



“The German Energiewende”: Shining or Warning Example for Europe?

5th Conference ELECPOR

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„Dann geht in Deutschland das Licht aus“

RWE-Chef Peter Terium über einen drohenden Blackout, den Kampf gegen den Untergang des Energiekonzerns, seine Forderungen an die neue Regierung und Ausstiegsszenarien für den Tagebau

INTERVIEW: MARKUS BALSER

RWE-Chef Peter Terium, 50, kennt sich mit vertrackten Situationen aus. In seiner Heimat spielte der Niederländer viele Jahre in der Bundesliga Golf-Billard, eine Mischung aus Snooker

vom Netz gehen. Das ist voraussichtlich noch nicht das Ende. Denn klar ist: Rund 10 000 MW stehen in ganz Europa unter kritischer Beobachtung. Ein Teil davon geht sicher vom Netz. Ich hoffe, dass die Politik aus diesen Warnungen

künftig mit weniger Mitarbeitern auskommen müssen. Um eins klar zu sagen: Rückzug aus Deutschland ist nicht infrage und



Peter Terium ist Wirtschaftsprüfer und arbeitete zunächst für das niederländische Finanzministerium. Vor zehn Jahren stieg er bei RWE ein und löste 2012 Ex-RWE-Boss und Atombefürworter Jürgen Großmann ab.
 FOTO: DPA

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RWE warnt vor Strom-Blackouts

Der Chef des Essener Konzerns befürchtet, dass es europaweit zu Engpässen kommt. Jedem fünften Kraftwerk drohe mangels Rentabilität die Abschaltung. Erstmals übt der Manager auch Selbstkritik

VON MARKUS BALSER

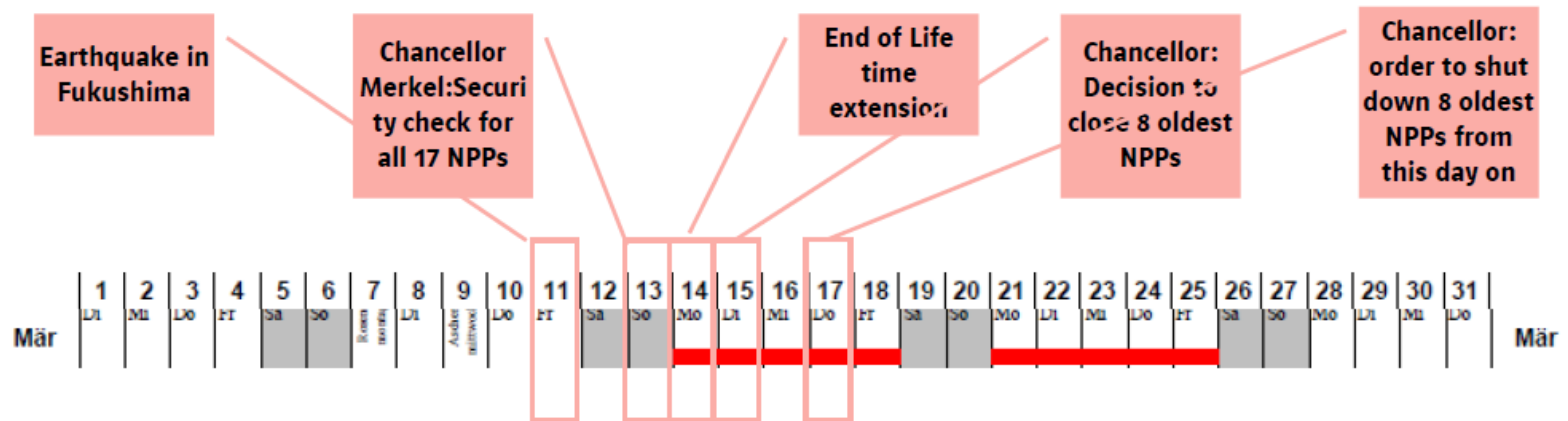
Berlin – Deutschlands Stromindustrie warnt angesichts einer neuen Welle von Kraftwerksabschaltungen vor gefährlichen Blackouts in Europa. Dem gesamten Kontinent drohen Engpässe, sagt Peter Terium, Chef des zweitgrößten deutschen

beizern auskommen. Auch einen Zusammenschluss von RWE mit einem Partner schließt das Unternehmen nicht aus.

Erstmals rechnet der seit Juli 2012 amtierende RWE-Chef auch mit der Vergangenheit des Konzerns unter seinem schillernden Vorgänger Jürgen Großmann ab.

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March 2011: Impact of Fukushima



What are the elements of the German Energiewende?

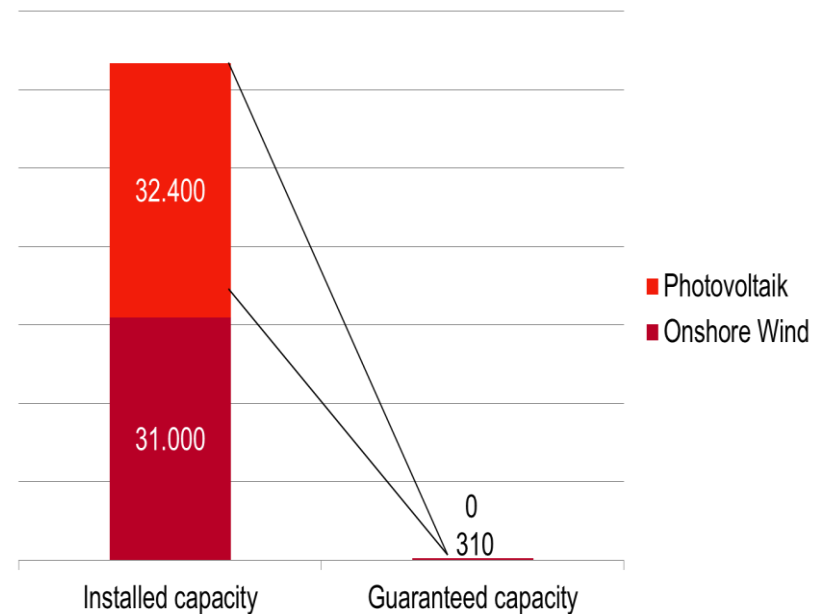
- 1 **Low-carbon economy by 2050:** (CO₂ emissions to be reduced by 85-90% compared to 1990)
- 2 **Economy build on RES** (80% power generation from RES in 2050, fossil only back-up)
- 3 **Expedited nuclear phase-out** (till early 20s)
- 4 **Load destruction and efficiency gains**

The project is based on the assumption that a highly industrialized society can be securely and competitively supplied by a generation system based predominantly on RES.

