

Overview of the German Wind Market and the Lessons Learned for India



Dr. Kurt Rohrig, Fraunhofer IWES

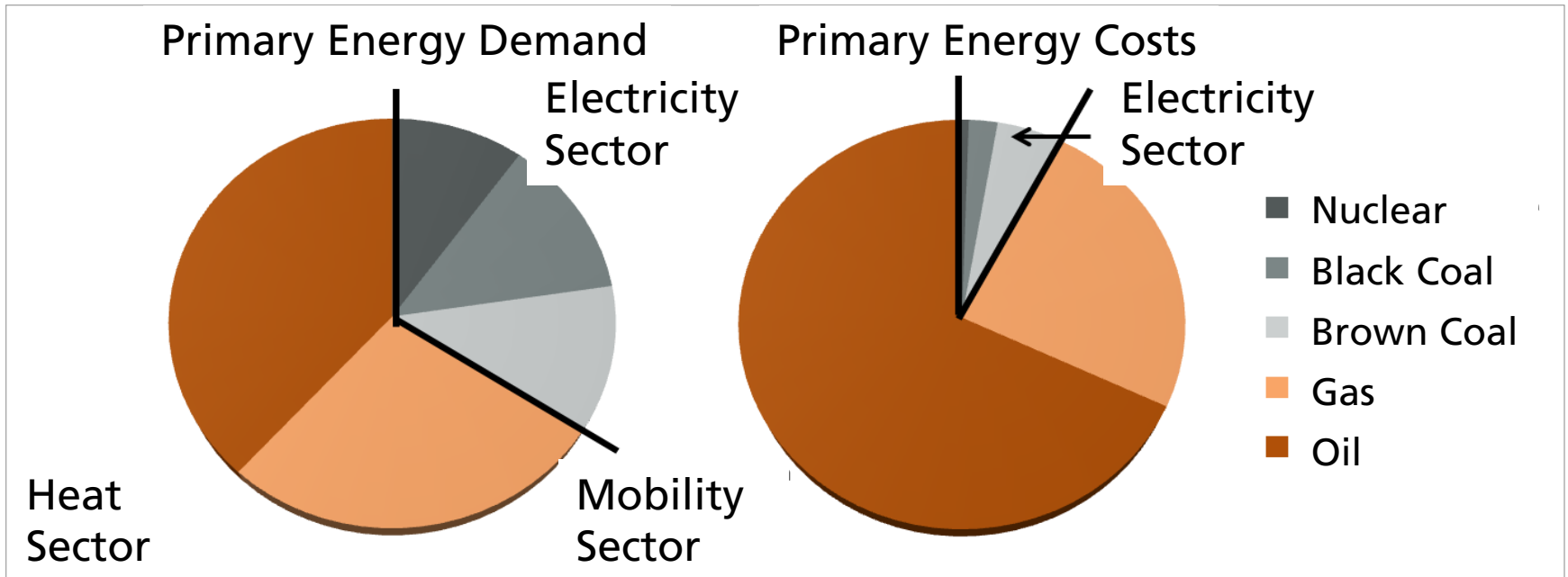


1989:

„ What contribution can Wind Energy
provide for the power supply
- In the energy sector scale - ?“



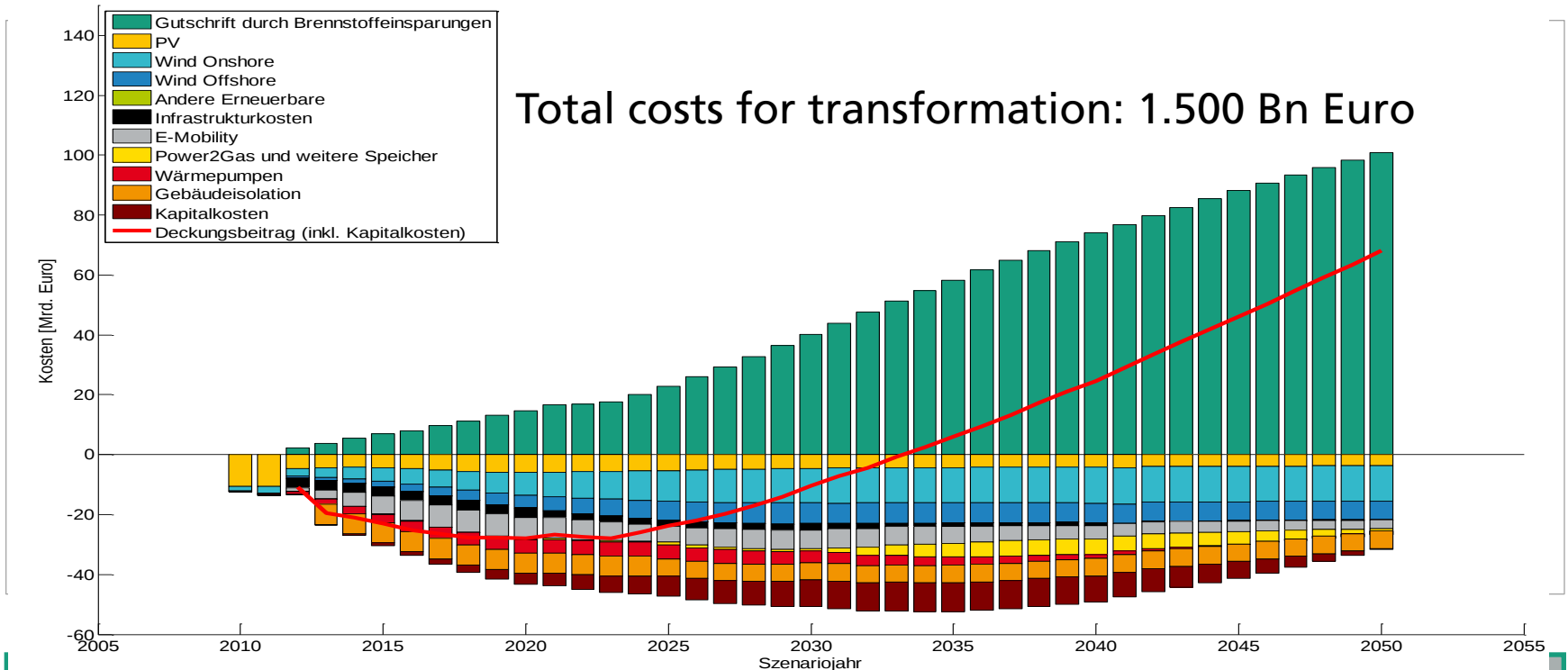
Primary Energy Demand in Germany – 3600 TWh – 85 Bn Euro



