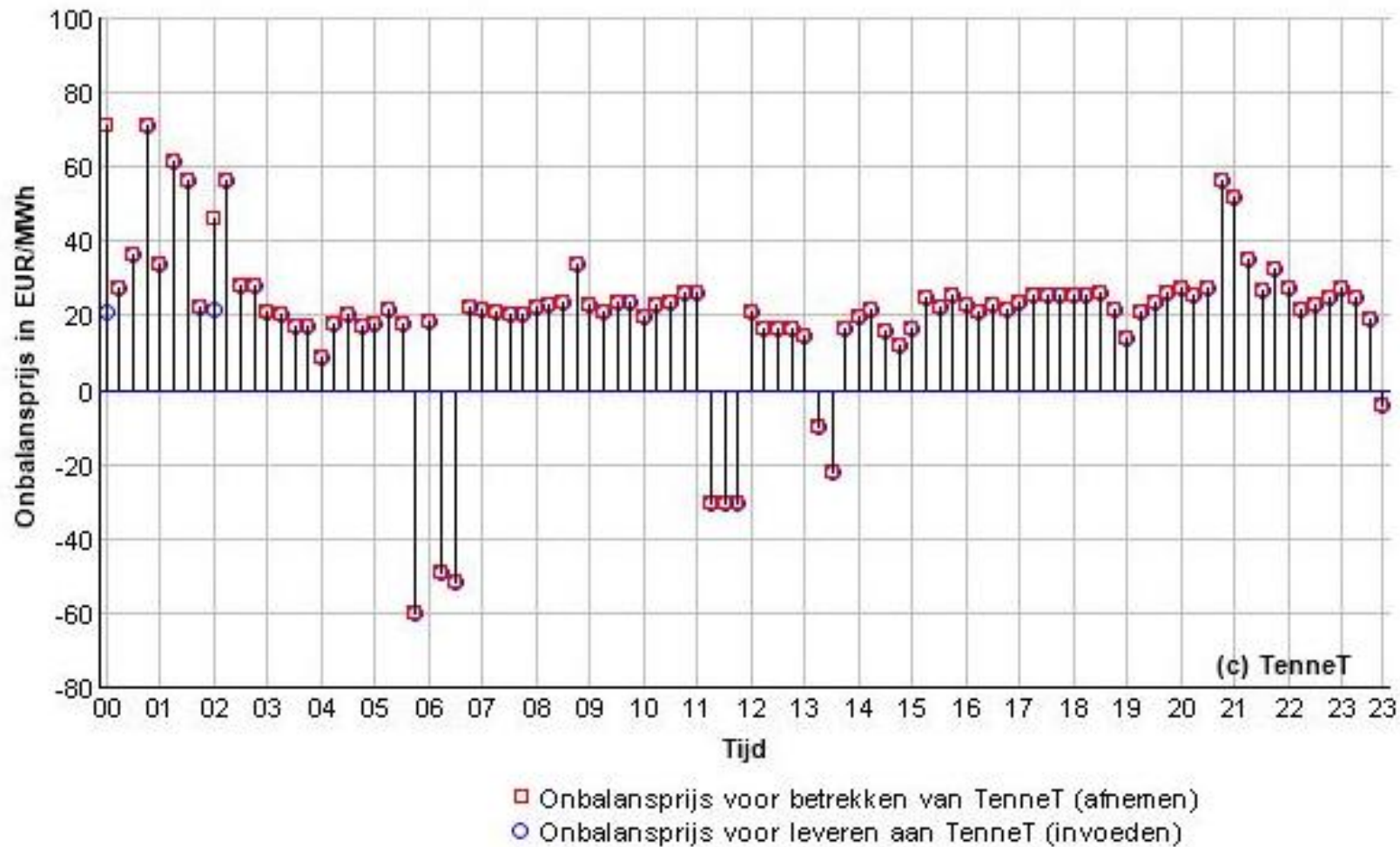
Actual real time information

Level of imbalance and price are realtime available.