RES capacity (in MW)* w/o hydro

	1991	2000	2010	2012
Wind	100	6.100	27.200	31.300
PV	- -	<100	17.500	32.600
Other				7.500
Total				71.400

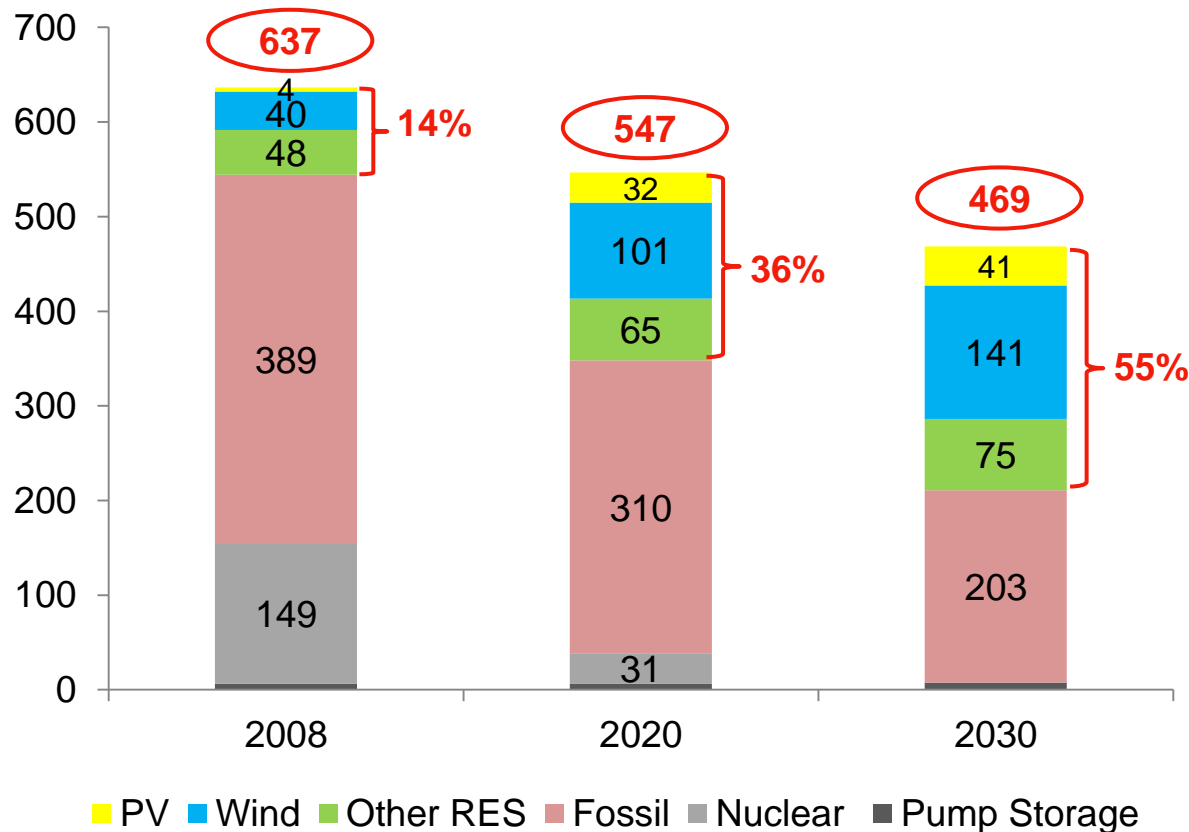
Installed and guaranteed capacity from onshore wind/pv at the end of 2012 in MW



* Source: BMWi

In the context of heavy load destruction, RES will become the dominant energy source

Electricity Generation mix 2008-2030 in TWh

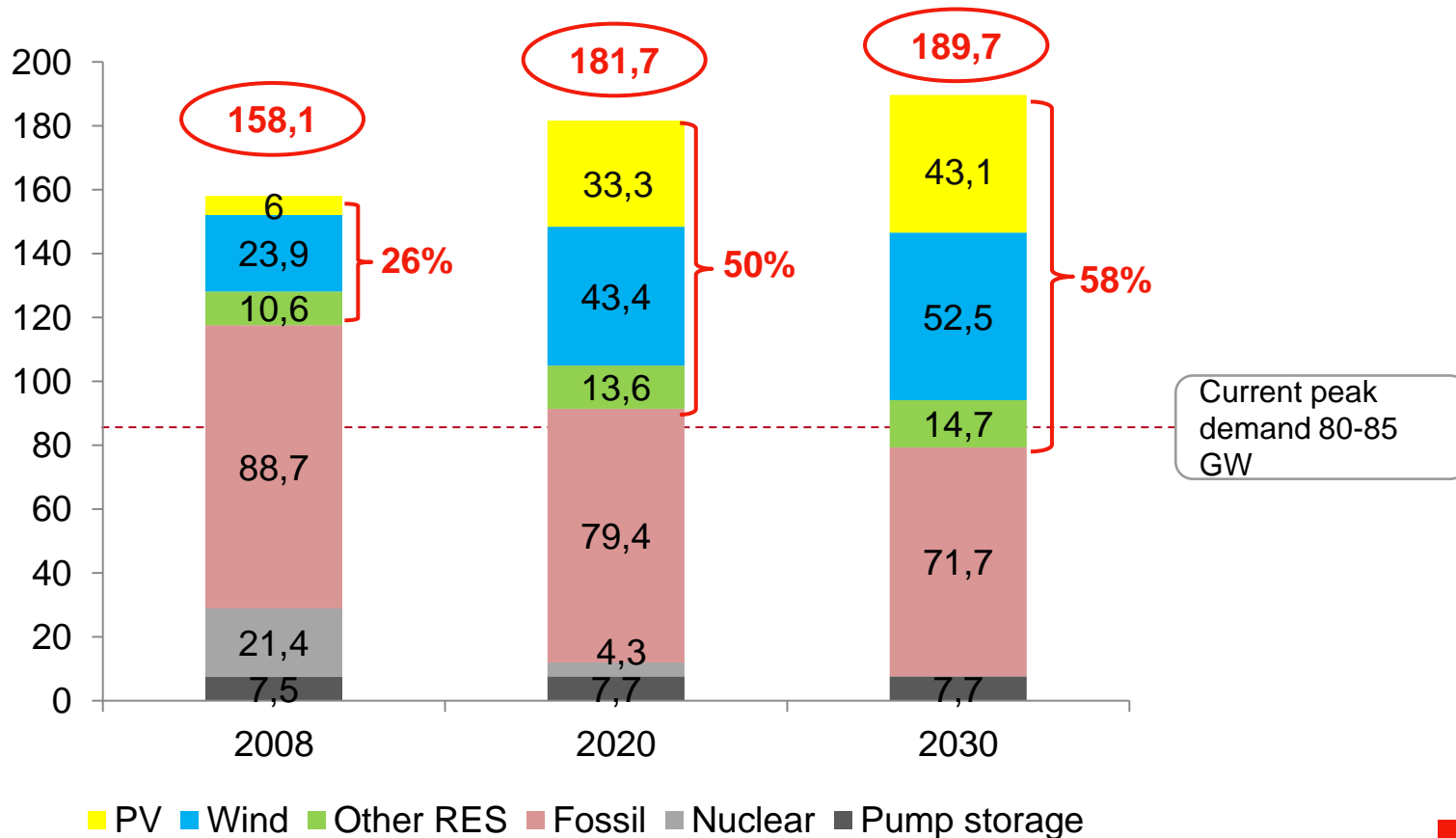


- 1) RES becoming the dominant energy source (~ 55%)
- 2) Overall load destruction through assumed efficiency gains

Source: Prognos, EWI, GWS 2011

In addition, installed RES capacity will 'explode' while running hours of conventional back-up will steeply decline

Installed Generation capacity 2008-2030 in GW



Source: Prognos, EWI, GWS 2011

Four phenomena show that the current market set-up is clearly off-balance and far from meeting the ambitions of the Energiewende

