



Smart TSO-DSO interaction schemes, market architectures and ICT
Solutions for the integration of ancillary services from demand side
management and distributed generation

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TSO-DSO Coordination Schemes for Accommodating Ancillary Services from Distribution Networks

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Agenda

- TSO-DSO coordination schemes: scope and definitions
- Characteristics of 5 TSO-DSO coordination schemes for flexibility-based services
- Conclusions

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TSO-DSO coordination schemes: scope and definitions

- Objective: analyze TSO-DSO coordination schemes (CSs) for the provision of flexibility-based system services by distributed resources (DG, DSM, ...)
- Analyse each CS, focusing on:
 - envisioned set of roles and responsibilities,
 - potential market architectures, and
 - relevant information exchanges
- Impact on TSO grid operation, DSO grid operation, the role of other market participants and the related market design ↔ national regulatory frameworks and EU context



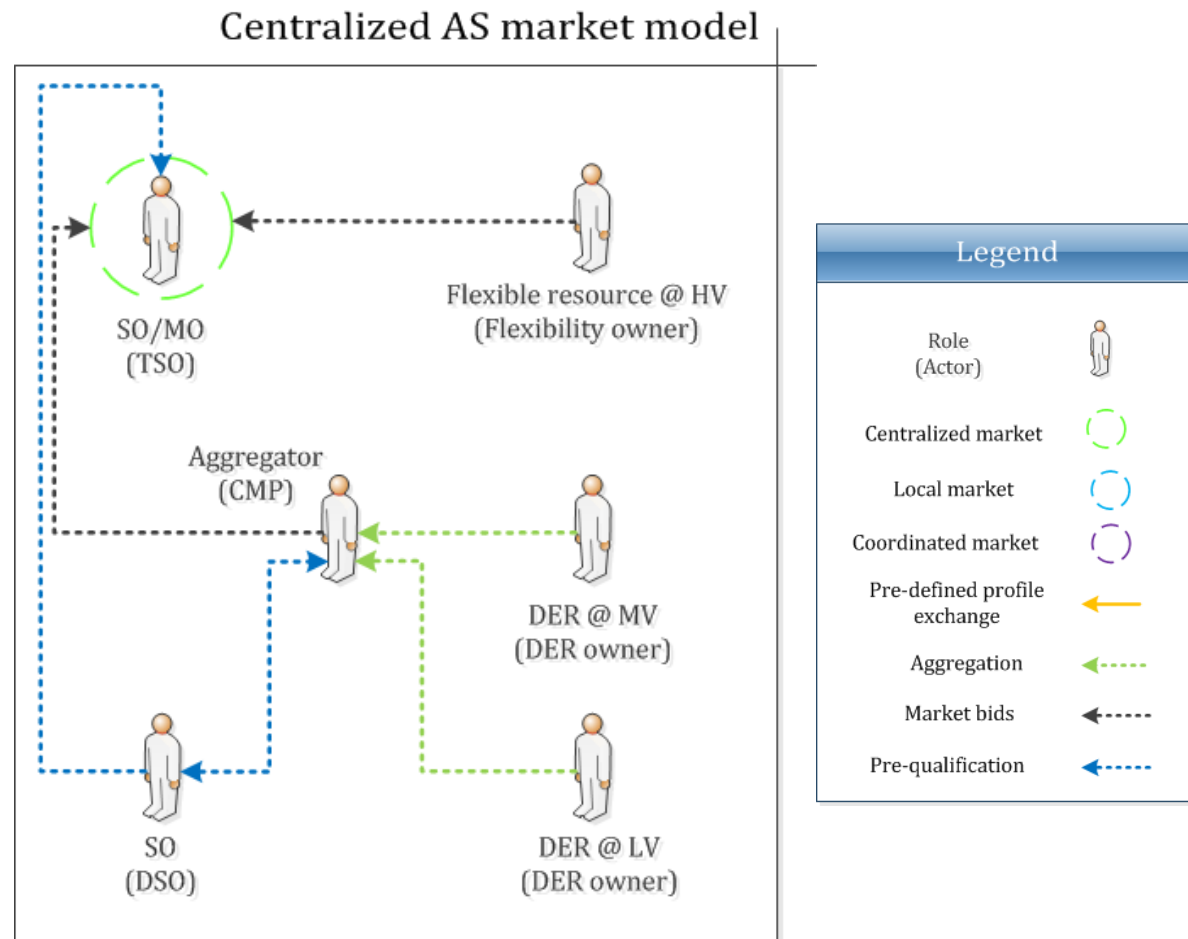
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Five possible TSO-DSO coordination schemes:

1) Centralized AS market model

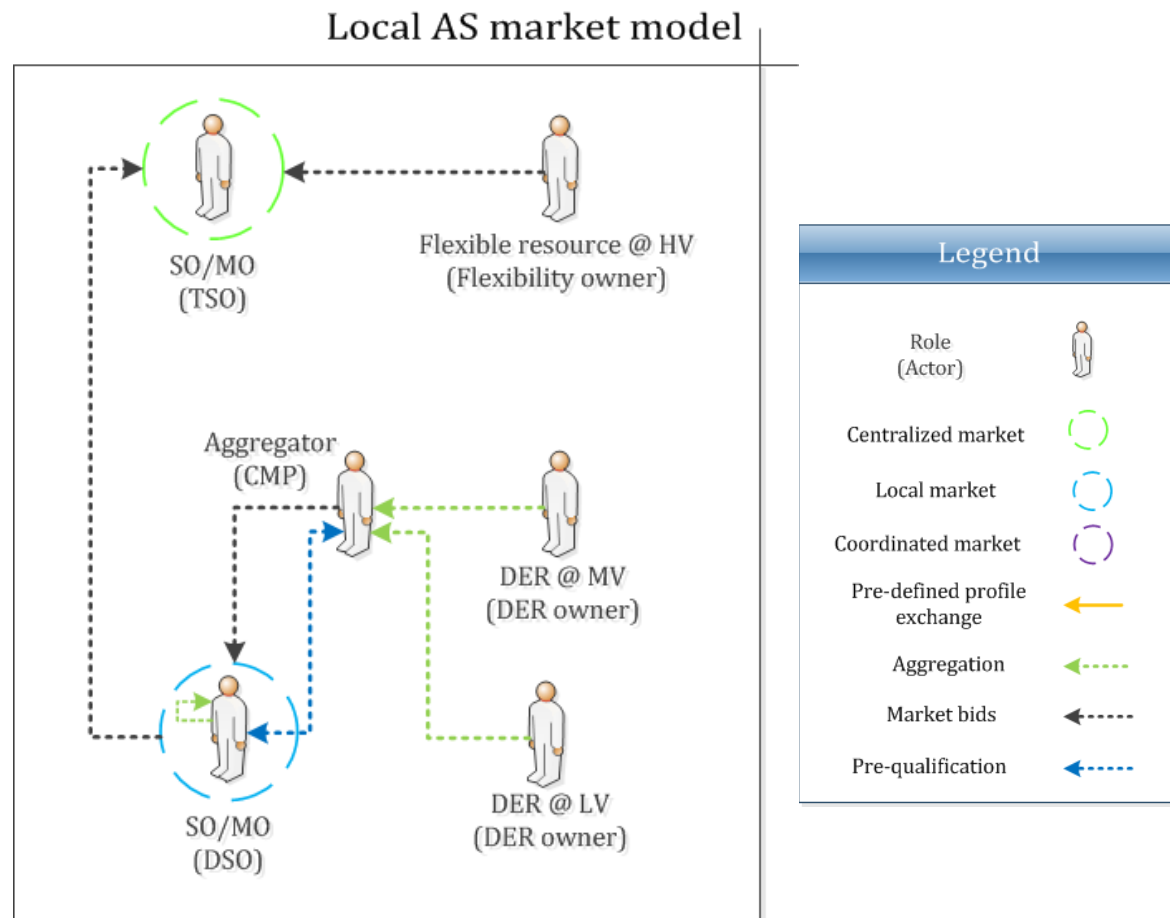
- 1 common ancillary services market managed by TSO
- Separate DSO process for checking distribution constraints (e.g. prequalification)



Five possible TSO-DSO coordination schemes:

2) Local AS market model

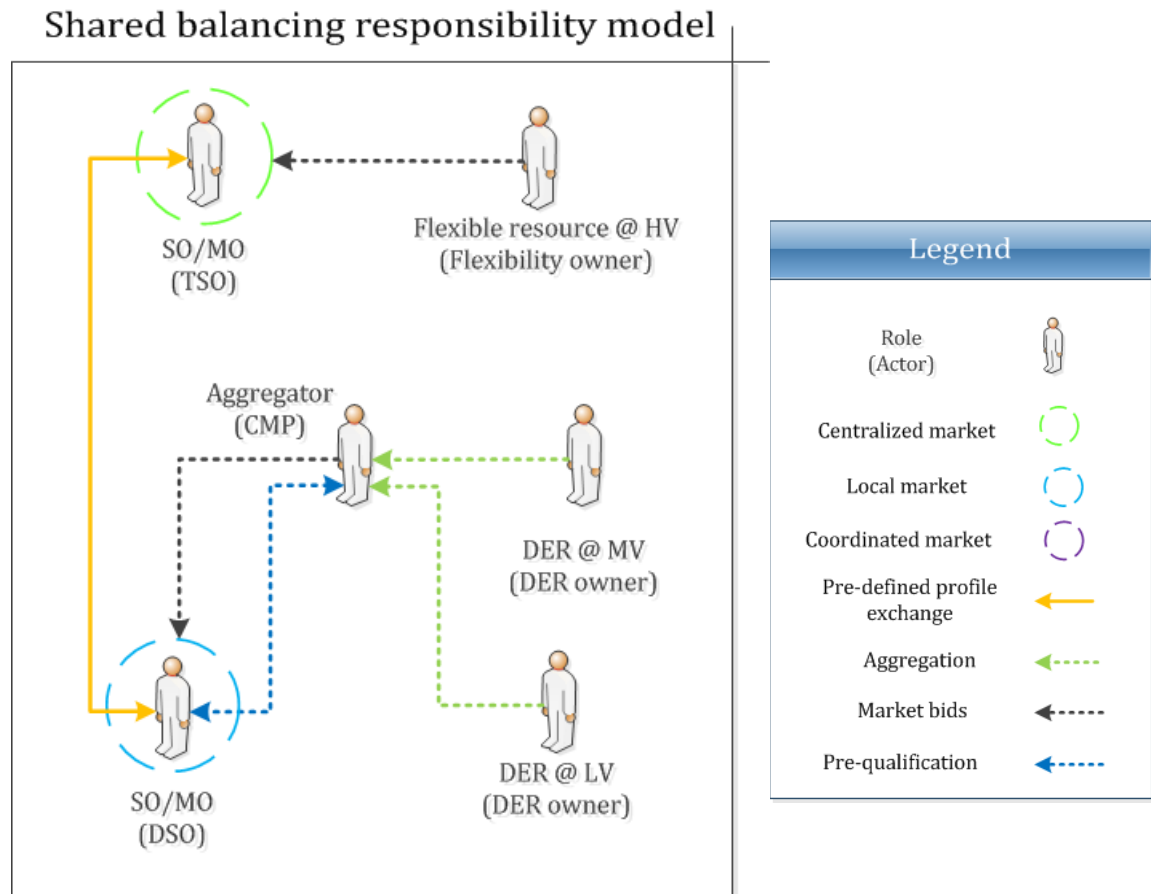
- Separate local market managed by DSO for local issues
- Transfer remaining flexibility to TSO ancillary services market level



Five possible TSO-DSO coordination schemes:

3) Shared balancing responsibility model

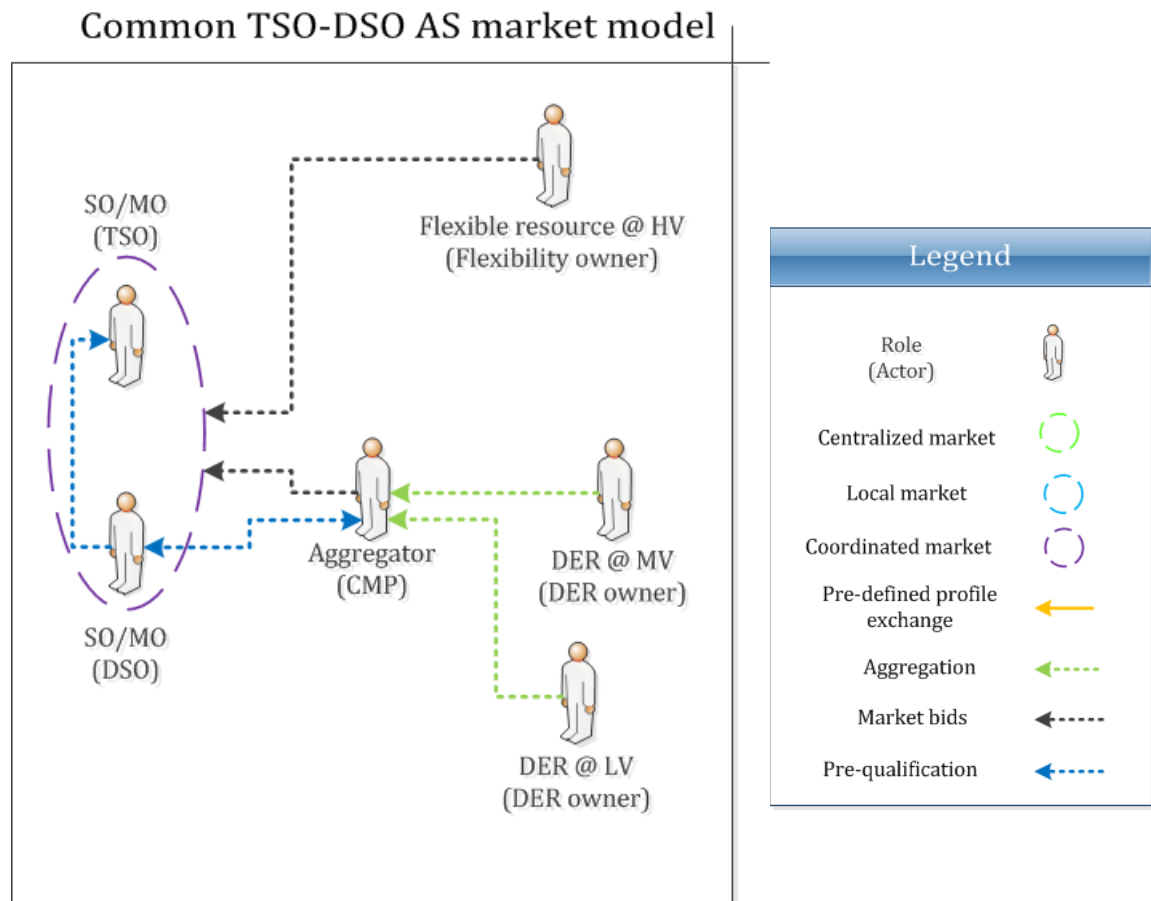
- Ancillary services market for transmission grid-connected resources managed by TSO
- Local market for distribution grid-connected resources
- Agreed pre-defined TSO-DSO scheduled profile



Five possible TSO-DSO coordination schemes:

4) Common TSO-DSO AS market model

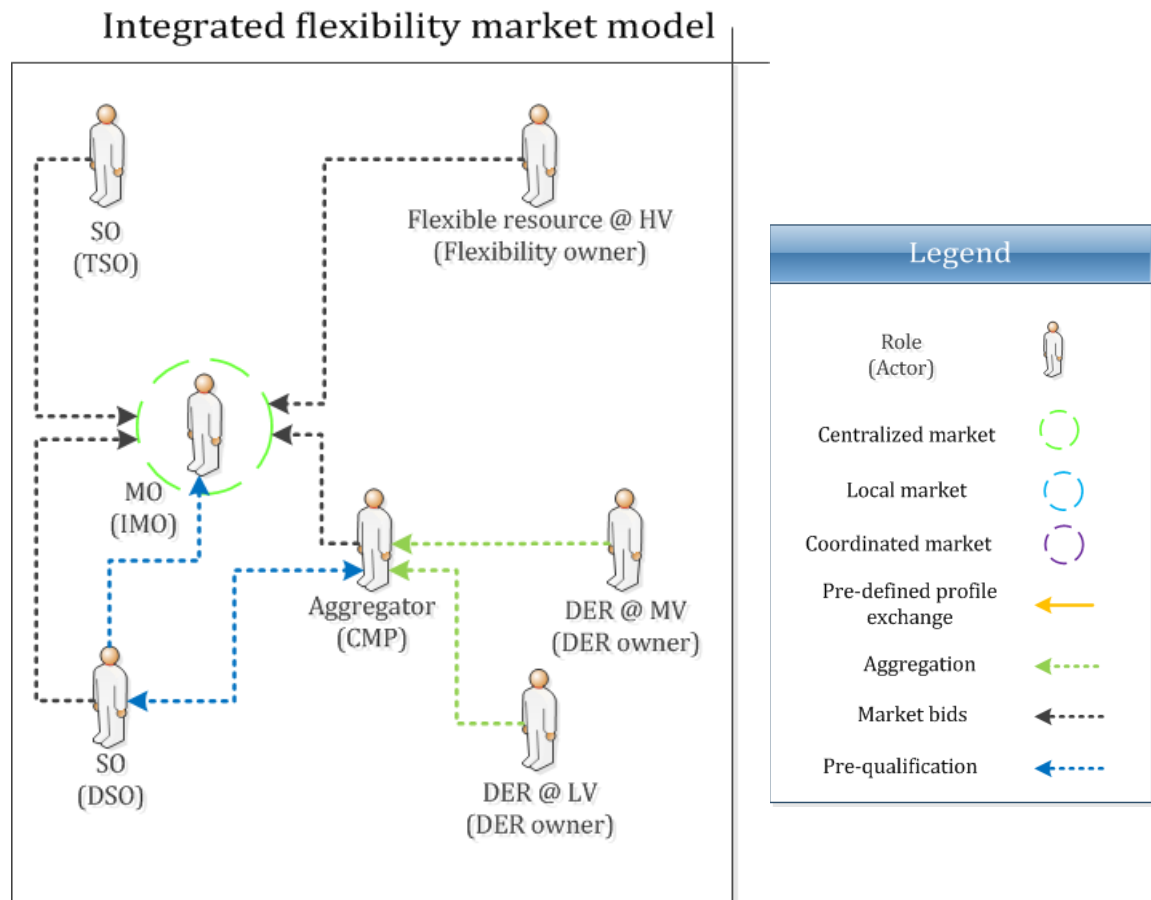
- Common flexibility market managed jointly by TSO & DSO
- Variants:
 - One optimization with all grid constraints
 - Two optimizations: distribution & transmission constraints



