

**GOFLEX**  
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# FLEXIBILITY markets of the future and TSO-DSO cooperation

Session 2: How is the link to other markets organised?

## GOFLEX Project view

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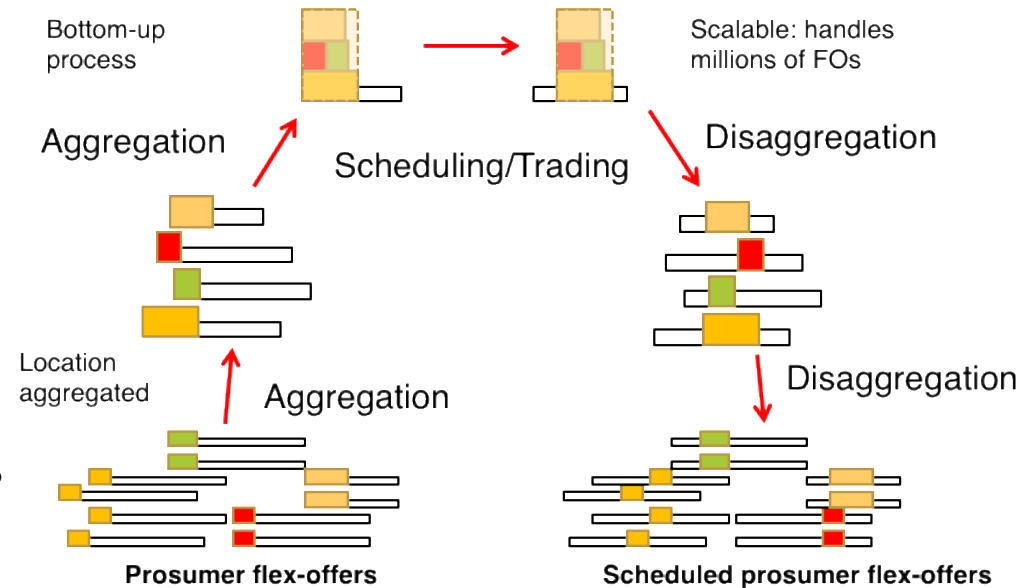
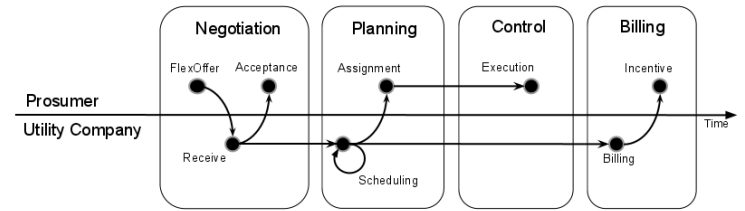
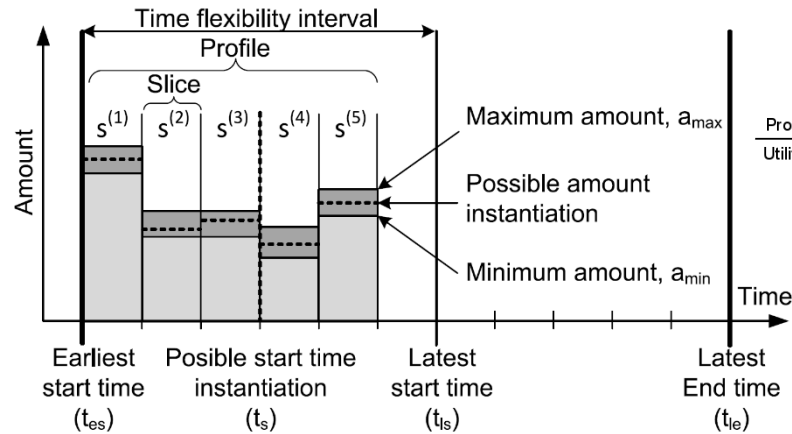
The project Generalized Operational FLEXibility for Integrating Renewables in the Distribution Grid (GOFLEX) has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 731232.

# FlexOffers as standardized high level protocol for flexibility trading

- describing any type of energy flexibility product
- possibility to aggregate and disaggregate
- connectivity with legacy systems allows for large scale deployment of multiple flex trading technologies

Join FlexOffer community!