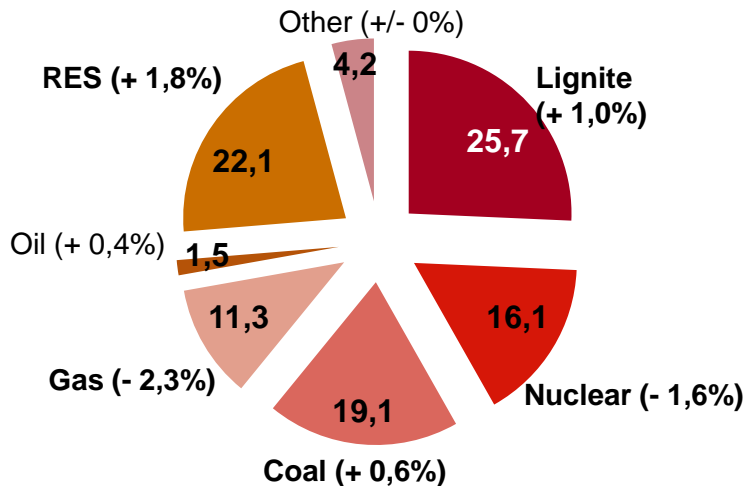
- 1 **CO₂ emissions are up**, because falling wholesale prices squeeze out efficient new gas power plants and favor old coal and lignite
- 2 **Costs for end-consumers are up** and continue to grow, which causes a debate around burden sharing with industrial customers that pay only a fraction of grid and RES subsidies
(price for 2014: ~30,0 ct/kWh, thereof 6 ct for RES subsidies only)
- 3 Grid operators need to step-in more often to **ensure grid stability**
(~ 1200 interventions in 2012 only)
- 4 **Competitiveness and investability** of European utilities are **at stake**

CO₂ emissions are up...

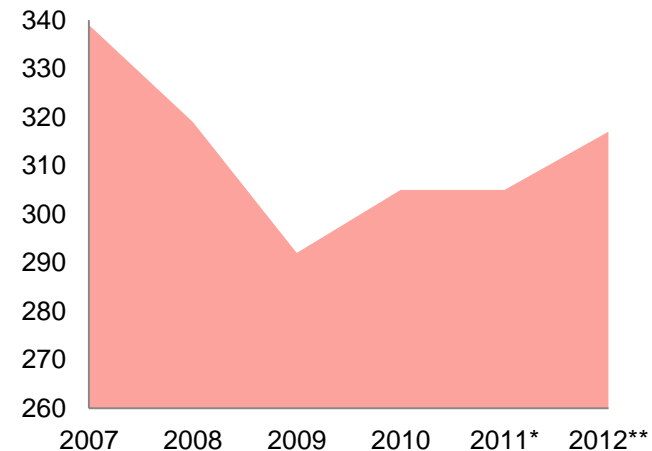
Current market set-up

- Due to massive RES priority feed-in, wholesale electricity prices at the German power exchange are falling (last year's estimate for 2014 power price at 48€/MWh, today's estimate at 37€/MWh)
- Load destruction and margin destruction: highly efficient gas power plants are squeezed out of the market in favor of old coal and lignite

Sources of power generation in Germany in 2012 (in percent)



CO₂ emissions due to power generation (in mio. t.)



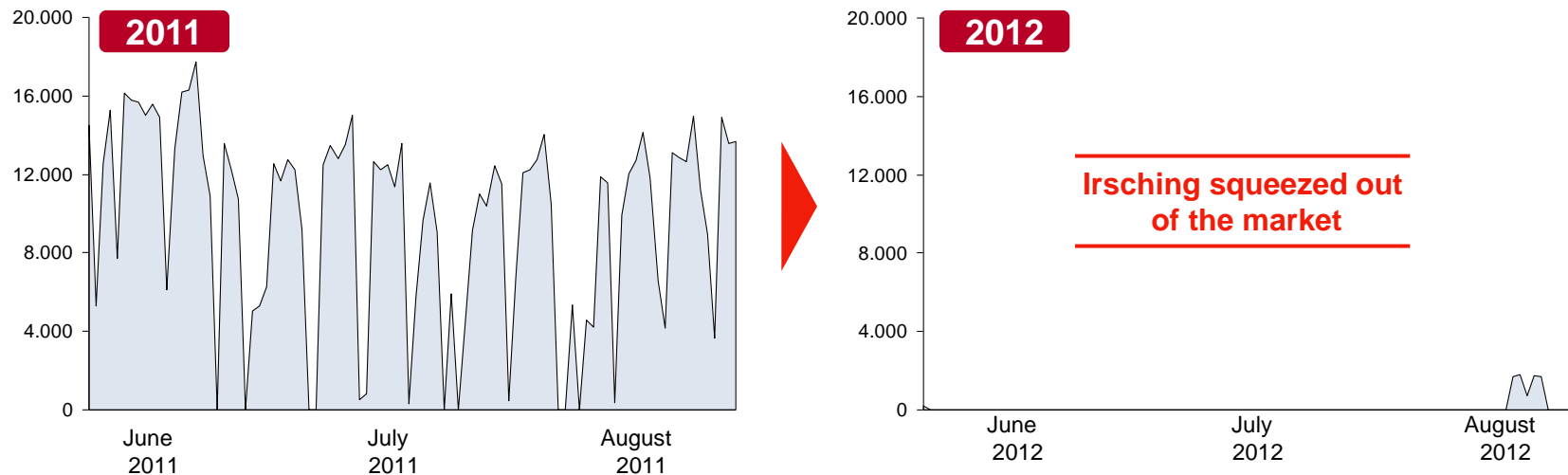
Source: AG Energiebilanzen; (Figures in brackets: comparison to 2011)

Source: German Federal Environment Agency;
* Preliminary, ** First estimate

...because falling wholesale prices squeeze out efficient new gas power plants in favor of old coal and lignite

Example:

Electricity generation at E.ON's Irsching Gas power plant (2011 vs. 2012, in MWh)



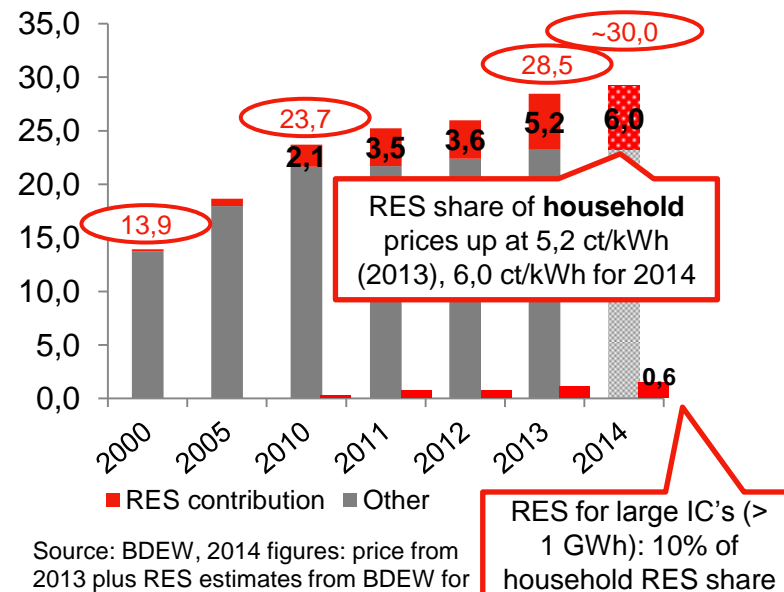
Source: www.eon-schafft-transparenz.de

Costs for end-consumers are up and cause a public debate around burden-sharing, while industrial customers only pay a fraction of the subsidies

Current market set-up

- Must run for RES and feed-in guarantee for producers
- Producers compensated via a contribution added to the general electricity bill for end-consumers (households, SMEs, industrial customers)
- Energy-intensive industries can be exempted from RES contribution

