The FlexOffer Model and the GOFLEX local flexibility market

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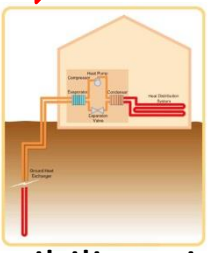
What is a FlexOffer? Consumption First

No or simple flexibility patterns → **Complex flexibility patterns**

- No flexibility

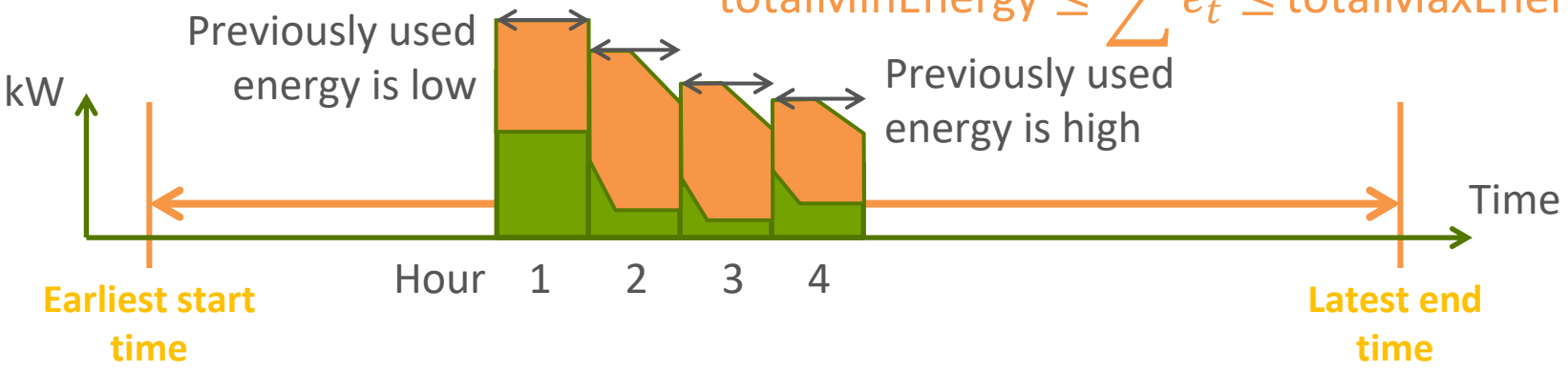
- *Time-shift* flexibility

- *Time-shift* flexibility
- *Amount* flexibility
- [*Total Amount* requirement]



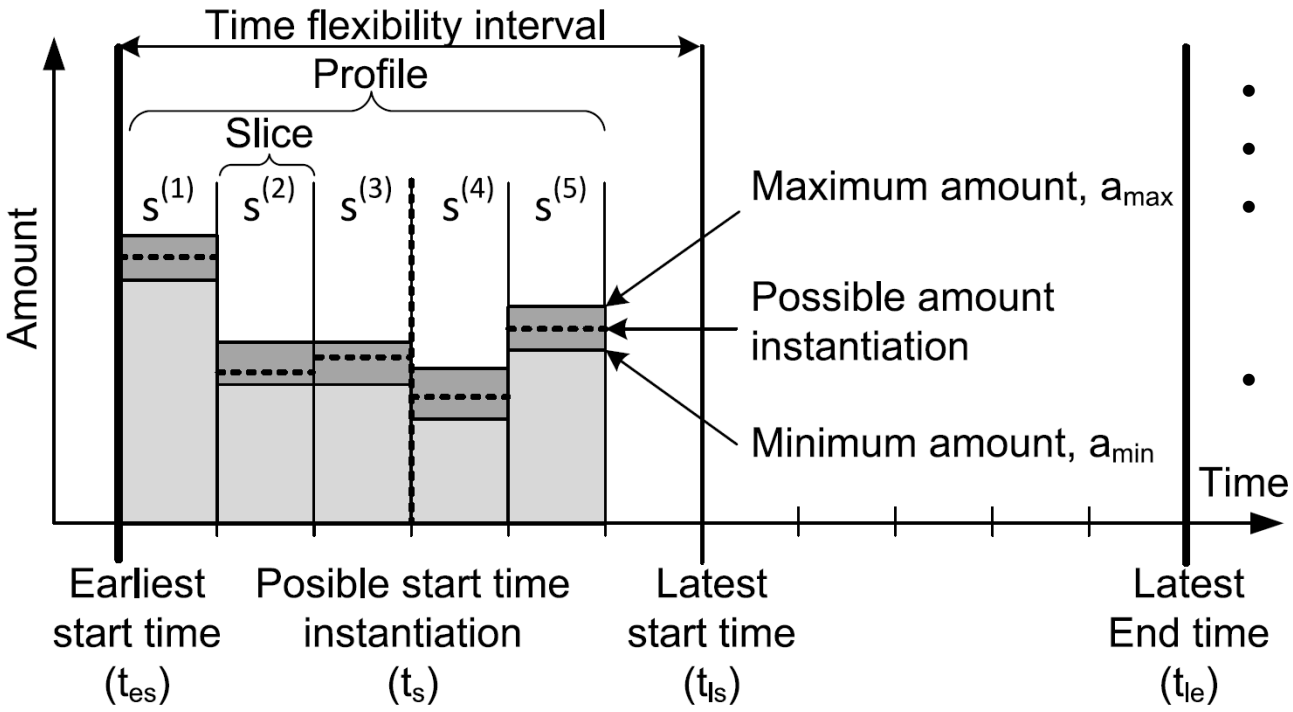
- Amount flexibility with intra-time unit dependencies