The Netherlands: balancing price

19-06-2016





The Netherlands: balancing price

Table									
Table 2-hours			XML		Explanation			Export data	
Time indication			Activated power					Price development	
			Regulating		Reserve		Emerg. (0/1)	Highest price	Lowest price
Number	Seq. nr.	Time	Up	Down	Up	Down	Up	Up	Down
1	1416	23:35	0	13	0	0	0		25,78
2	1415	23:34	2	13	0	0	0		25,78
3	1414	23:33	3	8	0	0	0		26,21
4	1413	23:32	6	6	0	0	0		26,65
5	1412	23:31	7	3	0	0	0		27,51
6	1411	23:30	9	0	0	0	0		
7	1410	23:29	10	0	0	0	0	24,99	
8	1409	23:28	13	0	0	0	0	25,74	
9	1408	23:27	17	0	0	0	0	27,09	
10	1407	23:26	23	0	0	0	0	27,09	
11	1406	23:25	25	0	0	0	0	27,09	
12	1405	23:24	31	0	0	0	0	27,12	
13	1404	23:23	37	0	0	0	0	27,85	
14	1403	23:22	44	0	0	0	0	28,03	



Germany: main energy transit country in Europe

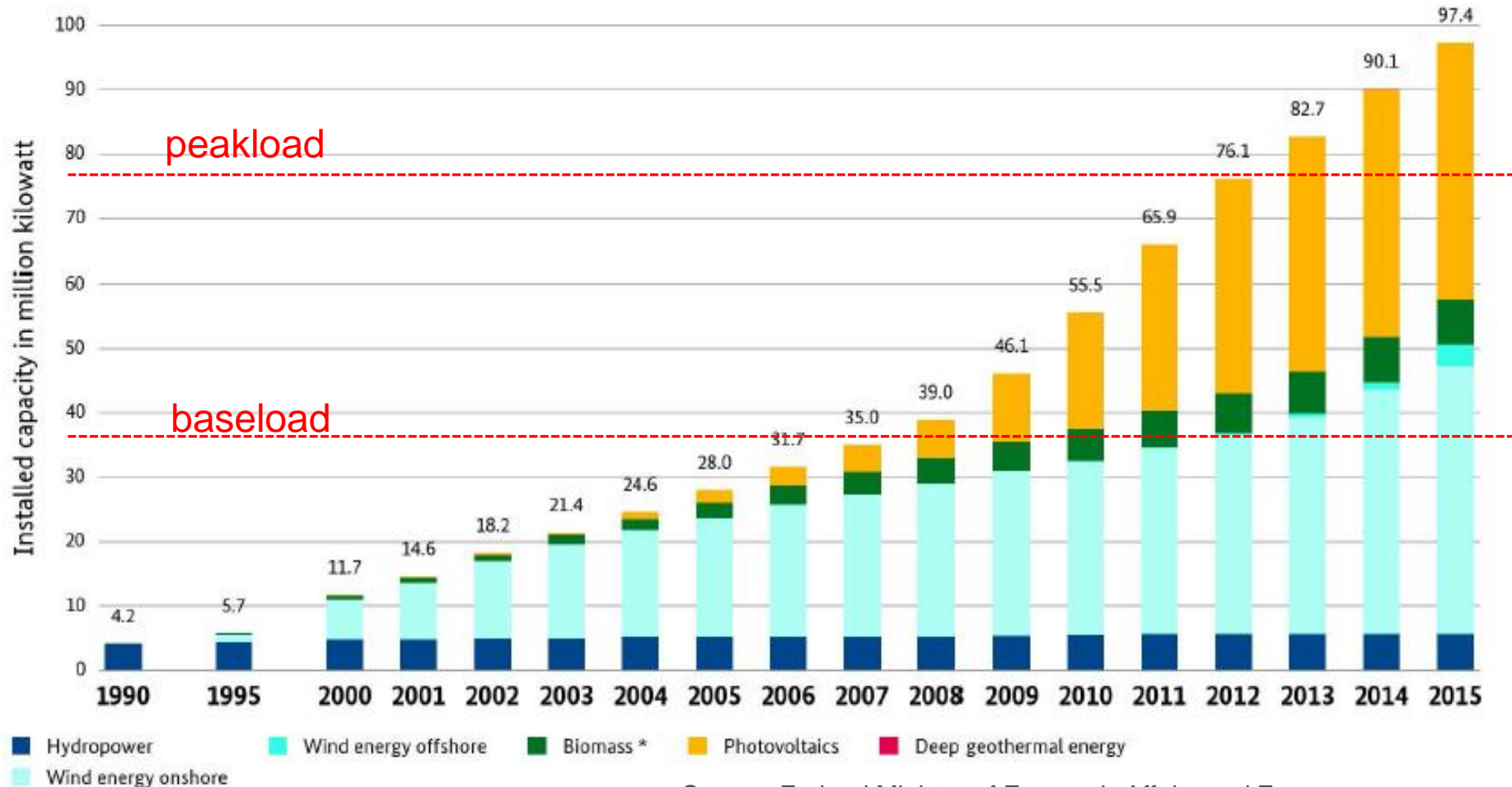
Renewable Energy Act:

- Priority for renewables on the grid
- Feed-in tariff for 20 years
- Resulting in high level of investment security





Germany: development installed capacity RES

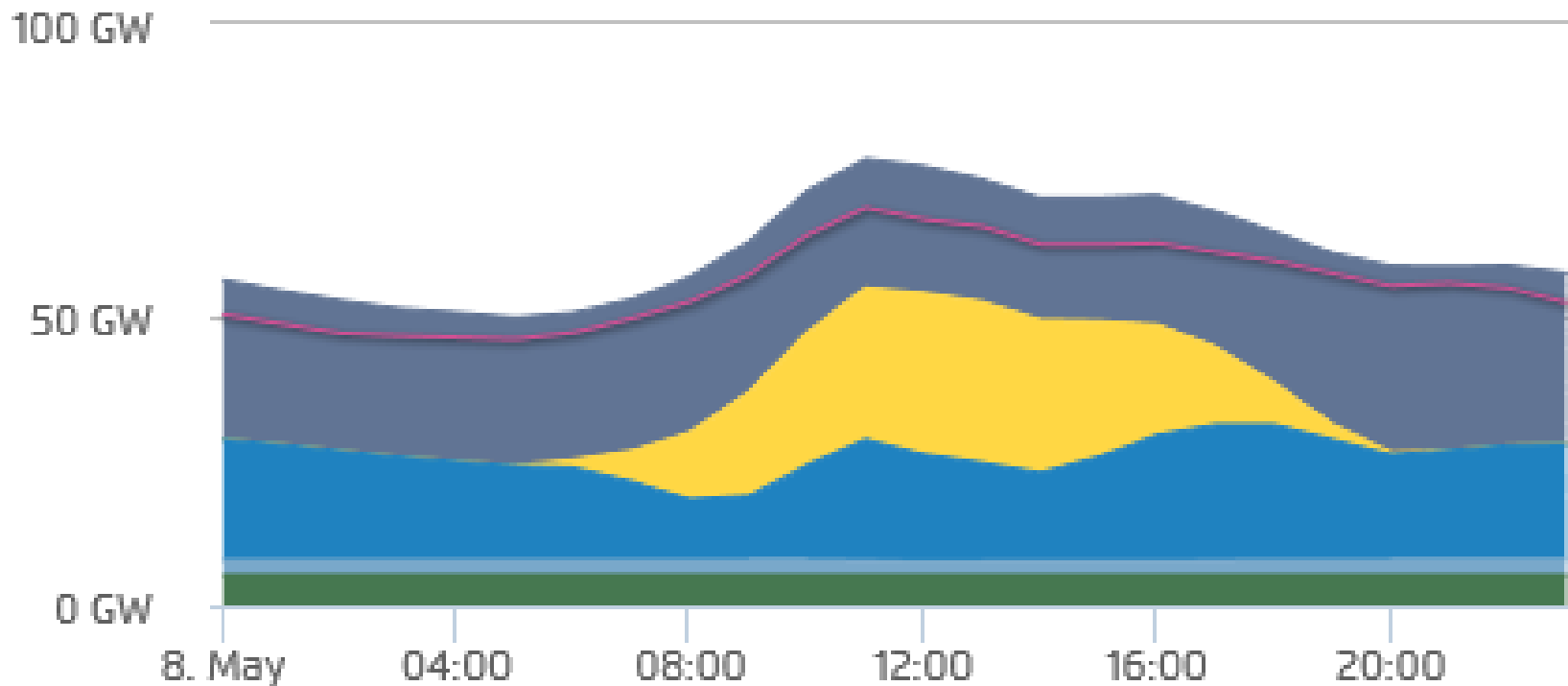


