

Imbalance Handling in Europe

2015-09-07

Imbalance Handling in Europe

- **Introduction of Balancing Group Concept**
- Scheduling and operation
- Imbalance settlement in Germany

Introduction of European Balancing Group Concept

- **Self balancing**
- **Self dispatching**

- **Information of generation and load (balancing group → TSO)**
- **TSO supervises load and generation**
- **TSO balances remaining imbalances**

The principle of balancing groups

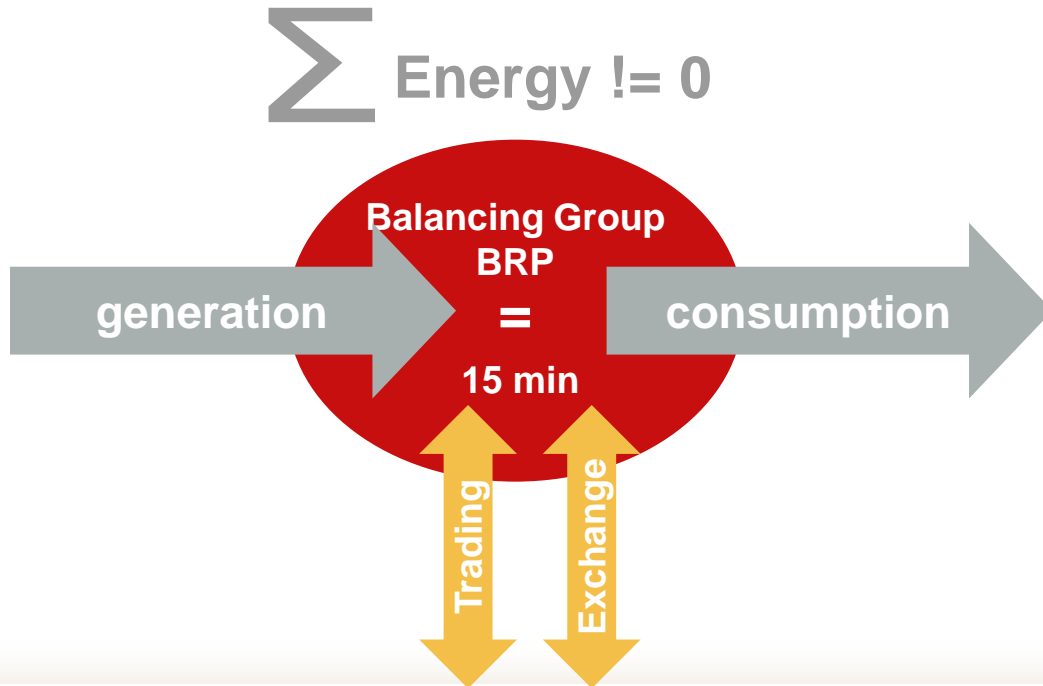
Balancing Groups

- **Have a Balancing responsible party**
- **Accumulation units**
- **Pure balancing → no physics involved**
- **Create schedules**
- **Are responsible for forecast deviations**
- **Use balancing energy**
- **Predefined Contract between the grid operator and the BG**

Balance Responsible Parties (BRPs) in Germany

- BRPs are created by market players
 - Utilities
 - Traders
 - Industrial consumers
 - Aggregators
 - RE direct marketing
 - Distribution system operators
 - TSOs
 -
- A company can have more than one BRP in a TSO control area
- Example: Amprion control area
 - about 2900 BRPs
 - 135 of RWE Sales
 - 12 of DB Energie (German train)
 - 2 of ArcelorMittal
- Over 5,000 BRPs are listed currently in Germany.

