



Renewables and Climate Protection
A Look at the European Union and
Germany
- Framework, Chances, Limits

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- I. European Union Framework**
- II. European Emissions Trading Scheme**
- III. European Renewables Directive**
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EU Directives and National Legislation

The European Union has 25 member states. Main constitutions are the European Council, the European Parliament and the European Commission.

EU-Directive

Targets
Minimum Standards

Transformation into National Legislation

Emission Limits
Obligations

Power Generation - Industry - Consumers - Traffic Sector

Several Instruments for Climate Protection in the EU

Emissions Trading

- Reduction of CO₂ emissions of **power plants and industrial plants**
- Cap and trade-principle, complemented with FlexMex JI and CDM

Renewable Energies

- Reduction of CO₂ emissions by **substituting power generation**
- Promotion of renewable energies by support mechanisms

Energy Efficiency

- Reduction of CO₂ emissions by **reducing power demand**
- Measures concerning end consumers

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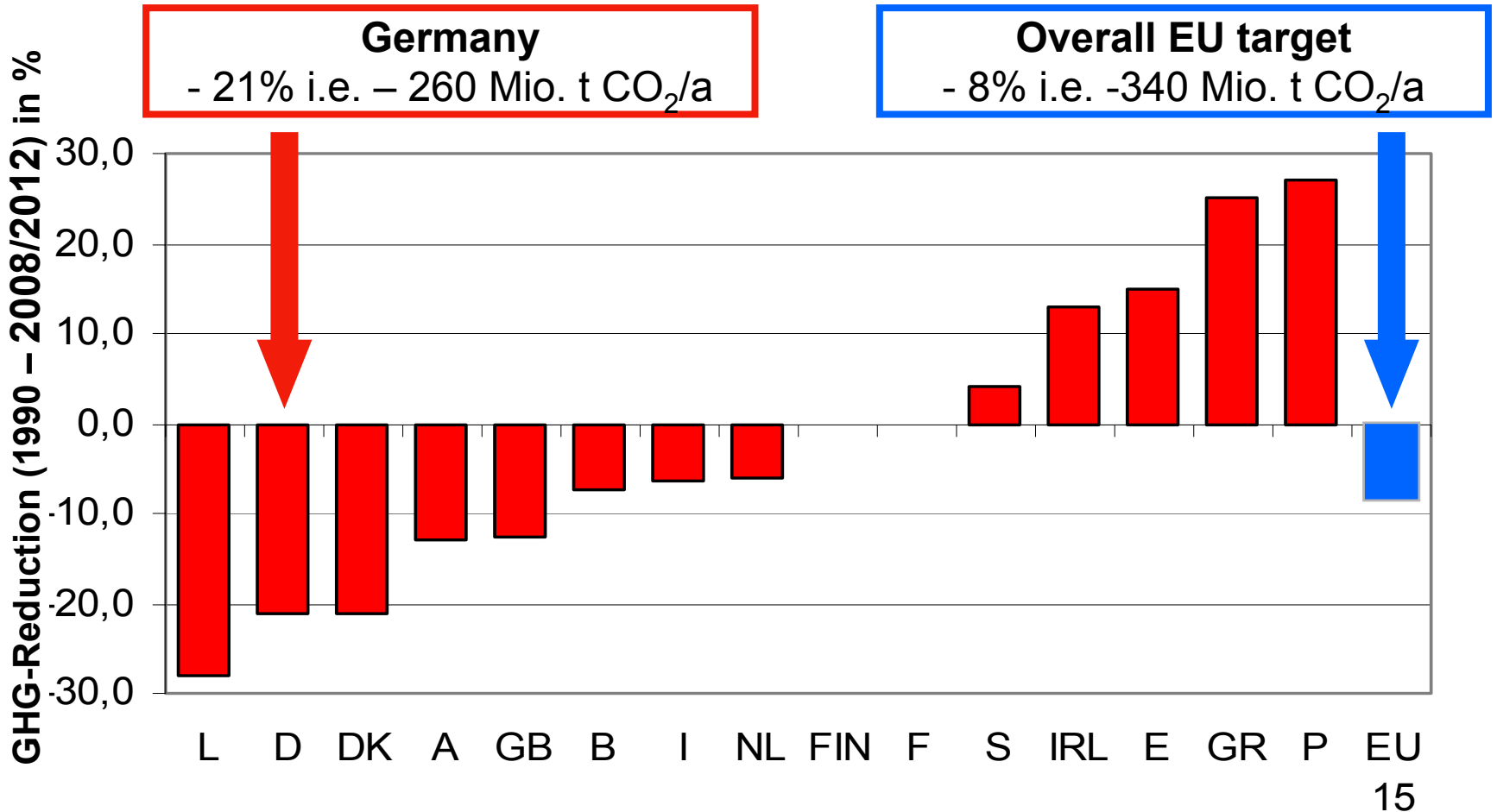
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EU Emissions Trading Scheme (ETS)

