



Consequences for the German Electricity Market after the „Energy Turnaround“

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The four fleets at E.ON

Steam Fleet



Gas-CCGT Fleet



Hydro Fleet



Nuclear Fleet



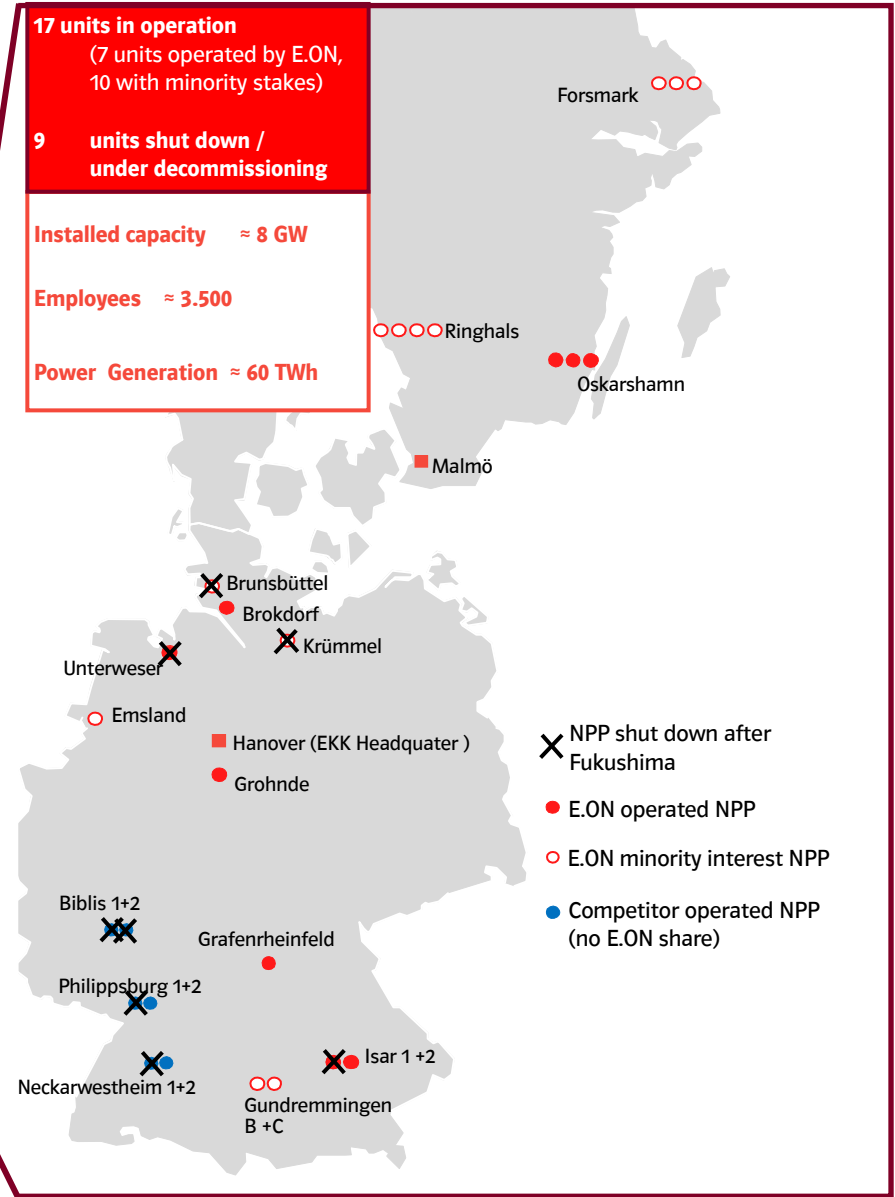
17 units in operation
 (7 units operated by E.ON,
 10 with minority stakes)

