

How Much *European* Regulation Do We Need for Electricity Markets?

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The German *Energiewende*

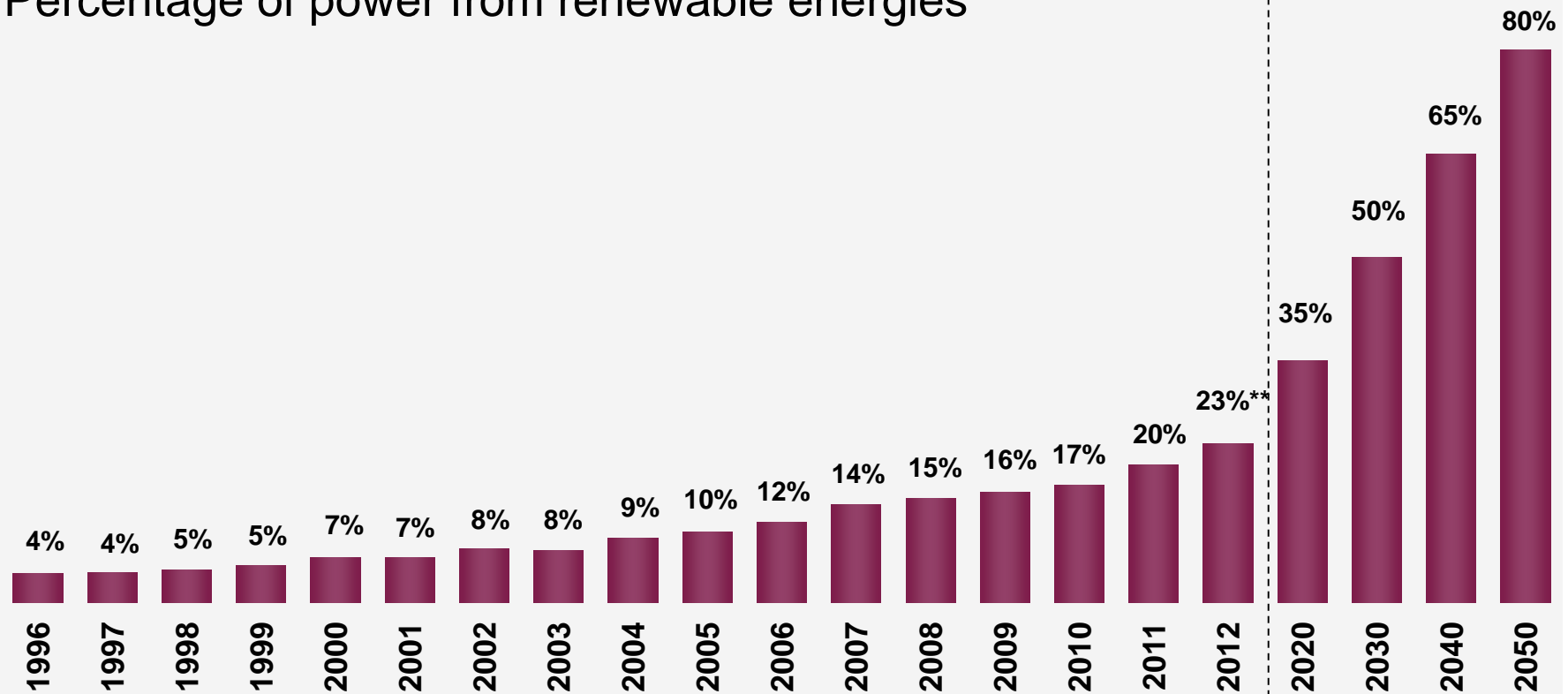
- Tsunami in Japan on 10 March 2011
- Immediate shut-down of eight nuclear power plants in Germany (14 March 2011), complete move to nuclear-free electricity until 2022,
- Switch to renewable energies: 35% of electricity consumption in 2020, 50% until 2030 and 80% until 2050.
- This is called *Energiewende* (energy turnaround).
- Regional and local Governments now even try to exceed these quotas.
- Main instrument to foster build-out: feed-in-tariffs set by Parliament,
- Feed-in tariffs are guaranteed for 20 years,
- Transmission line operators are required by law to purchase all electricity produced from renewables or reimburse producers anyway

The German *Energiewende*

- Philosophy: Reimburse producers (cost incl adequate rate of return),
- This has now lead to a system of about 4000 different feed-in-tariffs because costs differ due to
 - Technology (solar, wind, bio mass, hydro, geothermal),
 - Location (on-shore/off-shore wind, solar on roofs/land),
 - Time of construction,
 - Generation capacity
- Transmission line operators have to purchase **all** electricity from renewable energies and sell it on at the electricity exchange
- The difference between feed-in-tariff and revenue from sale at electricity exchange is borne by consumers, as a levy on every kwh.

