

Support of Renewable Electricity and Investments in Conventional Generation

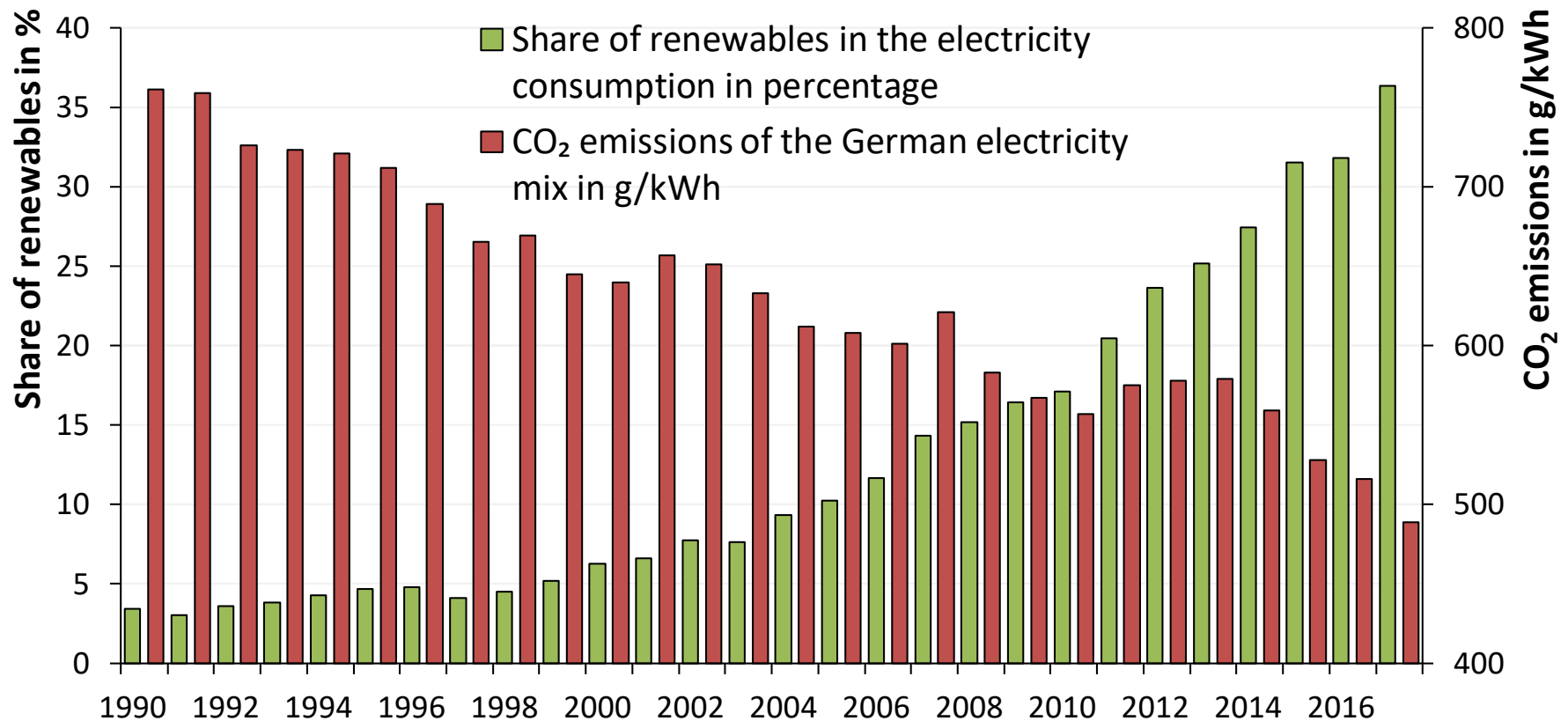
Experiences from the German 'Energiewende'

SIEW 2018, Energy Studies Institute Roundtable

Unlocking Power System Flexibility:
Innovative Wholesale Market Design and Business Models