**9 units shut down /
 under decommissioning**

Installed capacity ≈ 8 GW

Employees ≈ 3.500

Power Generation ≈ 60 TWh





France: Steam Fleet focus

E.ON power supplied in France

E.ON shareholdings

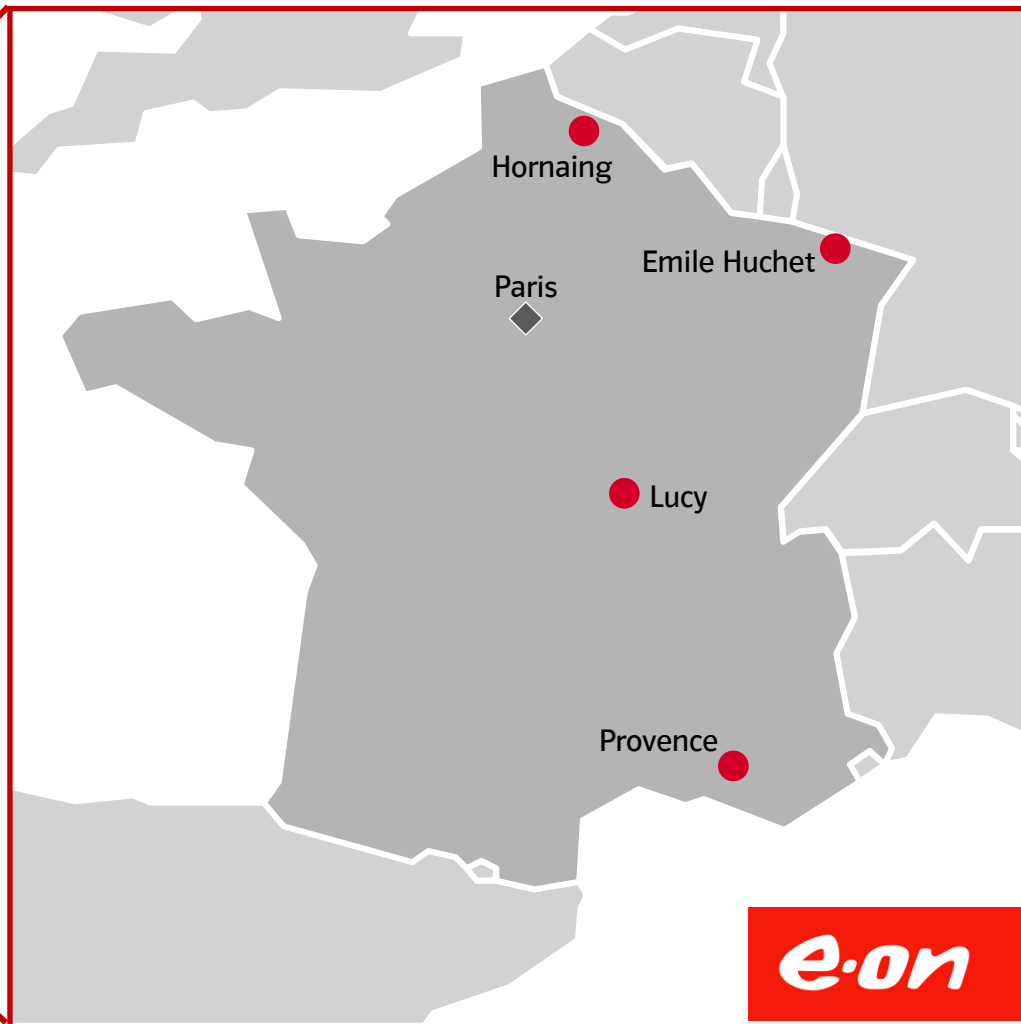
Overall market¹

13.1 TWh

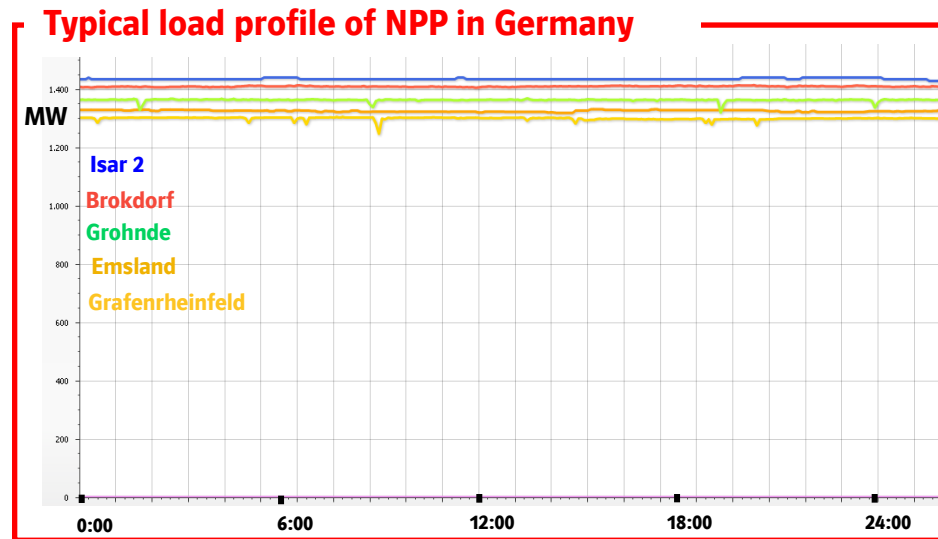
436.7 TWh

¹ As of September 30, 2011.

Steam Fleet

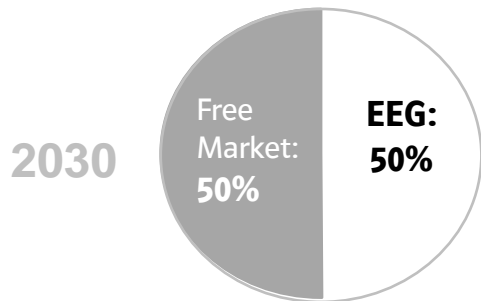
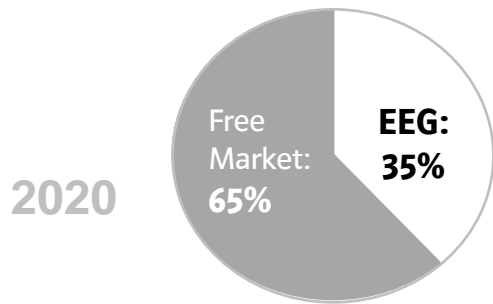
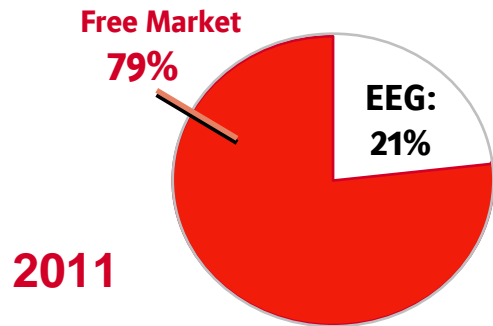


Load profiles of NPP in Germany

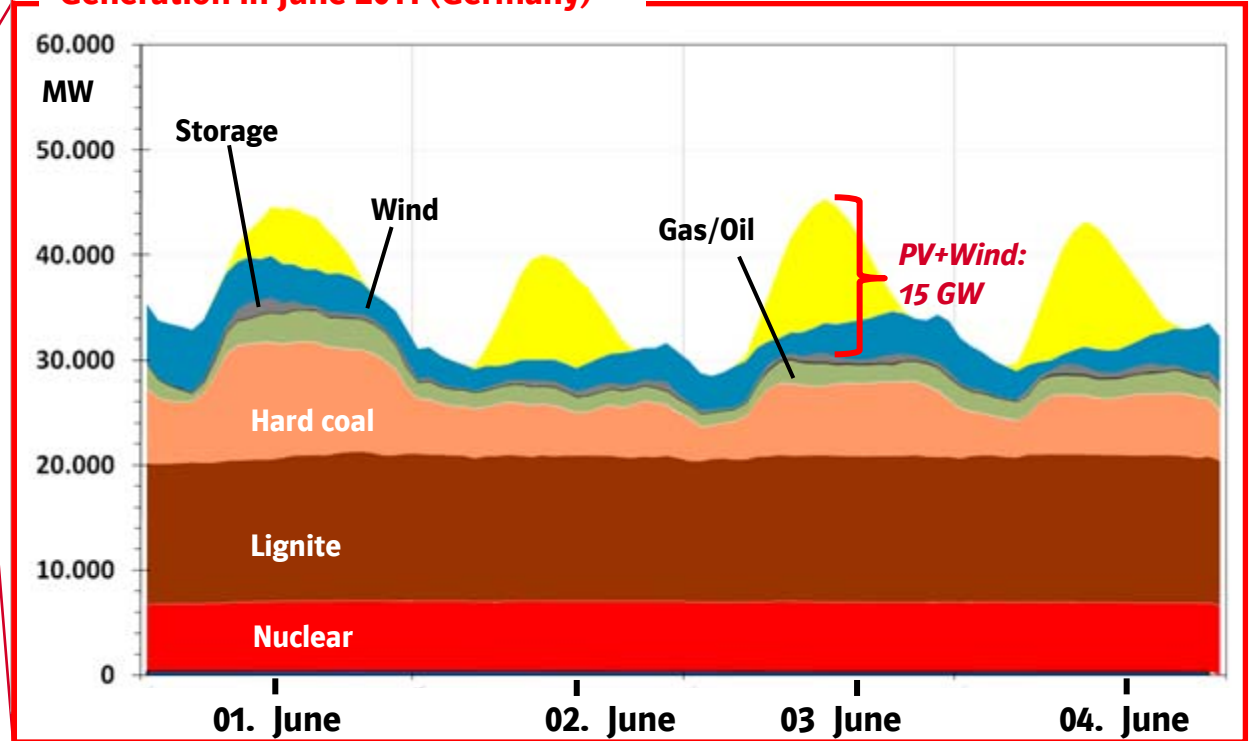


Free electricity market is shrinking

Electricity Market in Germany



Generation in June 2011 (Germany)