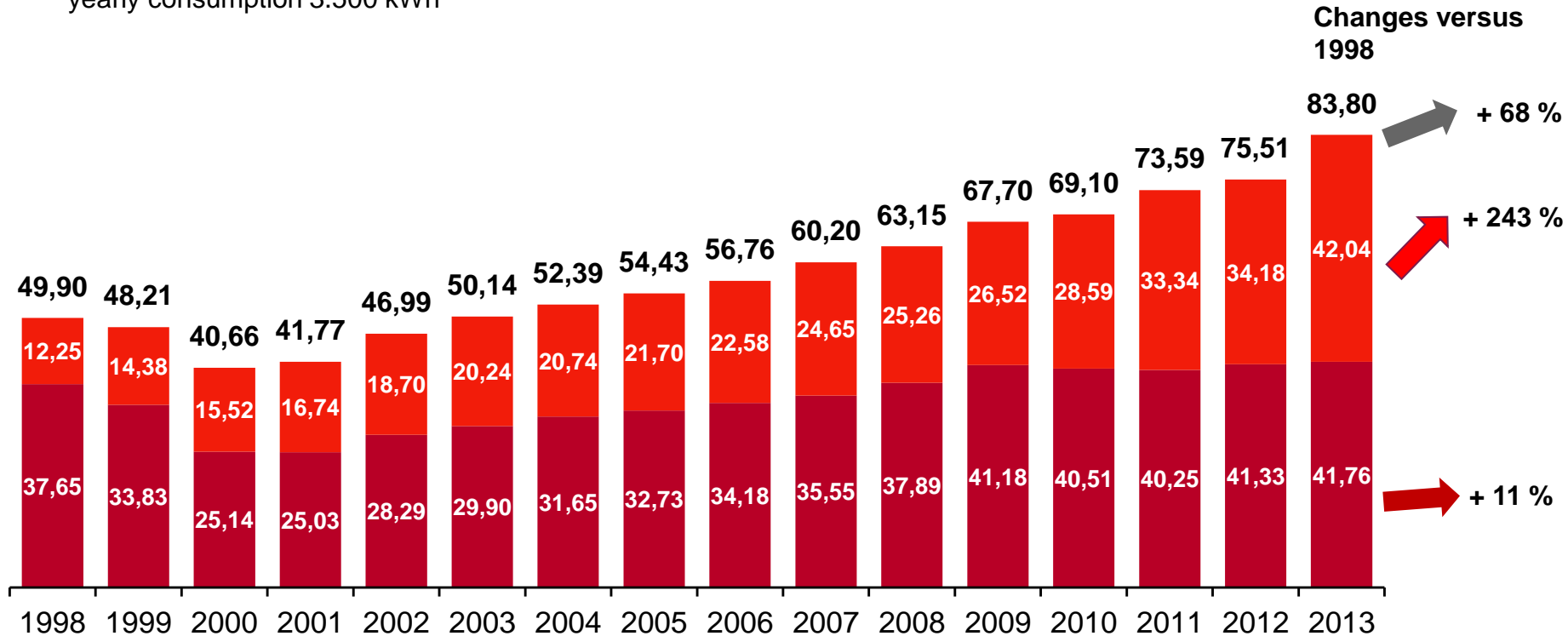
Average household electricity price (in ct/kWh, yearly consumption of 3.500 kWh)



Electricity bills for households

Average monthly electricity bill of a three-person household in Euros

yearly consumption 3.500 kWh



Generation, transport and sales

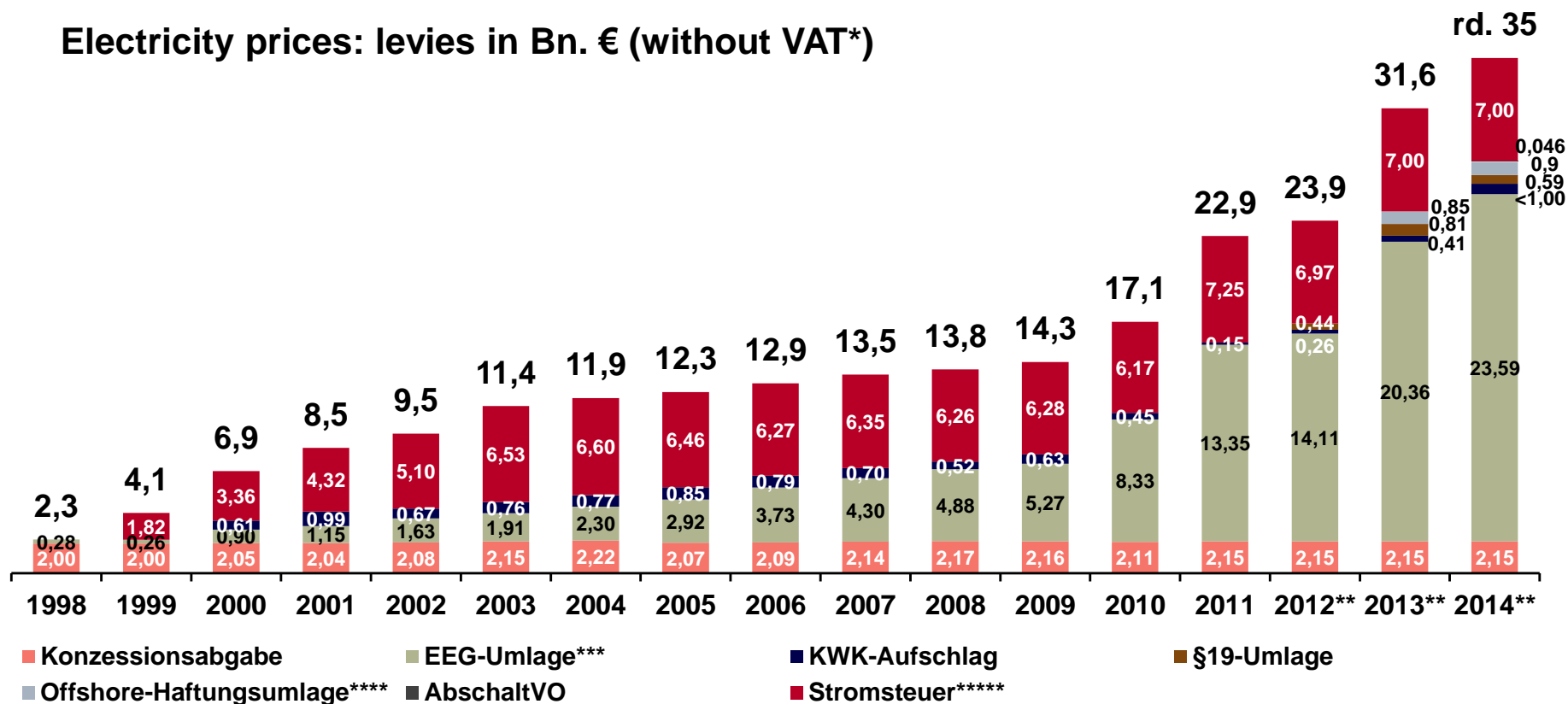
Taxes, charges and levies
 (German Renewables Energies Act (EEG), Combined Heat and Power Generation Act, levy based on §19, electricity tax, concession fee, VAT)

Source: BDEW, as of: 04/2013

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Electricity price: Taxes and levies

Electricity prices: levies in Bn. € (without VAT*)



