



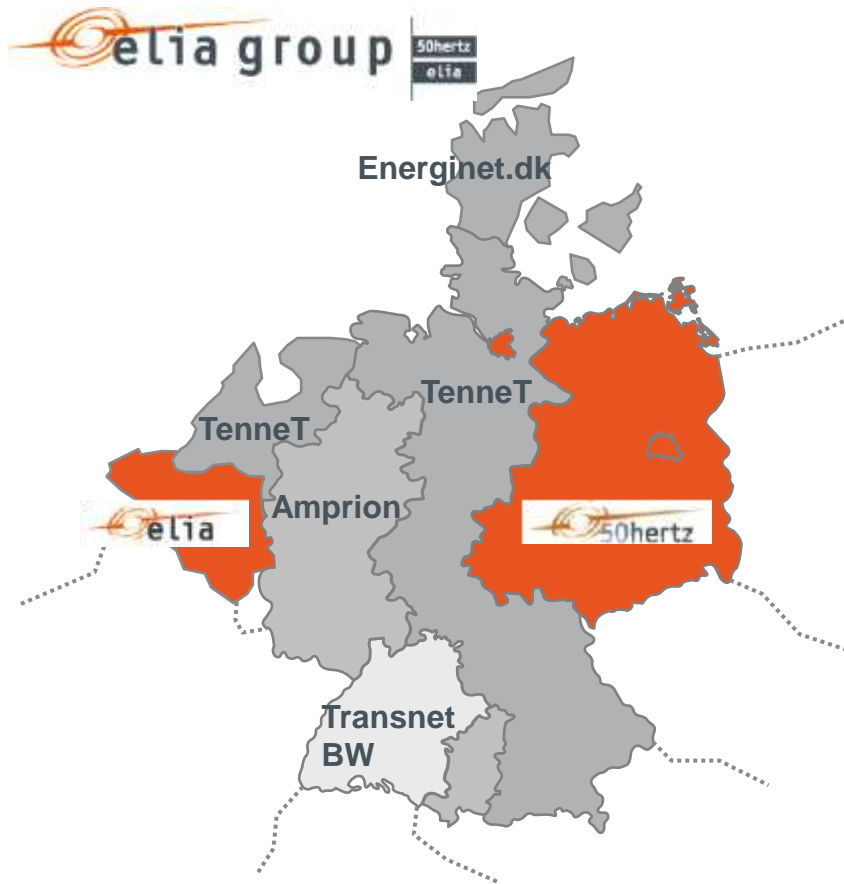
# Lessons Learnt from German Energy Transition

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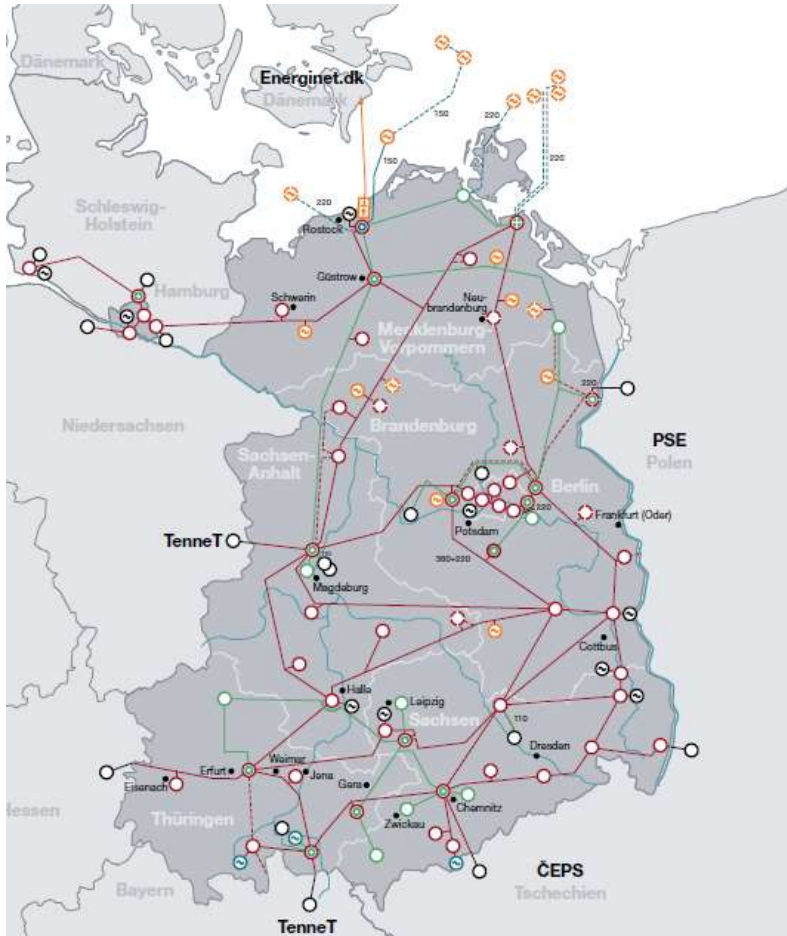