- MIRABEL (FP7) 2010-13
- Totalflex (DK) 2012-16
- KIBERnet (SI) 2013-16
- Arrowhead (FP7) 2013-16
- DiCyPS (DK) 2015-20
- GOFLEX (H2020) 2016-20
- Flexible Energy Denmark 2019-23
- GIFT (H2020) 2019-23
- [FEVER) (H2020) (2020-23)]...



# From Thinking to Doing



## Deploy flexibility to have a self-sufficient energy supply

- Meeting energy needs of residential & commercial customers with 100% renewable & regionally produced energy



## Explore flexibility offered by the public sector

- Testing the microgrid case of a university as local energy community



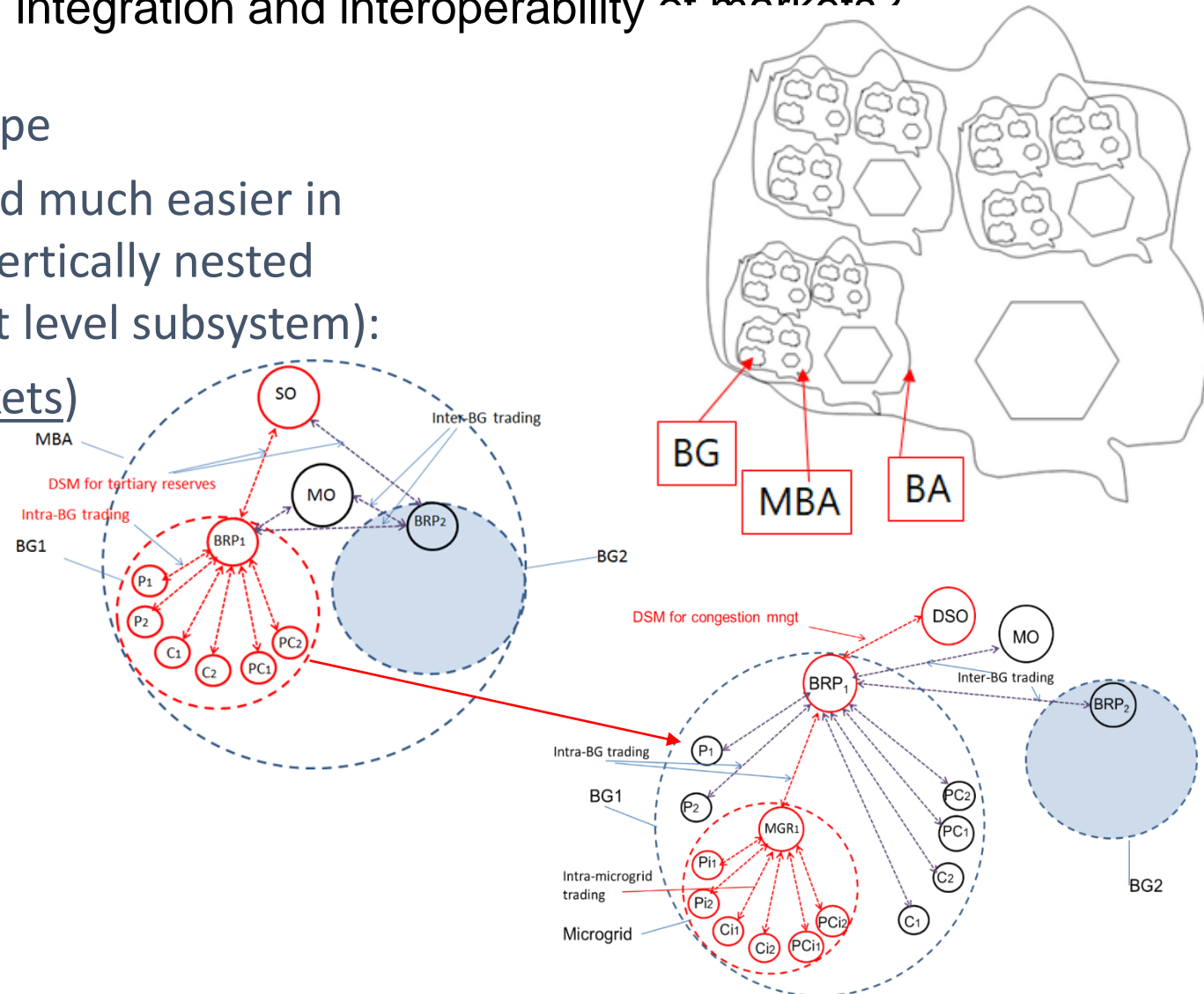
## Use flexibility to reduce the need of upgrading grid infrastructure

