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OPTIMAL BATTERY STEERING

Maximising revenue on the passive imbalance market

Laura Brafine

CONTENT

WHY THIS MATTERS

OPPORTUNITY:
Imbalance Market is volatile and full of revenue potential

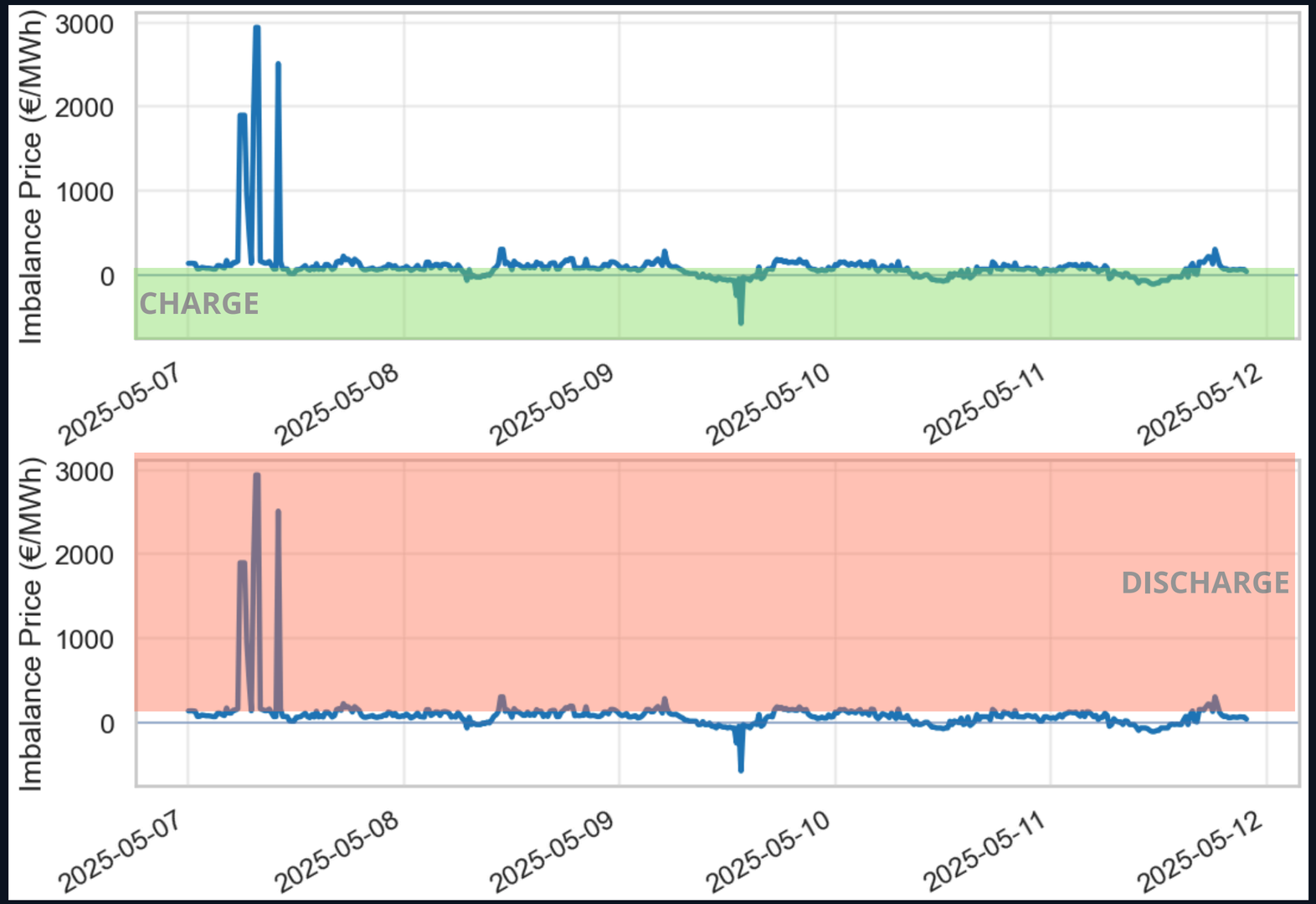
CHALLENGE:
If battery operates on greedy strategy you miss out on revenue

SOLUTION:
A smart steering algorithm that sees the full picture, steering battery for maximal returns with minimal wear

THE PASSIVE IMBALANCE MARKET

- **Maintain balance** in the power grid.
- Bridge the **gap** between forecasted and actual supply and demand.
- T**wo pricing** mechanisms:
  - **Long price:** Indicates surplus power on the grid.
  - **Short price:** Indicates insufficient power.
- Settlement occurs every 15 minutes **(PTU).**
- **Flexible assets** can earn by helping maintain balance.

