Federal Ministry
for Economic Affairs
and Energy

The German Energy Transition ("Energiewende")

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German Energy Transition – long-term strategy up to 2050

Includes a long-term strategy towards a high share of renewables and higher energy efficiency

philosophy and policy behind it:

- **Nuclear-free energy system (political decision)**
- **Climate protection as an international goal**

  ⇨ **Reduction of greenhouse gas emissions**
- **Reduction of energy import dependency**

  ⇨ **against background of increasing global energy demand**
- **Incentives for development of new technologies a markets**

  ⇨ **Renewable, efficiency and other clean technologies**

Energiewende … in short

- Phasing out of nuclear PP until 2022

- Decision to base future energy system on renewables and efficiency
- Ambitious targets (see next slide)
  - minus **80-95%** GHG-emissions in 2050 compared to 1990
  - **80%** RES share in electricity consumption in 2050
  - minus **50%** of primary energy demand in 2050 (compared to 2008)
  - Concrete intermediate targets for 2020, 2030, 2040

While ensuring

- Triangle of energy policy objectives:
  - Not only climate protection
  - But also **security of supply and affordability of energy supply**

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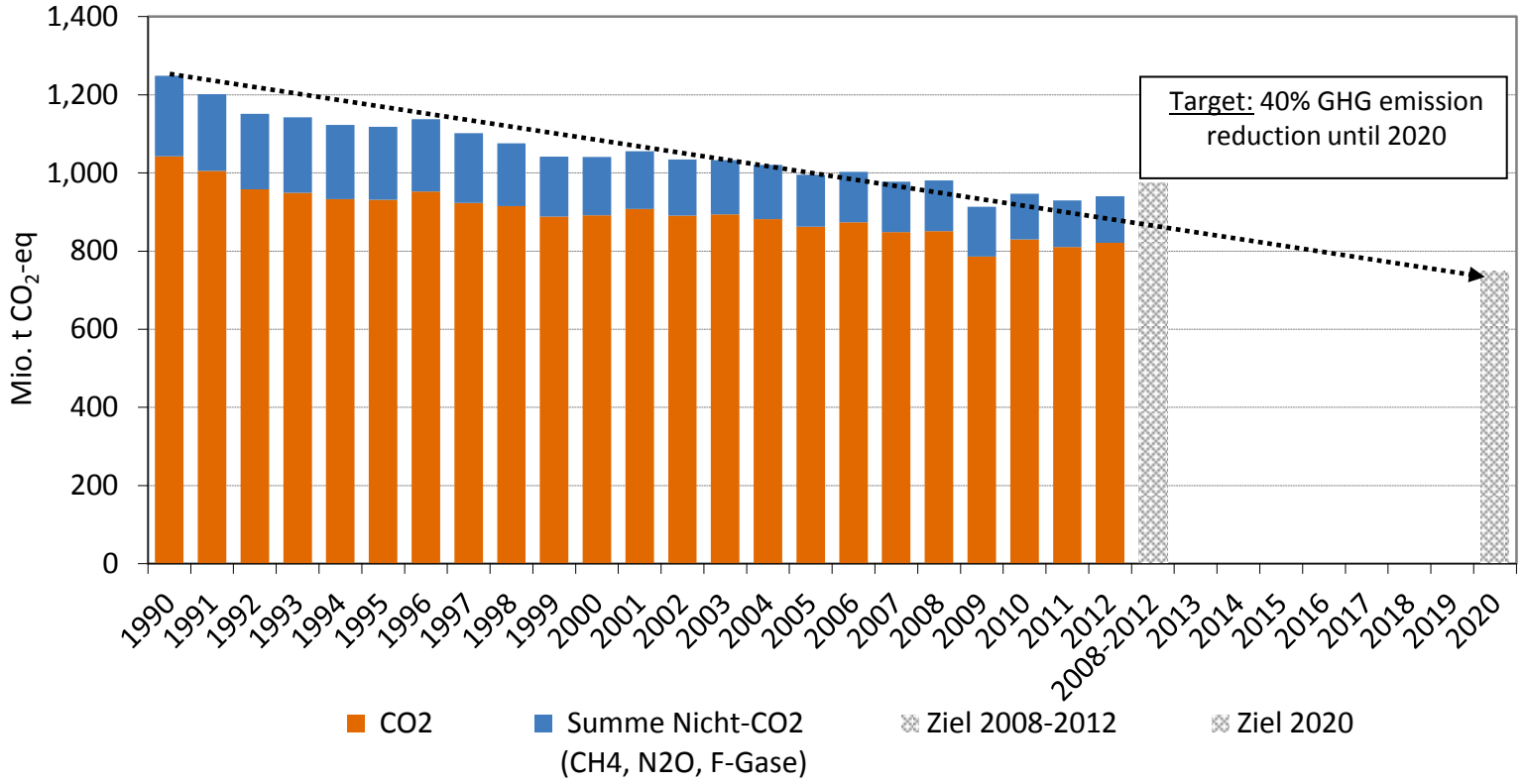
- Affordability means also maintaining **competitiveness of industry**