Singapore, November 2, 2018

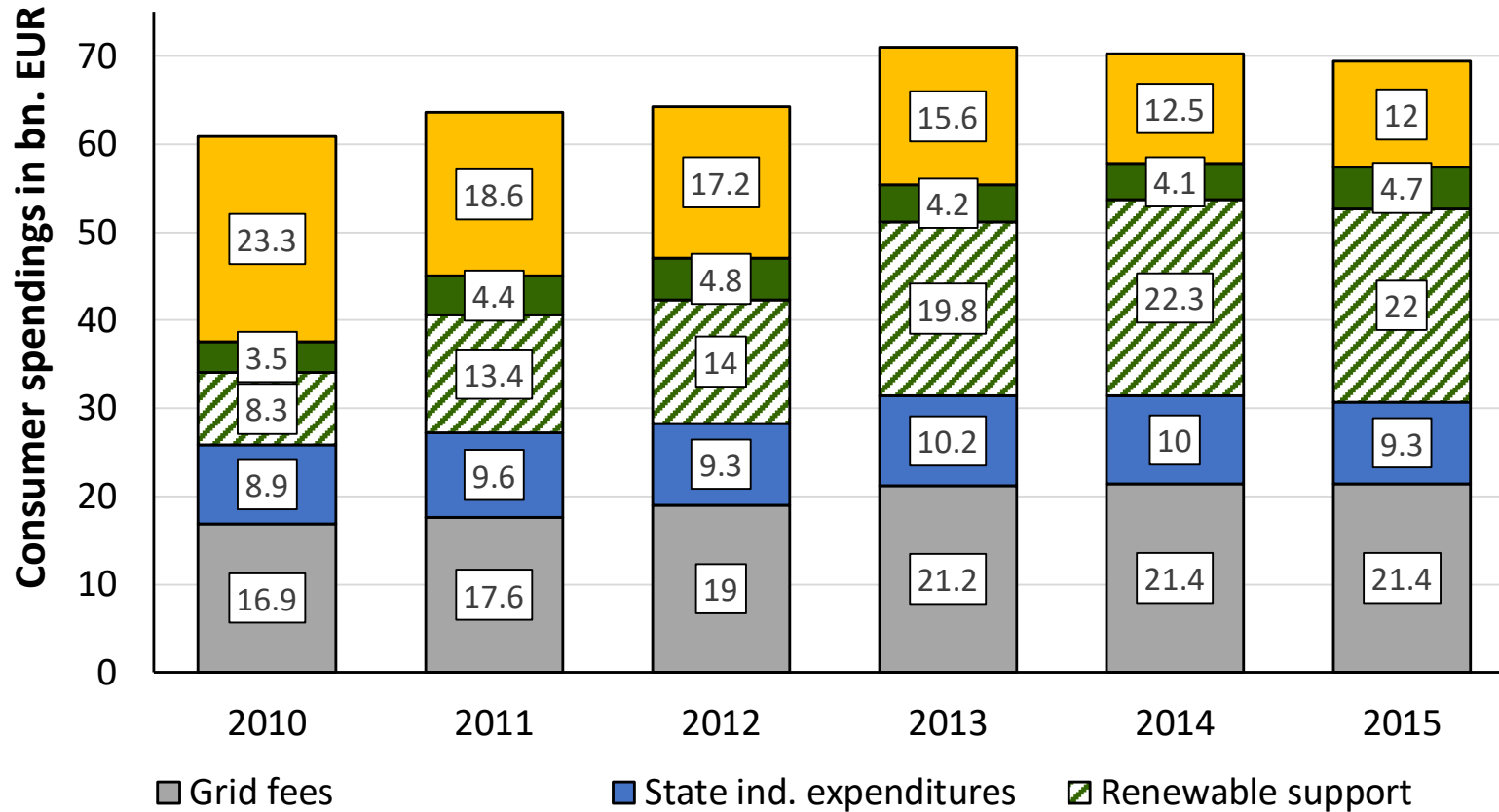
Development of the Shares of Renewable Energy in the Power Sector



Source: Praktiknjo (2018), Data: BMWi (2018)

- Share of renewable energy sources increased by factor of six from 2000 to 2017
- Regarding development of these shares, renewable support has been a success!