Source: Federal Ministry of Economic Affairs and Energy



Just a day in May

8 May 2016: Germany



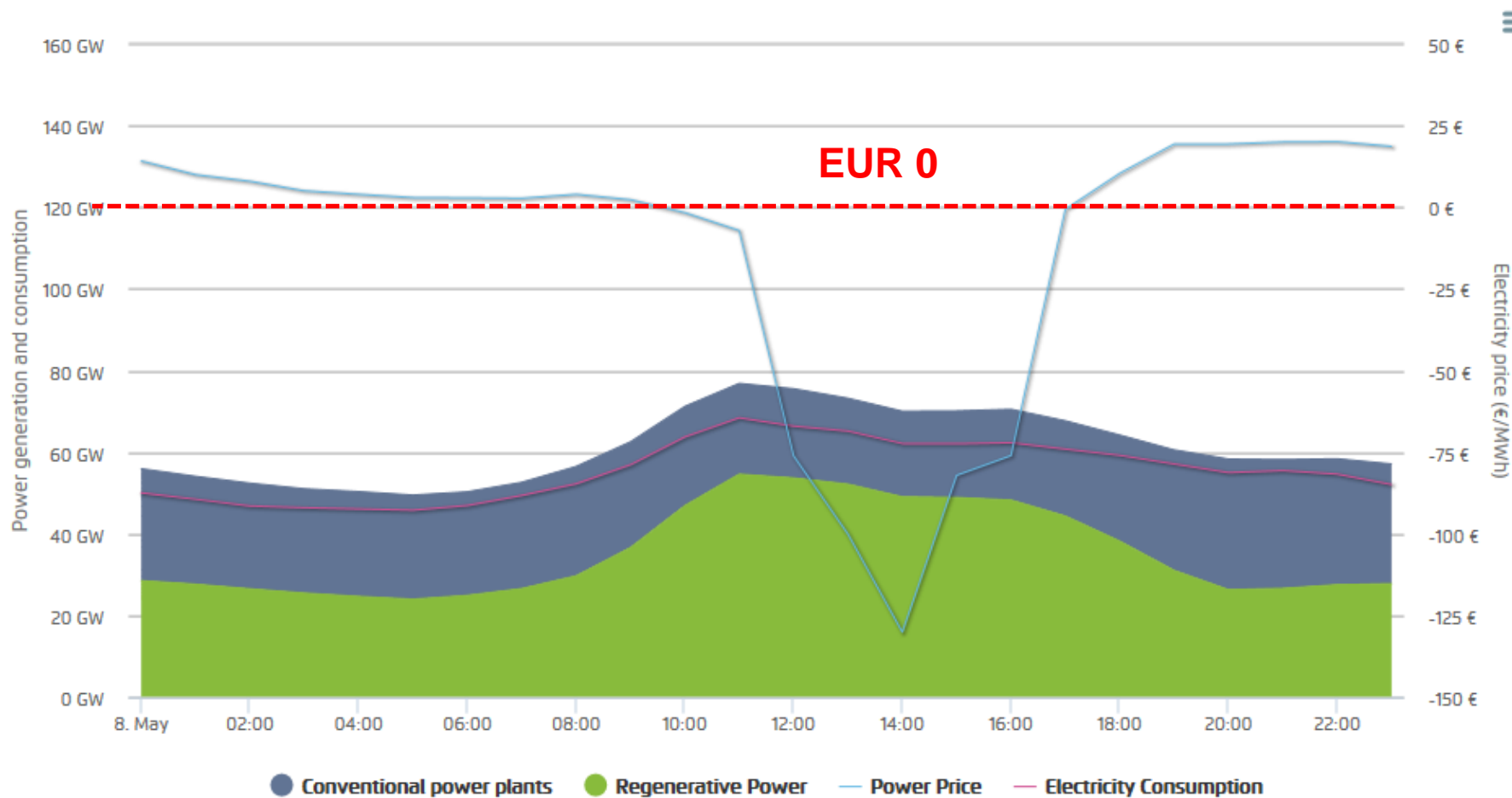
Agora Energiewende; Current to: 10.05.2016, 09:30