Germany‘s targets on greenhouse gases, renewable energy & energy efficiency

	2013	2020			
GHG Emissions					
GHG Emissions (cp. 1990)	**-24 %**	at least -40%	**2030** at least -55%	**2040** at least -70%	**2050** at least -80% bis -95%
Renewable Energy					
RES share in gross electricity consumption	**25 %**	at least 35%	**2030** at least 50%	**2040** at least 65%	**2050** at least 80%
RES share in final energy consumption	**12,4%**	18%	2030 30%	2040 45%	2050 60%
Energy efficiency					
Primary energy consumption (cp. 2008)	**-3,3%**	-20%	-50%		

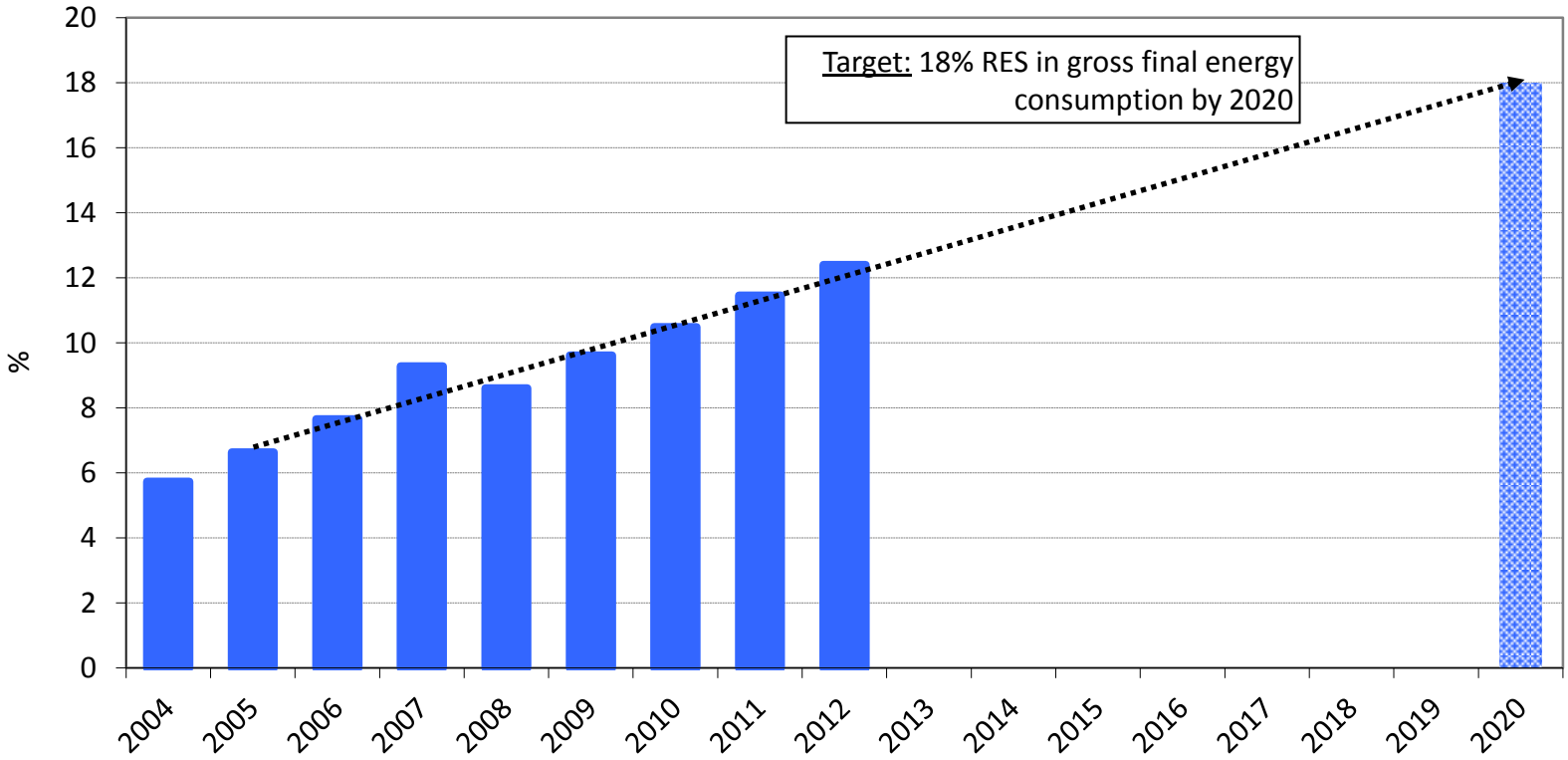
GHG emission reduction

- Target: reducing GHG emissions by 40 % until 2020 (cp. to 1990)
- 2012: 25,3 % (cp. to 1990, slight increase cp. to 2011)



