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

Design and Simulation of Novel Demand Response Management Systems under Enhanced TSO-DSO Interaction

Miguel Marroquin
Our New Energy (ONE)



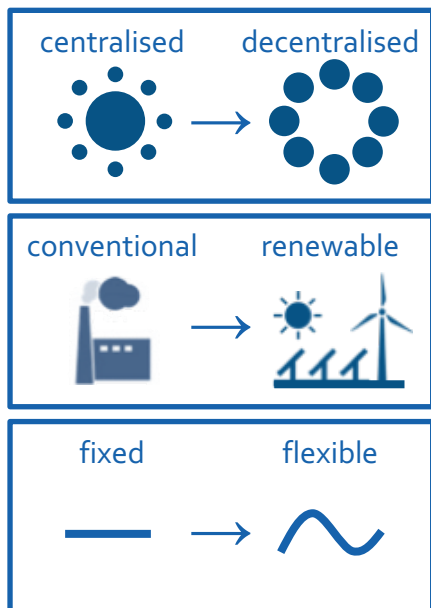
This project has received funding from the European Union's Horizon 2020
research and innovation programme under grant agreement No 691405

- About SmartNet Project
- Our New Energy (ONE) as 'Aggregator'
- Pilot Set-up: Spain & Denmark
- Aggregator Set-up
- Lessons Learned: Challenges, Remarks & Way Forward