- Conventional power plants
- Solar
- wind
- water
- Biomass
- Electricity Consumption
- Pumped hydro storage and storage water
- Natural gas
- Other



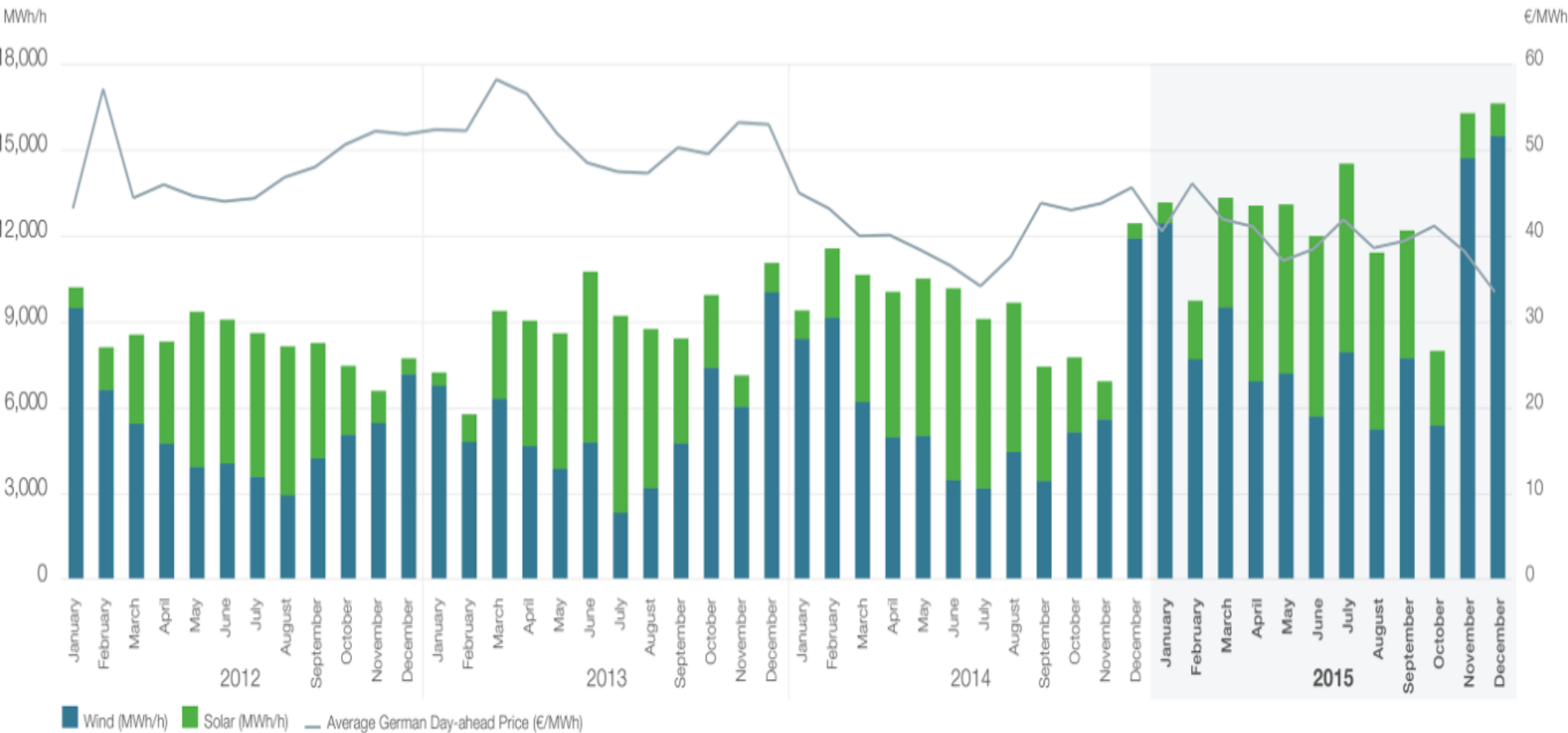
Just a day in May: RES versus electricity prices

8 May 2016: Germany





RES: the future





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

