



**Center for Geopolitics of Energy and Raw Materials
(CGEMP)**



In partnership with:



French Association of Energy Economists

Power in Germany: The turning point of 2011

One year later, lessons for neighbouring countries

Germany and the climate policy of the European Union after 2011

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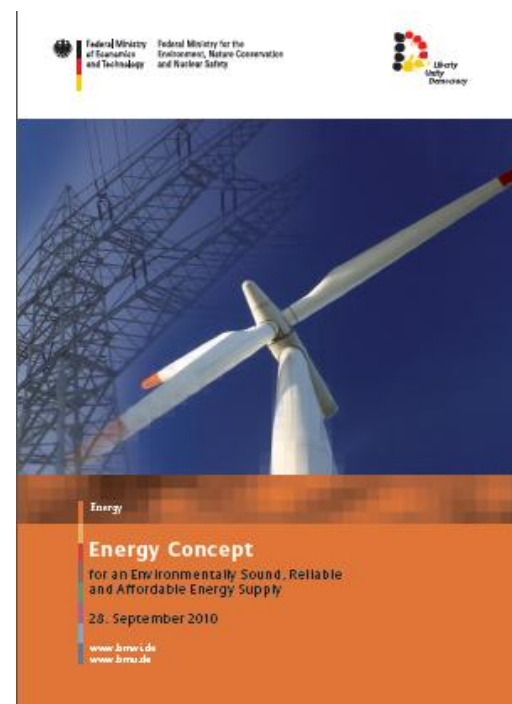
University Dauphine
Paris, June 2012

Overview

- German climate policy and the EU
- Situation in 2011
- KfW-ZEW CO₂ Barometer 2011/2012
- Scenarios for Germany after phase out

- Energy Concept of German Government

- “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 **science based monitoring** to determine whether actual progress is as expected and to what extent additional actions needs to be taken.”



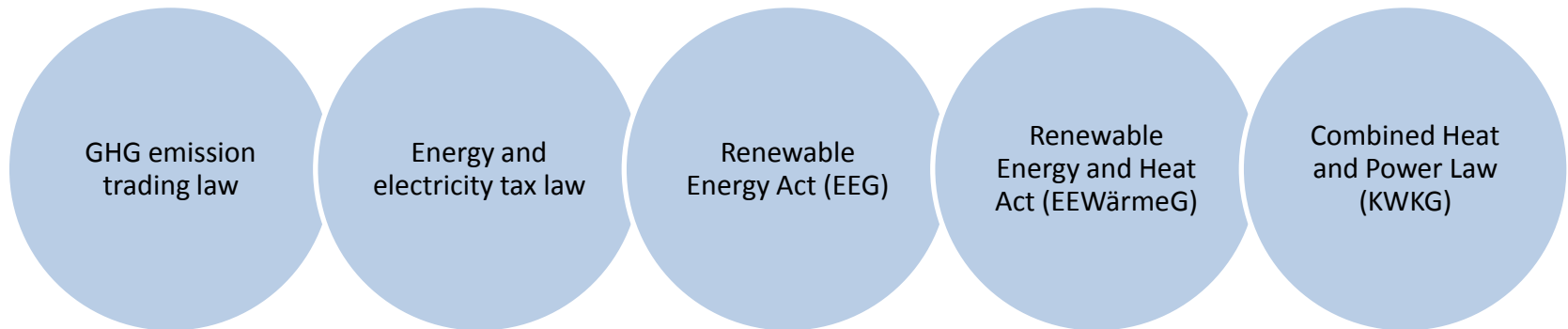
Targets of the German energy and climate policy

	Basis	Set target			
	2010	2020	2030	2040	2050
	Change in %:				
GHG-emissions (Basis 1990)	-23	-40	-55	-70	-80
TPES (Basis 2008)	-1	-20	-	-	-50
Total electricity consumption (Basis 2008)	-2	-10	-	-	-25
TFEC in the transport sector (Basis 2005)	-1	-10	-	-	-40
TPES of buildings	-	-	-	-	- 80
	Share in %:				
Renewable energies share of the TFEC	11	18	30	45	60
Electricity generation with renewables of the electricity consumption	17	35	50	65	80
Increase of energy productivity per year	1,84 % (1990-2008)	2,1 %			
Phase-out of nuclear power until 2022					

Sources: AGEb, AGEE, BMU, Bundesregierung, UBA

Instruments and measures in the EKonzept

- > more than 100 measures
- Reduction of GHG emissions, e.g.