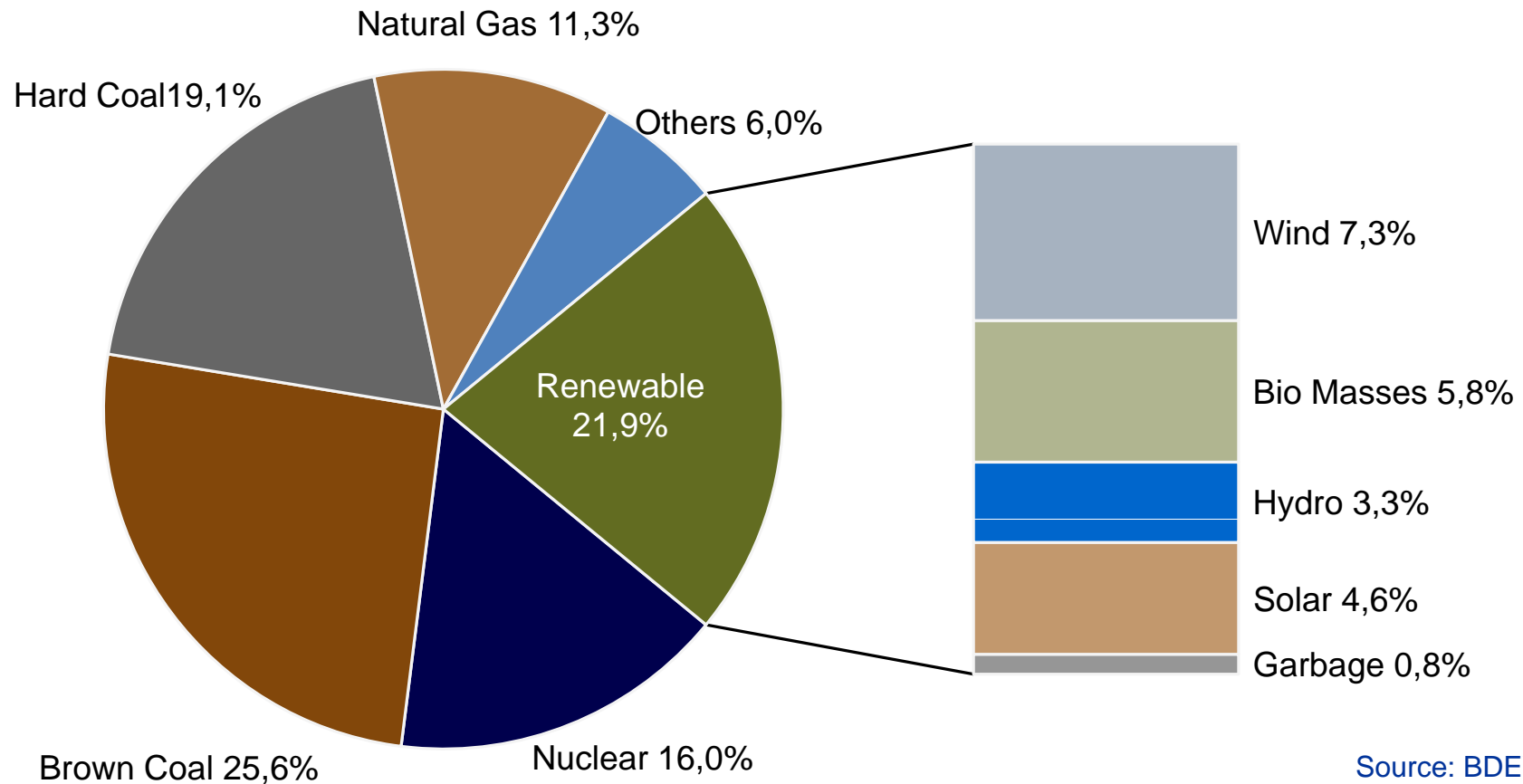
The German *Energiewende*

Percentage of power from renewable energies



Source: BDEW

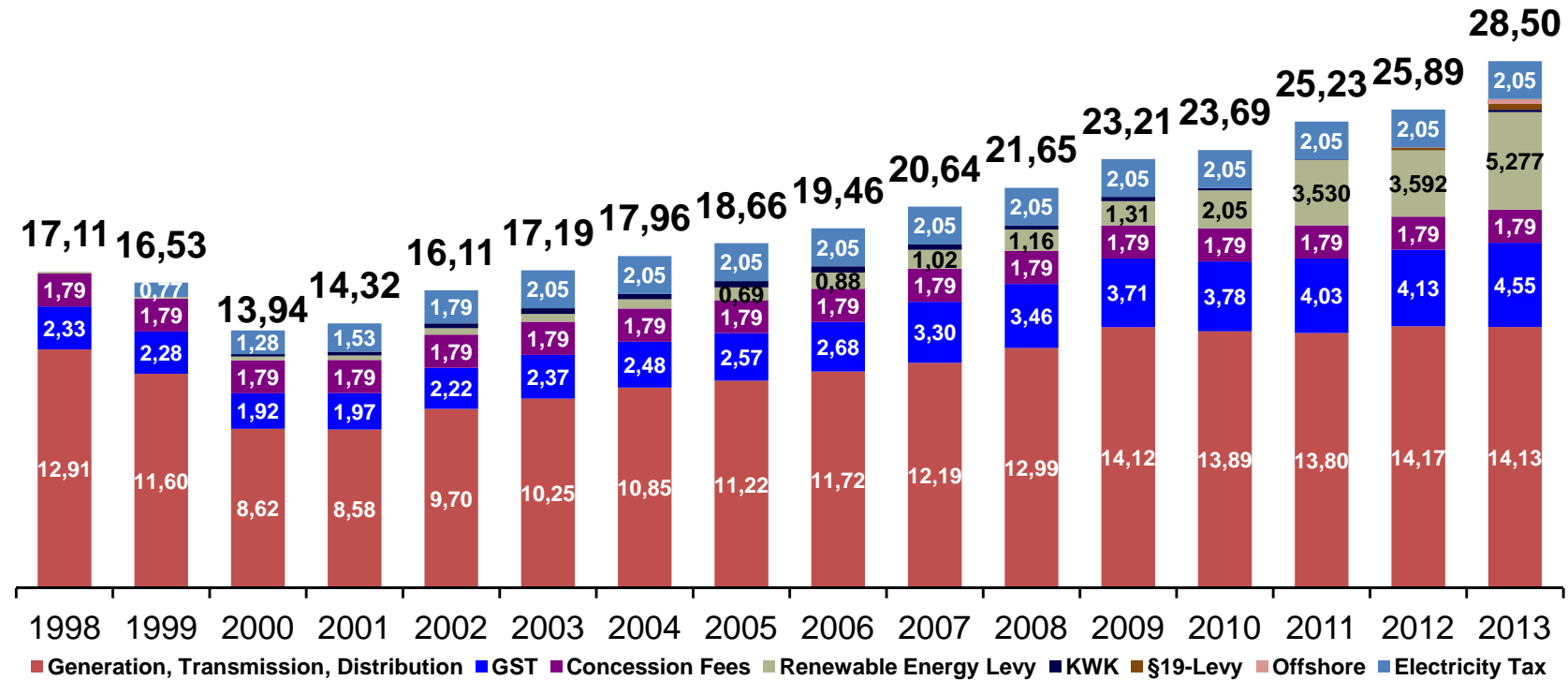
Electricity Generation in Germany



Source: BDEW

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Electricity Prices for Private Households