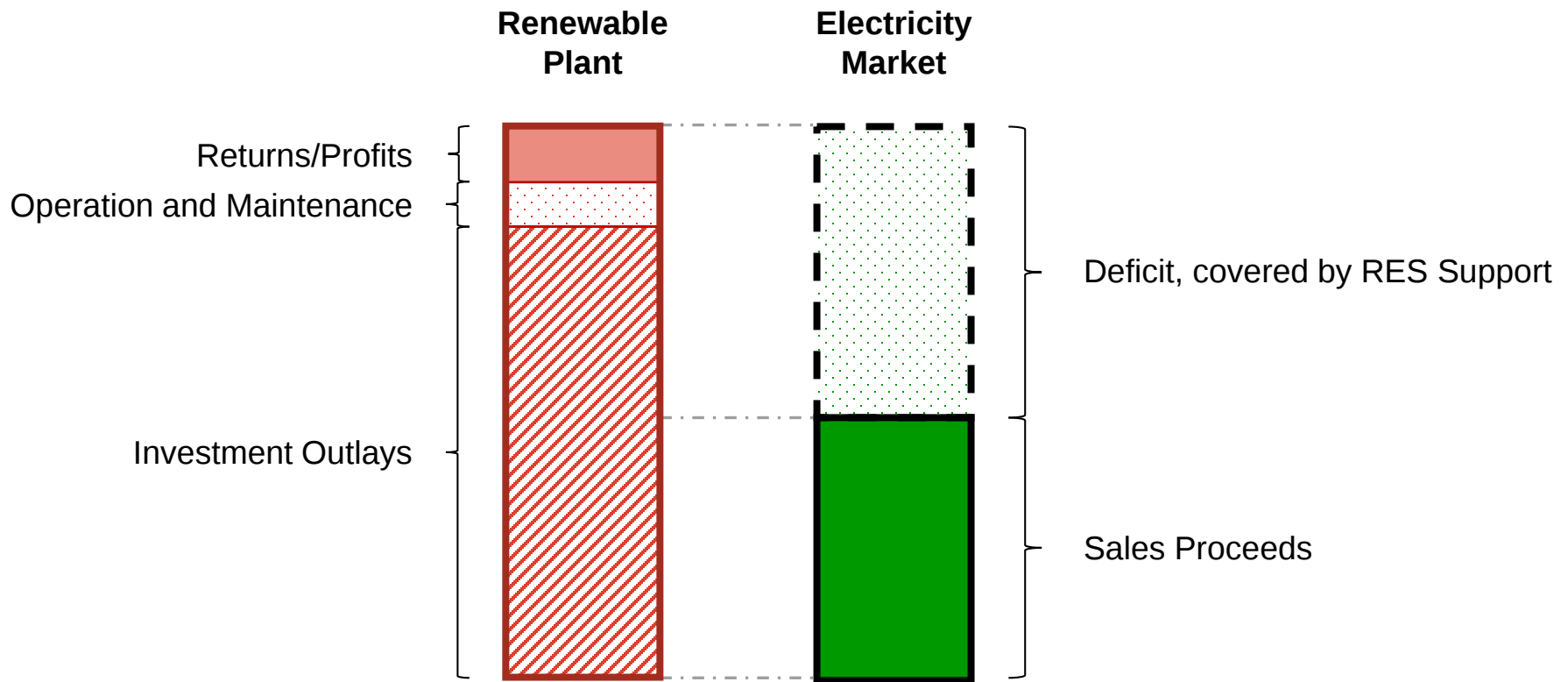
Power Market: Liberal or Planned?



Data: Energie der Zukunft (2016)