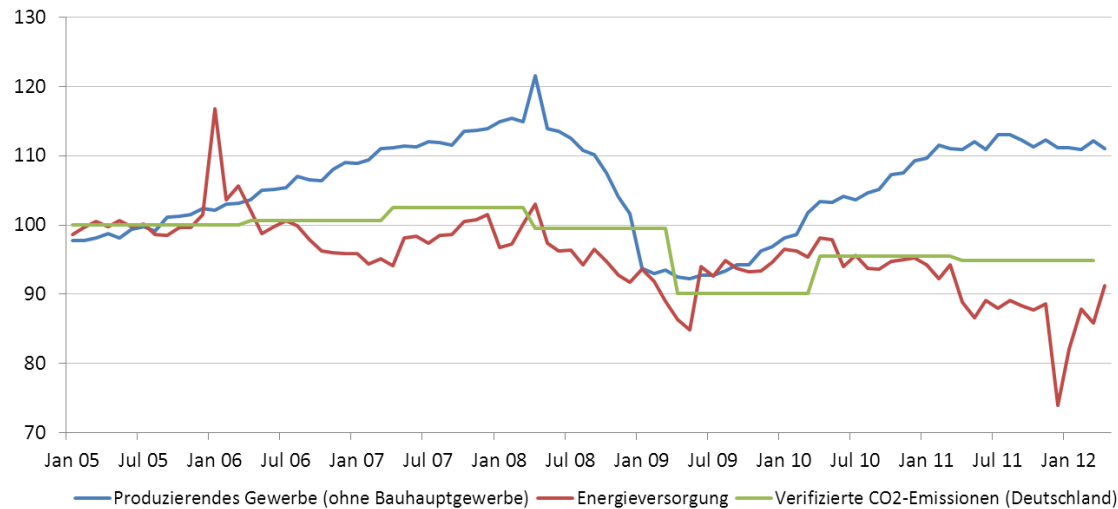


Development of the EU ETS: Phase III

- EU ETS Phase III: 2013 – 2020 (third phase)
 - **Free allocation will be progressively replaced by auctioning** (2009/29/EC, amending Directive 2003/87/EC)
 - Full auctioning for electricity generation
 - For other industries: in 2013 80% - this share has to be reduced down to 30% until 2020
 - For sectors producing trade and carbon intensive goods: Allocation based on a benchmarking system in order to avert economic disadvantages and carbon leakage
 - **More activities included in the EU ETS** (e.g. aviation from 2012 onwards)
 - Additional gases will be covered (N₂O, fluorinated hydrocarbons)
 - **Centralization of allocation** (EU-wide)
 - **Decreasing Cap:** Overall cap will be adjusted in 2013 and will decrease from 2013 onwards by 1.74 per cent/year
 - More restrictive regulations concerning the use of CERs / ERUs

Situation in 2011

- Slight reduction in emissions in 2011 (despite phase out, winter) (electricity - 5 million, industrie + 1 million tCO₂)



Source: CITL (2012), DEHST (2012)

	2005	2006	2007	2008	2009	2010	2011
Verified emissions (Mio. tCO ₂)	475,0	478,1	487,2	472,5	428,0	453,9	450,4
Change from previous year in percent		+0,6 %	+1,9 %	-3,0 %	-9,4 %	+6,1 %	-0,8 %
Cap	499,0	499,0	499,0	451,9	451,9	451,9	451,9

