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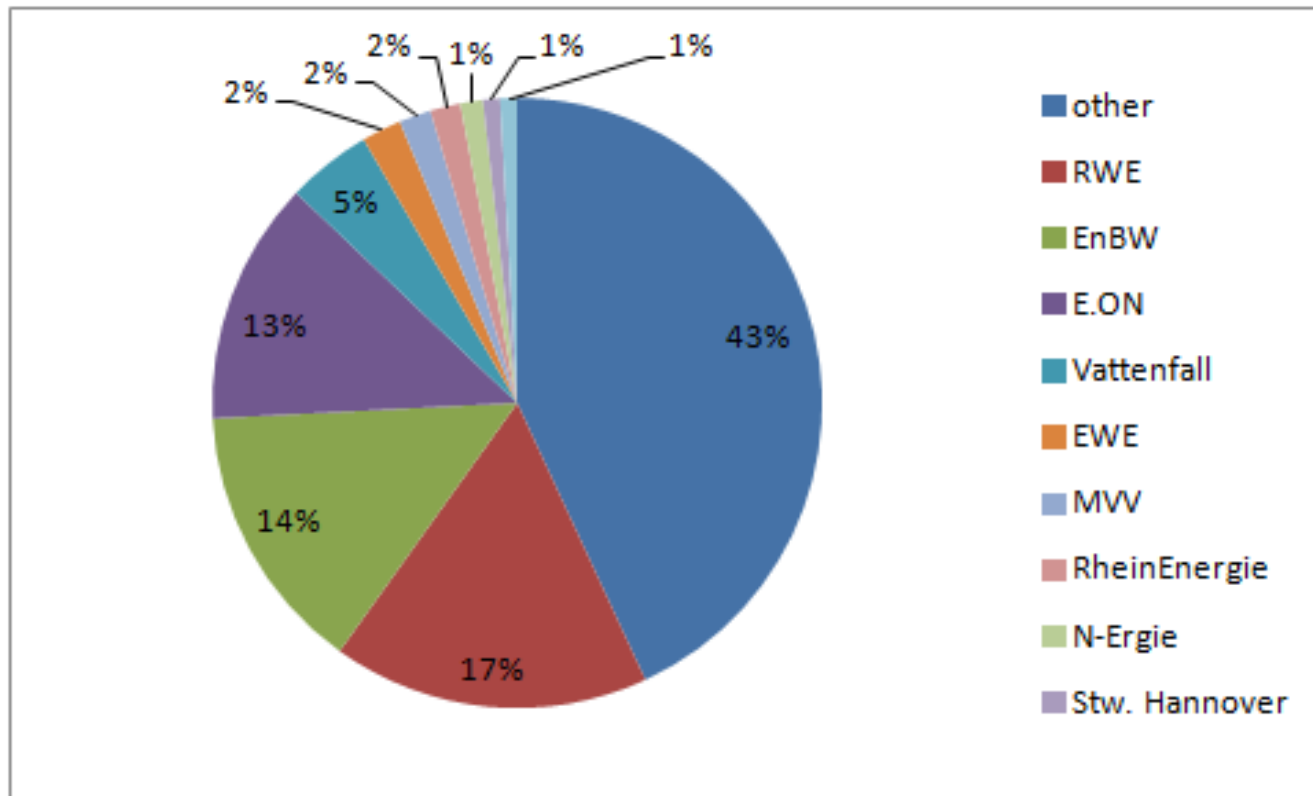
► CHANGING UTILITY BUSINESS MODELS IN GERMANY