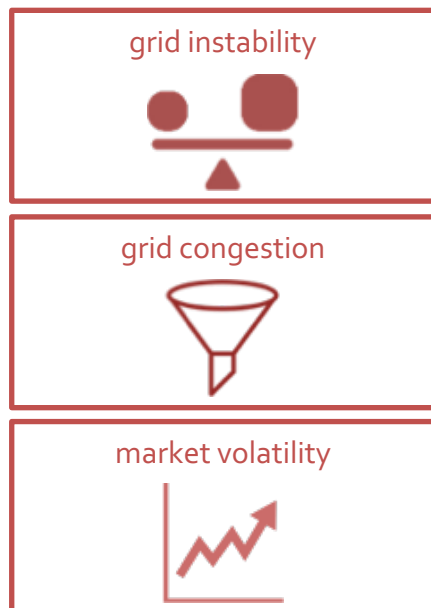
About SmartNet Project

Challenges in electricity networks

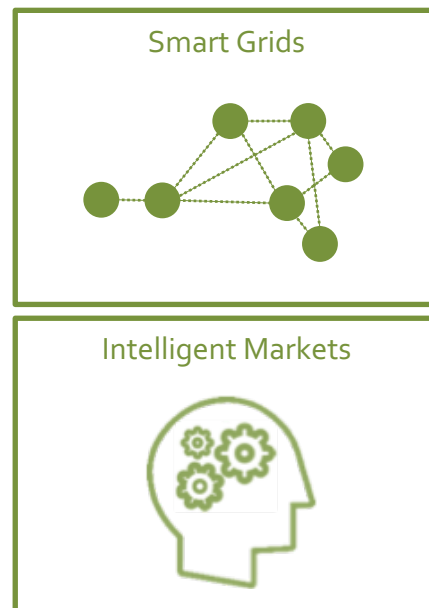
Trends



Obstacles



Solution



Key



About SmartNet Project

EU Horizon2020 project from 2016 to 2018