Situation in 2011

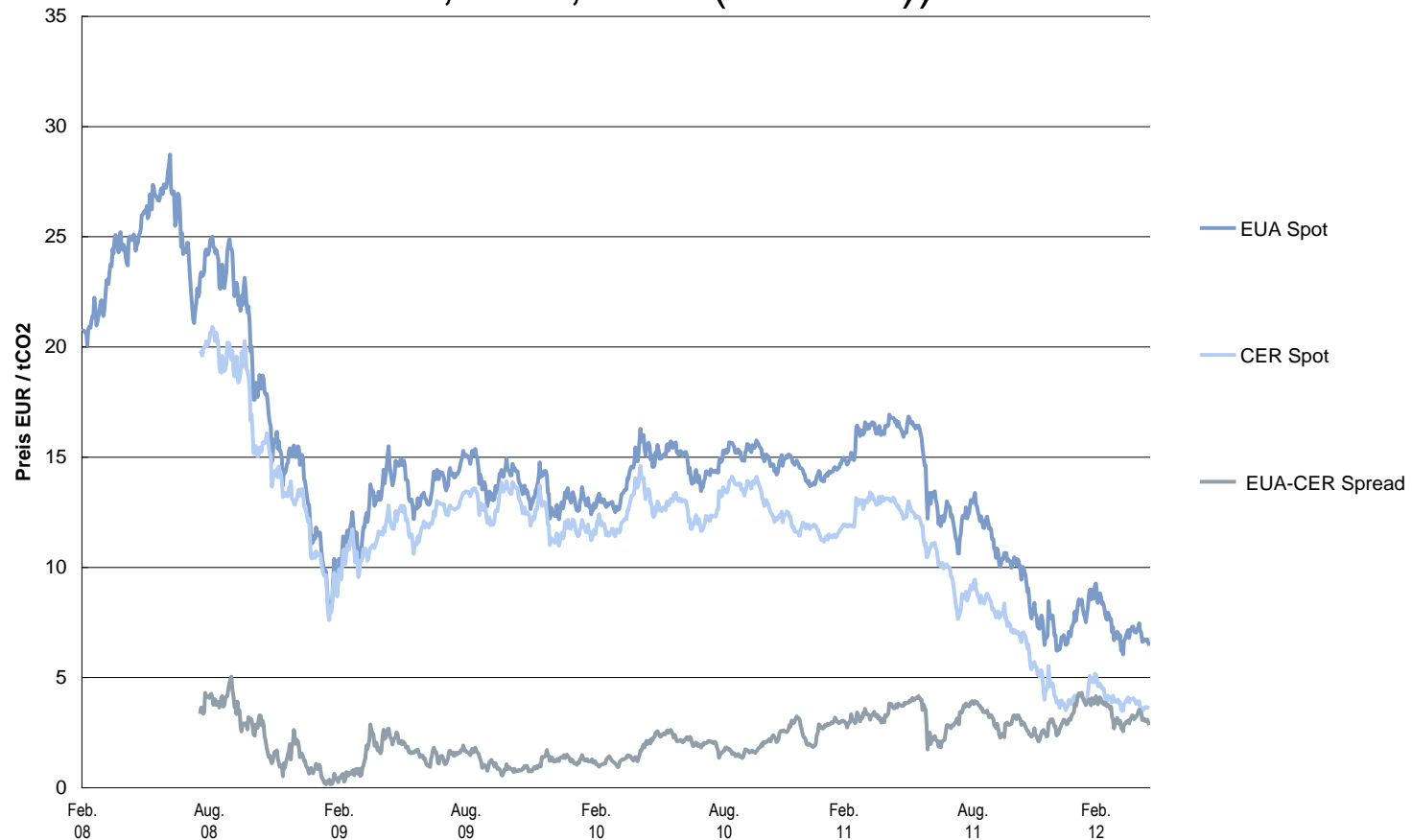
- Emissions and allocation in 2011 by industry

Sector	Verified emissions 2011 in ktCO ₂	Share of emissions (2011)	Change in emissions 2011 wrt previous year	Over- / under-allocation 2011 in ktCO ₂	# installations 2011
Power Plants (> 50 MW FWL*)	343.097	76,2 %	-1,3 %	-72.110	522
Iron, steel, cokeries	32.174	7,1 %	1,2 %	9.697	46
Refineries	21.751	4,8 %	-2,3 %	3.307	26
Cement	19.985	4,4 %	7,6 %	1.029	38
Lime	8.071	1,8 %	4,0 %	2.109	68
Small energy systems (20–50 MW FWL*)	6.813	1,5 %	-4,8 %	3.151	525
Propylen, ethylen & black	5.924	1,3 %	0,5 %	806	13
Pulp and paper	5.548	1,2 %	-5,3 %	1.467	130
Glass	4.196	0,9 %	3,4 %	827	93
Prime movers	1.396	0,3 %	-0,1 %	325	57
Ceramics	1.412	0,3 %	6,4 %	530	130
Sum	450.367	100,0 %	-0,8 %	-48.862	1.648

Electricity consumption decreased from 555 tWh (2010) to 544 tWh (2011)
 CO₂-emission factor electricity: 544 g/kWh (2010), 559 g/kWh (2011) (UBA)
 41 mill auction, 8 mill import of certificates

Situation in 2011

- Drop in CO₂ prices (from 16 to 7 EUR / tCO₂)
 (unchanged cap in economic crises lead to excess certificates in the EU-ETS of about 1,3 – 1,5 bn. (DEHST))



KfW/ZEW CO2 Barometer 2012

- Survey among all German companies in the EU ETS and international experts
- Survey on an annual basis (since 2009)
- Questions on trading activities, abatement measures, price expectations, CDM and JI
- Additional questions on current issues (voluntary emission reduction, carbon management)
- Combines the statements of companies and experts with official data sources like the Community Independent Transaction Log (CITL), Community Innovation Survey etc.
 - Size and branch of the companies (# employees)
 - Emissions of companies and installations (from CITL)
 - Analysis of short/long positions of EUAs.



