



SEESGEN-ICT

4° GENERAL WORKSHOP

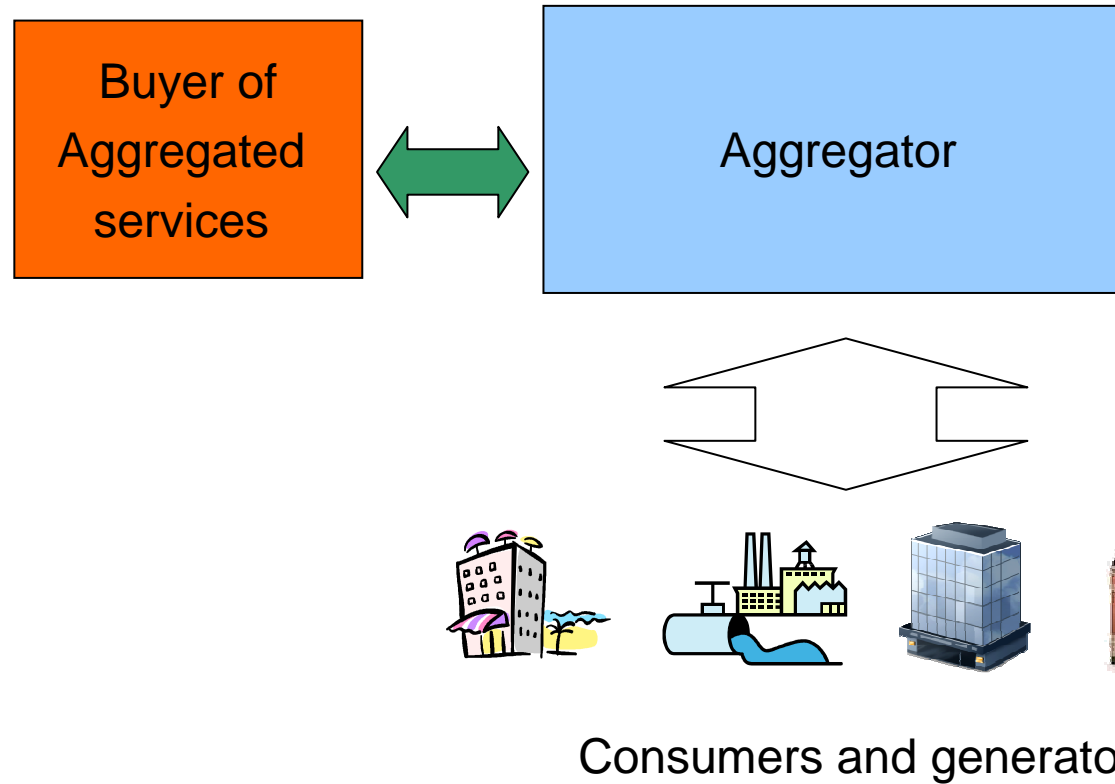
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Work package 5: Recommendations