Electricity: high share for primary energy
→ but import- and production-cost relative low

Oil and Gas: expensive and hardly to substitute
→ used in heat- and mobility-sector

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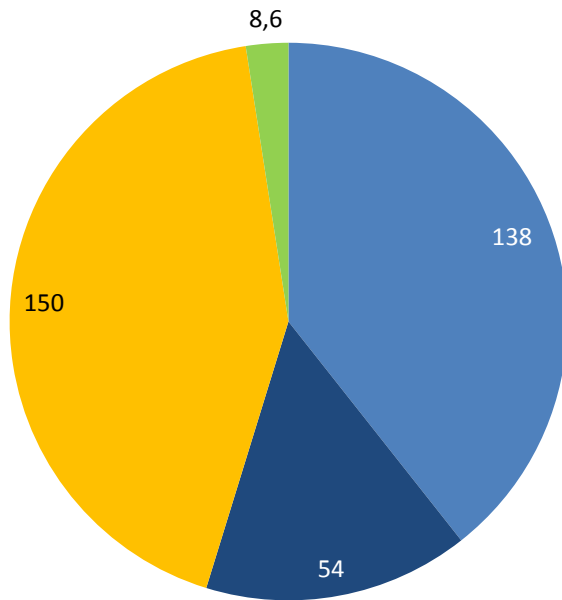


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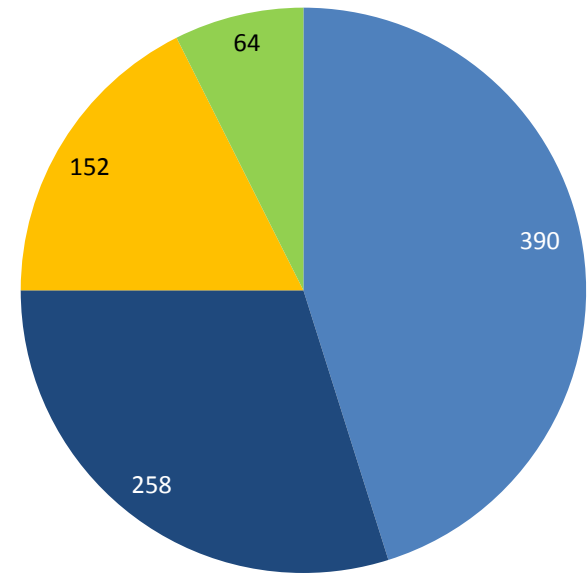
Role of Wind Energy for the German Energiewende

Share of Wind Energy to cover 80% of needed Energy



Capacity [GW]

- Onshore-Windenergie
- Offshore-Windenergie
- Photovoltaik
- Biogas, Wasserkraft u.a.

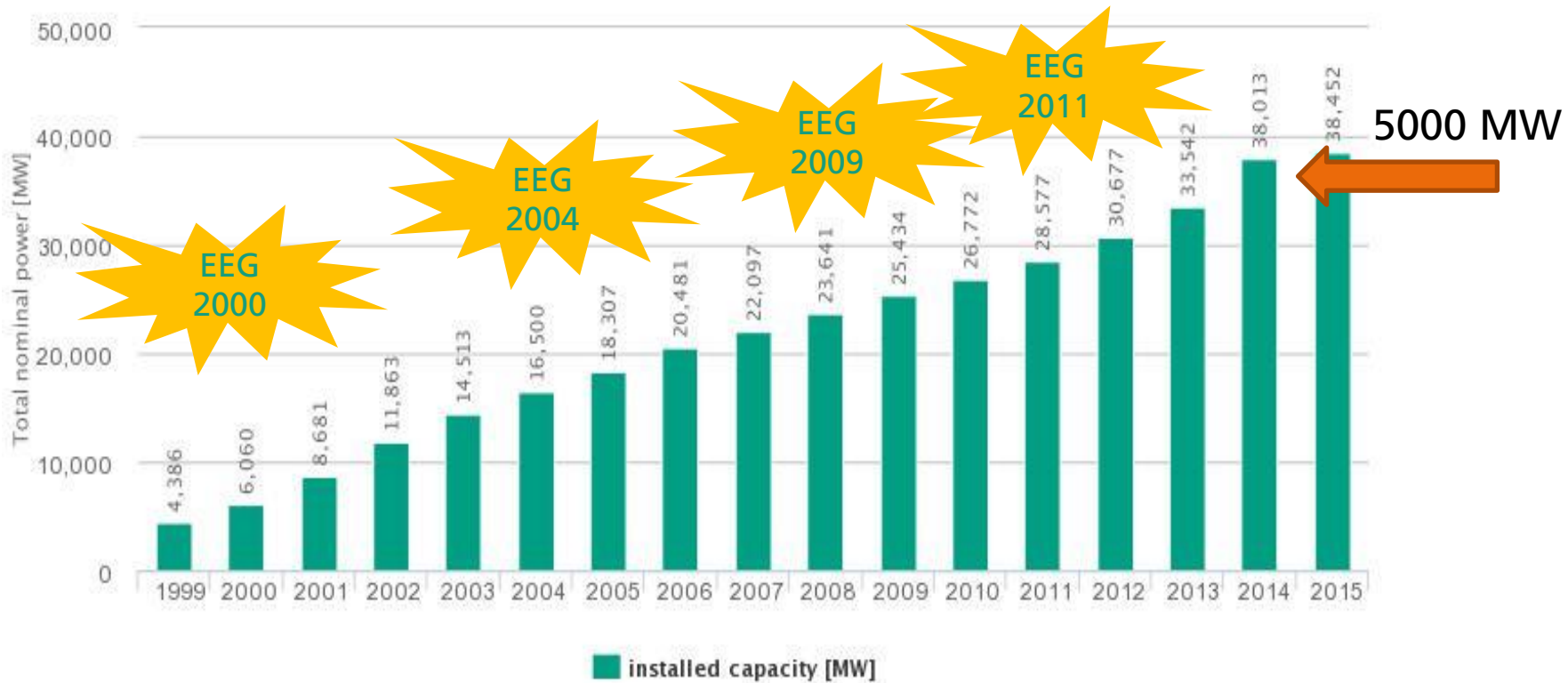


Energy [TWh]

Can Wind Energy meet this Challenge?



