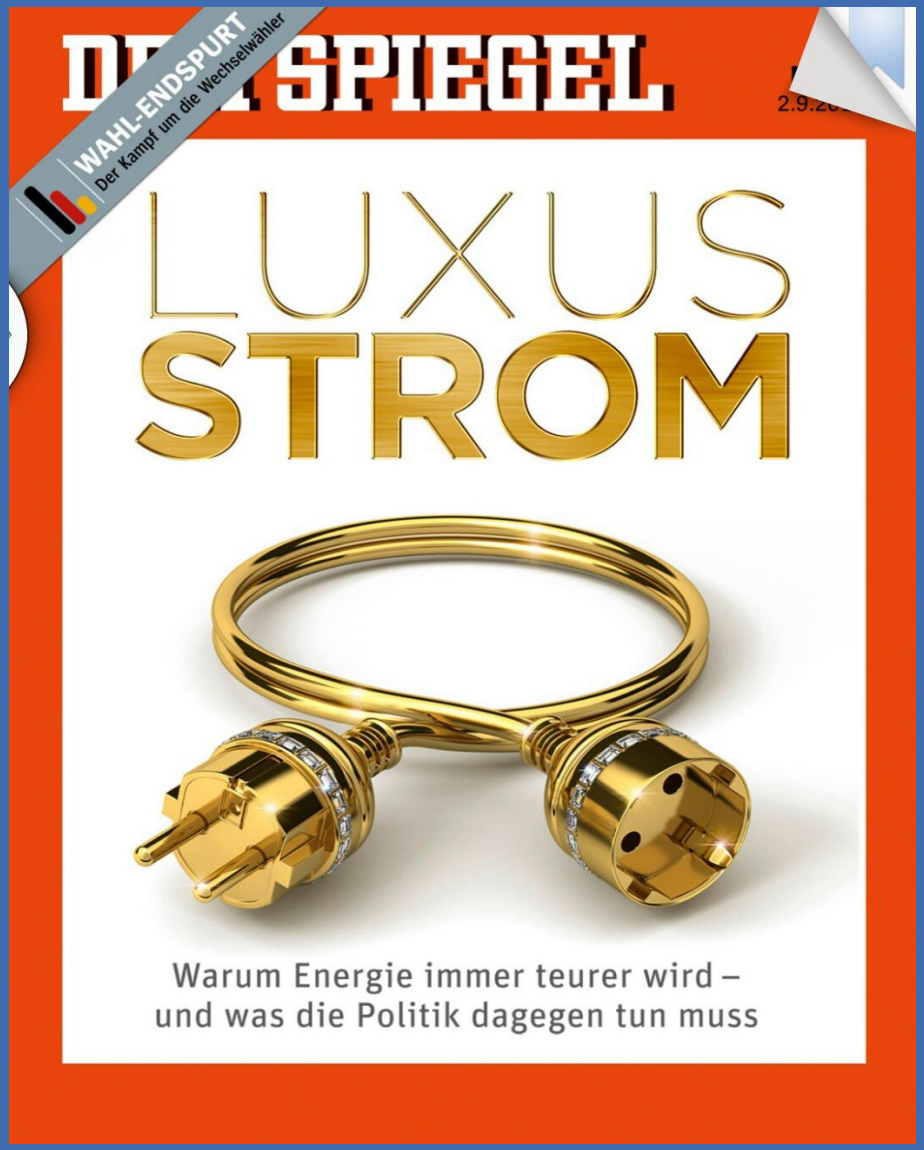
Auswärtiges Amt

БЪЛГАРСКИ ЕНЕРГИЕН ФОРУМ

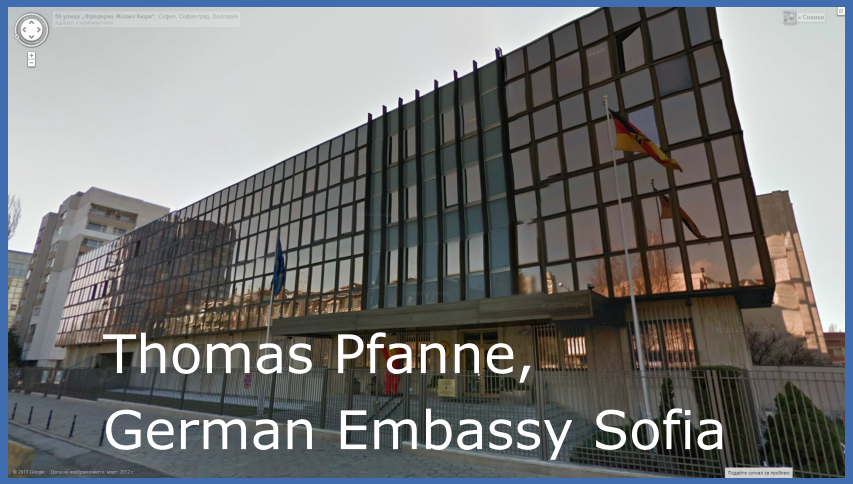
BULGARIAN ENERGY FORUM



Energiewende

(Energy Transition)

What is it all about?

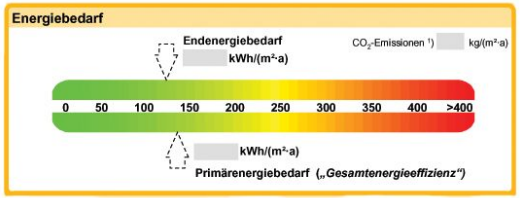



RIO+20
United Nations
Conference on
Sustainable
Development
Rio de Janeiro, Brazil
20 - 22 June 2012

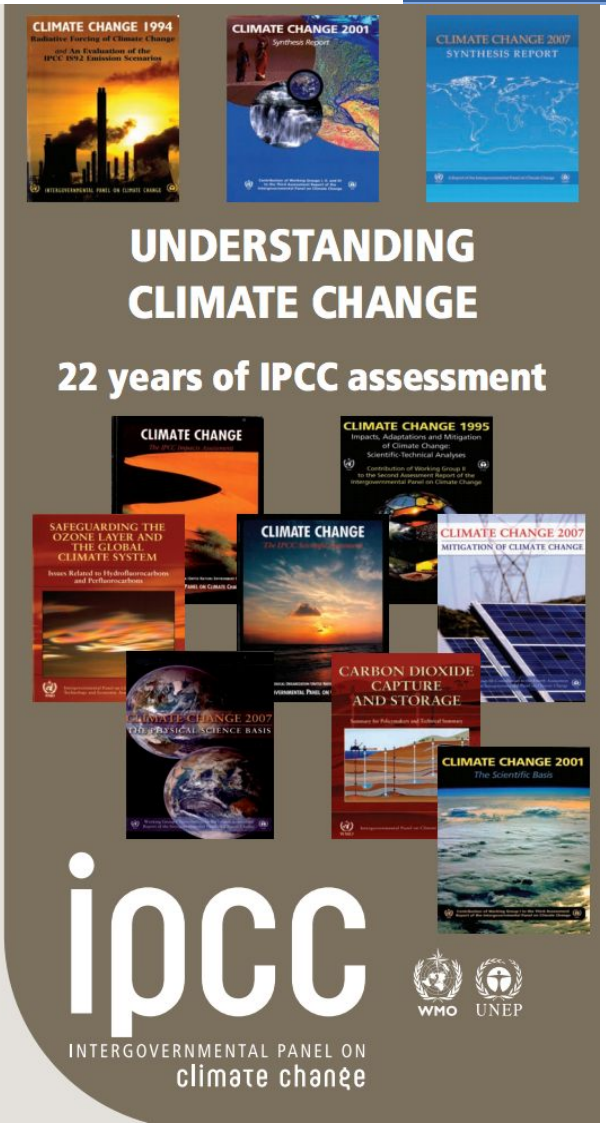
Energiewende (Energy Transition)**: Not a sudden move**

1970s – oil price shocks
1980s – no-nukes movement, environmental concerns
1986 – Chernobyl nuclear accident
1991 – feed-in-law for renewable energy
2000 – nuclear phase-out agreement
2010 – energy concept based on renewables
2011 – Fukushima nuclear accident

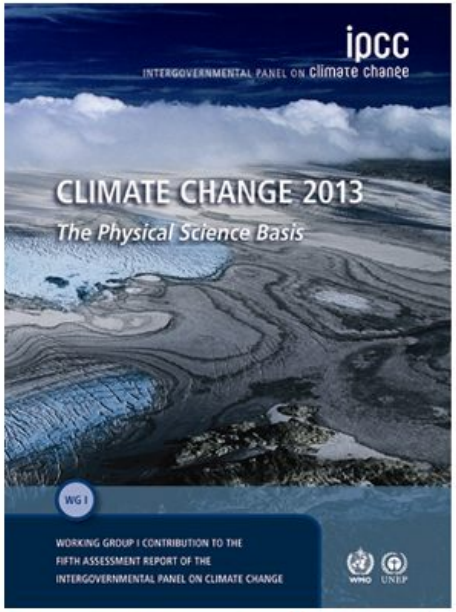
„Centennial challenge“
complete restructuring of energy system until 2050:



- **sustainable** – low-carbon, efficient
- **secure / safe** – diversification of supply, no nuclear
- **competitive**
  - cost of fossil fuels will continue to rise in the long term
  - export-oriented economy at cutting edge of technology