22 partners in 9 European countries

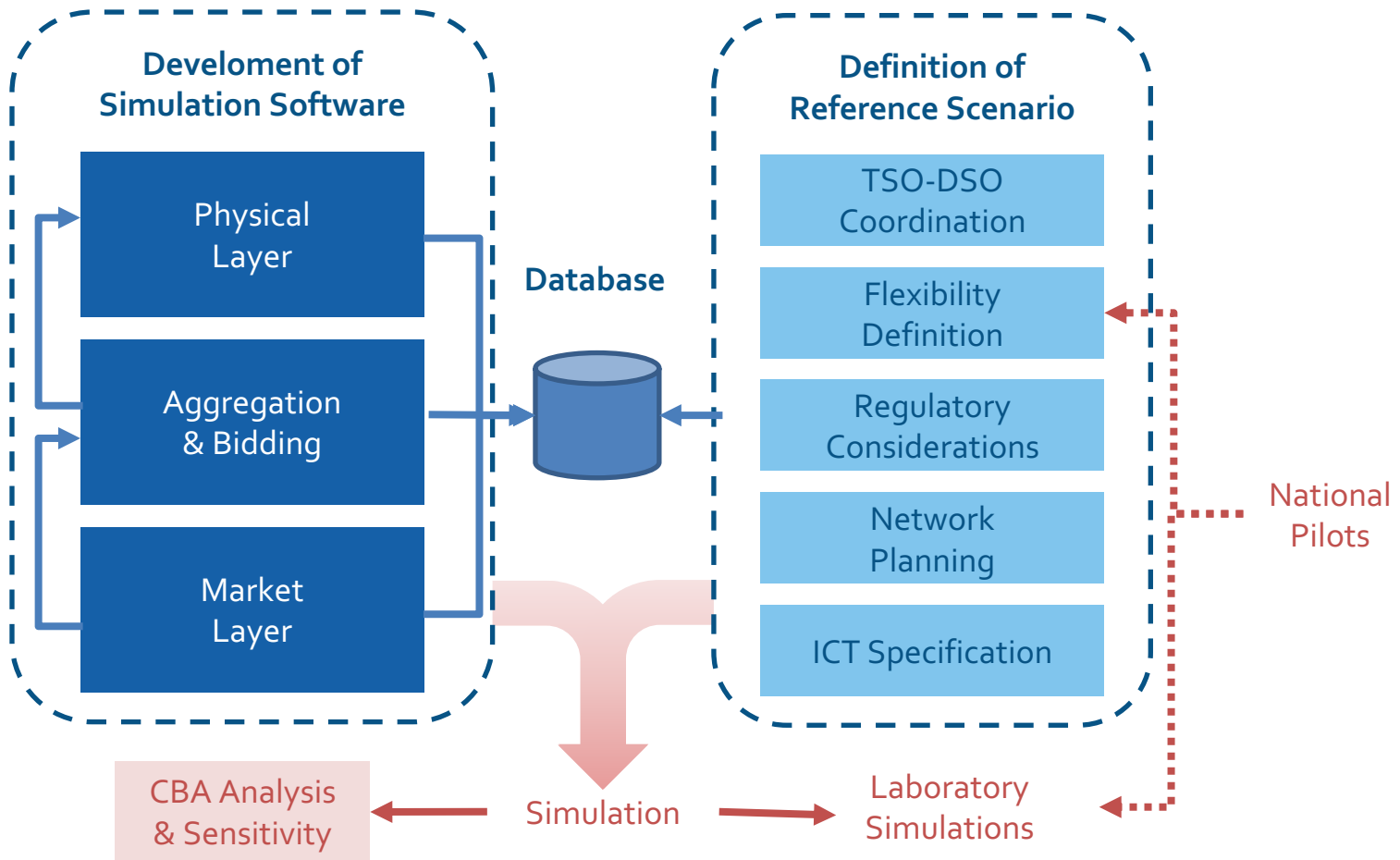
3 national cases: Spain, Denmark, Italy

Smartnet-Project.eu



About SmartNet Project

Overall project layout

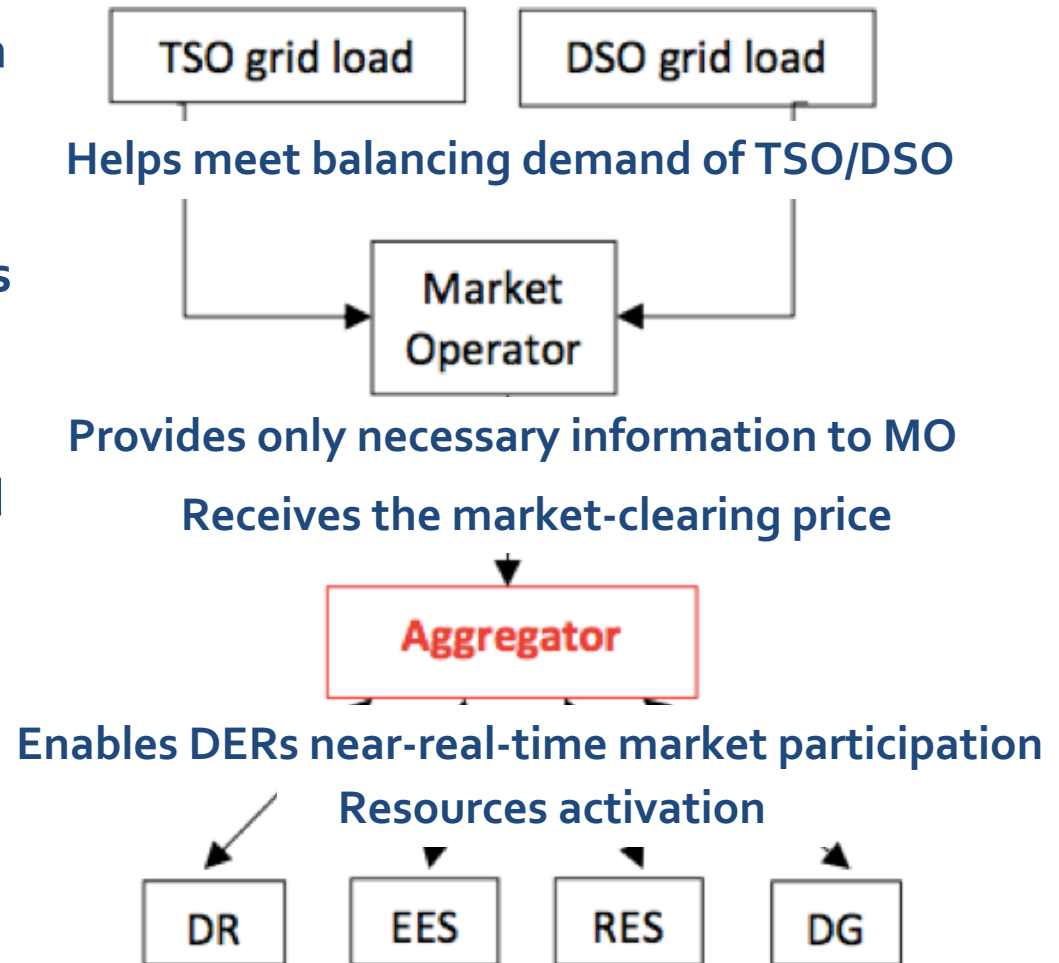


Our New Energy (ONE) as 'Aggregator'