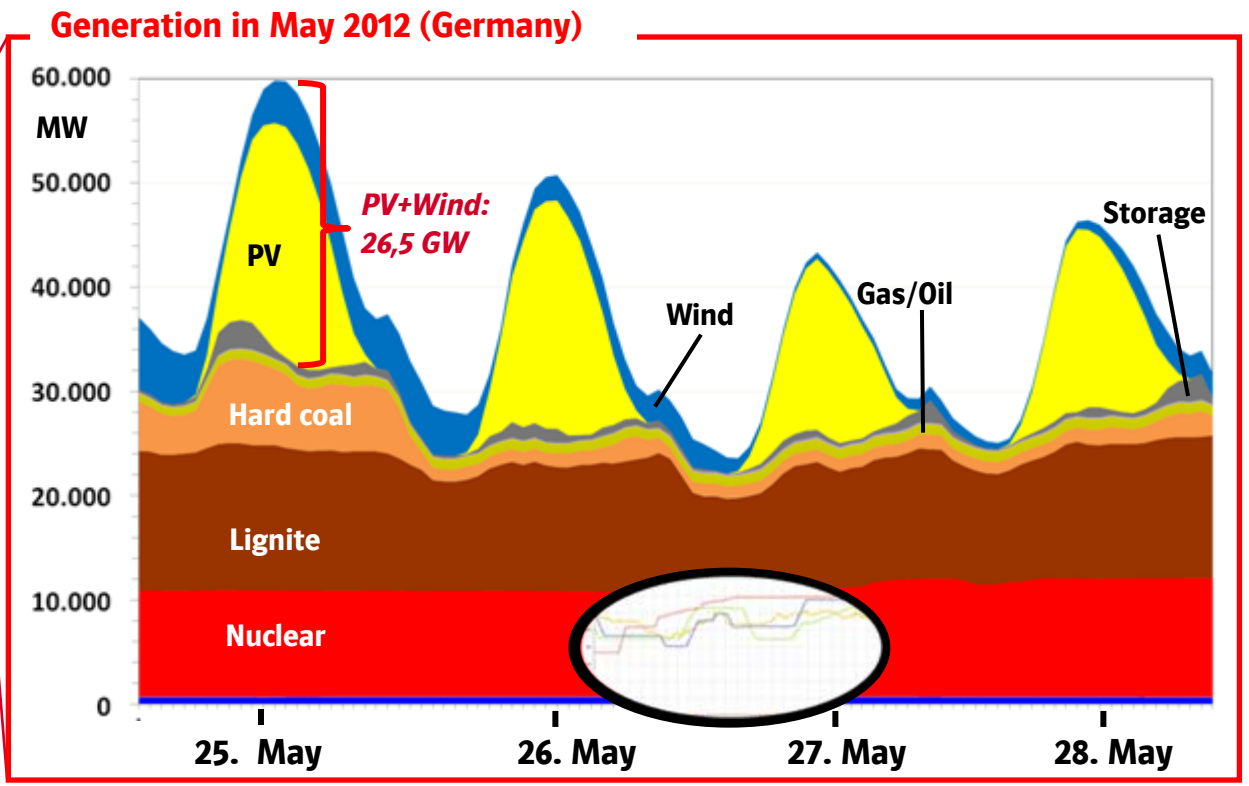
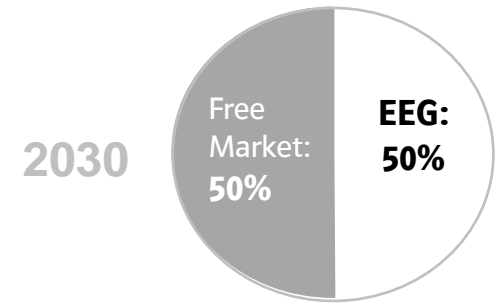
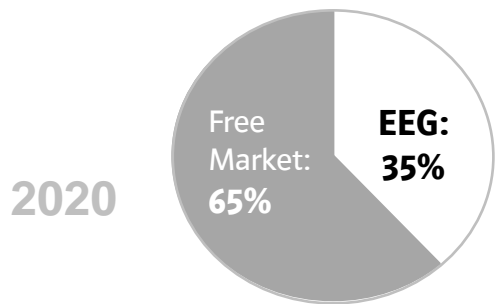
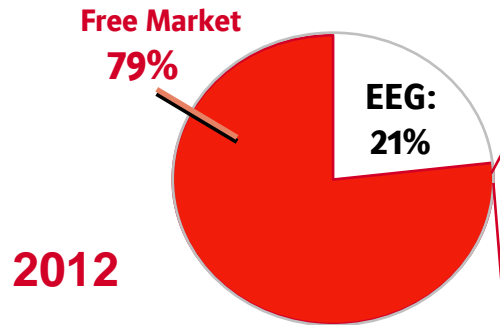


