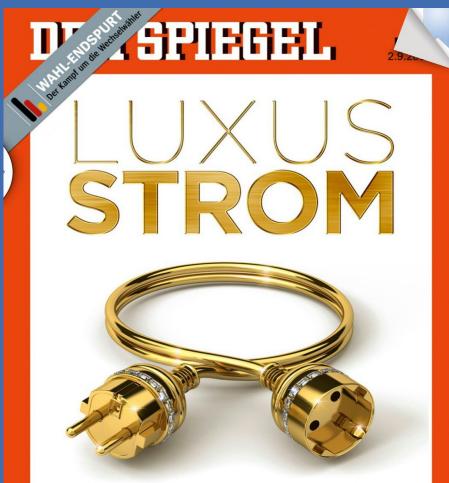


БЪЛГАРСКИ ЕНЕРГИЕН ФОРУМ BULGARIAN ENERGY FORUM





Warum Energie immer teurer wird – und was die Politik dagegen tun muss nergiewenae

(Energy Transition)

What is it all

about?



Auswärtiges Amt



RIO+20 United Nations Conference on Sustainable Development

Rio de Janeiro, Brazil 20 - 22 June 2012





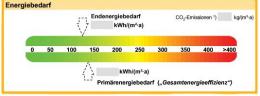
Energiewende (Energy Transition): Not a sudden move



- 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:

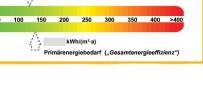




- sustainable low-carbon, efficient
- secure / safe diversification of supply, no nuclear

competitive

- cost of fossil fuels will continue to rise in the long term
- export-oriented economy at cutting edge of technology







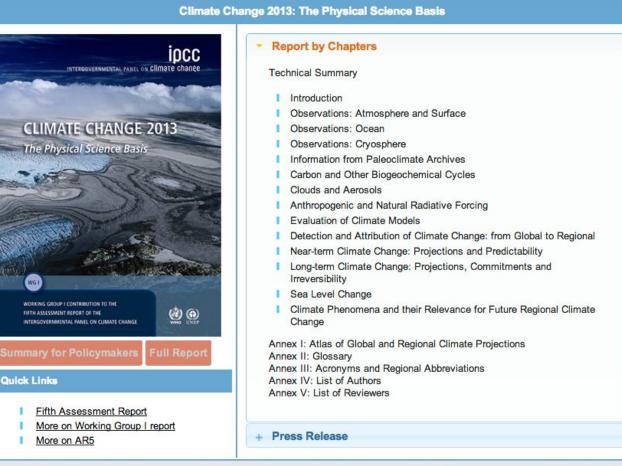


CLIMATE CHANCE 2007 SYNTHESIS REPORT

UNDERSTANDING CLIMATE CHANGE

22 years of IPCC assessment

<complex-block>



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).