Balancing group - Description



BG or BRPs are used for Commercial transfer of electricity

- BRPs account for all traded volumes, generation and consumption
- Every grid connection point (generation or consumption) is described by a measuring point number and allocated to a BRP within a TSOs control area.
- A BRP aggregates trading, generation and consumption

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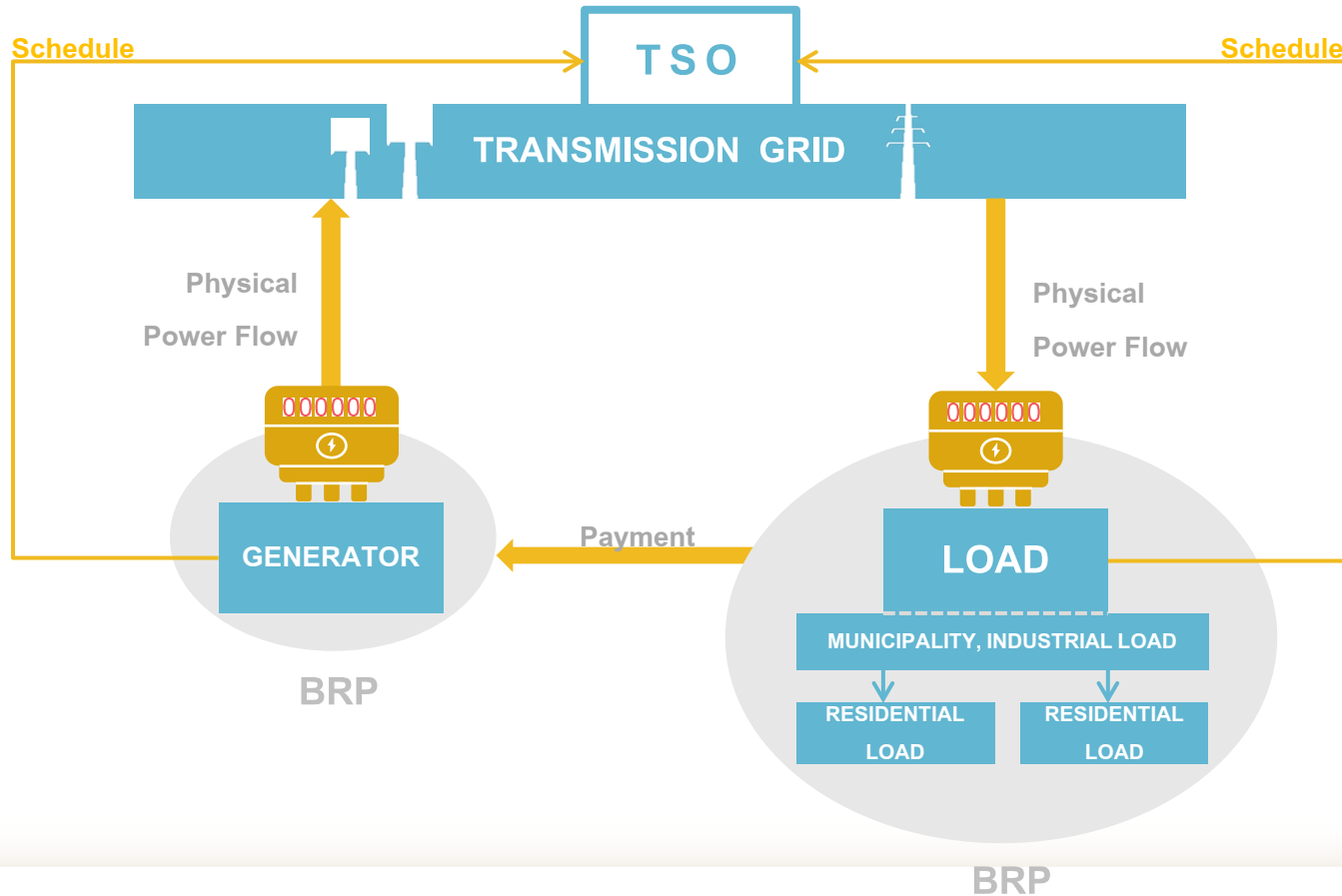
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Balancing group - Scheduling