KfW/ZEW CO₂ Barometer 2011 – Evidence from a German Company Survey

- **Surveyed German Companies** (data aggregated to the firm level):
 - 145 out of 816 companies responded (18%)
 - 392 of 1668 installations covered (24%)
 - 281 of 1,128 (25%) combustion installations
 - 111 of 540 (21%) industrial installations
 - 192 MtCO₂ of 454 MtCO₂ in Germany covered (42.3%)

- **Surveyed Carbon Market Experts**
 - About 2,000 persons in the database
 - 276 persons responded (14%)
 - 67% from private sector / 33% public or NGO
 - 70% from Europe, 11% Asia, 10% North America



The EU ETS and CO₂ Abatement Measures (1)

- **Abatement measures in retrospect**
 - 71 per cent of the companies implemented measures since the start of the EU ETS in 2005 - **In 2011, only small changes in abatement activities compared to the previous years.**
 - 32 % before 2005, 30 % 2005-2007, 47 % 2008-2011, 66 % 2013 -
 - large companies and manufacturing industry
 - 9 per cent say CO₂ abatement was the main reason for activities (17% for 2013-2020)

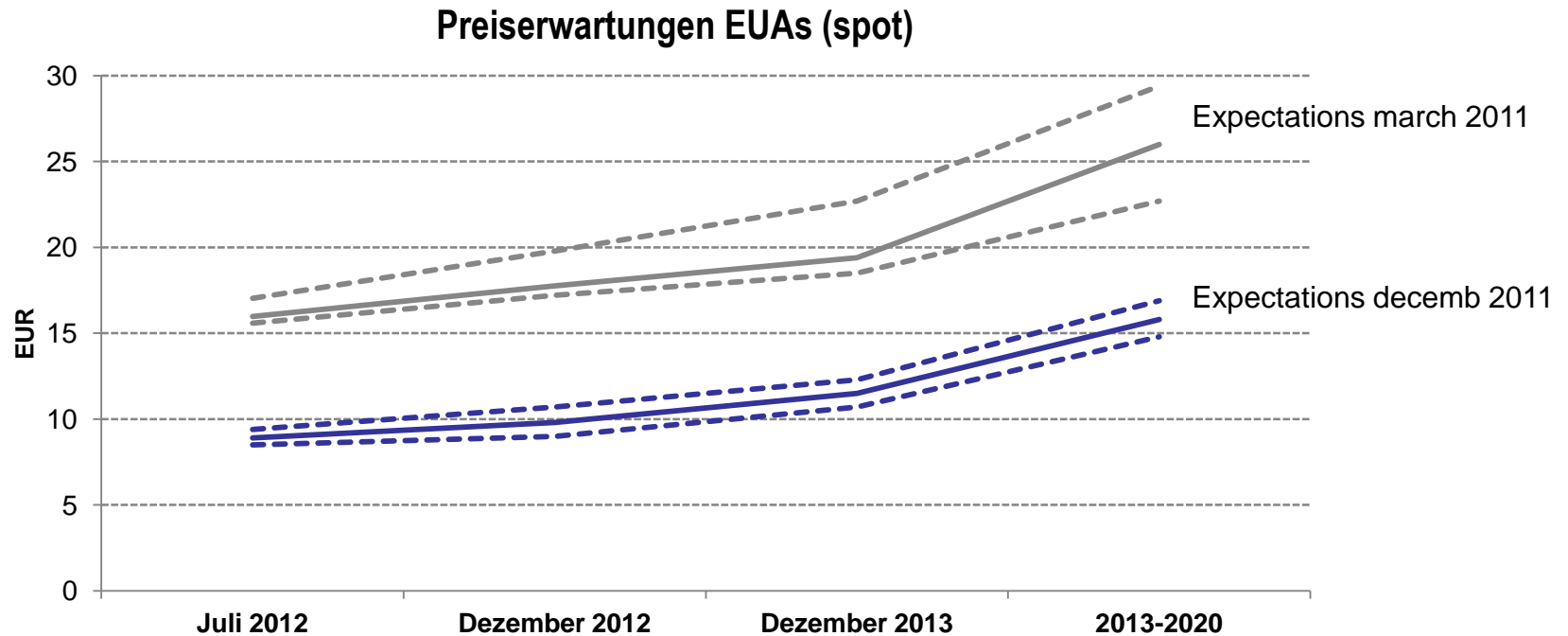
The EU ETS and CO₂ Abatement Measures (2)