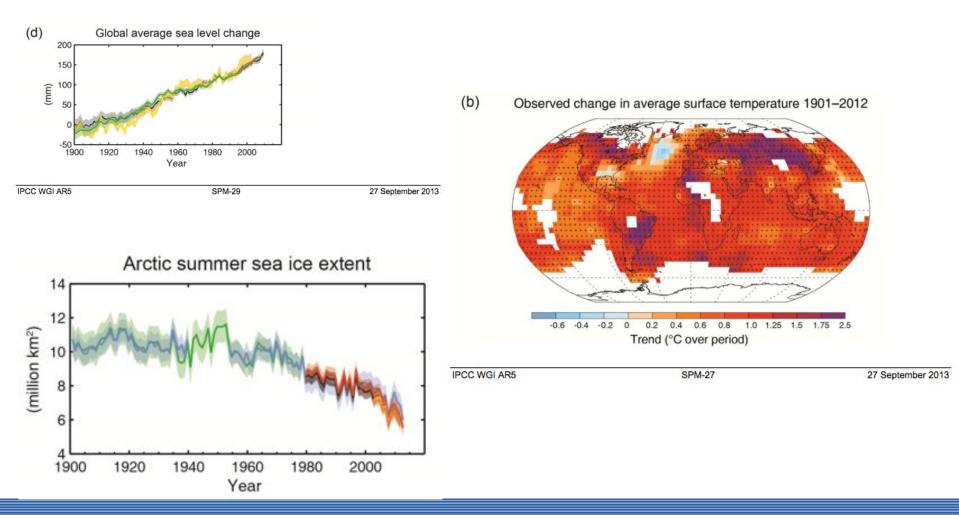


Nevertheless three out of four model calculations assess that the mean temperature will increase by more than 2 degrees - maximum up to 3,7 degrees (the fourth presumes worldwide radical climate protection, an unrealistic scenario).





Graphics from 2013 Approved Summary for Policymakers



Auswärtiges Amt

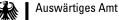


Framework: The European Union and EU Energy Policy



- 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
 <u>All</u> 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?



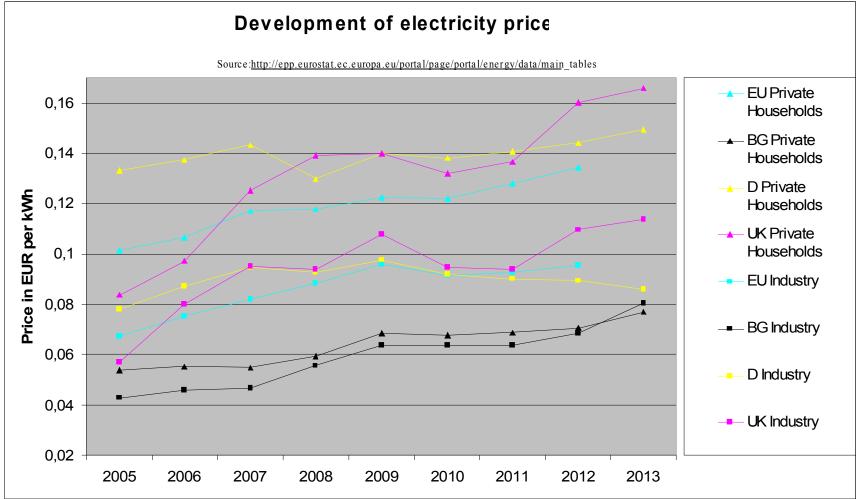
Energiewende Four challenges we really face:

- 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.





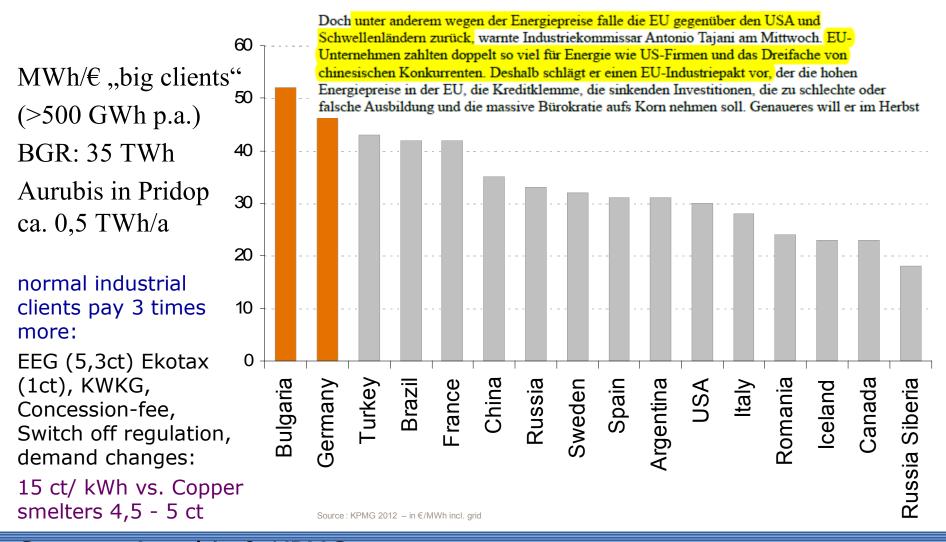




Source: http://www.eex.com/de/Marktdaten# Source: http://epp.eurostat.ec.europa.eu/