* Mehrwertsteuerbelastung 2013 rd. 7,5 Mrd. Euro

** teilweise vorläufig oder Schätzung

*** bis 2009 Mehrkosten gegenüber Börsenpreis; ab 2010 Anwendung AusglMech; 2012/2013 gemäß EEG-Umlagenprognose

**** 2013: Schätzung

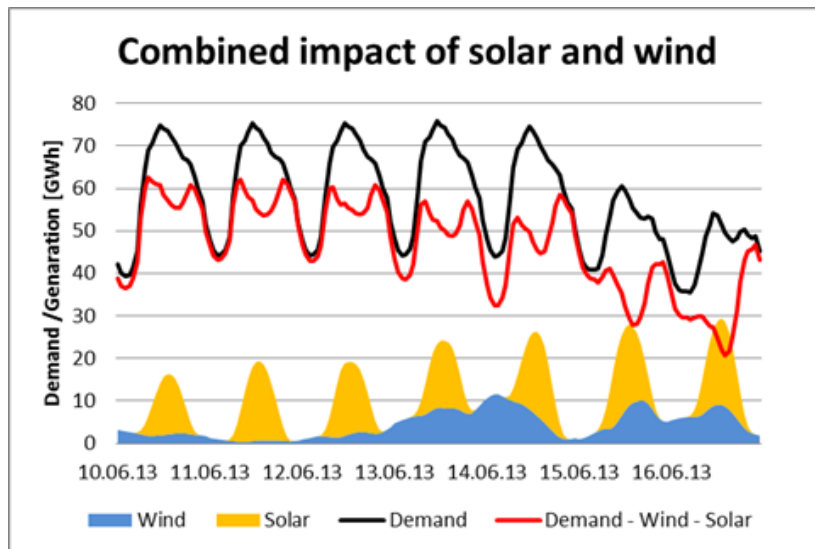
***** 2012/13: gemäß AK „Steuerschätzung“ des BMF, Mai 2013

Source: BDEW, as of: 24.10.2013,
KWK-Aufschlag 2014 noch nicht bekannt

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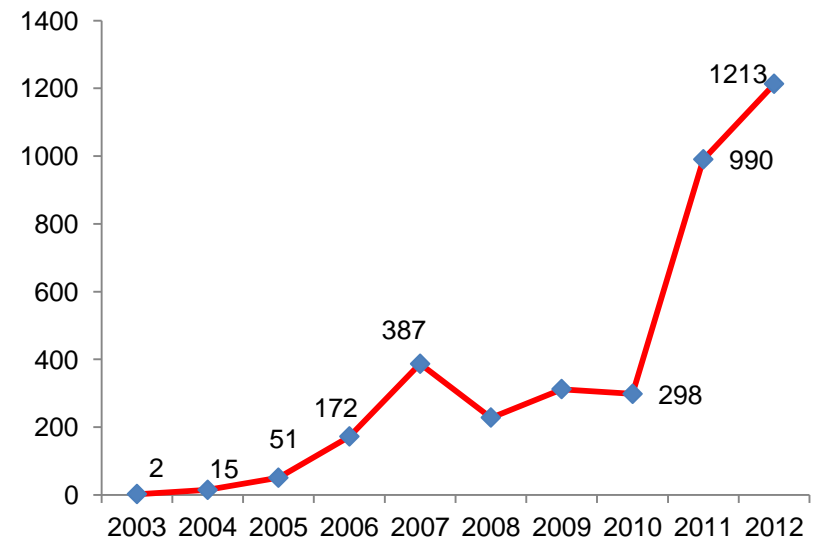
Wind and solar feed-in have strong impact on load curve so that grid operators need to step-in more often to ensure grid stability

Increasing volatility of German load curve



Source: E.ON Global Commodities SE

Interventions to stabilize the grid by grid operator Tennet, 2003-2012



Source: Tennet

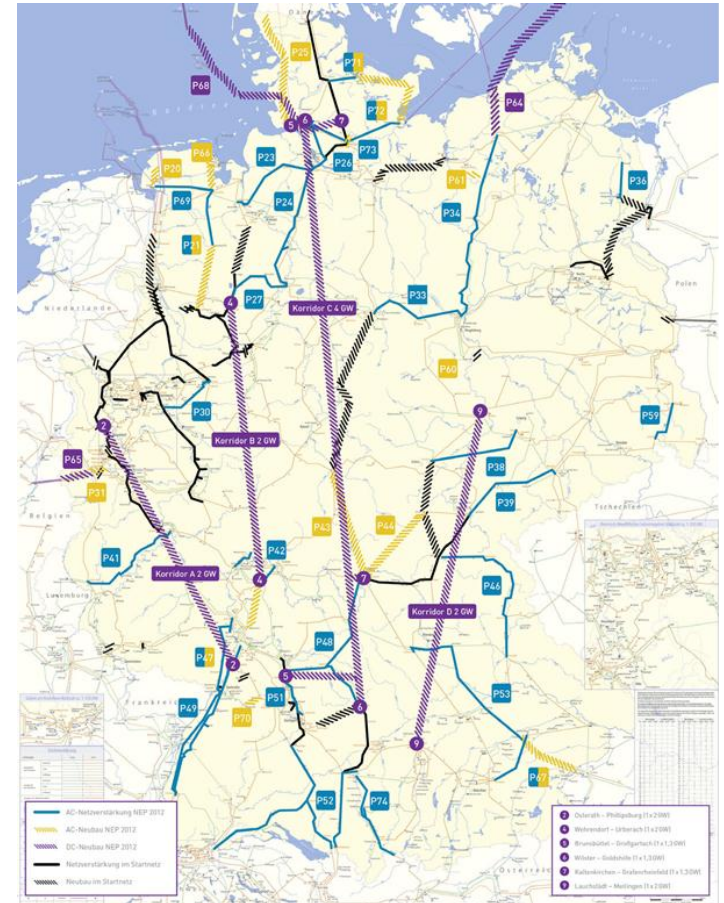
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Political discussion in Germany

Main forward-pressing issues in Germany are:

- Price increase of electricity tariffs
- Network expansion
- New system for renewables
- Capacity mechanism

Due to the election in September 2013 nothing will be implemented in Germany until 2014



We need four cornerstones to get the system back on track – turn the Energiewende upside down

1	Reform of the RES	Introduction of a capacity mechanism	2
<ul style="list-style-type: none">• RES to take <u>responsibility for the whole system</u> and to become part of the EU Internal Market for electricity• Installation of additional capacities only <u>in line with grid enhancement</u> and <u>based on cost competitiveness</u> (various models discussed)		<ul style="list-style-type: none">• Introduction of a capacity market needed, that<ul style="list-style-type: none">• <u>avoids closures</u> of existing conventional generation capacity and <u>incentivizes new-builds</u>• is not technology-specific, non-discriminatory• Discussion on ageing fleet and its efficiency	
<ul style="list-style-type: none">• ETS needs to regain its steering function• Therefore <u>quick-fix for 2020</u> and <u>high objectives for 2030</u> needed		<ul style="list-style-type: none">• In Germany, between <u>21–27 bn. € investments</u> into the Grid needed• Thereof 60% within the 110KV grid• Ensure that RES producers pay their share in <u>grid modernization</u> (myth around net metering)	
3	Reform of ETS	Reform/ modernization of the grid	4

▶ Thus make the energy system efficient, European and cost competitive again!