Five possible TSO-DSO coordination schemes:

5) Integrated flexibility market model

- Common flexibility market managed by an independent / neutral market operator
- No priority for TSO, DSO or commercial market player



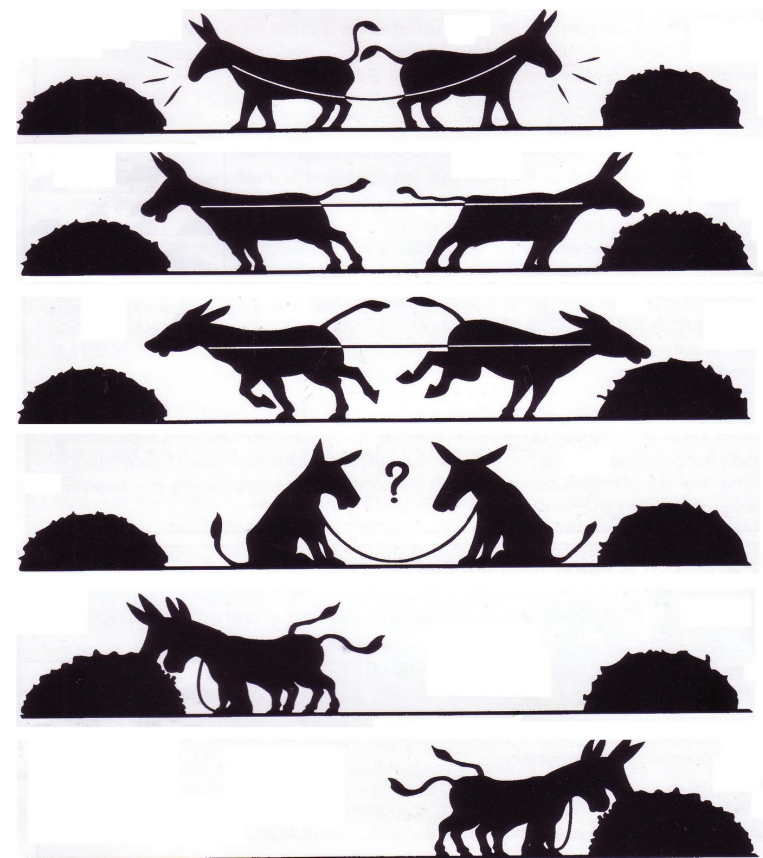
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TSO-DSO coordination schemes: conclusions

- Different possible TSO-DSO coordination schemes: each have their own benefits and risks
- Different coordination schemes imply different roles, responsibilities, market design, regulation, grid operation, cost of implementation, ...
- Public deliverable coming soon

*If they want to go fast, system operators could go alone;
if they want to go far, they should go together,
turning challenges into opportunities*



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This presentation reflects only the author's view and the Innovation and Networks Executive Agency (INEA) is not responsible for any use that may be made of the information it contains.



Thank You

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