- Optimising the balance for the DSO to reduce corrective costs
- Using demand-side management to reduce peak loads on the distribution grid



# 1. How do you assess the impact of design choices on existing markets (day-ahead, intraday, ancillary services...) and on harmonisation, integration and interoperability of markets?

- **design choices** depending on market type
- **interoperability and scalability** achieved much easier in harmonized system (= structured into vertically nested “cellular” systems, prosumer the lowest level subsystem):
  - limited number of use cases (=markets)
  - same (type of) roles (=unit players)
  - same (type of) unit processes

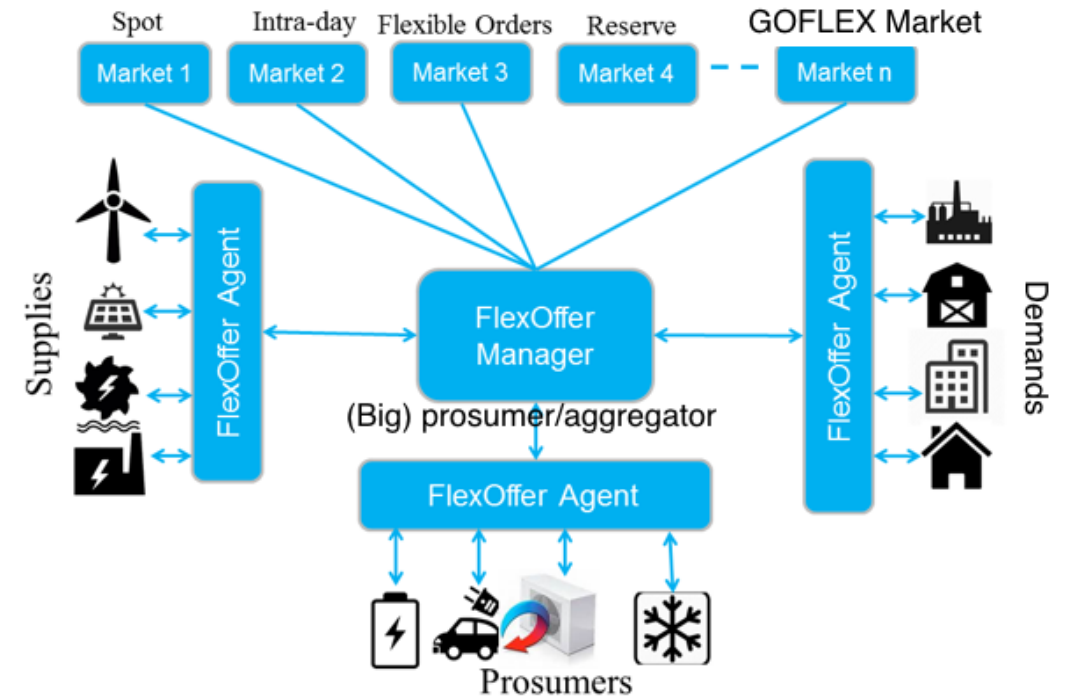


2. How do you ensure that flexibility markets, dynamic connection agreements and dynamic grid tariffs fit together? Where do you see synergy potentials for consumers and system operators?

