



Energy

Grid

Storage

In

Norway

?

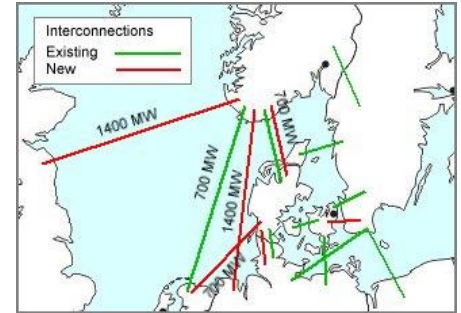




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- Increased price volatility
- Changes in load profiles
- Increased grid complexity
- ...and increased grid investments

# Grand-scale grid investments ahead

\$18bn 2015-2025



60% in distribution grid

30% end-user tariff increase

# Behind the meter storage

- Rapid rooftop solar growth
  - But limited to 0.02% of total (2016)
- EV storage?
  - Potential: 100 GW by 2030
  - V2H/ V2G still prohibitively expensive
- Capacity tariffs
  - «Subscription model» reduces the case for solar+storage



*...but...*



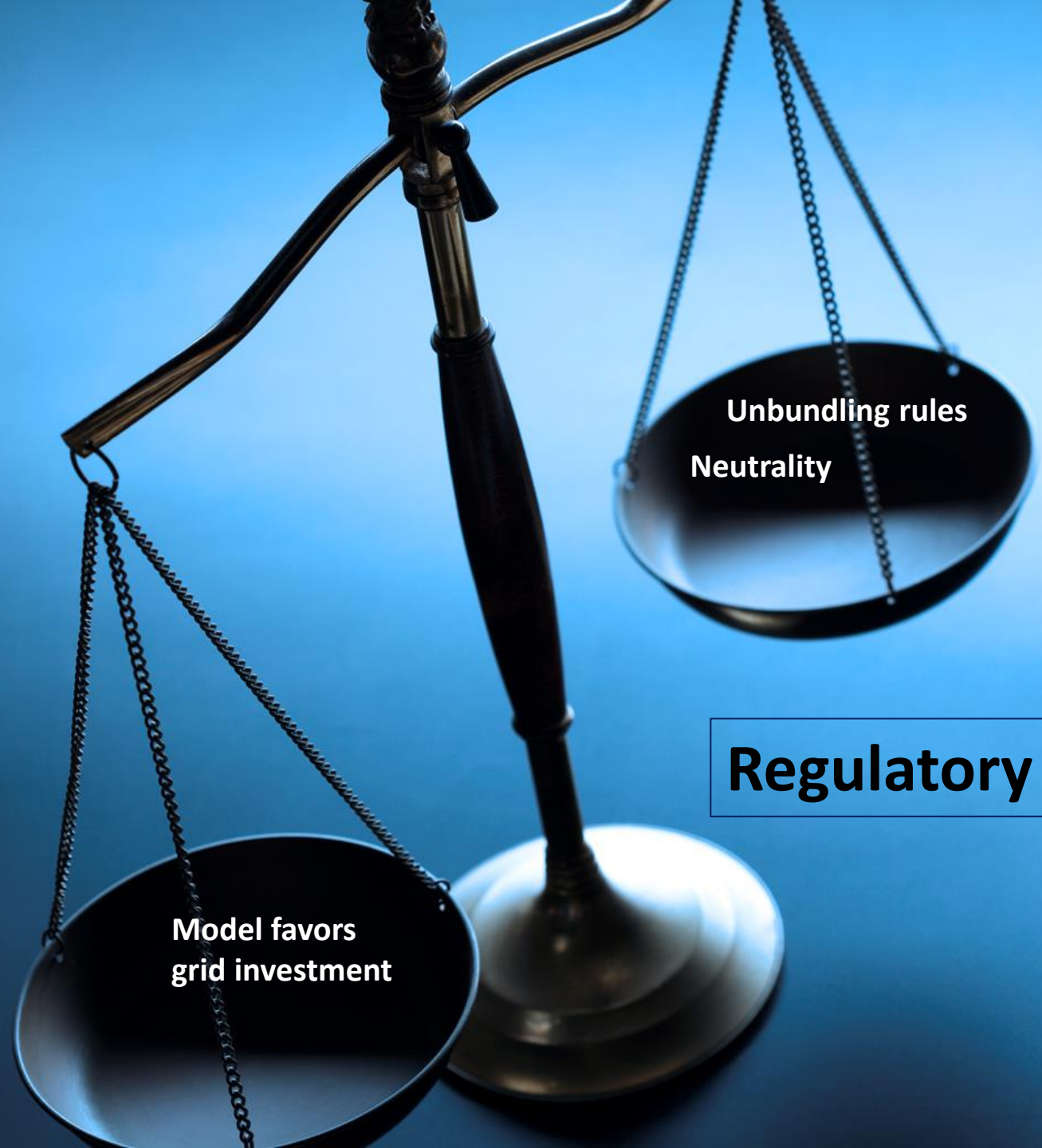
# Batteries in grid

- Various usages
  - Ancillary services
  - Quality of supply
  - (Security of supply)
- Transportation use
  - Reduces peak load from fast charge
- But few incentives to invest today



Ampere ferry:

- 1000 kWh batteries
- 350kWh battery banks in dock
- 60 ferries by 2021



**Unbundling rules**  
**Neutrality**

**Model favors  
grid investment**

**Regulatory challenges**