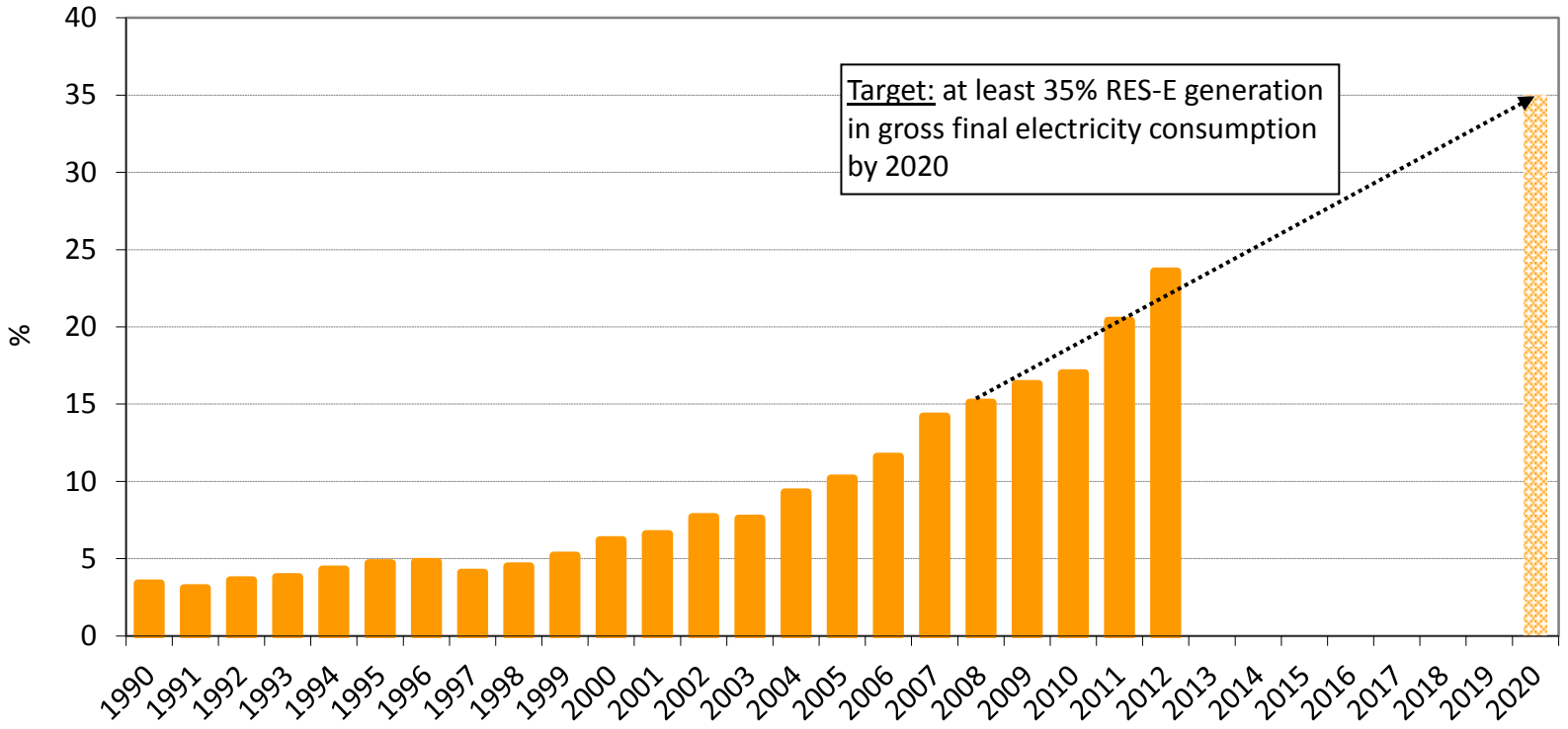
RES share in gross final energy consumption

- Target: share of RES in gross final energy consumption of 18 % by 2020
  2012: 12,4 %



RES share in gross final electricity consumption

- Target: at least 35% RES-E generation in gross final electricity consumption by 2020
- 2014: with 25% RES surpassed nuclear and became second largest generator



The German Renewable Energy Sources Act (EEG)

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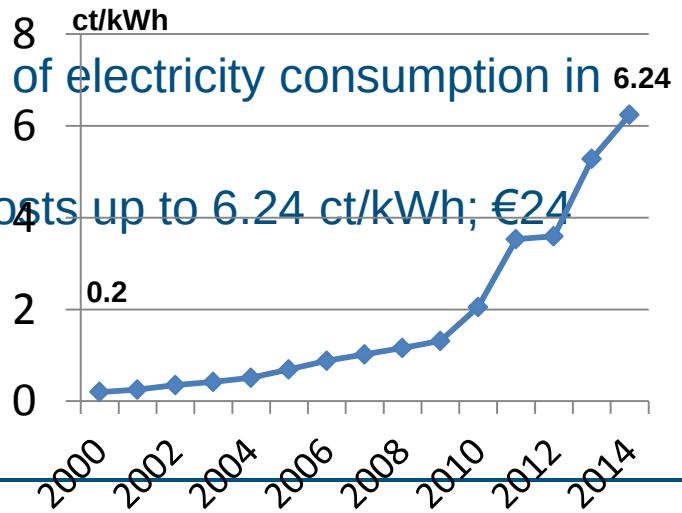
- Priority access, feed-in tariffs and long-term security as key elements of the Renewable Energy Sources Act.