Climate Change 2013: The Physical Science Basis



Summary for Policymakers | Full Report

Quick Links

- Fifth Assessment Report
- More on Working Group I report
- More on AR5

Report by Chapters

Technical Summary

- Introduction
- Observations: Atmosphere and Surface
- Observations: Ocean
- Observations: Cryosphere
- Information from Paleoclimate Archives
- Carbon and Other Biogeochemical Cycles
- Clouds and Aerosols
- Anthropogenic and Natural Radiative Forcing
- Evaluation of Climate Models
- Detection and Attribution of Climate Change: from Global to Regional
- Near-term Climate Change: Projections and Predictability
- Long-term Climate Change: Projections, Commitments and Irreversibility
- Sea Level Change
- Climate Phenomena and their Relevance for Future Regional Climate Change

Annex I: Atlas of Global and Regional Climate Projections
Annex II: Glossary
Annex III: Acronyms and Regional Abbreviations
Annex IV: List of Authors
Annex V: List of Reviewers

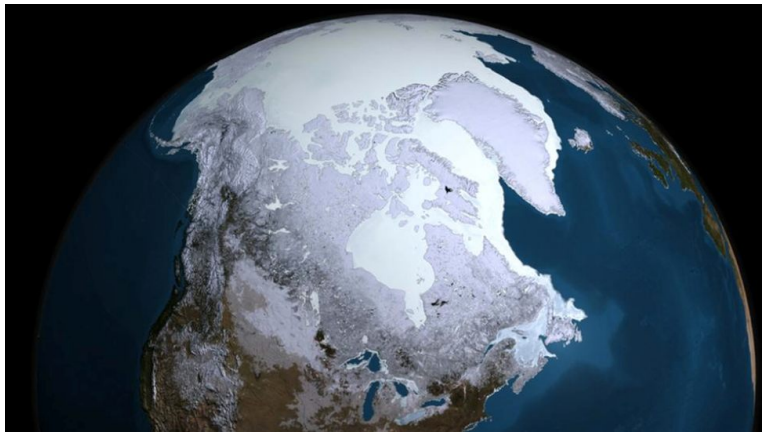
+ Press Release

Disclaimer: The Summary for Policymakers will be released on Friday, 27 September 2013. The accepted Final Draft of the full Working Group I report, comprising the Technical Summary, 14 Chapters and three Annexes, will be released online in unedited form on Monday 30 September. Following copy-editing, layout, final checks for errors, and adjustments for changes for consistency with the Summary for Policymakers, it will be published online in January 2014 (tbc) and in book form by Cambridge University Press a few months later.

Interesting developments, but:

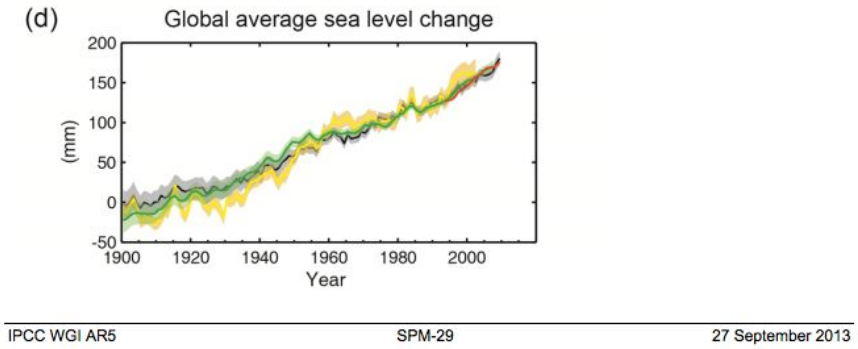
Warming does happen !

In the last few years heating was significantly slower (0,05 degrees per decade instead of 0,2).

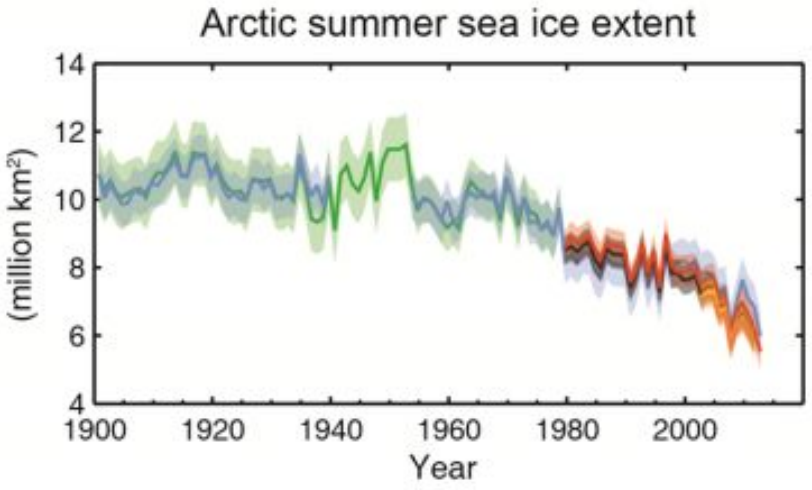


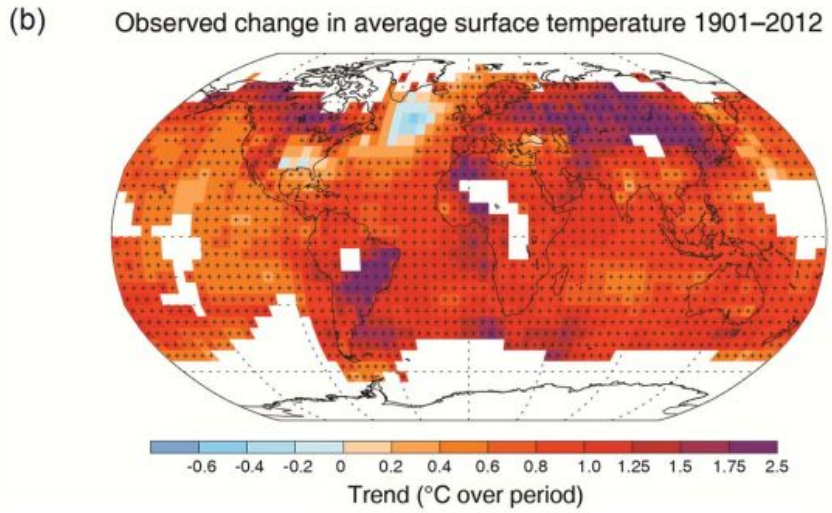
Nevertheless three out of four model calculations assess that the mean temperature will increase by more than 2 degrees - maximum up to 3,7 degrees (the fourth presumes worldwide radical climate protection, an unrealistic scenario).

Graphics from 2013 Approved Summary for Policymakers



IPCC WGI AR5 SPM-29 27 September 2013





IPCC WGI AR5 SPM-27 27 September 2013

Framework:
The European Union and EU Energy Policy

- **EU Single Market for Electricity and Gas**
  Aim: to fully integrate national energy markets by 2014 (interconnected, more competition, more secure supplies)

- **EU Energy Roadmap 2050**
  All scenarios include a substantial increase in renewables and energy efficiency

- **EU Climate Goals „20-20-20“**
  in 2020: 20% RE power, 20% increase in energy efficiency, 20% reduction of GHG emissions

Energiewende
Four assumptions you'd rather check:

- *„You will experience black outs"*
  The electricity supply in Germany was and is 4 to 6 times more reliable than in the UK, France or the US.
  (average failure time 2012 in Germany: 15 min / year / customer)

- *„You will have to import electricity"*
  Germany saw an all-time record export of power in 2012.

- *„There will never be enough electricity"*
  There is enough renewable energy out there.

- *„Renewables are too costly"*
  Yes, power prices rise – but: Electricity only 2% of household spending. And what about other energy prices? Long term?

