



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

European Utility Week | Oct. 6<sup>th</sup> 2017

# The Danish Pilot: Electrically heated swimming pools as flexible assets

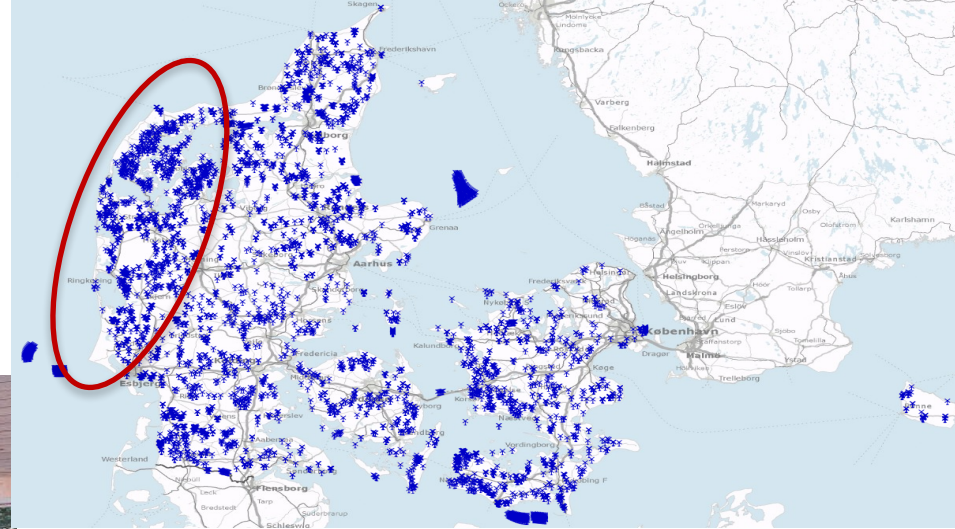
Loui Algren, Engineer  
Energinet



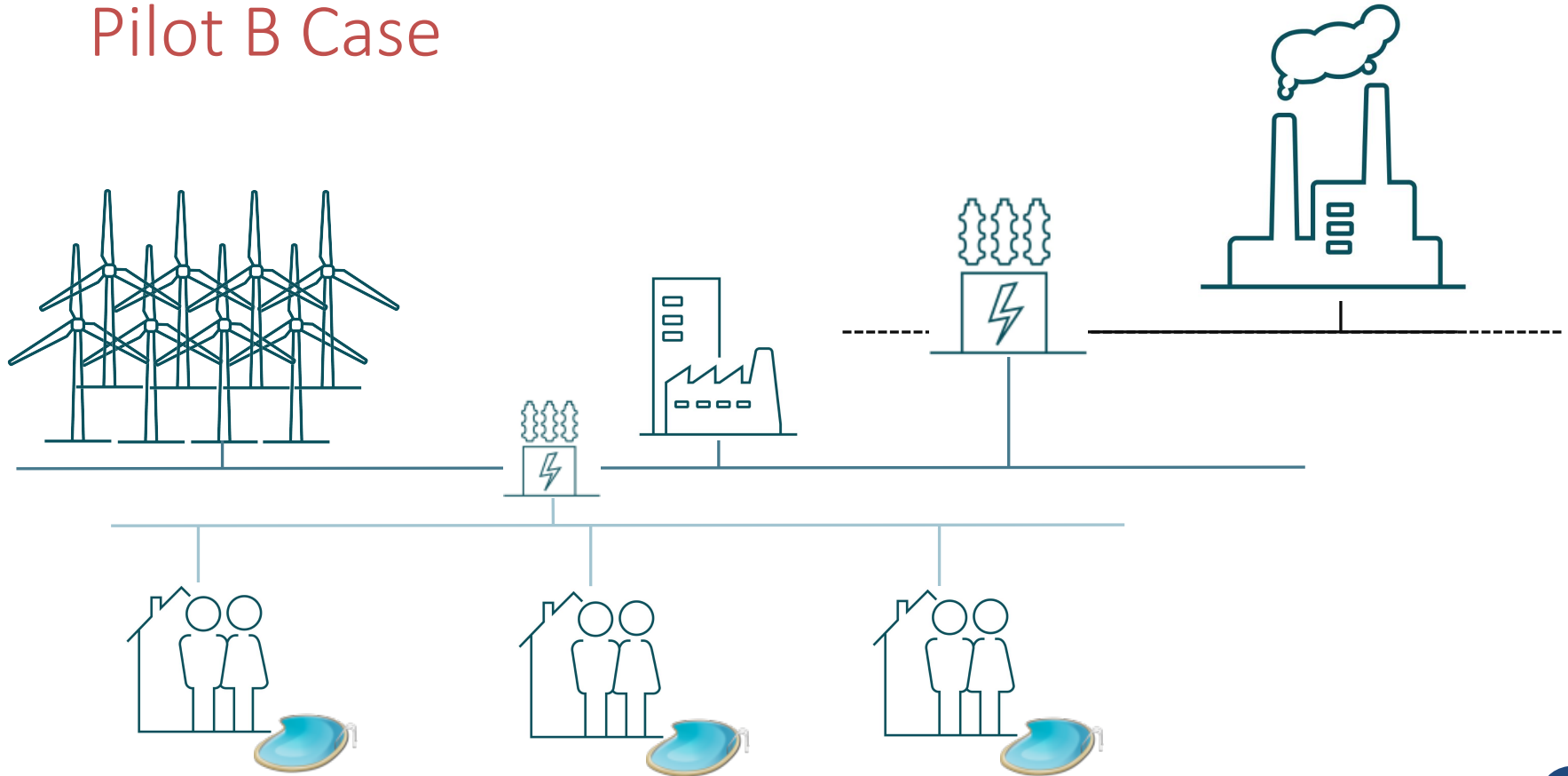
This project has received funding from the European Union's Horizon 2020  
research and innovation programme under grant agreement No 691405