- **Overall system optimization in MBA:** energy transfer costs added to costs of energy flexibilities when comparing flex offers in the MBA (implicit transfer capacity trading):
  - Point of comparison is topological location of (predicted) congestion or disbalance.
  - Different users (TSO, DSO, BRP,...) compete for the same flexibility using open market principles.
- **Avoided cost principle applied** to selection of flex energy supplier and to TSO-DSO partitioning of responsibilities and remuneration
- **Synergy between system operators and prosumers:** dynamic pricing based on local conditions of the grid

3. What cannot be solved by the market, i.e. which products/services should be tackled via regulated systems?

- if **TSO or DSO buyer** of flexibility: market has to be “regulated” within the boundary conditions for “ancillary” services (e.g. “minutes reserves” where TSO is the only buyer)
- **other markets** (e.g. balancing market, intra-day market): no special regulation required except for role of MO (see answer 5)

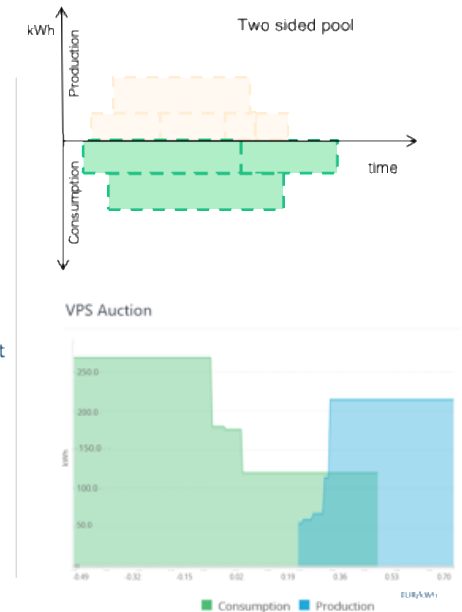
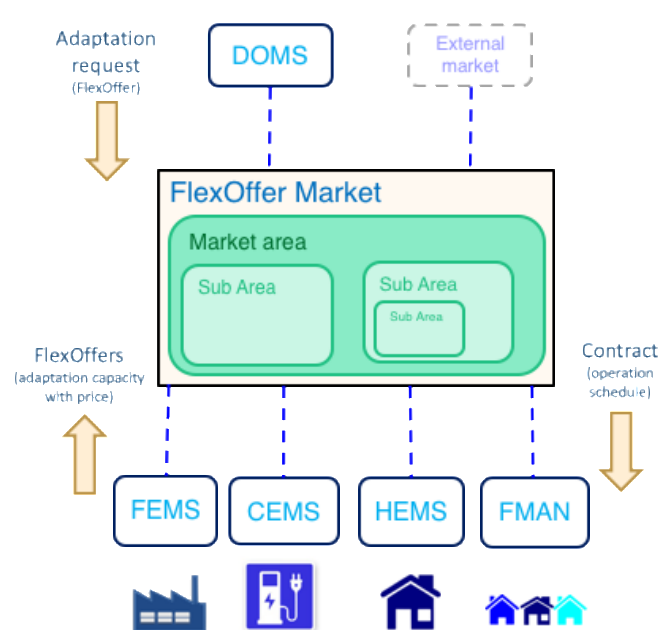


Interfacing of flexibility market components.



4. How transparent is your market? What data do you provide? (e.g. electricity flows, grid observation data, availability and impact of different grid assets)?

- Depending on use case: one-sided pool (1:many) or two-sided pool (many: many)
- Closed flexibility contracts between seller and the buyer - market operator a third party
- Data concerning concluded contracts available to all participating parties (respecting GDPR):
  - relevant energy consumption and production,
  - grid observation data,
  - trading volume (traded flexibilities)
  - prices of flexibilities



5. How are the different tasks – especially the running of a platform - split between the regulated and the commercial area and why? If running a platform is not a regulated activity, how do you prevent market abuse?
- “1 : many”: **transparency** as of answer 4 sufficient
  - “many : many”: **Market Operator to be played by a transparent and credibly neutral entity** (e.g. municipality)





# Biggest drivers to implement a Goflex system

- ... to reduce costs in balancing portfolios
- ... to reduce costs in managing grids (CAPEX, OPEX)
- ... to manage autonomous systems
- ... to operate islands or islanded parts of the overall system
- ... to support local energy communities  
(including regional energy market platforms)
- ... to have a stable platform to host many services  
(including FlexOffer solutions)



# Thank you for your attention!

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