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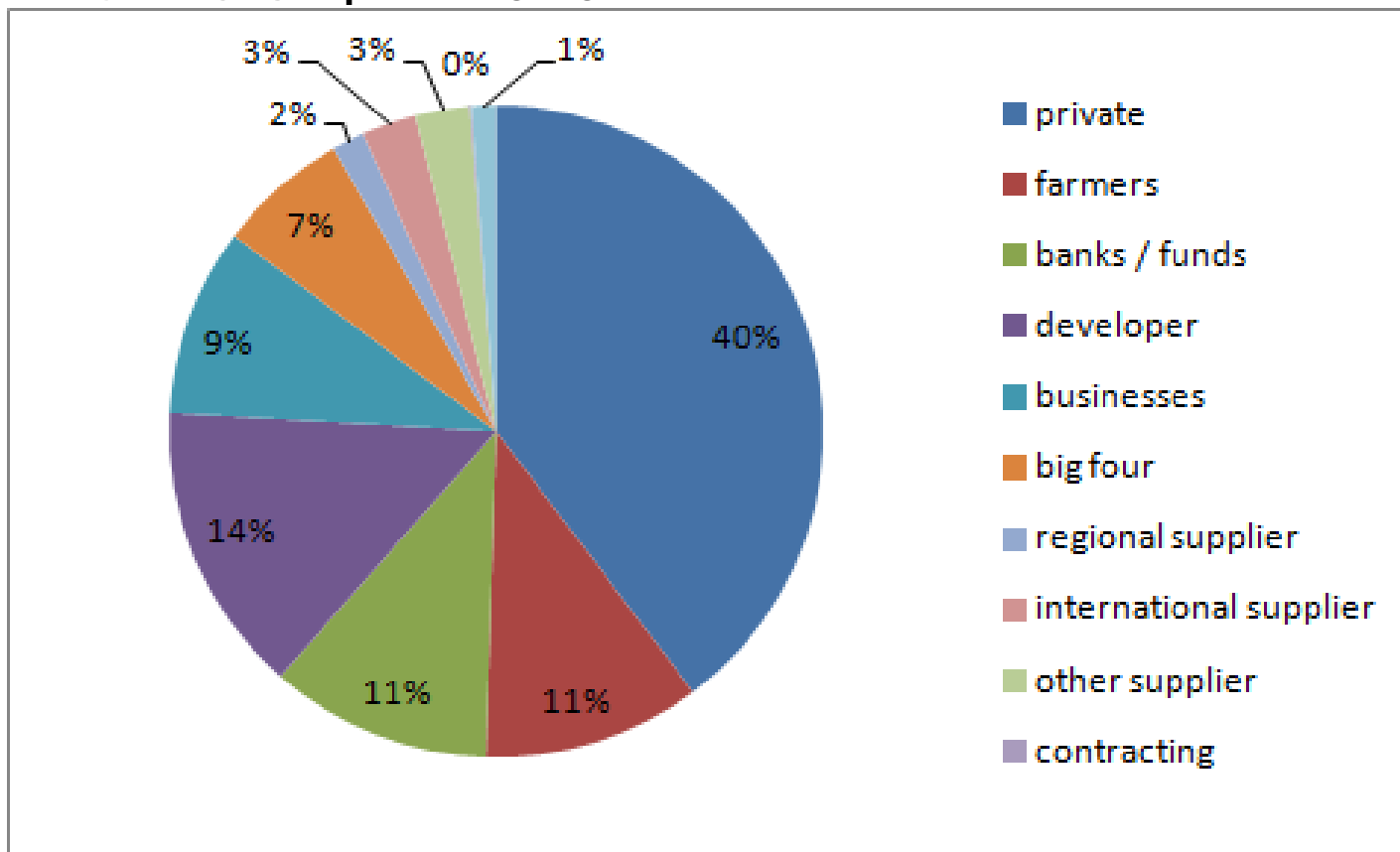
Liberalised electricity retail market

- ▶ 1,100 electricity suppliers, 300 suppliers >1MW
- ▶ four large suppliers cover 49% of retail market (2009), decreasing:



renewable electricity

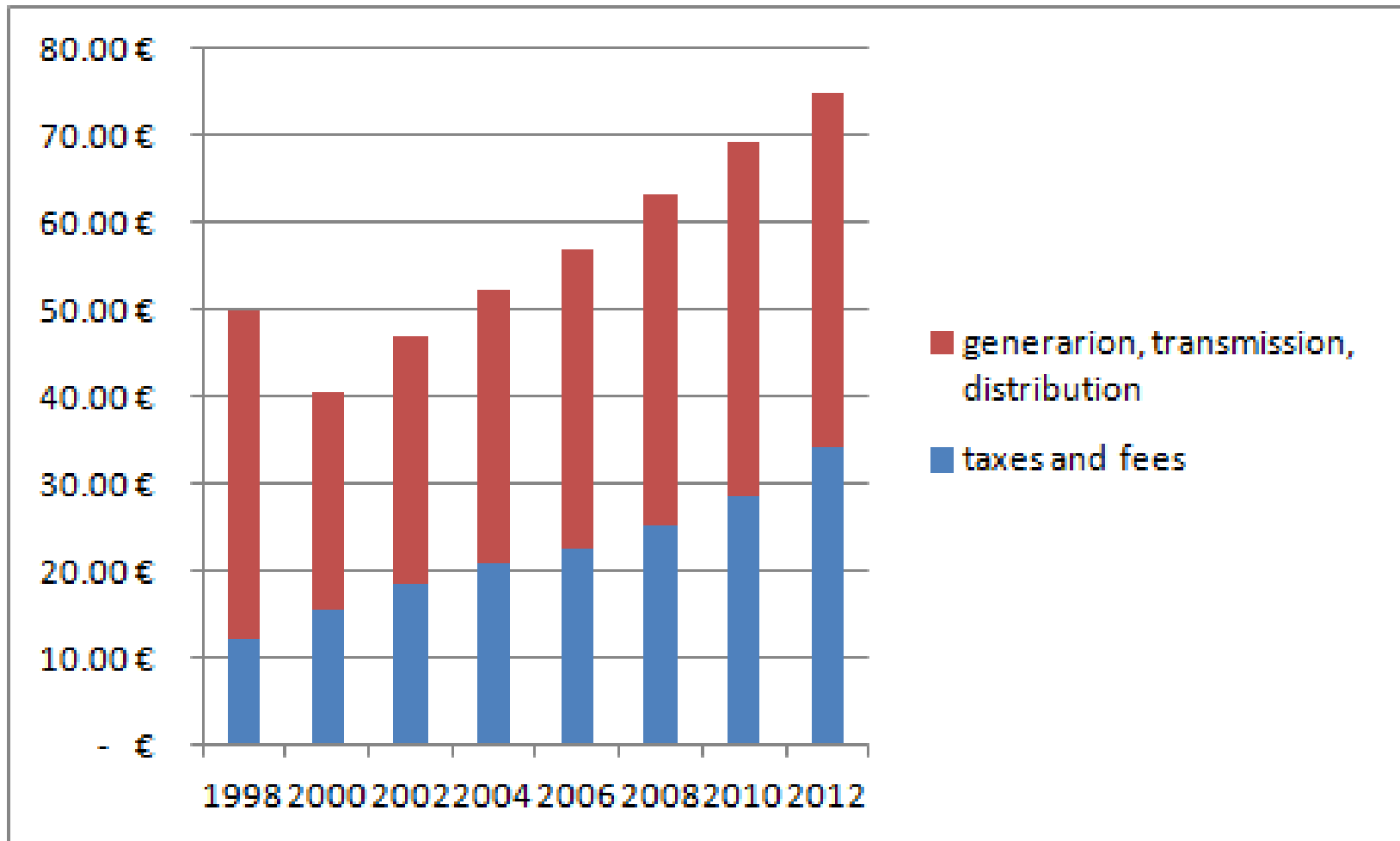
- ▶ market share 25% in 2013
- ▶ ownership in 2010



