

Regulatory challenges of large-scale integration of renewables – governance of flexibility markets

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CV steps:

- Groningen (NL)
- Freiburg (GER)
- Cambridge (UK)
- Tilburg (NL)
- Karlsruhe (GER)

Topics

- Network regulation
- Network charging
- Governance systems of Smart Grids
- Market design

Current projects (selection)

- With CRIEPI, Tokyo, (2015); Is the energy transition in Germany a „disruptive challenge“ for the utilities?
- “Green-2-Store” (2016); multi-purpose-storage under unbundling rules.
- “**enera**”, (start 2017); institutional framework within a large Smart Grid demonstration project.

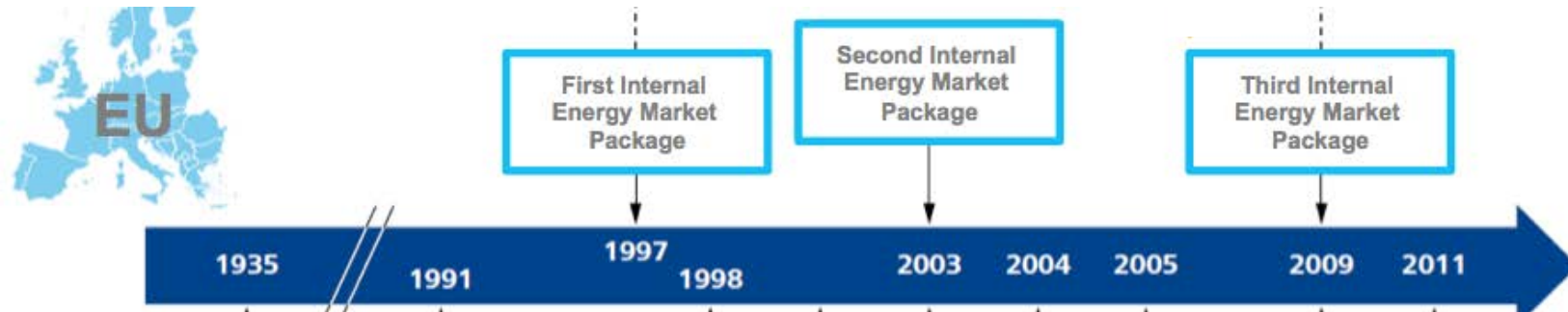
<http://www.energie-vernetzen.de/index.html>

- “Flexibility markets and the TSO-DSO-interface”; study for a German DSO (2017).



UNBUNDLING IN THE EU DIRECTIVES

Unbundling in the EU directives



EU: First directive 1996/92/EC

- ▶ Unbundling: *accounting separation*
- Non discriminatory network access
- Prevention of cross-subsidies
- Transparency

EU: Second directive 2003/54/EC:

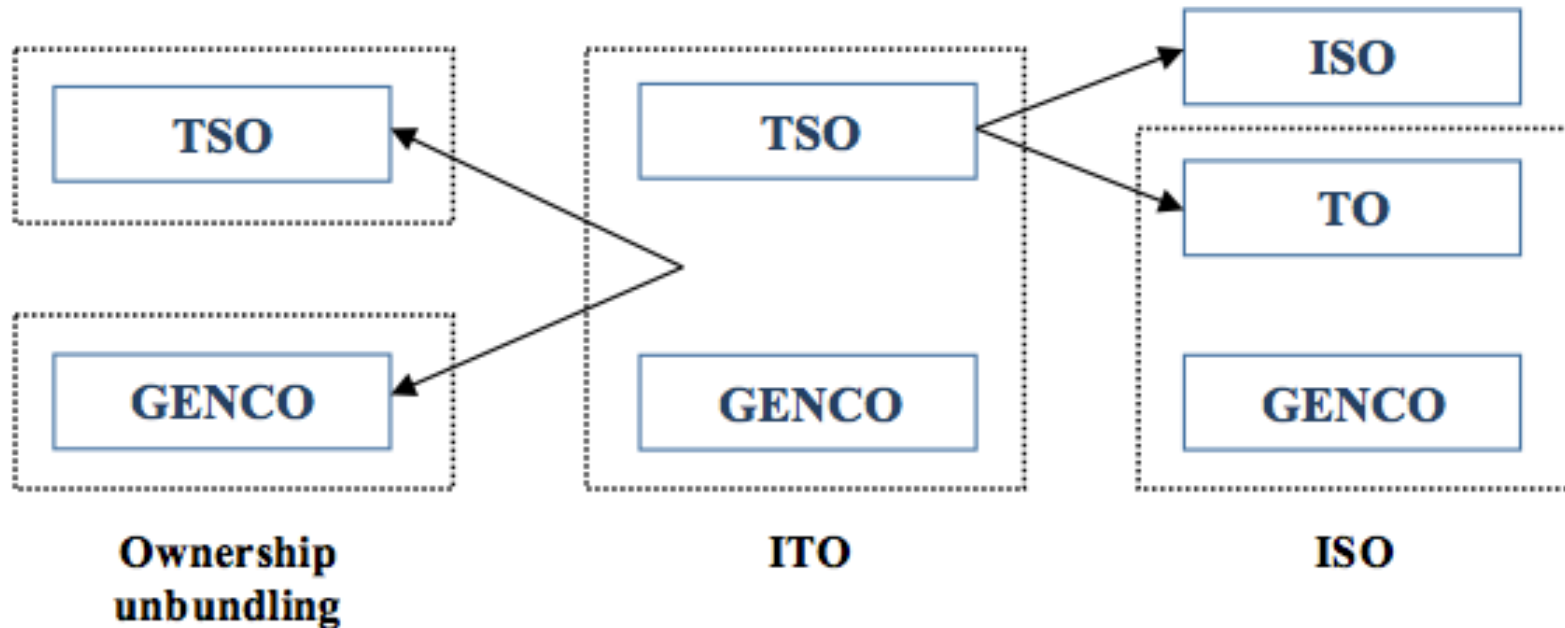
- ▶ Legal, functional and managerial unbundling
- Legal unbundling
- Managerial unbundling
- Personnel split
- Independent decision rights for network maintenance.
- Firewalls

EU: Third Directive 2009/72/EG

- ▶ Option out of three:
 1. Ownership unbundling
 2. Deep-ISO
 3. Independent Transmission Operator (ITO) (“third way”)

▶ **Note: concerns TSO unbundling (gas and electricity) ; distribution is a different story and is at stage of legal unbundling**

Unbundling in the EU: three options



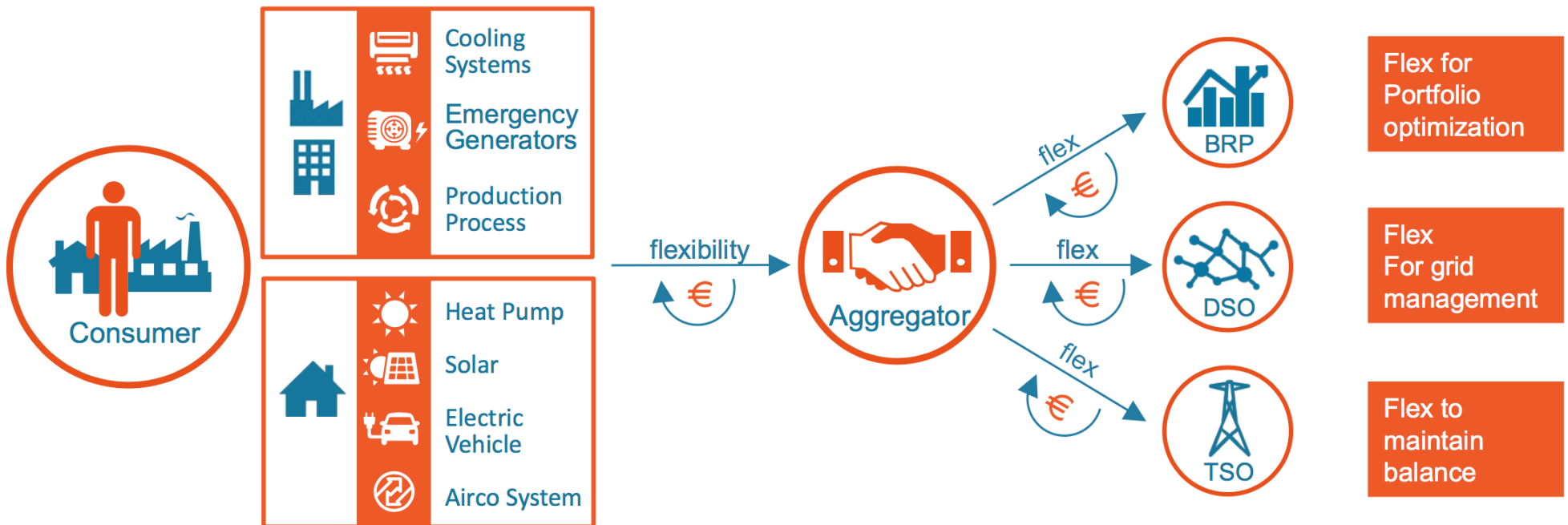
The dotted lines indicate ownership structures. GENCO = generation company; TSO = transmission system operator; ISO = independent system operator; TO = transmission owner.