- EU-wide **Emissions Trading Scheme (ETS)** was introduced on January 1st 2005 after less than 2 years preparation.
- The **aim of the ETS** is the **cost-efficient reduction** of CO₂-emissions via a market-based mechanism.
- ETS covers about **46% of the CO₂-emissions** in the EU:
 - ⇒ **Covered**: furnaces > 20 MW, power plants, industry: coke/steel/paper and pulp/chemical industry, refineries
 - ⇒ **Exempted**: furnaces < 20 MW, biomass and waste, traffic/domestic sector
- **Cap and trade-principle**: Emitters receive a yearly decreasing emissions budget. Exceeding emissions have to be covered by CO₂ emission certificates purchased from the EU-wide market.

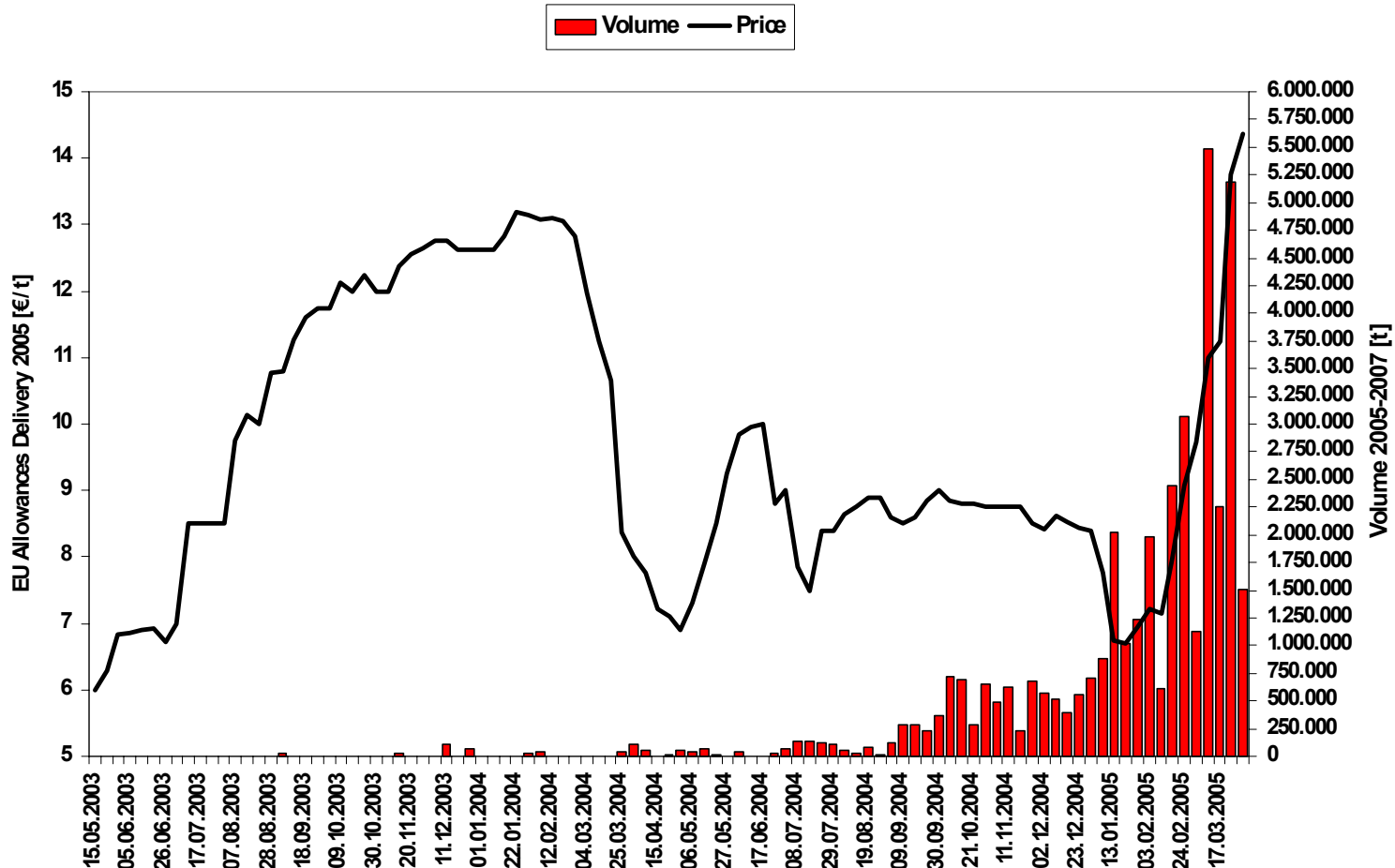
Burden Sharing of CO₂ Reduction in the EU 15

Burden Sharing: Each member state contributes to the overall EU target.



