

European  
Utility Week



3 - 5 October 2017  
RAI Amsterdam, The Netherlands

DTU



SmartNet

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 | October 5<sup>th</sup> 2017

# The role of aggregators

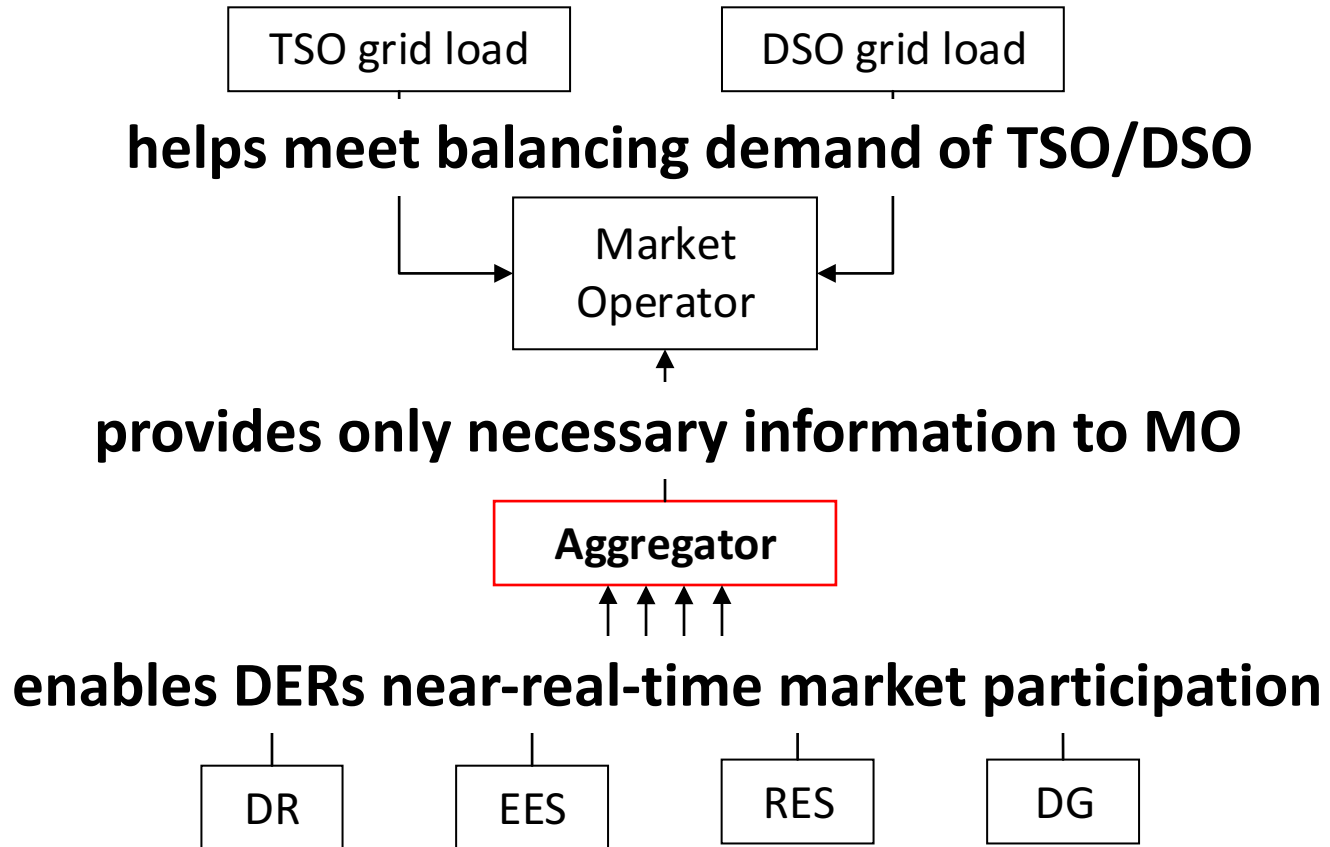