# 50Hertz – a fully unbundled European Transmission System Operator (TSO)



- 50Hertz is a fully unbundled TSO and part of **Elia Group**.
- Our shareholders are the Belgian TSO **Elia** (60% of shares) and the Australian infrastructure fund **IFM Investors** (40% of shares).
- 50Hertz owns and operates the transmission grid for **18 million people** in Eastern Germany.
- Within Elia group, 50Hertz is committed to **international cooperation** and supports partners in grid operations, RES integration and market design.

# 50Hertz at a glance



	Value (Share in DE)
<b>Surface area</b>	109,360 km <sup>2</sup> (30%)
<b>Total length of lines</b>	9,855 km (30%)
<b>Maximum load</b>	~ 16 GW (20%)
<b>Energy consumption</b>	~ 95 TWh (20%)
<b>Installed capacity:</b>	
- Renewables	~ 47,8 MW (~25%)
- Wind	24,9 MW (~30%)
	14,6 MW (~40%)
<b>Workforce</b>	893
<b>Turnover</b>	
- of which grid	8,1 billion €
	0,9 billion €

# German Energy Transition (Energiewende)



- Phase-out of nuclear energy production within 10 years



- Renewable Energy Sources (RES) development  
→ target corridors 40-45% by 2025, 55-60% by 2035



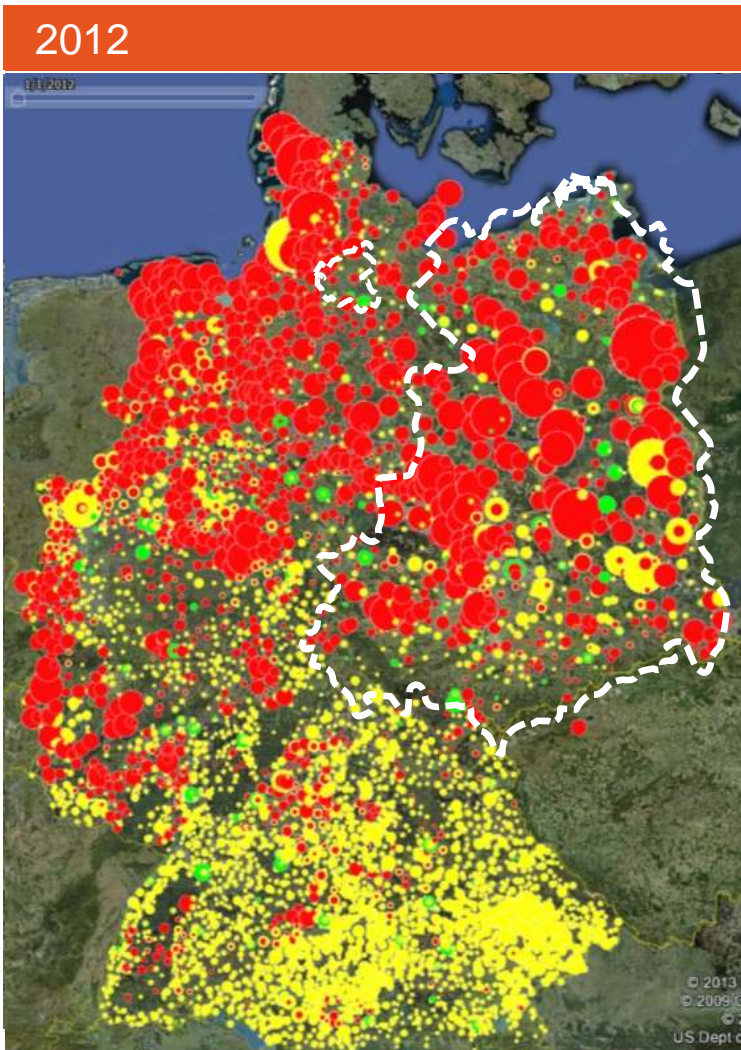
- Efficiency program to reduce energy consumption



- Grid extension identified as key for successful development

Energiewende is the major change project for German society since reunification in 1990.