- Type of abatement investment in 2005-2011

Jahr	Process optimization	Investment in energy efficiency	Fuel switch	Renewables	Output reduction
2009	66 %	58 %	14 %	15 %	20 %
2010	63 %	59 %	26 %	25 %	9 %
2011	65 %	63 %	27 %	22 %	8 %

Emissions Trading in Practice

- Price expectations in the longer run:



Expectations concerning the EU ETS Phase III

- 72% of surveyed firms had evaluated their free allocation form 2012 onwards by March 2010
- In average firms expect 65% free allocation compared to the current allocation in Phase II of the EU ETS
- currently 27% of firms (not installations) in Germany are “short” - based on individual expectations 63% of firms in Germany would be “short” in 2013 (10 % expect even higher free alloc)
- end of Jan request by industries (published end of Oct), provisional allocation based on requests send to EC in May

CDM / JI

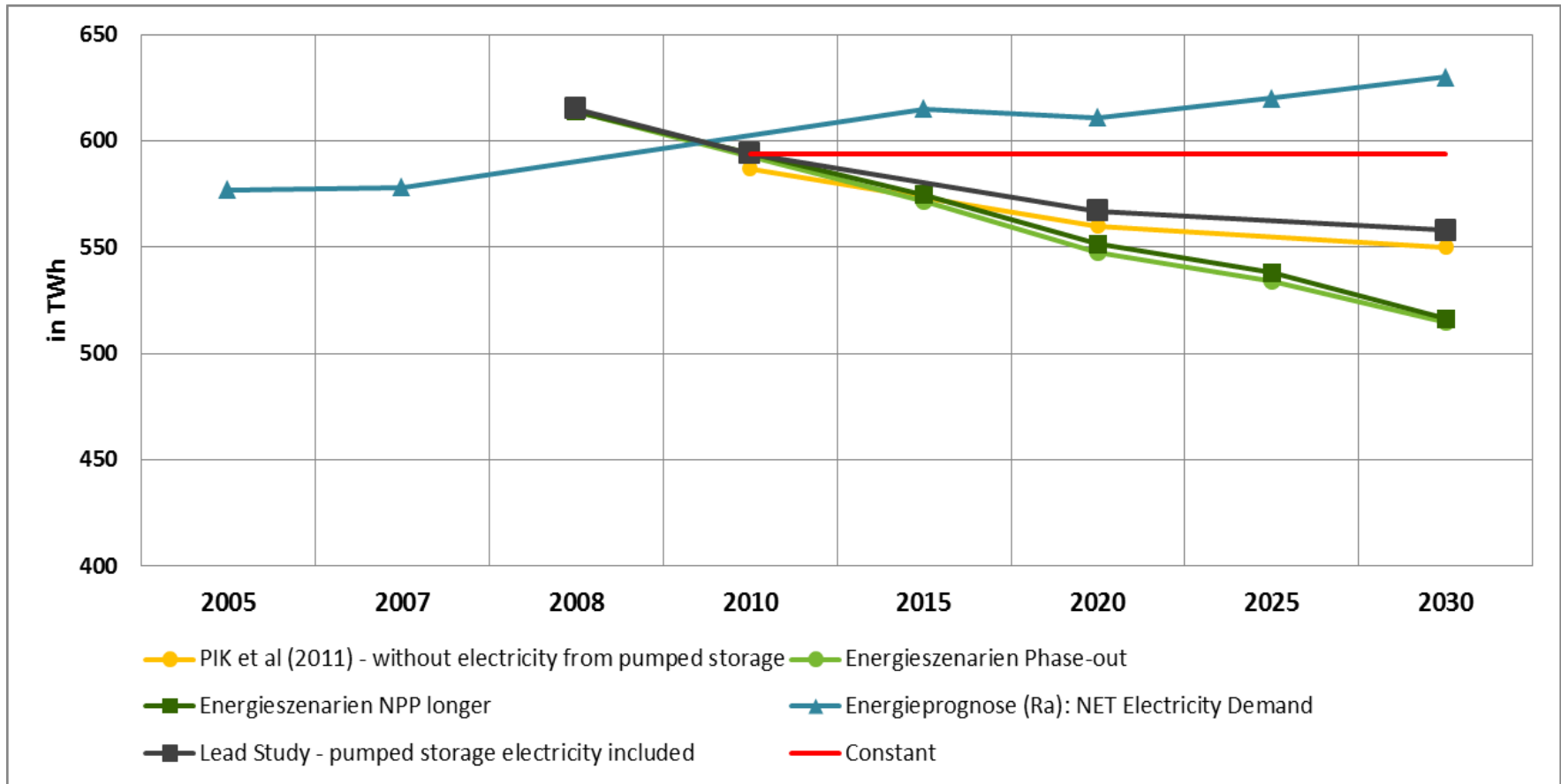
- **increased use for compliance (also more issued)**