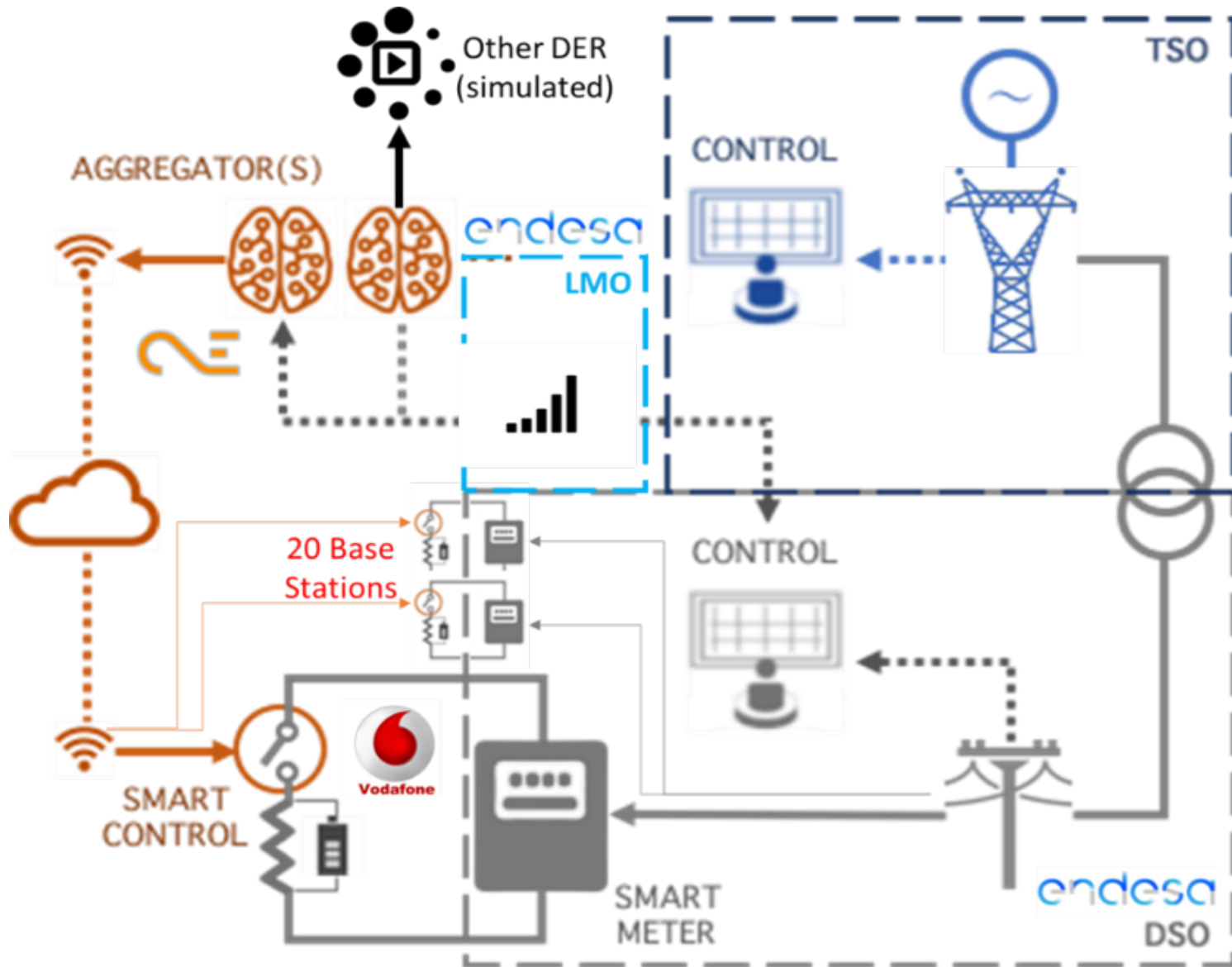
Who we are:

- Young, determined **Spanish SME**
- Brings together experts to propose **novel market ideas and products** to empower the **energy transition**
- Advised on **1st unsubsidised RE asset in Europe** relying only on private **PPA**
- Performs key role as **aggregator** in SmartNet project