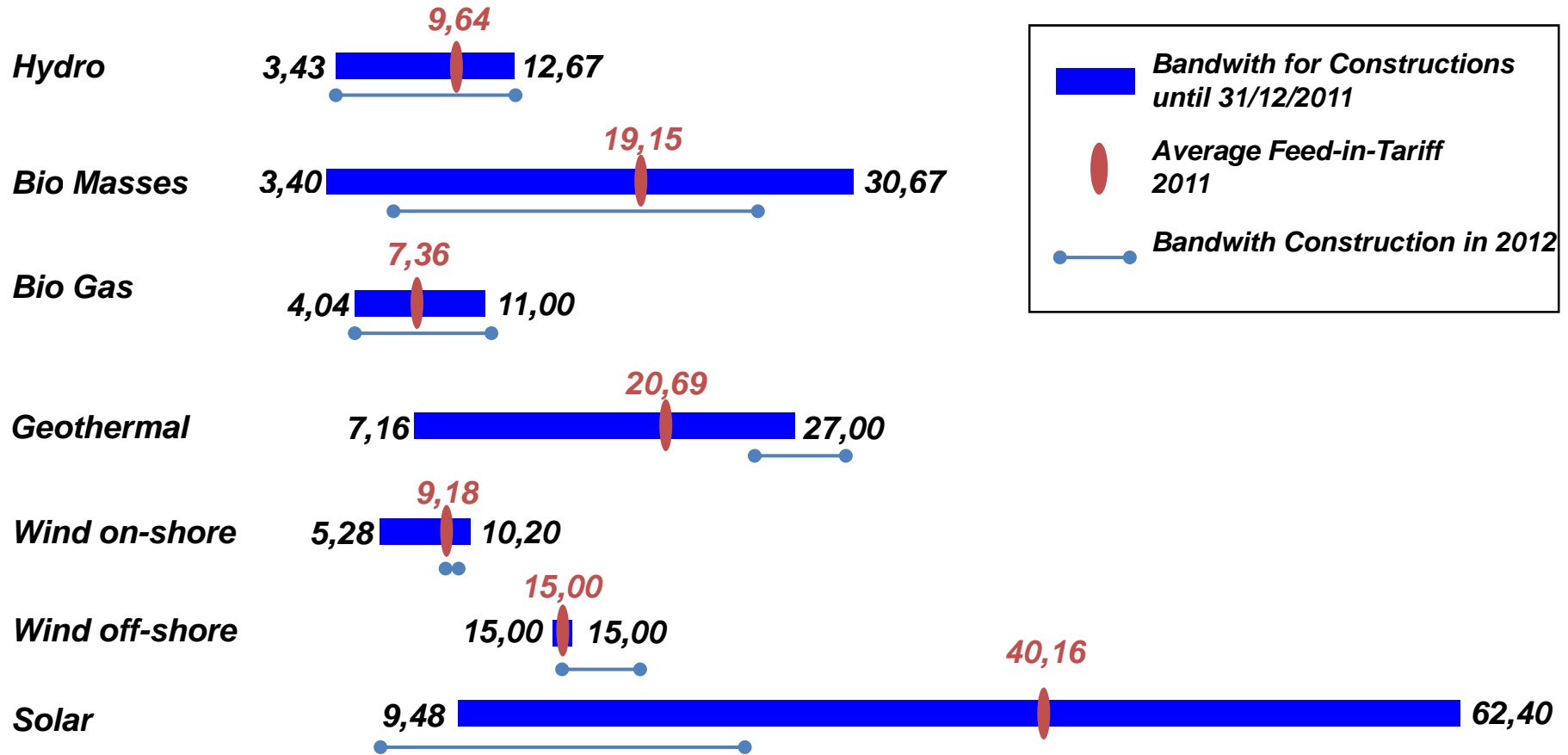


Source: BDEW

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Development of Feed-in-Tariffs