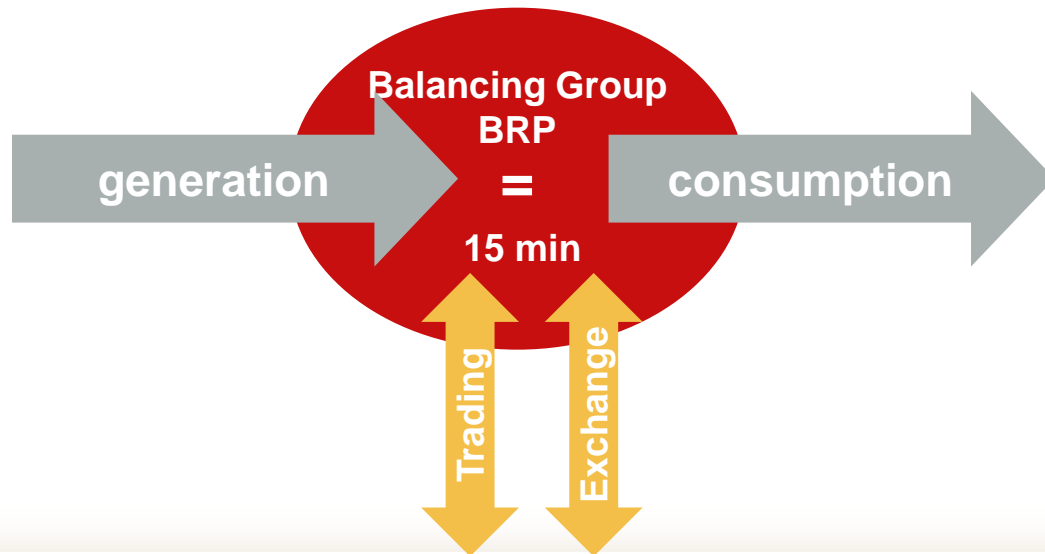
Prerequisite: Meters with 1/4h time resolution and memory. Only large customers or generators.

- Load BRP forecasts consumption in $\frac{1}{4}$ h increments on day ahead at the latest.
- Load BRP purchases energy from generation BRP or power exchange
- Both BRP send schedules about their trade towards the TSO until gate closure (e.g. day-ahead 2:30 pm)
- TSO cross checks if schedules are equal and sends back confirmation if so.
- After the fact TSO compares schedules with meter readings and bills any imbalances towards BRP.
- Updates during day of delivery are possible as long as sent before actual delivery.

