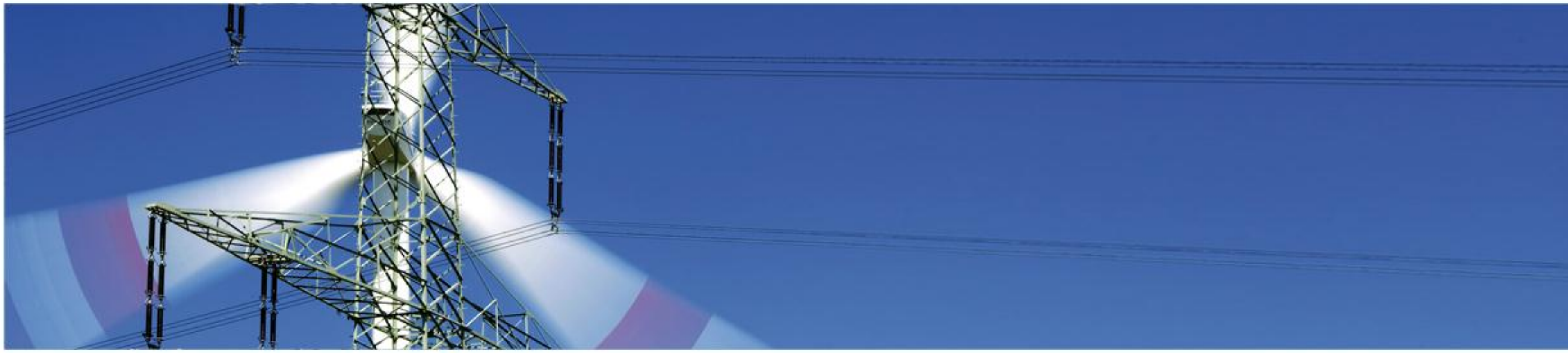
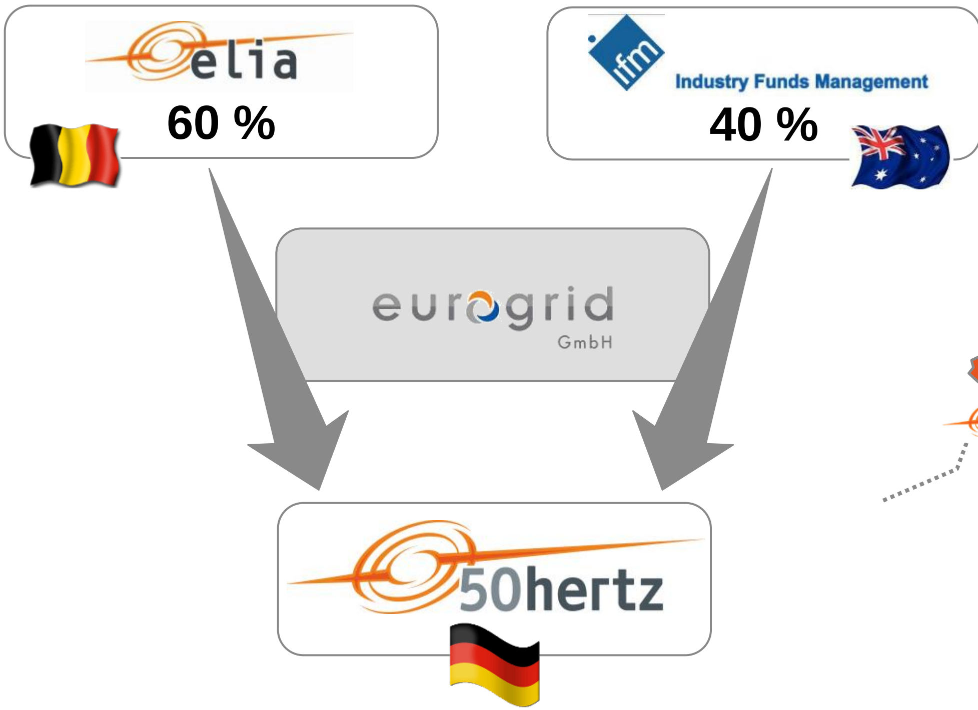


