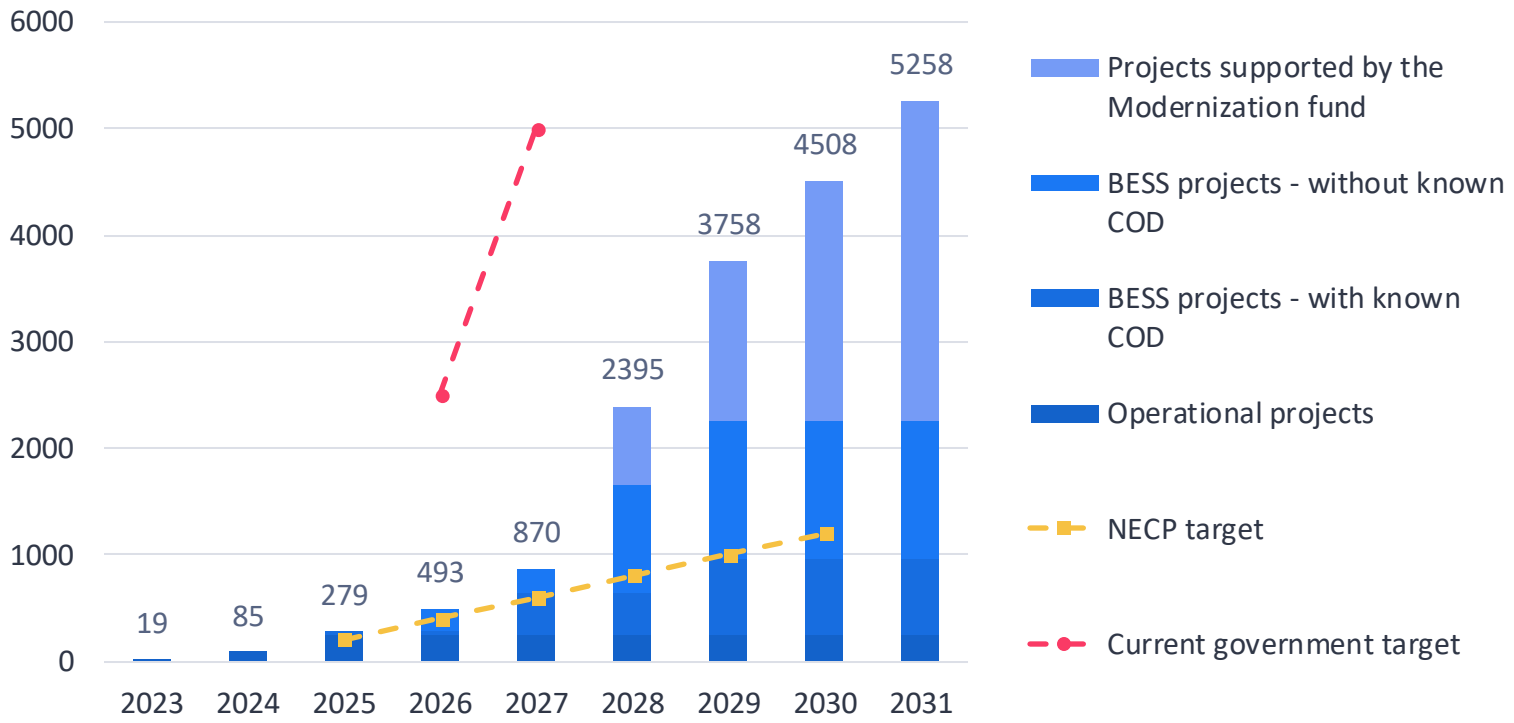
Clean Horizon anticipates a rapid expansion in battery capacity in the coming years, reaching over 5 GW of installed BESS by 2031

- Romania's battery capacity remains limited today but is rapidly expanding, with 6625 MW of publicly announced projects, supported by important public subsidies.
- Of the over 6.6 GW of BESS projects announced for development in Romania, around 5.25 GW have received technical approvals for the connection to the grid.
- Since 2023, Romanian policymakers have been actively supporting renewable energy and storage development through tenders funded mainly by European programs like the NRRP (National Recovery and Resilience Plan) and the Modernization Fund. They are also planning on introducing support schemes such as Contract for Difference (CfD) tenders to encourage investment in storage.

Forecast of the installed BESS capacity in Romania – Clean Horizon assumptions – Central scenario