$$\text{totalMinEnergy} \leq \sum e_t \leq \text{totalMaxEnergy}$$



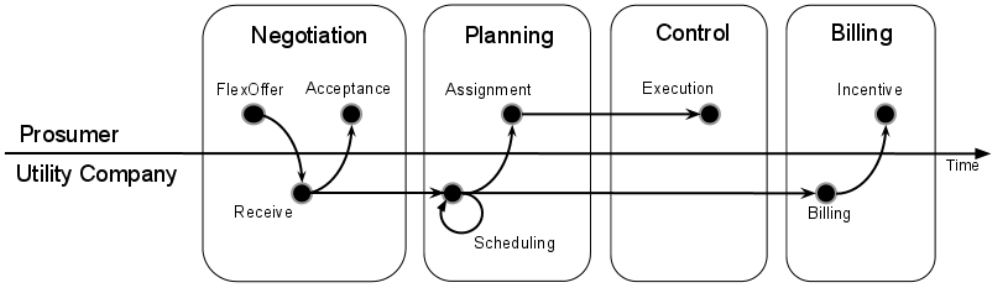
Simple FlexOffer Definition

A FlexOffer[1, 2] *f* is a tuple $f = ([t_{es}, t_{ls}], p)$, where $[t_{es}(EST), t_{ls}(LST)]$ is the time interval during which to trigger the Activate action and *p* is the