Balancing group - Scheduling



Balancing group - Scheduling

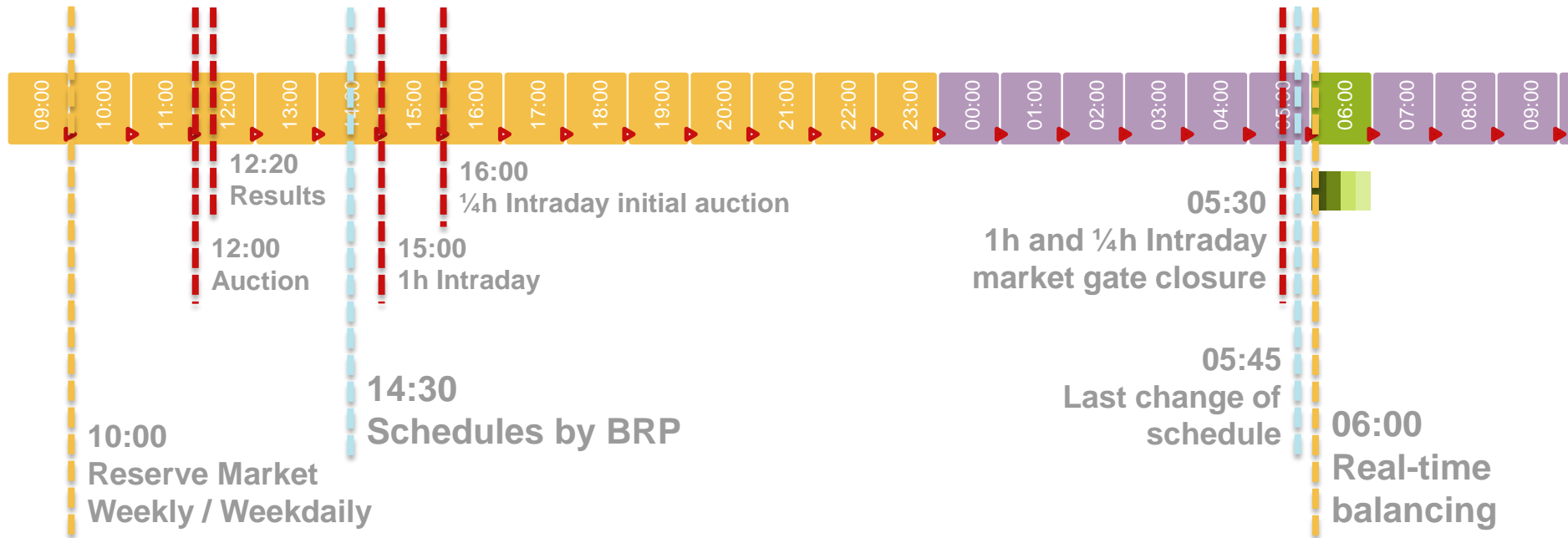


- Day-ahead scheduling
- Submission from BRP to TSO until 2:30 pm previous day
- Balanced quarter hour performance for the day ahead
Intraday changes of schedules within the German LFC block
- Change of schedules is possible with a minimum notice of a quarter hour to each quarter hour of each day