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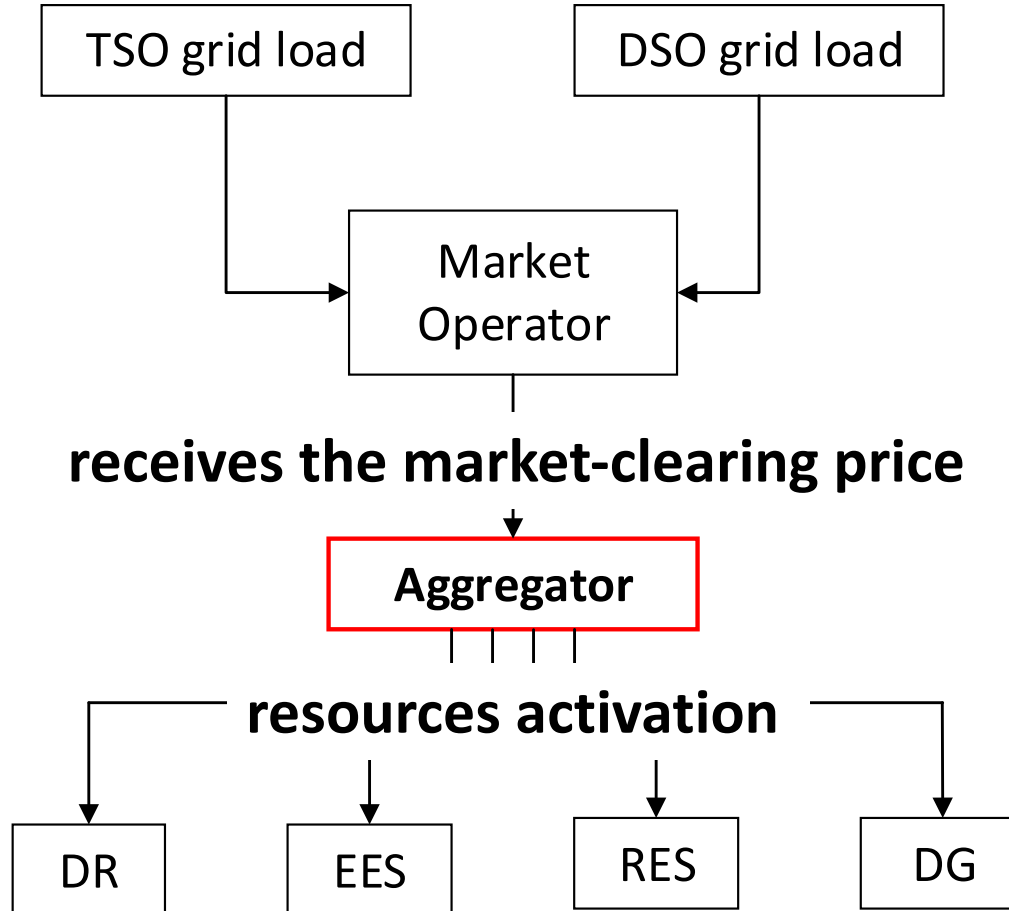
# Agenda

- Aggregator's role
- Aggregation models
- Flexibility cost framework
- Literature

