

# **Monitoring Germany's Energy Transition**

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**Member of the Independent Energy Expert Commission  
Chair, Berlin Climate Advisory Board**

***“Climate Policy Strategies and Energy Transition”***

**18th REFORM Group Meeting,**

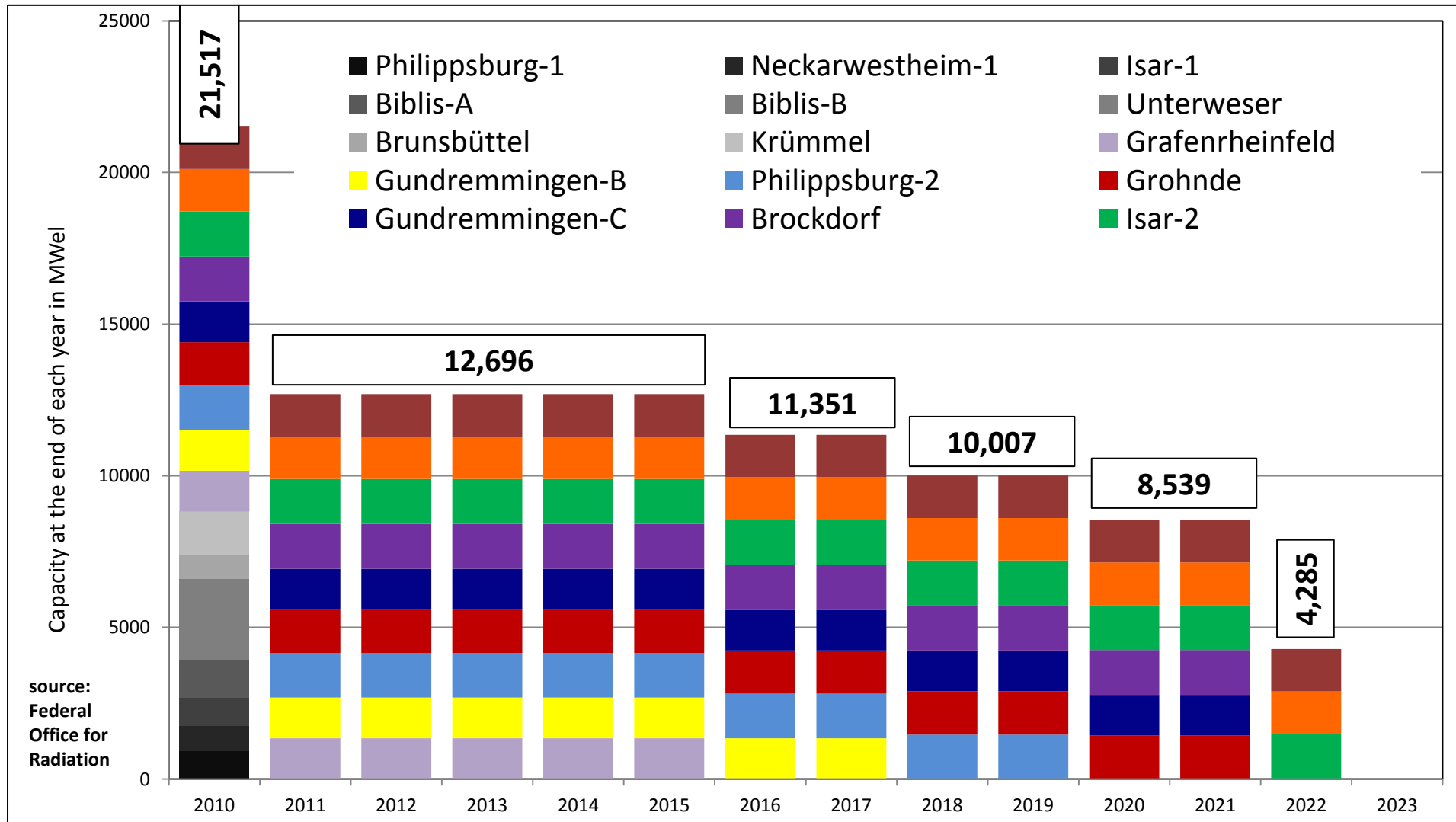
**Schloss Leopoldskron**

**Salzburg – August 26–30, 2013**

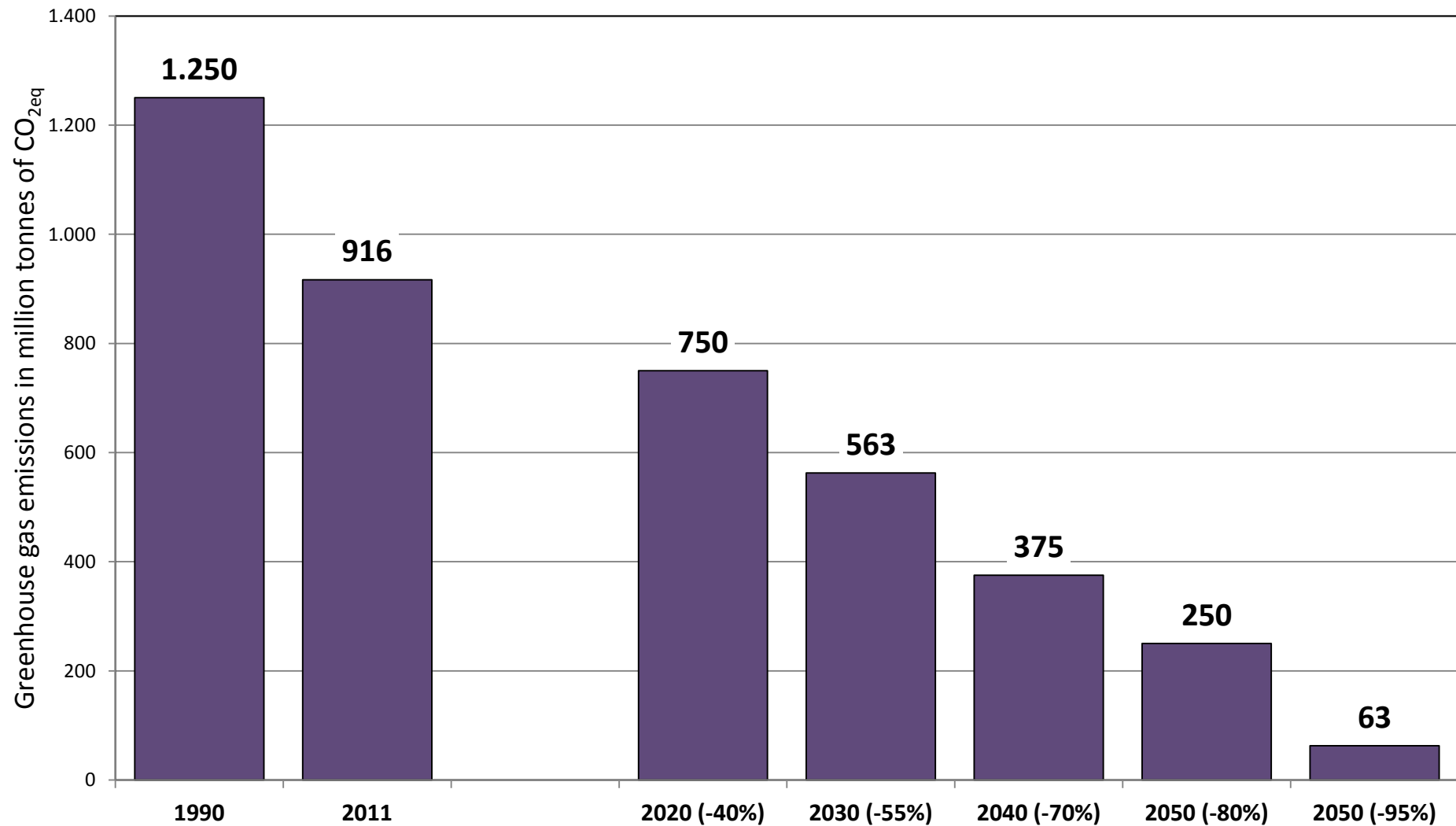
# The targets of Germany's energy and climate policy: Decarbonisation of economy and society

	Base year	2020	2030	2040	2050
<b>Nuclear Power (MW)</b>	21517	8539	last reactor will be shut down by 2022		
<b>Greenhouse gas emissions</b>	1990	-40%	-55%	-70%	-80% to -90%
<b>Share of renewable energies</b>					
<b>Gross final consumption</b>	xxx	18%	30%	45%	60%
<b>Power generation</b>	xxx	35%	50%	65%	80%
<b>Energy consumption/efficiency</b>					
<b>Primary energy</b>	2008	-20%	xxx	xxx	-50%
<b>Space heating</b>	2008	-20%	xxx	xxx	-80%
<b>Transport</b>	2005	-10%	xxx	xxx	-40%
<b>Power consumption</b>	2008	-10%	xxx	xxx	-25%
<b>Final energy productivity: Increase of 2.1% p.a. from 2008 to 2050</b>					
<b>Doubling of the annual building renovation rate to 2% of the total building stock</b>					
<b>Building stock should be almost climate-neutral by 2050.</b>					

# The phase-out pathway of nuclear energy in Germany: the last reactors will be shut down at the end of 2022



# Greenhouse gas emissions in Germany: 1990 to 2011 and targets for 2050



source: National emissions inventory; Government's Energy Concept

# Challenges of the energy transition

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- The **German energy transition** is much more than phasing out nuclear energy.
- **Fundamental reconstruction** of our total energy system
- The reduction of greenhouse gas emissions by 80 to 95 % means nothing less than a widely **fossil und nuclear free economy and society** and instead of this a society **based on renewable energies**.
- **Large scale investments** necessary regarding the transformation of the infrastructure (generation facilities, grid system, storage systems and overall measures for more energy efficiency in all sectors)
- **Market forces alone will not be enough** to make the energy transition a success. It needs societal acceptance and effective as well as efficient policies and measures..
- The success of the energy transition is fundamentally dependent upon **efficient as well as effective policies and measures**.