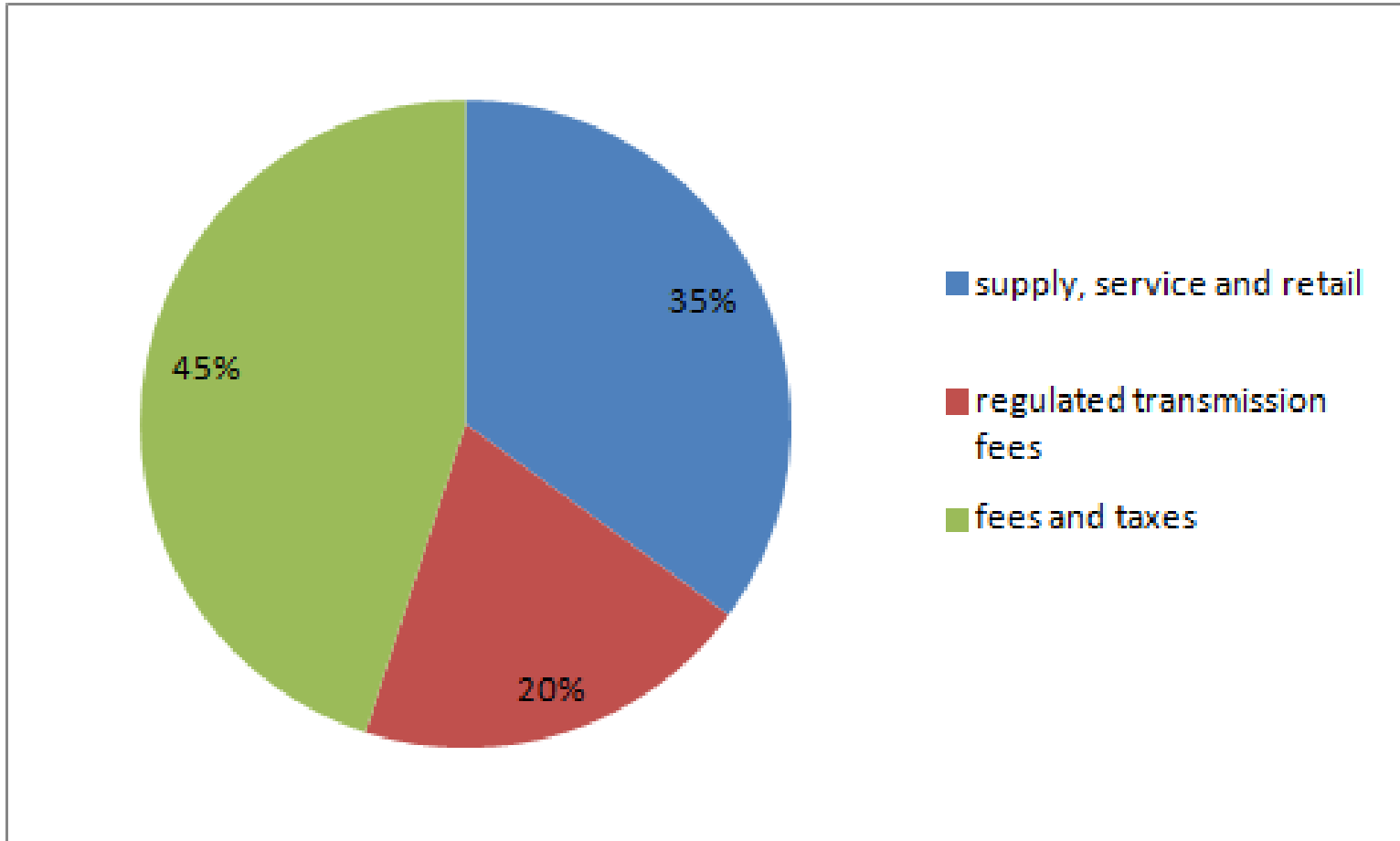
Overview of electricity market in Germany

- ▶ liberalized at retail level (average of 147 suppliers available to household customers in 2010)
- ▶ since market opening in 2005, 28% of households have switched supplier (2012)
- ▶ only 15% of households are not with their local primary supplier (2010)
- ▶ slow process, consumers not eager to switch
- ▶ increasing retail prices

Average monthly family electricity costs



High share of taxes and fees in household electricity prices (2012)



Wholesale market overview

- ▶ negative wholesale prices more frequent
 - energy utilities run power plants near margin
 - losses on operating thermal plants
- ▶ merit order effect pushes out natural gas
 - gas price in Germany 4 times US prices
- ▶ wholesale price decrease does not translate into retail prices
 - static household tariffs
 - no incentive for demand response

Power balancing market

- ▶ 20 utilities part of balancing
- ▶ increased share of fluctuating energy causes pressure on grid system
- ▶ market value now at 1.1 billion USD
- ▶ daily and weekly auctions of balancing capacity (15 min, 5 min, 30 sec)
- ▶ up to 13,922 Euros per MWh
- ▶ small generators can participate via pooling

Balancing market outlook

- ▶ new entrants into the market
- ▶ increased participation by utilities
- ▶ significant price cuts
 - 1 MWh @ 5 min was 1,690 Euros in January and dropped to 1,109 Euros in July
- ▶ increase in number of balancing requests
- ▶ coal plants becoming flexi-plants
- ▶ new business opportunity for capacity bundlers / brokers (e.g. Next Kraftwerke GmbH)

Utility business model outlook

- ▶ near zero profits from wholesale markets
- ▶ increased participation in balancing market
- ▶ opportunities for smart energy and smart new market entrants
 - depending on regulatory framework
- ▶ trend towards re-municipalization

THANK YOU FOR LISTENING!

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