# Aggregator's role



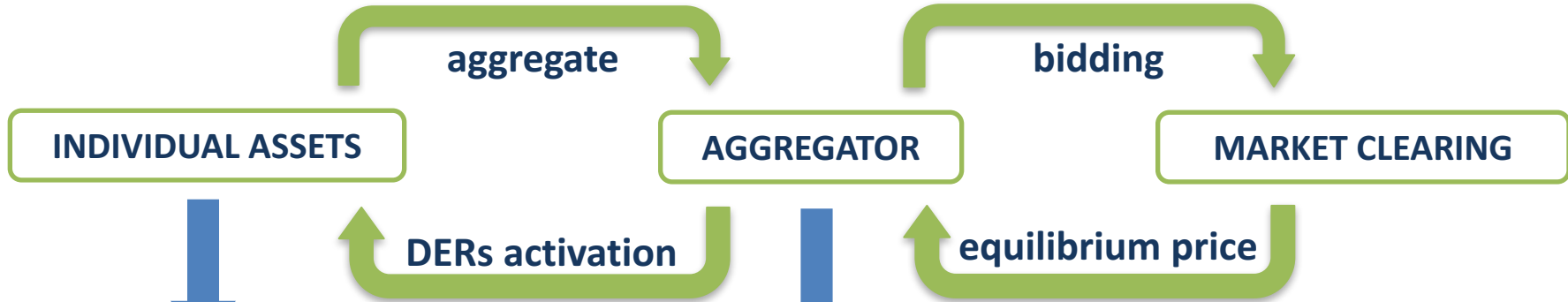
# Aggregator's role cont'd



# Aggregation models

- four distinct aggregation approaches identified
  - **physical**, hybrid, traces and data-driven
- developed five aggregation models
- they draw from the eight DER categories and four flex. cost components, defined in the project
- technology based aggregation

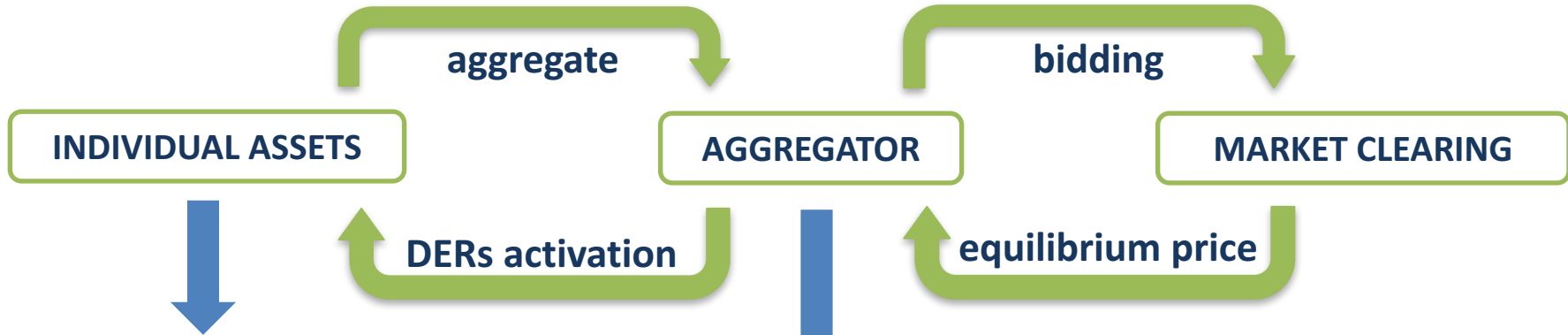
# Aggregation models cont'd



1. Stationary EES
2. EVs
3. Variable RES
4. Conven. gen.: fossil fuel generators, conven. hydro
5. CHPs
6. TCLs
7. Shiftable Loads
8. Curtailable Loads

