

Route to market analysis of a battery in France & Belgium

Comparison of the relevant revenue
streams and offers

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Main Revenue Streams for batteries in France and Belgium

ANCILLARY SERVICES

FCR

aFRR

- The battery gets paid for providing its capacity to the TSO
- During the day, the battery is activated according to the TSO's need and the energy is also paid

ENERGY MARKETS

Spot

Intraday

Imbalances

- The battery picks up price spreads between charge and discharge

NEED FOR OPTIMIZATION
The energy and the capacity of the battery must be arbitrated between the markets

+ Capacity Mechanism

FCR Market

France and Belgium are participating to the **same daily auction** for the FCR capacity

- FCR Cooperation = 4 hours Block auction with other EU countries: AT, BE, DE, DK, FR, NL, SN, CH
- 30% of the reserve must be contracted locally and 30% can be exported

Belgium

- Reserve size: **88 MW**
- Average price in 2022: **127 €/MW/4h**
- **25 min energy reserve** in both directions is required

France

- Reserve size: **514 MW**
- Average price in 2022: **89€/MW/4h**
- **15 min energy reserve** in both directions is required

Coupling rate to the FCR Cooperation in 2022

59
%

Decoupling mainly due to a **small national pool of low price offer**

90
%

Decoupling only due to a **large national pool of low price offer**

aFRR Market

Belgium

FULLY LIBERALISED MARKET

- Capacity is procured through **daily auction**
 - avg up + down price of 94 €/MW/h in 2022 (per CCTU auction)
- Energy is activated through a **national merit order**
- PICASSO connection has been postponed

France

MARKET OPENING IS ONGOING

- Capacity market should open mid-2024
- Energy market should open in November 2023

Until Then:

- Capacity is contracted by **obligations at 22,05 €/MW/h** (up+down)
- Energy is activated through a **national signal** and paid at the spot price

Minimum Energy stock for a continuous service (capacity + energy)

1h
15

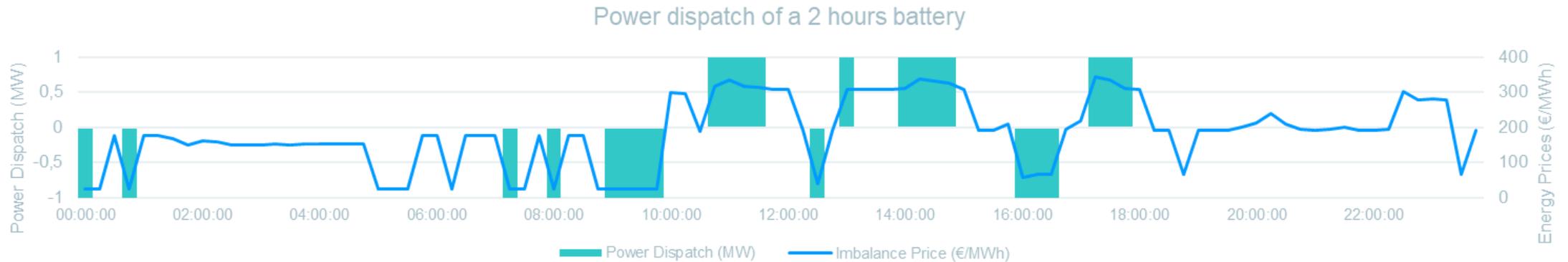
The SOC management power must be bought before the closing of the EU market and 15 min products are available

2h

The SOC management power must be scheduled 1h ahead delivery for a 1h slot

Energy Markets: Spot, Intraday & Imbalance Markets

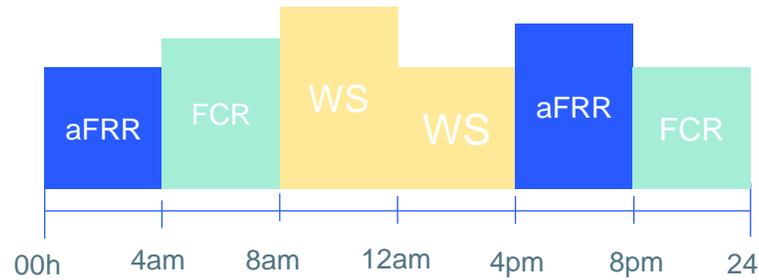
- More opportunities for batteries with more than 2 hours of stock