R1: Verification of aggregator services





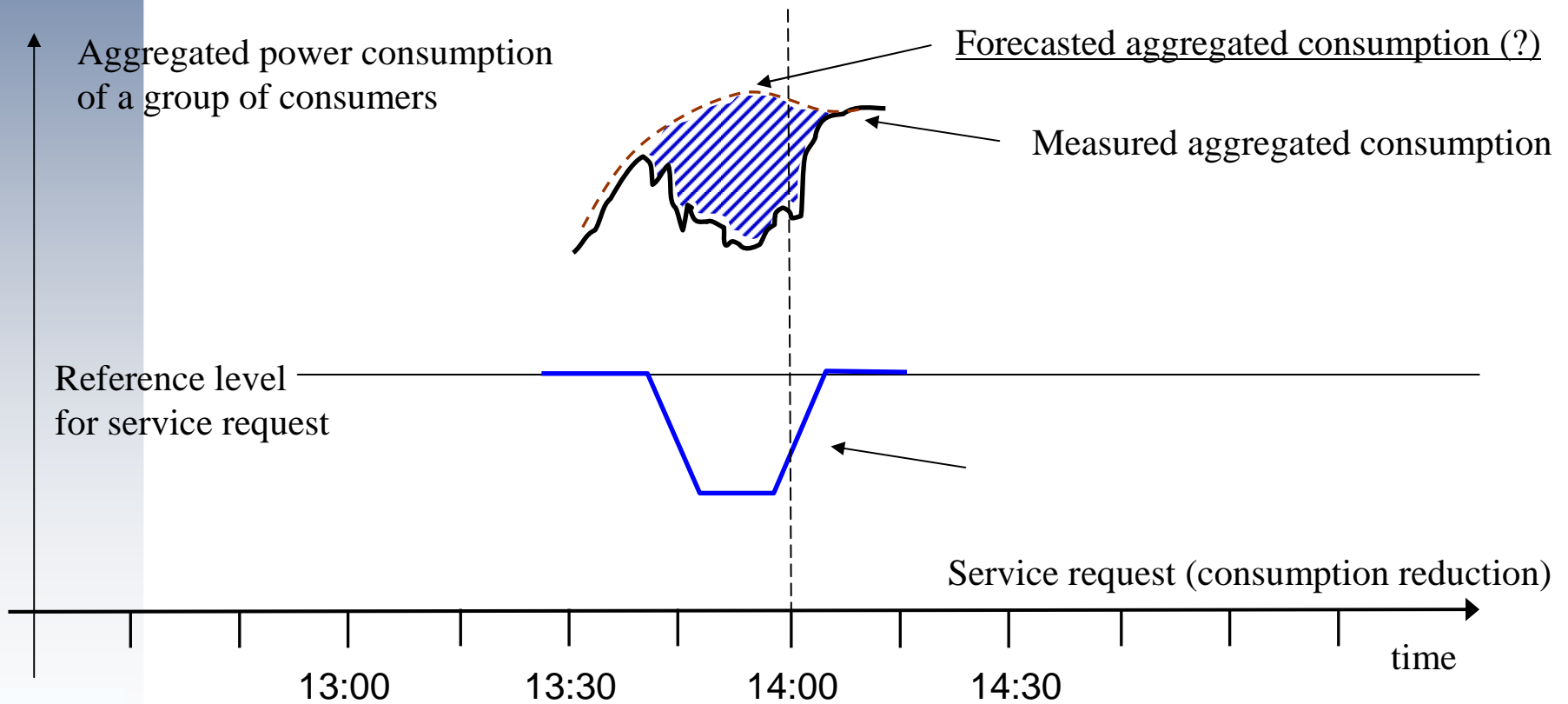
Verification of aggregator services

- ❑ The buyer of aggregator's services wishes to make sure that the aggregator has delivered the power reprofiling which was ordered
- ❑ The problem arises from the fact that the behavior of distributed resources as a result of the aggregator's action cannot be observed exactly
 - ❑ Load and generation can be measured but what should they be compared to?
- ❑ Assuming that
 - ❑ the aggregator is the balance supplier of the aggregated portfolio
 - ❑ Time and spatial resolution of the service does not exceed that of balance settlement
 - ❑ => no special verification is needed



Verification of aggregator services

How to get the baseline (**forecasted**) consumption in absence of the service request?