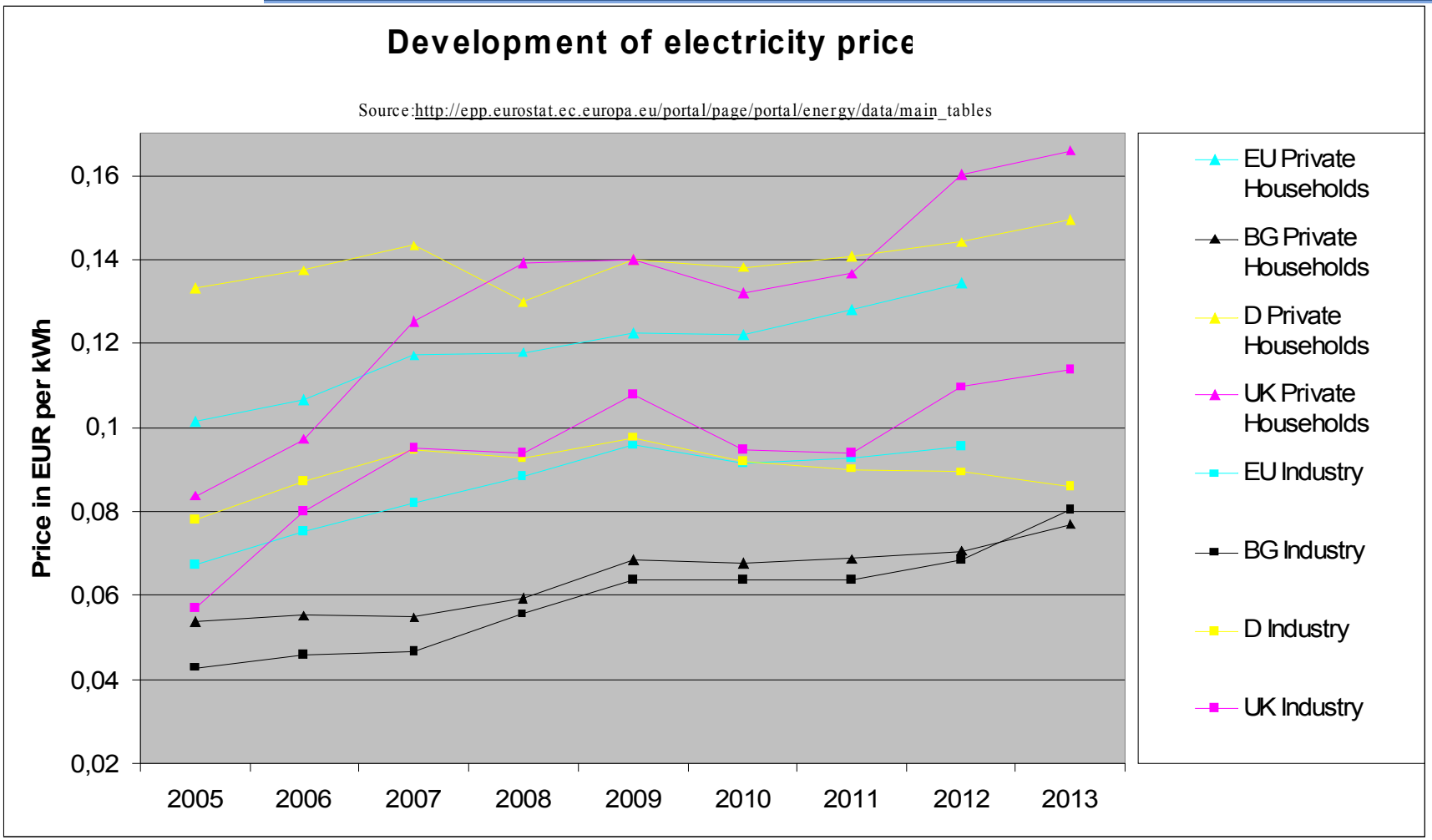
Energiewende
Four challenges we **really** face:

1. *Fluctuating supply of renewables*
   The wind is not always blowing, the sun not shining in the night: how to transmit and store electricity?

2. *Restructuring of the grid*
   Electricity is not produced where needed.

3. *Reform of the renewable energy subsidy system*
   A success story needs to be re-invented…

4. *Energy efficiency and new solutions*
   Cheapest kWh is the one not consumed!
   Be flexible - smart grids, smart meters.



Source: http://www.eex.com/de/Marktdaten#

Source: http://epp.eurostat.ec.europa.eu/

Aurubis: Global champion in energy efficiency, but challenged by EU energy and climate costs

Comparison of the industrial electricity price

MWh/€ „big clients“ (>500 GWh p.a.)

BGR: 35 TWh

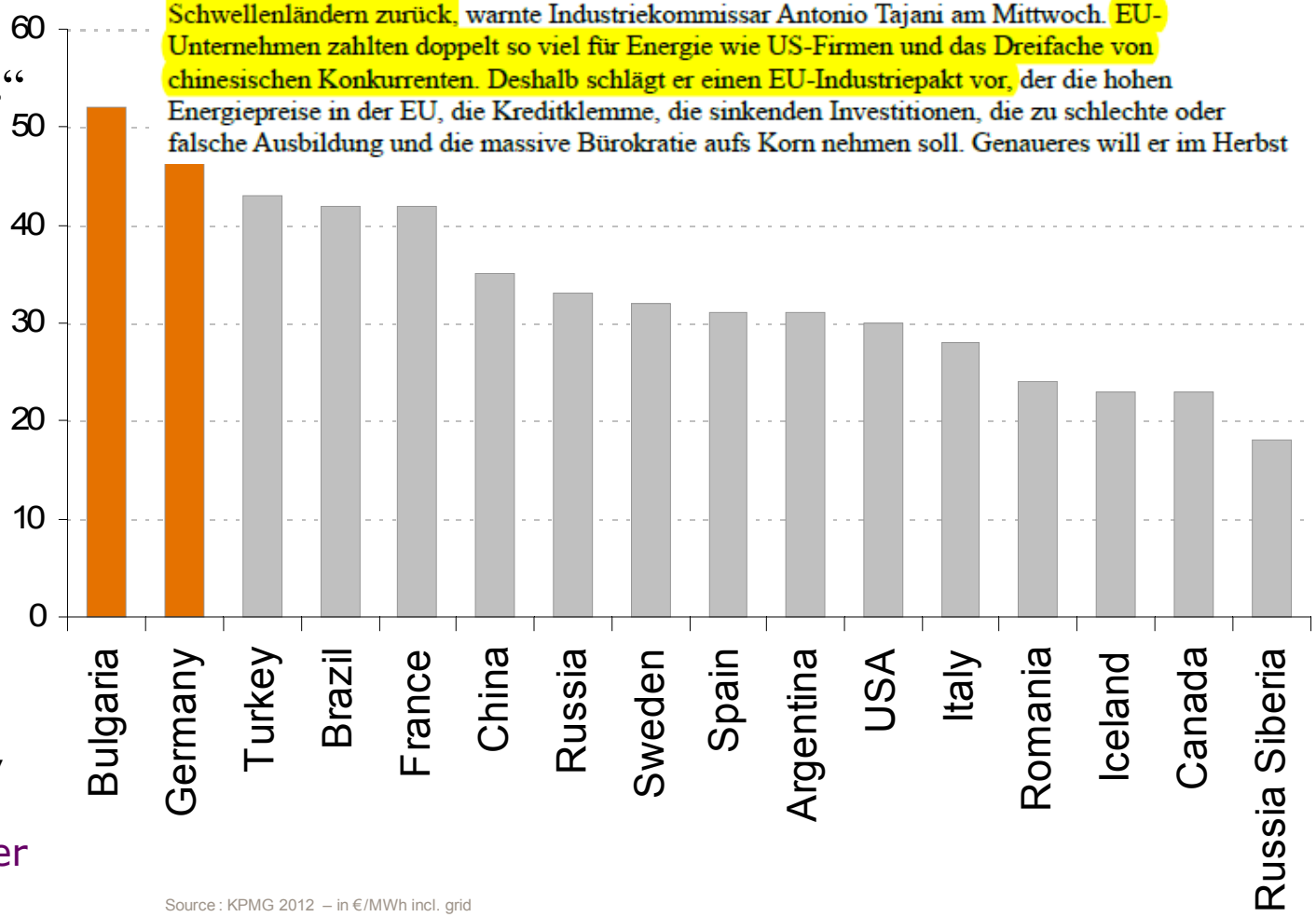
Aurubis in Pridop ca. 0,5 TWh/a

normal industrial clients pay 3 times more:

EEG (5,3ct) Ekotax (1ct), KWKG, Concession-fee, Switch off regulation, demand changes:

15 ct/ kWh vs. Copper smelters 4,5 - 5 ct

Doch unter anderem wegen der Energiepreise falle die EU gegenüber den USA und Schwellenländern zurück, warnte Industriekommissar Antonio Tajani am Mittwoch. EU-Unternehmen zahlten doppelt so viel für Energie wie US-Firmen und das Dreifache von chinesischen Konkurrenten. Deshalb schlägt er einen EU-Industriepakt vor, der die hohen Energiepreise in der EU, die Kreditklemme, die sinkenden Investitionen, die zu schlechte oder falsche Ausbildung und die massive Bürokratie aufs Korn nehmen soll. Genaueres will er im Herbst



Source : KPMG 2012 – in €/MWh incl. grid

Source: Aurubis & KPMG

A new nuclear plant ? 2 GW, producing all year

Kapitalkosten	operativer Gewinn	Jahresergebnis bei Zinssatz in %	1	2	3	4	5	
8200	400	1. Jahr	7882	7964	8046	8128	8210	
		2. Jahr	7560,82	7723,28	7887,38	8053,12	8220,5	
		3. Jahr	7236,4282	7477,7456	7724,0014	7975,2448	8231,525	
		4. Jahr	6908,79248	7227,30051	7555,72144	7894,25459	8243,10125	8
		5. Jahr	6577,88041	6971,84652	7382,39309	7810,02478	8255,25631	8
		6. Jahr	6243,65921	6711,28345	7203,86488	7722,42577	8268,01913	8
		7. Jahr	5906,0958	6445,50912	7019,98082	7631,3228	8281,42008	8
		8. Jahr	5565,15676	6174,4193	6830,58025	7536,57571	8295,49109	9
		9. Jahr	5220,80833	5897,90769	6635,49766	7438,03874	8310,26564	9
		10. Jahr	4873,01641	5615,86584	6434,56259	7335,56029	8325,77893	9
		11. Jahr	4521,74658	5328,18316	6227,59946	7228,9827	8342,06787	9
		12. Jahr	4166,96404	5034,74682	6014,42745	7118,14201	8359,17127	9
		13. Jahr	3808,63368	4735,44176	5794,86027	7002,86769	8377,12983	9
		14. Jahr						1
		15. Jahr						1
		16. Jahr						1
		17. Jahr						1
		18. Jahr						1
		19. Jahr						1
		20. Jahr						1
		21. Jahr	809,936297	2115,13714	3783,6212	5898,21748	8557,19252	1
		22. Jahr	418,03566	1757,43988	3497,33583	5734,14618	8585,05214	1
		23. Jahr	22,2160165	1392,58868	3202,25591	5563,51202	8614,30475	1
		24. Jahr	-377,561823	1020,44046	2898,32359	5386,0525	8645,01999	1
		25. Jahr	-781,337442	640,849265	2585,27329	5201,4946	8677,27099	1
		26. Jahr	-1189,15082	253,666251	2262,83149	5009,55439	8711,13454	1
		27. Jahr	-1601,04232	-141,260424	1930,71644	4809,93656	8746,69126	1
		28. Jahr	-2017,05275	-544,085633	1588,63793	4602,33403	8784,02583	1
		29. Jahr	-2437,22327	-954,967346	1236,29707	4386,42739	8823,22712	1
		30. Jahr	-2861,59551	-1374,06669	873,385981	4161,88448	8864,38848	1
		31. Jahr	-3290,21146	-1801,54803	499,587561	3928,35986	8907,6079	1
		32. Jahr	-3723,11358	-2237,57899	114,575187	3685,49426	8952,98829	1
		33. Jahr	-4160,34471	-2682,33057	-281,987557	3432,91403	9000,63771	1
		34. Jahr	-4601,94816	-3135,97718	-690,447184	3170,23059	9050,66959	1
		35. Jahr	-5047,96764	-3598,69672	-1111,1606	2897,03981	9103,20307	1
		36. Jahr	-5498,44732	-4070,67066	-1544,49542	2612,9214	9158,36323	1