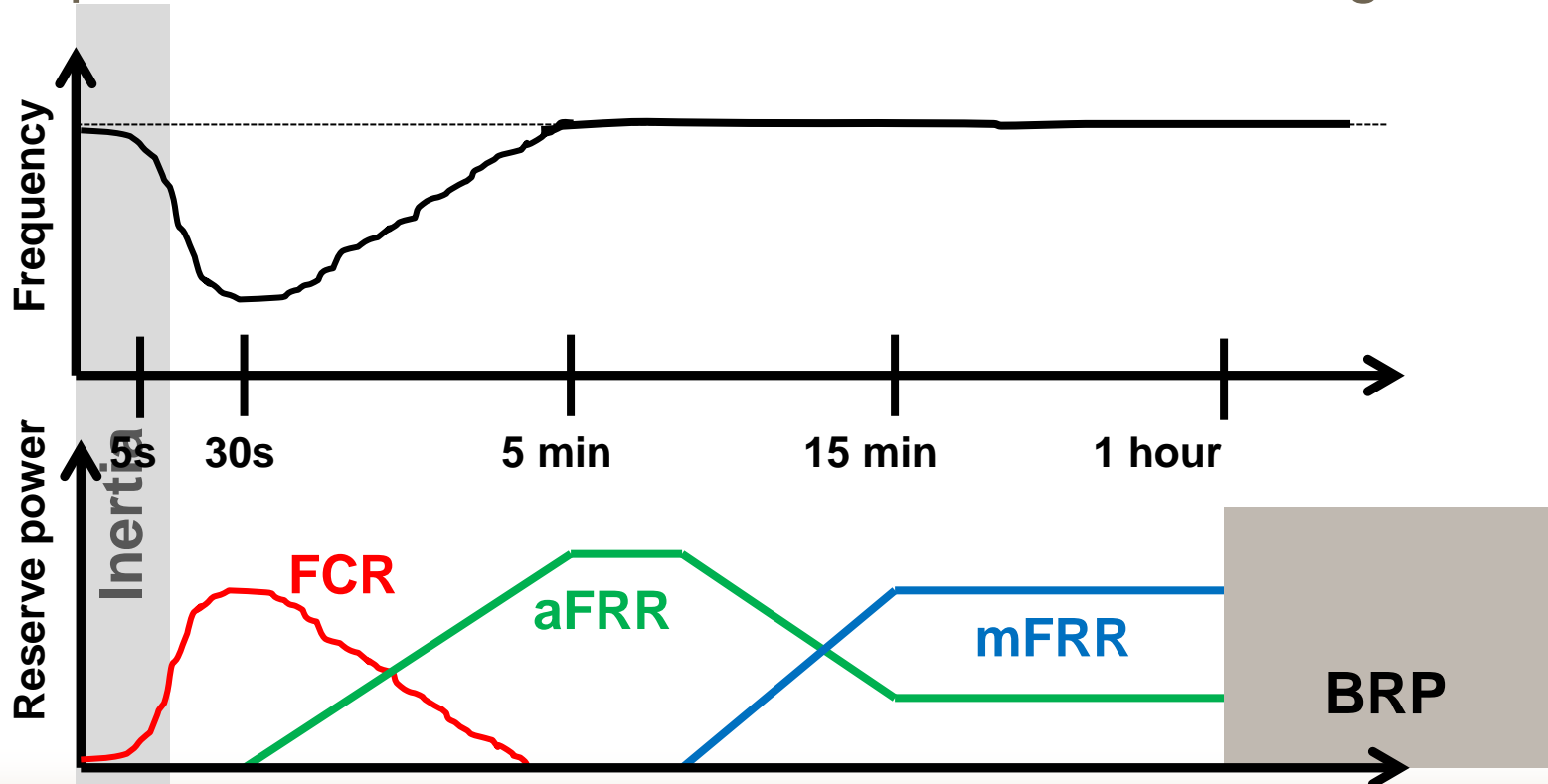
Intraday continuous trading

- Two products at the power exchange
 - 1 hour contracts or
15 min contracts
 - Last trade 30 min before physical settlement
 - Minimum volume increments: 0.1 MW
 - Positive and negative prices are possible

Balance responsible parties' Daily operation



Dispatch of control reserve for real-time balancing



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Settlement of Balancing Energy

Example 1

Price for balancing Energy:
150 €/MWh (set by supplier of reserves)