FURTHER STEPS IN UNBUNDLING OF DISTRIBUTION NETWORKS?

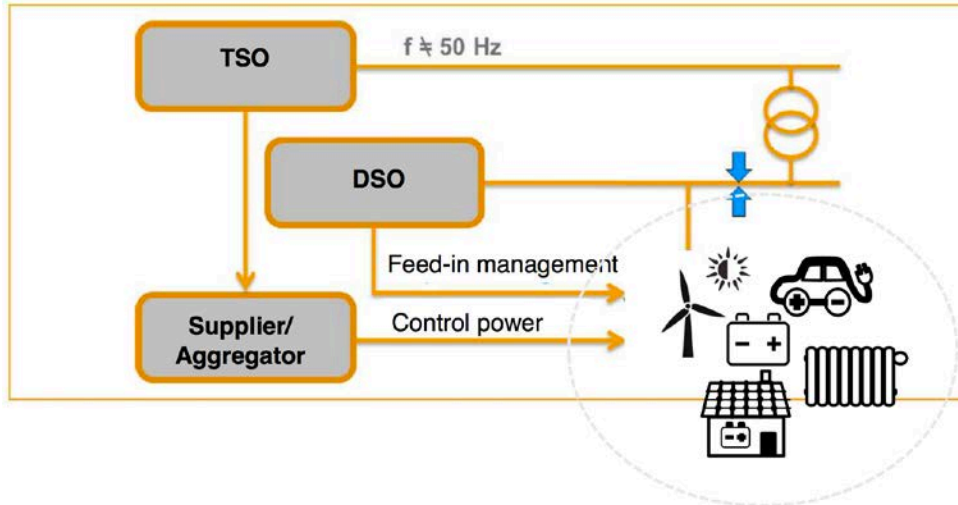
Disclaimer: the following slides are preliminary ideas only and are not intended as policy recommendations.

Flexibility

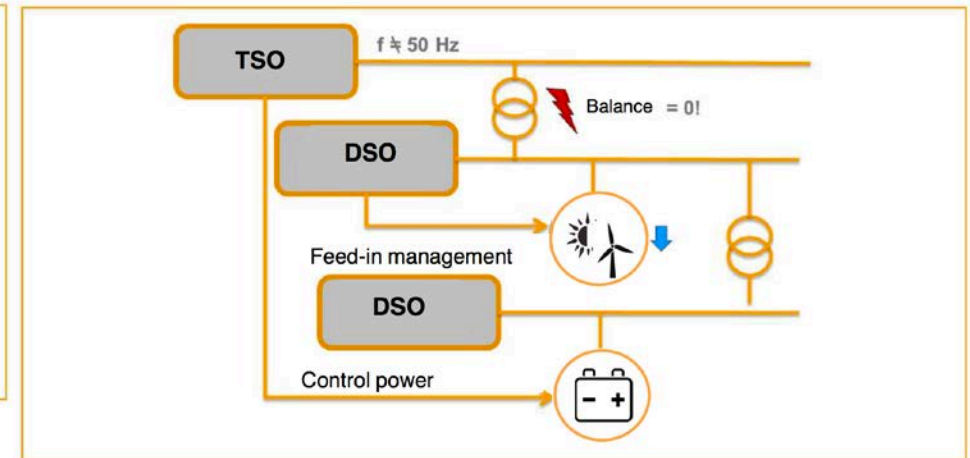
Flexibility is controllable energy supply, demand response and storage at *distribution level*.