Source: EEX, EED-VEN



Free electricity market is shrinking

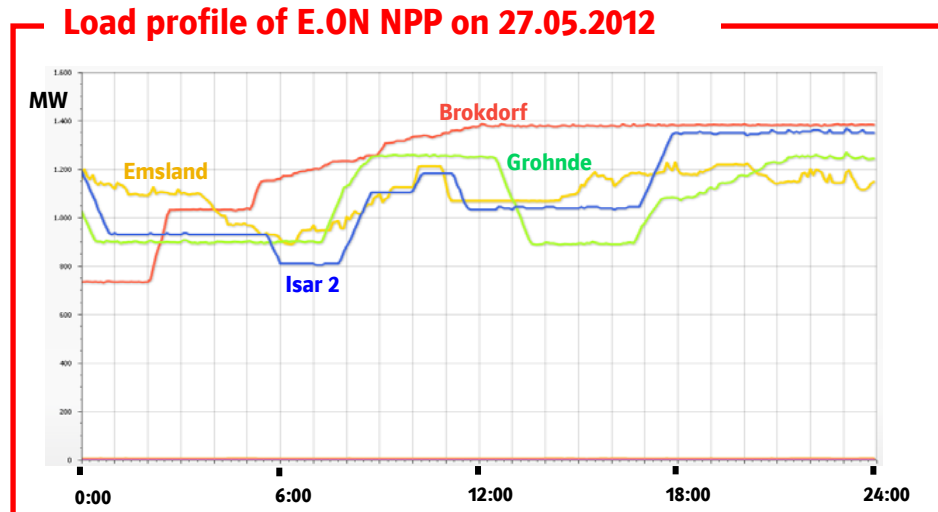
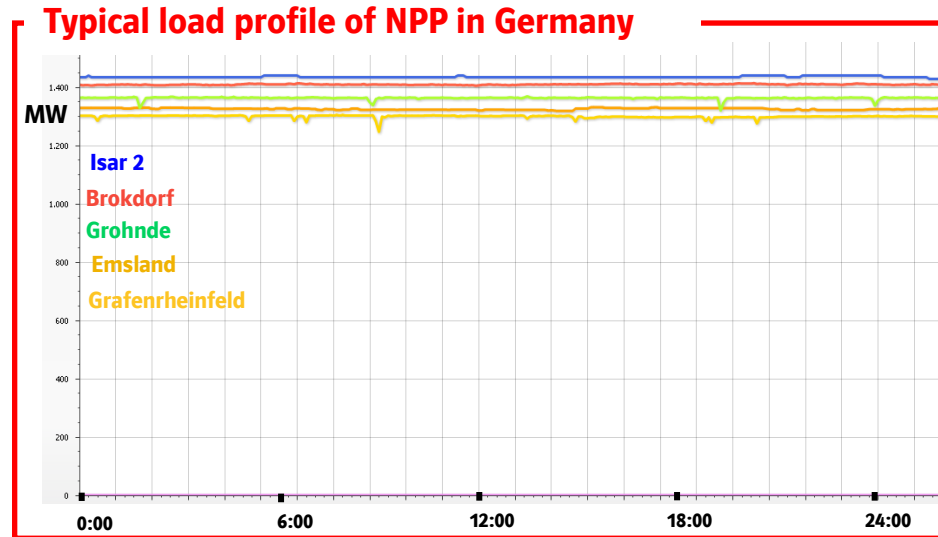
Electricity Market in Germany



Source: EEX, EED-VEN

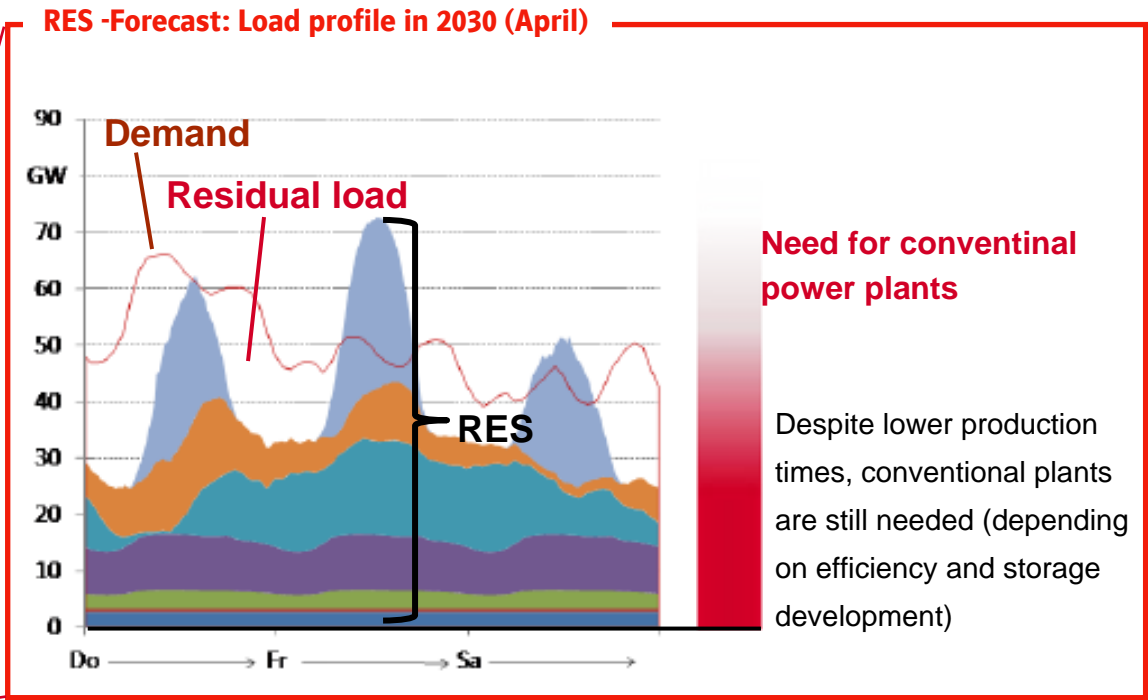
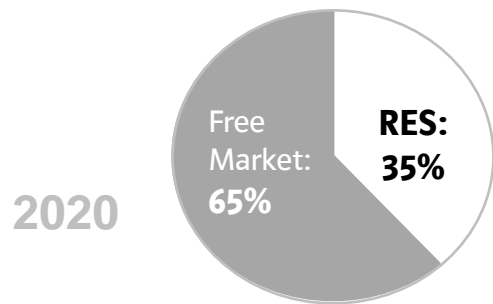
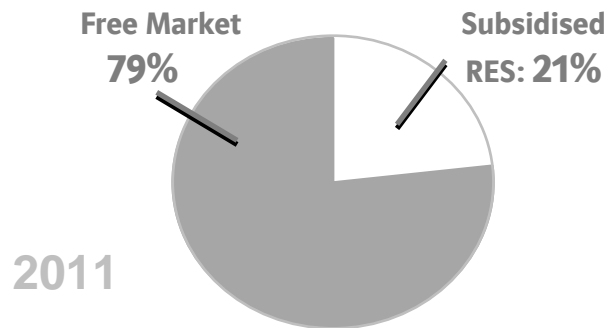