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

Comparison of the industrial electricity price



Source: Aurubis & KPMG

A new nuclear plant ? 2 GW, producing all year

operativer Gewinn Jahre sergebnis bei Zinssatz in % 1 2 3 4 5 8200 4001 Jahr 7784 7864 6046 8128 8210 2. Jahr 7753,28 7787,746 7724,014 7975,2448 8231,525 8231,525 3. Jahr 723,36,428 7277,7051 7567,2144 7894,2459 8224,310125 4. Jahr 6908,7924 7280,3939 7810,02478 8255,2661 6. Jahr 6243,66921 6711,8462 7883,9571 8256,4916 7. Jahr 6906,956 6445,5091 7019,9082 7536,57571 8256,4916 9. Jahr 5220,9033 5897,9079 6636,49766 743,80184 830,58025 7536,57571 8256,9101 10. Jahr 4873,01641 5616,86564 6434,5629 7335,56029 8325,77893 11. Jahr 4520,9033 597,97045 5634,4762 739,897112 711,835 12. Jahr 1406 5034,7476 5734,8027 7002,86789 8377,1283								
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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

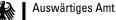
new extra-high voltage (i.e. 800 kV) DC lines (HGÜ = Hochspannungs-Gleichstrom-Übertragung)

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.





Börsenstrompreise am Terminmarkt der EEX von Jan. 2011- Jun. 2013



➢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-





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?





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

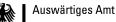
- Not included *risks (Fukusima:* 80 bn €) and renaturization costs
- For new nuclear plants investors in UK and TUR demand a guaranteed purchase price of 12 ct / kWh, which is **higher** then the 11 ct for newest wind energy projects in Germany

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

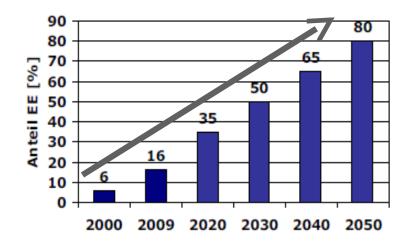
III. Perspectives

• 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

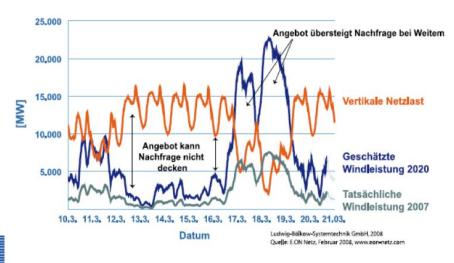


Challenges for Changing the System

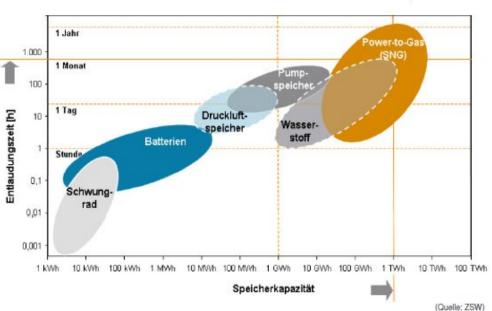




System stability



Security of supply





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

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Delegationsreise unter Leitung des Parlamentarischen Staatssekretärs im Bundeswirtschaftsministerium Burgbacher

Delegationsreise unter Leirung 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 kan∕n man die bulgarische Energi∉wirtschaft 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