Decentralized flexibility



TSO and DSO both rely on decentralized („distributed“) flexibility

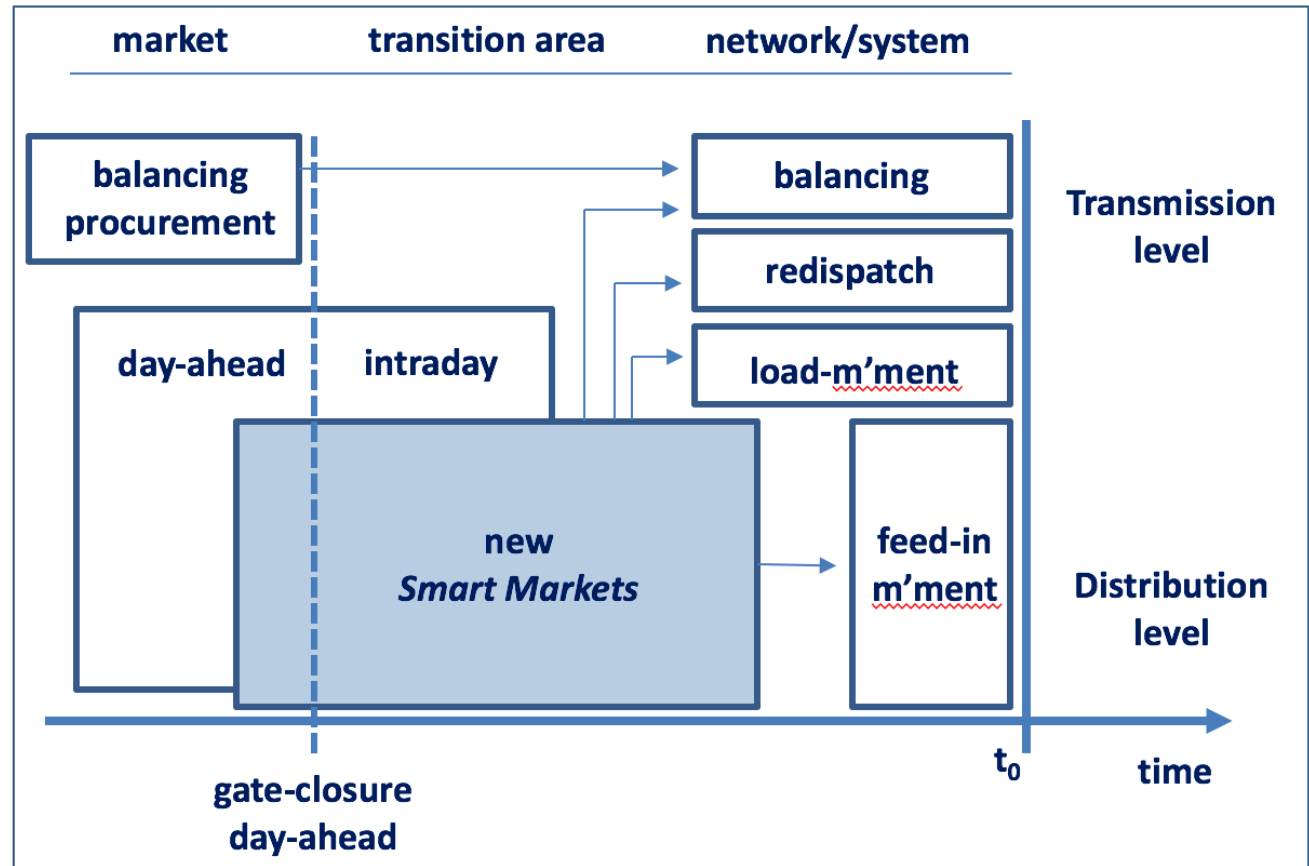


Conflict: what happens if network management of one level (say, TSO) affects network stability on the other level (say, DSO)?

- ▶ TSO-DSO-coordination and –interface
- ▶ Flexibility markets?
- ▶ Future role of DSO?