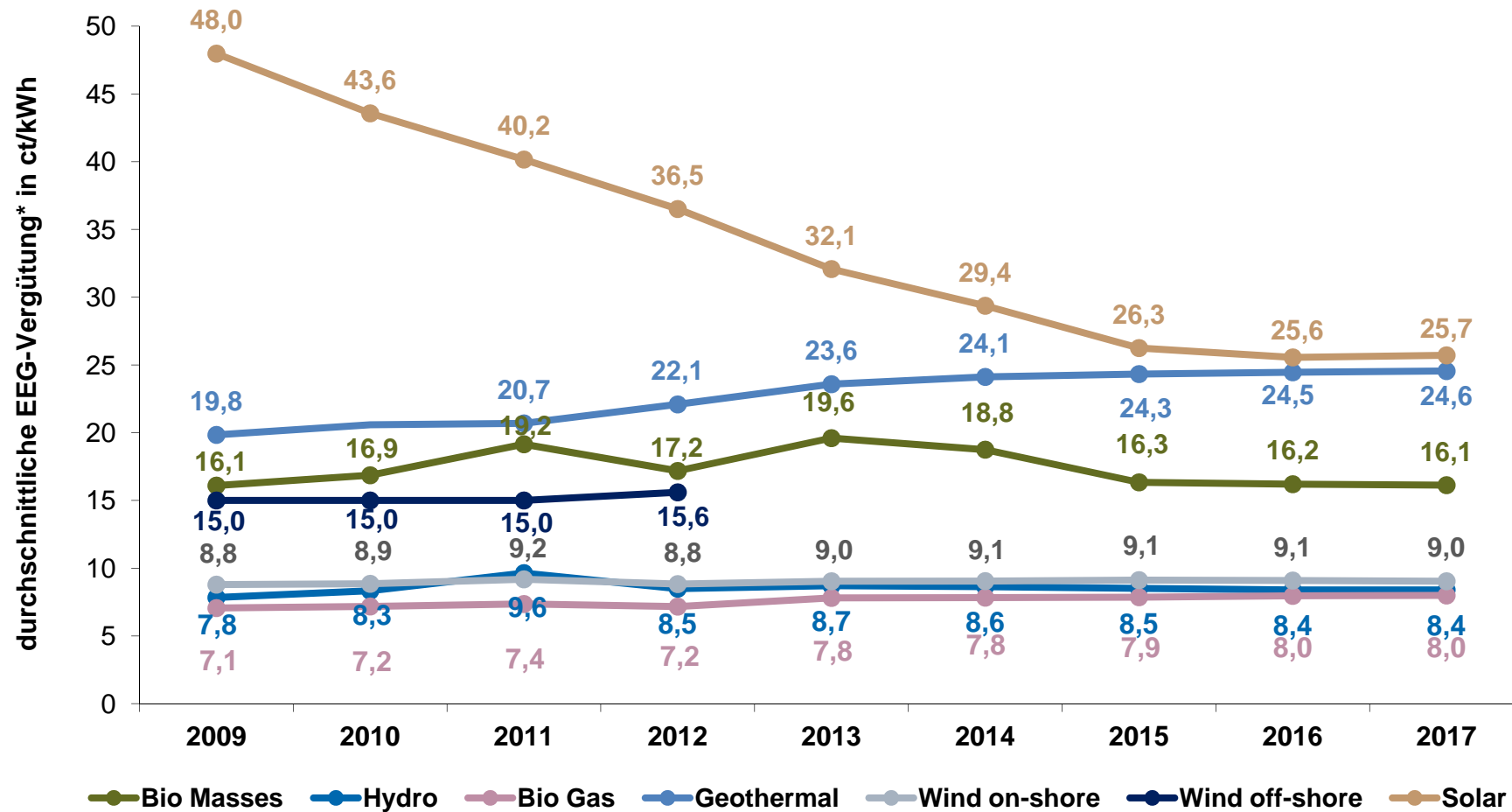
Bandwidth and Average Feed-in-Tariff 2011 in ct/kWh



Source: BDEW