Only a few years ago, a kilowatt-hour of solar power cost between 32 and 43 cents

Today it is a mere 11 to 16 cents

Source: Embassy calculation

Challenge No 2: Adaption of the power grid

Expansion of the transmission grid

extra-high voltage, i.e. 220 or 380 kV
35,000 / 2,900 / 2,800 km
current *upgrade* *expansion*

Pilot projects

new extra-high voltage (i.e. 800 kV) DC lines
(HGÜ = Hochspannungs-Gleichstrom-Übertragung)

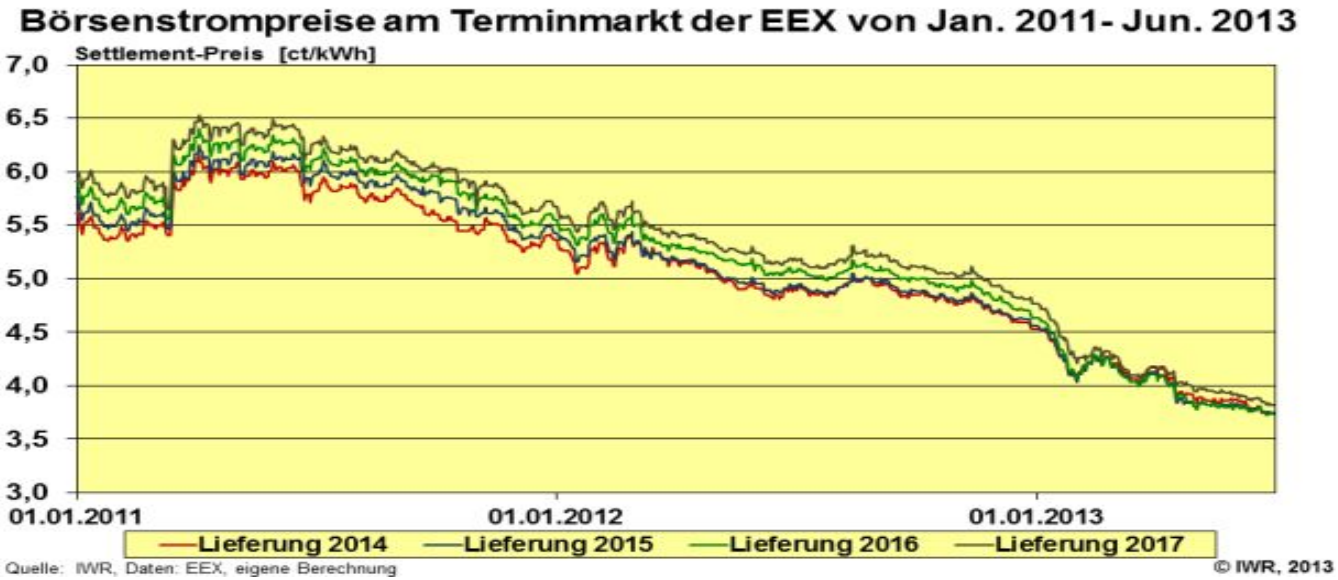
Speeding up implementation

e.g. by national coodination of grid planning, transfer of planning competence from state to federal level and swifter procedures

Flexibility needs a new framework

new Ordinances on smart grids, revision of the Electricity Network Access Ordinance, study on need to invest in distribution grids, etc.

Challenge No 3:
Reform of the renewable energies subsidy scheme



- Growing volume of renewable power traded at the electricity stock exchange (*EEX*) reduces market price for electricity.
- The price difference to the guaranteed feed-in-tariff, the renewable energies remuneration (*EEG-Umlage*) paid by consumers, rises.
- All but old, written-off power plants risk to become unprofitable.

Renewables – victim of their own success? *Rather a success story that needs to be re-invented.*

Challenge No 4:
Energy efficiency and new solutions

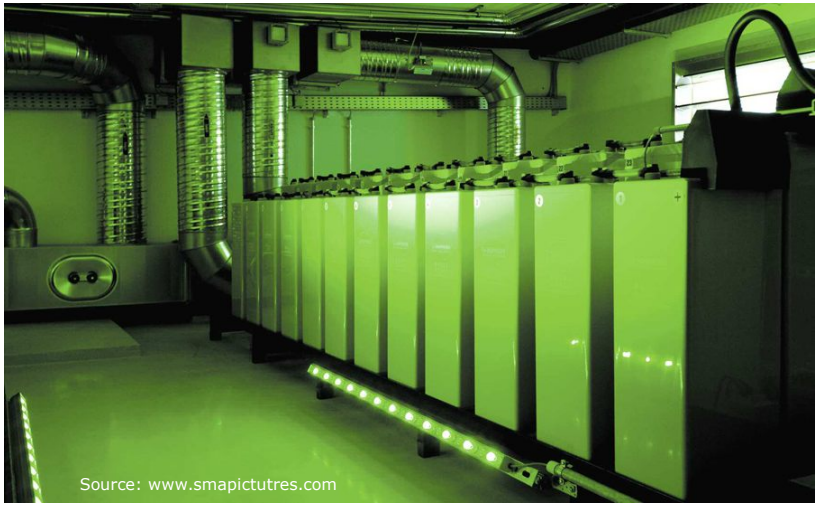
The cheapest kWh is the one not consumed.
Less emissions reduce climate change cost.

How to switch to low-carbon transport?

Who pays for huge investments to better insulate buildings?

Challenge No 4:
Energy efficiency and new solutions

Do we have to live from hand to mouth with renewable energy?


Source: www.smapictutres.com


Source:, Florian Stelzer, „Unter Strom", www.piqs.de

Cost-efficient storage solutions

…and a world with smart grid, smart meters – how to get there?

Take aways: comparison (pure economic view)

I. Nuclear plants

- Not included *risks (Fukusima: 80 bn €) and renaturization costs*
- For new nuclear plants investors in UK and TUR demand a guaranteed purchase price of 12 ct / kWh, which is **higher** then the 11 ct for newest wind energy projects in Germany

II. Coal

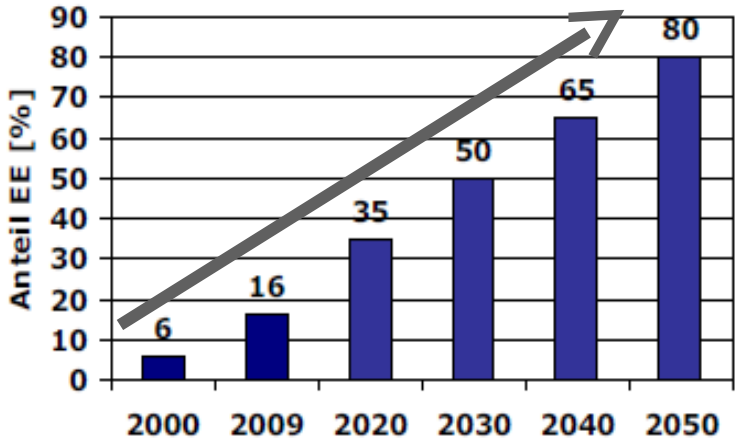
- CO2-tax is very low at the moment (0,31 / kWh)
- The fracking boom in the USA (gas as necessary by product) creates the possibility to import hard coal at very cheap prices 1,75 ct / kWh
- External costs: Climate, health