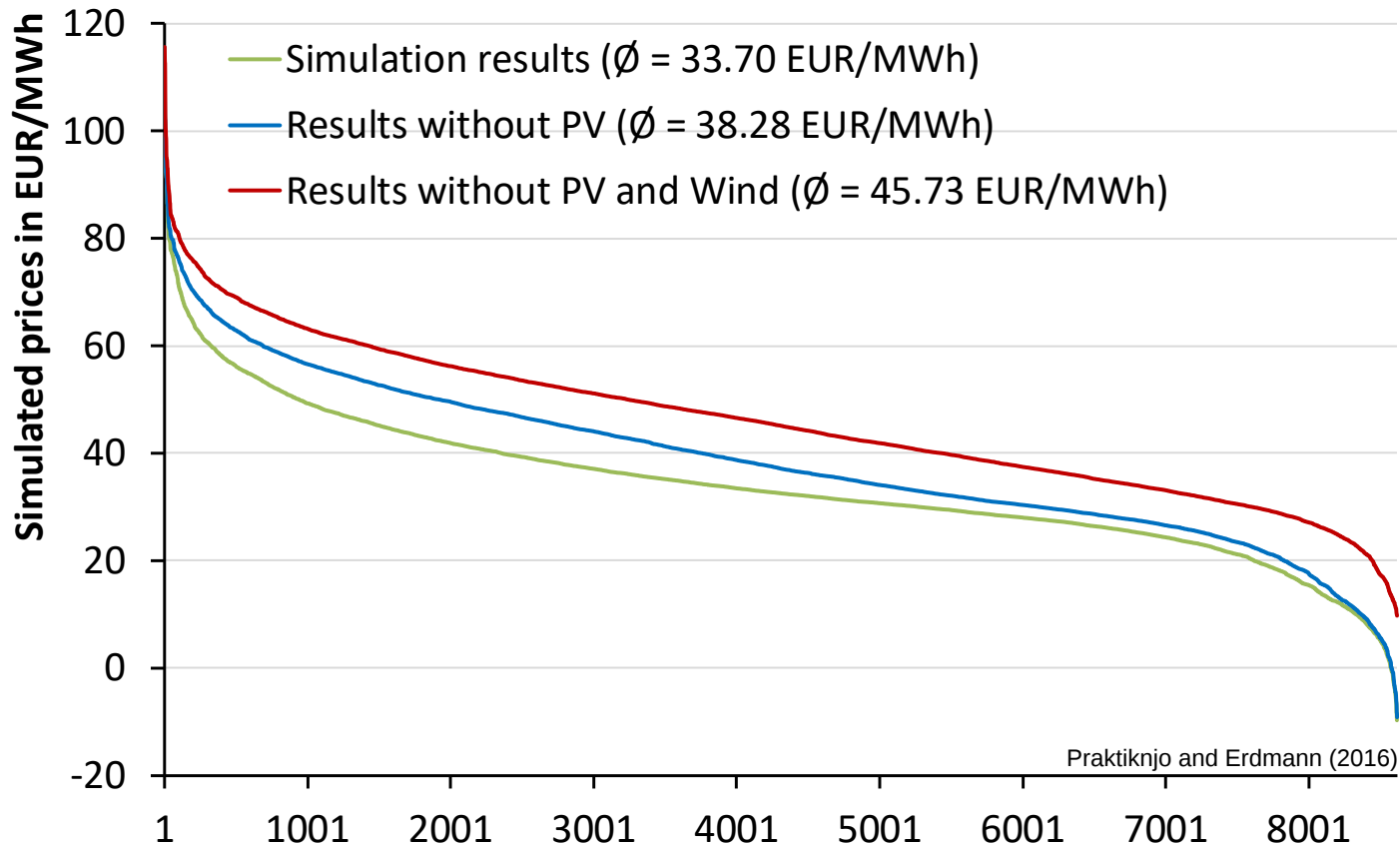
- Shares of governmentally planned components of electricity prices are increasing
 - Shares of market-based components of electricity prices are decreasing
- Renewables not a niche technology anymore in Germany with shares over 35%

Support of Renewables until Recently in Germany



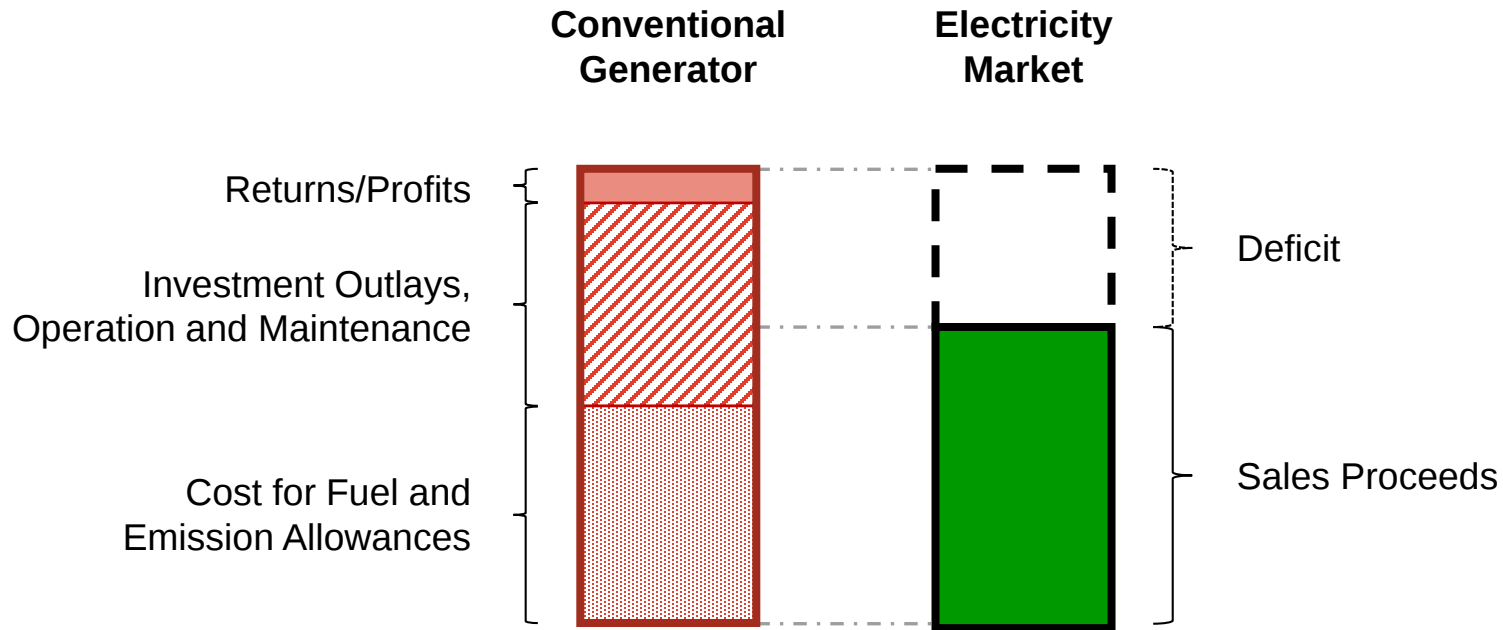
- Usually, contribution margins are insufficient for investments in renewables
- Differences are covered by feed-in premiums → “guaranteed” profitability for investments in renewables