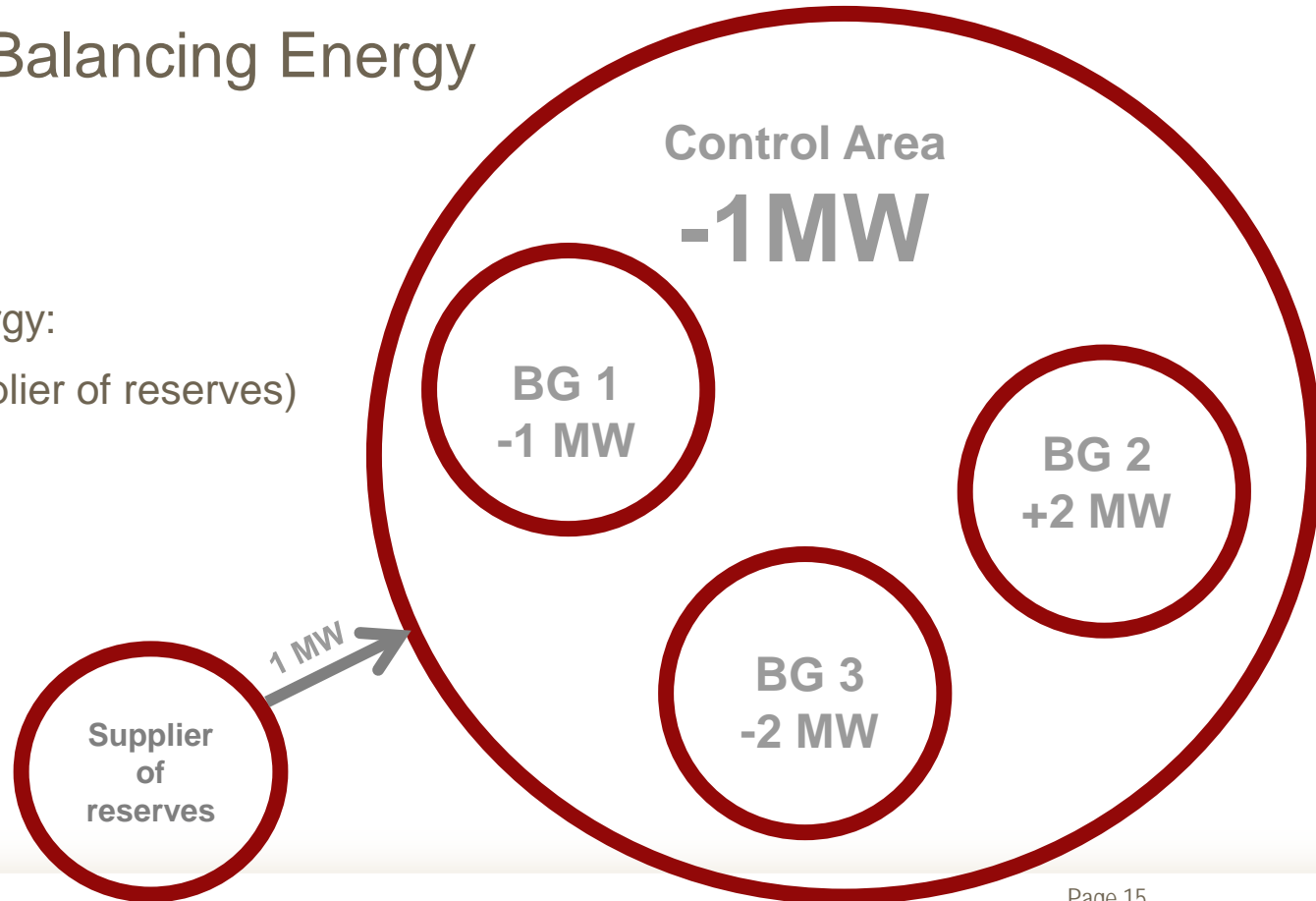
Payment:

TSO → Supplier: 150 €

BG1 → TSO: 150 €

TSO → BG2: 300 €

BG3 → TSO: 300 €



Settlement of Balancing Energy

Example 2

Price for balancing Energy:
5 €/MWh (set by supplier of reserves)