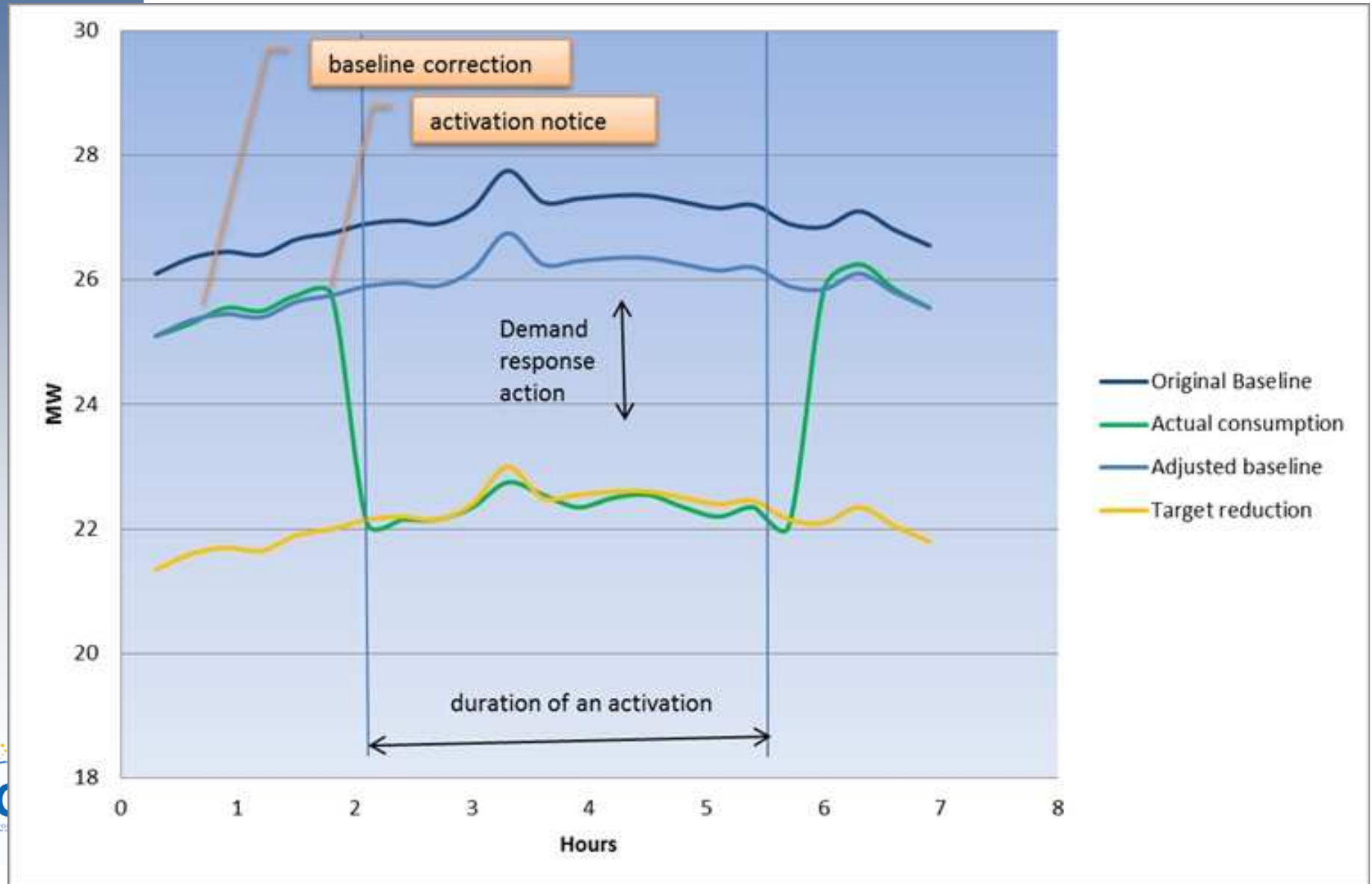


Verification of aggregator services: solution 1

- Calculate a baseline consumption/generation for the aggregated portfolio so that it is
 - verifiable
 - nonbiased and accurate (adaptable to current major factors affecting electricity consumption)
 - understandable and easy to use
 - easy to implement
 - does not cause high cost for consumer/aggregator
 - minimizes possibility of manipulation
 - allows different load types to be taken into account



Verification: example ERDC





Verification of aggregator services: solution 2

- Another solution avoids the verification process totally by allowing the buyer of aggregated services to send price signals to consumers
- The drawback is that the buyer has to bear the risk that the power response is different from expected
- This solution also creates problems in balance settlement if the buyer is not himself the balance supplier of the aggregated portfolio



R2: accuracy of metering

- At least 15 min resolution consumption/generation measurements should be provided to the aggregator for settlement purposes
- Metering data with 5 min resolution can be useful for load response modeling by aggregators
- For most services there is no need for real-time measurements
- Target: standardization bodies involved with smart meters



R3: coordination of aggregator activities by system operators

- Aggregators should coordinate their control actions with DSO's to keep the network within the normal operational limits
- Thus, aggregators should inform DSO's beforehand about their future control actions, load area by load area
- ADDRESS project suggests that DSO in each case gives a "go ahead" for the control action or requires a certain curtailment
- In rare cases the control actions can also negatively affect the transmission grid. DSO's can further consult the TSO about aggregator plans in their area.