III. Perspectives

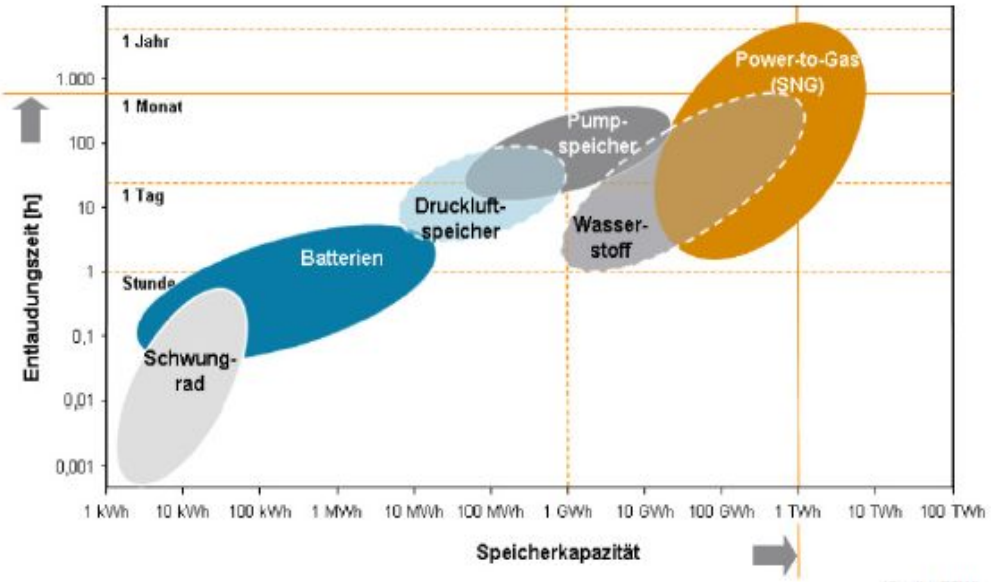
- Electricity prices of *renewable energy*: the *trend of constant, rapid decrease* of production prices will continue because of technological progress; this assumption can‘t be made for oil, gas and coal

Challenges for Changing the System

Task

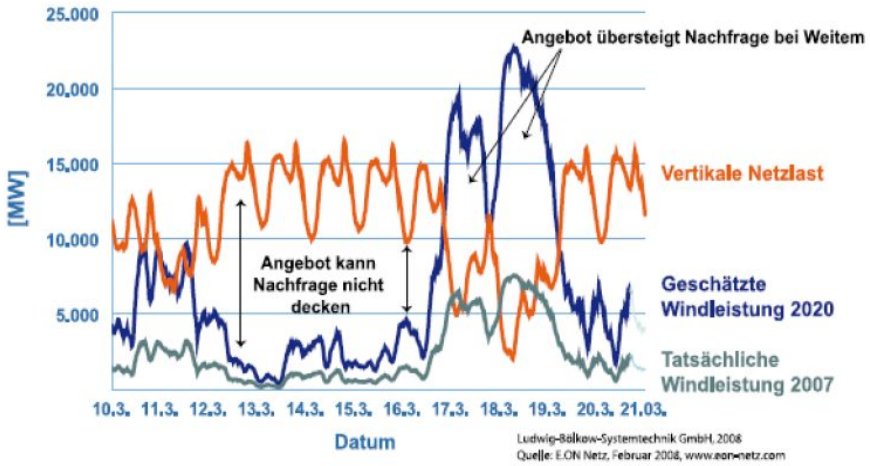


Security of supply



(Quelle: ZSW)

System stability



Auswärtiges Amt

Challenges for Changing the System: click here at http://sofia.diplo.de

- Startseite
- Willkommen in Deutschland
- Die Botschaft
- Außen- und EU-Politik
- Konsular- und Visainformationen
- **Wirtschaft**
  - Deutschland
  - **Deutschland und Bulgarien**
    - Delegationsreise Staatssekretär Burgbacher
    - Bulgariens erstes Elektroauto
    - Wirtschaftliche Zusammenarbeit
  - Wirtschaftsnachrichten
  - Wettbewerbsfähigkeit
  - 20 Jahre Wirtschaftsblatt
- Kultur und Bildung

Deutschland und Bulgarien

Delegationsreise unter Leitung des Parlamentarischen Staatssekretärs im Bundeswirtschaftsministerium Burgbacher

Delegationsreise unter Leitung des Parlamentarischen Staatssekretärs im Bundeswirtschaftsministerium Burgbacher Der Parlamentarische Staatssekretär beim Bundesminister für Wirtschaft und Technologie und Beauftragte der Bundesregierung für Mittelstand und Tourismus, Ernst Burgbacher, MdB, reiste vom 15. bis 17.07.2013 nach Sofia. Dort traf er unter anderem mit dem bulgarischen Staatspräsidenten Rossen Plevneliev und der stv. Ministerpräsidentin Bobeva zusammen.

› Delegationsreise Staatssekretär Burgbacher

Empfehlungen der Weltbank und der EU-Kommission über Auswege aus dem wachsenden Defizit des Energiesystems Bulgariens

Wie kann man die bulgarische Energiewirtschaft retten? Fundierte Schlussfolgerungen und Empfehlungen sind in den beiden Papieren von Weltbank und der Europäischen Kommission enthalten, die in den letzten Tagen der Übergangsregierung übergeben wurden.

› Empfehlungen der Weltbank und der EU-Kommission

Schriftgröße A A A

Deutschland und Bulgarien

Datenblatt Bulgarien

Datenblatt Bulgarien [pdf, 231.49k]

Bulgariens erstes Elektroauto

Auf Einladung von Botschafter Höpfner stellte die bulgarische Firma Vromos ihren ersten Elektrowagen „Kiwi" der Deutschen Botschaft vor...

› Bulgariens erstes Elektroauto

» Bulgarische Investitionsagentur

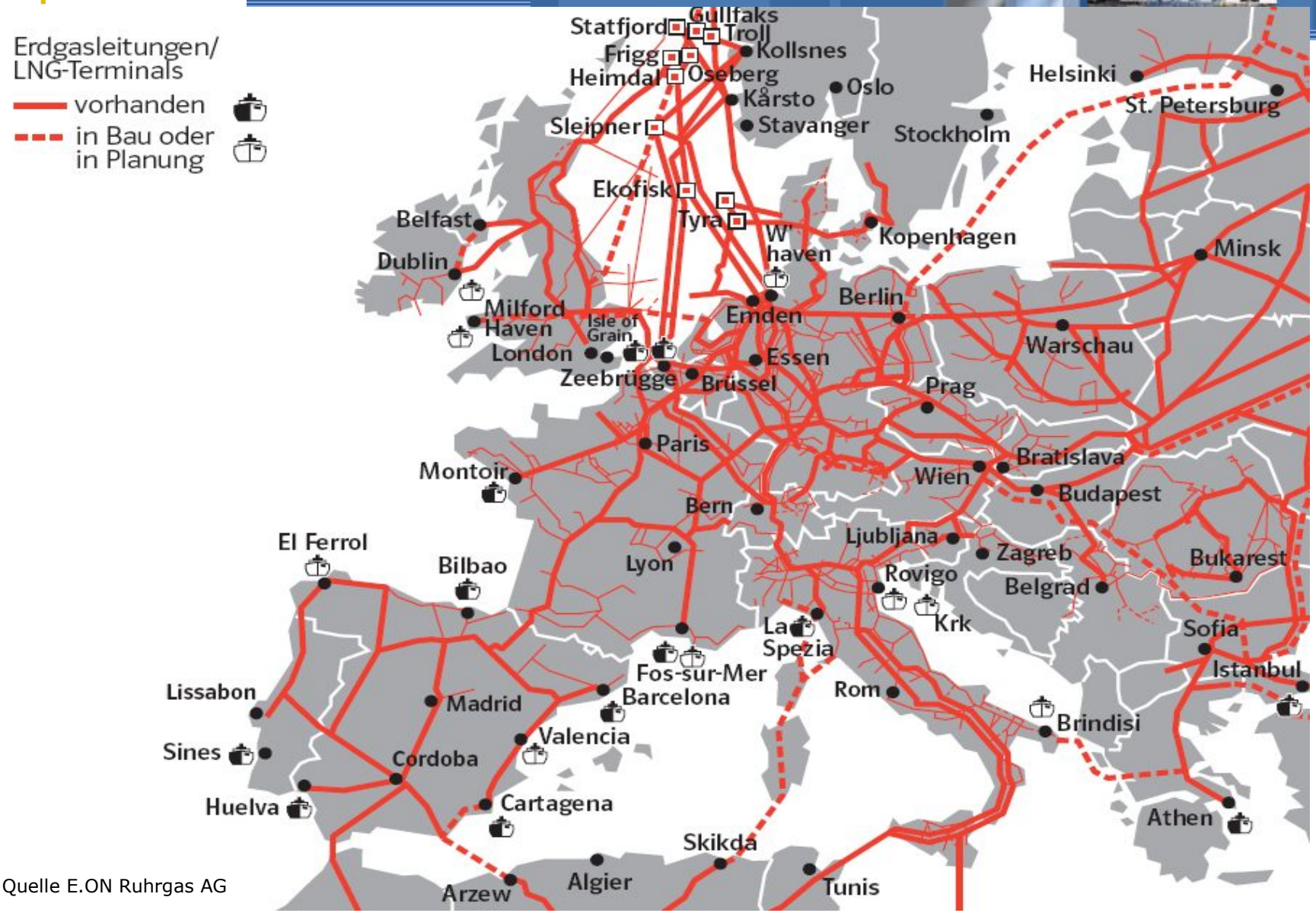
Bonus material:

4th Regional Energy Conference

„ENERGY DEVELOPMENT AND INTEGRATION OF REGIONAL ENERGY MARKETS”

8 October 2013

Sofia, Sheraton Hotel Balkan



Quelle E.ON Ruhrgas AG

4. „Energy efficiency pays“

additional power plant

vs.