Discussion about integration of renewable electricity

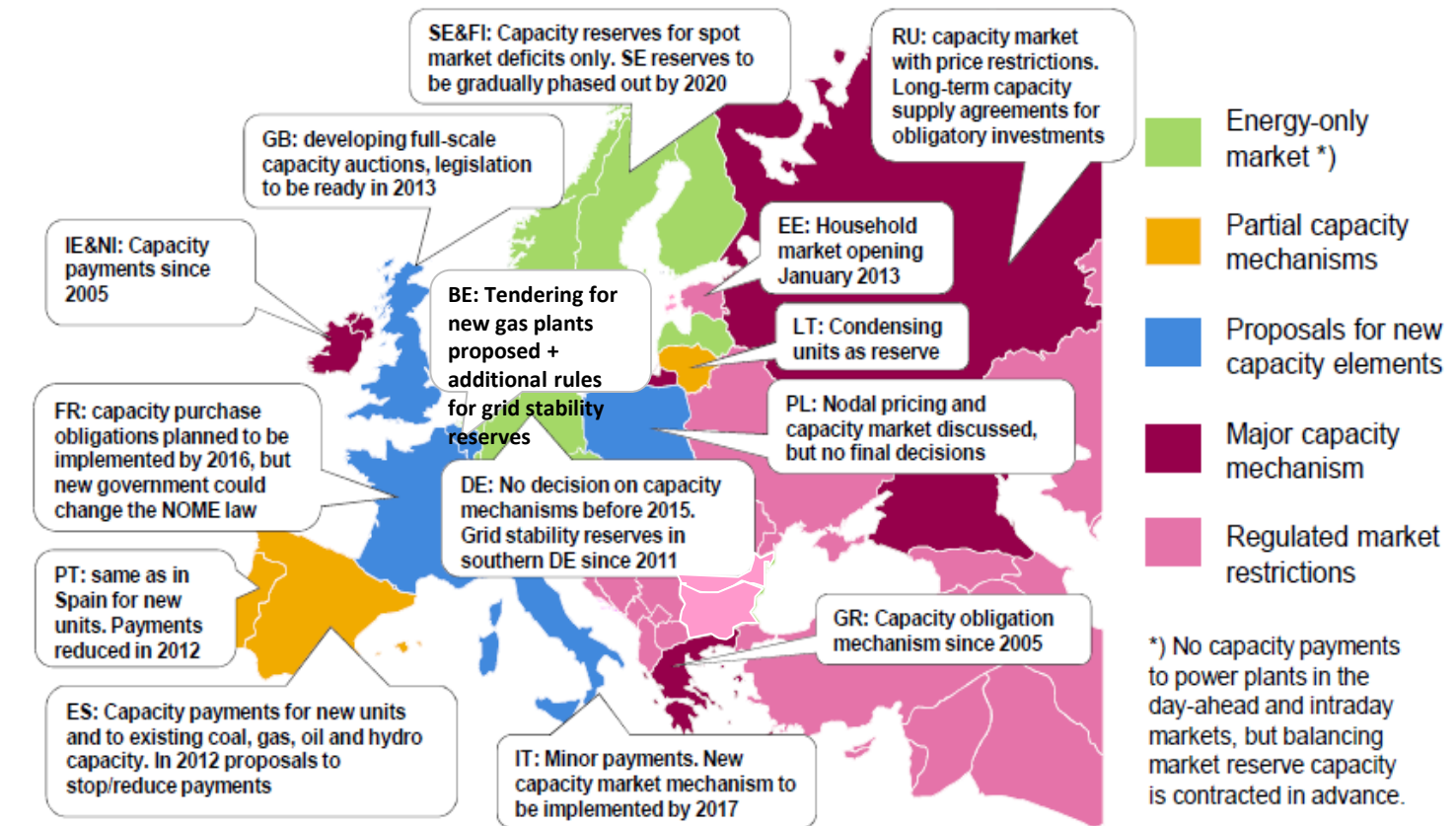
Also the discussion about new renewable system is in progress. All political parties agree in changing the existing model – driver is the cost reduction. At least there is no majority to implement due to the election in September 2013.

E.ON Position:

- RES should become part of the internal market for electricity, therefore support systems should be based on market-mechanisms.
- E.ON believes that RES support should evolve to an EU-wide approach
- Reliable support schemes within a market environment are the best precondition for cost reduction of RES technologies
- RES-E should be subject to the same market and grid related rules as conventional generation capacities.

Will we see a European capacity mechanism design?

Member States have taken the lead



Discussion about capacity markets

Discussion about capacity markets is in progress

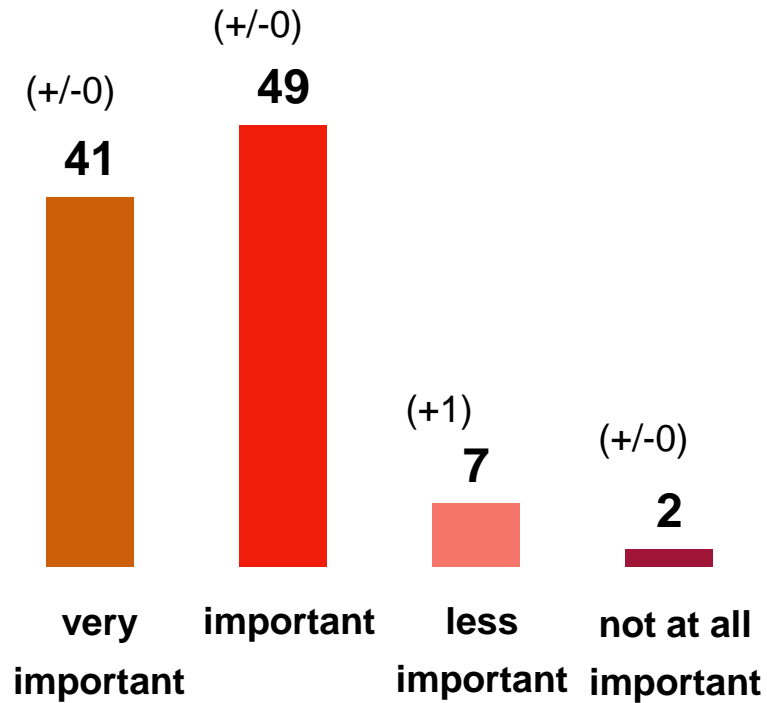
In 2014, new government must decide on new capacity mechanism in Germany.

E.ON Position:

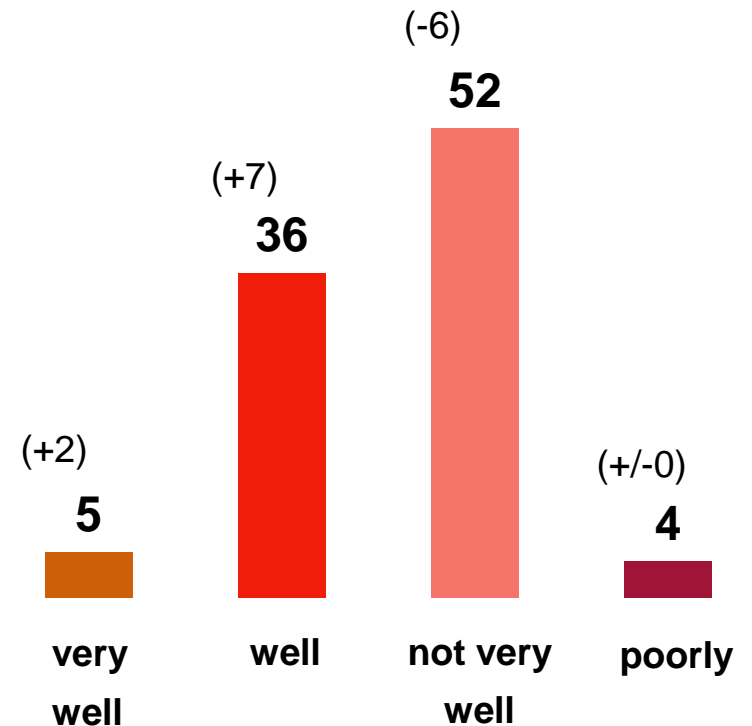
- Market design shall be based on competitive elements to ensure efficient solutions
- Capacity mechanisms should be considered only if security of supply is at risk
- Any capacity mechanism shall be designed from a European perspective and harmonized with neighbouring countries
- Capacity mechanisms should not favor a specific technology or new investment only and it should not exclude any market participants

Importance and progress of the „Energiewende“

The Energiewende is...