I Loos dar hulasricakan Wirtcahaft



AA

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…

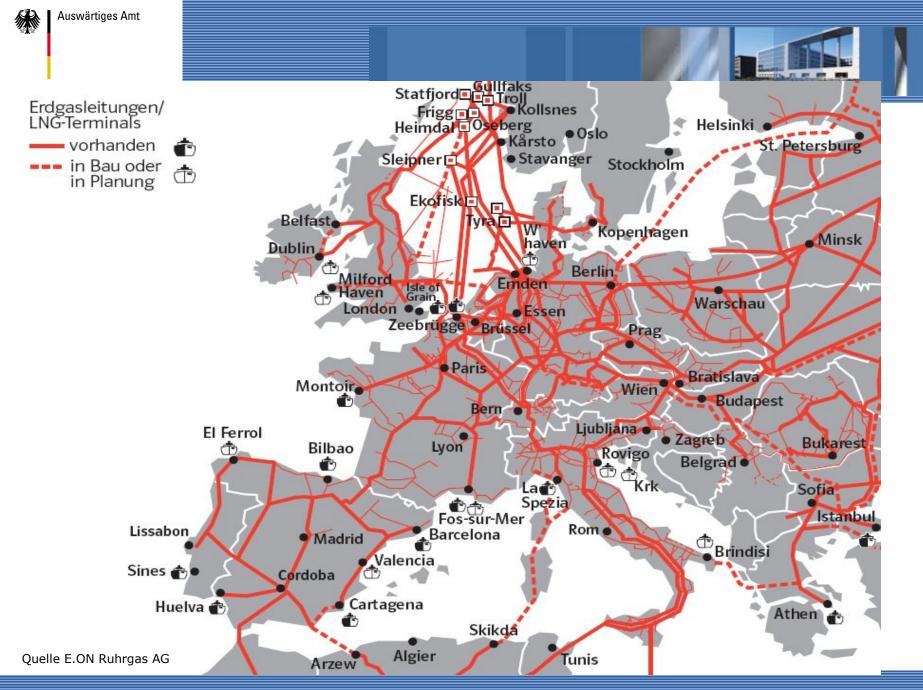
- > Bulgariens erstes Elektroauto
- >> Bulgarische Investitionsagentur





Bonus material:

4th Regional Energy Conference "ENERGY DEVELOPMENT AND INTEGRATION OF REGIONAL ENERGY MARKETS" 8 October 2013 Sofia, Sheraton Hotel Balkan







VS.

additional power plant

investment into efficiency En

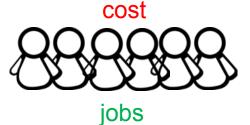
Energy efficiency saves money and ressources, creates jobs.