Renewables – Strong growth and technology learning have come at a cost

Promotion of renewable energies through Renewable Energy Sources Act (EEG) 2012

- fixed feed-in tariffs (for 20 years; differ among technologies) or feed-in-premiums
- priority grid access
- financed through renewable energy surcharge
- Success: strong increase to roughly 25% of electricity consumption in 2014
- But on the other side sharp increase of costs up to 6.24 ct/kWh; €24 bn in 2014 to be paid by electricity suppliers



Reform of the EEG – Key Elements

Achieve renewables targets whilst
limiting the costs and driving market integration

- Define binding corridors for the deployment of renewable energies
- Focus on cost-efficient technologies, i.e. onshore wind and PV
- Prevent over-compensation – inter alia through automatic, market-driven degression of support – and repealing bonuses
- Economic integration of RE into electricity markets by the following instruments:

- Support levels will de determined by way of bidding procedures by 2017 at the latest

- Mandatory direct marketing

- Fair distribution of cost amongst all consumers, without endangering international competitiveness of electricity-intensive industries

Setting up of Binding Deployment Corridors

Technology-specific quantitative control of deployment

- Offshore wind capacity: 6.5 GW by 2020 and 15 GW by 2030
- Onshore wind capacity: increase by up to 2,500 MW per year (flexible cap)
- Solar energy: increase of 2,500 MW per year (flexible cap)
- Bioenergy: focus on waste and residues, increase of up to 100 MW per year
- Geothermal energy and hydropower: no need to exercise quantitative control

Integration of Renewables into the Electricity Market

- Sliding market premium becomes mandatory

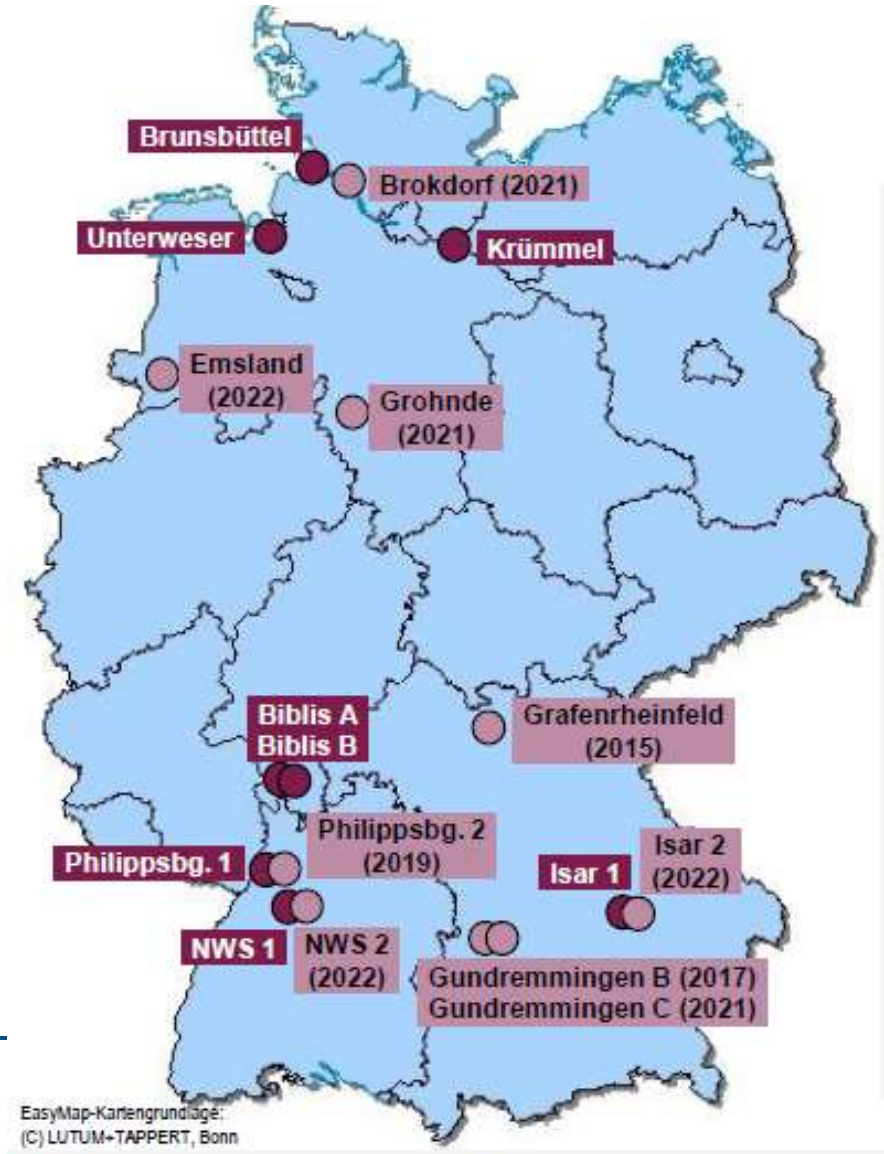
- *De minimis* threshold for mandatory direct marketing lowered annually:
  - August 2014: installations with a capacity of 500 kW and above
  - January 2016: installations with a capacity of 250 kW and above
  - January 2017: installations with a capacity of 100 kW and above
- Remote-control of installations required
- “Default selling” option at 80% of market premium yield introduced for operators who temporarily cannot sell the power they generate

Cost-effective Deployment of Individual Technologies

- Onshore wind: support levels reduced, flexible cap introduced, bonuses abolished or phased out, support levels in 2015 at profitable sites 10-20% lower compared to 2013
- Offshore wind: “acceleration model” extended until 2019, remuneration reduced by 1 ct/kWh in 2018 and 2019
- Photovoltaics: the 2012 PV reform is working, flexible cap is continued
- Biomass: biogas bonus abolished for new installations and support rates reduced if deployment exceeds 100 MW