Market Development – CO₂ Prices

Market is slowly growing to become a real market



Role of Renewables within the ETS

- Renewable energies not covered by the ETS
 - ⇒ **Biomass and Waste** incineration exempted from the ETS
- Renewables may only play a part in **JI/CDM-projects**
 - ⇒ JI within EU is seen as difficult option: danger of double counting!
 - ⇒ JI outside EU or CDM remain as options
- **Problems** with CO₂-related renewables projects
 - ⇒ Relatively low CO₂-reduction
 - ⇒ High CO₂-avoidance cost
 - ⇒ Competition with compulsory avoidance, e.g. landfill gas usage
 - ⇒ Feed-in tariffs more profitable

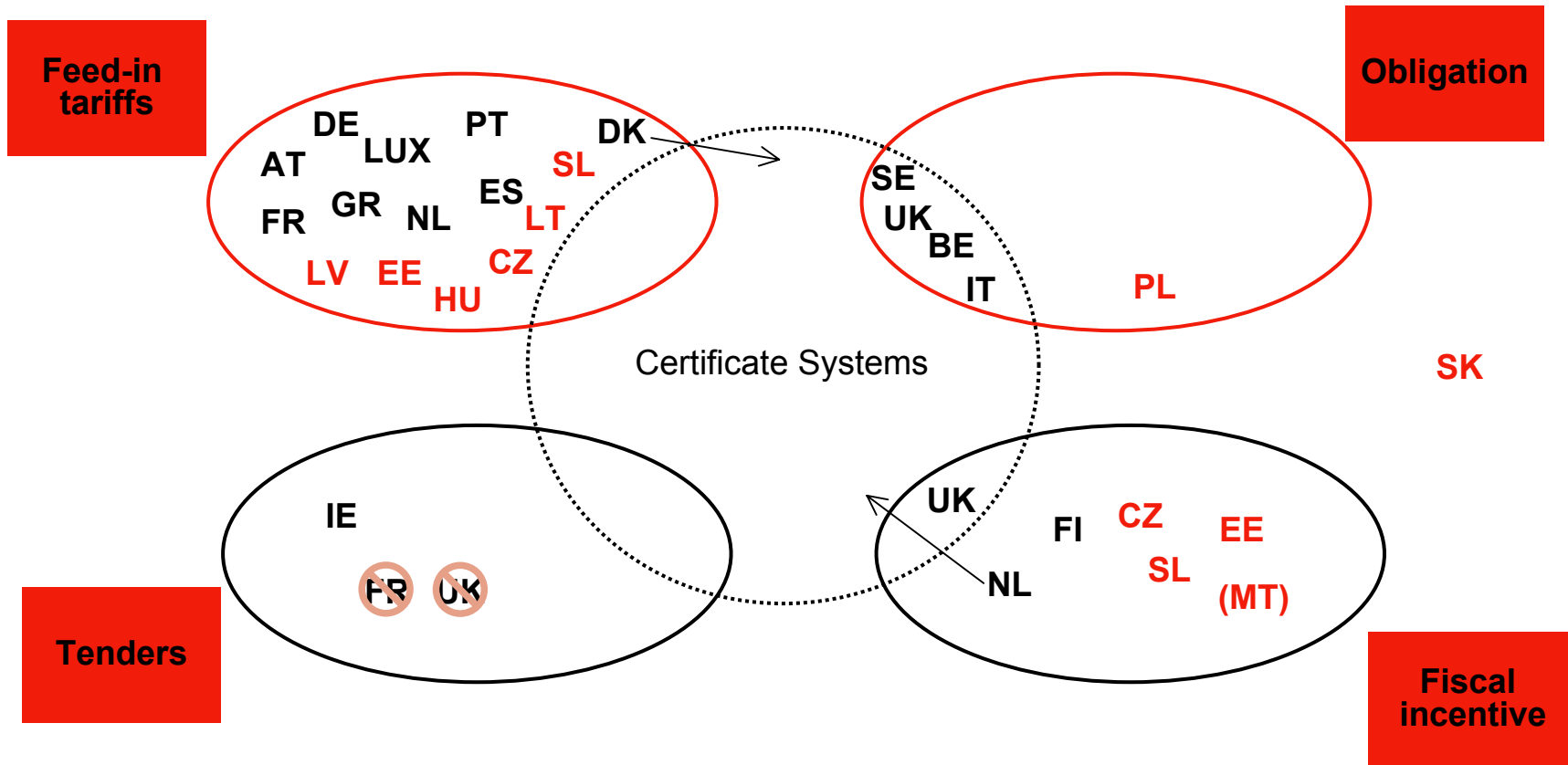
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Contents and Goals of the EU-Directive