# Energy Concept



Federal Ministry  
of Economics  
and Technology

Federal Ministry for the  
Environment, Nature Conservation  
and Nuclear Safety

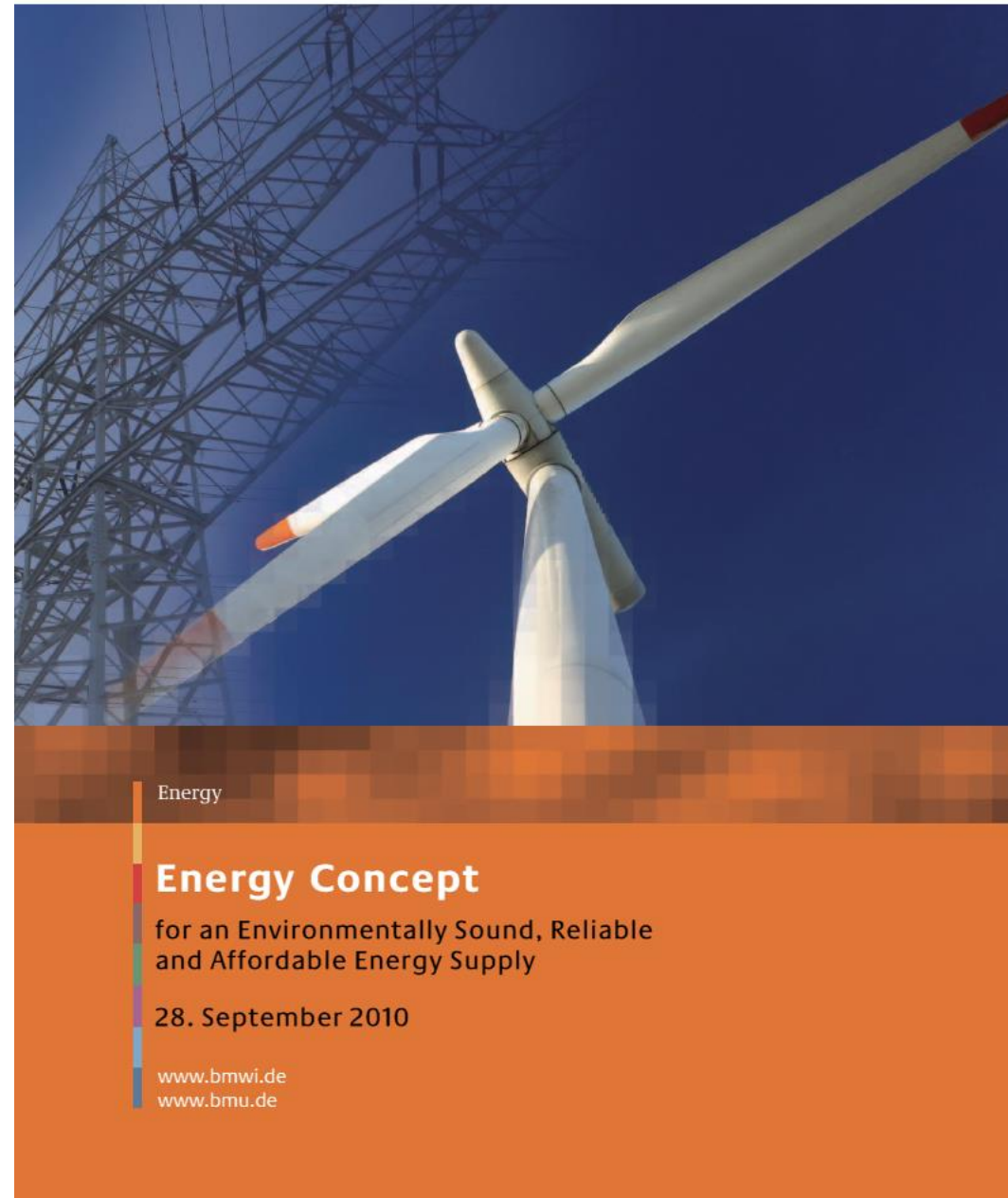


## Energy Concept

as of 28 September 2010:

*„Securing a reliable, economically viable and environmentally sound energy supply is one of the great challenges of the 21st century. [...]*

*The German government will use scientifically tested monitoring to determine whether actual progress is within the corridor marked out by the above development path and to what extent action needs to be taken.*



The Federal Government's Decision to monitor the „Energiewende“

## **Task and Objective**

The aim of the monitoring process is to continuously review to what extent the implementation of the energy policy decisions taken is in line with the objective of environmentally friendly, reliable and affordable energy supply, and make adjustments if necessary.

## The Monitoring Process „Energy of the Future“

- The monitoring process is carried out jointly by the Federal Ministry of Economics (BMWi) and the Federal Ministry for the Environment (BMU).
- BMWi and BMU annually prepare a monitoring report. In addition, a progress report will be presented every three years.
- The annual monitoring report was published for the first time in December 2012 for the year 2011. The first progress report will follow in 2014.
- To support the monitoring process an independent four member expert commission was set up. The government's monitoring report should consider the expert commission's opinion.
- The expert commission's opinion together with the Government's report will be published will be forwarded to the German Parliament and the Federal Council.as well as to the public.



## The annual monitoring report (I)

### **The annual monitoring report shall...**

- ... be based on facts
- ... include an assessment of the progress made towards achieving the goals of the energy concept
- ... be elaborated by comparing current and target values
- ... include a tabular overview of policies and measures
- ... use official data provided by the StBA, BAFA, UBA, BNetzA, BKartA, AGEb, AGEE-Stat and others.
- ... concentrate on facts as well as on policies and measures

## The three-yearly progress report

### **The three-yearly progress report shall ...**

- ... contain a detailed comparison of the present status-quo and the long-term targets
- ... evaluate the status of the implementation of the policies and measures on the base of thorough analyses and specific surveys if necessary
- ... analyse the effectiveness and efficiency of policies and measures which had been implemented
- examine the causes and barriers and propose effective policies and measures

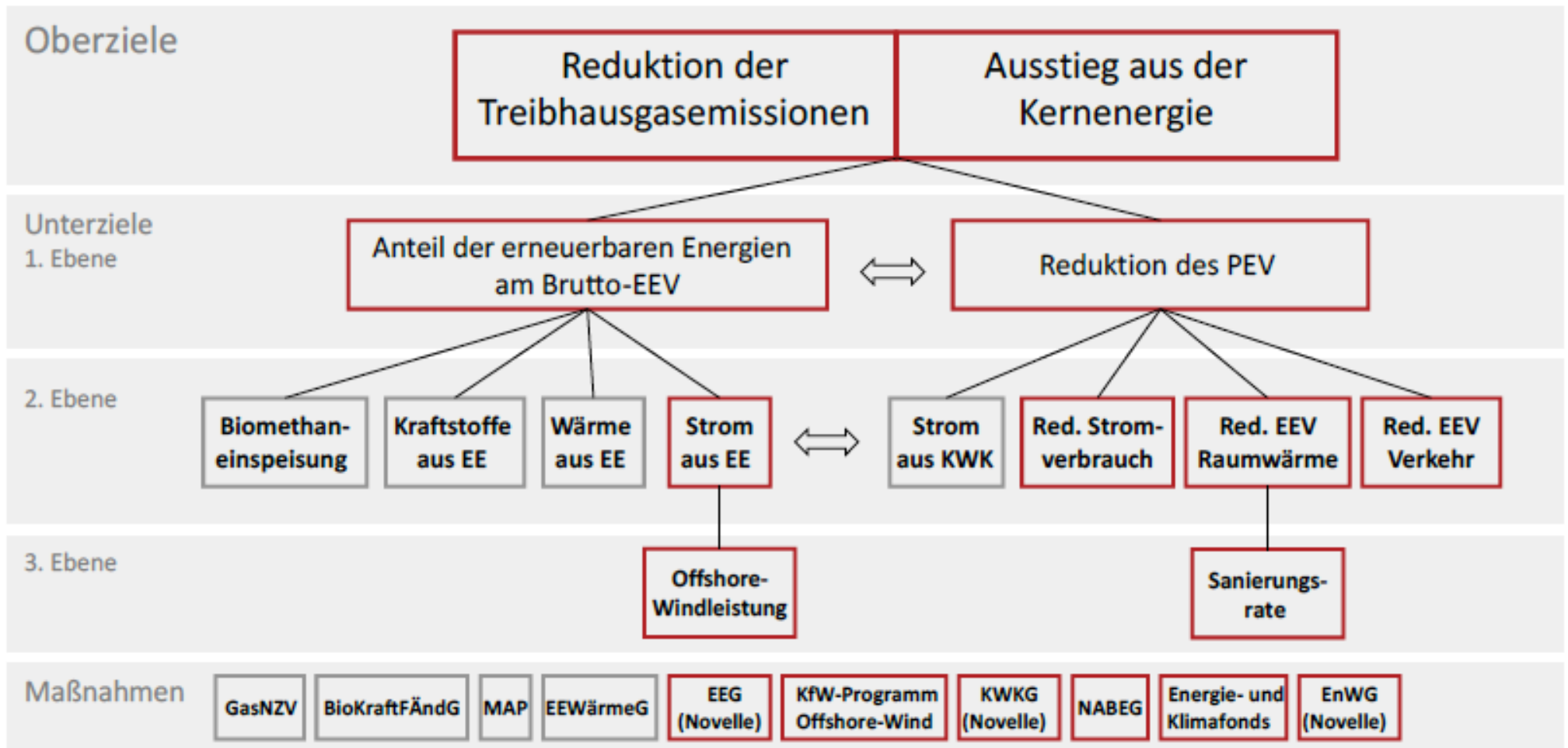
## Organisation of the Monitoring Process

