

# Capacity reserve in Germany

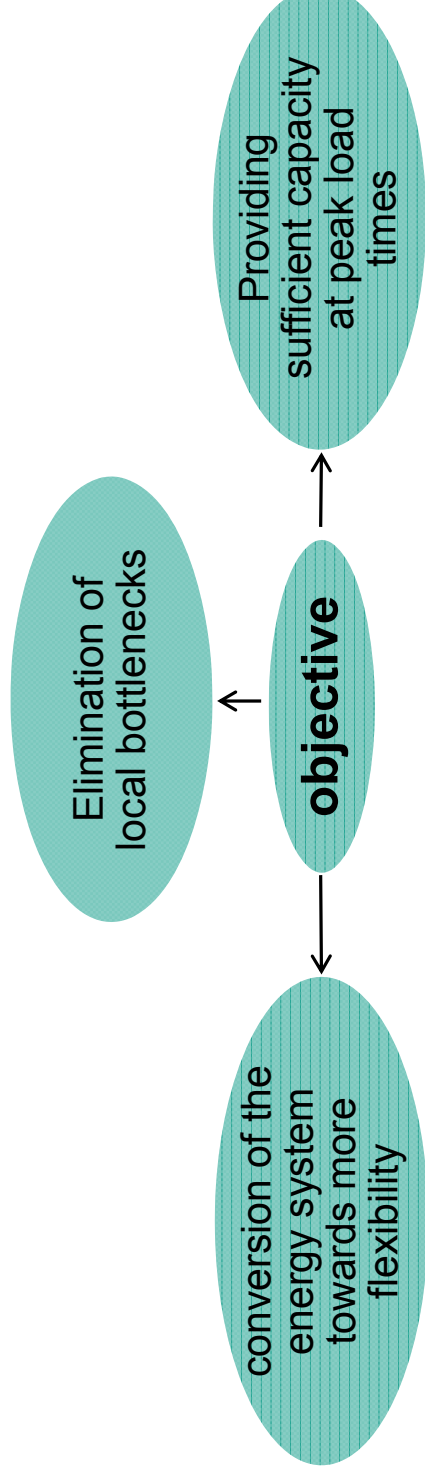
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## Main intentions for the capacity reserve in Germany

- Concerns about security of supply (generation adequacy), currently increased number of decommissions of flexible capacities and nuclear phase out, yet only few new investments
- However: It is not proven that the energy-only-market will provide insufficient investment incentives



## Current status of the implementation of a strategic reserve (capacity reserve) in Germany

- A network reserve (“Netzreserve/Winterreserve”) is already implemented (since 2013)
  - For local grid congestion (between north and south Germany)
  - Mainly power plants in the south
    - 3091 MW (Winter 2014/2015)
    - 6700–7800 MW (Winter 2015/2016)
    - 5400 MW (Winter 2016/2017)
    - 10400 MW (Winter 2017/2018)
  - Procurement together with capacity reserve
- Climate reserve (official “Sicherheitsbereitschaft”, security reserve)
  - 8 lignite power plants (in total 2,7 GW) join stepwise the climate reserve between 2016-2019
  - Final decommission after 4 years participating
  - (To achieve the 2020 climate targets )