Wind Energy – Turbine Development

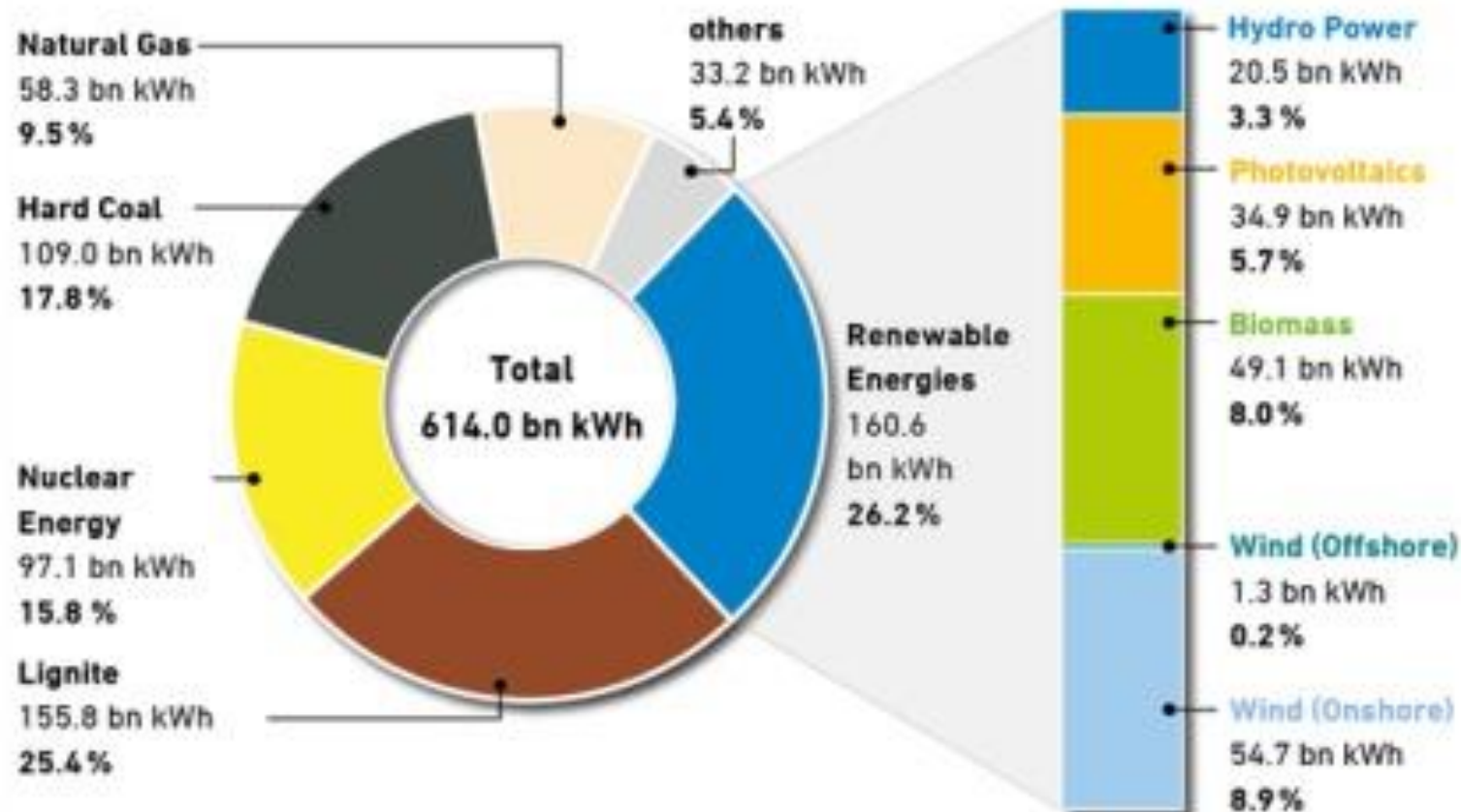


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Wind Energy – Energy Production

Germany's power mix in 2014

Renewable Energies contributed 160.6 billion kilowatt hours or 26.2 percent to gross electricity production. The share of renewables in electricity consumption increased to 27.8 percent.