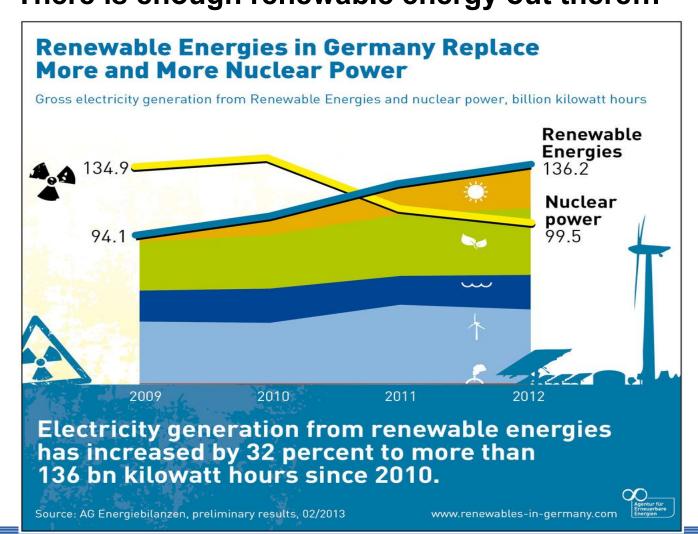








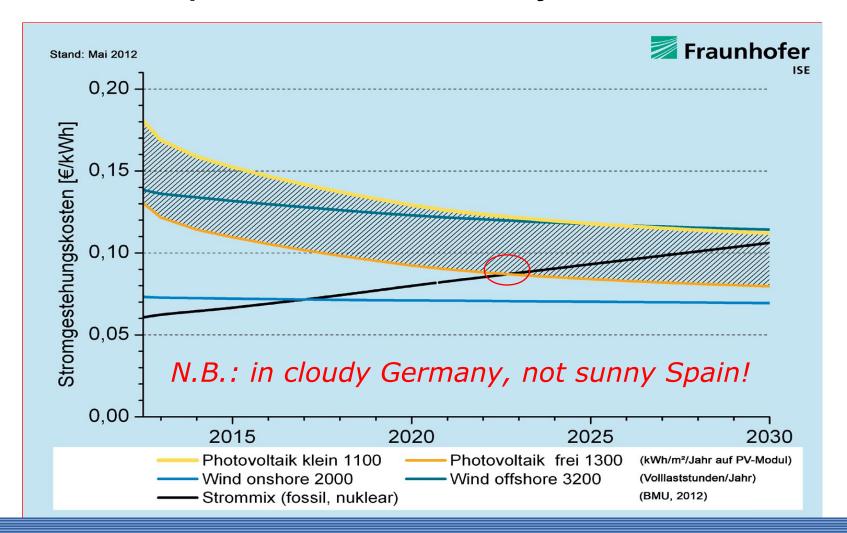






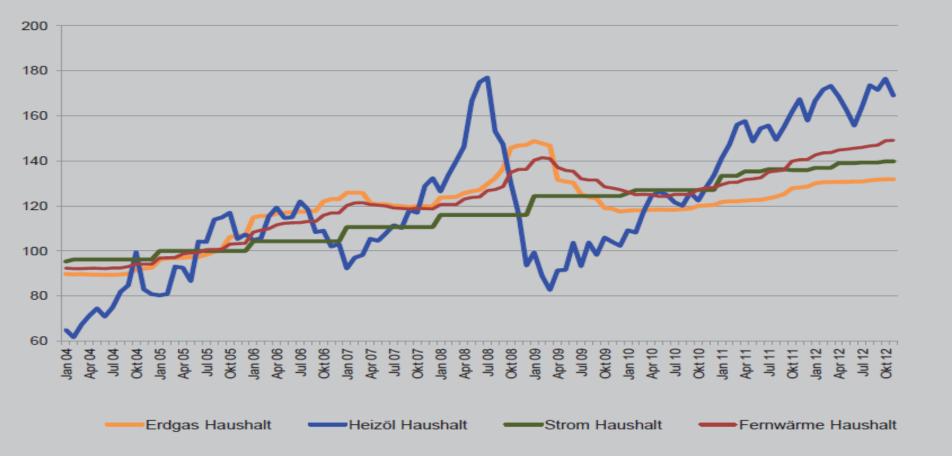


... and solar power will be there in 10 years.



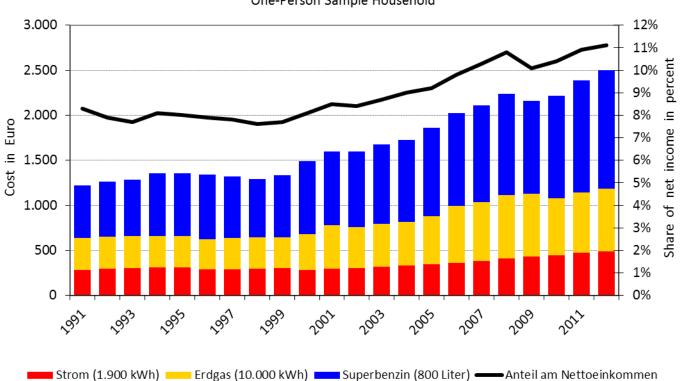








Electricity scores rather better than other energies and is the smaller part of the problem.