Load profiles of NPP in Germany



Free electricity market is shrinking

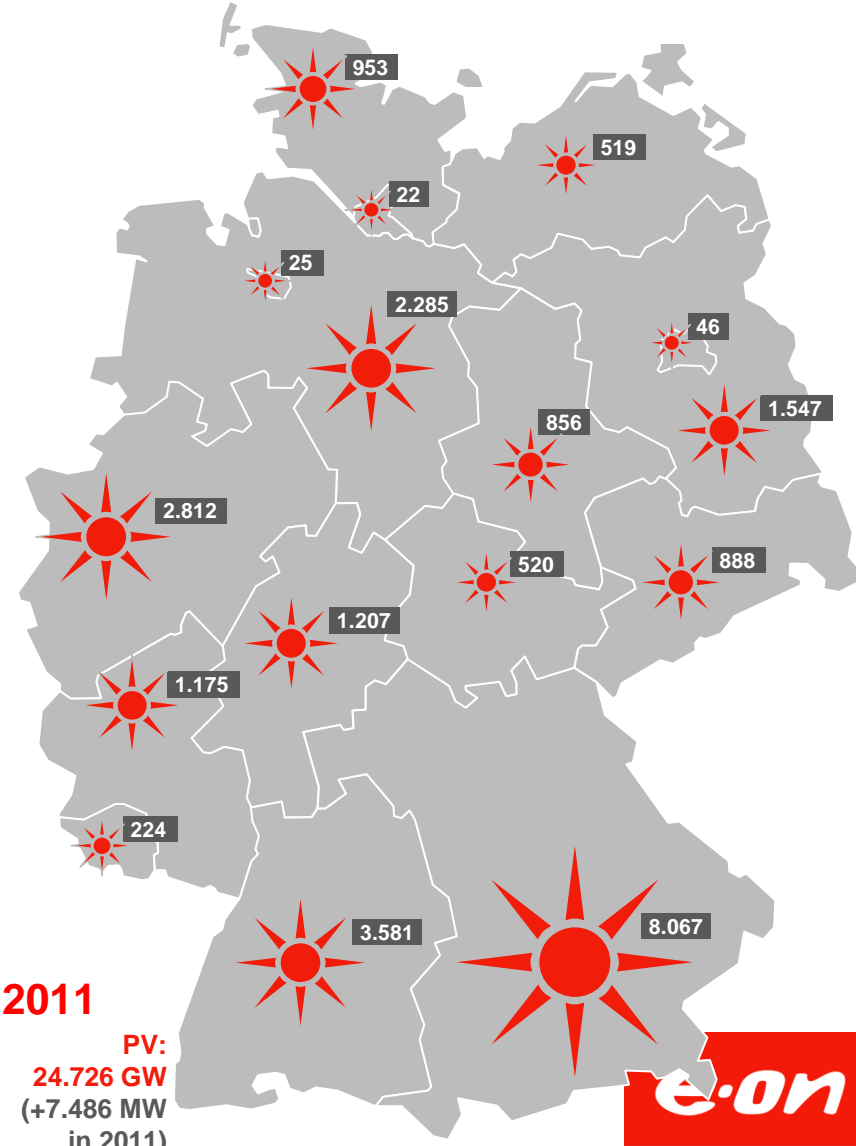
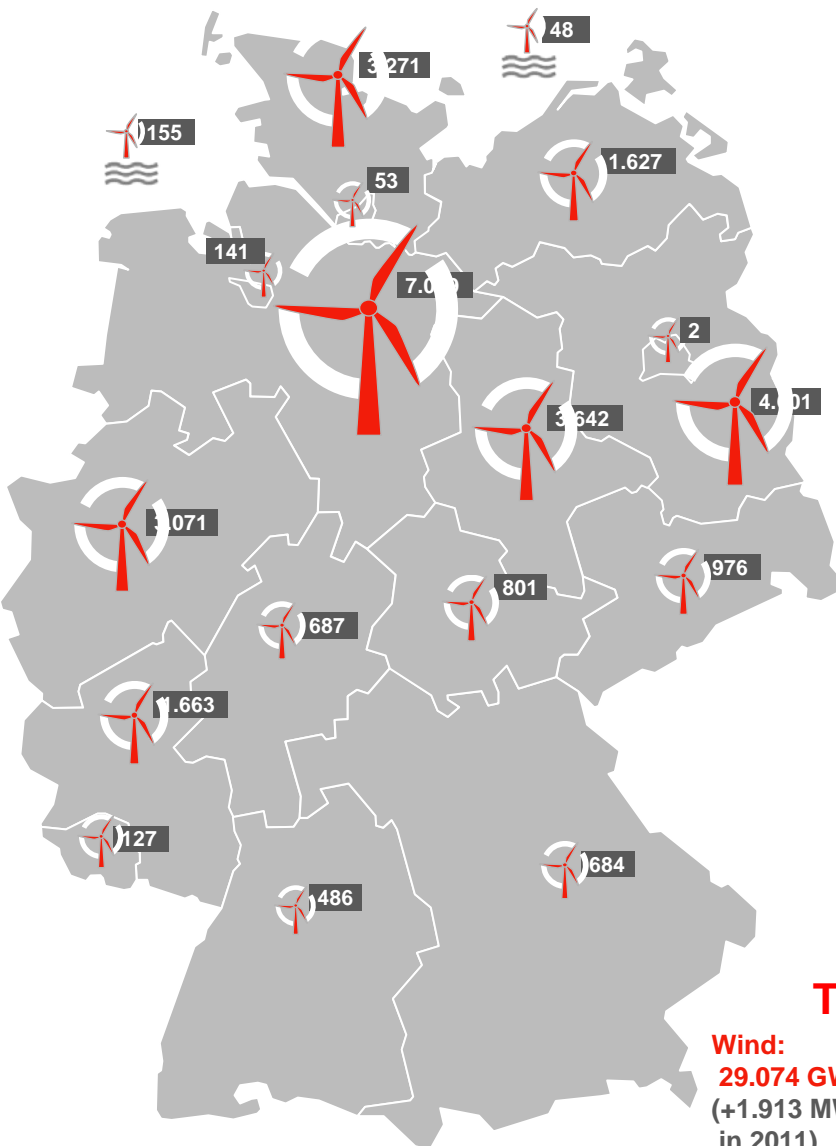
Electricity Market in Germany



Source: Study Consentec for BDEW, Basis scenario 2030, April



Wind and solar capacity (MW) in Germany 2011



Totals in 2011

Wind:
29.074 GW
 (+1.913 MW
 in 2011)

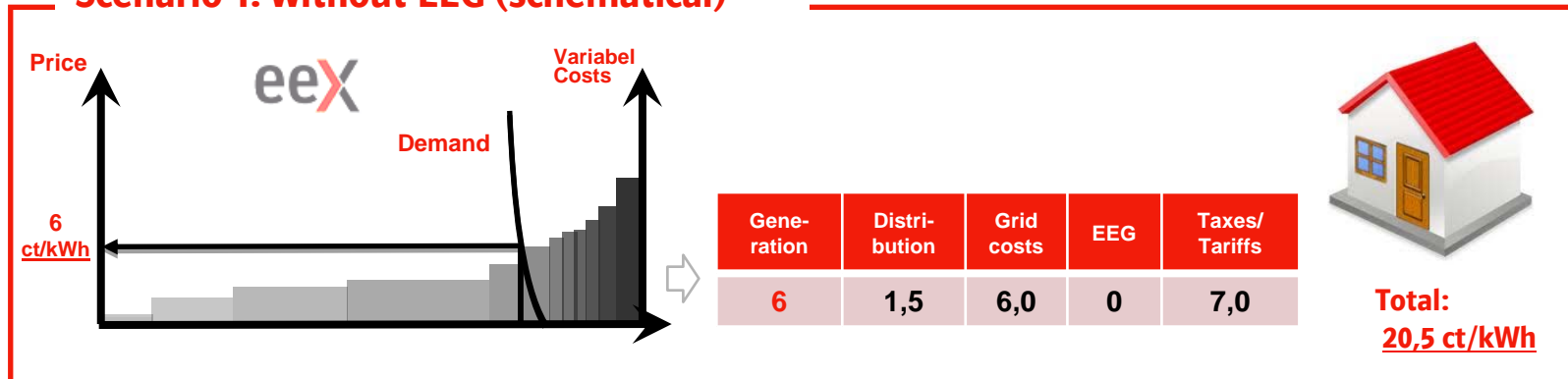
PV:
24.726 GW
 (+7.486 MW
 in 2011)