1. Atomic Loads
2. CHP Units
3. TCLs
4. EES Units
5. Curtailable Gen./Loads

# Aggregation models cont'd

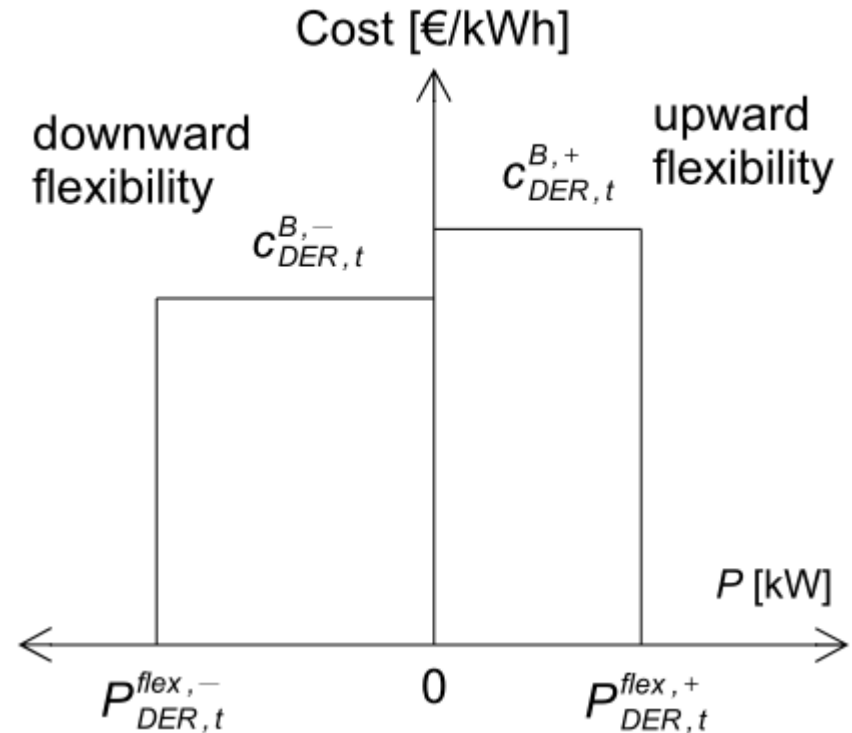


1. **Stationary EES**
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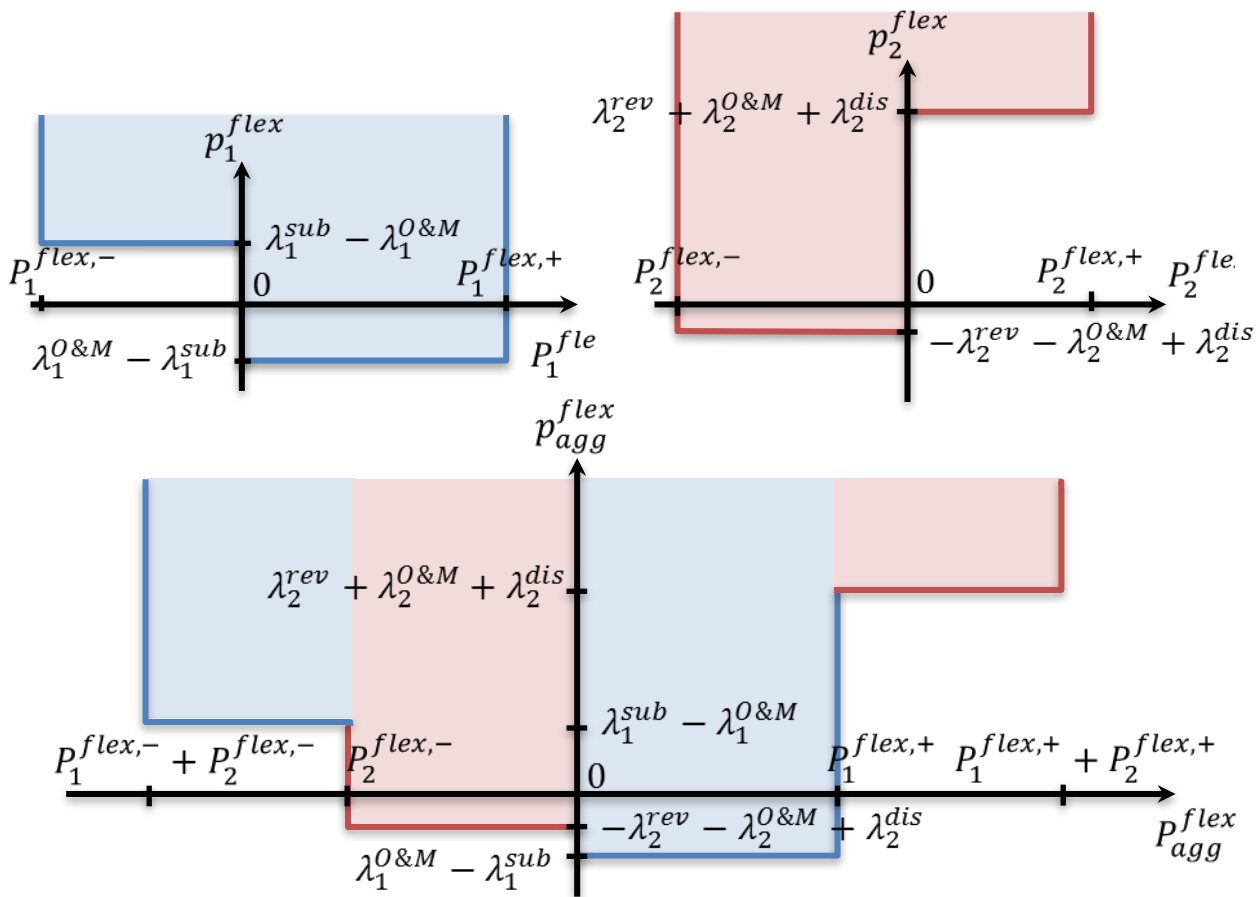
# Flexibility cost framework