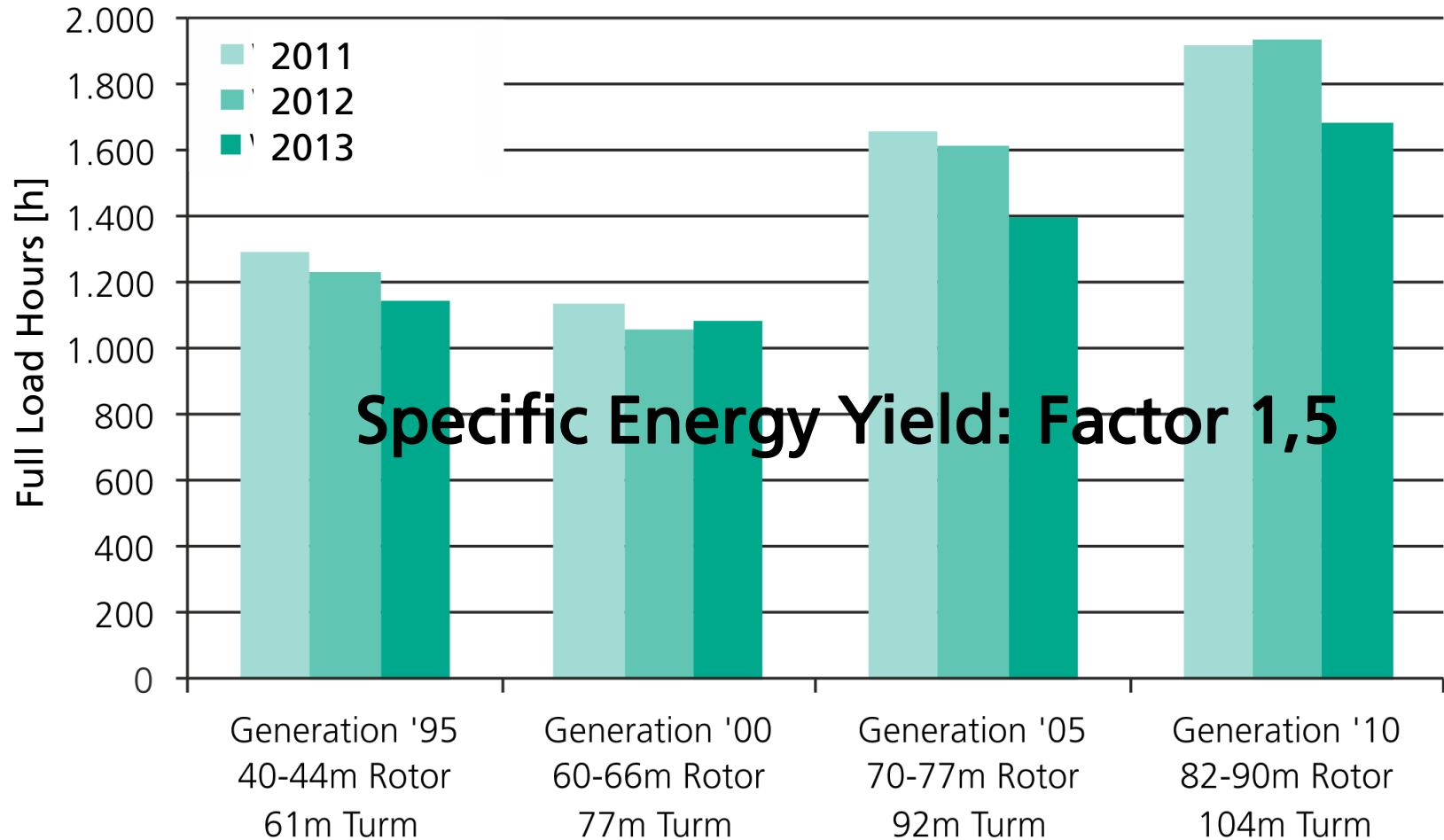


Sources: AGEE-Stat. BDEW;
As of: 3/2015

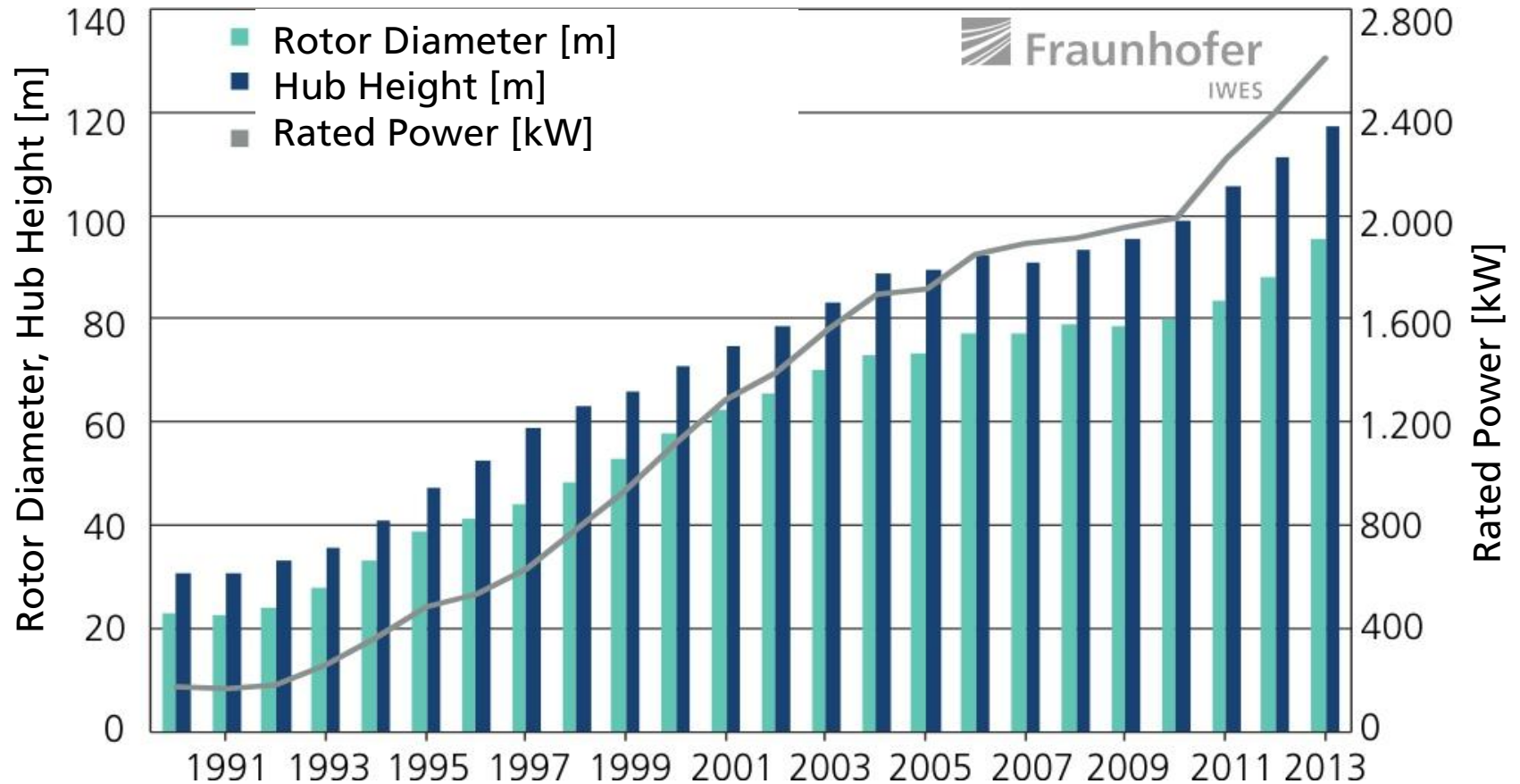