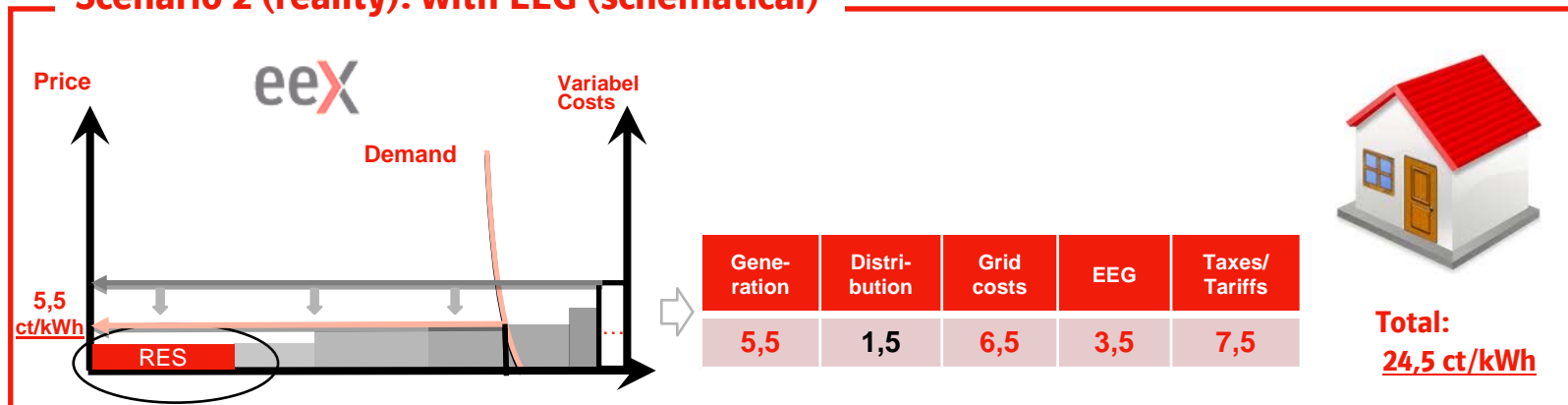


Renewables-effect on electricity prices (households)

Scenario 1: without EEG (schematical)

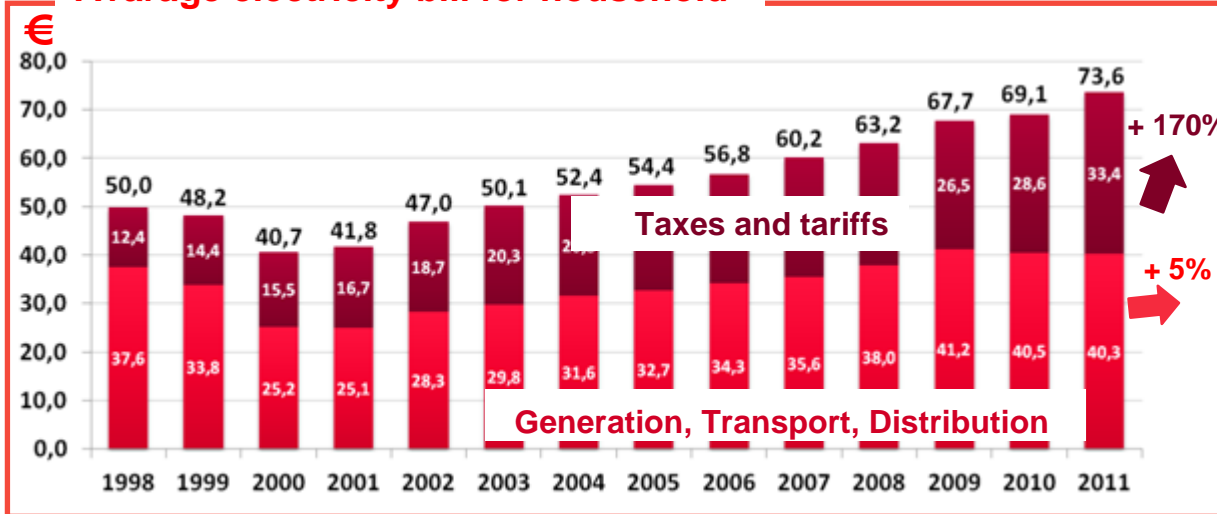


Scenario 2 (reality): with EEG (schematical)