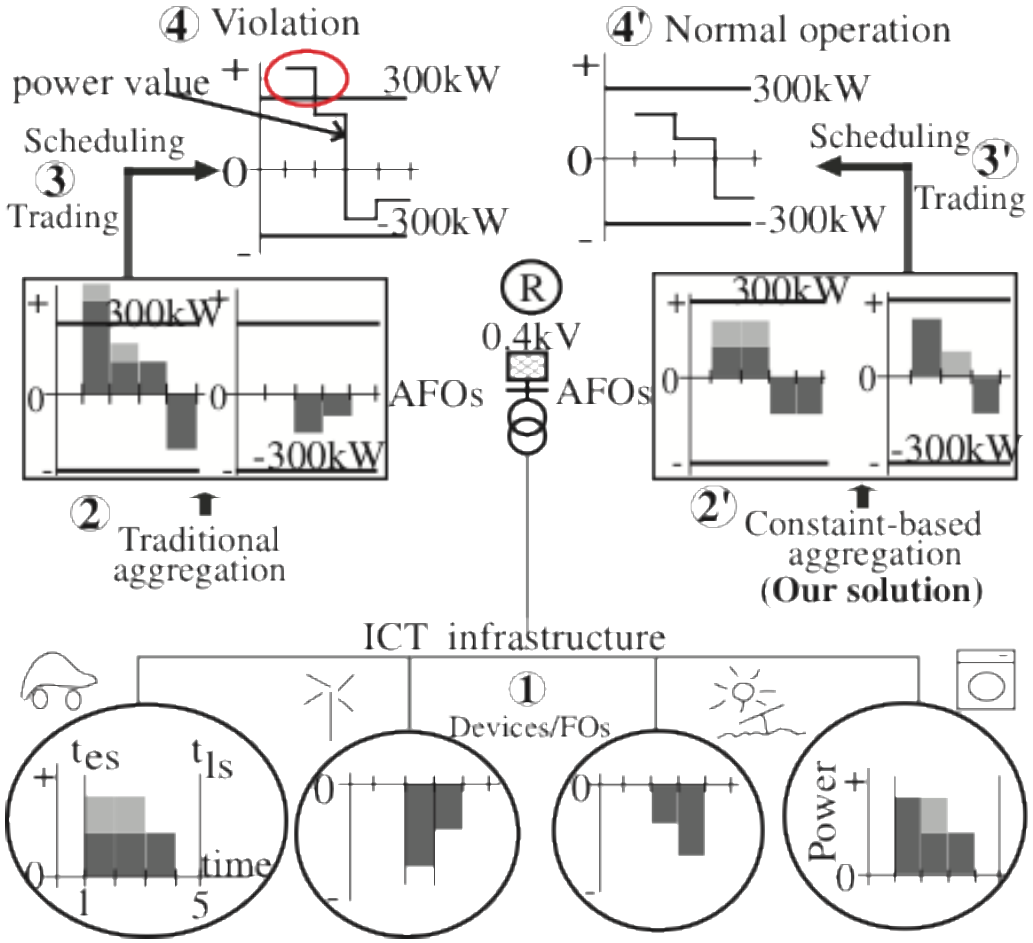
- Total energy constraint
- Slice dependencies
- Exact **location**
  - **Aggregatable**

- It is an **OFFER** from prosumer to flex purchaser
  - No force/curtailment
  - Explicit offer with commitment