# Expansion of Renewable Energy Sources in Germany



~ 1,500,000 plants

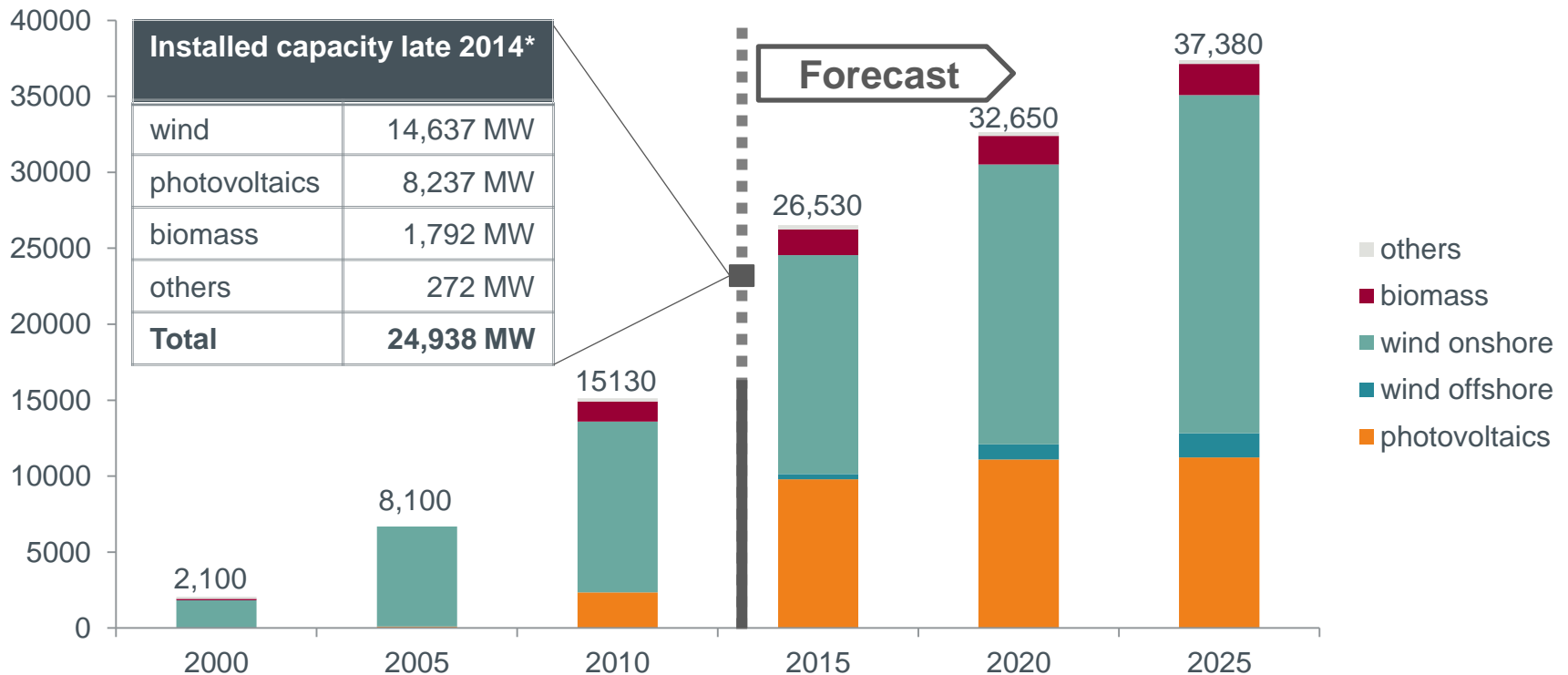
Area proportional to installed capacity

- wind
- photovoltaics
- biomass

Sources: 50HertzT, TenneT, Amprion, TransnetBW, Google Earth

# RES development – 10 years outlook

Installed RE capacity in the 50Hertz-control area [MW]