- The Federal Network Agency acts as the head office and supports the monitoring process
- Responsibilities:
  - BMWi** is in charge of grid expansion, power plant expansion, replacement investments and energy efficiency
  - BMU** is responsible for the expansion of the renewable energies
  - Expert Commission** provide a duly reasoned opinion as well as recommend to the ministry's report
- The **Federal Cabinet** adopted the first monitoring report on 19 December 2012

## Outline of the Commission's report

1. About target priorities
2. Monitoring process and the system of indicators
3. Initiatives concerning energy efficiency
4. Progress of renewable energies
5. Environmental impacts of the energy transition
6. Security of supply
7. Economic efficiency of the energy system
8. Macroeconomic effects
9. Coordination between the German and the European energy policy
10. Interactions between the quantitative targets of the German energy concept

# Prioritisation of objectives with regard of the energy transition



## Problems regarding the monitoring

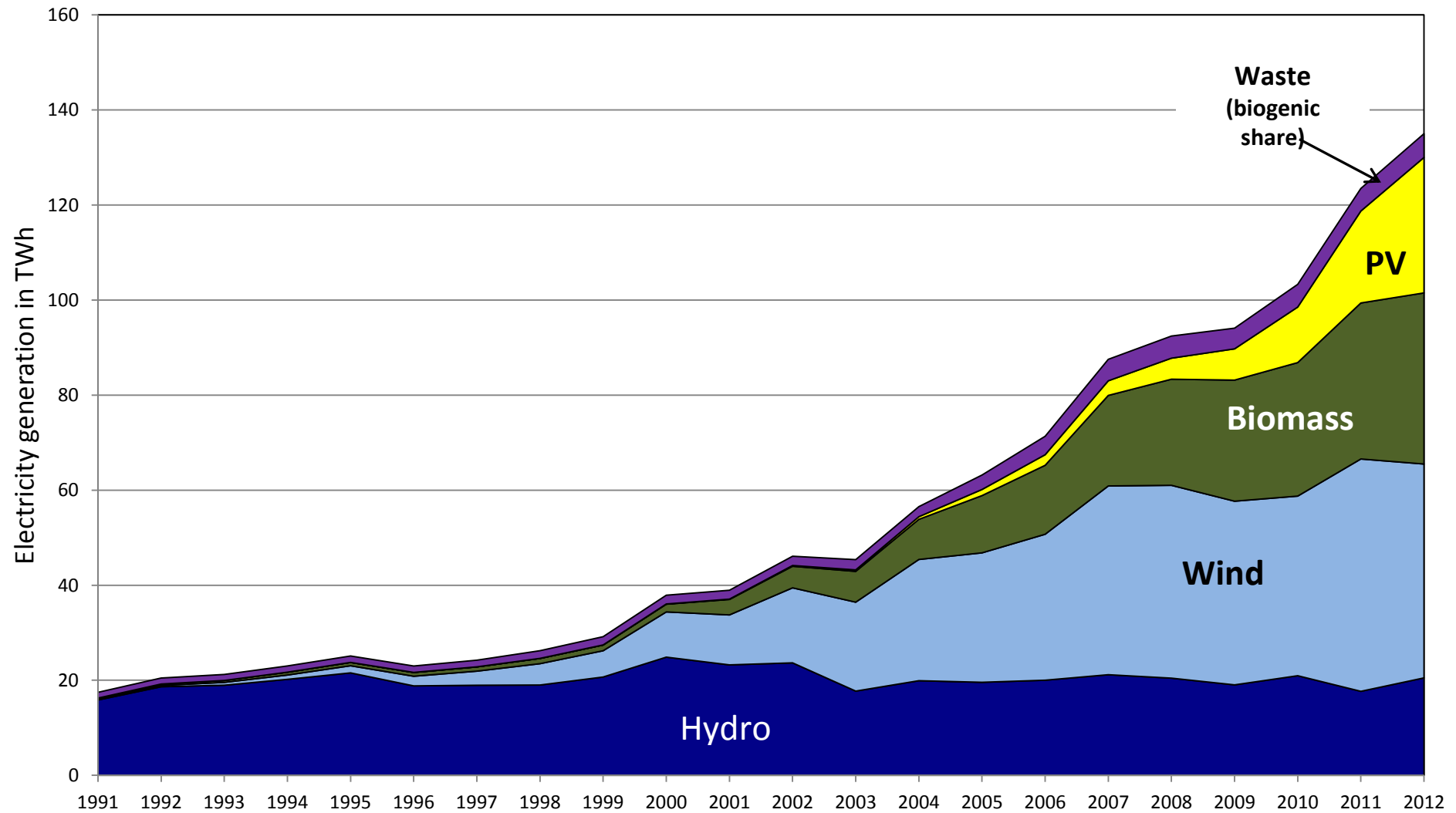
- choice of indicators
- data availability, timeliness, transparency, resilience
- Qualified description of policies and measures
- Cause-and-effect-relationship
- Focussing targets – conflicts of goals – hierarchy of objectives
- Ex-post versus ex-ante analysis

# Areas for actions addressed by the expert commission

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- In need of particularly urgent action:  
improving energy efficiency in all sectors,  
especially in the building and transport sector
- Implement policies and measures improving the efficiency of electricity uses to reduce electricity consumption
- Stepping up efforts to introduce renewable energy particularly for thermal purposes
- Development of a new market-design in the electricity sector (“capacity markets”)
- Clear definitions what is meant by “competitive prices”, “economic viability” or “affordability”
- Urgent need for improvements regarding the data base (“energy statistic law”)

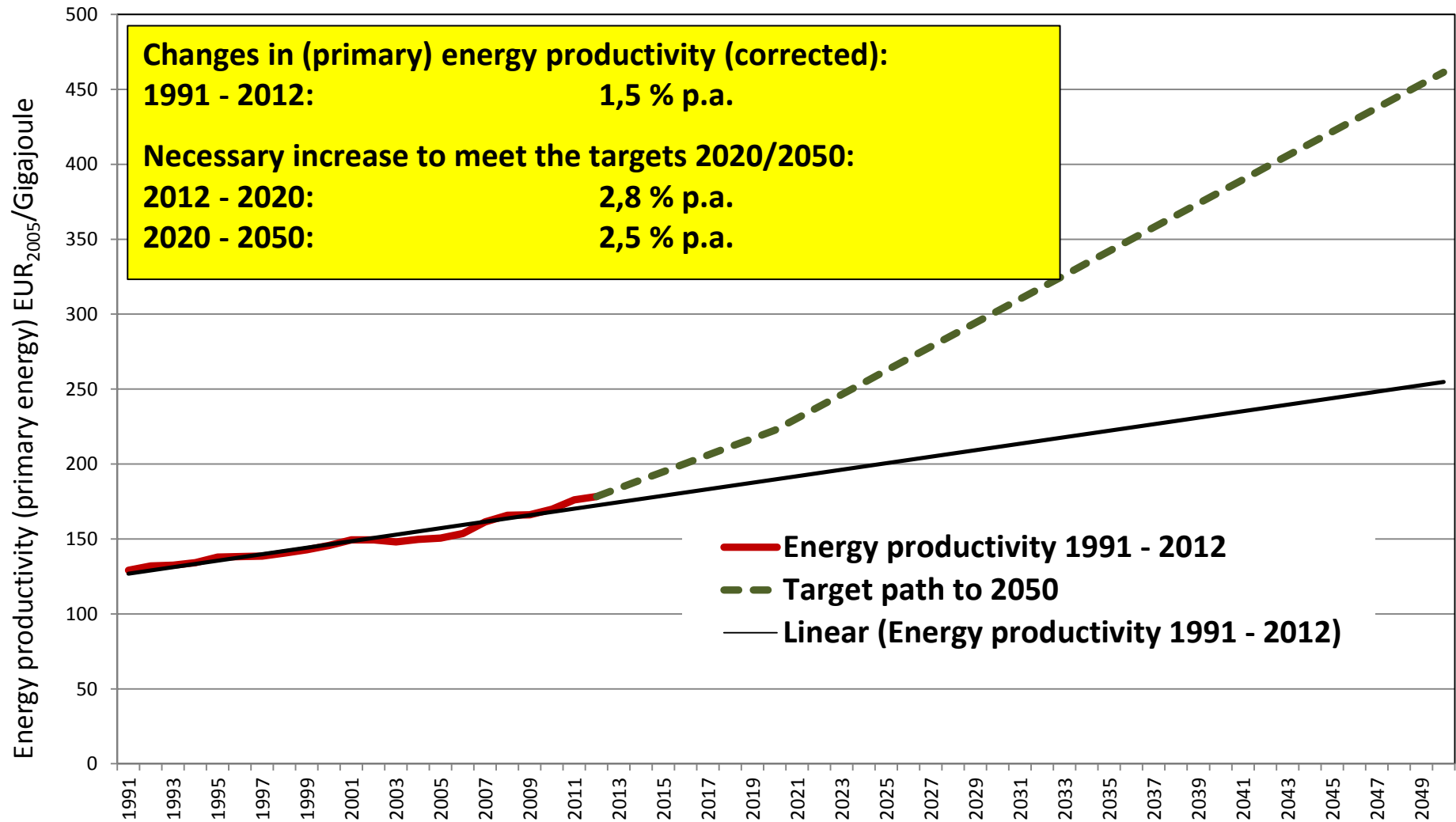
# Electricity generation in Germany based on renewable energy sources 1991 to 2012: A success story