The Energiewende is progressing ...



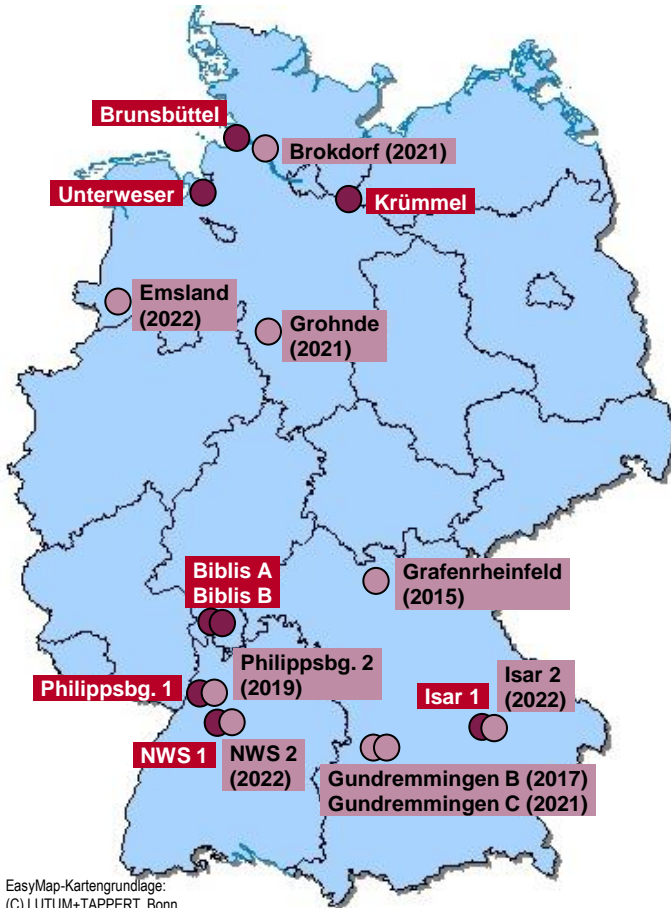
n = 1.016
changes vs. 06/2012 in brackets

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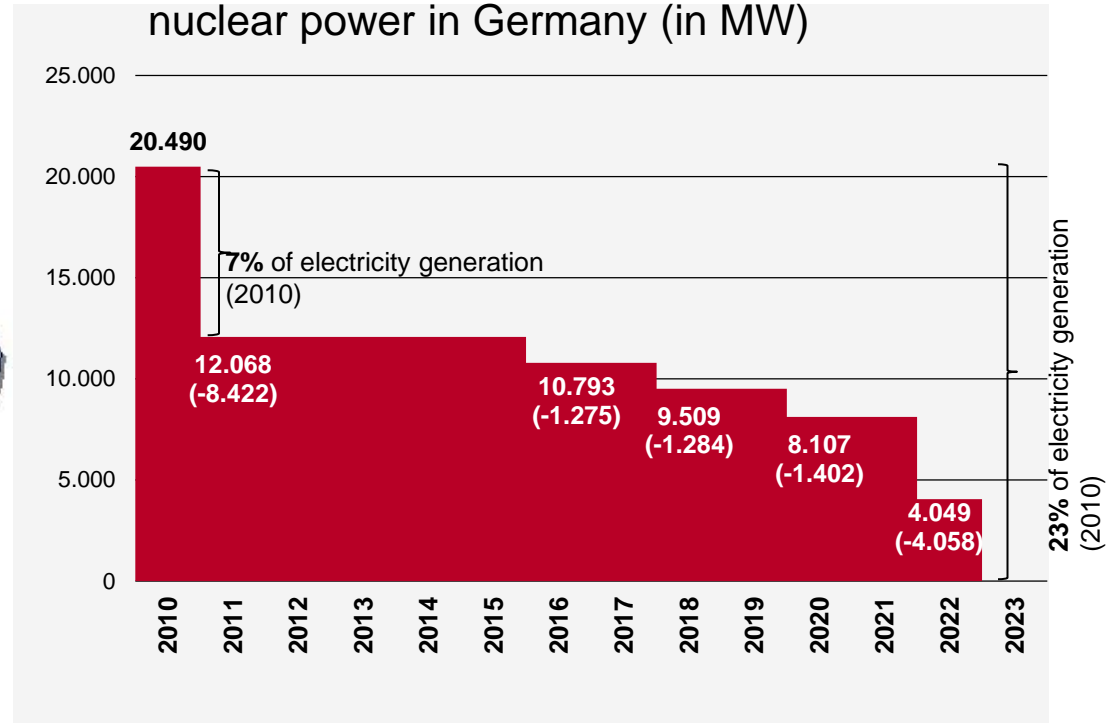
Back-up

Two years anniversary of the Energiewende?

The conversion of energy supply



Development of installed capacity of nuclear power in Germany (in MW)



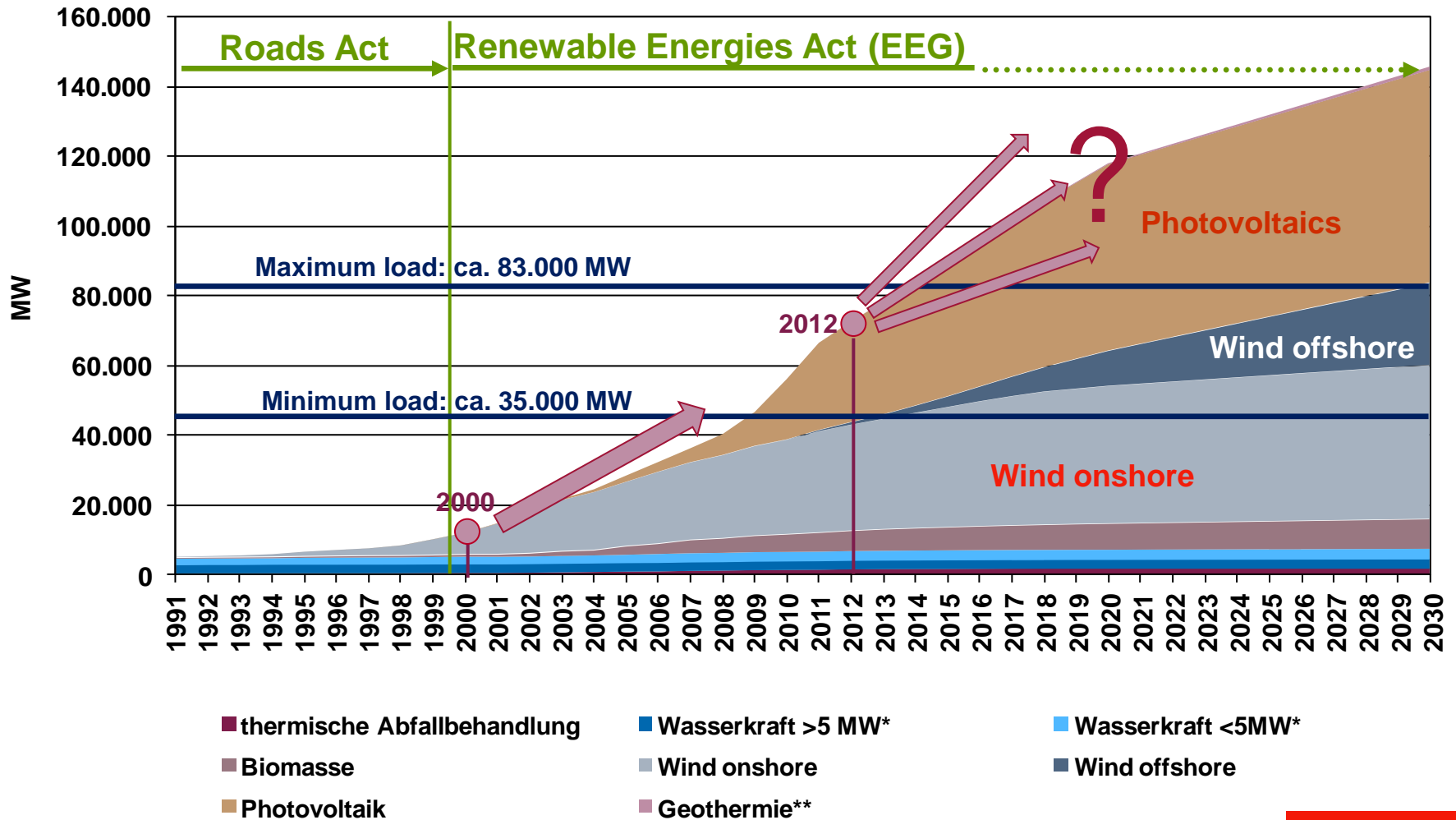
- Shutdowns in 2011
- Shutdowns in 2015-2022*