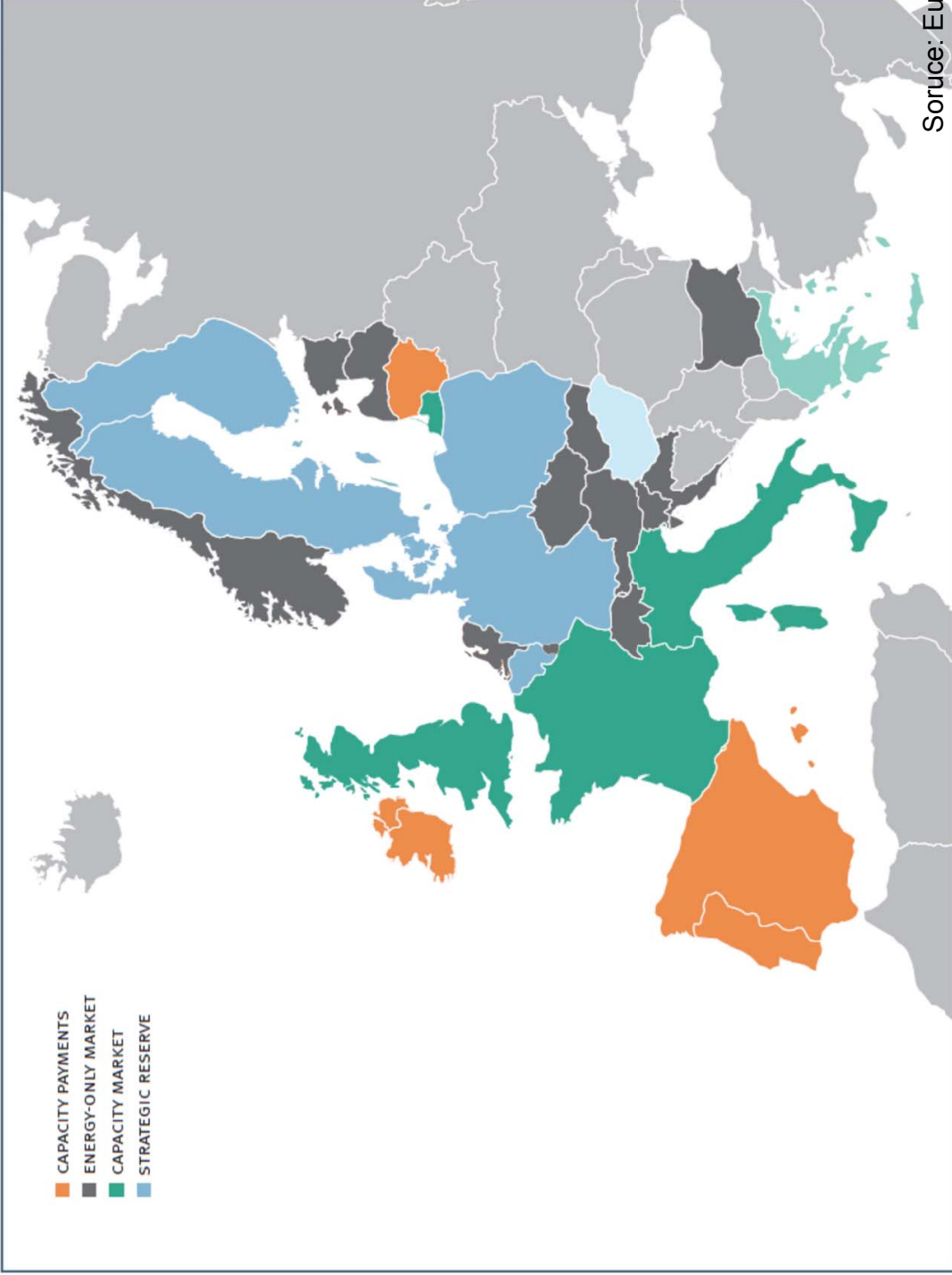
## Capacity reserve (I)

- **Auction/Tender**
  - Yearly procurement for upcoming year
  - Up to 5 % (about 5 GW) of the total yearly demand in Germany
    - Start with 2 GW in 2018/2019
  - Maximum price 100.000 EUR/MW p.a.
  
- **Usage**
  - If markets (day-ahead and intraday) cannot be cleared, TSOs dispatch capacity of the capacity reserve
  - Variable costs are reimbursed to power plant owners, profits remain with TSOs
  - Prices for dispatch: minimum double of the maximum price of intraday continuous trading (maximum price: 9.999 EUR/MWh) (KapResV)

## Capacity reserve (II)

- **Requirements**
  - Technical requirements: Power plants need to be available 12 h after request, except of climate reserve
  - Power plants which are once in the strategic reserve are not allowed to participate in other markets again (no-way-back)
- **Who wants participate?**
  - Power plants that have been unprofitable for several years bid their fixed costs in order to avoid decommission
  - New power plants offered with CONE

# Capacity mechanisms in Europe



Source: Eurelectric 2017

## Strategic reserves in other European countries

- Finland introduced a strategic reserve in 2011 with a capacity of 600 MW. However, in 2013 the capacity was reduced to 365 MW.
- Sweden started a reserve in 2011, which will be phased-out by 2020. The capacity is currently around 1500 MW. Costs amounted up to 10.2 million Euros in 2011.
- Belgium established a strategic reserve in 2014 with a capacity of 850 MW. In winter of 2014, the unexpected unavailability of three nuclear power plants (Doel 3, Doel 4 and Tihange 2) increased scarcity. Due to the mild winter and market reactions no loss of load occurred, even though forecasts expected scarcity situations.
- In Poland the required capacity of a strategic reserve ranges from 800 to 1000 MW. From 2016 to 2018 a volume of 830 MW has already been procured, with an option to extend the duration until 2020



## Conclusions from Keles et al. (2016)

- The proposed strategic reserve of 5 GW
  - effectively increases the generation adequacy
  - is mainly used after 2030 in extreme demand peak hours and low generation by fluctuating renewable energy sources
- Increased demand side management capacities can have similar effects on generation adequacy
- A strategic reserve entails the risk of inefficiencies and capacity markets may prove to be a more cost-efficient option than a large strategic reserve



# THANK YOU FOR YOUR ATTENTION

# Literature



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