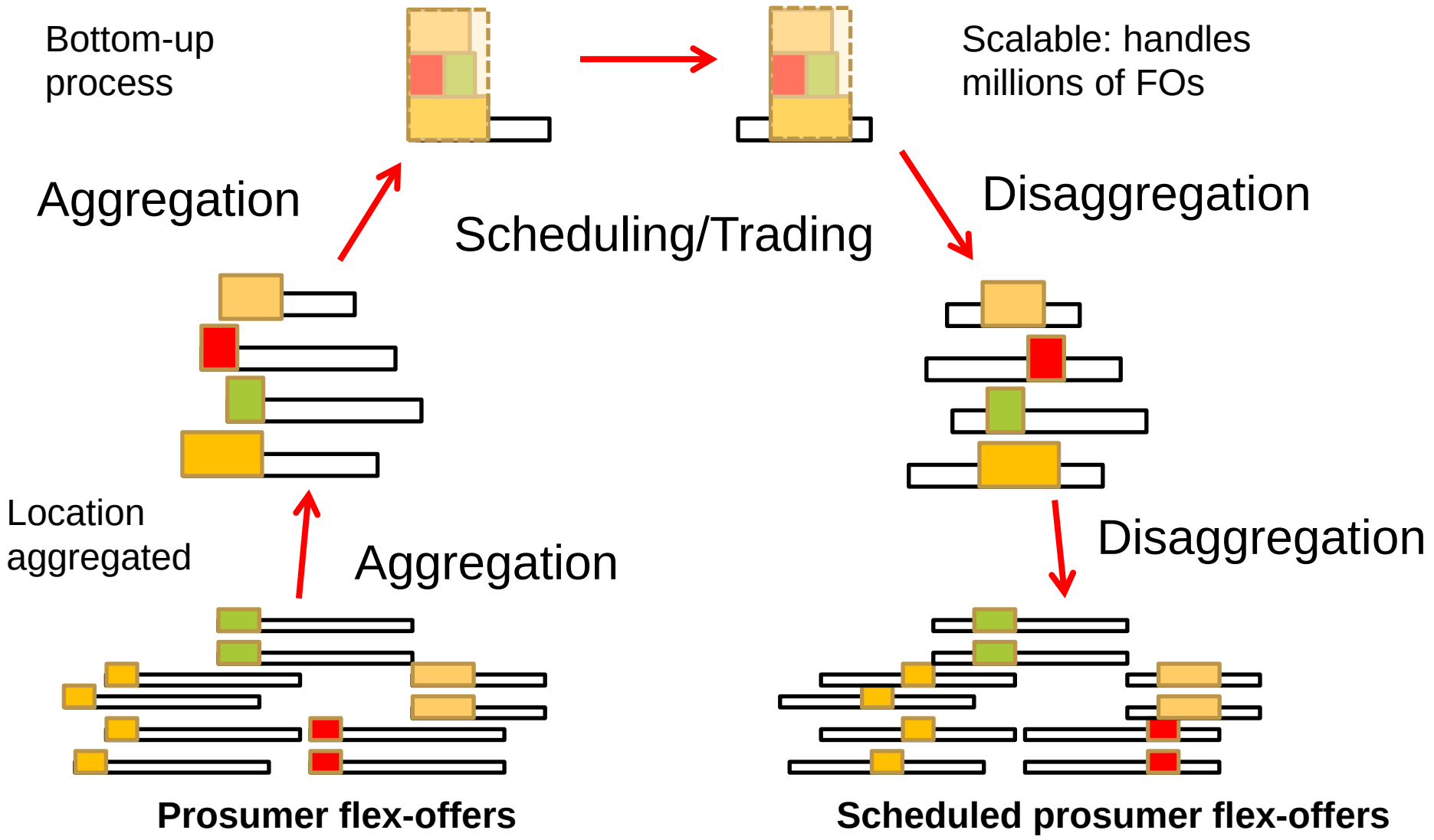


Complex FlexOffers

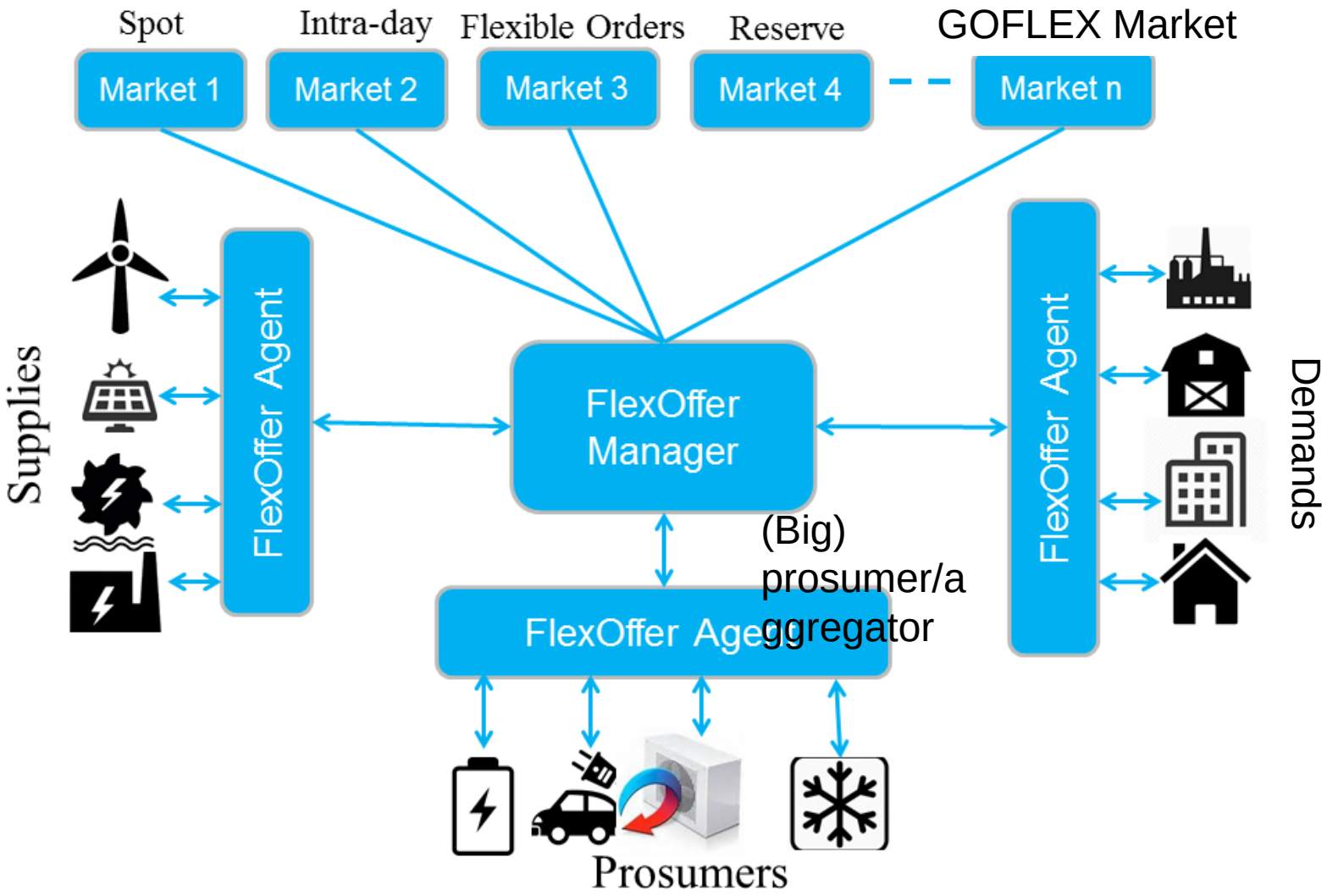
- Can also represent
  - Production
    - Maybe no flexibility
- Mixed prod/consumption
  - Balancing
  - Self-consumption
- Grid congestion avoidance
  - Constraint aggregation