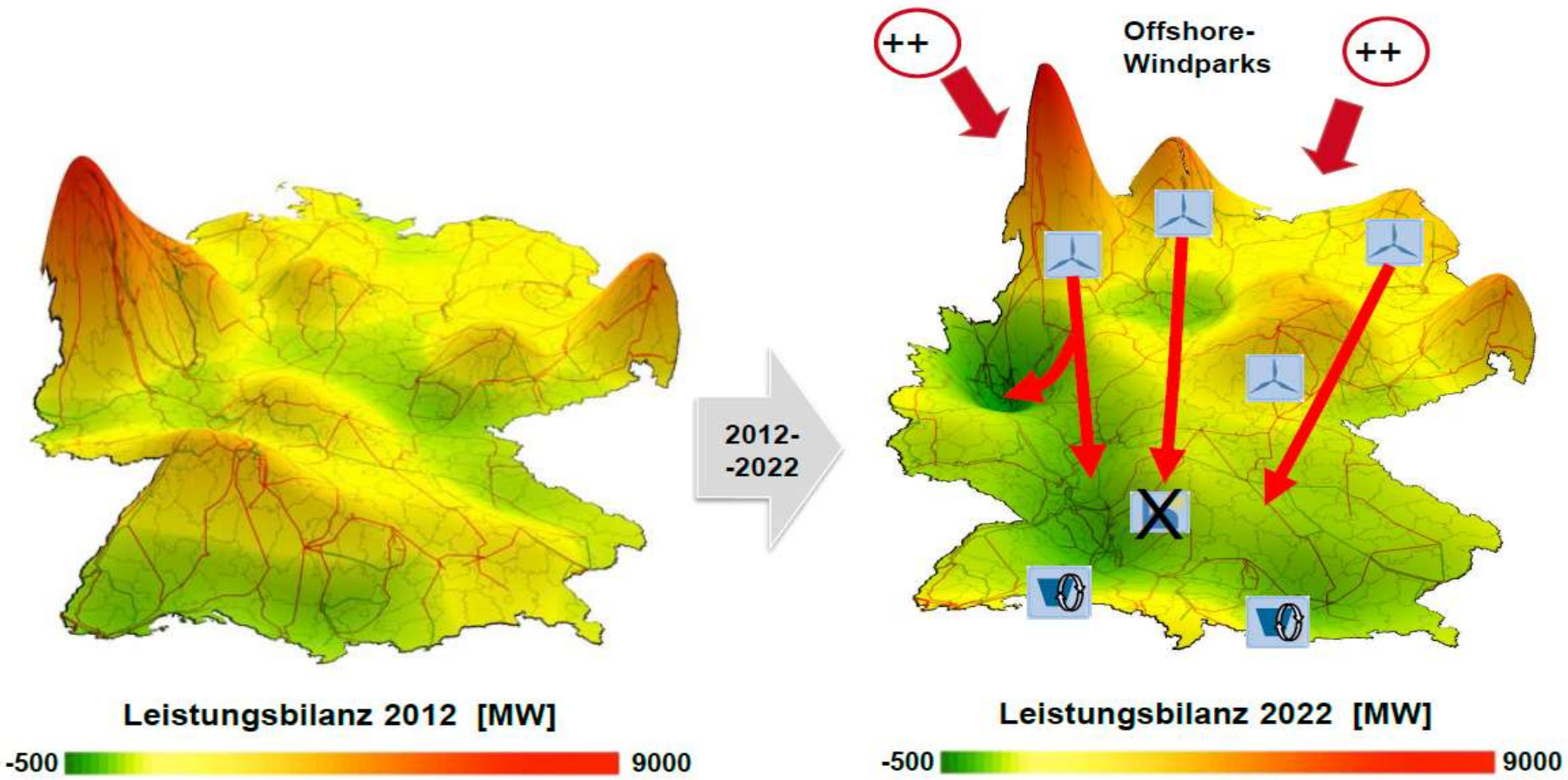
Challenges for transmission grid development

Phase out of nuclear energy electricity production (June 2011)