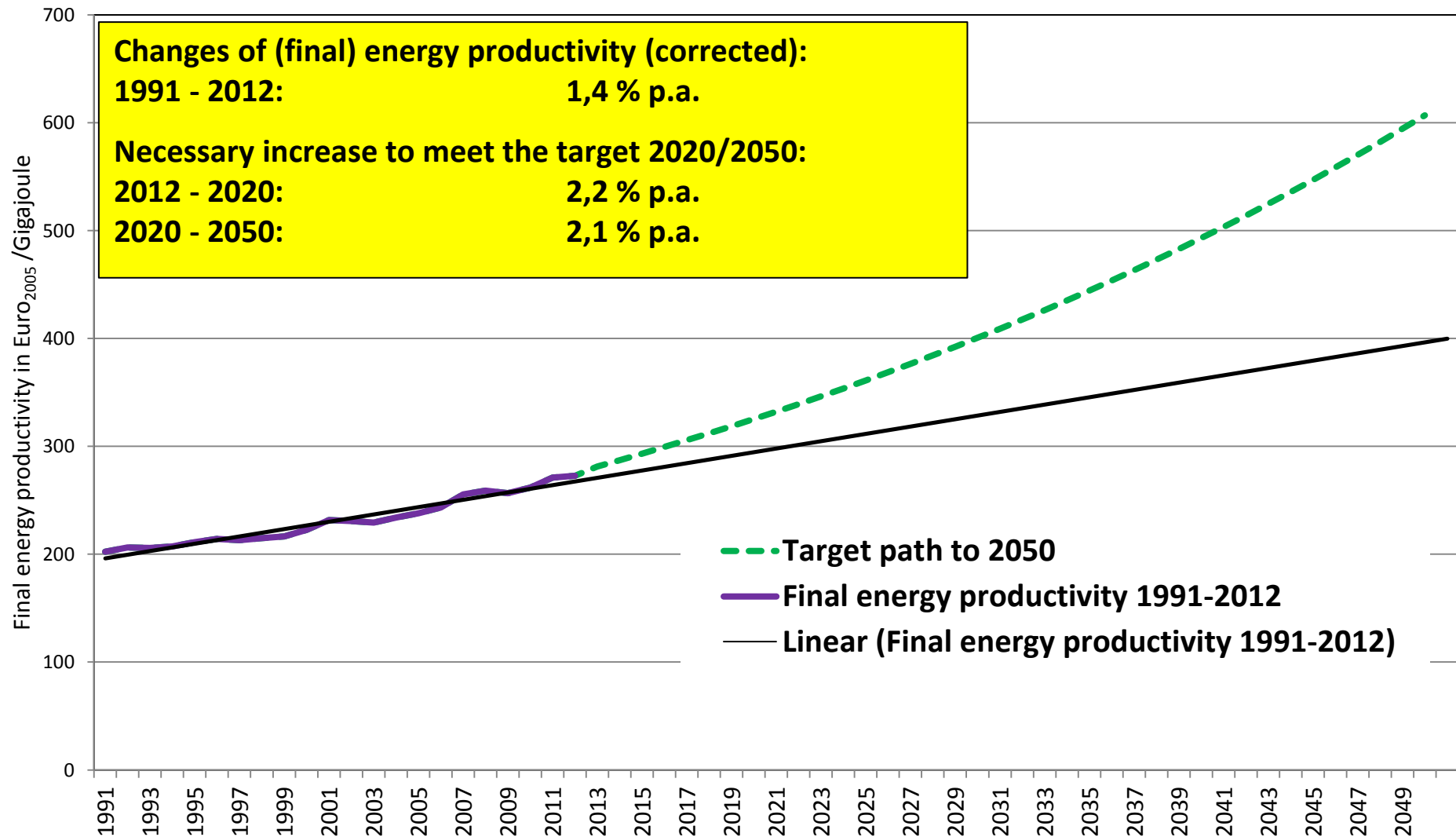
sources: BDEW; AGEEStat.



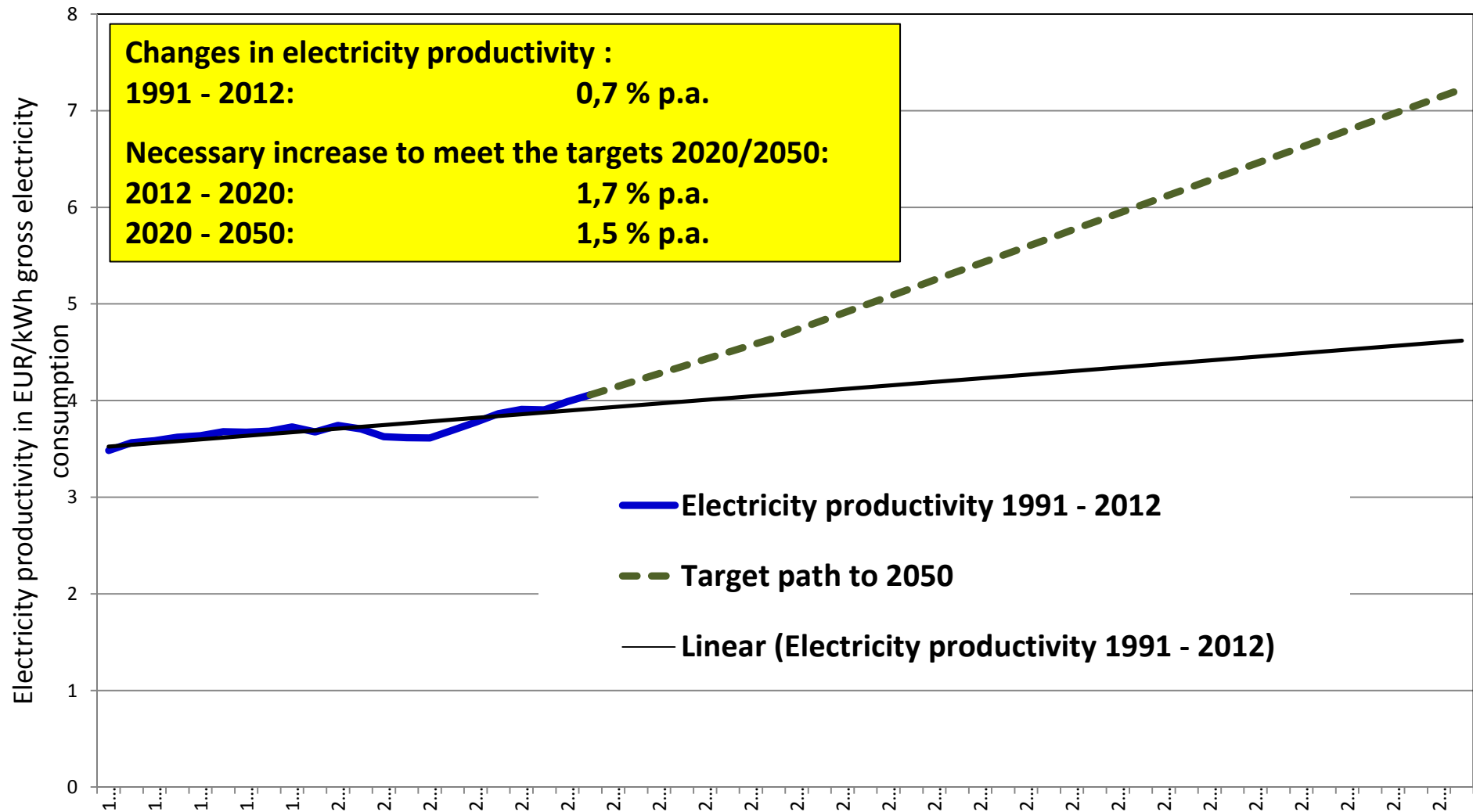
# Changes in primary energy productivity in Germany 1991 – 2012 and targets for 2050