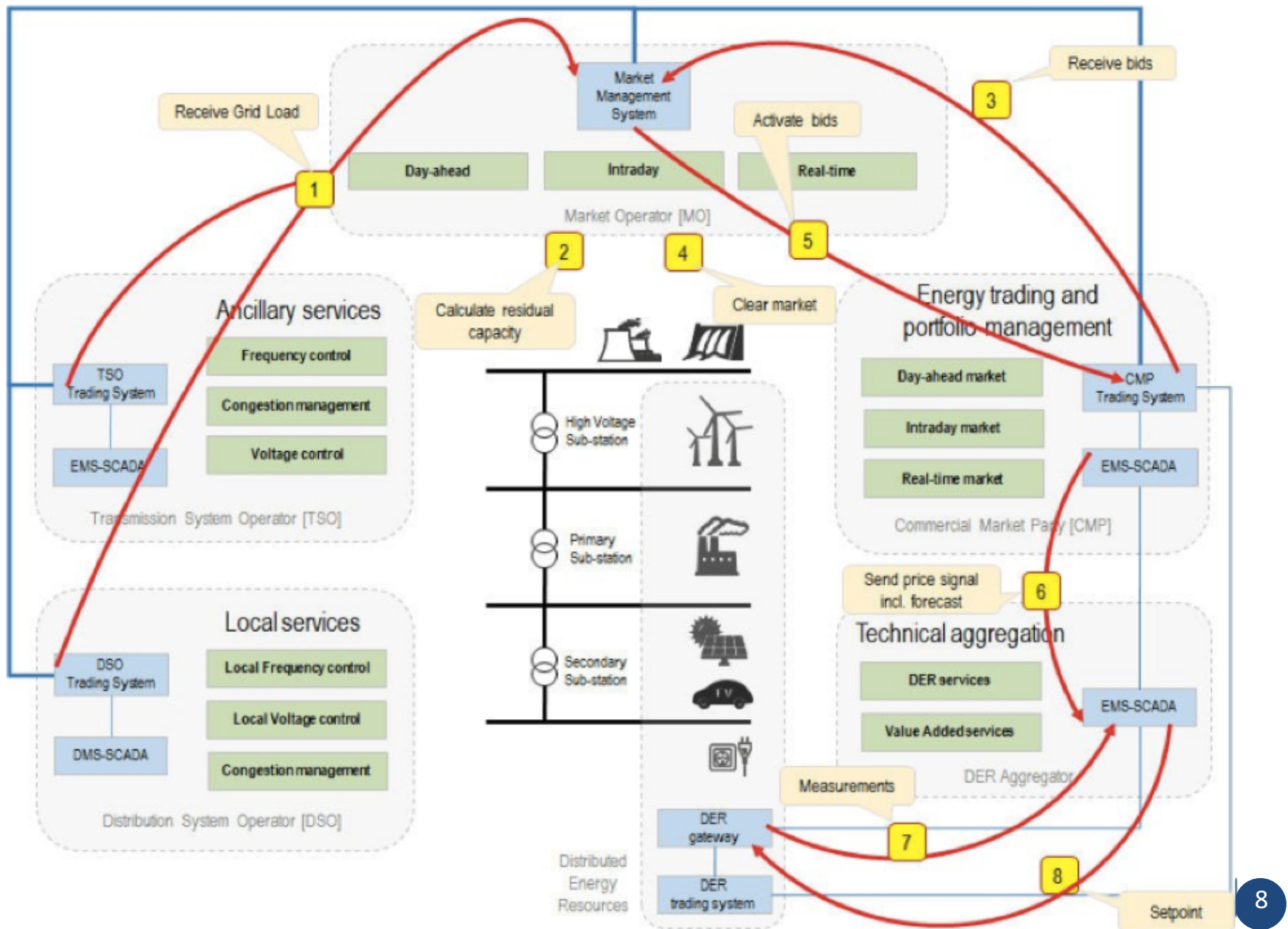
Our role as 'Aggregator':