# Pilot case

- 30 summer houses
- Electric heated swimming pools
- Highly flexible consumption

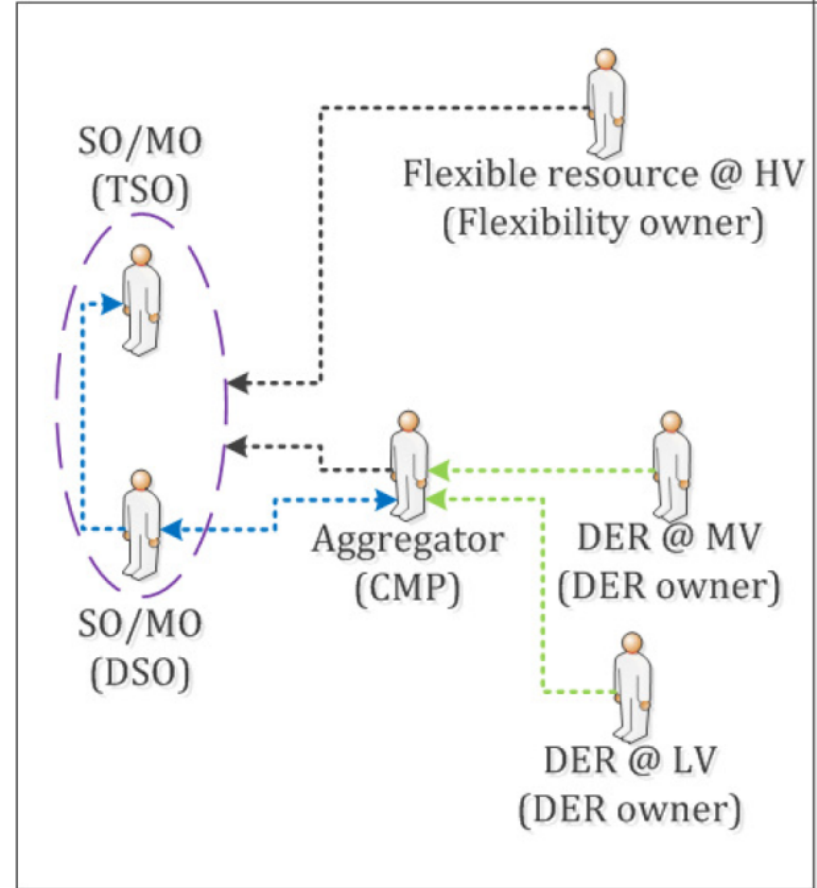


# Pilot B Case



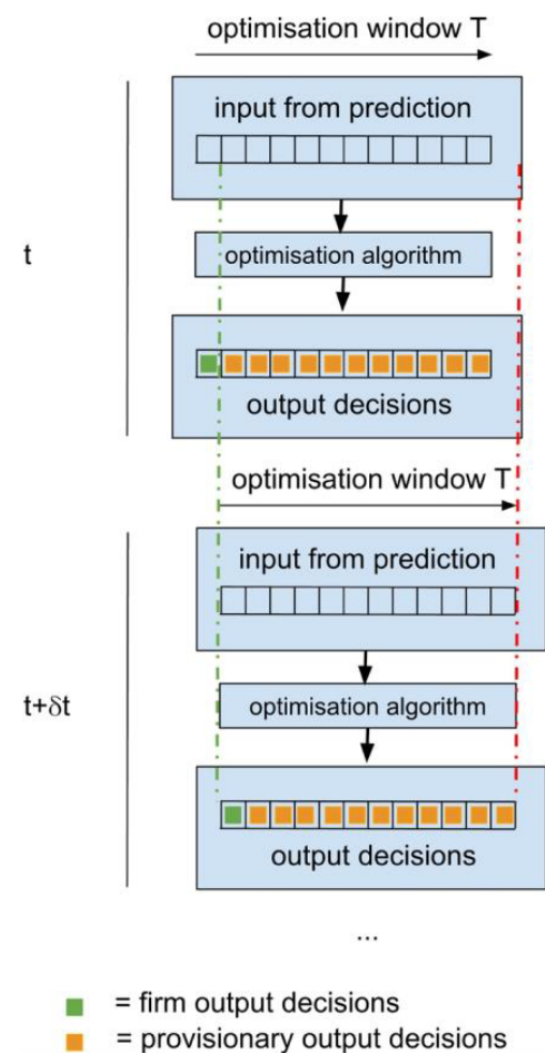
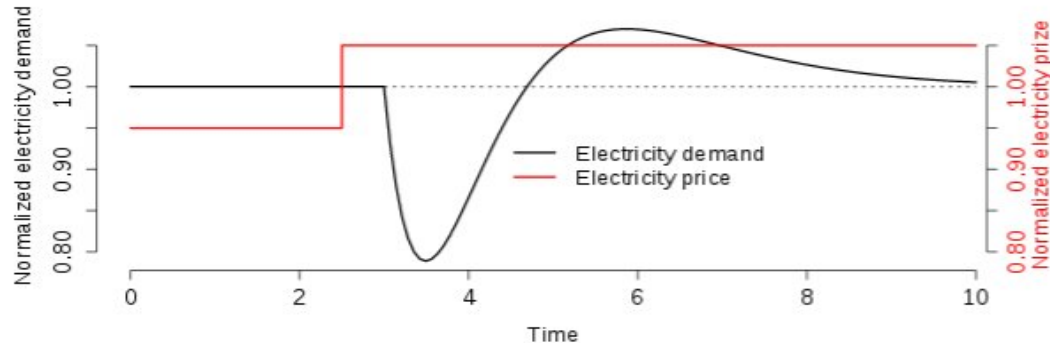
# Coordination Scheme D

- Common TSO/DSO market



# SmartNet Reserve Market

- Higher time resolution (5 min)
- Higher spatial resolution = Price areas on distribution level
- Rolling Horizon Optimization
- Advanced bid types