investment into efficiency

cost

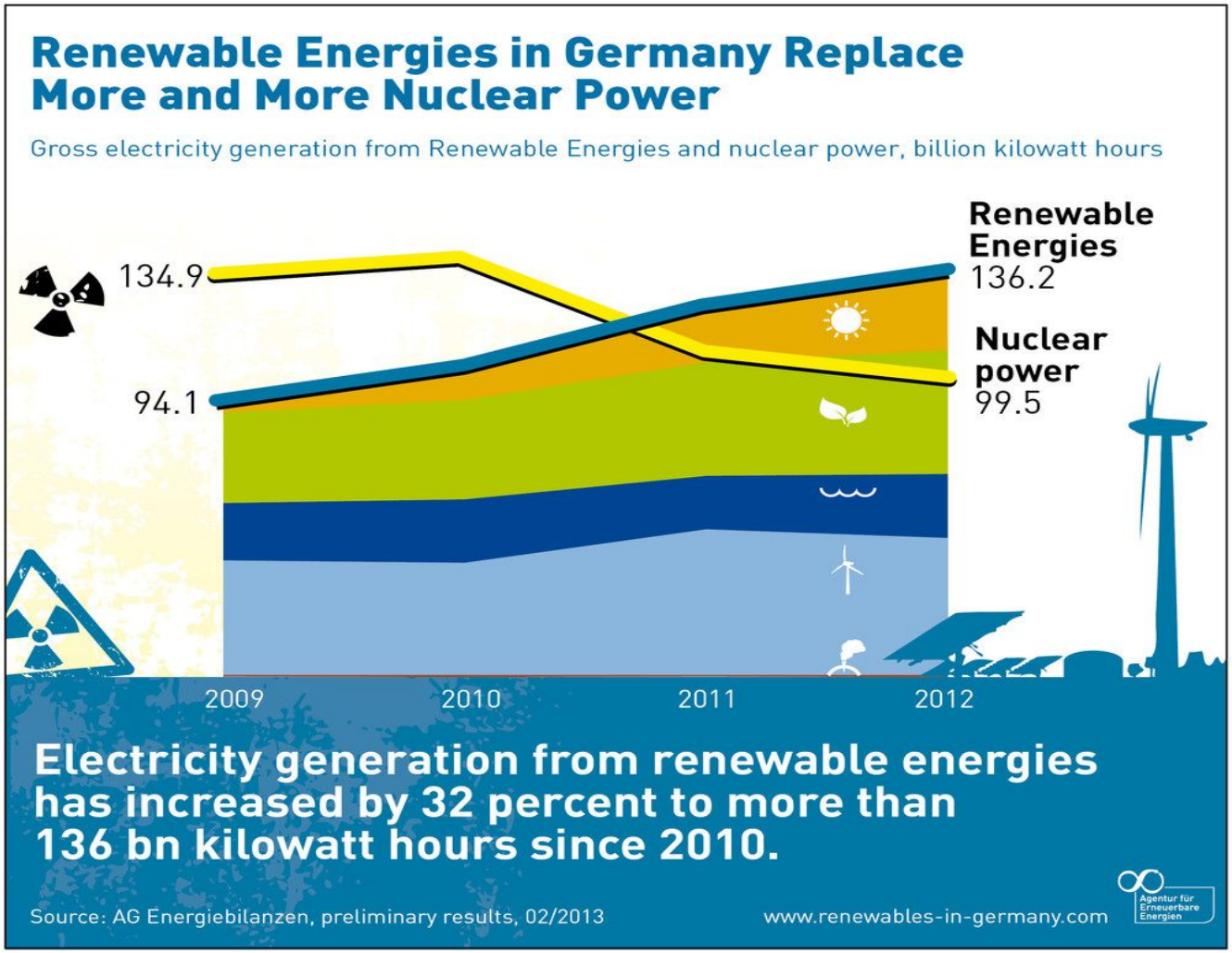
jobs

cost

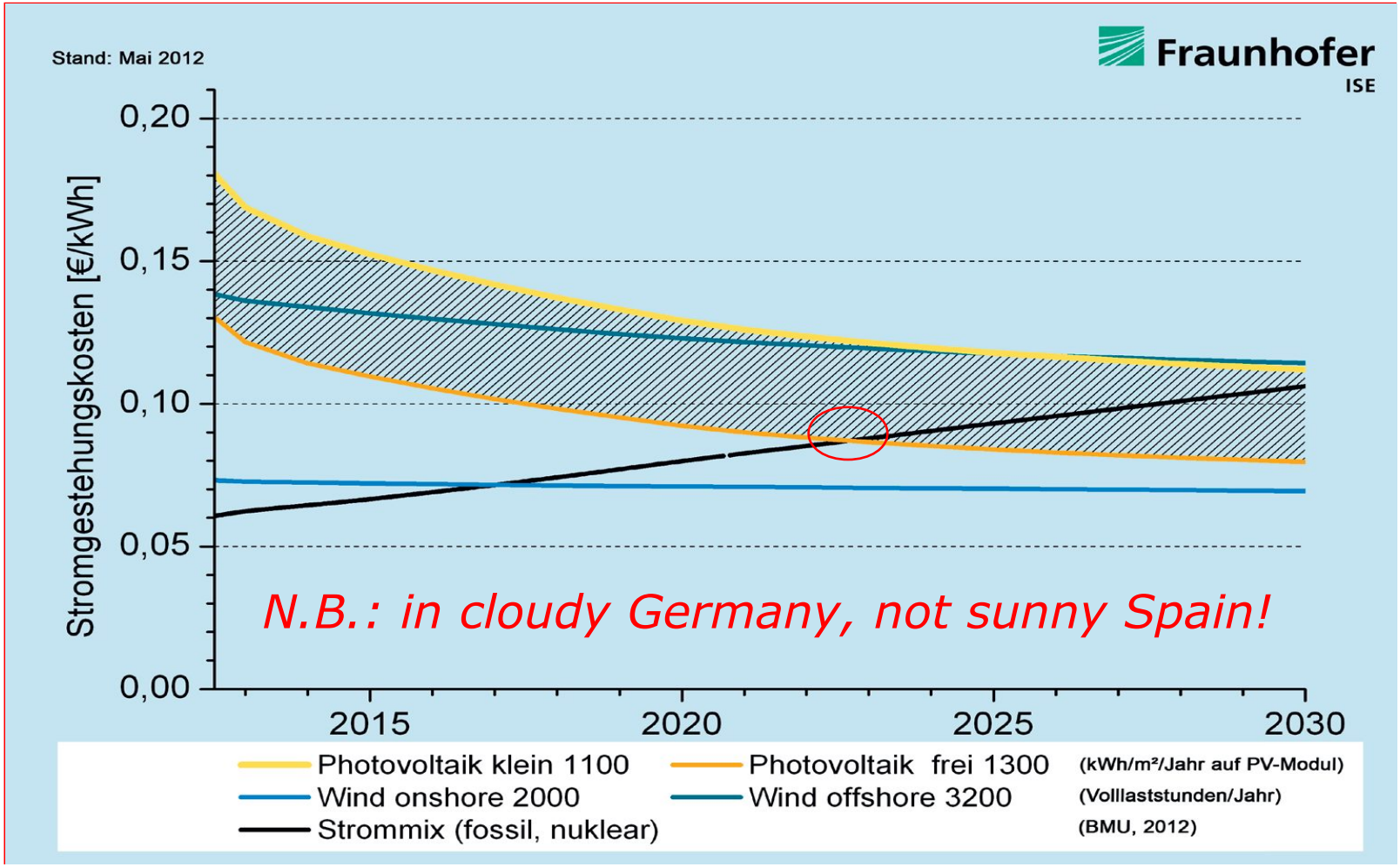
jobs

Energy efficiency saves money and ressources, creates jobs.

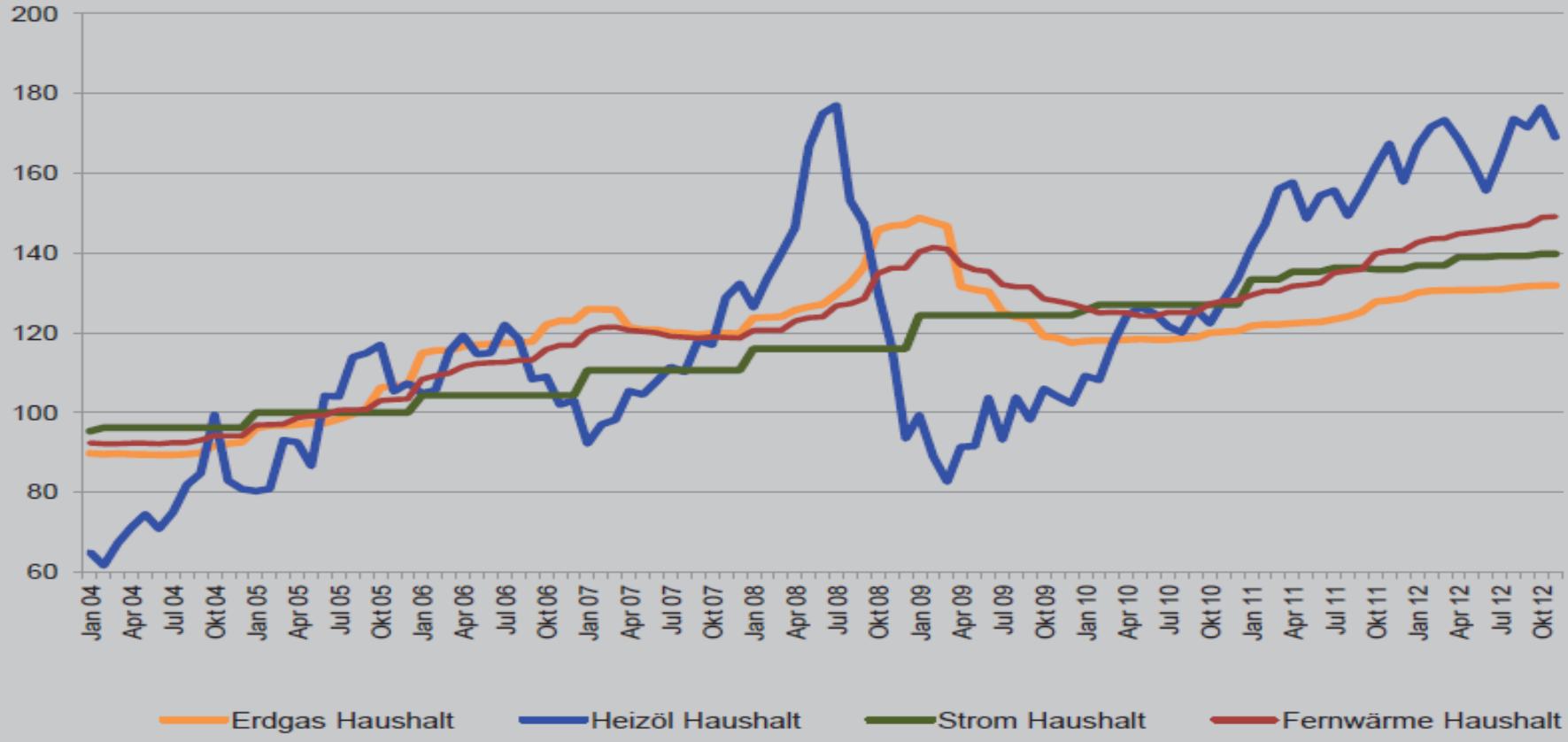
There is enough renewable energy out there…