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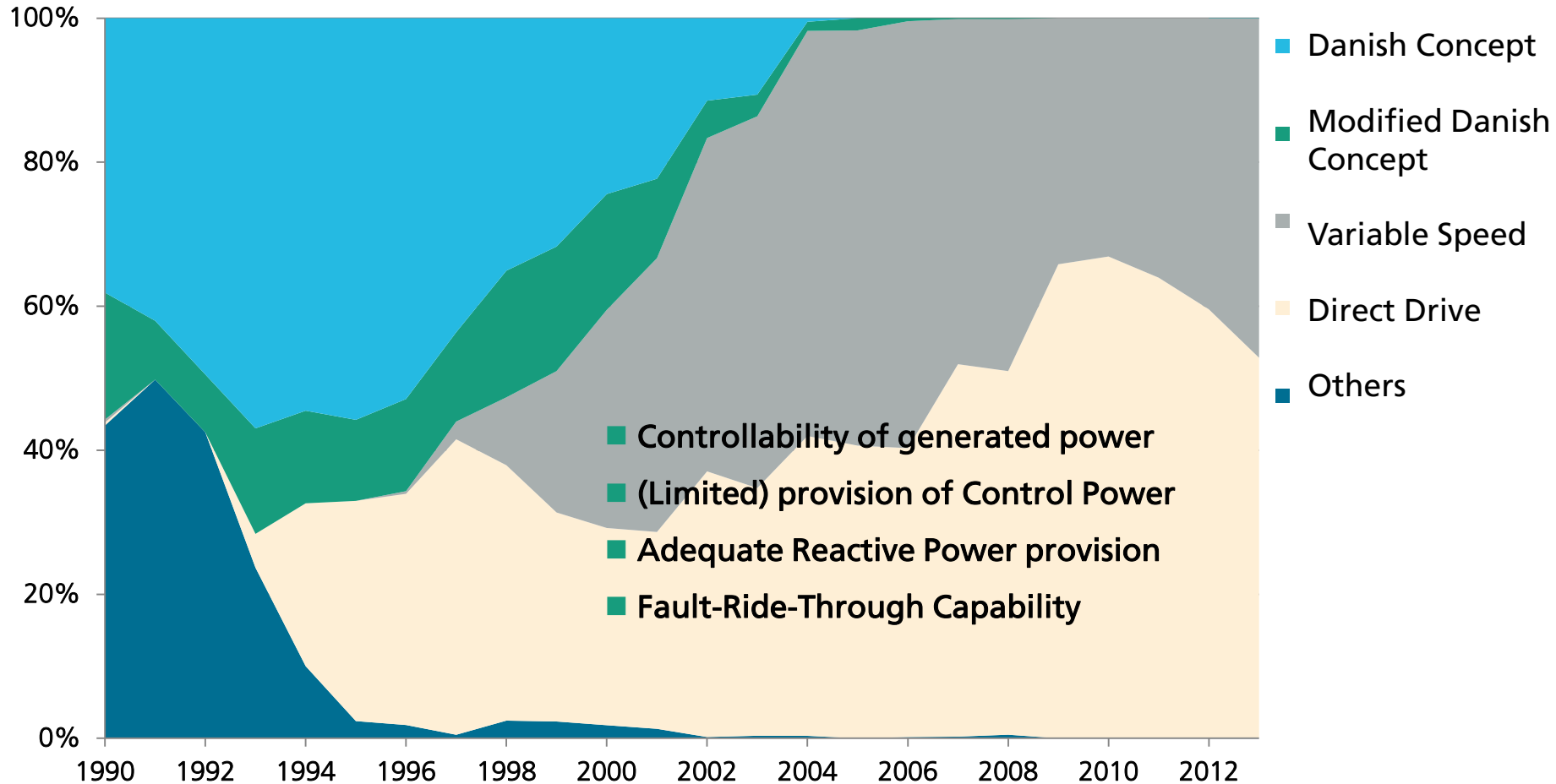
Efficiency Improvement