	2008	2009	2010	2011	Gesamt
EU					
CERs	82,5	77,9	116,9	178,8	456,1
ERUs	0,05	3,2	20,1	75,8	99,2
Deutschland					
CERs	23,7	26,0	33,4	41,1	124,2
ERUs	0,0	0,67	4,2	33,2	38,1

Phase out scenarios for Germany

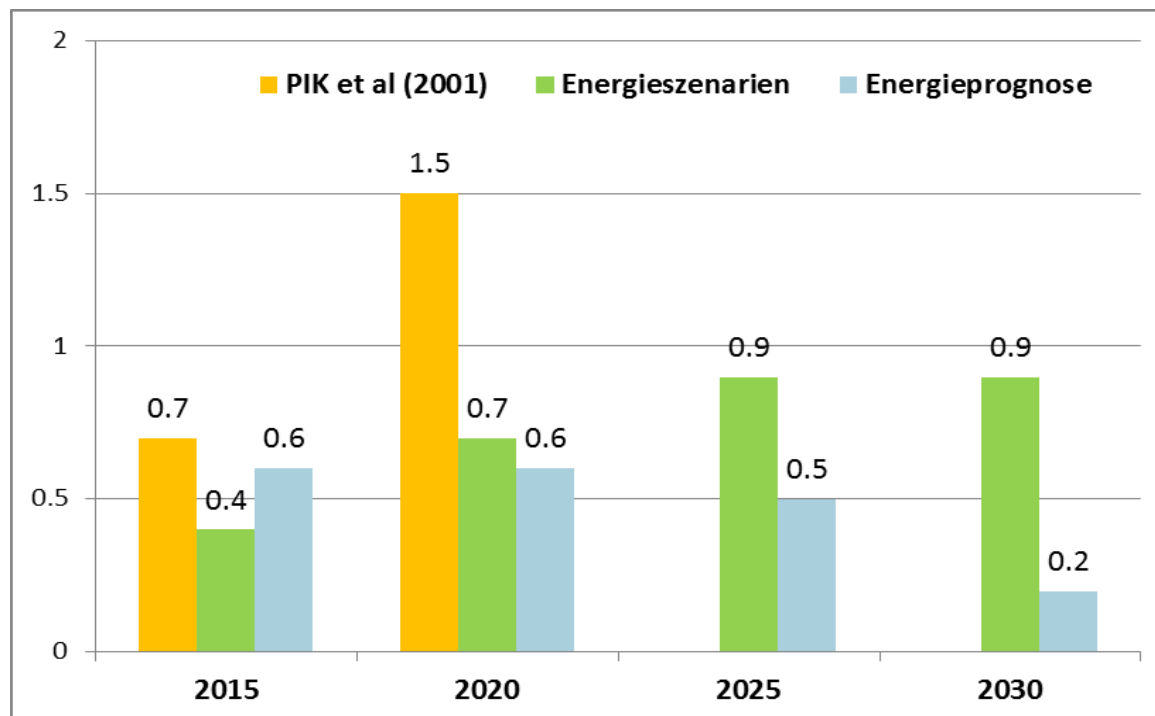
<p>Target Scenarios</p>	<ul style="list-style-type: none"> - PIK et al (2011) for Friedrich-Ebert Foundation, June 2011 - Energieszenarien 2011/Energy Scenarios 2011 by EWI, GWS, Prognos AG for the Federal Ministry of Economics and Technology (BMWi), July 2011. There exists an earlier version (Energieszenarien 2010) that had been ordered by the German government for the Energiekonzept. - Leitstudie 2010/Lead Study 2010 for BMU, December 2010
<p>Non-Target Scenario</p>	<p>Energieprognose 2009 by IER, RWI, ZEW for the Federal Ministry of Economics and Technology (BMWi), March 2010</p>