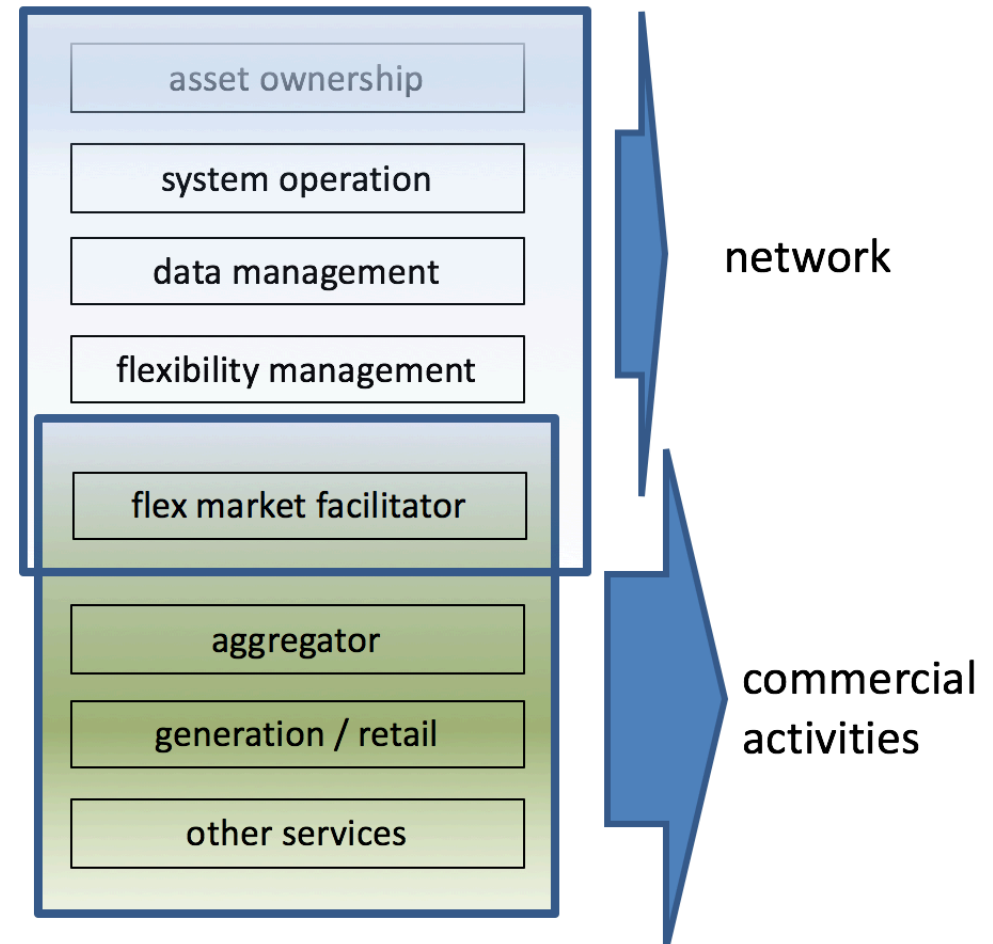
Flexibility markets

Future role of DSO in flexibility markets?



Governance of DSO

- **Potential sources of third-party discrimination:**
 - Short-term: system operation
 - Long-term: strategic network investment
 - Esp. “strategic investment withholding”
 - Information advantage
 - Value of flexibility depends on network development, which is private information of network owner