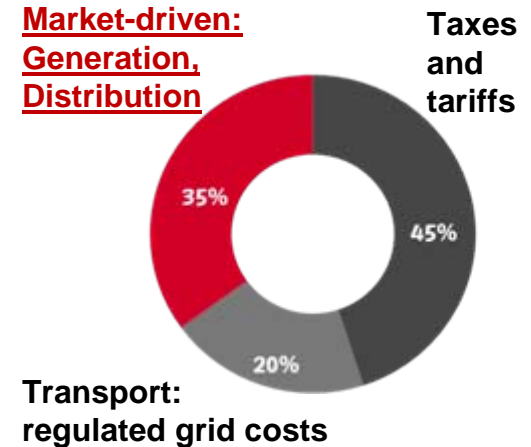


Electricity price development for private customers

Average electricity bill for household



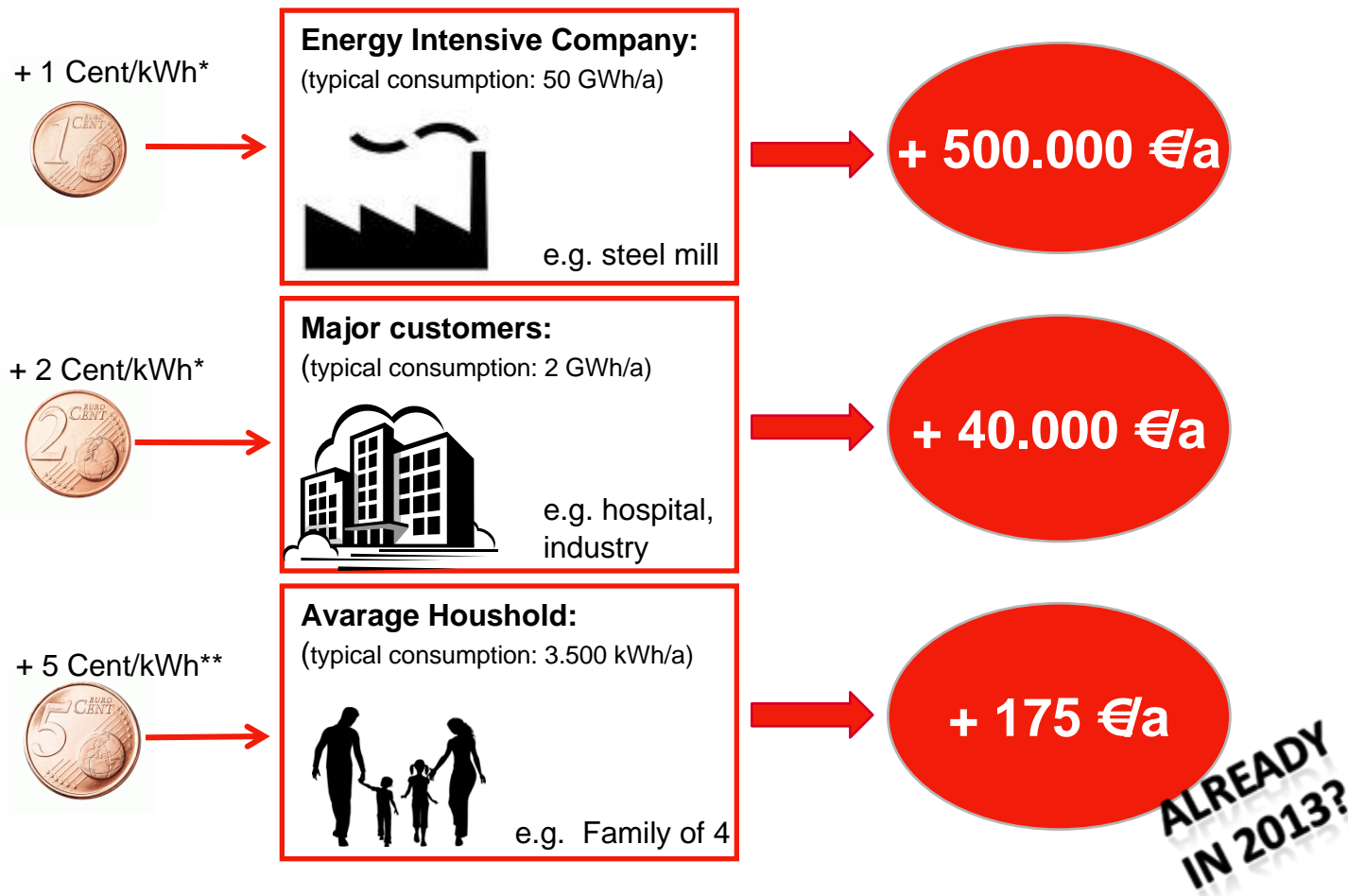
Main price components



- Currently 45% of the electricity price are taxes and tariffs, while only 35% are caused by production and distribution/sales
- Government and most experts expect a further increase in taxes, tariffs and grid costs

► Price increased due to rising taxes and tariffs since the start of liberalisation in 1998

What have customers to expect until 2020?

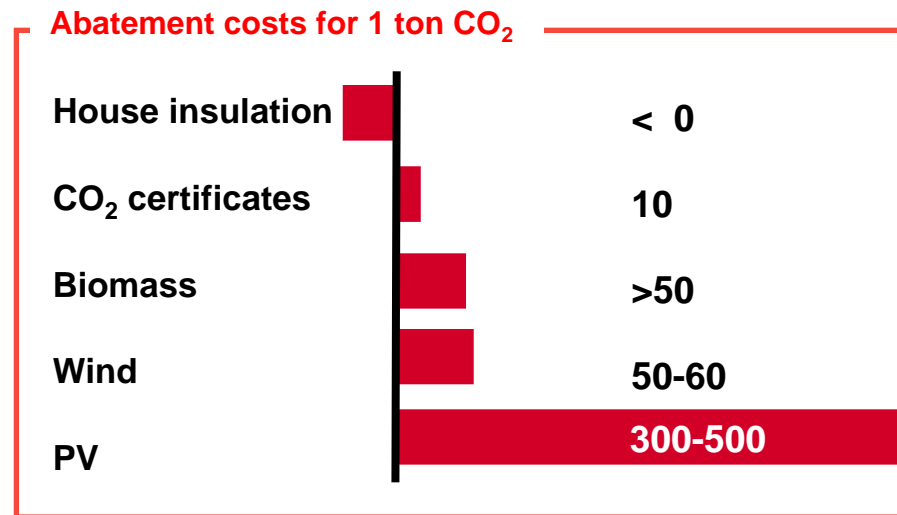
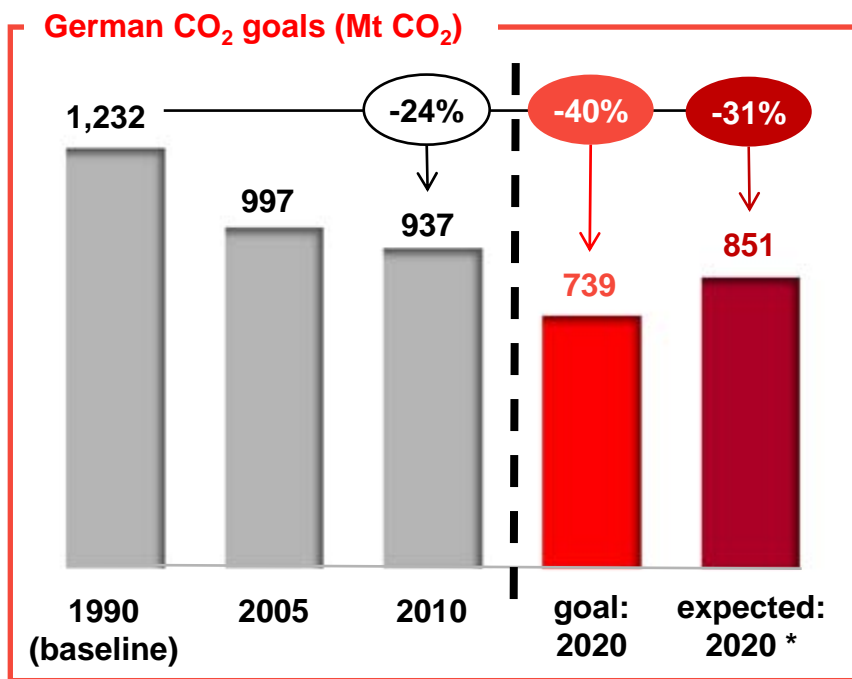


* Estimate based on studies by TU Berlin and Prognos, 2011

** German TSOs and a number of experts (TU-Berlin, RWI, dena) expect a higher EEG-Umlage by up to 5 cent in 2013. On top higher grid costs are expected.