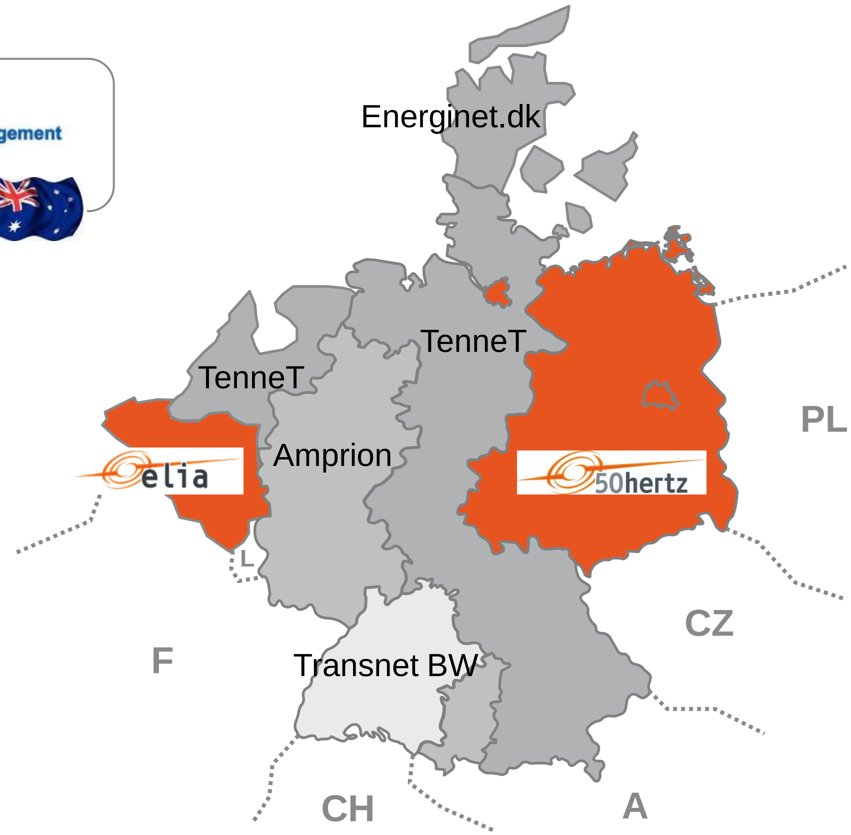
Renewable Energies as a Business Driver for Transmission System Operators

REvision2013 Conference
26/02/2013

50hertz

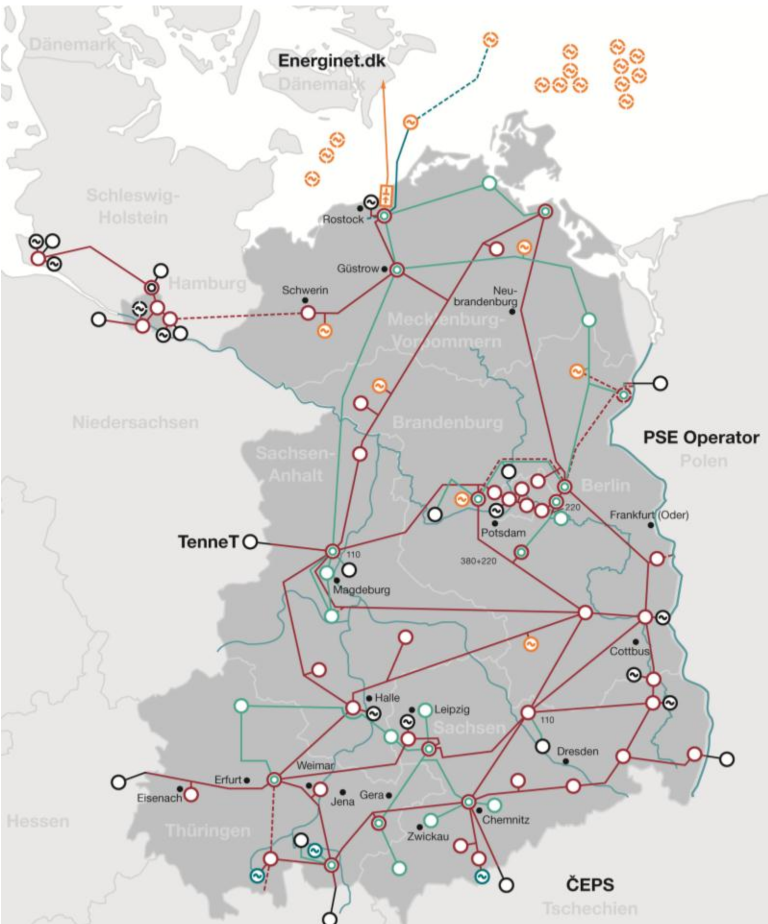
50Hertz Transmission – a fully unbundled transmission system operator (TSO)





50Hertz with two shareholders and as integral part of Elia Group.