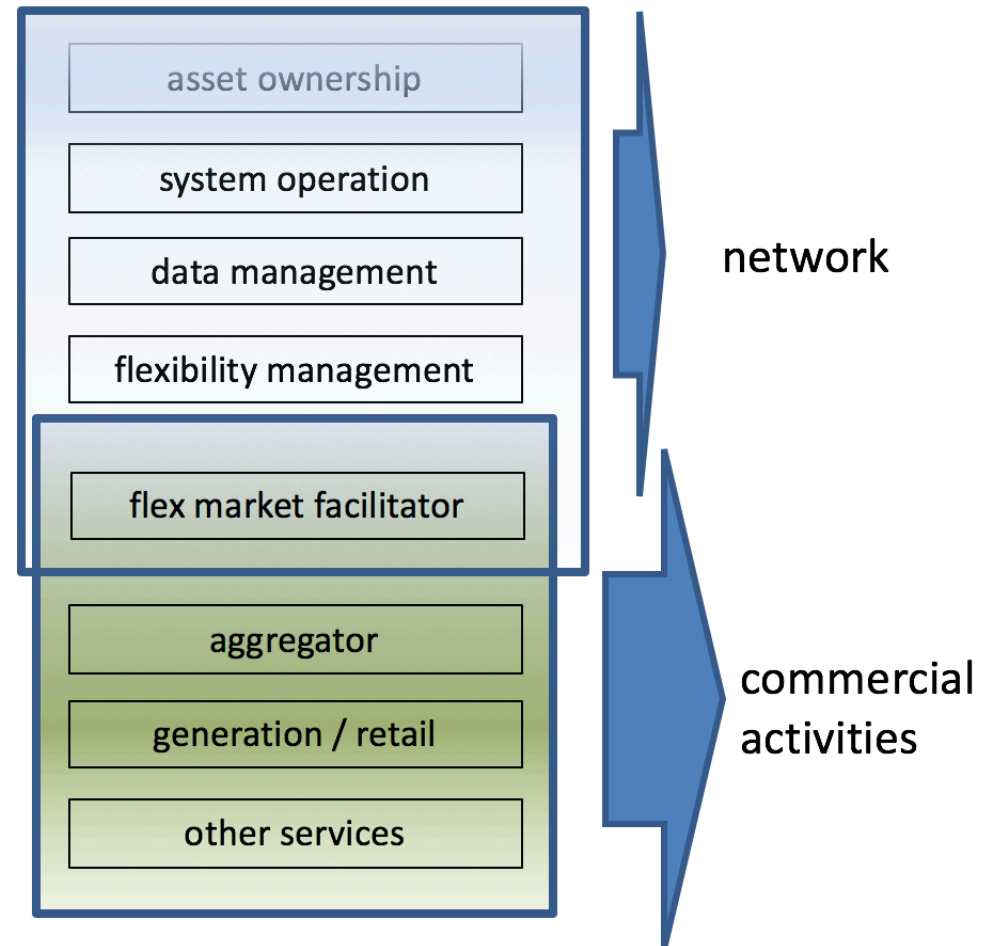
Governance of DSO (cont'd)

- **DSO-level: legal unbundling**

Third Directive 2009/72/EG, Art. 26.1:
„it shall be independent at least in terms of its legal form, organisation and decision making from other activities not relating to distribution,,