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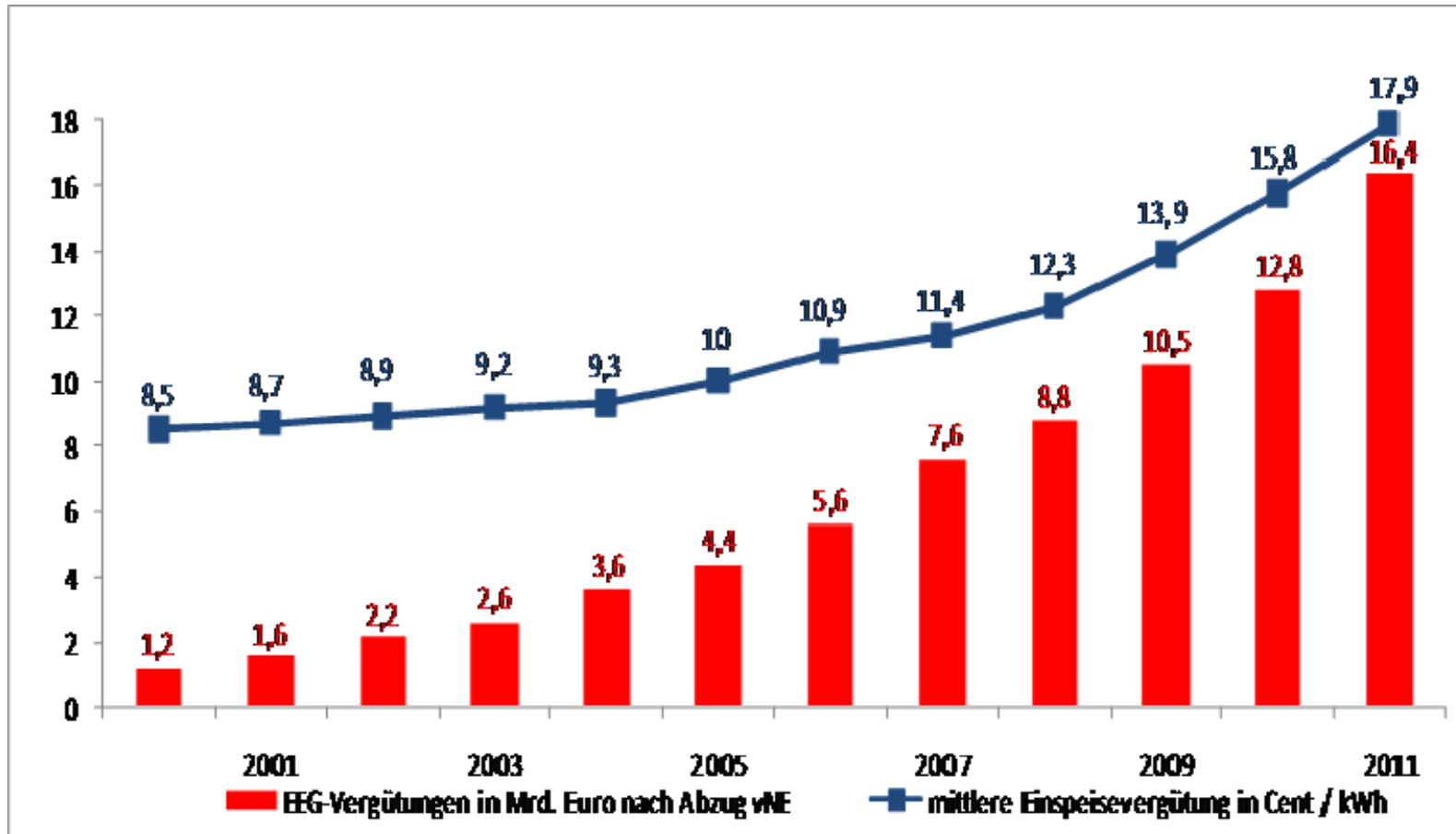
Development of Feed-in Tariffs