- **EU-Directive 2001/77/EU** on the promotion of electricity produced from renewable energy sources in the internal energy market
- **Promotion of Renewables** is given high priority to contribute to environmental protection and sustainable development
- **Indicative targets** for member states for renewables share in 2010:
 - Status 1997: EU 13.9 %, Germany 4.5 %
 - 2010 Target: EU 22 % , Germany 12.5 %
- **No harmonised EU support** scheme, i.e. 25 different schemes now
 - ⇒ Promotion of renewables with national focus, no transferability
 - ⇒ No European market for renewable power; first attempts for Green Certificate trading based on RECS

RES-E Support schemes in EU-15 and EU-10



- 25 different support **systems**
- Strongly diverging **levels** of support
- Voluntary vs. binding commitment to **targets** (DE: binding target of 20% in 2020)
- EU-Commission measures success in targets and degree of support, not in efficiency terms

Future of EU Promotion of Renewables

- EU-Commission is currently revising different national support schemes to publish an experience report by October 2005
- In 2006 EU-Commission may publish 2nd report on renewables support with recommendations for future support
 - ⇒ **One single harmonised support scheme** in sight???
 - ⇒ It may be **too early** for harmonised support
- Without harmonised conditions and a harmonised support scheme there will be no market for green power or green certificates in the EU
 - ⇒ No market-based support of renewables without EU renewables market
 - ⇒ So far only „prototype market“

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Emissions Trading in Germany

- Germany is obliged to reduce **260 Mio. t CO₂/a (21 %)** by 2012
 - ⇒ Almost 75 % of overall EU CO₂ reduction
 - ⇒ Breaking down industry in Eastern Germany taken into account
 - ⇒ **1990**: 1,218 Mio t CO₂/a; **2002**: 990 Mio t CO₂/a, **2012**: 962 Mio t CO₂/a
- Current status: about 19 % reduction achieved
 - ⇒ **Germany one of the few EU countries to reach its target**
- Administrative handling by Central German Emissions Trading Office
 - ⇒ GHG Emissions Trading Law, National Allocation Plan Law, FlexMex Law
- Only industry and power sectors included in the allocation plans
 - ⇒ Other sectors included indirectly by special measures (e.g. renewables campaign, improvement of energy efficiency, bio fuel usage)

Renewable Energies in Germany

The German Energy Act (Renewable Energy Feed-In Law) ...

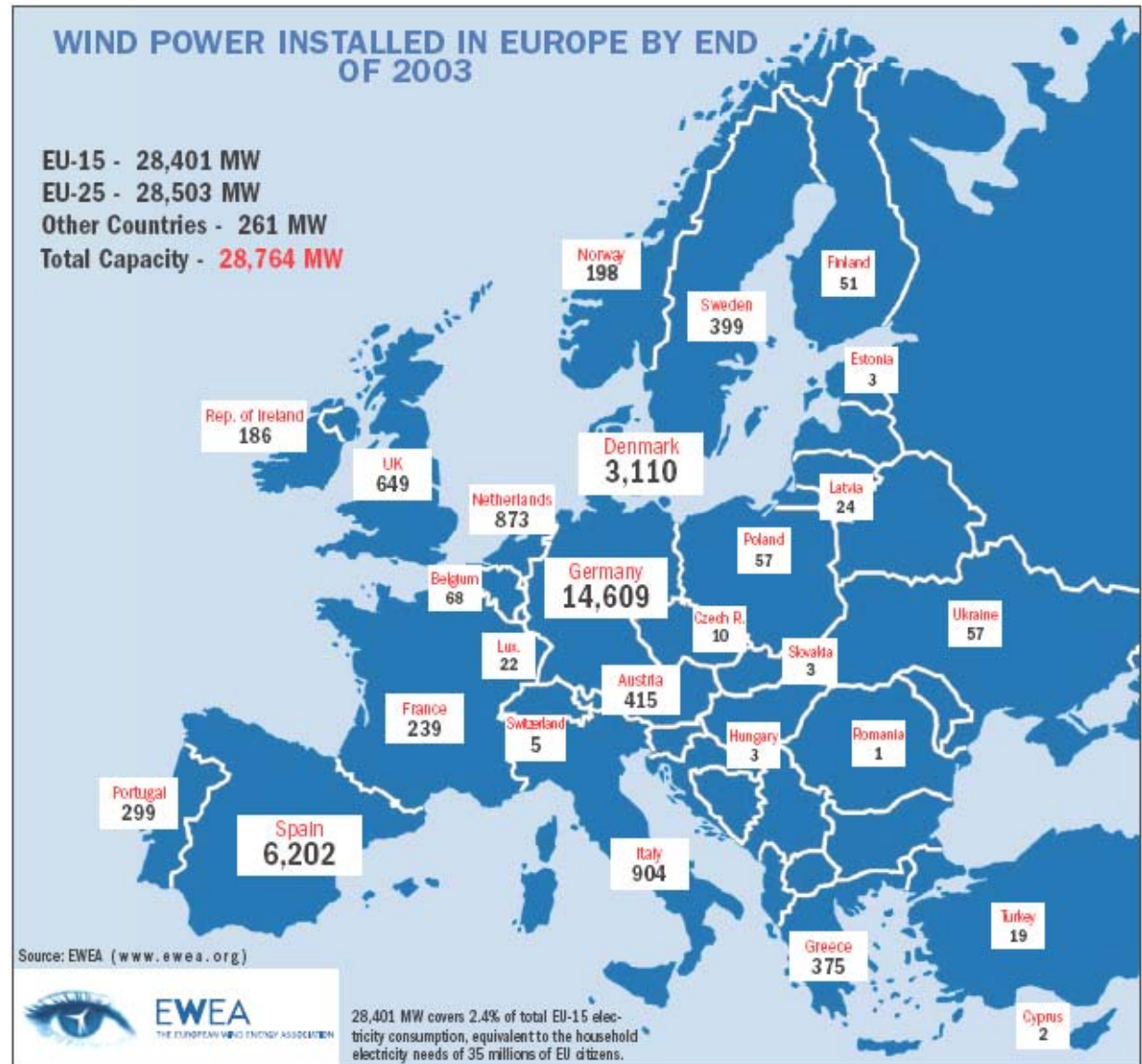
- ...grants fixed feed-in tariffs for renewable energies
- ...grants **priority** of grid access and power feed-in
- ...has lead to a **boom of wind power** at on-shore sites
- ...aims for **further extension** of renewables in the power sector from now 9 % to 20% in 2020