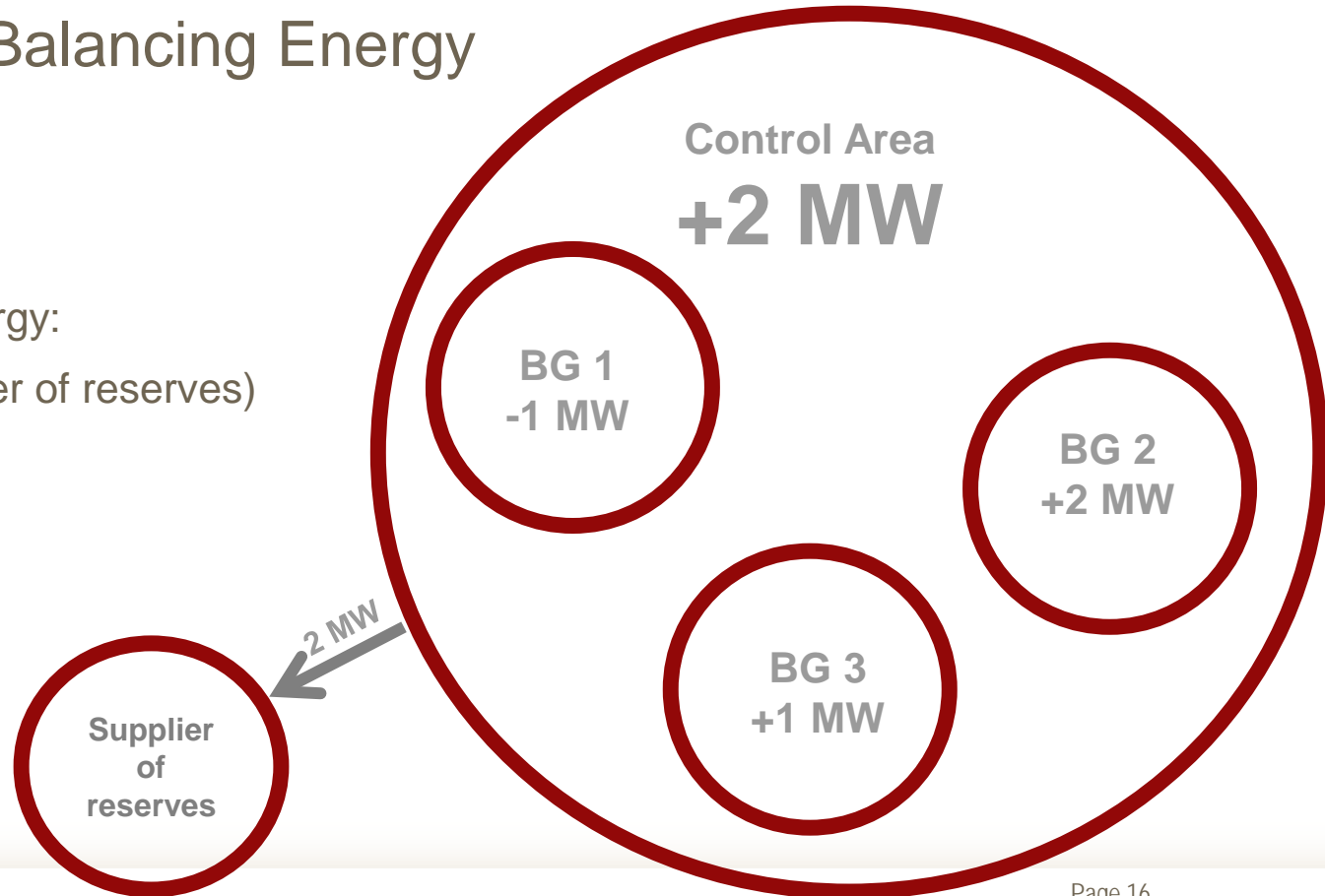
Payment:

Supplier → TSO: 10 €

BG1 → TSO: 5 €

TSO → BG2: 10 €

TSO → BG3: 5 €



TSO cost recovery in Germany

- Capacity
 - Grid users
- Energy
 - Data of all generators and consumers of each BRP are compiled (15 min base)
 - Data have to be provided from the BRP to the TSO
 - Smaller generators/ consumers are assessed by standard load profiles
 - Costs for balance deviation is charged to BRP on monthly basis
 - Latest settlement: 42 working days after delivery month

BRPs for specific purposes

- Balancing group for system operators :
 - EEG-Trading (TSOs): German TSOs are responsible to trade the energy that is subsidised due to the EEG and that is not marketed by direct marketers. Forecast is in the responsibility of the TSO.
 - Grid losses (TSOs and distribution system operators (DSOs))
 - Residual deviations (DSOs): Imbalances within the DSO's grid which cannot be assigned to any other balancing group due to quarter hour data which is not available.
- Balancing groups of the power exchange:
 - Traders at the power exchange and the power exchange itself (no imbalances)

Conclusions

- Self Balancing
- Self scheduling
- Balancing group concept
- Scheduling is essential
- Remuneration of reserves due to actual imbalances
- Benefits for helping the system

Questions?

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