Source: BDEW

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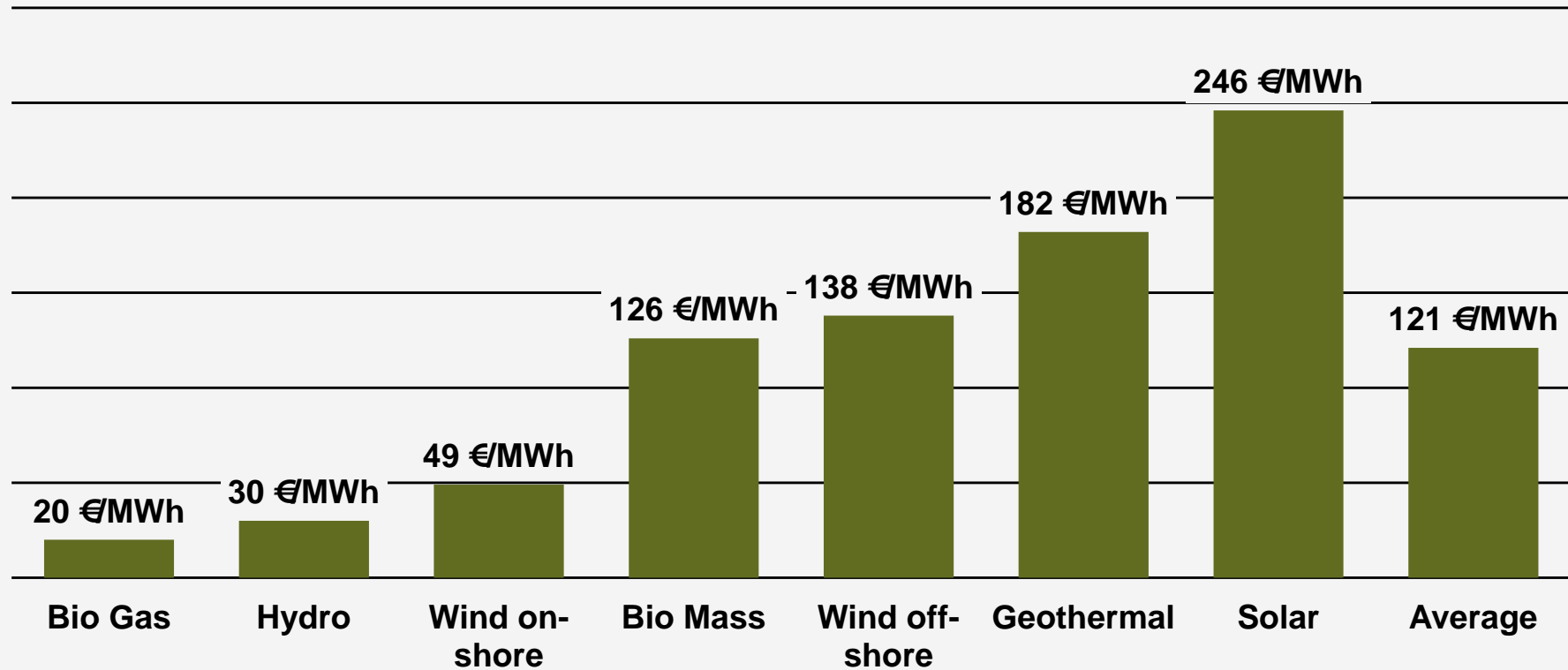
Subsidy per kwh of Green Electricity in Germany