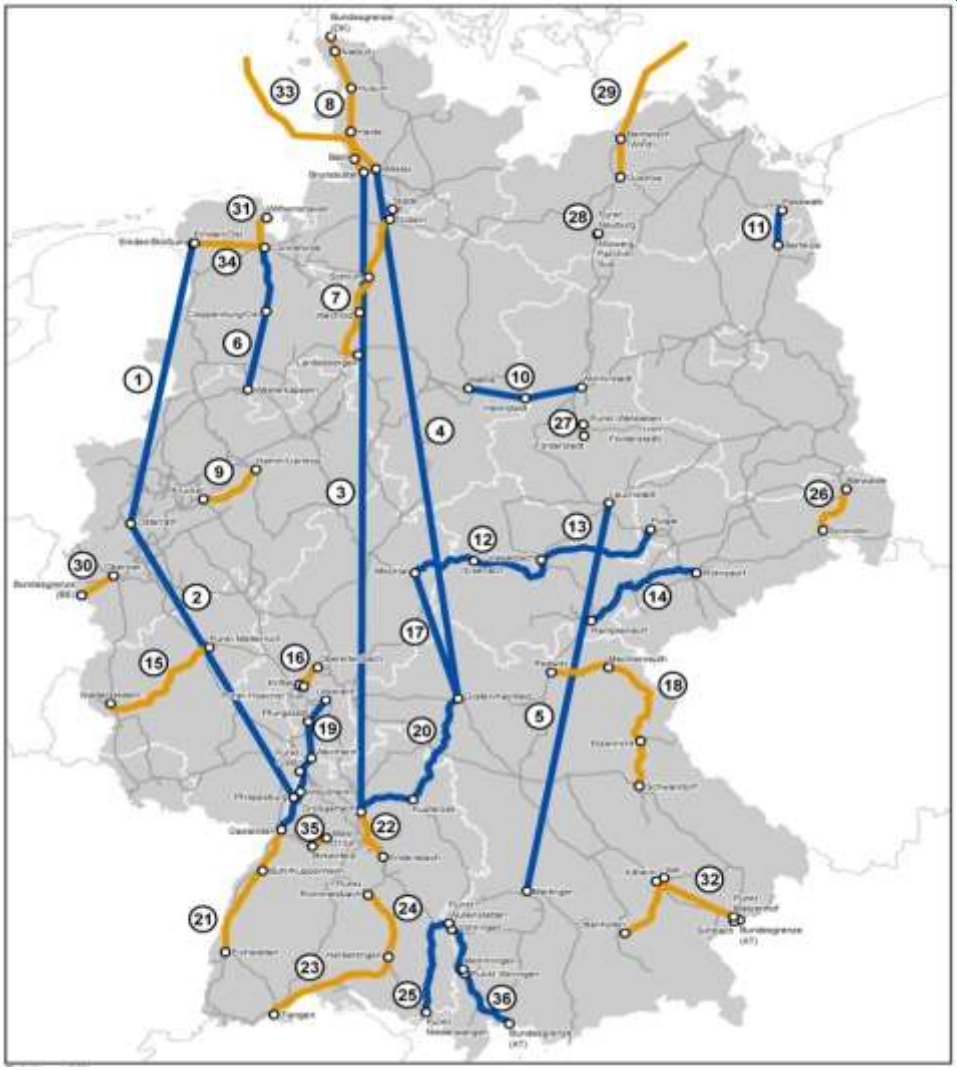


- Shut down 2011
- Shut down 2015-2022

Nuclear energy phase out and expansion of renewables increase need for North-South transmission capacities