50Hertz at a glance – Situation at the end of 2012

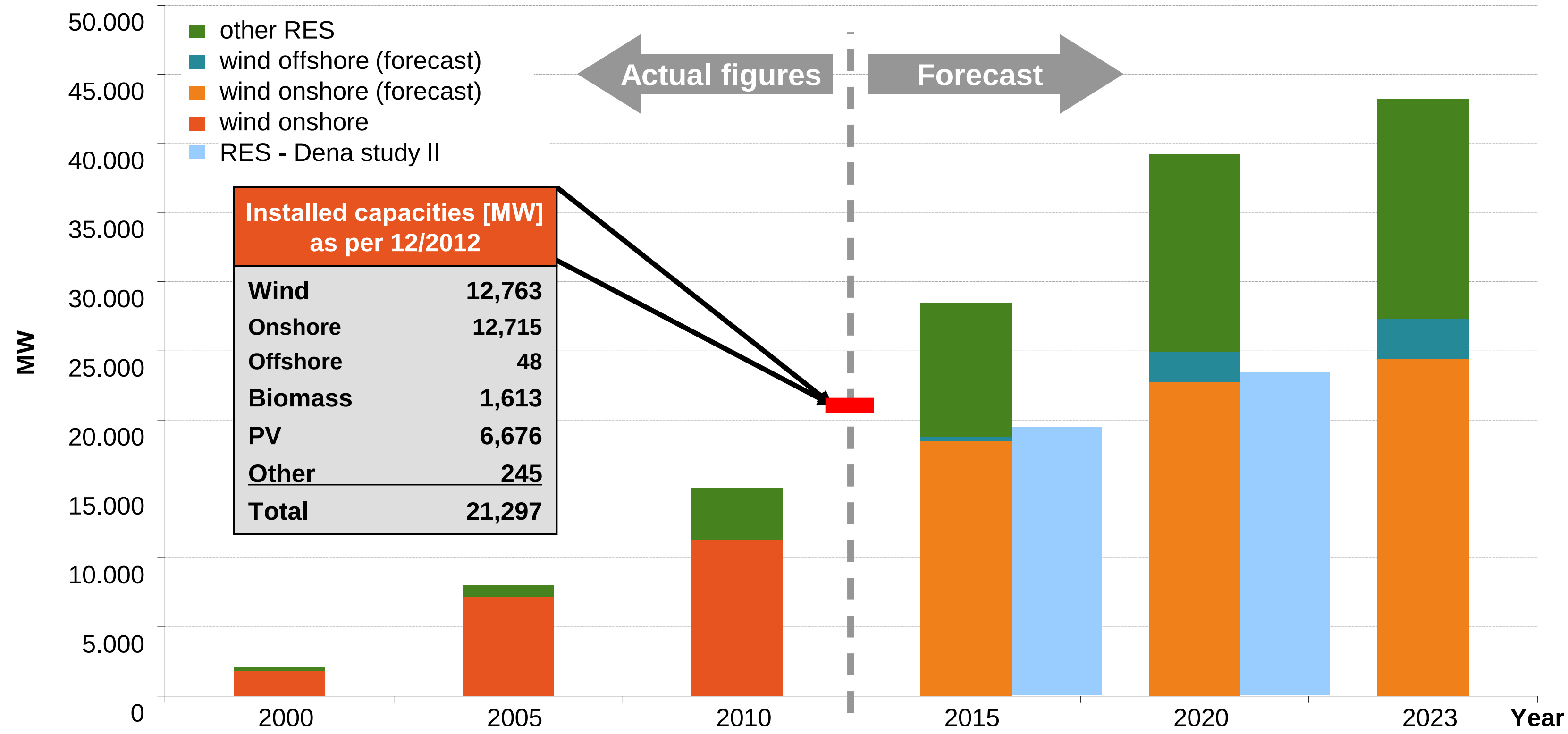


*) Preliminary figures; **) 2011

	Value (share of GER)*
Geographic area	**109,360 km²** (31%)
Total circuit length	**9,980 km** (28%)
Maximum load	**~15 GW** (18%)
Electricity consumption**	**~98 TWh** (20%)
Installed capacity: - thereof RES - thereof wind	**~43 GW** (25%) **21.4 GW** (31%) **12.4 GW** (41%)
Employees	**~760**
Turnover** - thereof grid	€ 6.9 bn **€ 0.6 bn**

