

DRAFT1 Story board outline Balance Responsible Service

iPower: FLECH BR demo



Overview

- Definition of Balance Responsible Service
- FLECH activity timeline:
 - Planning and scheduling
 - Settlement
- Remarks
- Summary

Timeline

1. BRP buys/sells energy in the day-ahead market
2. BRP gets updated forecasts and has the option to trade intraday
3. BRP still forecasts imbalance after intraday trading is closed (note that the service could also be used as an alternative to intraday trading)
4. FLECH Balance Responsible Service market opening
5. **Aggregators evaluate portfolio flexibility and submit bids**
6. FLECH clears the market and contracts service providers
7. FLECH requests historic meter data and establishes a base line for aggregator bids
8. **Aggregators adjust load/production for the service period**
9. FLECH requests actual meter data from delivery period and settles the service

BR Service Request

Assuming intraday market closes at 12:00 for the period 13:00-14:00 (this needs to be adjusted to DK situation)

- 23/6-2015 @ 12:00 – BRP identifies need for additional changes in total load/production in BR region for 13:00-14:00.
- 23/6-2015 @ 12:15 – BR decides to acquire this service on FLECH.
- FLECH service specification:
 - Type: Balance Responsible Service.
 - Period: 23/6-2015 @ 13:00-14:00
 - Market period 23/6-2015 @ 12:15-12:55
 - Activation duration: 1H (accepted bids are required to be activated)
 - Bid size: min 0.1 MW
 - Requested power volume (can be positive or negative)

FLECH market opening

- 2/6-2015 @ 9:00 – Based on BRP request, FLECH opens a single BRS market:

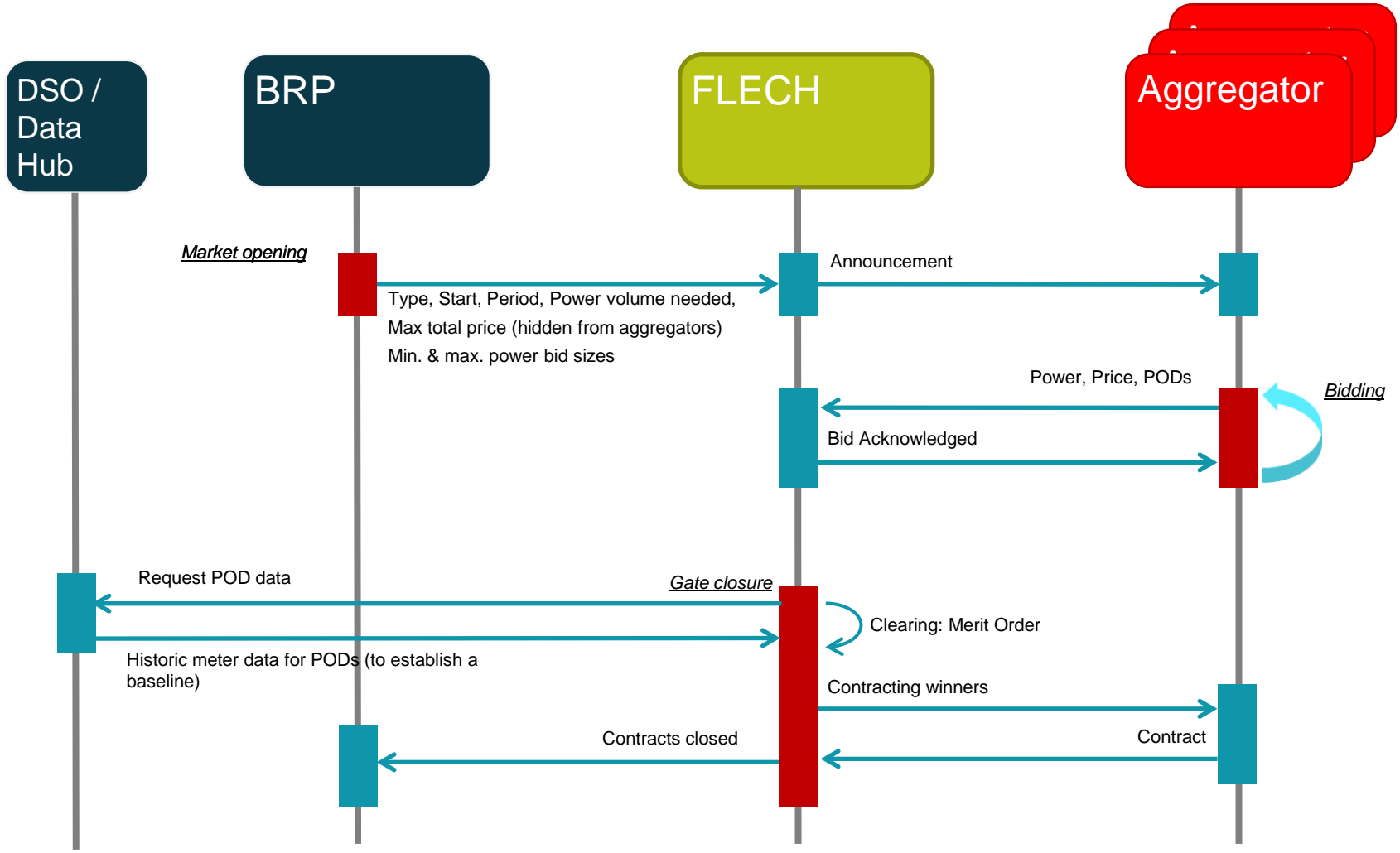
Aggregator example

- Aggregators (several small ones) normally controls residential heating systems (heat pumps and direct electric heating) based on the spot price (assumed to be linked to standard tariff)
- Aggregators decides to provide bids in the BRS market because forecasting of future heating periods is available on a short time horizon.
- This implies change in heating schedule
- Opportunity loss from spot price:
 - 13-14: ???
- Imbalance costs are not directly visible to the aggregators

FLECH market clearing activities

- Market gate closures:
 - 5 min before activation
- Market clearing:
 - Merit order.