Impact of Renewable Support on Liberalized Market



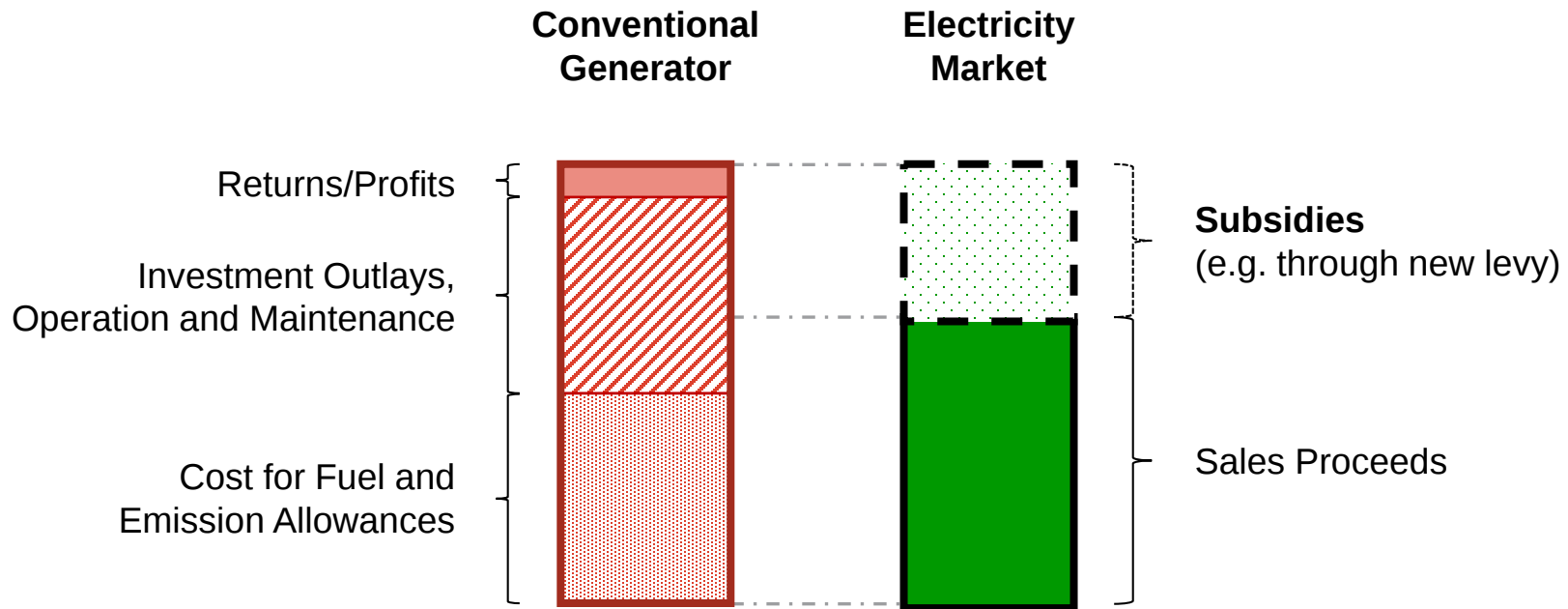
- Feed-in tariffs → Incentive to invest in renewables
- Investments in renewables → Lower electricity prices (12 EUR/MWh in avg.)