FlexOffer Aggregation and Disaggregation

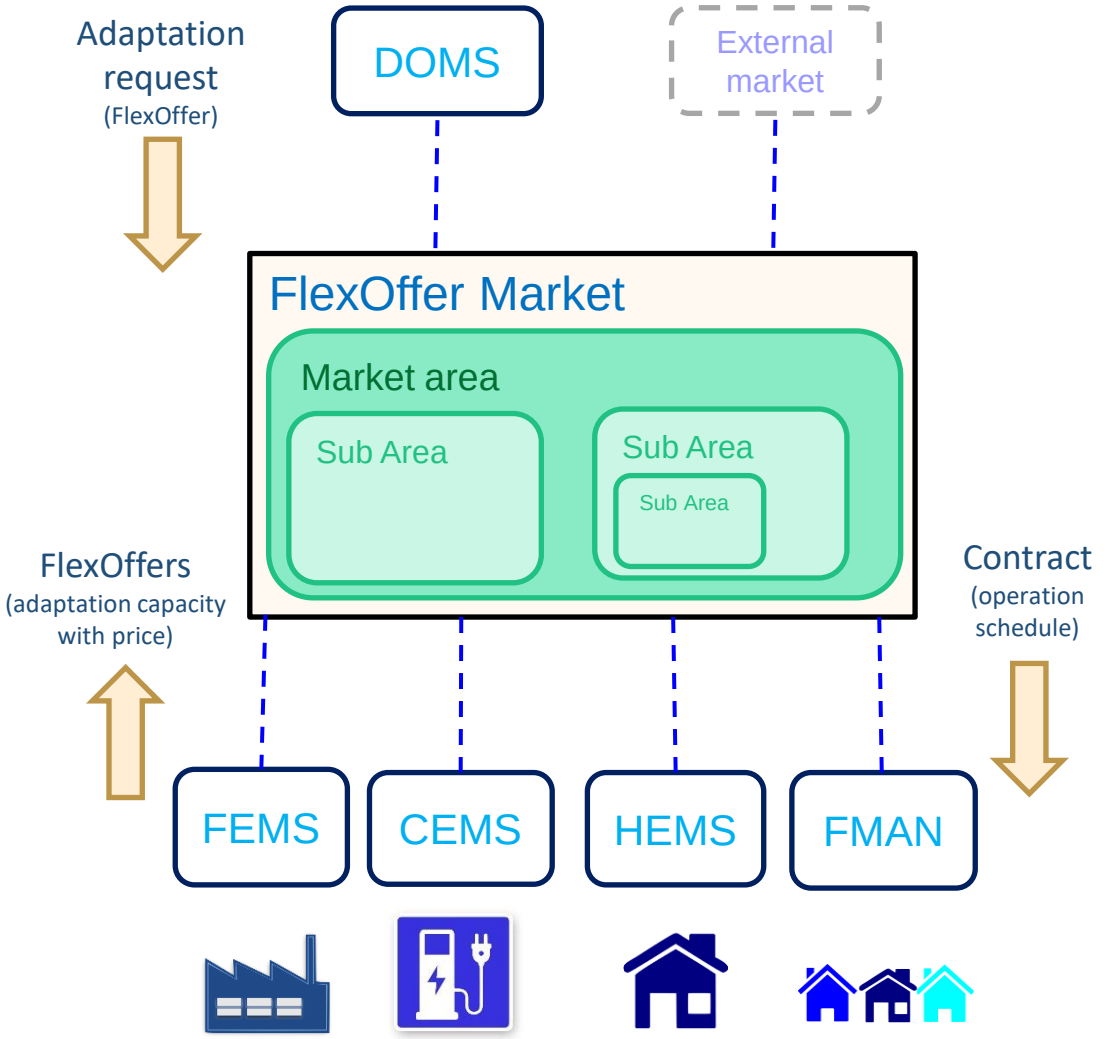


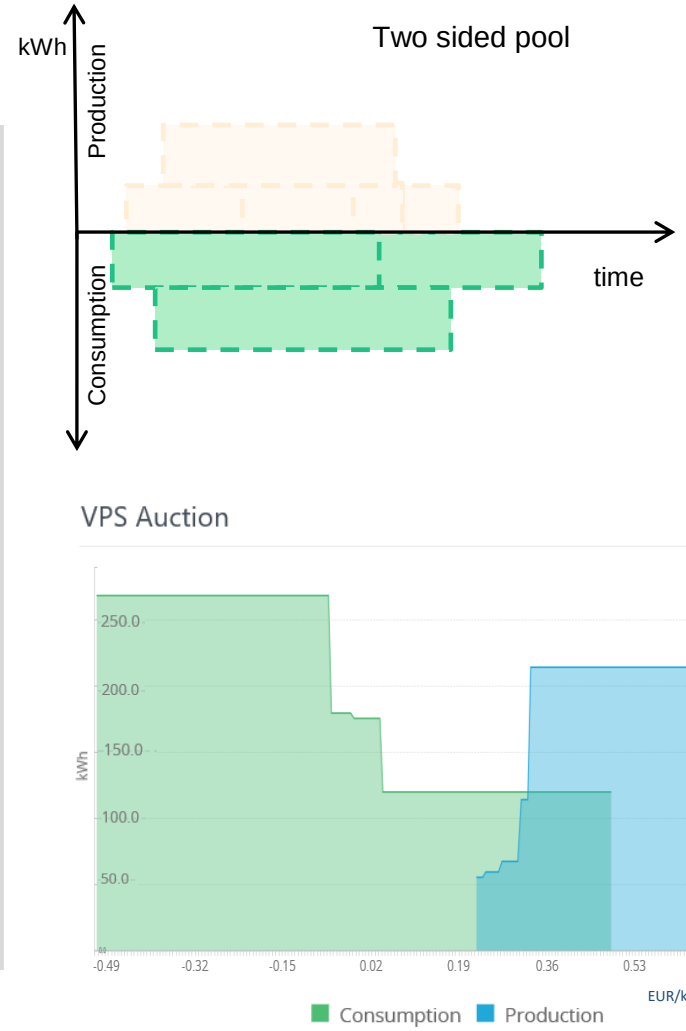
FlexOffer System Integration



Interfacing of flexibility market components.

GOFLEX Market – Local Trading





Conclusion

- FlexOffers can be the **joint basis** of
  - The flexibility market(s)
  - At all levels
  - Starting bottom-up
  - Let's go…

ACM eEnergy 2017, Hong Kong

- Awards for FlexOffers
  - Best Poster Award, World Smart Grid Forum 2013 (MIRABEL project)
  - Best Paper Award, ACM International Conference on Future Energy Systems (ACM e-Energy) 2017 "Generation and Evaluation of FlexOffers From Flexible Devices" (GOFLEX project)