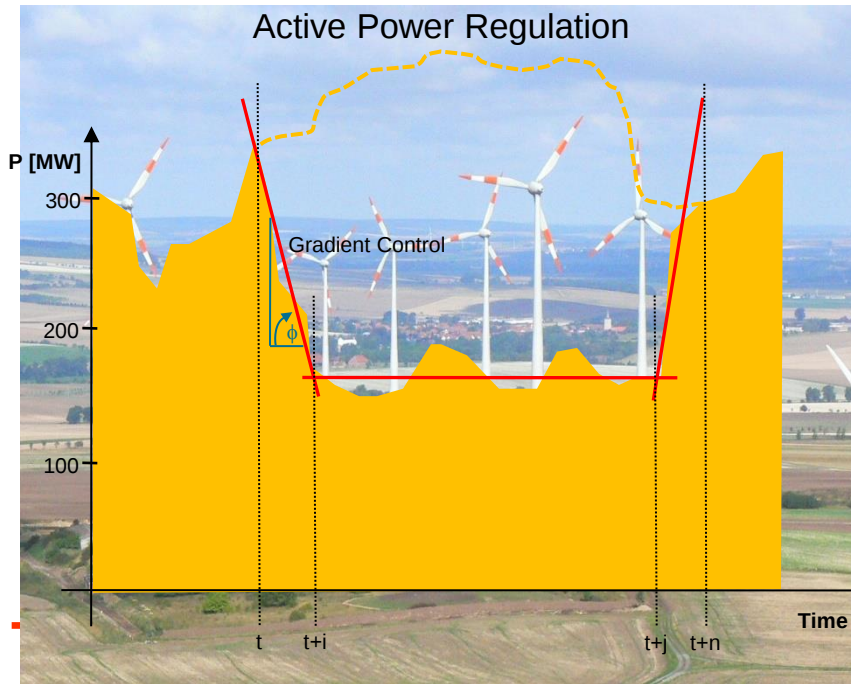
Size Development



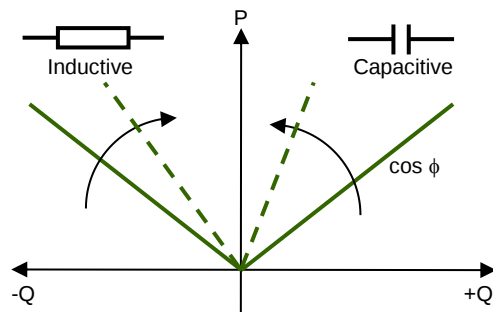
System Adequacy



Active Contribution to System Reliability



Reactive Power Regulation



Adjustable power factor

Frequency Control

Wind power reserve