Source: Own Calculations based on BDEW Data

Subsidies for Renewable Energies in Germany

Subsidy per MWh in 2013



Source: BDEW

(More) Problems with Feed-in Tariffs

- Producers of Green Energy have developed a “produce and forget”-mentality,
- Price signals do not play any role for investment or production of green electricity,
- New model: Decentrally planned economy.
- If you are even paid if you do *not* produce, but just would have been able to, where do you locate best?

A Riddle



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(And More) Problems with Feed-in Tariffs

- So-called redispatch costs are increasing (but that is only minor)
- Costs for necessary network investment (both transmission and distribution lines) is increasing – network stability is increasingly being jeopardised,
- Necessary investment into traditional (fossil) electricity generation plants may be jeopardised – Government response: Government order to run and maintain certain power plants, more subsidies
- Common European market for electricity (any market) will disappear.

Alternative: A Renewable Quota Obligation

- Obligation on (a) electricity retailers, (b) electricity users which import, generate or buy electricity on wholesale markets, and (c) electricity-intensive firms to use x % of green electricity per year (example: Sweden).
- To the extent to which electricity-intensive firms purchase electricity from retailers they do not need to fulfill the quota obligation (to avoid a „double“ obligation)
- Green electricity generators receive a (tradable) green certificate for every 100 kWh of electricity they produce.

A Renewable Quota Obligation

- Starting on 1 January 2015 an additional z % of green electricity can be added per year $z=(35-B)/6$, where B is the percentage of green electricity in 2013. If B was 26%, then we had $z=1,5$ % additional per year.
- Duty to fulfill obligation is *demand* side in wholesale electricity markets.
- Duty to connect generators to the grid and distribution networks remains.
- No ex post change for green electricity plants built until 31 December 2014..

A Renewable Quota Obligation

- To fulfill their quota electricity retailers can produce green electricity on their own, purchase green electricity or simply purchase green certificates
- Obligated firms can contract for green electricity as they see fit.
- If firms fail to fulfill their obligations a penalty must be paid (e.g., 150% of average certificate price)
- Banking of certificates should be allowed, but no deferral of fulfillment.