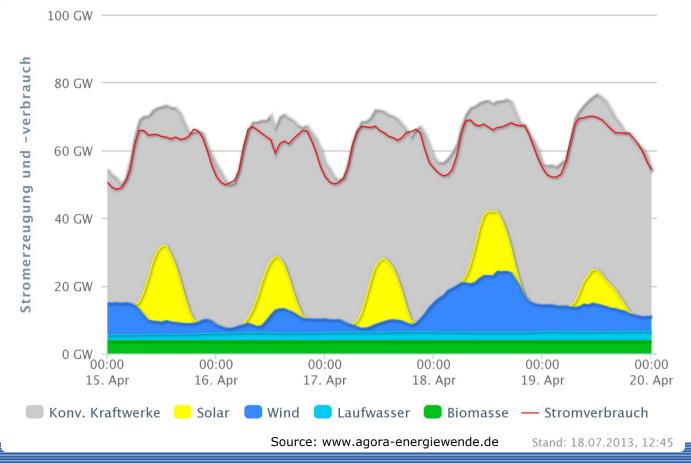


One-Person Sample Household



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

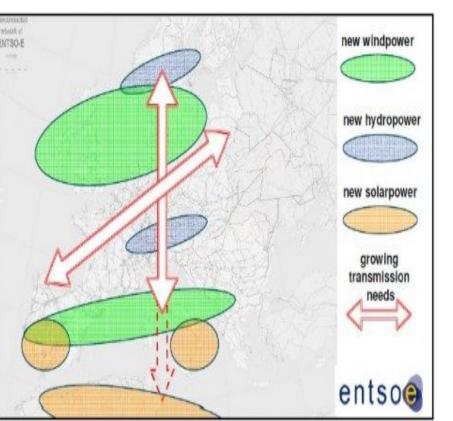
- very successful instrument to increase share of RE power
- copied by many countries

... 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 \rightarrow 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

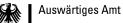
We need to develop the power grid for the European Single Market:

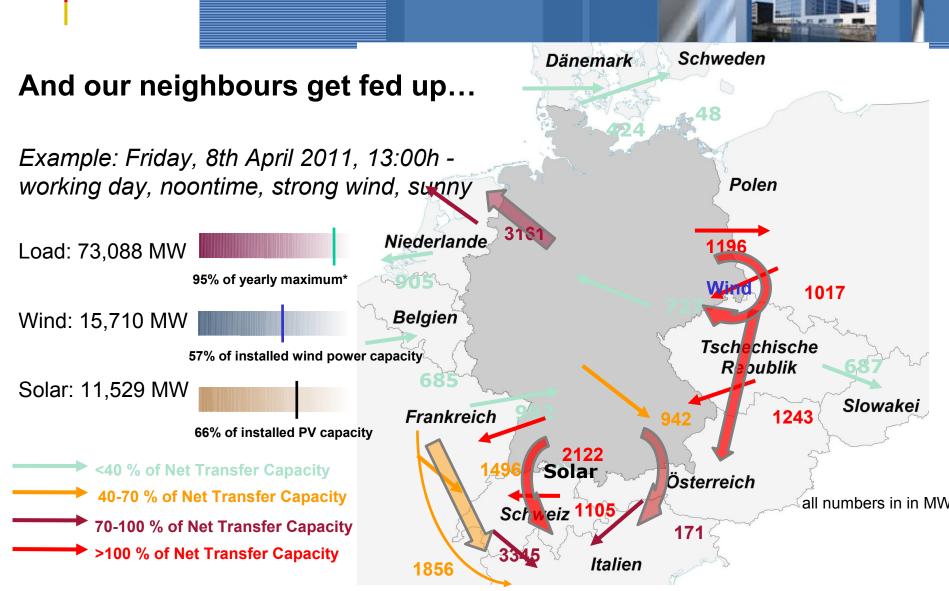
- •North-South electricity flows:
 - Renewables (from North and Baltic Sea to Southern Europe)
 - Production capacity gaps (Southern Germany, Italy, Balkans)
 - Integration of pump storage capacity (in the Alps and Scandinavia)

•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)





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/km² vs. North Dakota 3.6 p/km²), strong public concerns about fracking do exist.

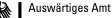
EU (Commission, DG Energy):

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: CO₂, 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.