STEERING ALGORITHM INTUITION



HOW THE STEERING ALGORITHM THINKS

Max Capacity
Max Charge Power
Ramp limits
Max Cycles a Day

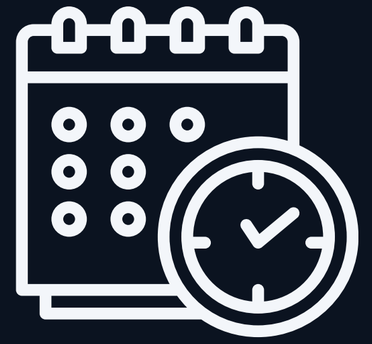
Charge:
When prices are low and there's room in the battery

Discharge:
When prices spike and SoC allows

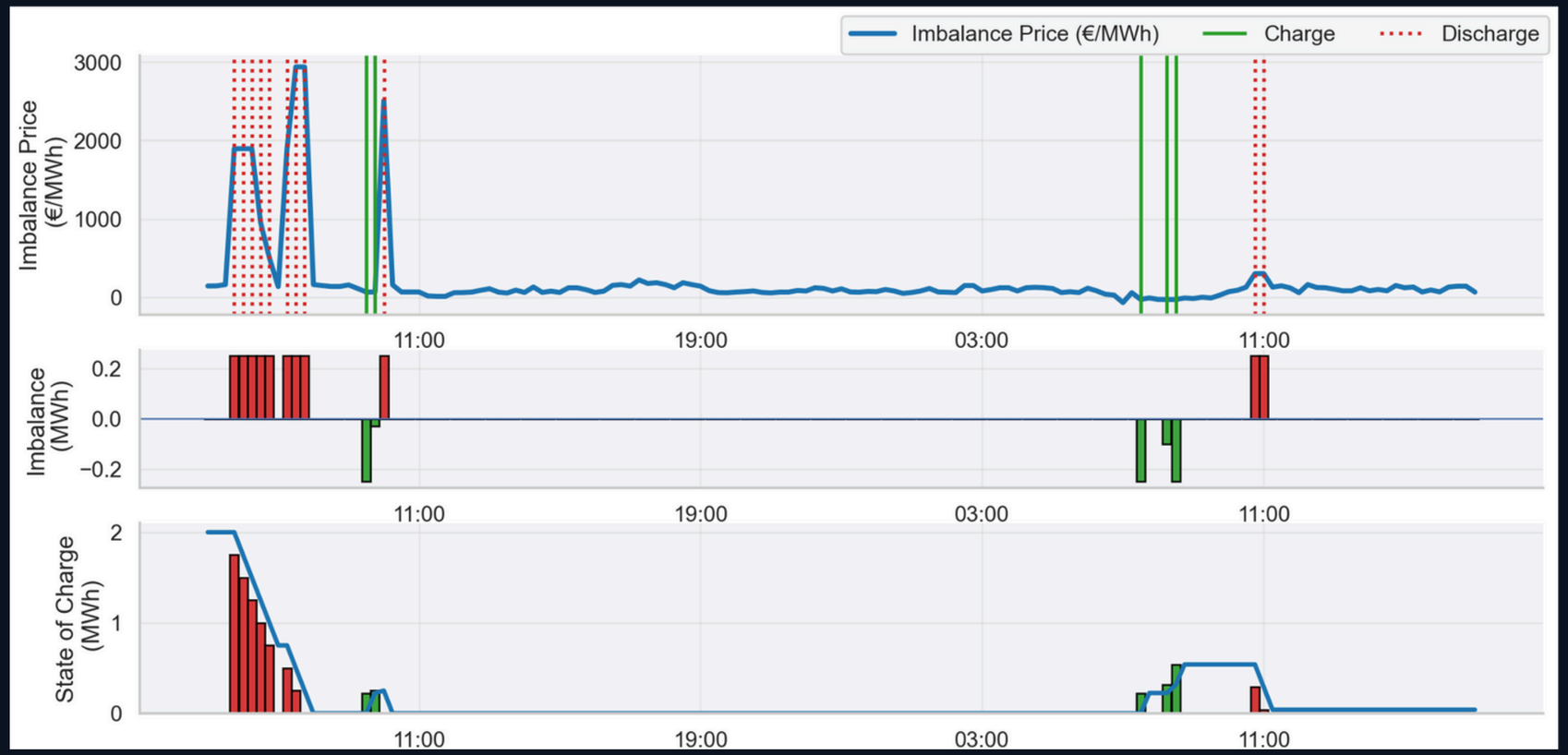
Hold:
When neither condition is ideal

Maximize Revenue

Optimal Dispatch Strategy



A GOOD STEERING DAY



1. **Max capacity = 2 MWh**
2. **Max power = 1 MW**
3. **Roundtrip efficiency = 0.9**