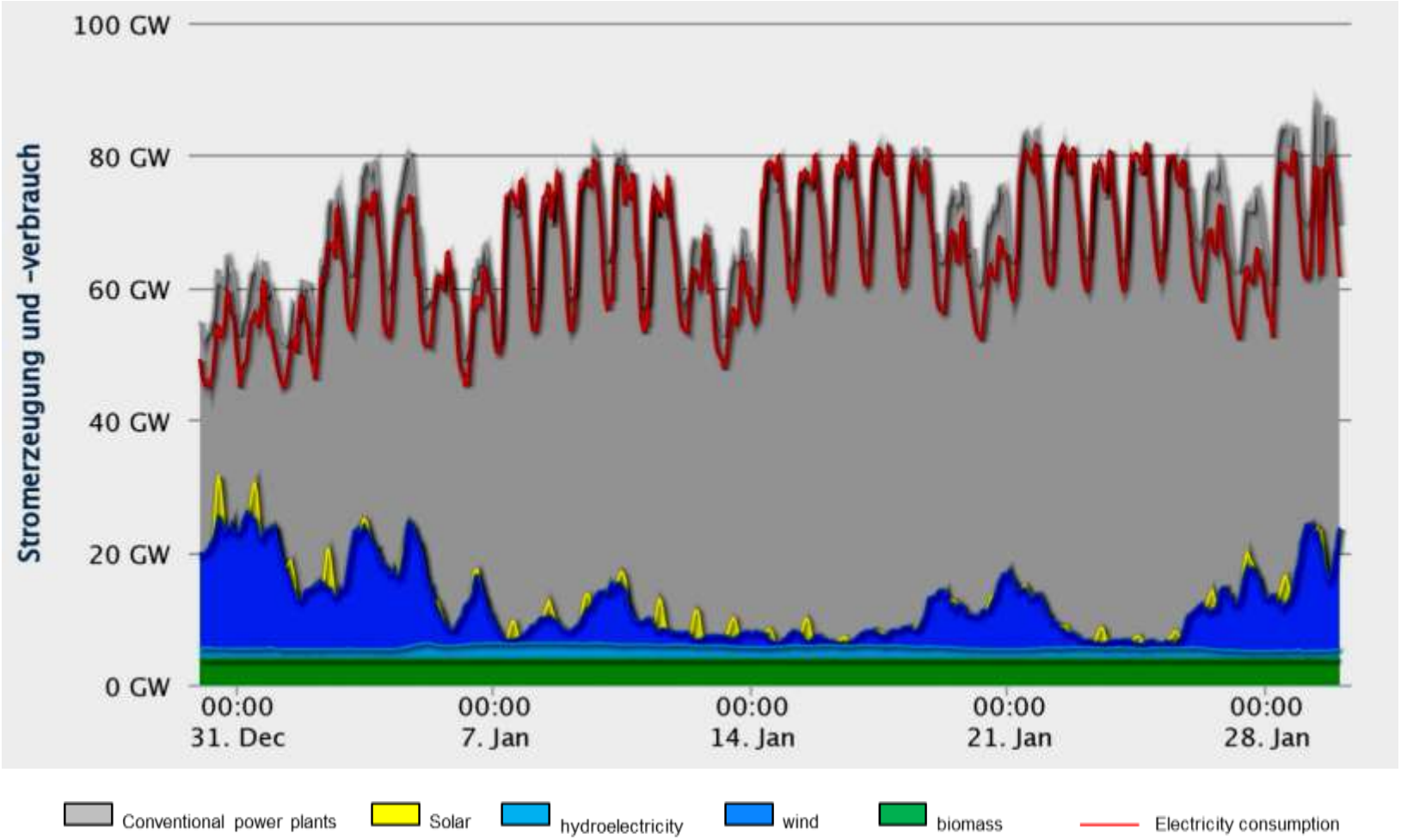


Grids and market coupling are key for market integration



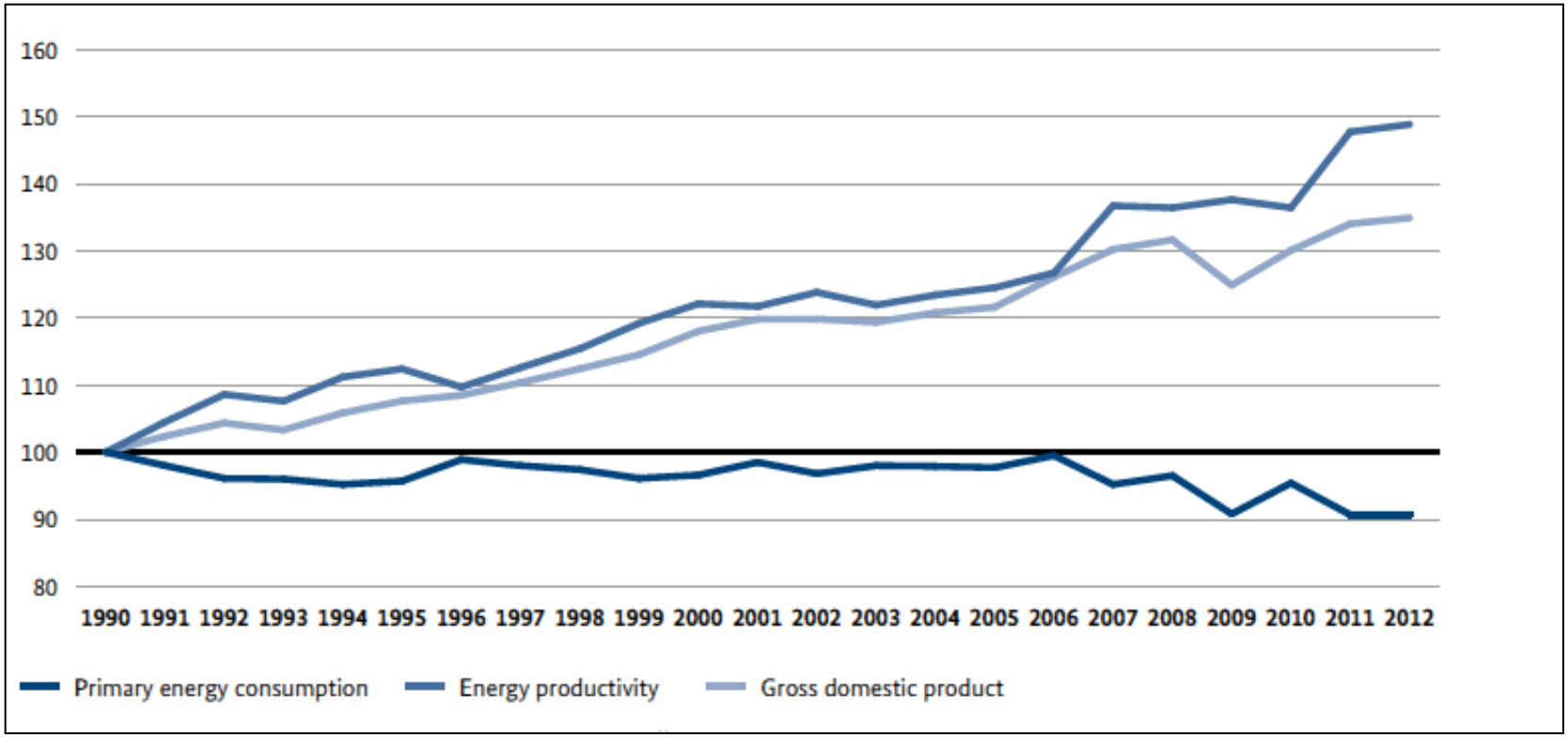
- Challenge: transport from North to South
- Key: High Voltage DC-transmission lines
- Also key: European market integration
  - Interconnectors (!)
  - Market coupling
  - Liberalisation