- four flex. cost components, defined in WP1 of the project:
  - discomfort cost
  - indirect cost
  - change in operational costs
  - revenue change
- they form a bid cost

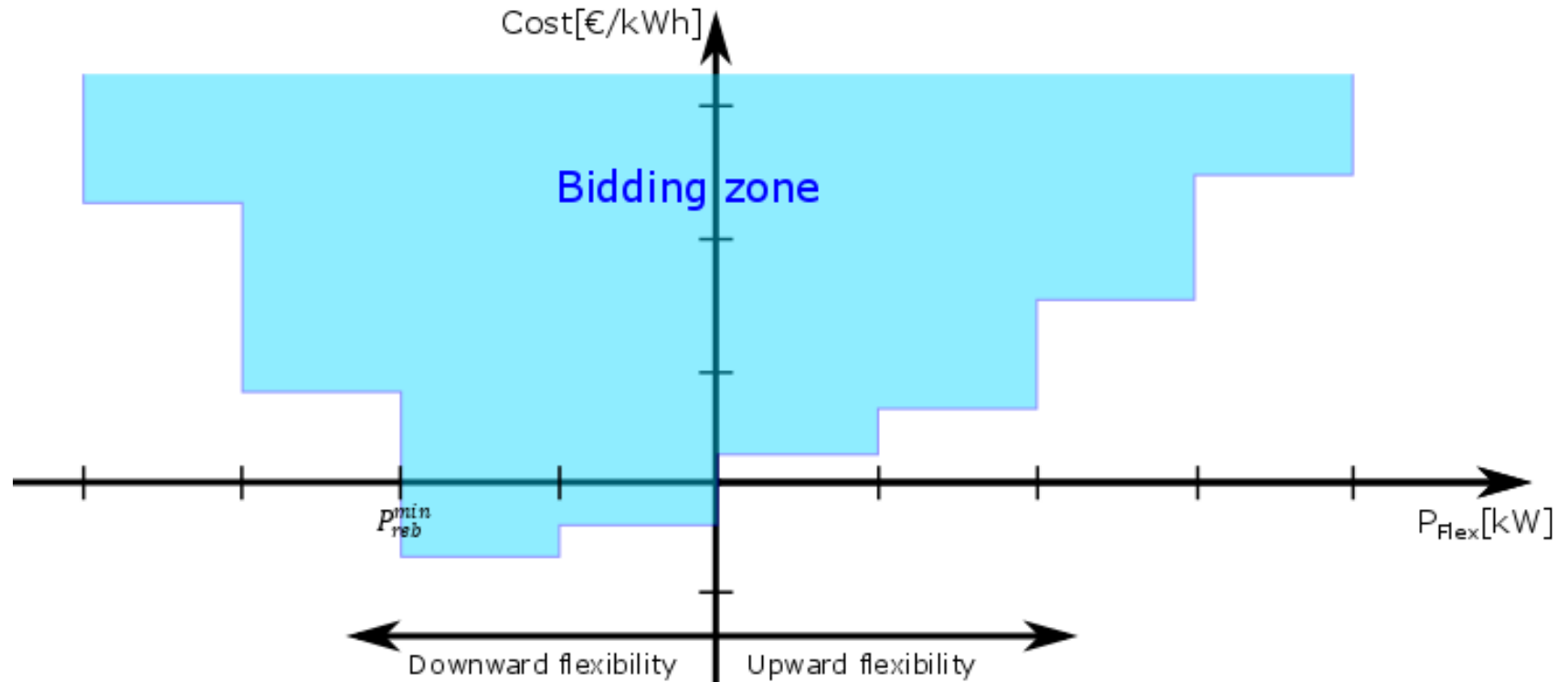




# Flexibility cost framework cont'd



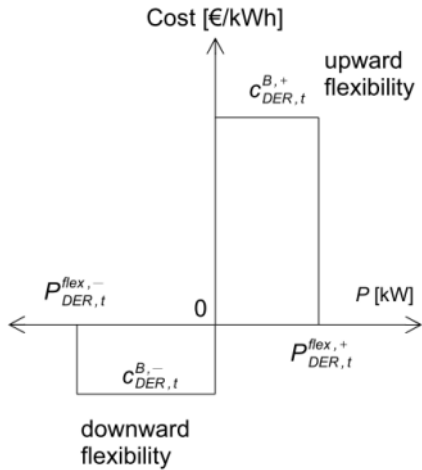
# Flexibility cost framework cont'd



# Aggregator's role cont'd

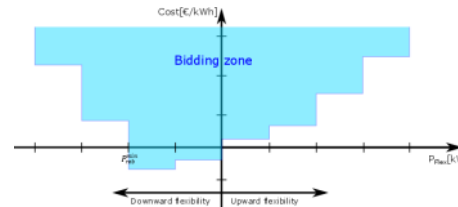
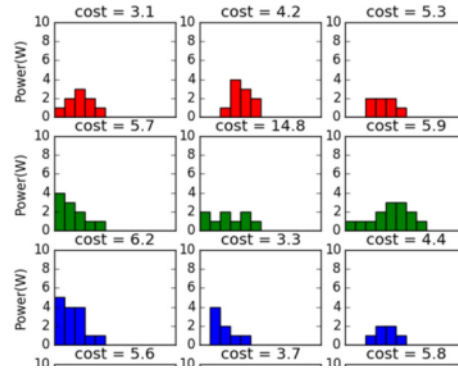


## Transmission Level Generation

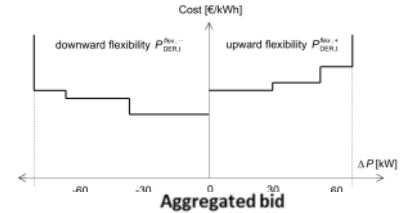


## Aggregator

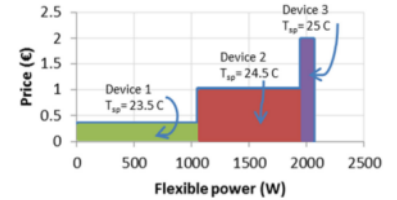
- Atomic
- CHP



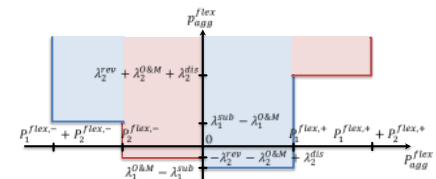
## EES



## TCL



## Unified



# Literature

- detailed results are described in the deliverable: "Aggregation models: preliminary report"
- **available on SmartNet website, even if classified as confidential**
- internal review
  - Miguel Marroquin (ONE)
  - Ivana Kockar (UofS)
- **final version due end of 2017**



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## Aggregation models: preliminary report

D2.3

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<b>Distribution Level</b>	Confidential
<b>Responsible Partner</b>	4 - DTU
<b>Checked by WP leader</b>	Date: 15/06/2017 - Mario Dzararija (DTU)
<b>Verified by the appointed Reviewers</b>	Date: 16/05/2017 - Miguel Marroquin (ONE) 24/05/2017 - Ivana Kockar (USTRATH)
<b>Approved by Project Coordinator</b>	Date: 16/06/2017 - Gianluigi Migliavacca (RSE)



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[SmartNet-Project.eu](http://SmartNet-Project.eu)

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Thank You

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