R3: coordination of aggregator activities by system operators

- The procedure for DSO's validation should be such that it does not make aggregator's operation too complicated
- Question about how DSO allocates the control margins set by the network to different aggregators remains unsolved
- See also recommendation 8/WP2

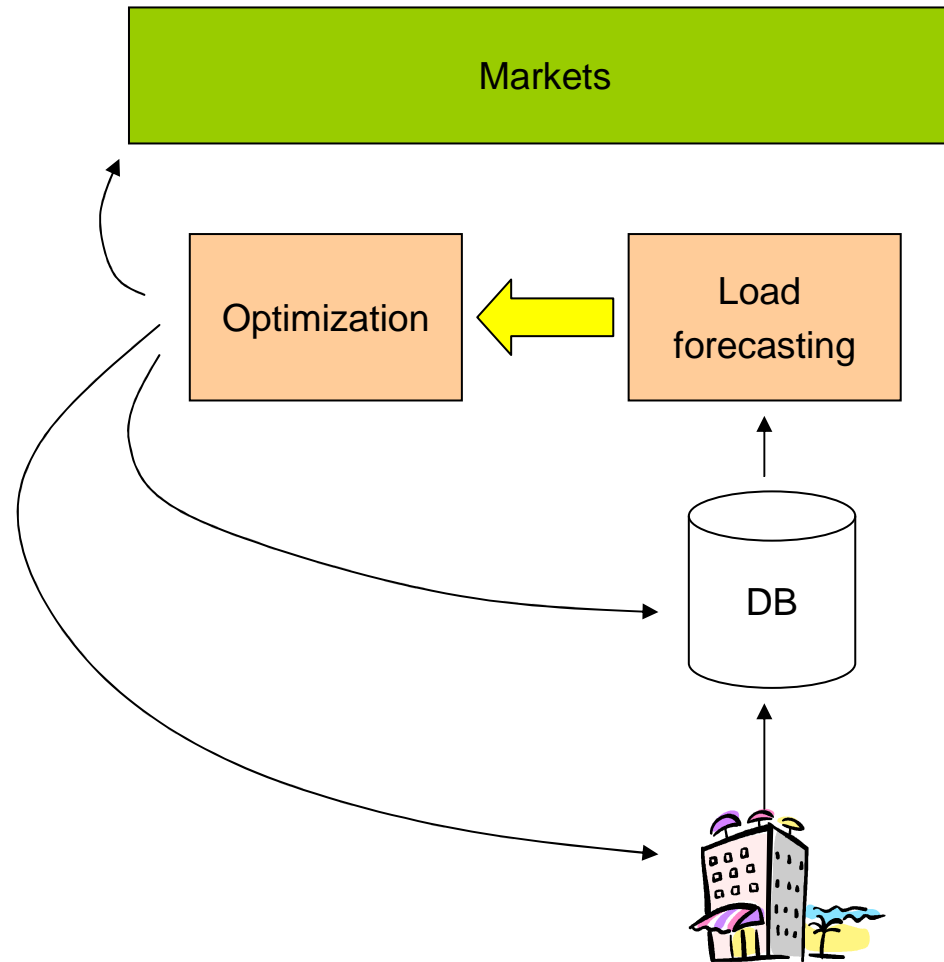


R4: development of load forecasting and optimization tools

- Development of operational optimization tool for DER aggregator - a tool which can optimize offers on different energy markets and on the other hand the control signals sent to consumers and distributed generation / distributed storage
 - Inclusion of stochastic effects such as variable-output generation, price uncertainty
- Development of a forecasting tool which can predict consumer/prosumer response to various price signals with different notice times
- Target: policy makers
- impact: ICT industry, research & academia



R5: Creating a standard format for the load curve which includes demand response properties





Creating a standard format for the load curve which includes demand response properties

- A standard data format for the consumer or consumer cluster load curves, which also include the information about demand elasticity or response to different types of control signals, would be developed. This data could be used by aggregator's optimization tool in order to decide the proper control signals in each situation.
- The data format would serve purpose of separating response forecasting from operational optimization, thus making one big problem into two smaller ones



R6: establishment of load response type library

- Data or models about load responses of consumers as response to DR signals
- The information should be public and should be parameterized based on region, season, type of consumer and type of signal.
- The results could be used in network planning (cf. article 14/7 of EU directive 2003/54), aggregator business planning and as first guesses in aggregator operational optimization
- Thus lowering the threshold for new market entrant aggregators.