4. **Ramp limit = 1 MW per PTU**
5. **Max cycles a day = 2**
6. **Degredation cost = 1.5 euro/MWh**
7. **No simultaneous charge and discharge**

WEEKLY PERFORMANCE SNAPCHOT

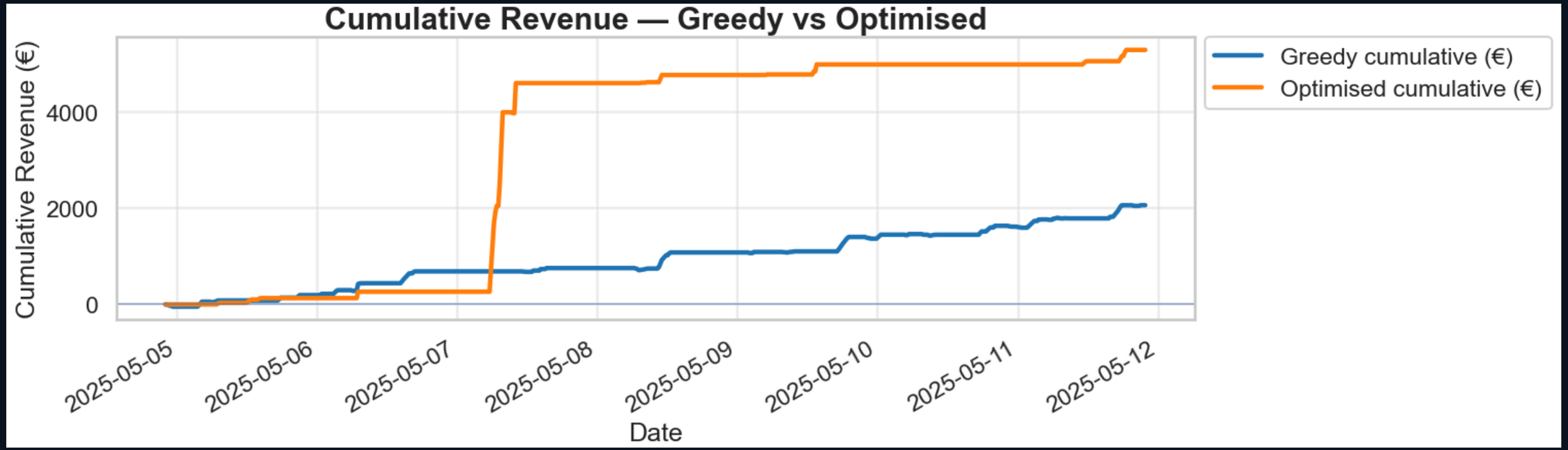
Total Revenue
€4973

Average Sell Price (€/MWh)
€ 1253

Best Day
€4335 on 2025-05-07

Average Buy Price (€/MWh)
€ 128

SMART VS GREEDY



NEXT STEPS

01 Further tailor algorithm to desired asset

02 Impose market rules

03 Include stochasticity/forecasting to determine optimal future dispatch