Even with stronger grids: Conventional generation capacity still needed

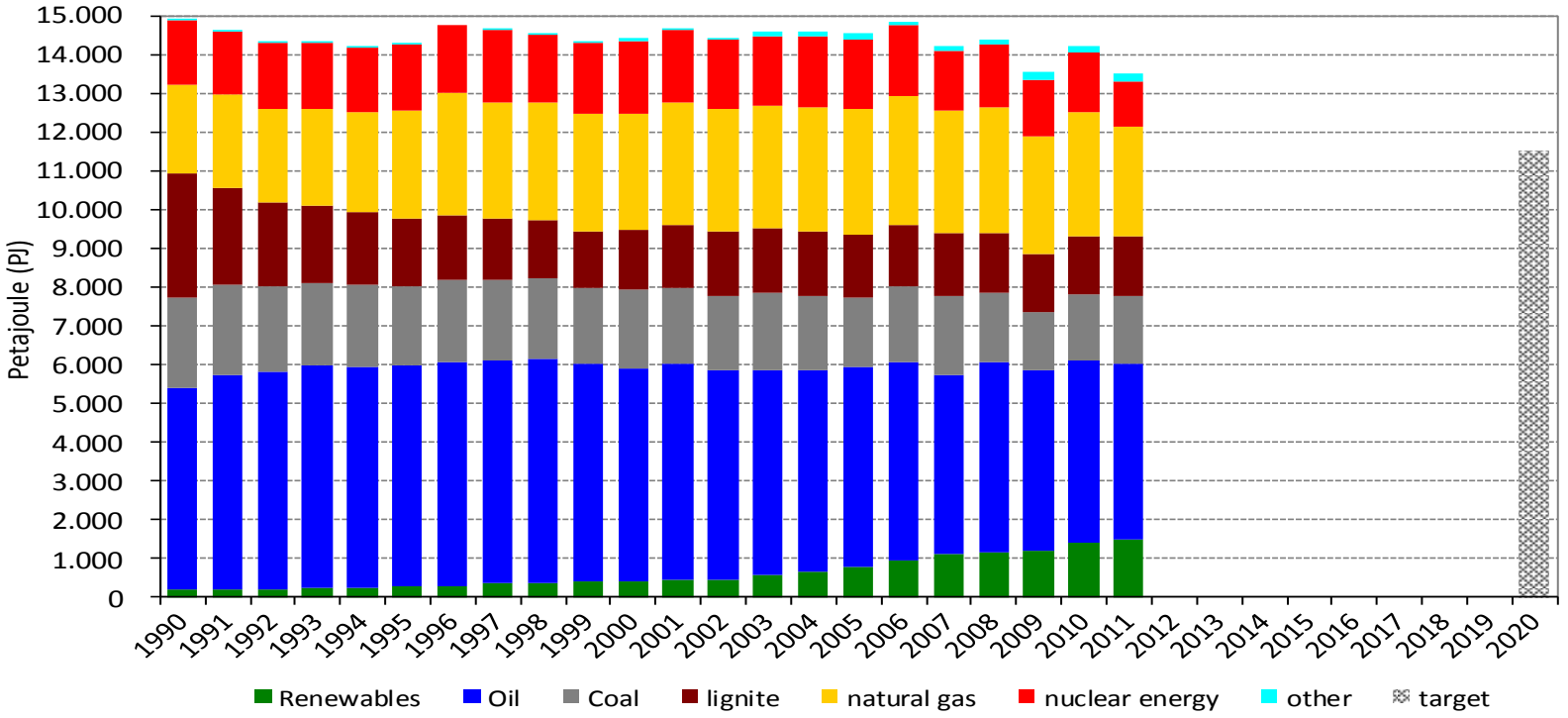


Energy efficiency

Decoupling of economic growth and energy consumption achieved



Reduction of primary energy consumption – ambitious goals



But: further reduction of primary energy consumption still a big challenge.

Energy efficiency – need for broad mix of instruments

- **<u>Buildings</u> account for almost 40 % of German energy consumption:**
  - **<u>Standards:</u> National standards + EU Buildings Directive 2010/31/EU**
  - **<u>Incentives:</u> "CO_2 Building Modernization Program" increased to currently 1.8 billion € per year**
  - **<u>Information:</u> Energy advice for residential buildings**
- **<u>Product standards and labeling</u>: EU standards for minimum energy efficiency requirements and energy labelling**
- **Implementation of the Energy Efficiency Directive (EED) (ongoing)**

Need for a supportive and coordinating European framework

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- Energiewende need European integration and cooperation with neighbours
- **Need ambitious 2030 targets: Climate** (at least 40% EU domestic) also on **RES** (at least 30%) and **Efficiency**
  - **Reliability and predictability** (electricity market impact, grids)
  - **no-regrets;** more **jobs, innovation and reduced fossil fuel imports**
  - allow for a **new EU-framework** and coordination
- More emphasis on interconnectors, market coupling and security of supply

Next steps

- Need an urgent **ETS reform,** also taking care of competitiveness
- October European Council:
  - Decide on **EU 2030 targets**
  - Common understanding on **first basic governance principles**
    - **flexibility,**
    - **reliability** of contributions to the EU-targets
    - **a balanced and diversified** approach
    - different governance where EU targets exist