Sequence diagram: Planning and scheduling of BR service



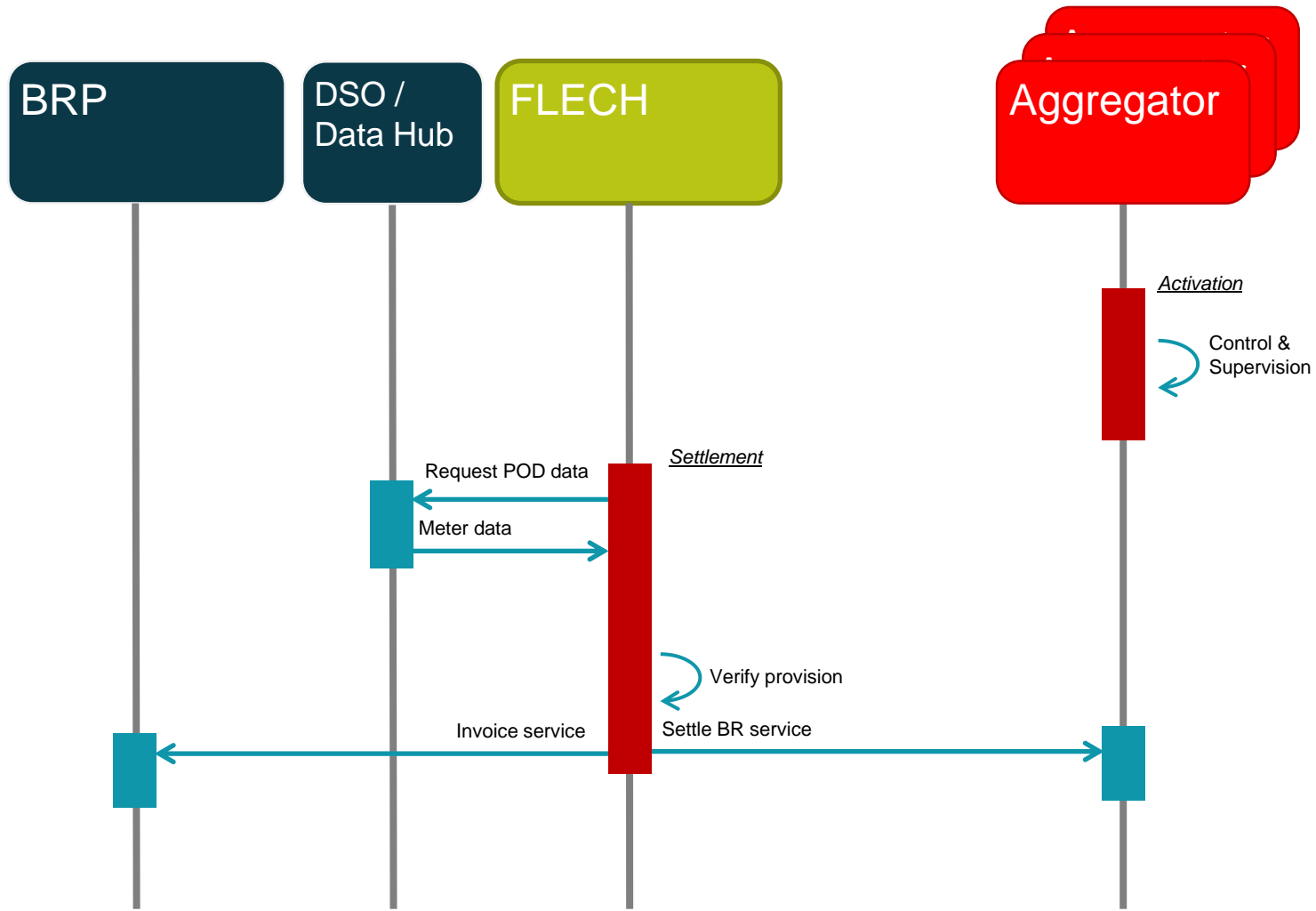
A winning Aggregator

- Assume only a subset of Aggregators wins provision in market.
- The Aggregators will integrate the contracted winning bid in the portfolio heating schedules.
- When the contracted activation period occurs, the contracted aggregators automatically activate the changes in heating schedules.
- When the contracted activation period expires, the aggregator resumes normal operation of heating resources

FLECH settlement

- When a service has been provided, FLECH will perform the settlement:
 - Retrieve meter data associated to PODs of contracted service within the contractual period.
- Verify the performed provision of change in load.
- Settle Aggregator payment and invoice BR.

Sequence diagram: Settlement of Balance Responsible Service



Remarks

- The aim of this service is to integrate flexible resources with the BRP on a shorter time horizon than on a day-ahead basis. There are many flexible resources still available on a shorter horizon that could help BRPs to balance their regions.