Germany is the
**Wind Power
World Champion**



14.609 MW
Wind Power Installed
2003

16.500 MW
Wind Power Installed
2004



Shady Sides of Renewable Energies in Germany

The massive extension of renewable energies, especially wind power ...

...has lead to **generation switching** from conventional to renewables

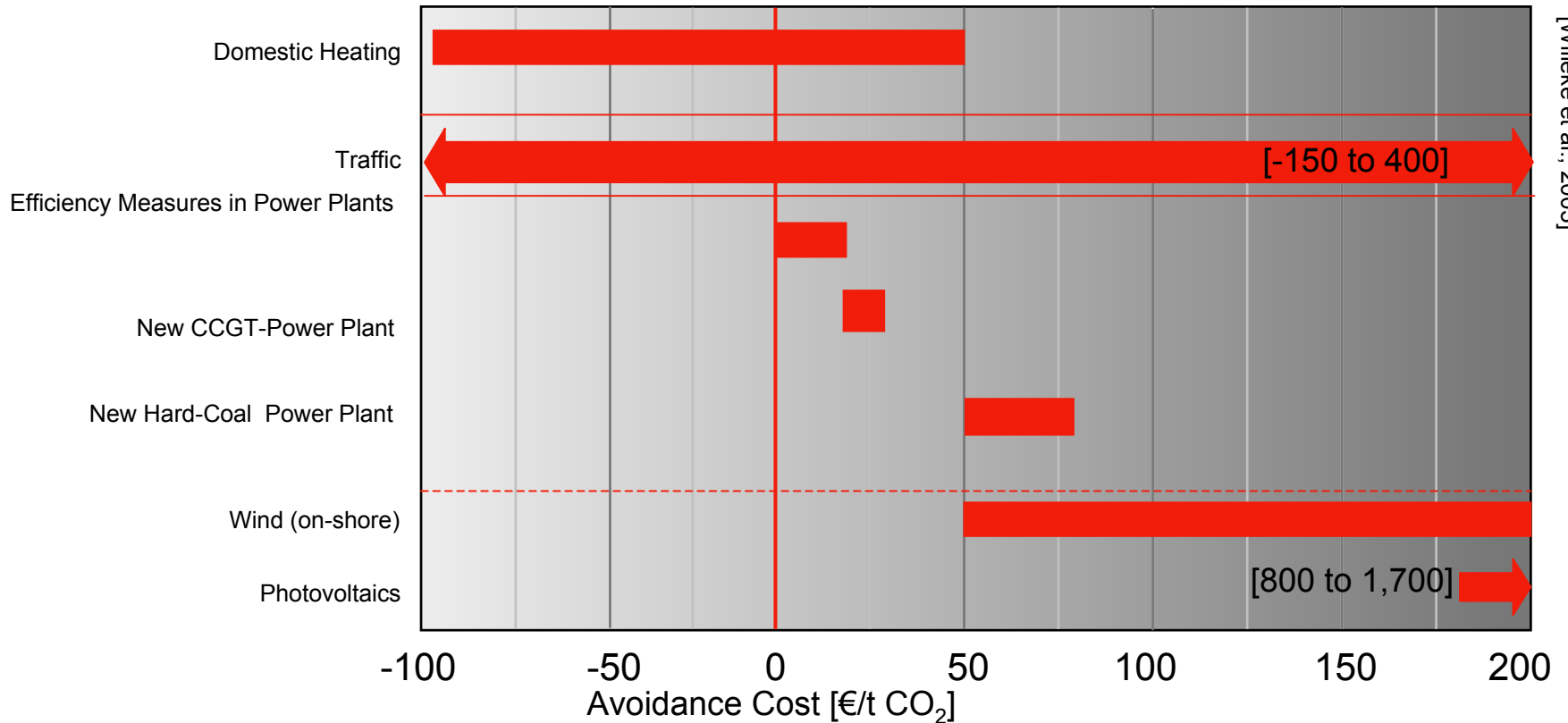
...shows that **wind power is very unreliable** (8% capacity effect), which requires back-up power plants and reserve power (2,000 MW)