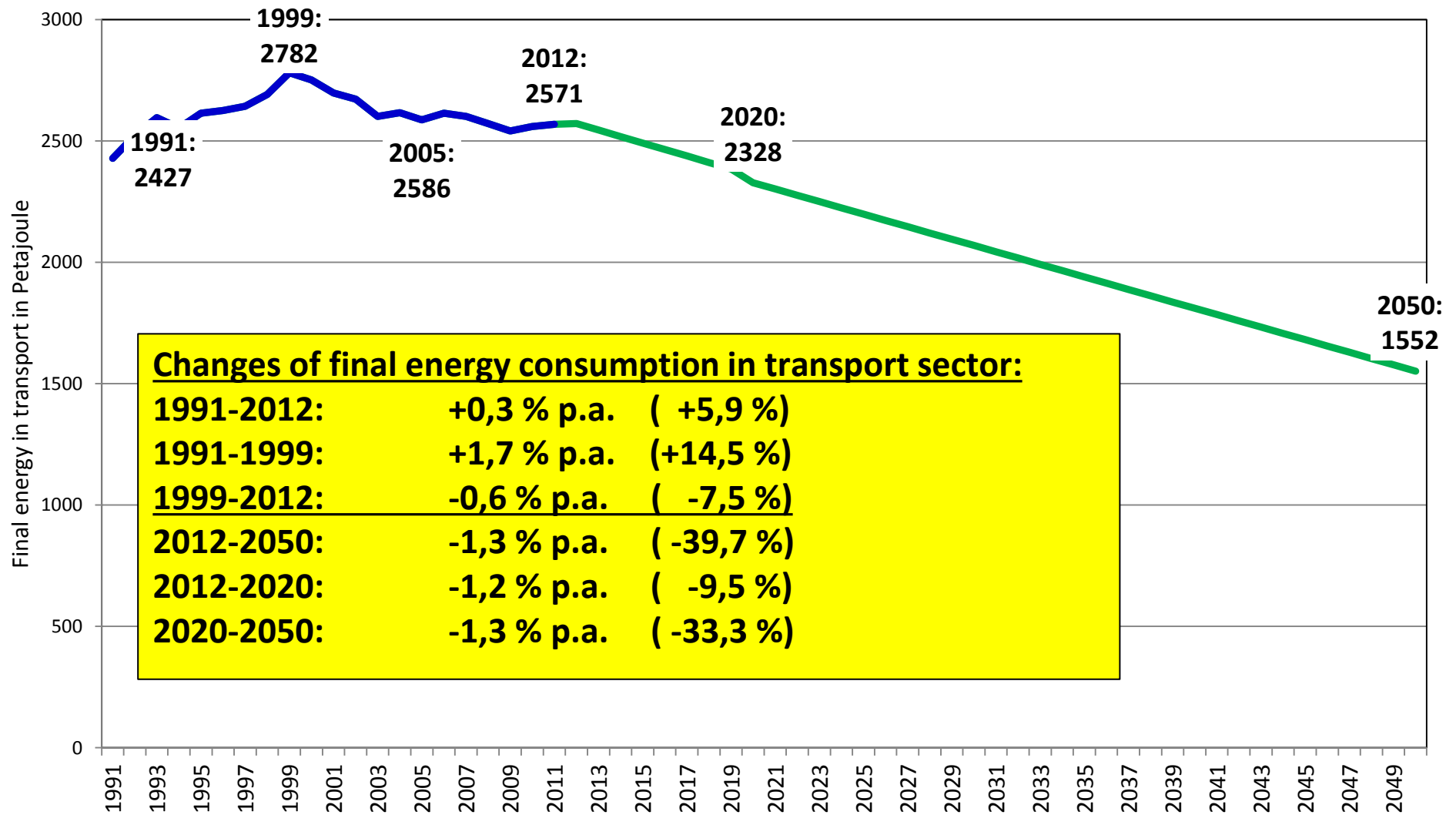
# Changes of final energy productivity in Germany 1991-2012 and targets for 2050



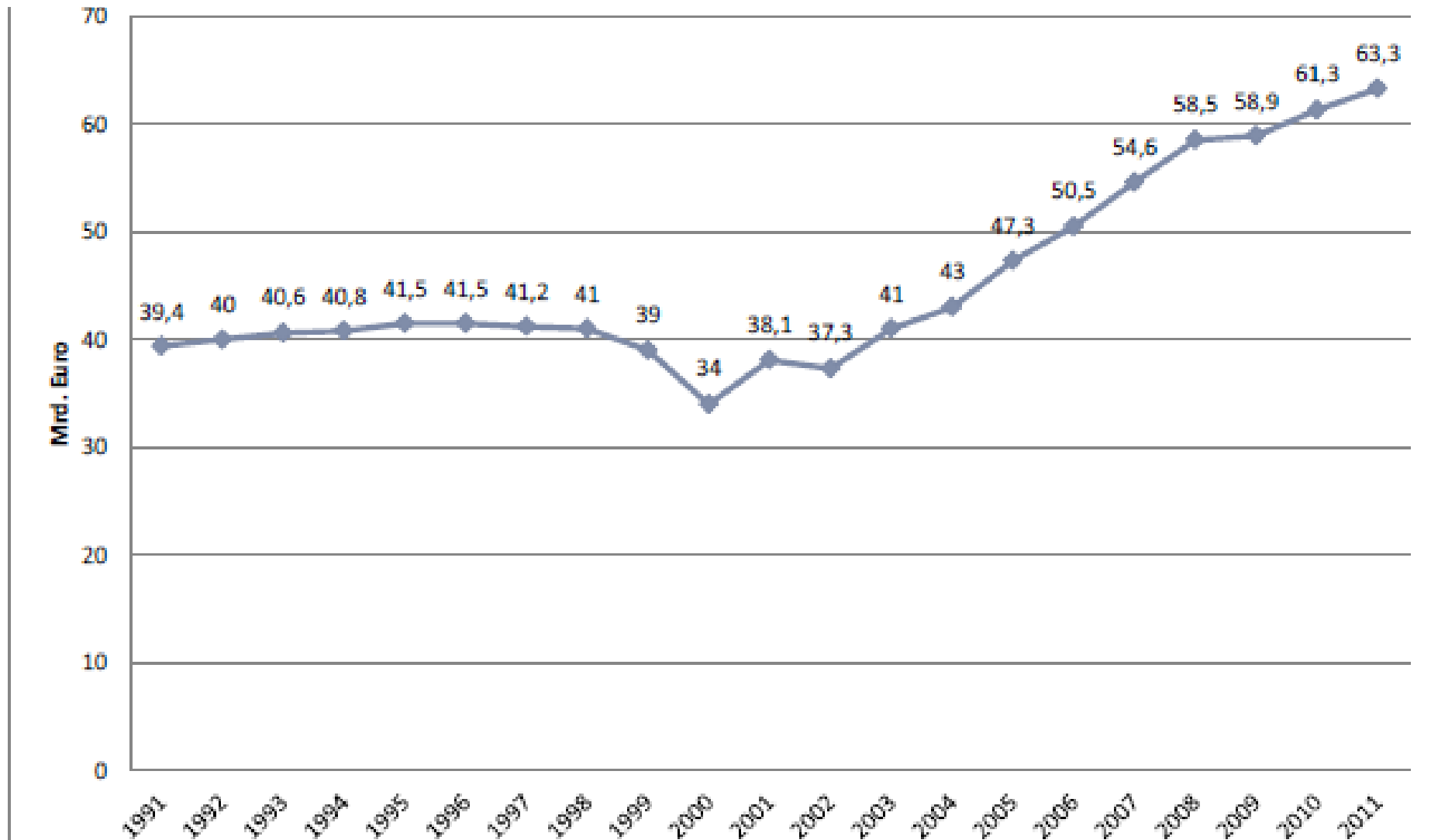
# Changes in electricity productivity in Germany 1991-2012 and targets for 2050



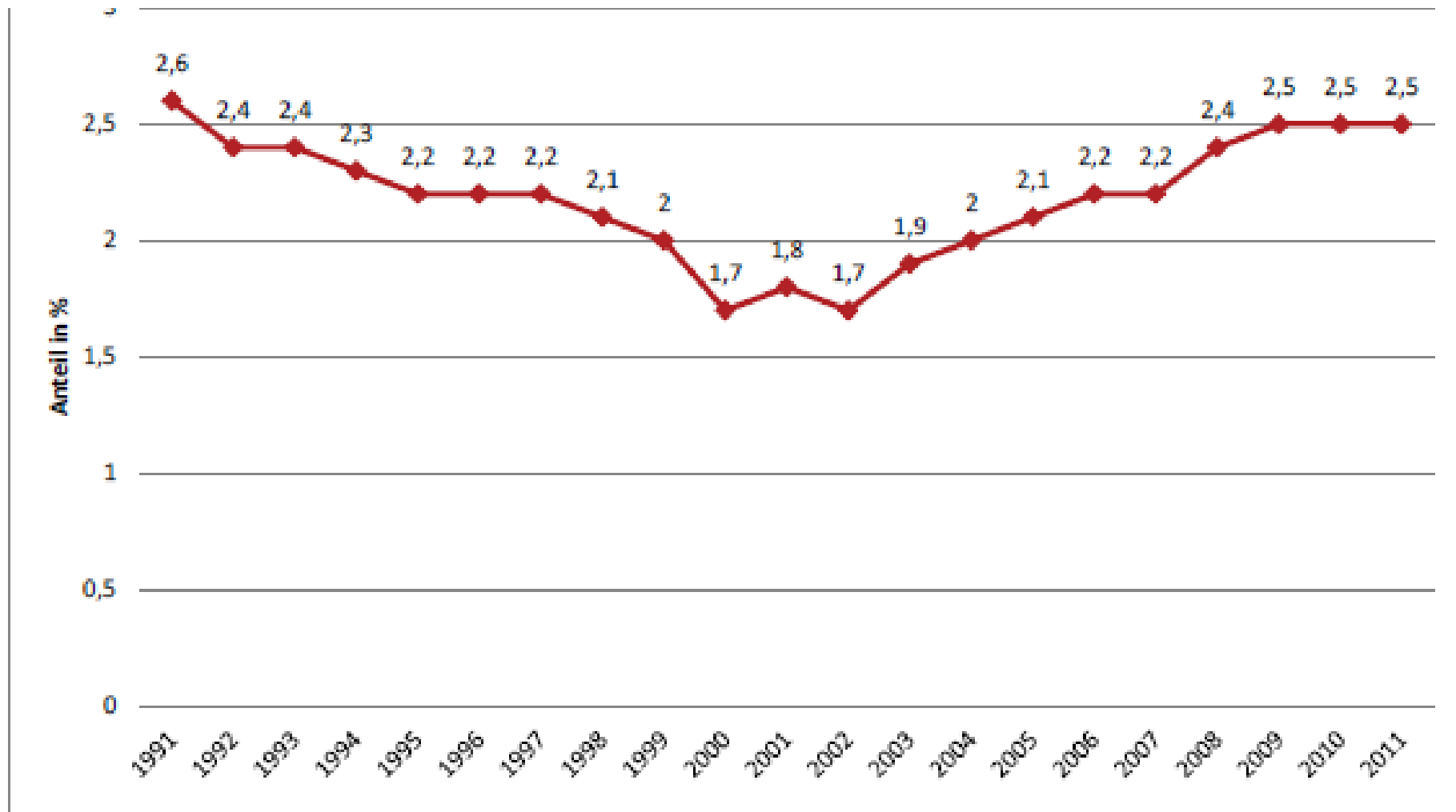
# Changes of energy consumption in transport in Germany 1991-2012 and targets for 2020 and 2050