… and solar power will be there in 10 years.



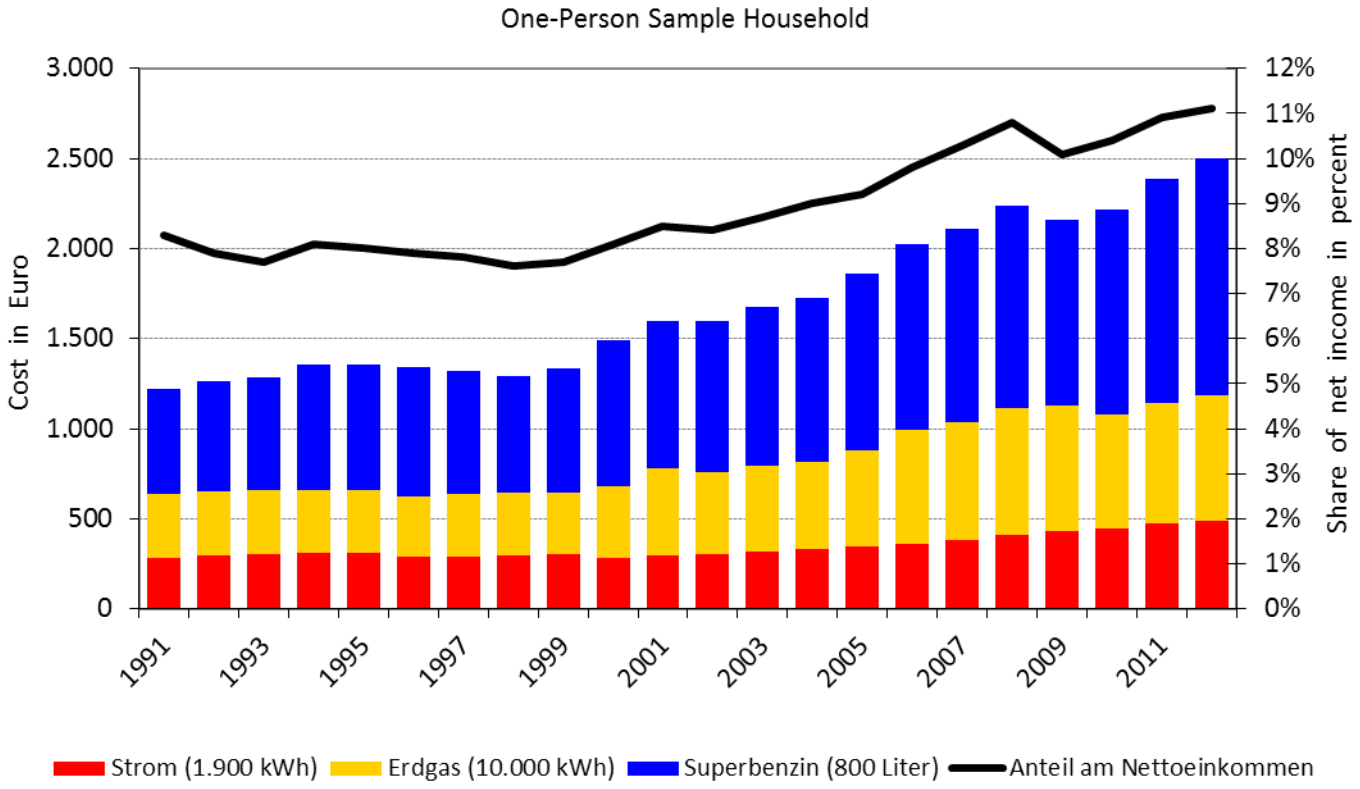
Source: Fraunhofer ISE



Quelle: Statistisches Bundesamt / BDEW

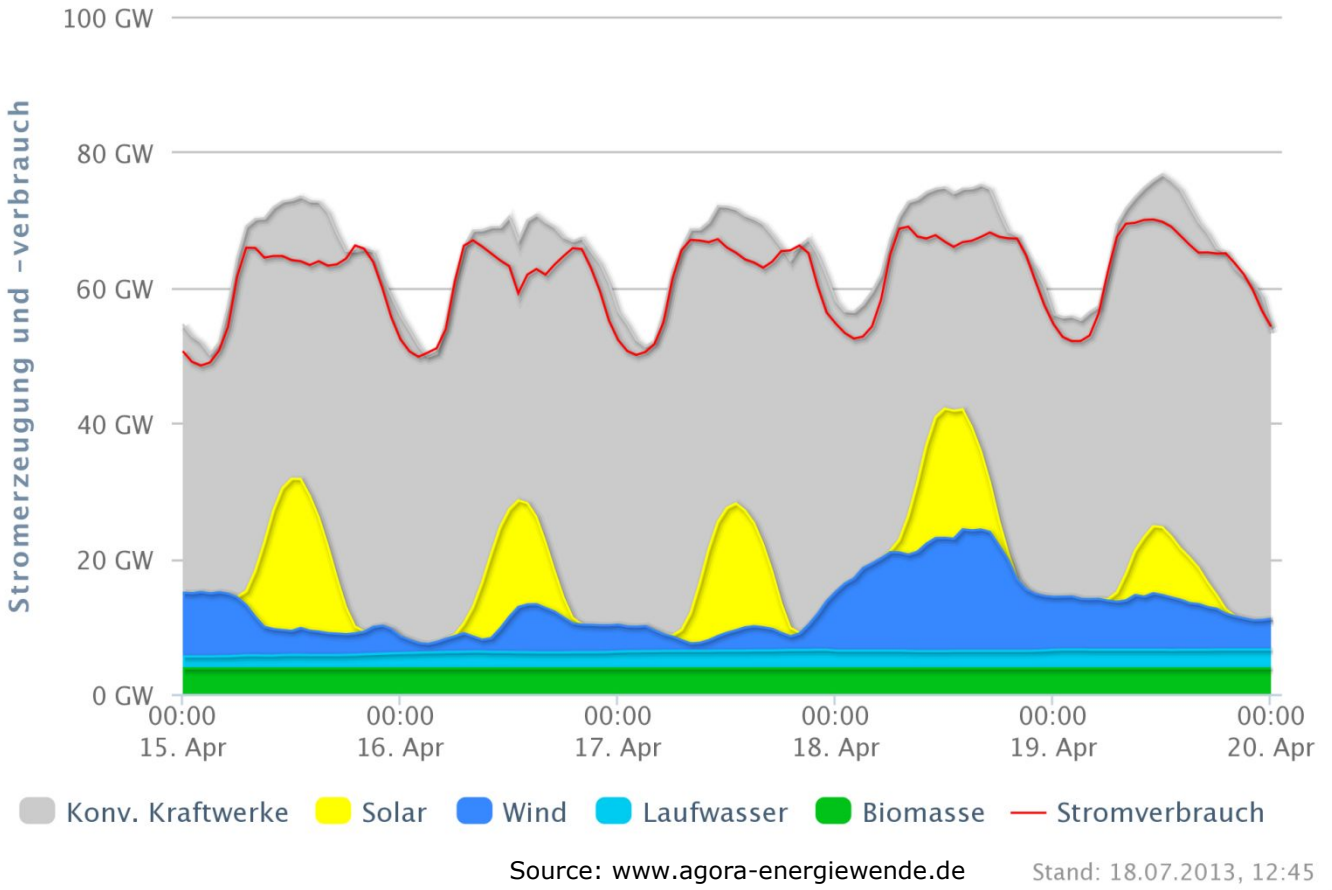
Electricity scores rather better than other energies

and is the smaller part of the problem.



Challenge No 1:
Fluctuating supply of renewables *(status: 2013, 20% RE)*

The wind is not always blowing, the sun not shining in the night.