...shows that wind power requires **extension of the grid infrastructure**

...leads to cost of **3,4 billion €** per year for feed-in payments

...renewable energies have fairly **high CO₂-avoidance cost**

CO₂-Avoidance Cost in Germany



- CO₂-avoidance cost differ greatly in different sectors
- Efficiency improvements cheapest measure in energy sector
- Usage of renewable energies most expensive measure for CO₂ reduction

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Conclusions

- ETS in the EU established successfully and will grow to a real CO₂ market.
 - ⇒ Power generation and industry obliged to reductions
- Other measures will also play an important role in CO₂ reduction , but are not covered by the ETS
- Renewables play an important role in climate and resource protection
 - ⇒ At fairly high prices for CO₂ avoidance
 - ⇒ For a long time outside the Emissions Trading Scheme
- EU has not yet established a green electricity market
 - ⇒ Differing support in the member states
 - ⇒ No harmonised system, but 25 different support schemes
- **In the long term a European-wide harmonised approach to support renewable energies is needed**

Thank you for your attention!



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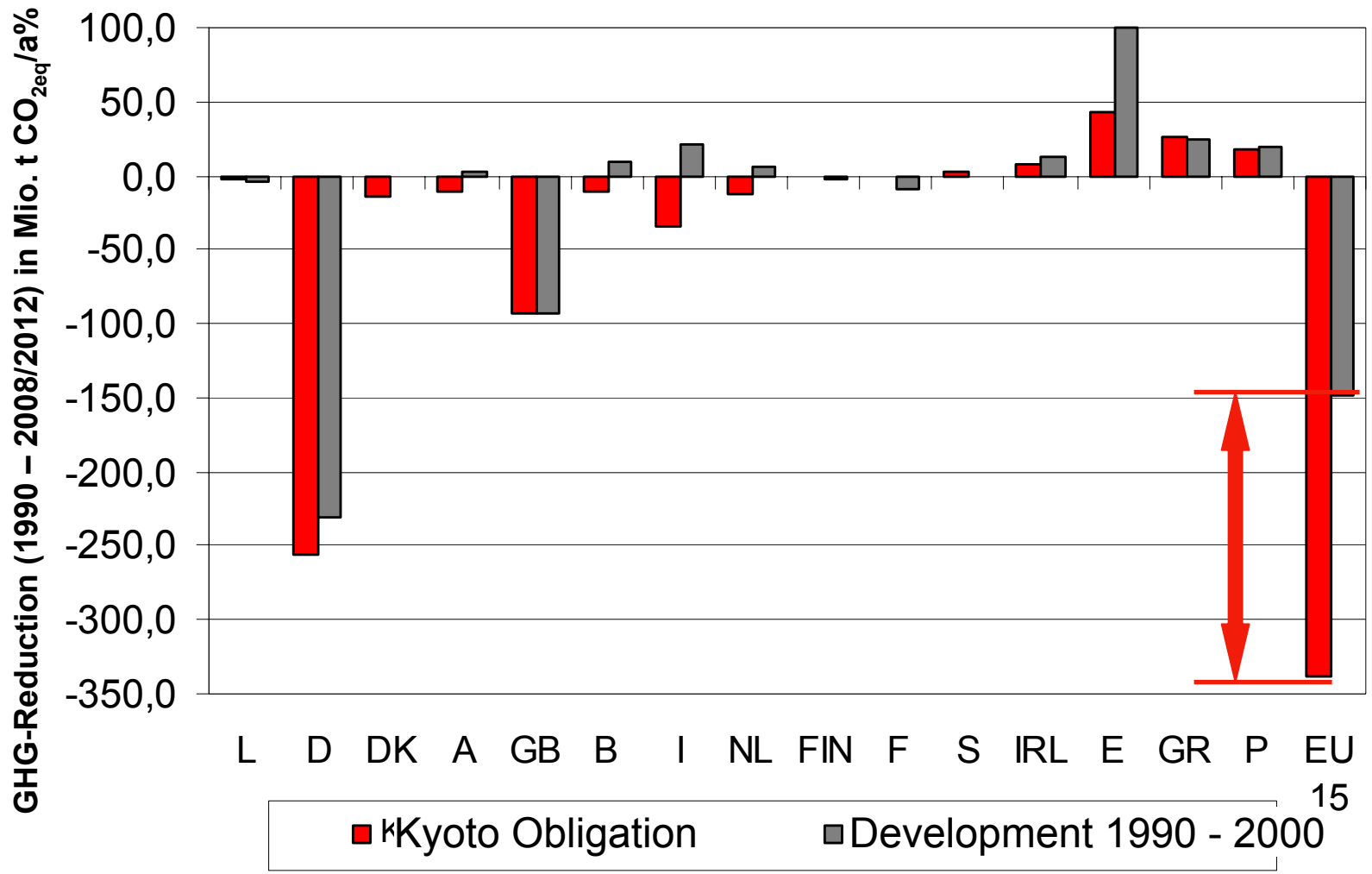
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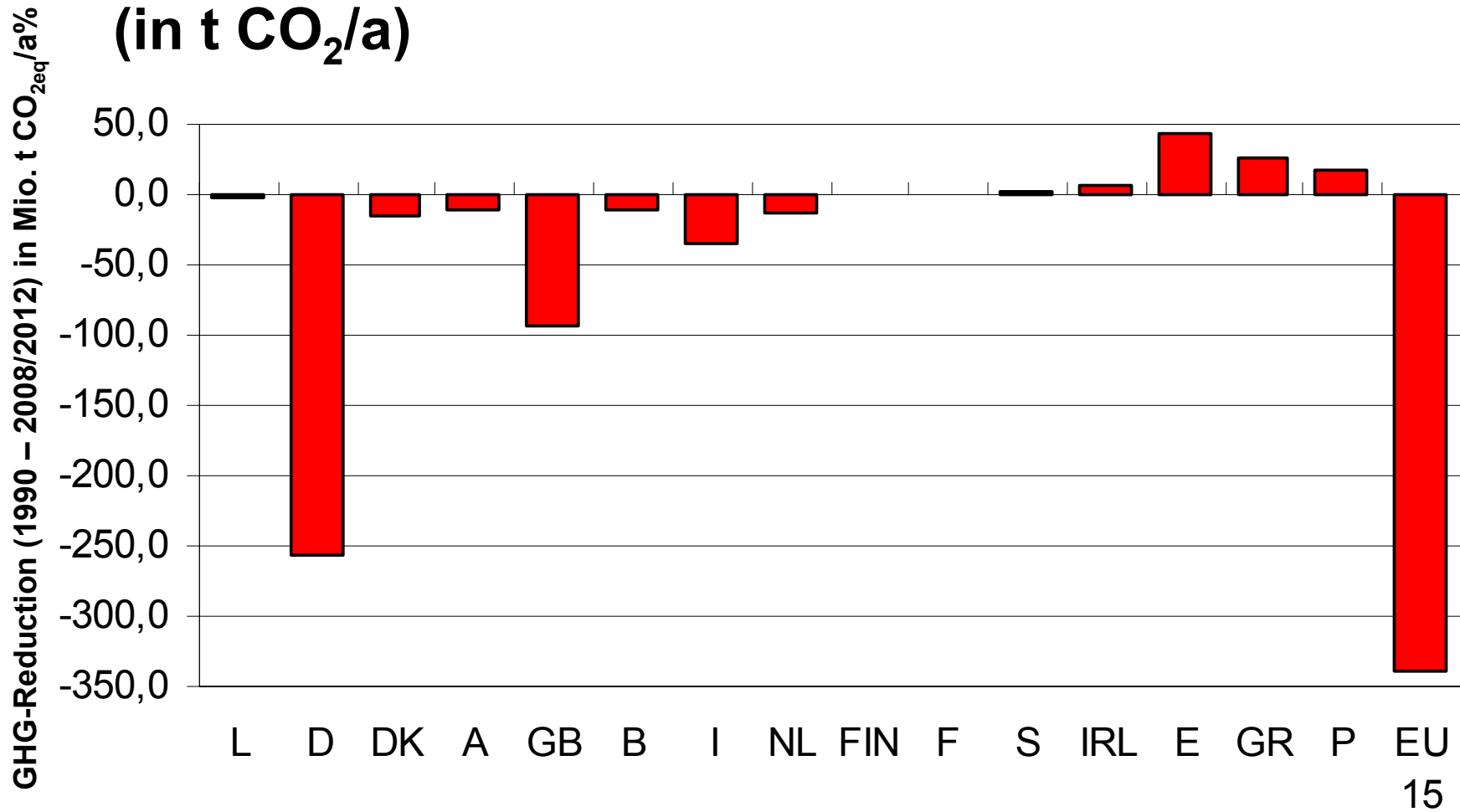
thorsten.schneiders@eon-energie.com