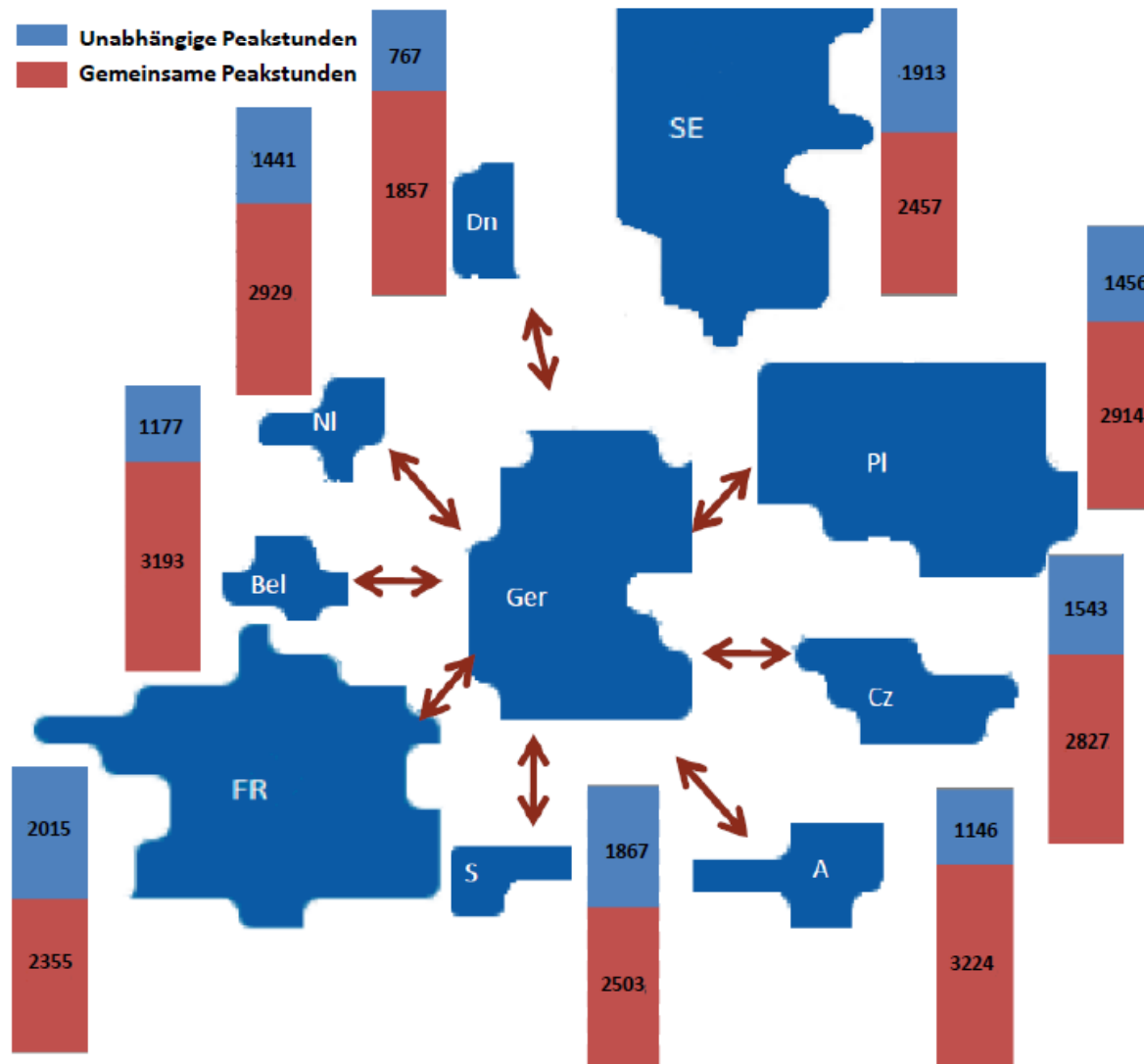
A Renewable Quota Obligation

- Advantage 1: Build-out of green energy can be better planned, hence also expansion of grid and distribution lines.
- Advantage 2: Electricity retailers compete for customers – concern for cost efficiency.
- Advantage 3: Competition between contractual forms (unlike in case of public procurement).
- Advantage 4: Self- consumed electricity can be rewarded with green certificates.
- Advantage 5: Partial quotas (e.g., for offshore wind) can be added.
- Advantage 6: European market integration is possible, huge efficiency gains
- Details (in German): <http://www.et-energie-online.de/Zukunftsfragen/tabid/63/NewsId/466/Zeit-fur-eine-grundlegende-Reform-der-EEGForderung--das-Quotenmodell.aspx>

Capacity Mechanisms

- (National?) capacity payments? (State aid?)
 - Public procurement for security of supply (public good?)
 - Is there really a problem?
 - Alternatives?
-
- Details (in German): <http://ideas.repec.org/p/zbw/diceop/24.html>

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Market Monitoring

- National market monitoring is of little use as markets are increasingly integrating (Böckers/Heimeshoff, 2012, <http://ideas.repec.org/p/zbw/dicedp/50.html>)
- As markets are integrating market surveillance should be located at the European level (ACER)
- German initiative for a market transparency body has come too late and may provide only few benefits (if any), given that market integration has significantly increased

Conclusions

- The current system of purely national (apart from Sweden/Norway) subsidy schemes for renewable energies jeopardizes the European integration of power markets
- Huge efficiency gains are lost, as green electricity is produced inefficiently
- A European quota system could heal many of the weaknesses of the current subsidy schemes based on national feed-in tariffs
- Capacity mechanisms should not be designed at the national level, but rather at a regional (supranational) level to account for the extent of European power markets
- Similarly, market monitoring is a European task rather than a national one, as electricity markets are no longer national.

Thank you for your attention!

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