Impact of Renewable Support on Investments in Power Plants



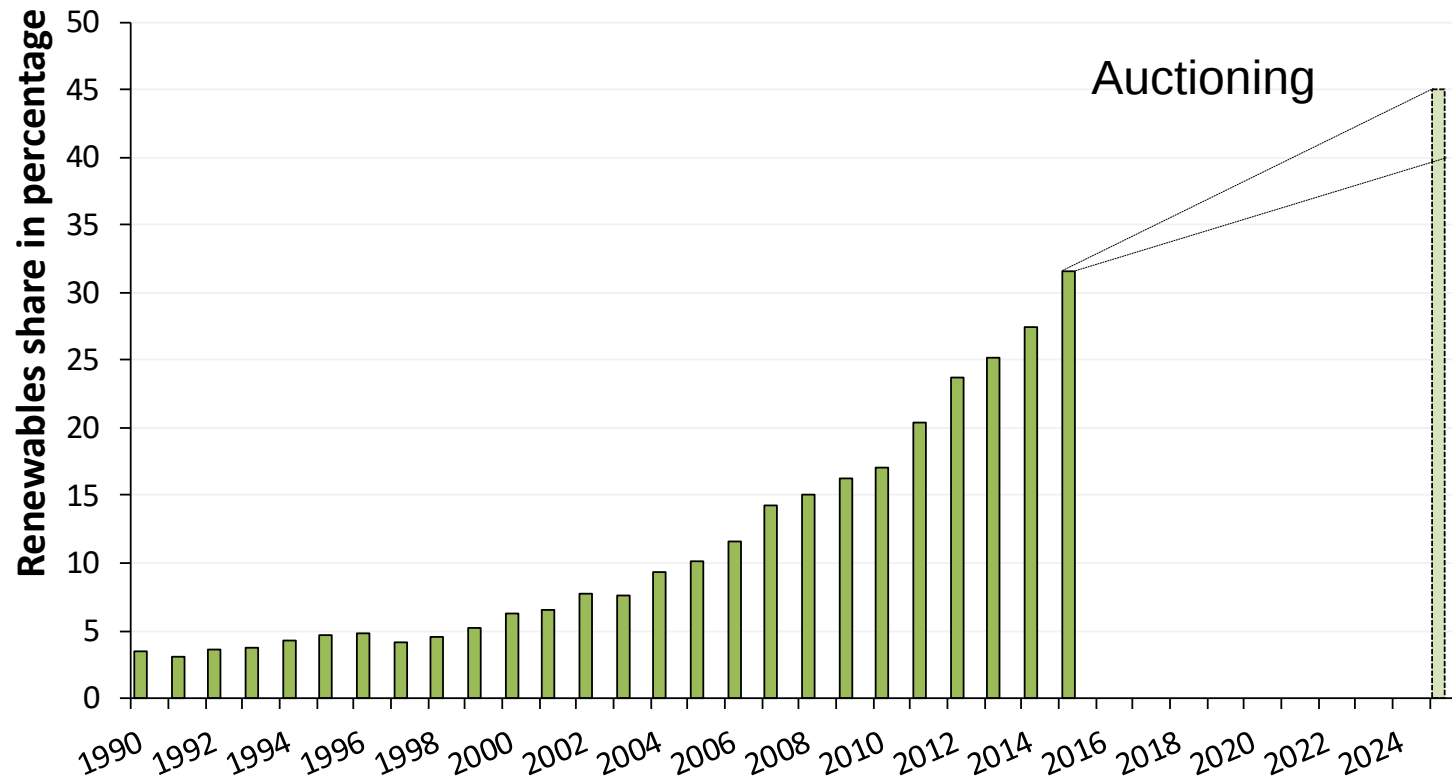
- Investments in flexible plants unviable due to low wholesale prices
→ Normally, indicator for over-capacities in market
- Investments in conventional plants ceased, but incentivized and ongoing for renewables → Distortion of the market
- Potential impacts on security of supply

Option 1: Additional Subsidies for Conventional Generators



Upside: Investments in conventionals profitable → positive for system reliability
Downside: All generators independent from market → lack of competition