Prices and climate - what to expect in 2020?



Source: McKinsey, RWE, Bundesverband erneuerbare Energien

„It is already obvious that the RE-boost in Germany is not helping the climate. What we reduce here, somewhere else in Europe is being emitted.“

Prof. Haucap, Chairman of the German Monopoly Commission

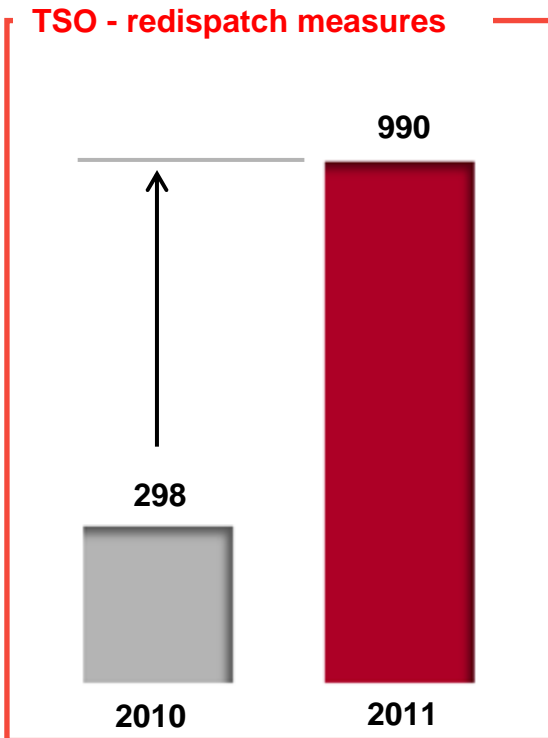
- ▶ **German CO₂ goal will most probably be missed.**
- ▶ **Allocation of resources is currently not efficient for climate protection.**

e-on

*Source: McKinsey 2012, expected result in the (optimistic) scenario (Referenzpfad), if the government goals in i.e. offshore wind, efficiency will not be met only -24% reduction in 2020 can be reached.



Critical grid situations in 2011/12



Source: www.tennetso.de

E.ON Costs for redispatch (reimbursed):

- 2011 total: **18 Mio. €**
- Q1 2012: **32 Mio. €**

Impact on E.ON during the critical grid situations 2011/12, e.g.:

- Requests from TSOs to postpone revisions of E.ON plants
- Gas delivery shortages from Russia led to shut downs of some gas fired E.ON plants
- Some of these plants switched from gas to oil and could deliver the needed electricity despite the shortage, but with higher costs.

► **The grid situation during the winter was critical.**



Critical grid situations in 2011/12 - Consequences

Report on Security of Supply (SoS) in winter 2011/2012 by the Federal Network Agency:



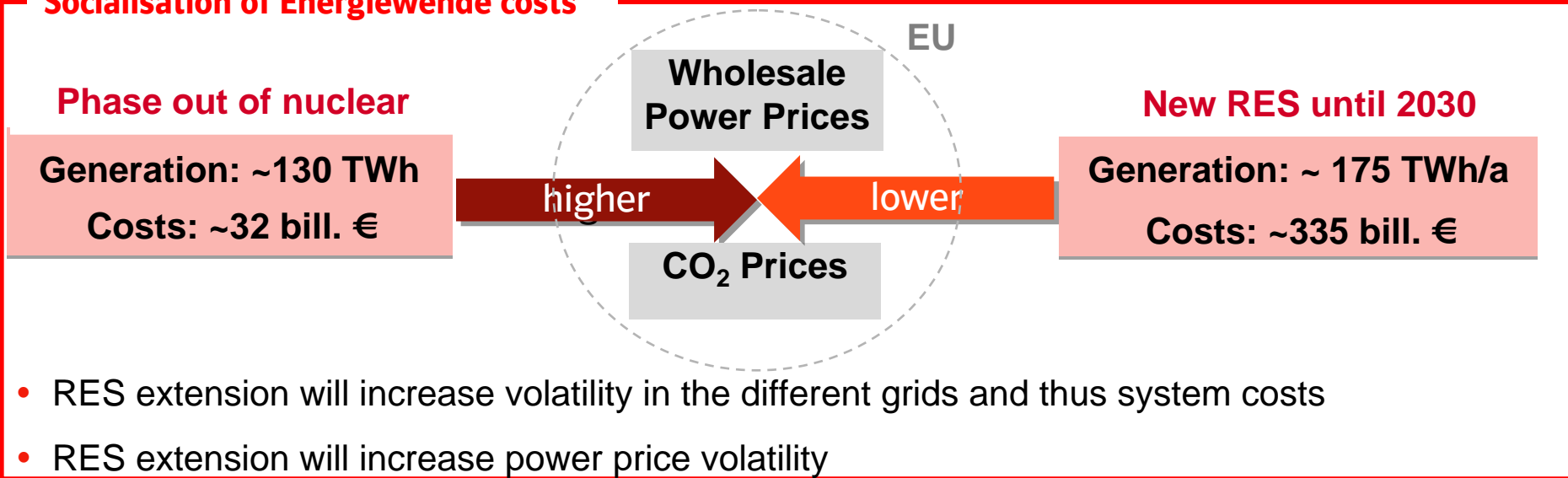
- Five highly critical situations described, overall SoS decreased significantly
- TSOs had to enforce a record number of emergency measures (redispatch)
- The current level of system reserve capacity is not sufficient for the next winter
- The Network Agency proposed urgent legislation to prevent e.g. short term decommissionings (“further decommissionings in Germany are not justifiable”)

Possible intermediate solution until the needed grid extension: TSOs could contract older uneconomic plants to establish a system reserve . (Same procedure as with Austrian reserve plants in 2011)

- ▶ **Further decommissionings are announced, for emissions and/or economic reasons.**
- ▶ **The situation next winter will be at minimum critical again.**
- ▶ **In similar situation next winter, less exports to France for security margin reasons**
- ▶ **A number of uncertainties (TSO measures, weather, import/export, technical failures) could intensify the critical situation in 2012/2013.**

Summary

Socialisation of Energiewende costs



Security of Supply

- Germany will not be able to play a grid stabilizing role as in previous years
- Energiewende at least mid-term will impact Security of Supply, especially during winter