Challenge No 3:
Reform of the subsidy scheme for renewable energies

A SUCCESS STORY… – the Renewable Energies Law EEG

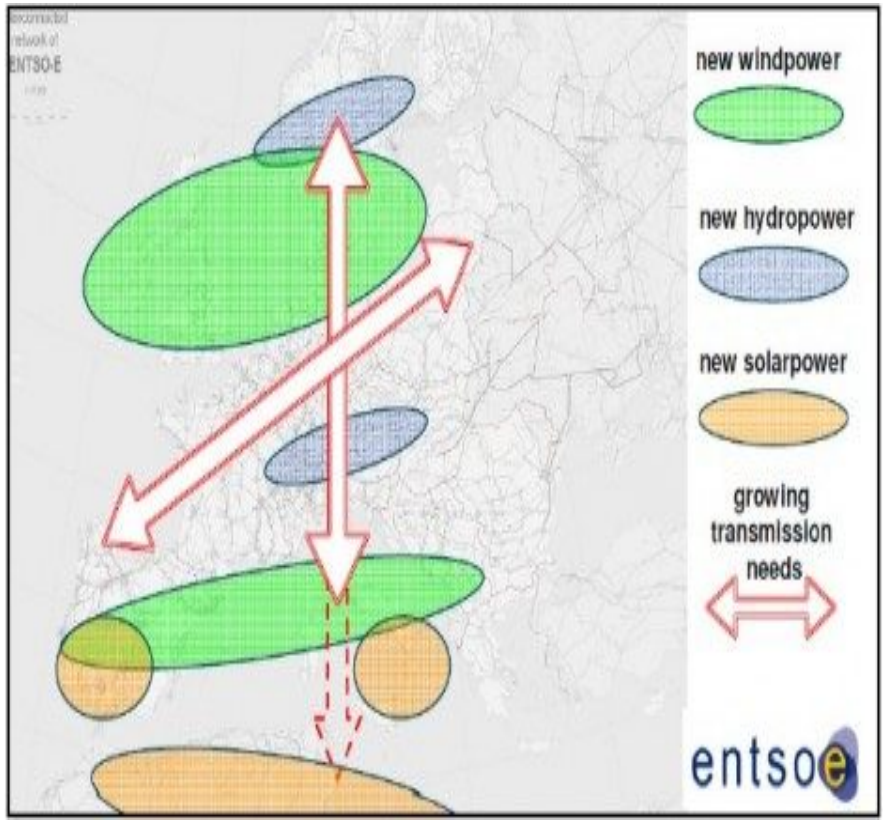
- *Priority feed-in for RE electricity at guaranteed feed-in-tariffs*
  - *very successful instrument to increase share of RE power*
  - *copied by many countries*

…NEEDS TO BE RE-INVENTED – there is consensus on the need to overhaul the EEG

- *Feed-in-tariffs guaranteed for 20 years for individual installation*
  - *how to swiftly adapt feed-in-tariffs to sinking cost, technological progress?*
  - *how to incentivise RE to adapt to demand patterns and power grid development?*
- *RE offer makes EEX prices fall → the gap between EEX price and feed-in-tariffs grows*
  - *burden for consumers, covering the price difference, increases!*
  - *Subsidies for less cost-efficient technologies (e.g. PV)*

- WHICH IS A POLITICAL CHALLENGE – it is difficult to find common ground

- *Conflicting vested interests within German political and economic system, e.g.:*
  - *Northern states: wind; Southern states: PV*
  - *RE industry, real estate owners – „support"; energy intensive industry – „cost"*



Source: entso-e

We need to develop the power grid for the European Single Market:

- North-South electricity flows:
  - Renewables (from North and Baltic Sea to Southern Europe)
  - Production capacity gaps (Southern Germany, Italy, Balkans)
  - Integration of pump storage capacity (in the Alps and Scandinavia)
- Connect „energy islands“ – e.g. Baltic States, British Isles, Iberian Peninsula
- East-West electricity flows in South-Eastern Europe

⇒ EU Ten Years Network Development Plans (TYNDPs)

And our neighbours get fed up…

Example: Friday, 8th April 2011, 13:00h - working day, noontime, strong wind, sunny

Load: 73,088 MW

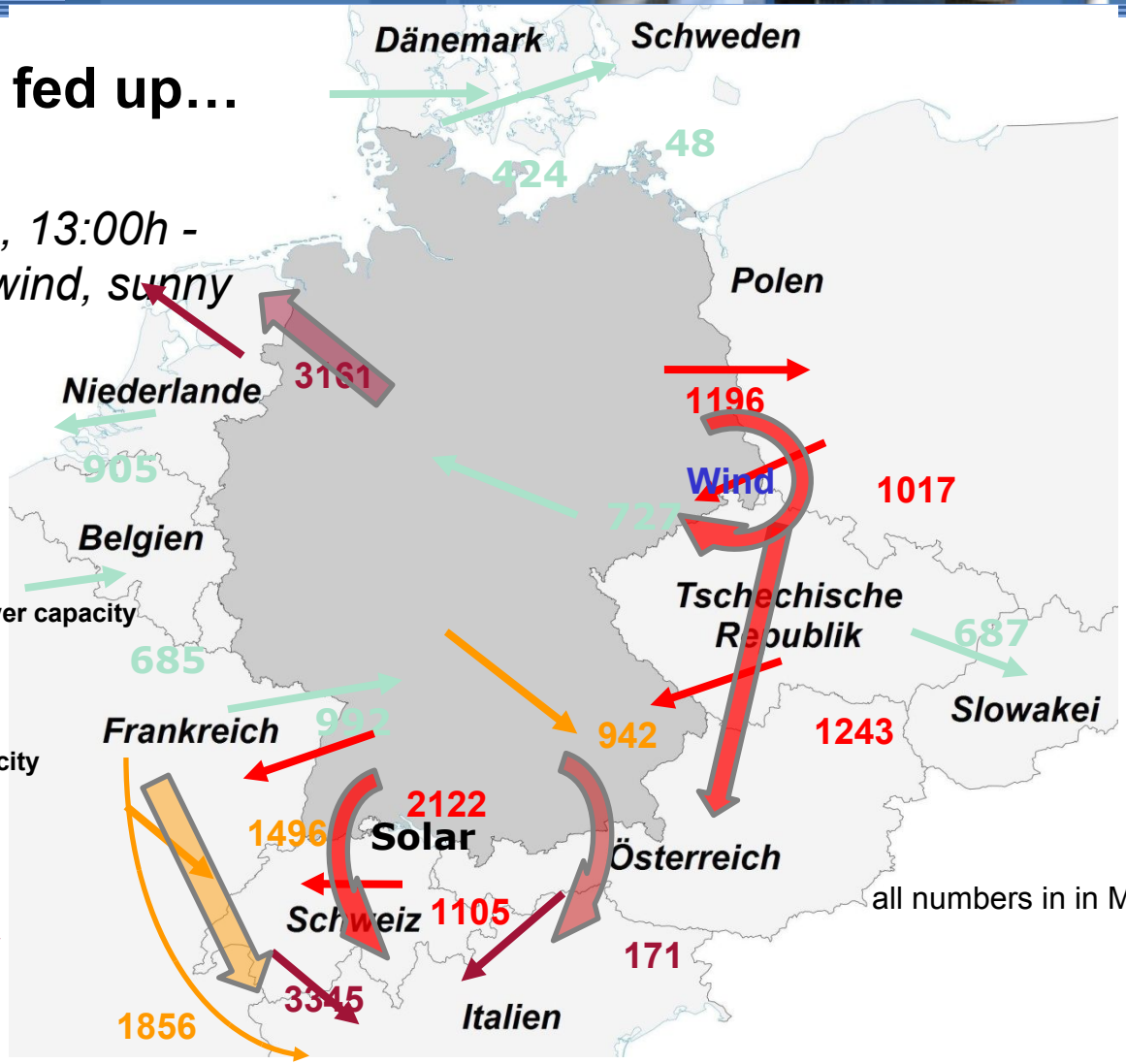
95% of yearly maximum*

Wind: 15,710 MW

57% of installed wind power capacity

Solar: 11,529 MW

66% of installed PV capacity



<200 % of Net Transfer Capacity

40-70 % of Net Transfer Capacity

70-100 % of Net Transfer Capacity

>100 % of Net Transfer Capacity

all numbers in in MW

Source: BDEW, entso-e

Is fracking an option?

Germany:

Shale gas could possibly replace the (minor) domestic supply of conventional gas for 100 years.

Exploration licences are granted, the regulating ordinance is still under discussion.

Conditions: high environmental and immission standards, absolute protection of aquifers.

Note: Germany is very densely populated (230 p/km^2 vs. North Dakota 3.6 p/km^2), strong public concerns about fracking do exist.

EU (Commission, DG Energy):

Currently analysing potential and limitations for exploitation of unconventional gas in the EU.

Ocher red: potential shale gas formations; Yellow: exploration licences; Hatched area: scientific exploration (RWTH Aachen)

Source: Federal Institute for Geosciences and Natural Resources BGR

Framework:
German energy and raw material foreign policy

Supply security:

High and increasing import dependency (Germany, EU)

- **Diversification**
  of sources, of providers, of routes
- **Renewables**
  Only domestic source besides lignite coal + some gas
  (coal: CO_2, costly to exploit; gas: reserves dwindling)
- **Natural gas**
  Additional suppliers (today: Russia, Norway, UK)
  Shale gas? LNG?

Raw materials:

Strategic importance of e.g. rare earth minerals.