Option 2: Capping Investments in Renewable Capacities



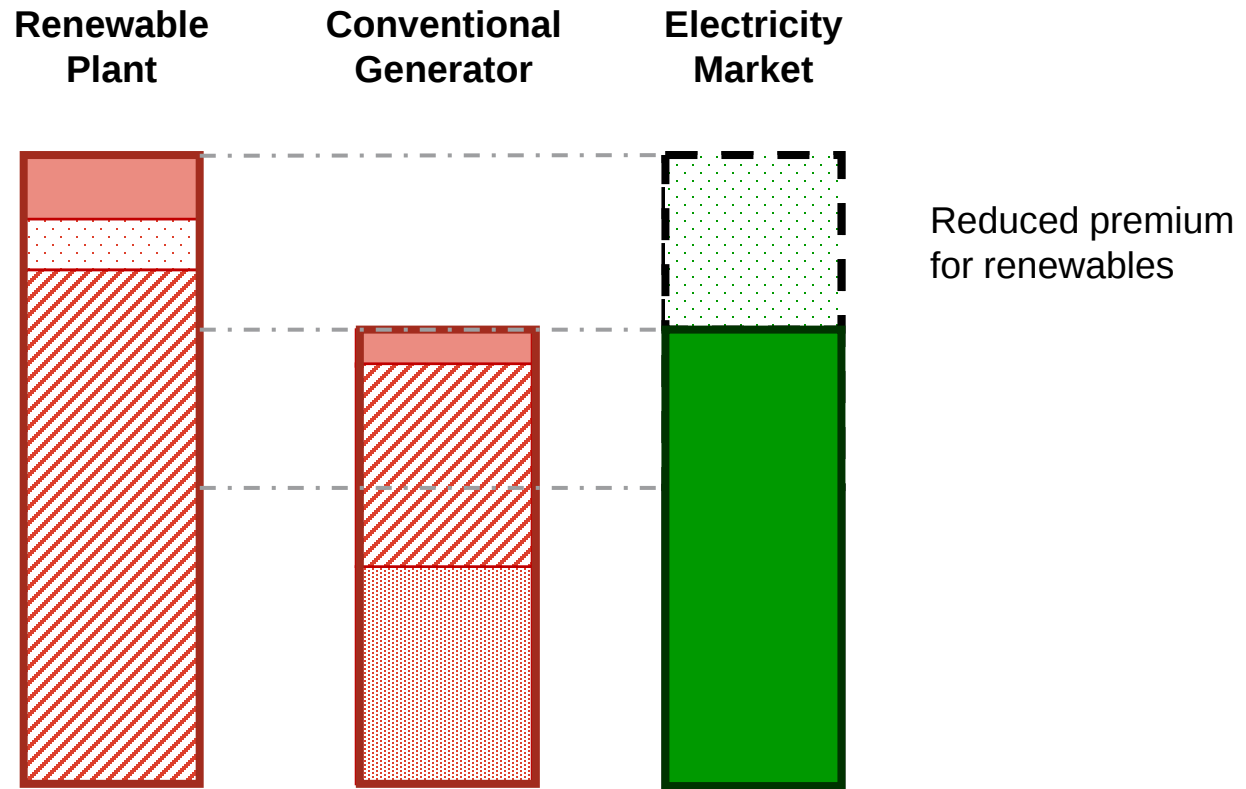
Upside: Competition determines amount of subsidies

Downside: Government controls capacity of renewables

Question: Is renewable cap sufficient for investments in flexible generation?