# Setup

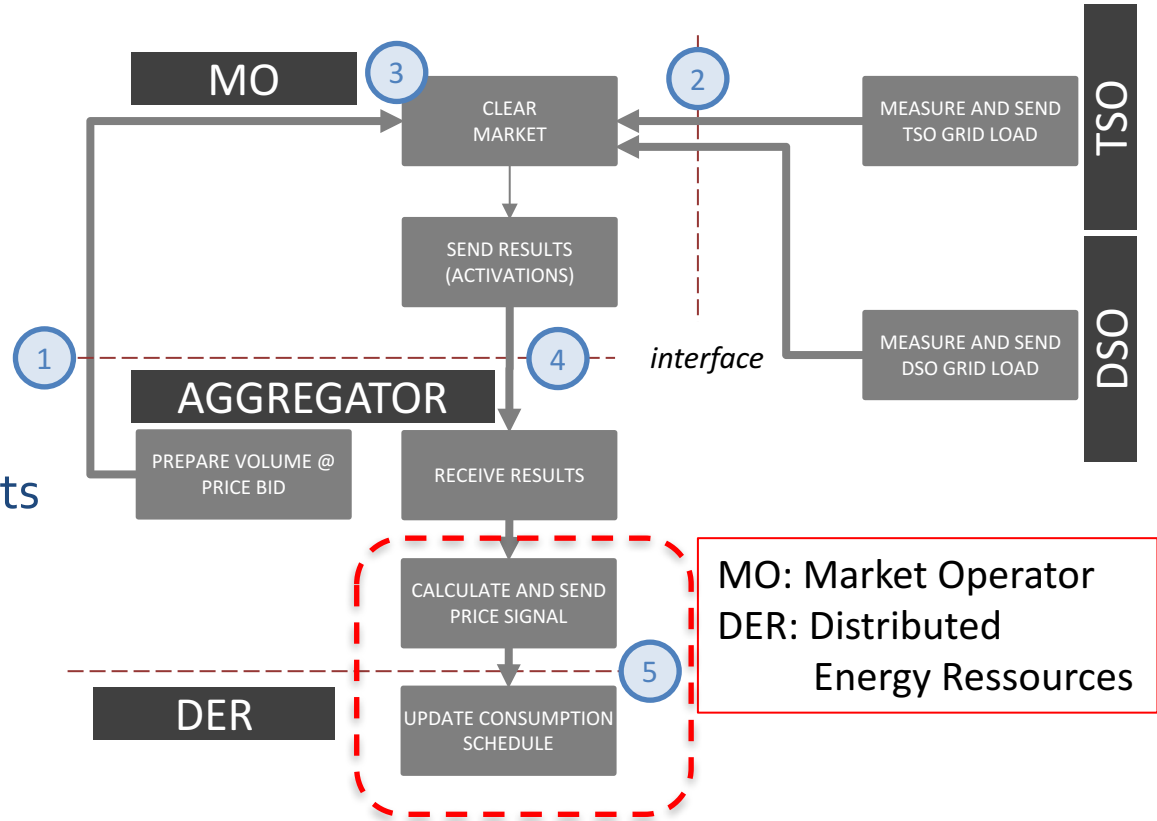
## Price based control

### Advantages

- Highly scalable
- No data safety issues
- Very low transaction costs

### Disadvantage

- Estimation of reaction



MO: Market Operator  
DER: Distributed Energy Ressources

## The Challenge is now!

*"Not the whole new load is from EVs. Lots of other electricity consuming goods are purchased in Norway these days such as **jacuzzis**."*  
[www.ing.dk](http://www.ing.dk)

## Electric vehicles overloads the Norwegian grid



Volkswagens e-Golf var den mest solgte elbil i Norge i juni. Hele 874 eksemplarer afsatte forhandlerne. (Foto: PR-foto)

Det norske elnet er mange steder for svagt til de mange nye elbiler. Det bliver nødvendigt med nye kabler, transformere og sandsynligvis også batterilagre for at klare efterspørgslen

# Consultation Document

## Challenges of Defining Direct (Scalar-based) or Indirect (Price-based) Control Signals for DERs to Access the Market Directly or Through Aggregators

The purpose of this document is to present an analysis framework for various control signals and market concepts in order to set an appropriate discussion about their advantages and challenges in Pilot B of the SmartNet Project.

Please give us your feedback!

**Link: <http://smartnet-project.eu/consultations/consultation-5/>**



## Thank You

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