Development of Gross Electricity Consumption



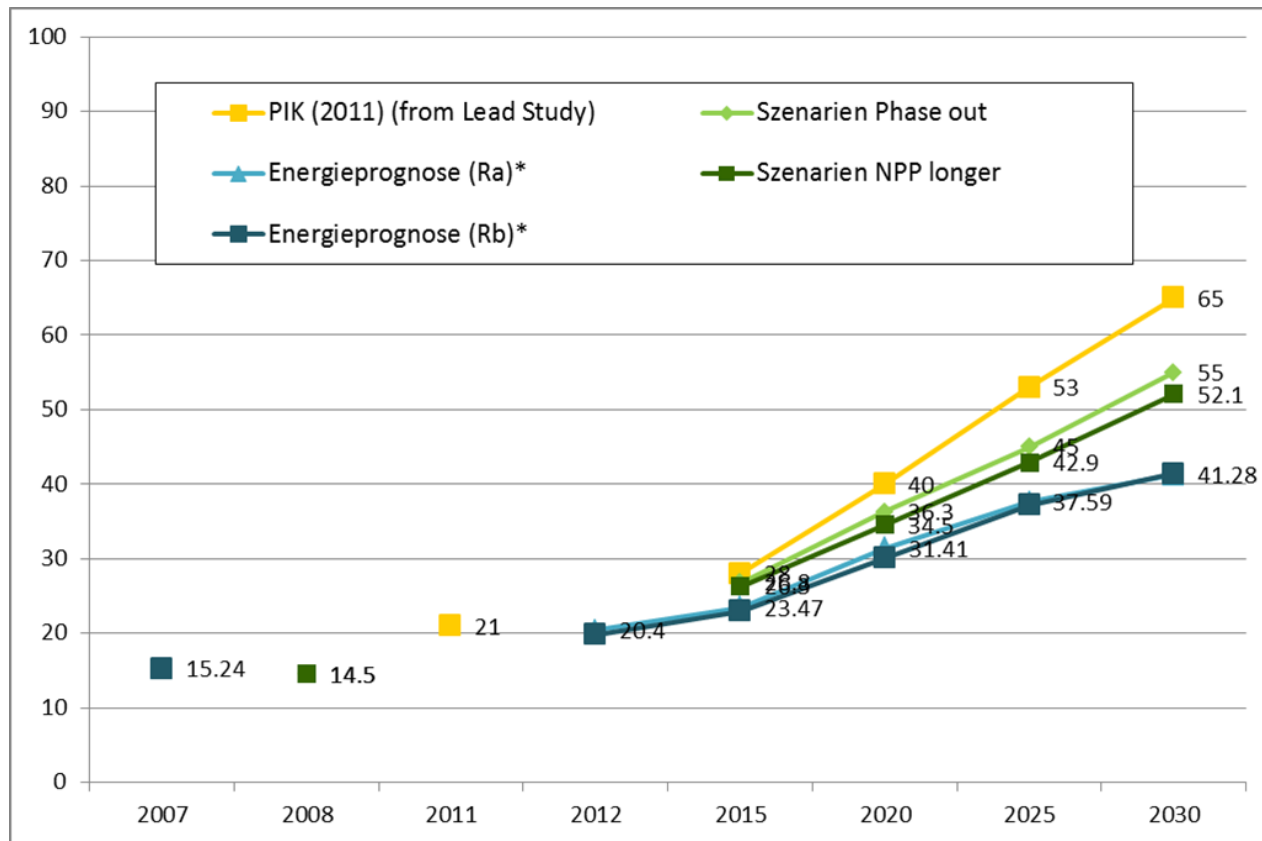
Change in Wholesale Electricity Prices in cent/kwh

- higher wholesale prices (base load) for electricity
- widening gap
- different assumptions - gas plants set price