Congestion management

Power limitation

Gradient control

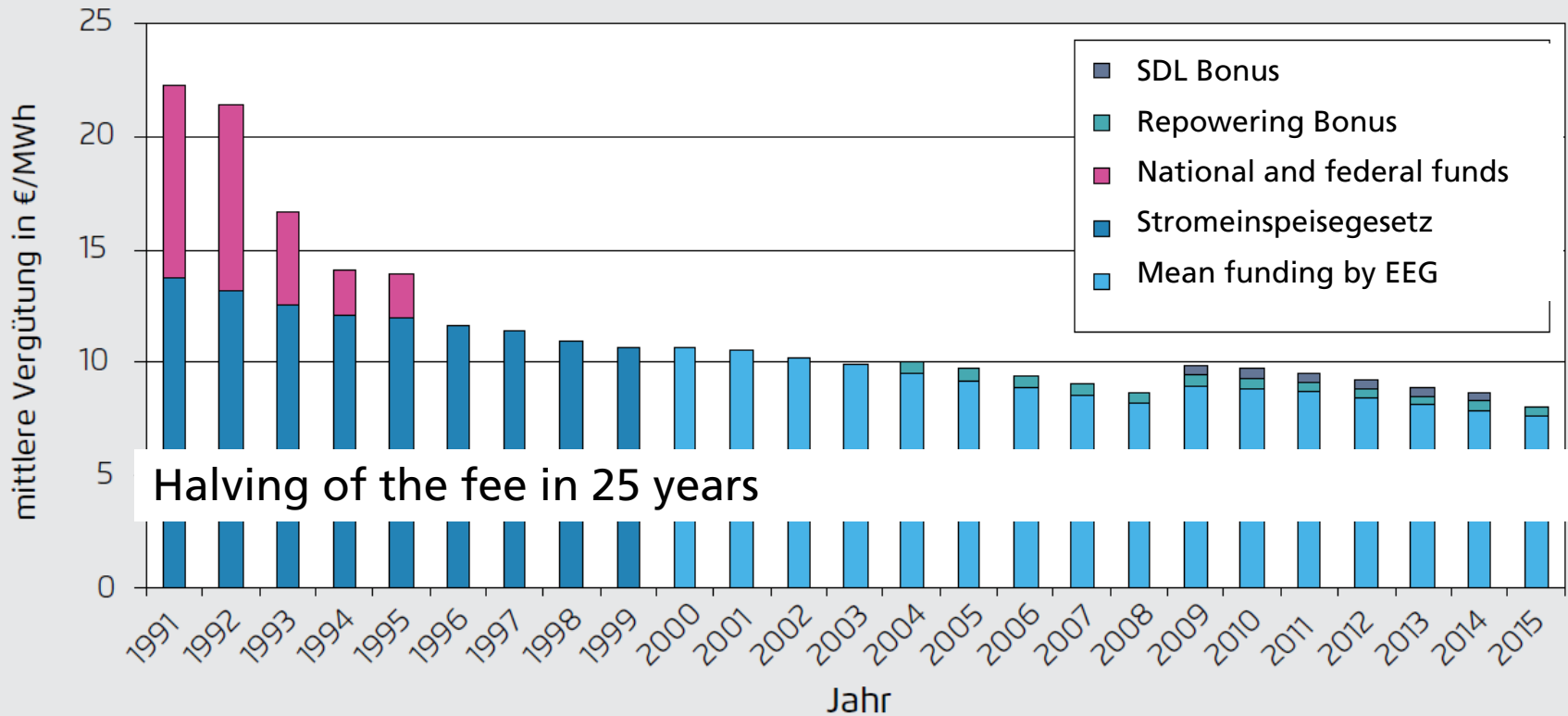
Reactive power range forecast

Reactive power control

Power factor control

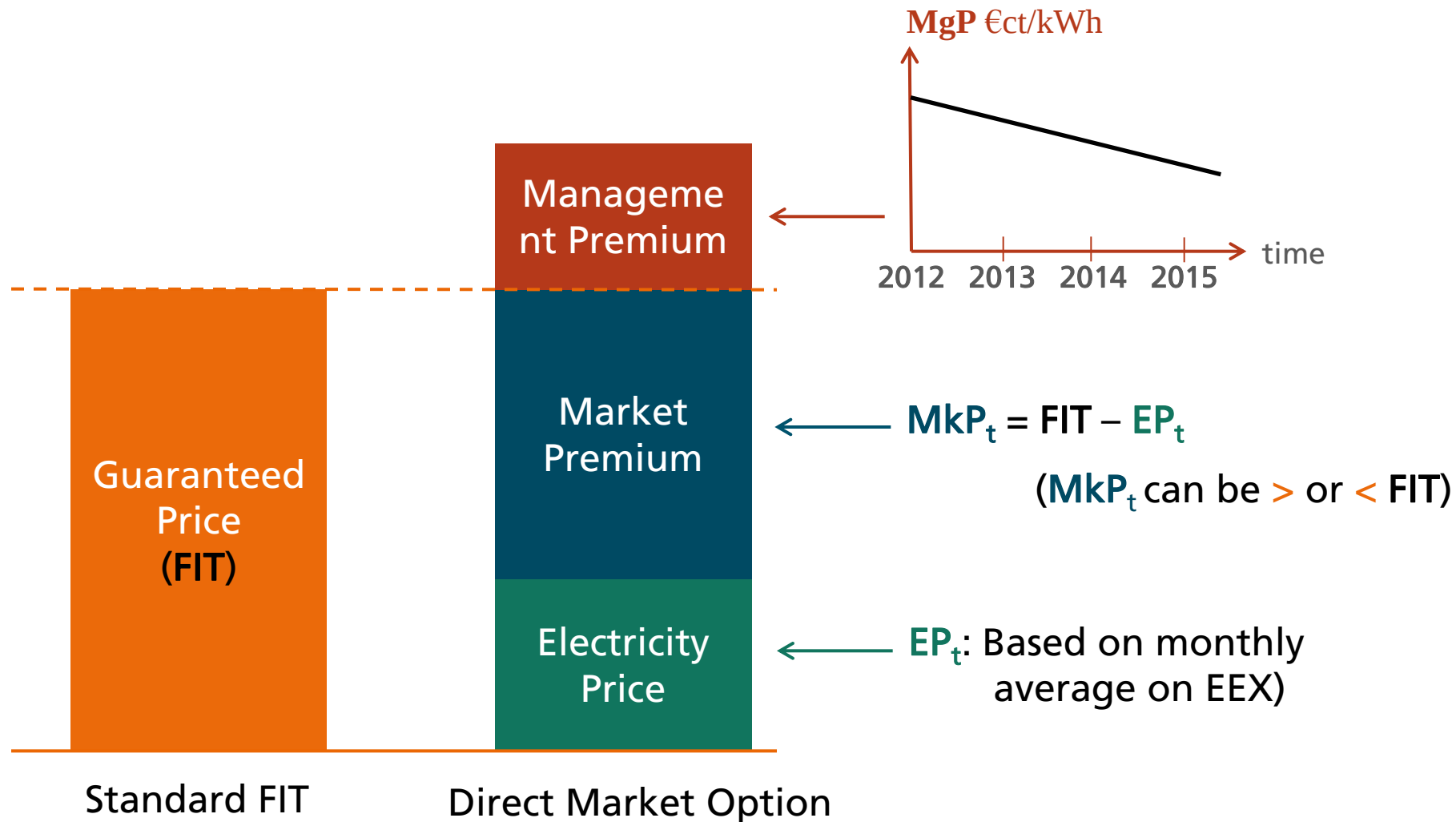
Voltage changes control

Reduction of Fee = Cost Reduction ?