- when residual electricity quantities as defined in Annex 3 of the AtG (Atomic Energy Act) have been reached, at the latest by 31/12 of the corresponding year

Source: Atomic Energy Act §7

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The German „Energiewende“:



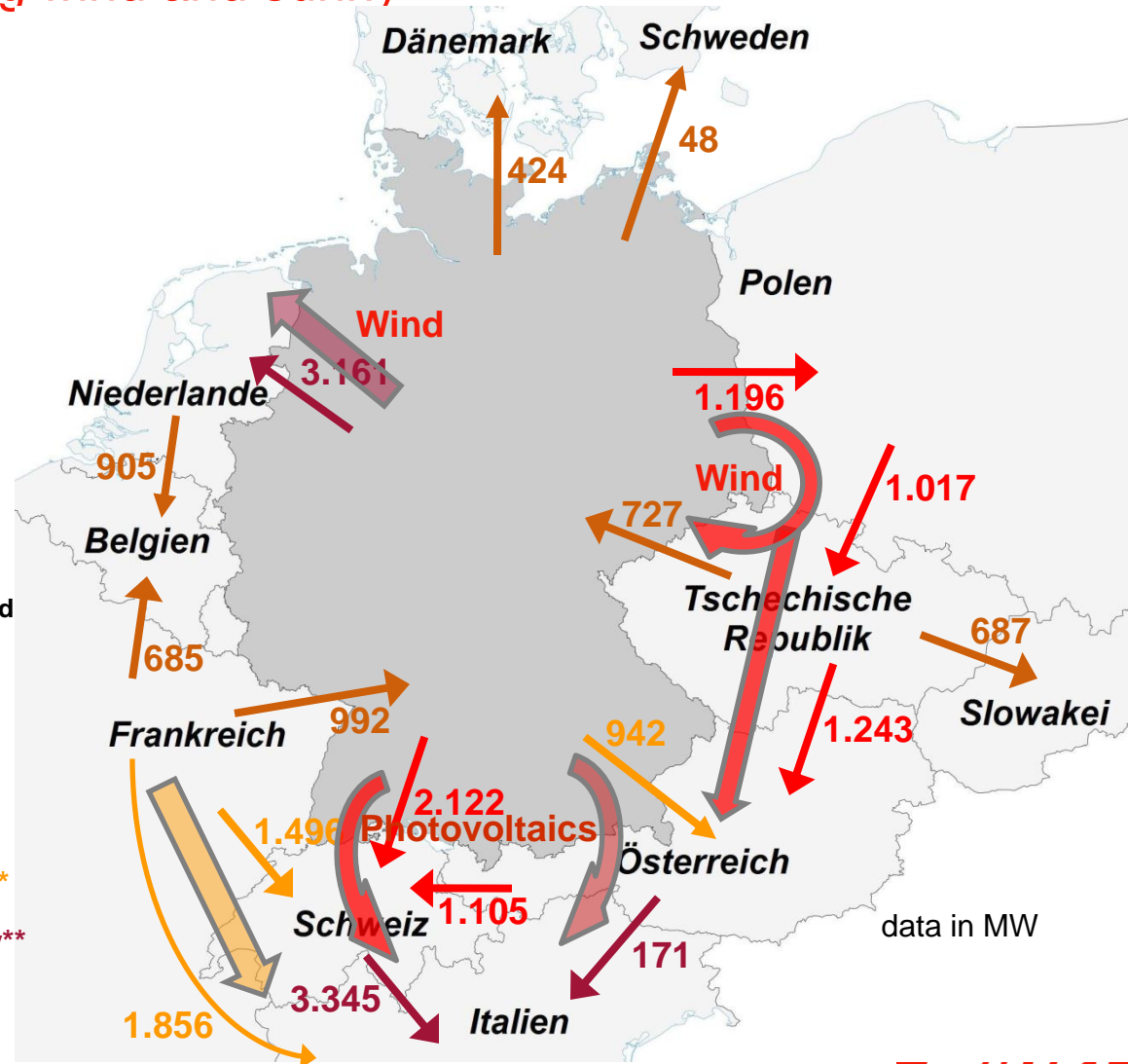
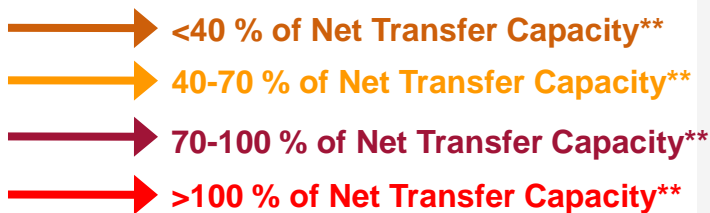
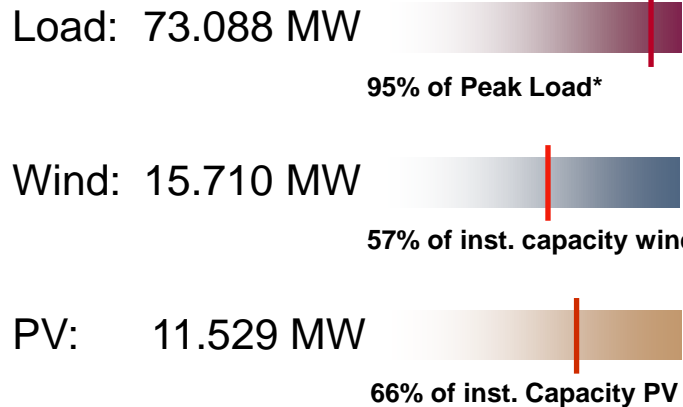
* Partly estimated; **Geothermal energy not visible (2011: 10 MW)

Source: BDEW, BMU-Leitstudie 2011

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Load flows in Central Europe: Spring 2011, Working day, noon, strong wind and sunny

**Spring 2011, Working day, Noon,
strong Wind and sunny**
(Friday, April 8th, 2011, 13:00h)



* Annual peak load in 2008 with 76.800 MW ** NTC-values Summer 2010