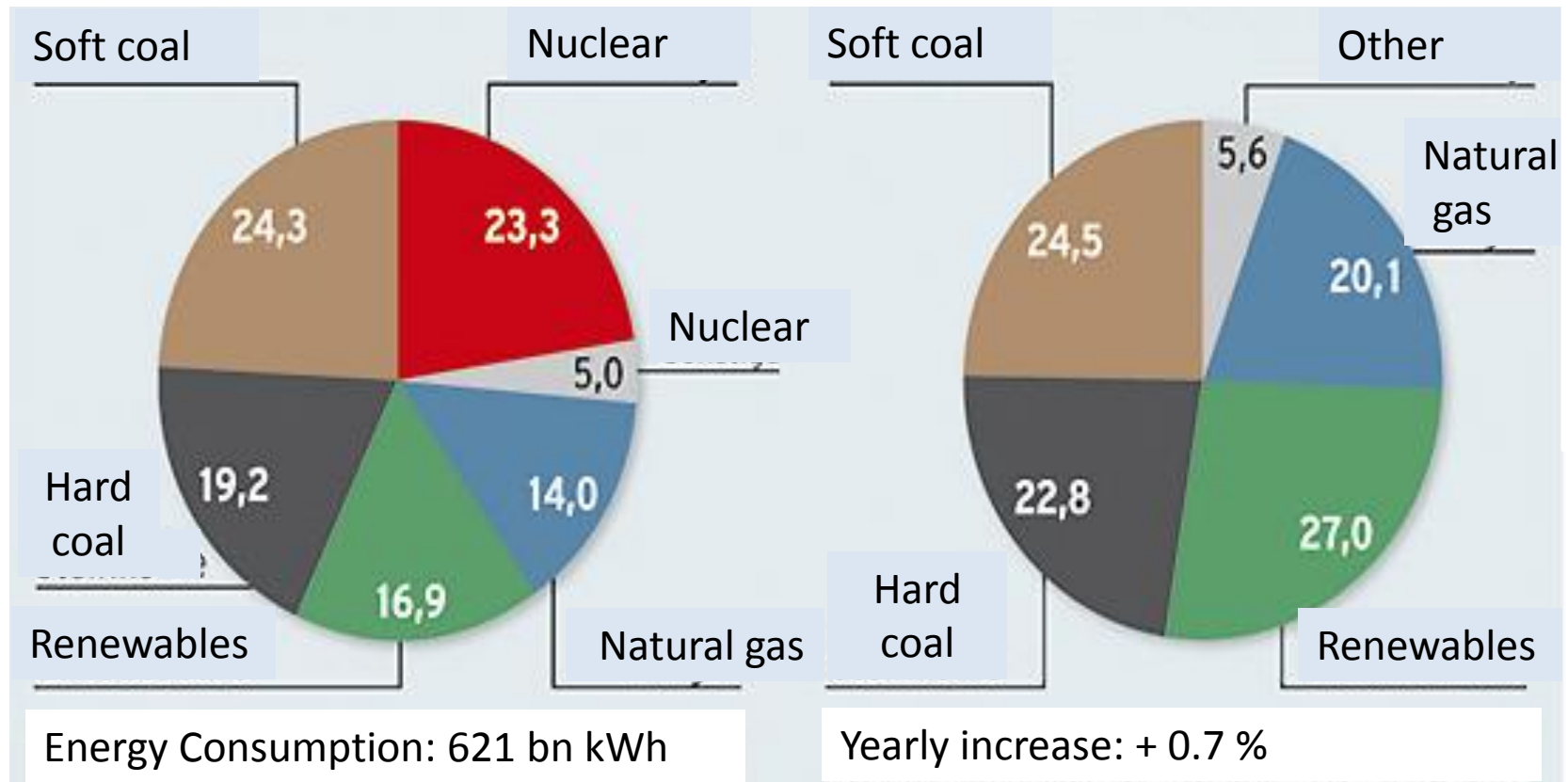


Share of renewables in electricity production

- achieved in Szenarien (newer)
- missed in Energieprognose



Structure of Electricity Generation



Quelle: Energieprognose 2009, F.A.Z.

Slightly reduced generation with increased imports

Large increase in Wind (offshore) and natural gas

Emissions and permit prices: Assumptions / results

	2015	2020	2025	2030
Emission Permits in EUR/t				
PIK et al (2011)	26	31.2	34.3	36.4
Energieszenarien	15	20	29	38
Energieprognose (Ra)	40.1	30.3	28.5	31.3
Energieprognose (Rb)	35.8	27.1	27.3	31.6

- Energieprognose

	Status Quo (2008)	Ziel 2020	Erläuterung	Phase out of nuclear		Extended lifetimes	
				2020	2030	2020	2030
CO ₂ emissions	-19% (1990-2007)	40 %		-33%	-43%	-34% bis -36%	-44% bis -48%
Renewable Energy	9,3% (2007)	18%	Anteil am Bruttoendenergieverbrauch	16%	20%	16%	20%
Renewables in Electricity	14%	30 % 35 %	Anteil am Bruttostromverbrauch	27%	36%	27%	35% bis 37%

Conclusion

- **Abatement** incentives from EU-ETS low, but companies plan to become more active in CO₂ abatement
 - **Stricter regulation in Phase III strengthens incentives**
- Higher **price** expectations for Phase III, but also still significant free allocation of allowances via **benchmarking** (price expectations dropped from last year)
- Achievement of German climate target likely
- Political pressure to increase CO₂ target in ETS