Backup

Development of GHG-Emissions in the EU-15

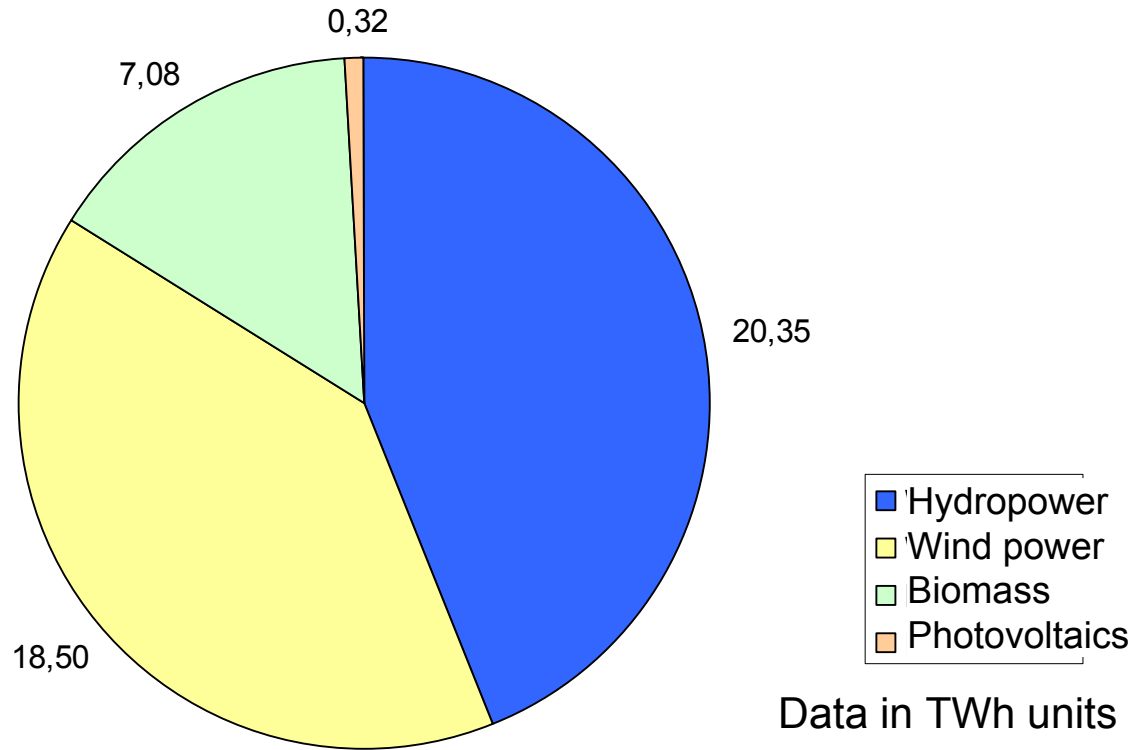
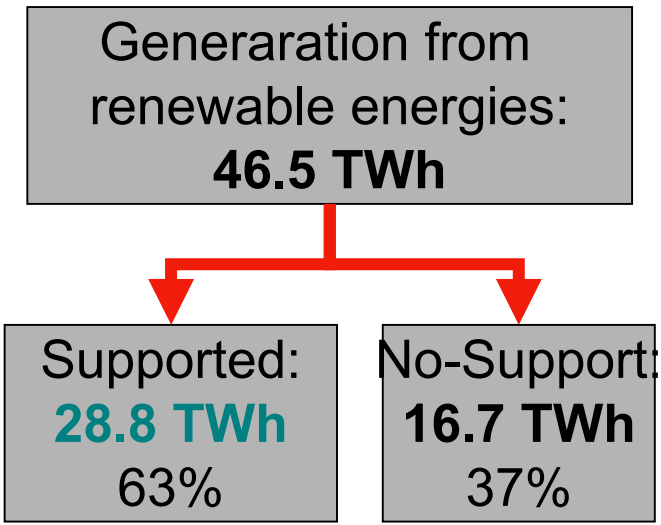


Burden Sharing of CO2 Reduction in the EU 15 (in t CO₂/a)



Contribution of Renewables to Power Generation in 2003

Supported Power Generation in 2003: **28.8 TWh**



Wind Power Requires Infrastructure

The German Energy Act (Renewable Energy Feed-In Law) ...

...grants **priority** of grid access and power feed-in

...has lead to a **boom of wind power** at on-shore sites

...aims for **further extension** of on-shore and off-shore wind power

Practical experience with boom of wind power in Germany shows that...

...wind power requires **back-up by conventional power plants**

...wind power requires **balancing and reserve power**

...wind power requires **extension of the grid infrastructure**