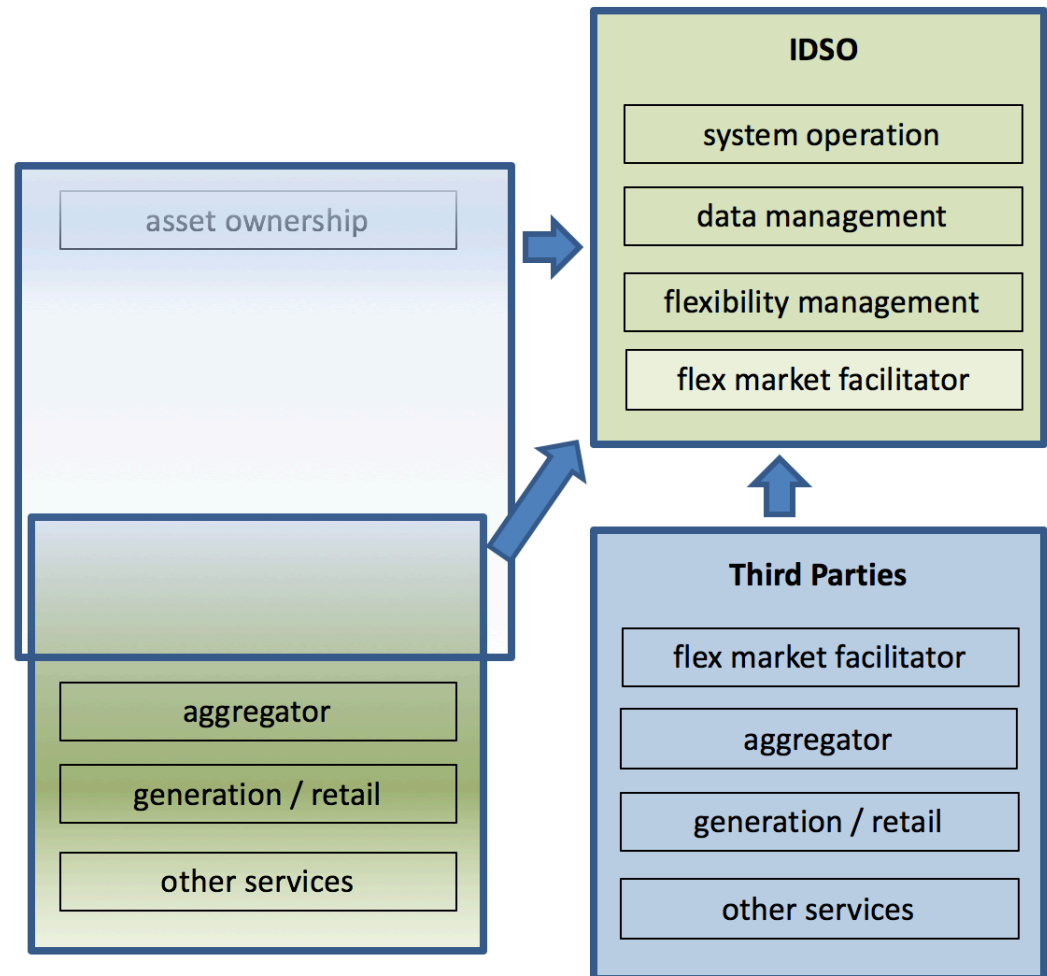
- **What's next? Options:**

- BAU ?
- ITO plus common flexibility platform ?
- IDSO ?
- Ownership Unbundling ?



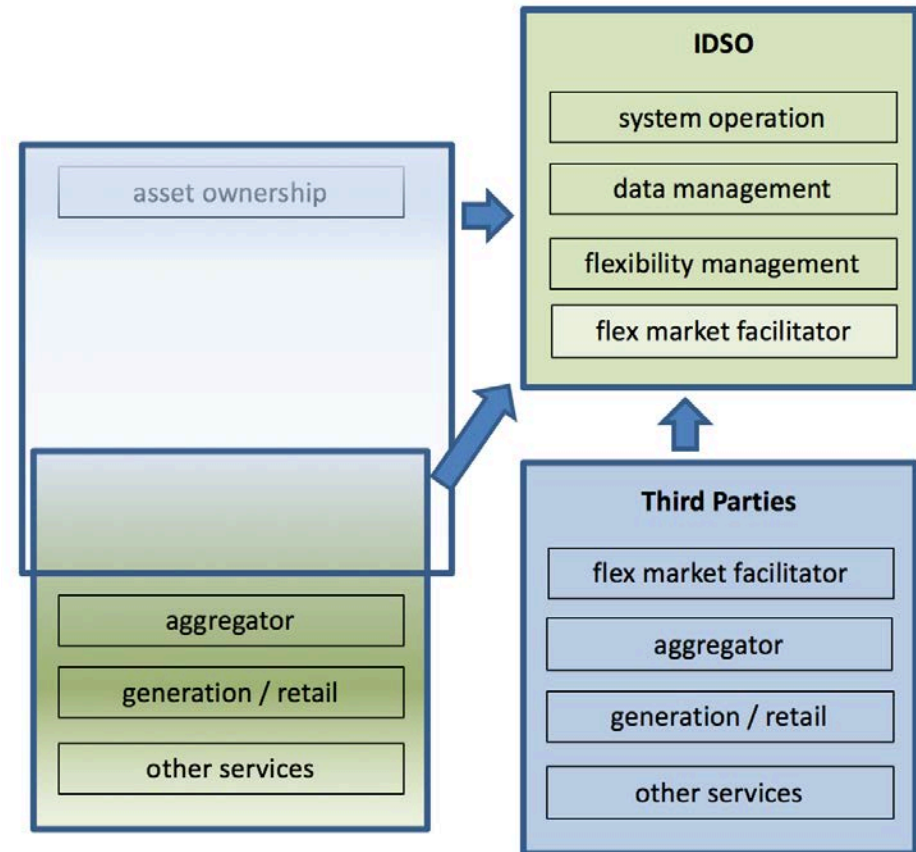
What is an IDSO ?

- DNO limited to asset ownership
 - SO, data-management, flexibility management and market facilitator go to IDSO.
 - DNO-asset-ownership and commercial activities remain to be integrated.
- IDSO does not own commercial activities, but can be market-facilitator
- Scale & scope of IDSO should follow optimal markets
 - Not limited to “one” network
 - Not per se “national”
- Real case: IDSO is being developed in California



IDSO and strategic investment withholding

- DNO has perverse incentives for “strategic investment withholding”
 - “deep-IDSO” is controversial
- Idea for an alternative to “deep-IDSO”
 - IDSO could be allowed in exceptional cases of market power to regulate the flexibility providers ▶ this reduce incentives for strategic investment withholding.
 - Pro: we have to address market power for flexibility providers anyhow.
 - Con: it reduce incentives for new investment in flexibility.



Thank you very much!

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