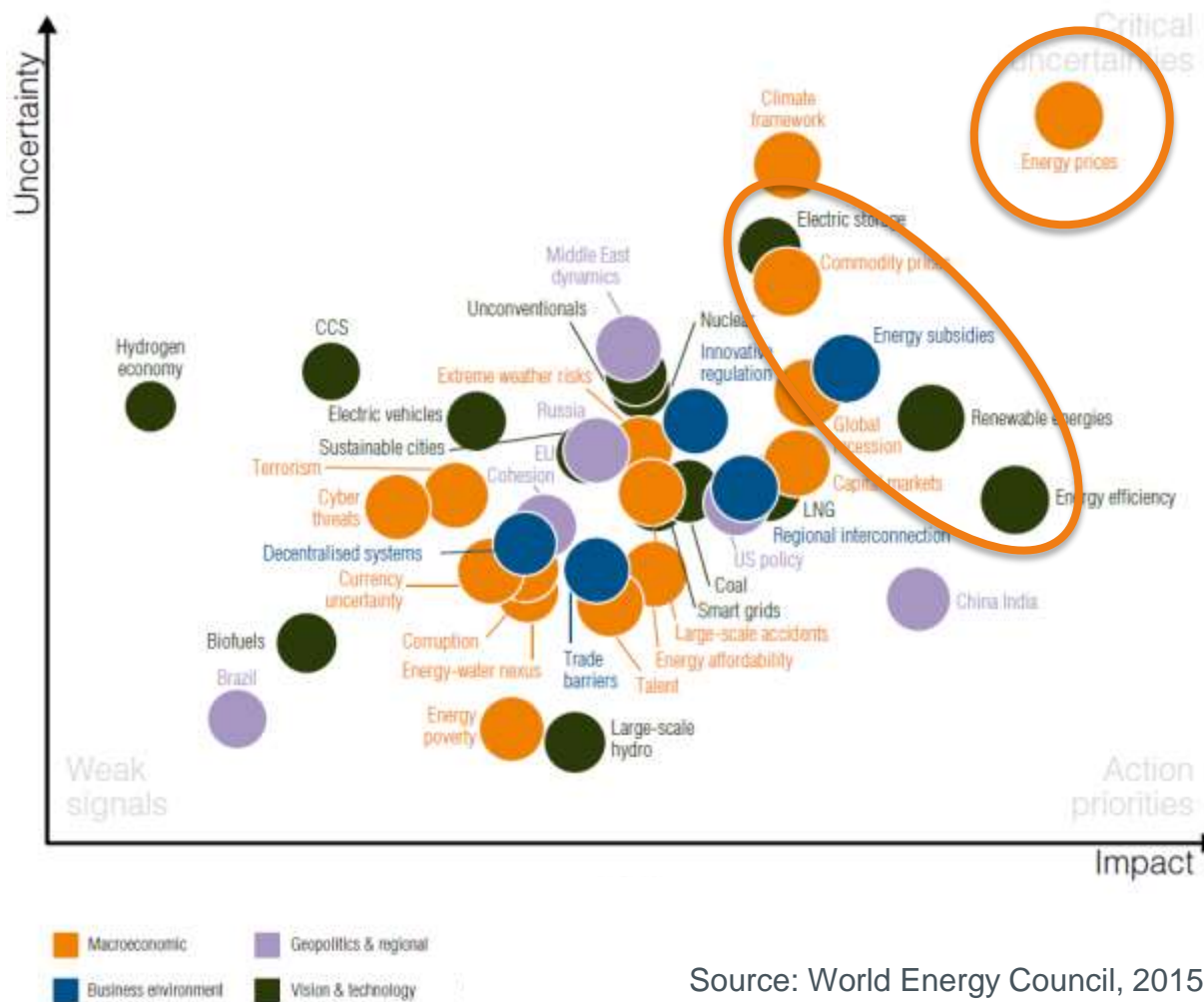


A steady growth of RE installations is expected over the next 10 years.

\* provisional data, Source: 50Hertz.

# 2015 World Energy Issues Monitor 2015

Prices, Climate Framework, RES, energy storage, energy efficiency



Source: World Energy Council, 2015 World Energy Issues Monitor

# Major challenges of Energiewende



Fundamental change of the electricity system and increasing complexity. Game changer for energy industry.



Ensure cost efficiency, keep energy prices in a competitive range.



Decreasing profitability of conventional generation within the current market design.



Legal and procedural framework must be further developed to keep pace with renewables expansion (first important steps have been made in 2014).



Increasing gap between grid development and renewables development.



Limited public acceptance of the consequences of “Energiewende” (infrastructure, costs...).



# Energiewende driving corporate development

## Example of new corporate initiatives and business fields

- Trading room for RES ('Front Office')
- 'GridLab'-center for grid simulations and operator training
- Participation in international system security coordination entities (Coreso, TSC)
- Participation in international markets and capacity allocation entities
- Coordinated German and European grid planning
- Extensive know-how-building in RES integration
- New subsidiary EGI to provide know-how to external clients and develop international business opportunities



New challenges have led to new areas of operation, new competences, new jobs and organic growth.

# Key lessons-learnt from German experience

1. **Realistic targets and developments paths** are needed as reliable guideline for the market: generation portfolio, RES share, grid infrastructure.
2. **Planning and investment security** to be ensured by a stable legal and regulatory framework allows for long-term investment decisions.
3. **Stable market design** taking RES into account. High penetration of RES has to be actively managed for its market impact.
4. **Efficient RES support** that allows to control transition speed (for the learning curve).
5. **Facilitate infrastructure development** that keeps pace. This requires political support and an appropriate legal framework with regard to project permissions.
6. **Stakeholder dialogue** to ensure the stakeholders' commitment and maximum public acceptance.
7. **Operational excellence** with good coordination based on well organised processes and data exchange among the great number of players.

# Thank you for your attention!

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