# Final consumers electricity expenditures in Germany 1991-2011 (in billion Euro)



# Final consumers electricity expenditures and its GDP share in Germany 1991-2011

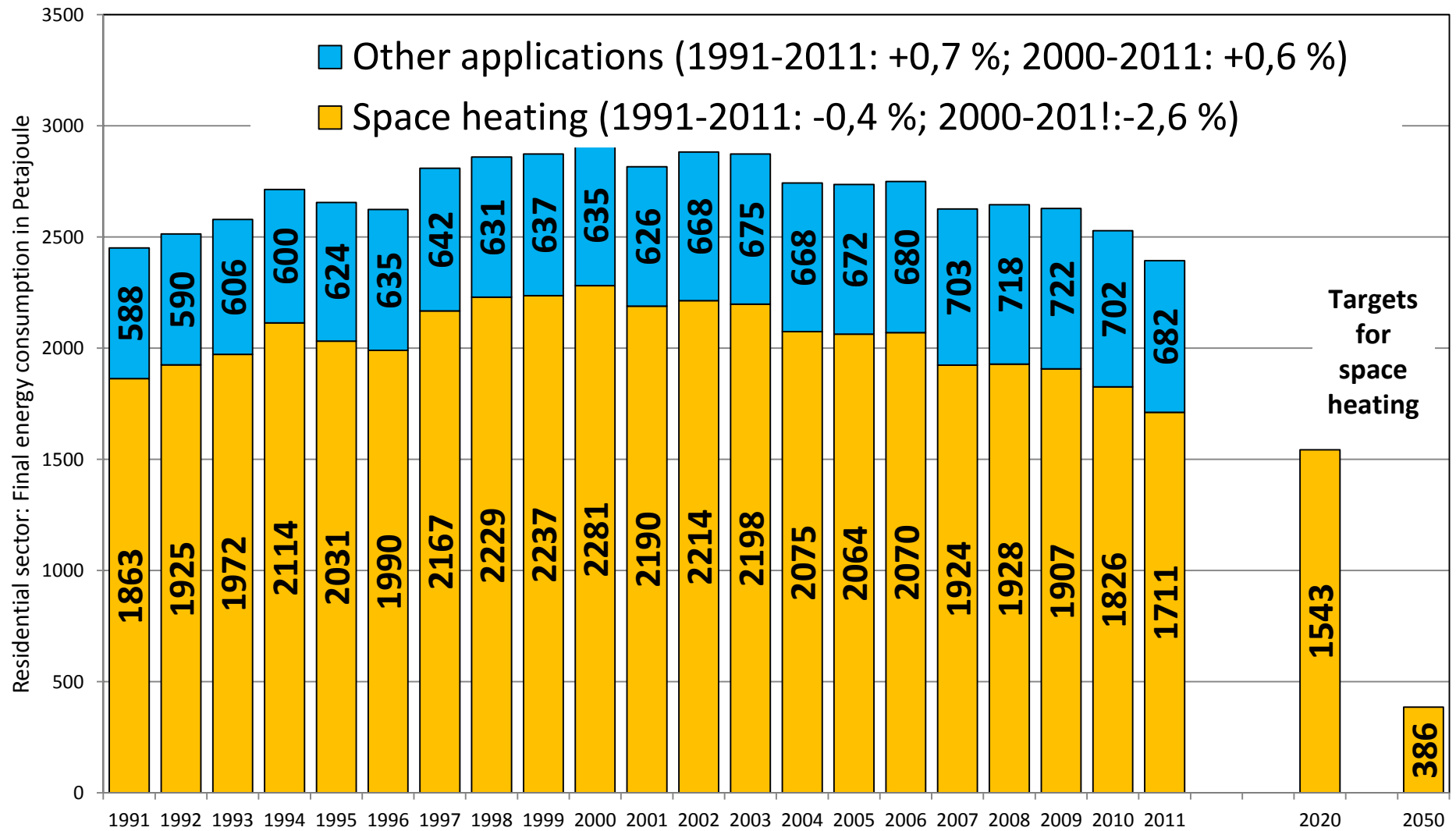


Quellen: [Destatis 2012a] [Destatis 2012b] (Eigene Darstellung)



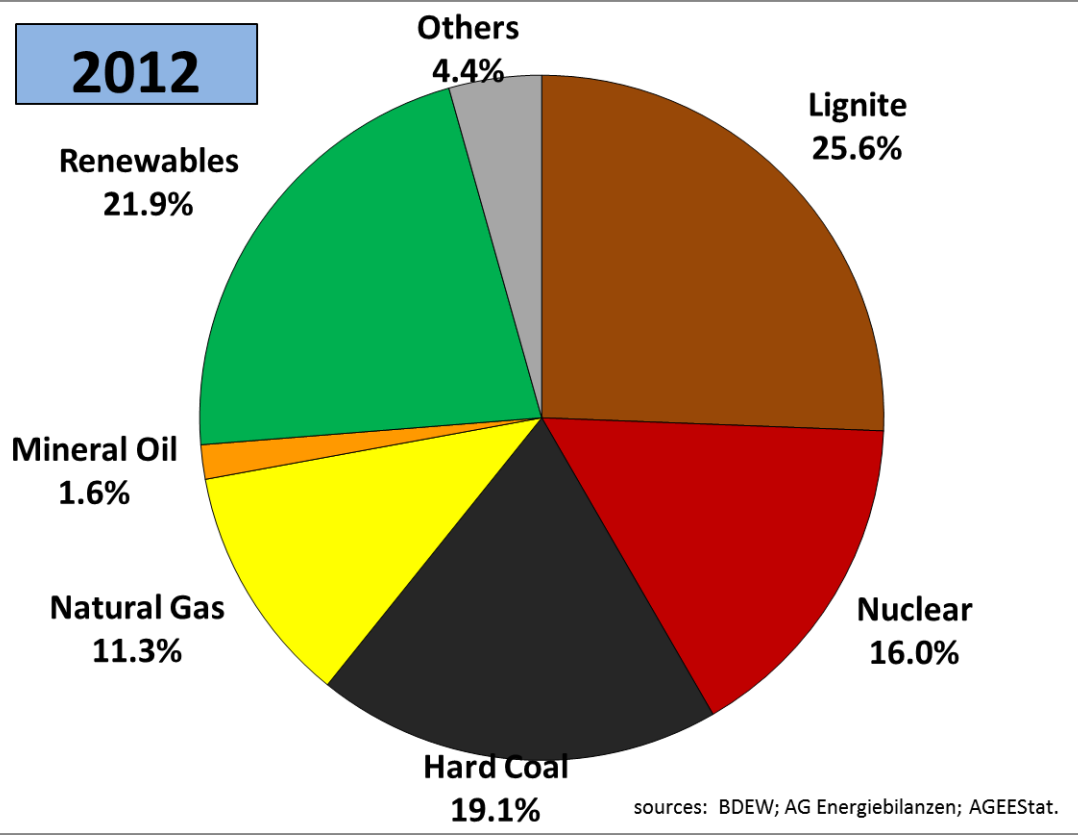
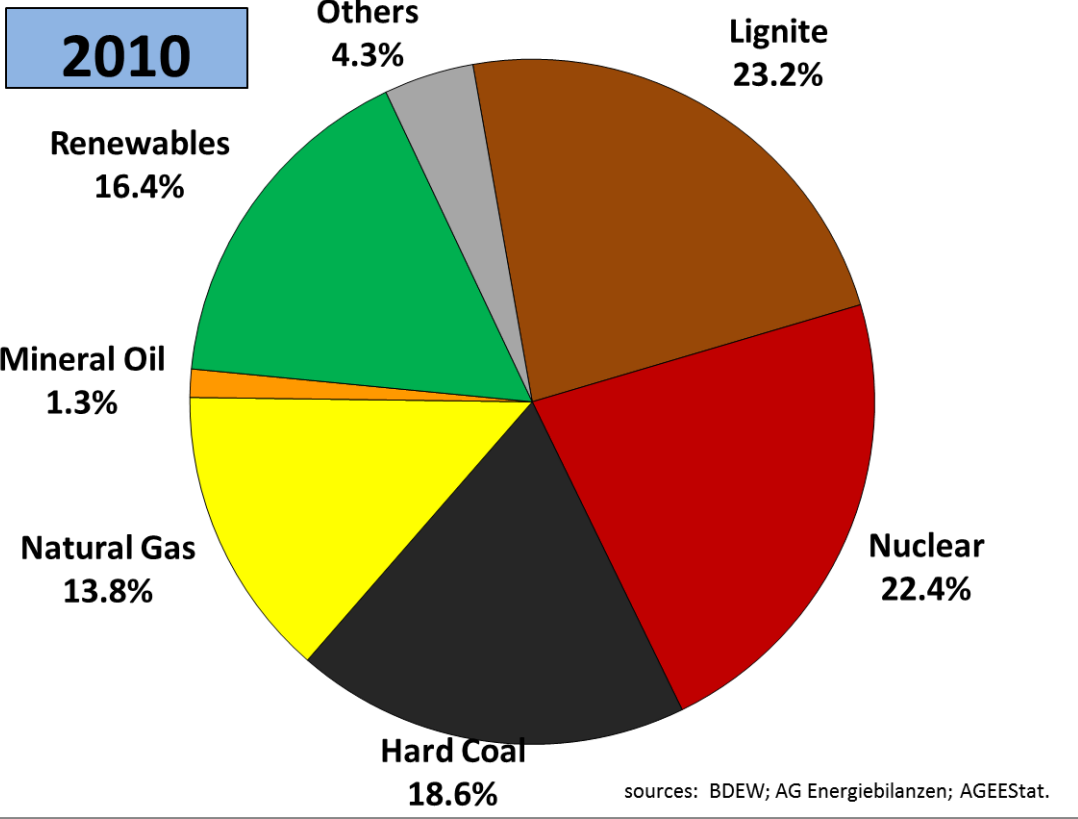
**Thanks for listening**  
**[hziessing@t-online.de](mailto:hziessing@t-online.de)**

