Specification & Harmonisation

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1 Entities involved

2 Settlement volumes involved

3 Prices involved

1. Entities involved

BRP

BSP

TSO*

- Connecting TSO or any third party entrusted in accordance with GLEB Article 13, with settlements pursuant GLEB

2. Settlement volumes, MWh per ISP

BRP

Imbalance

BSP

Balancing Energy

TSO

Intended TSO-TSO exchanges: IN, aFRR, mFRR, RR

3. Prices, €*/MWh per ISP

*or other currency

BRP

Imbalance price

BSP

Bid price(s)
Balancing Energy price(s)

TSO

Intended TSO-TSO exchange prices: IN, aFRR, mFRR, RR

4 Requirements imbalance pricing

5 Requirements balancing energy pricing

6 Summary

4. Requirements imbalance pricing

[Article 55]:
For any given imbalance price area
- for the calculation of an imbalance price

For any given ISP
- ultimately 15 mins

In each imbalance direction:
- BRP surplus (positive imbalance)
- BRP shortage (negative imbalance)

Boundary conditions to imbalance price(s) imposed by balancing energy price(s):
- One-sided limitations(´not be less than´ resp. ´not be greater than´)
- Non-exhaustive (boundary condition per direction prescribed)

Single imbalance pricing, unless conditions and specifications for dual pricing are accepted [Art 52 (2) (d)]
'single imbalance pricing' [currently not defined] is the use of a single price for positive and negative imbalances for each imbalance price area within an imbalance settlement period [Art 52 (2) (c)]

5. Requirements balancing energy pricing

[Article 45]:
For all balancing energy

For any given imbalance area
- in which imbalance is calculated, [imbalance area cannot be larger than imbalance price area]

For any given ISP
- ultimately 15 mins

Per balancing energy direction:
- Negative (relative withdrawal by BSP)
- Positive (relative injection by BSP)

Marginal pricing (pay-as-cleared), unless alternative is proven more efficient [Art 30] *

* out-of-scope for this project team]

6. Summary: Imbalance settlement process

1. Input components
   - Per ISP and per imbalance area/imbalance price area
2. Volume/Price determination rules
   - Single imbalance price, *unless* …
   - *Bounded* by (marginal) balancing energy prices
   - Subject to harmonization: partial or full?
3. Output
   - Imbalance price
     - Per ISP/direction/imbalance price area
   - Imbalance volume
     - Per ISP/BRP/imbalance area

BRP Imbalance settlement spectrum

A. Key used by TSO to extract exact TSO cost recovery from BRP?
   Focus on (public) TSO-cost

B. Real time product on energy only market for BRP to manage own financial risk?
   Focus on (individual) BRP-value

Overlaps:

A does result in BRP-value/incentive

B results in (some) cost recovery

entsoe

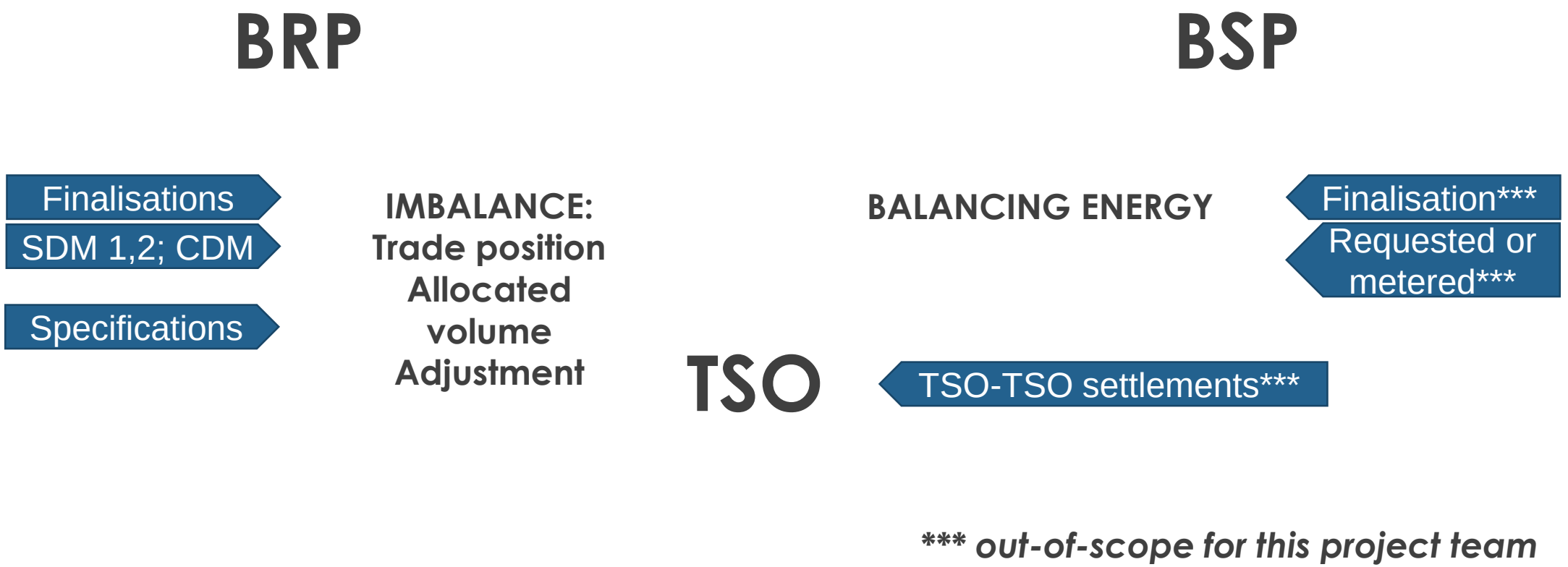
A) Cost recovery mechanism

1. Input components
    - BRP imbalance volumes [MWh]
    - Balancing market energy costs [€]:
        - Requesting TSO ∑(volumes * prices)
        - Connecting TSO ∑(volumes * prices)
    - Other costs [€]
2. Price determination rules
3. Output
    - Imbalance price(s)

B) Real time energy market product

1. Input components
    - BRP imbalance volumes [MWh]
    - Balancing market energy price(s) [€/MWh]
        - Requesting TSO
        - Connecting TSO
    - Other costs [€]
2. Price determination rules
3. Output
    - Imbalance price(s)

Specification/Harmonisation: volumes



*** *out-of-scope for this project team*

Specification/Harmonisation: prices

BRP

- Finalisation
- Single or Dual*
- Components**
- Marginal/WAP/other

Imbalance price

*** Conditions/methodology for application dual pricing**
**** *Main* Components, *other* than Balancing Energy price(s); value of avoided activation of Balancing Energy**

TSO

- TSO-TSO settlements***

BSP

Bid price(s)
Balancing Energy price(s)

- BE GCT***
- Marginal/other***

****** pricing methods out-of-scope for this project team***