Dynamic RE development – main driver for the TSO-business

Installed RE capacities in the 50Hertz-control area

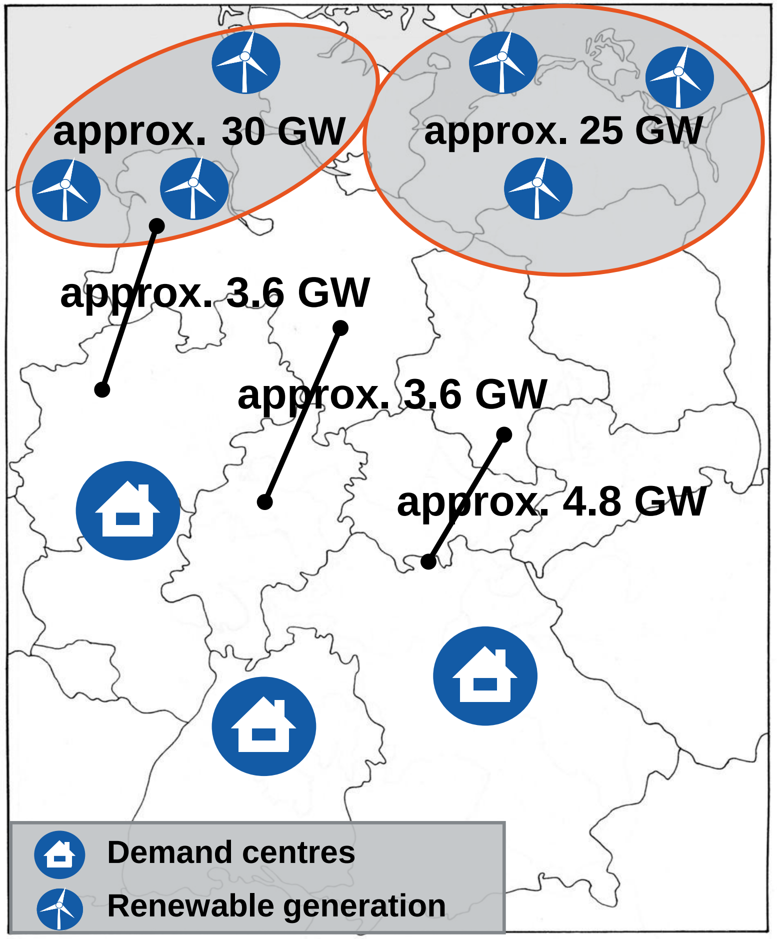


Installed capacities [MW] as per 12/2012	
Wind	**12,763**
Onshore	**12,715**
Offshore	**48**
Biomass	**1,613**
PV	**6,676**
Other	**245**
Total	**21,297**

Sources: Data for 2000 until 2010 (actuals): www.eeg-kwk.net from 13/12/2011; Data for 2015 until 2023 (forecast): EEG-Forecast 50Hertz Transmission, 2011

The current RE capacity of ~21 GW is expected to more than double within 10 years.

The German situation demonstrates the urgency of grid development



Particularly the existing north-south routes are already today at full capacity during strong winds

Approx. 50-60 GW new production (until 2020)
vs.
12 GW new transport capacity!

Increase of congestions cannot be avoided with the currently implemented projects.

Source: 50Hertz Transmission & TenneT GmbH forecasts for 2020; capacities of the lines see document of the German Bundestag 16/10491, statement of reasons for EnLAG.

The European transmission landscape in a process of change

Key EU policy themes:

- **Unbundling and liberalisation**
- **Greening**
- **Smartening**

Major change drivers:

- Further unbundling (Third EU Energy Package)
- RES development and integration (EU 20/20/20-targets and national RE targets)
- Creation of a pan-European integrated electricity market
- Ageing networks
- New technologies and need for smarter networks
- (Re)focus on security of supply

The past decade has seen an overhaul of the power (transmission) sector in Europe.

Main implications for TSOs

- TSOs as neutral and independent key players in the electricity value chain offer advise to politicians and society
- From a ‘support activity’ towards a stand-alone business
- New fields of operation and expertise (e.g. offshore connections, HV underground cables, RE forecasting and selling etc.)
- From supporting local generation and demand towards networks implementing EU energy and climate policies and maximizing welfare
- From delivering electricity to conceiving, shaping and building the power system of the future with high transmission investments ahead
- From safeguarding supply in individual control areas to transnational and European coordination and collaboration between TSOs

TSOs are at the heart of the power system and must therefore act as facilitators of the transnational power system of the future.

Our understanding of 100% RES integration

- Stable and secure grid connection and operation (SoS)
- Growing transport capacities (Grid extension/ enforcement)
- Public acceptance/ awareness of RES **and** grid enforcement
- Short-term enhancement of storage capacities
- R&D efforts for transmission technologies and long term energy transformation
- Well-trained personnel
- Stable legal and regulatory framework

50Hertz is fully committed to realizing the ‘energy transformation’.

Thank you.

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