Pilot Set-up: Spain

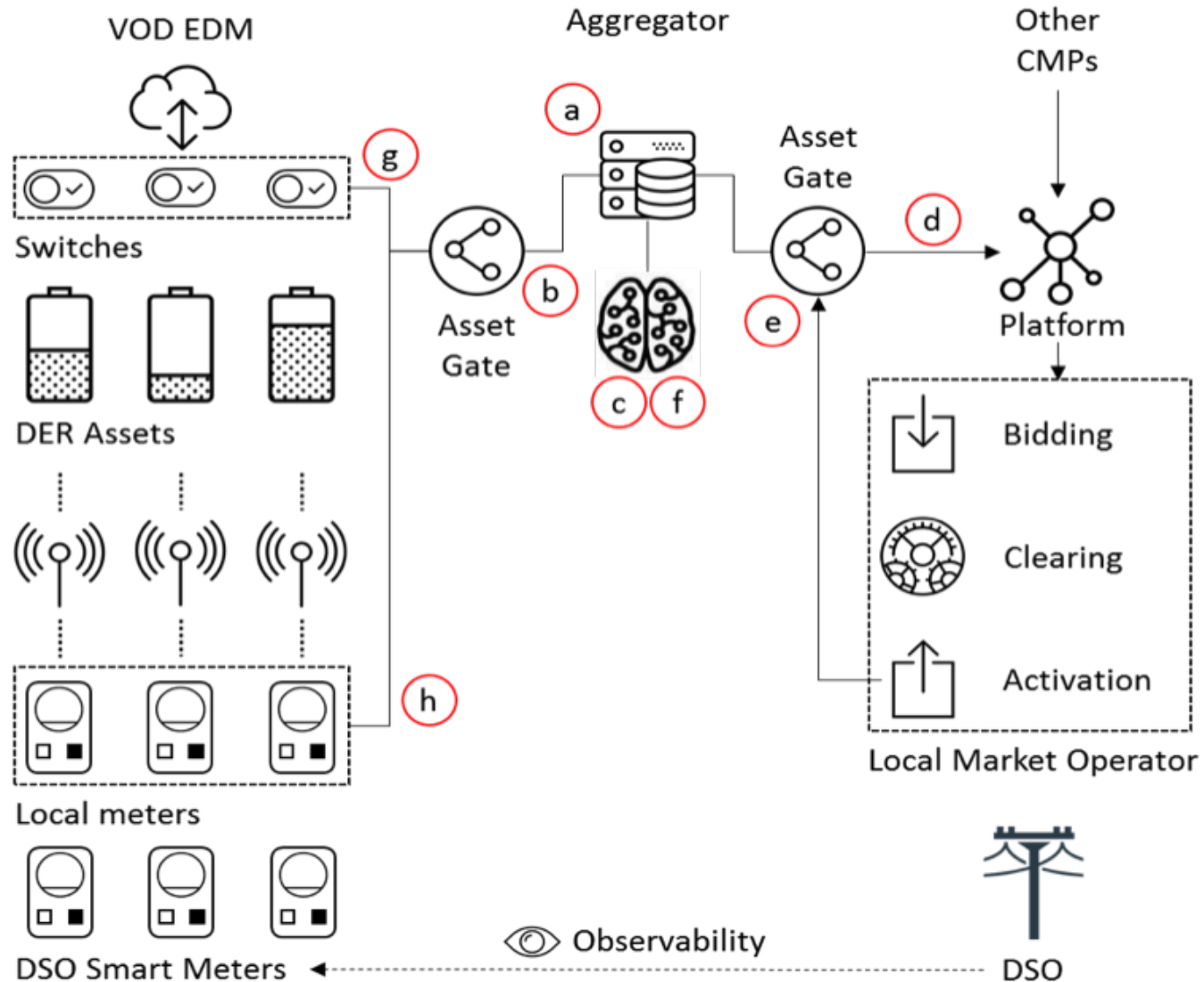


Pilot Set-up: Denmark



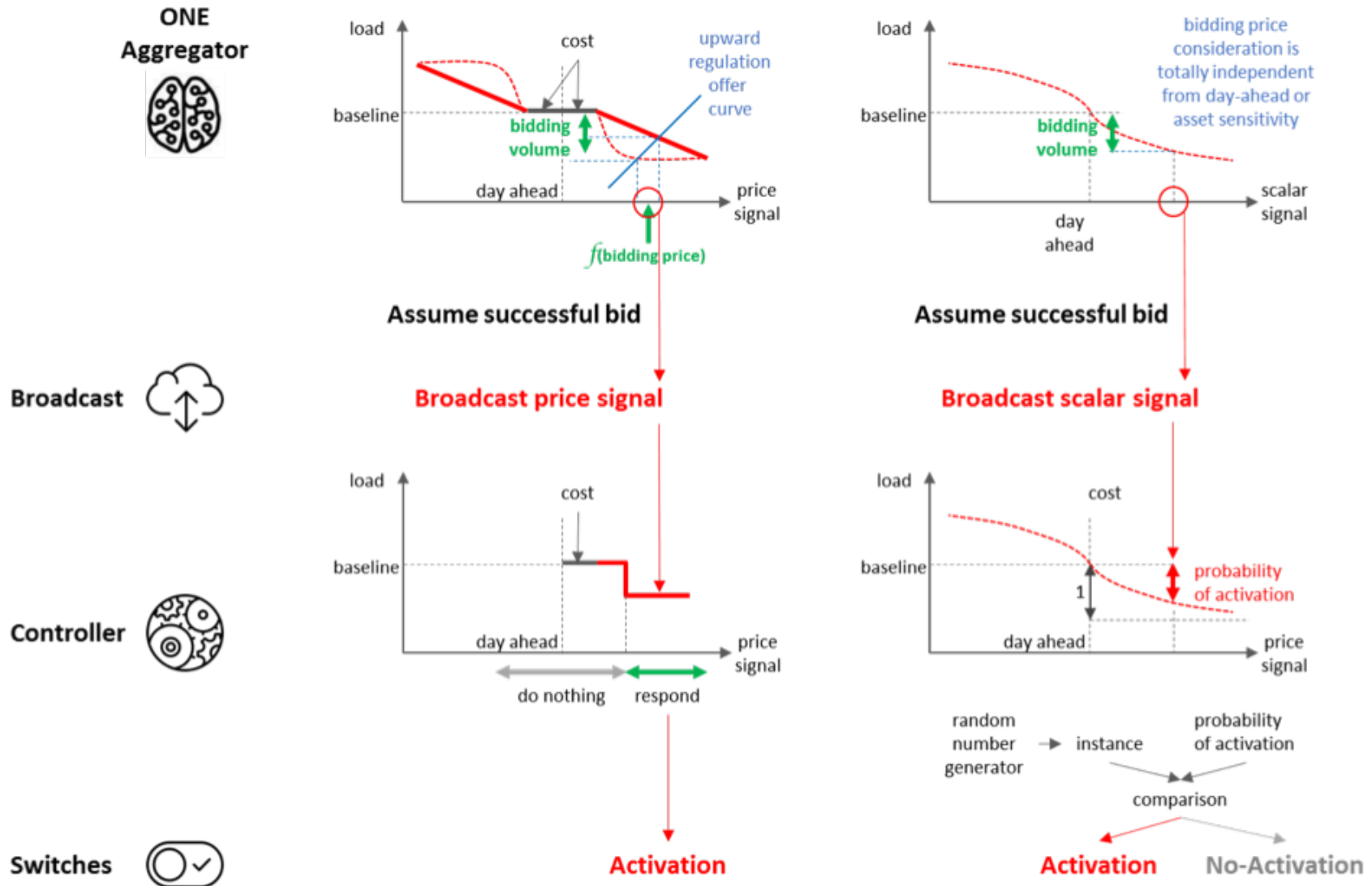
Aggregator Set-up: Spain

Direct control



Aggregator Set-up: Denmark

Indirect control



Challenges:

- Availability of DERs
- Mathematical representation of DERs flexibility
- Complexity in estimating DERs reaction
- Communication set-up

Remarks:

- DERs are highly sensitive to imbalances' price

Way forward:

- Real-life use of IoT & indirect control to test flexibility allows aggregator to redefine mathematical models of batteries and heated swimming pool
- Better understanding of electric flow congestion in urban and suburban areas and of aggregator role in a business model & response volumen risks
- DER owners to perform strategic re-thinking when acquiring flexible assets
- Valuable info for development of demand response activities of SmartNet industrial partners
- Useful for further research on demand response management systems & their commercial application in pan-Europe



Thank You

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