# Targets for space heating in residential sector

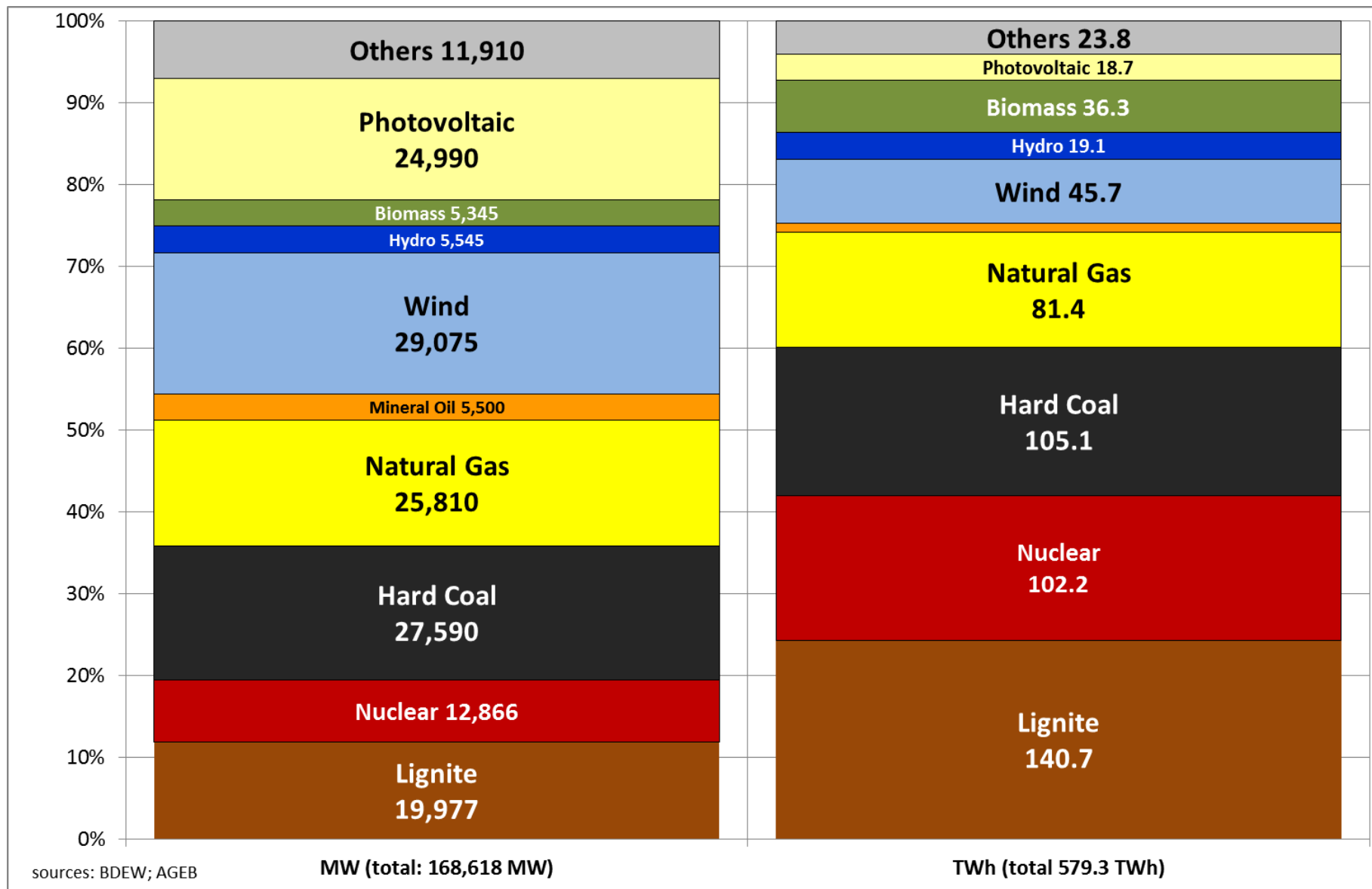




# Electricity generation in Germany 2010 and 2012 by fuels

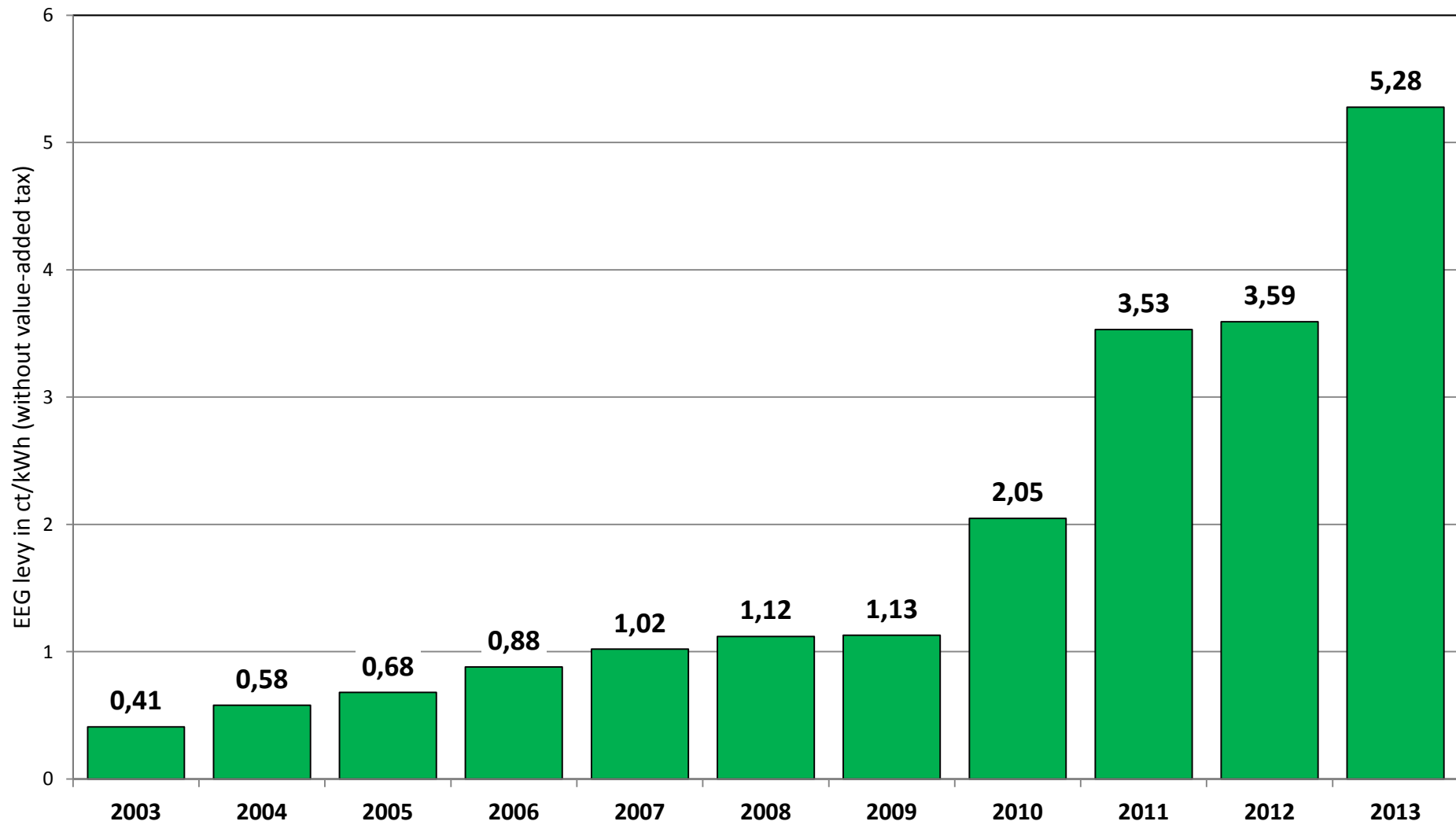


# Installed capacity and electricity generation in Germany 2011 by sources

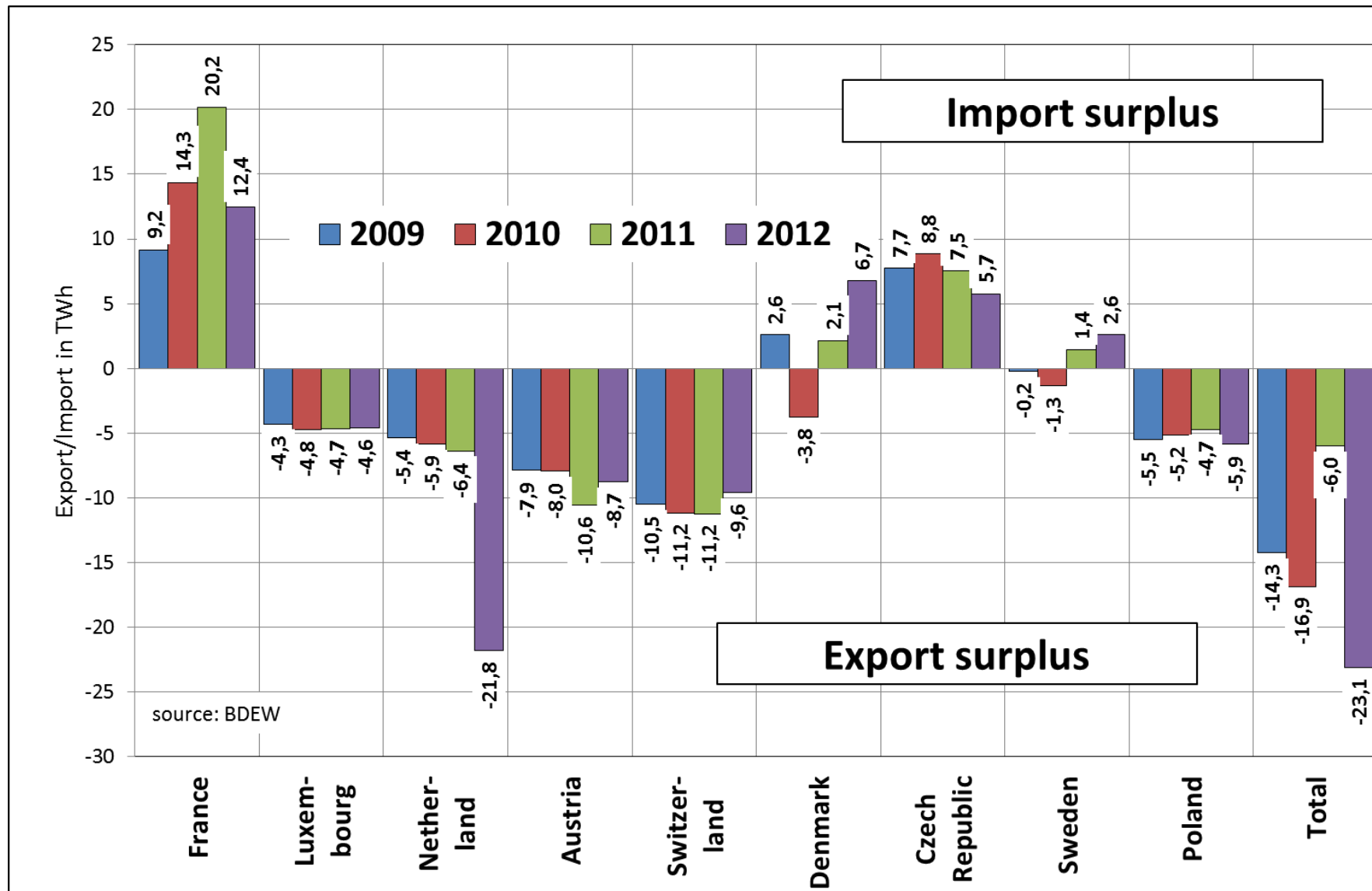


# Development of the EEG levy for renewable based electricity generation in Germany 2003 to 2013

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# Electricity trade balance in Germany 2009 - 2012



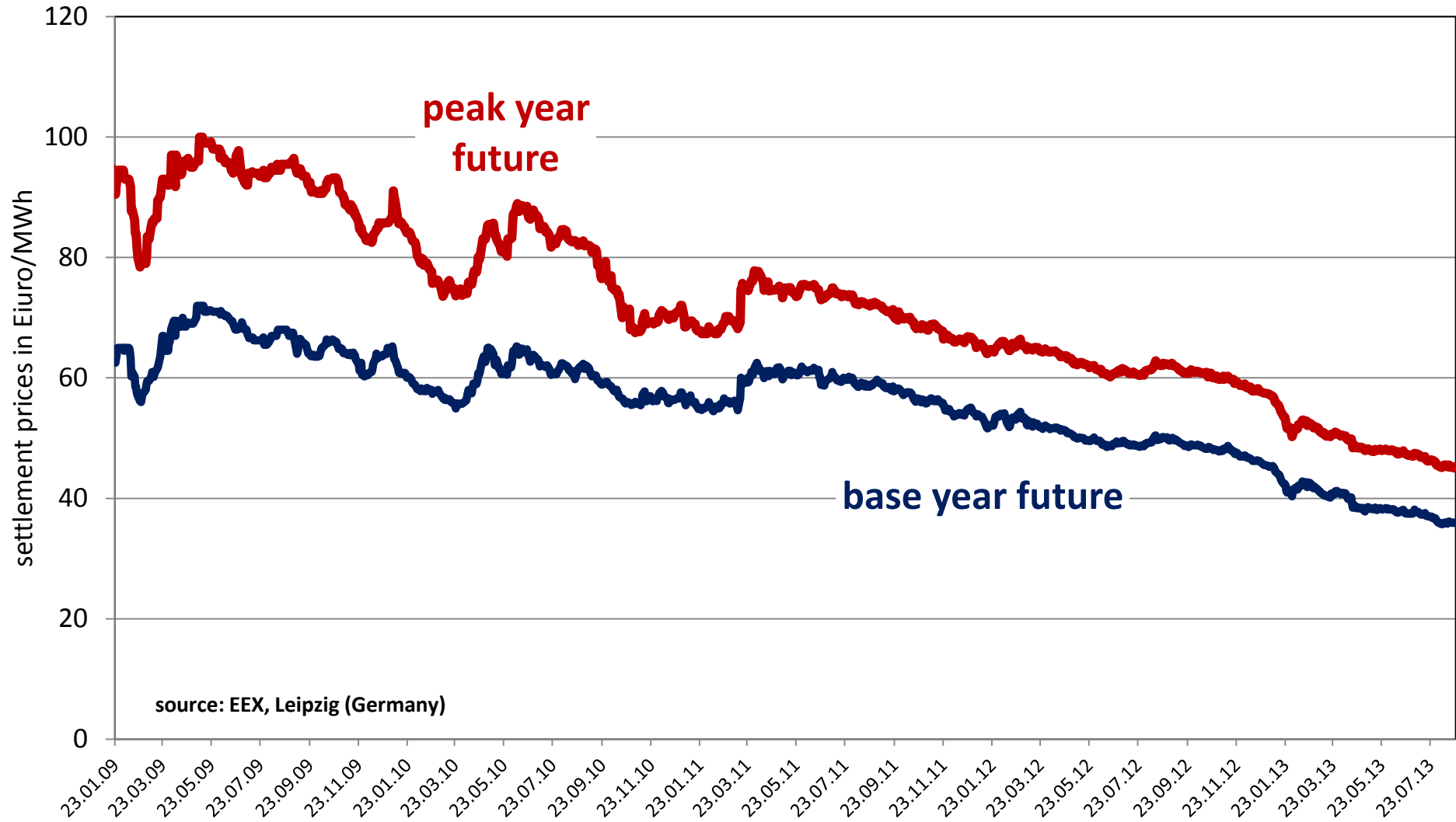
# Emissions 2011/2013: Settlement prices at the spot market



# Emission futures 2012/2013 for delivery period mid Dec 2014



# EEX Power Derivatives: Phelix-Base-Year- and Peak-Year-Future 2009 to 2013: Delivery Period: Jan 2015



## Government's Reaction in response to the expert commission's opinion

- Minister Altmaier: "I would like to thank the members of the expert commission for their independent and critical review of our report. Having this external perspective is vital to the monitoring process."
- The German government will carefully evaluate the comments and recommendations made by the independent members of the expert commission and use them as fresh impetus for the successful transformation of the energy system.

(see: BMU\_press release No. 164/12 19.12.2012)