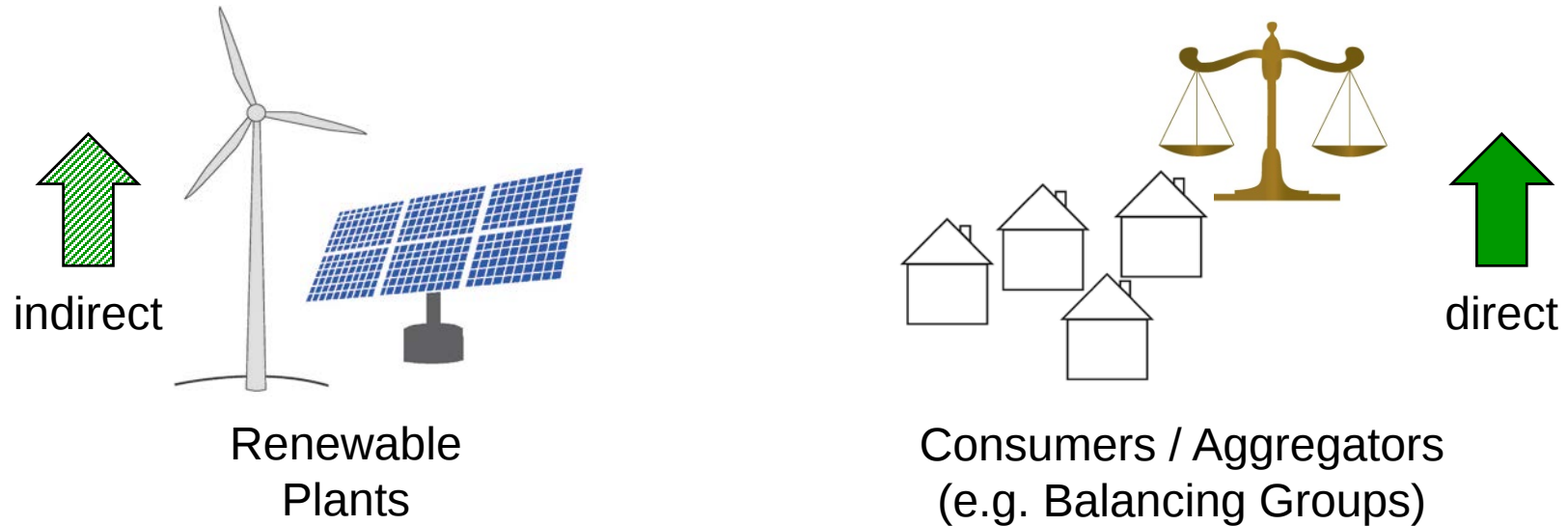
If not: Should capacities for flexible generation be auctioned as well...?

Option 3: Reducing Subsidies/Premiums for Renewables



- Upside:** Investments in both, renewables and conventional generation, will be viable again in the long run → Investments controlled by market
- Downside:** Expansion of renewables could be too slow

Option 4: Support of Renewables from the Demand Side

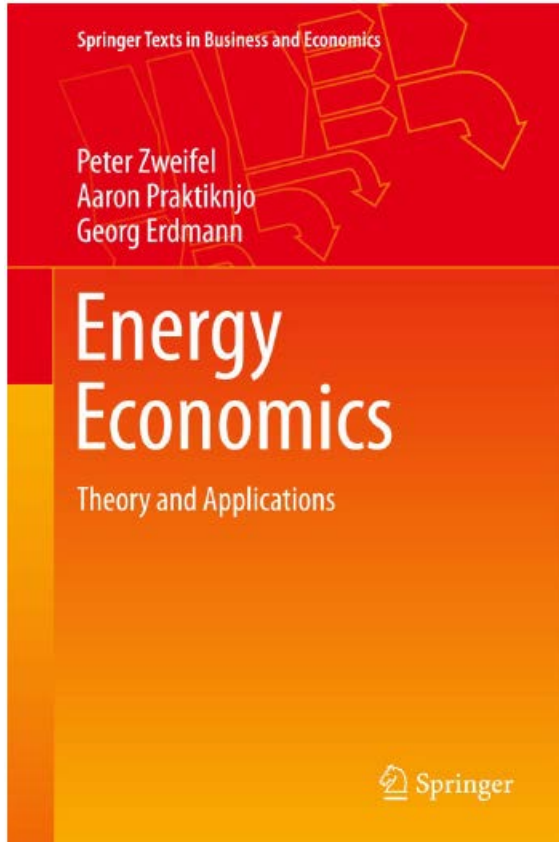


- Upside:** Market (and not government) decides on optimal technology mix to integrate renewables (interruptible load, storages, power to heat...)
→ Proposal would incentivize investments in flexibility options
- Downside:** Possibly lack of political support for this proposal
→ Lobby maybe too strong on supply and too weak on demand side

Wrap-up

1. **Renewables** are **not a niche** anymore in Germany. The power sector is at a **crossroad** between **liberal market** and **planned economy**.
2. **Paths pre-defined by government** for development of the energy system might be **effective and probably efficient**. However, such policy instruments are **instruments of planned economy** and should be labelled as such.
3. **Support** of renewables **from demand side** would strengthen the idea of a **liberal market**. At the same time, such a concept would also **incentivize investments in innovative solutions** to integrate renewables into the system.

Thank you for your attention!



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Energy Economics: Theory and Applications Springer Texts in Business and Economics

- ▶ Explains the economic foundations as well as empirical methods necessary to understand energy markets
- ▶ Covers all types of energy markets including those for liquid, gaseous and solid fuels, as well as electricity
- ▶ Provides comprehensive references to data sources that allow readers to carry out their own empirical analysis