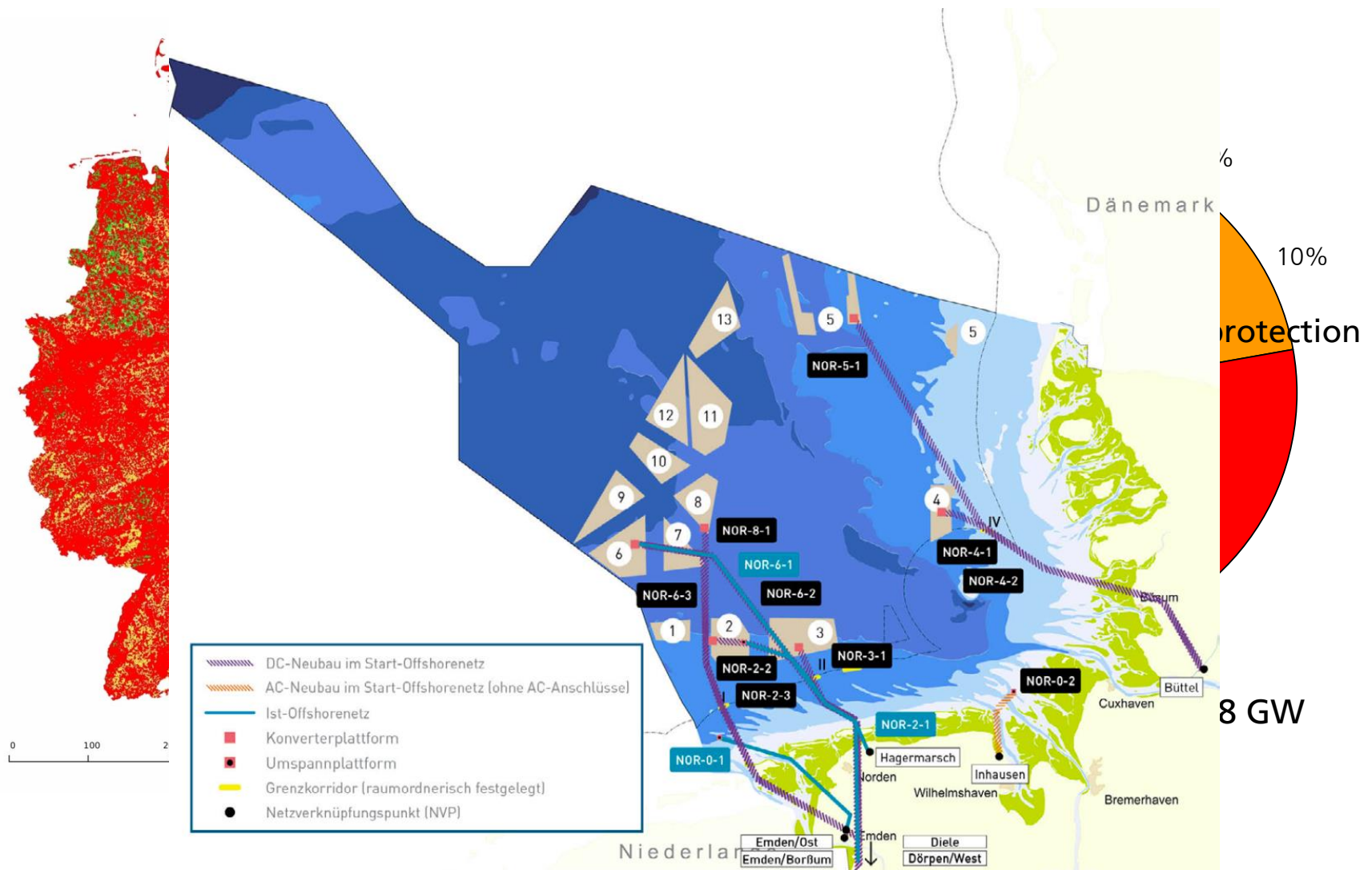


➔ Inflation adjusted average EEG payment at the reference site

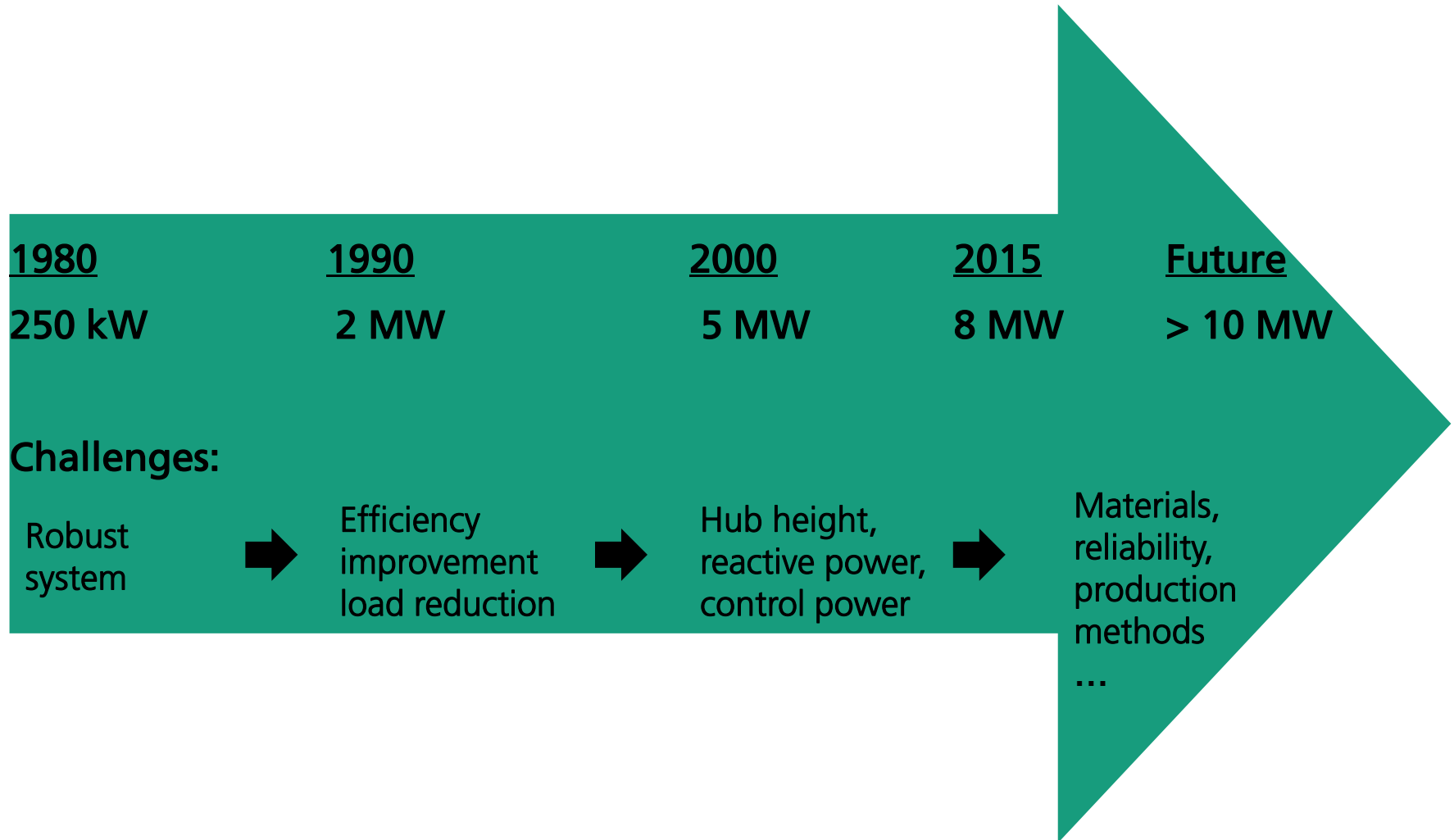
From German FIT to Direct Market



BWE Study: Available Areas for Wind Energy Use in Germany



Conclusion



Conclusion

- I Germany's Energy Supply needs 800 TWh from Wind and Solar
- II This Amount can only be covered by Wind Energy
- III Wind Energy development is a successful story and Wind will be competitive to other Sources
- IV The German funding schemes StrEG and EEG enabled this development and ensures security of investment
- V Wind Energy supports the electric supply system by ancillary services
- VI Market integration of RES is the next step to follow the German Energiewende

*Wind Energy will play the Key Role for
Germany's Energy Supply*

*Thank you
for the attention*

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Fraunhofer
IWES

Dr.-Ing Kurt Rohrig
R&D Division Energy Economy and Grid Operation

Fraunhofer Institute for Wind Energy and
Energy System Technology IWES
Königstor 59 | 34119 Kassel
Telefon: +49 (0)561-7294 330
E-Mail: kurt.rohrig@iwes.fraunhofer.de

Global Market, planned Growth 2013 to 2020