	Belgium	France
Grid Tariffs	Batteries are exempted	Only when consuming energy (approx. 14€/MWh)
Balancing	Prices are published every minute -> reactive balancing from Market Participants	Prices are published 30min after delivery -> balancing done by the TSO
Spreads (2022 avg max spread /day, 1h cycle)	Spot : 199 €/MWh Imbalance: 626 €/MWh	Spot : 174 €/MWh Imbalance: 327 €/MWh

Two ways to do a cross market optimization

Arbitrating along the day:



Pros:

- No specific regulatory constraints
- SOC Management is easier
- Light arbitrage and dispatch tool

Cons:

- Transition between two services can reduce the P&L
- Not necessarily the optimal economic

Arbitrating and Stacking the revenues:



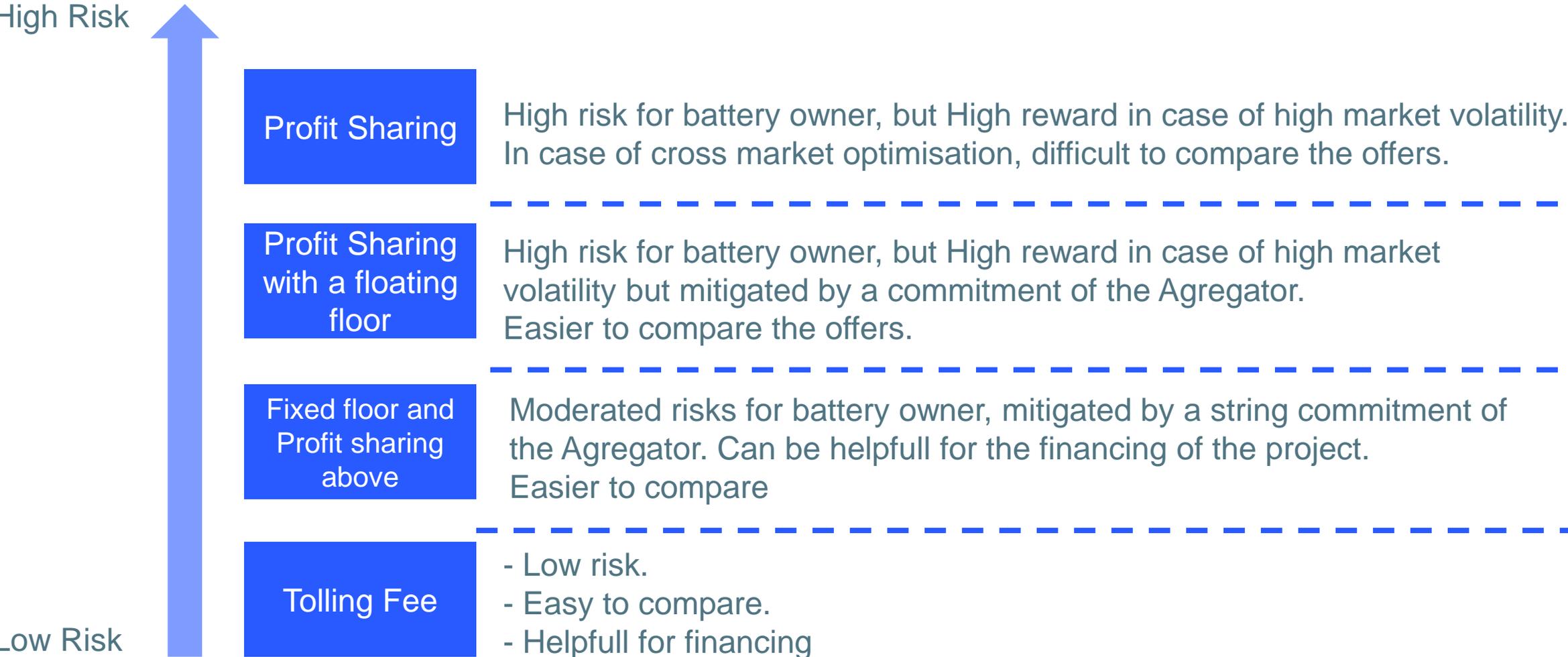
Pros:

- Stronger Optimization, leveraging PnL
- Risk mitigation

Cons:

- Not ok for all TSO
- Complex arbitrage and dispatch tools
- Complex SOC management strategy

Route to market offers and risk associated





Thank you