In MW



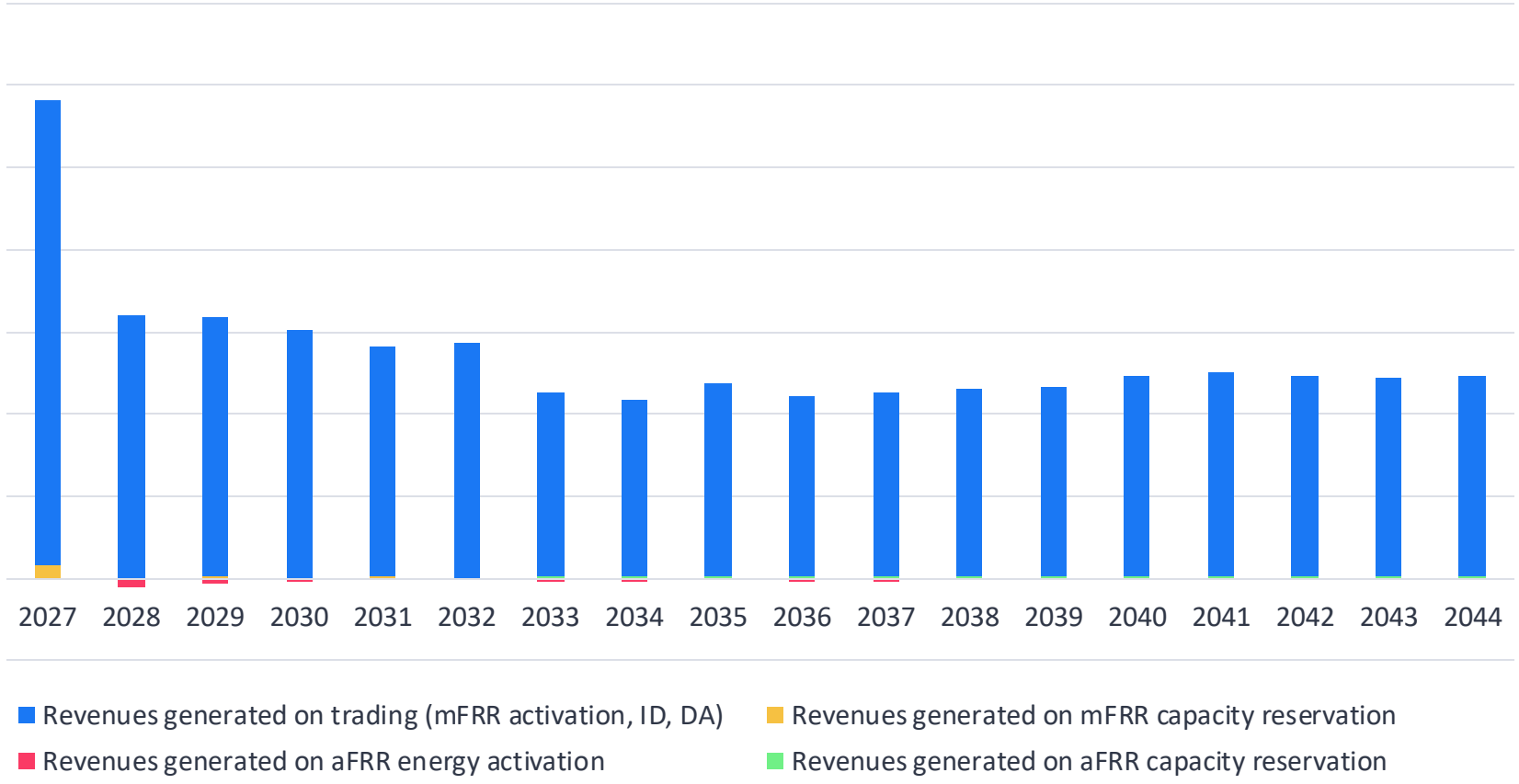
Source: Clean Horizon internal CHESS database, public information, Transelectrica report on grid connection contracts

1) *Minister of Energy announcement, 17/07/2024*
2) *Economica article, 30/06/2024*

*The Modernization Fund will aim to finance the deployment of at least 3 GW of storage by 2031

Revenue stack

Revenue stack for a 50 MW / 200 MWh BESS project in **ROMANIA** – Central scenario
In k€ – real 2025



Revenue Analysis

Revenues of 4-hour BESS are mostly coming from trading – day-ahead and intraday markets.

2027: Before saturation of the mFRR markets, BESS still benefit from capacity prices on reservation markets.

From 2028: As aFRR and mFRR capacity markets saturate, trading (on day-ahead and the intraday) represents the entire revenue stack. Some opportunities on aFRR energy down allow to charge the battery for low prices.

In some years, the net aFRR energy activation revenues can be negative. This occurs when the BESS chooses to buy energy from the aFRR market – taking advantage of lower prices – so it can sell it at a profit on another market with higher prices.

Discounted cashflow – With CAPEX subsidies

Discounted costs and revenues of the 50 MW / 200 MWh BESS project – Central scenario – COD 2027 - With 33k€/MWh subsidy bid

In k€ – real 2025

Project IRR – real 2025: ***7.0 %***

Cashflow Analysis

By bidding **33 000 EUR per MWh of installed capacity at the subsidy tender, the BESS projects starting in 2027** reach a 7% target IRR (acceptable for projects under long-term contracts).

Long-term forecast based on market fundamental parameters

The following assumptions are used as inputs to the model:

- Country load evolution and flexible assets
- Installed thermal capacity (gas, nuclear, coal, etc.)
- Installed wind & solar capacity
- Future electricity mix of neighbouring countries
- Fuel prices: gas, coal and CO2 price

Other fundamental parameters used in the modeling:

- Electricity and storage market knowledge
- Storage deployment
- Market depth evolution
- Weather scenarios
- Regulatory changes
- Opportunity cost of energy storage on other markets (day-ahead, intraday, and aFRR)

Clean Horizon's dedicated in-house expertise

- Expertise in energy storage
- Critical view of storage experts on inputs and obtained scenarios
- AI algorithm tailored for storage
- Mathematically reliable algorithm simulating scenarios
- Multiple iterations and data post-treatment to verify accuracy of results

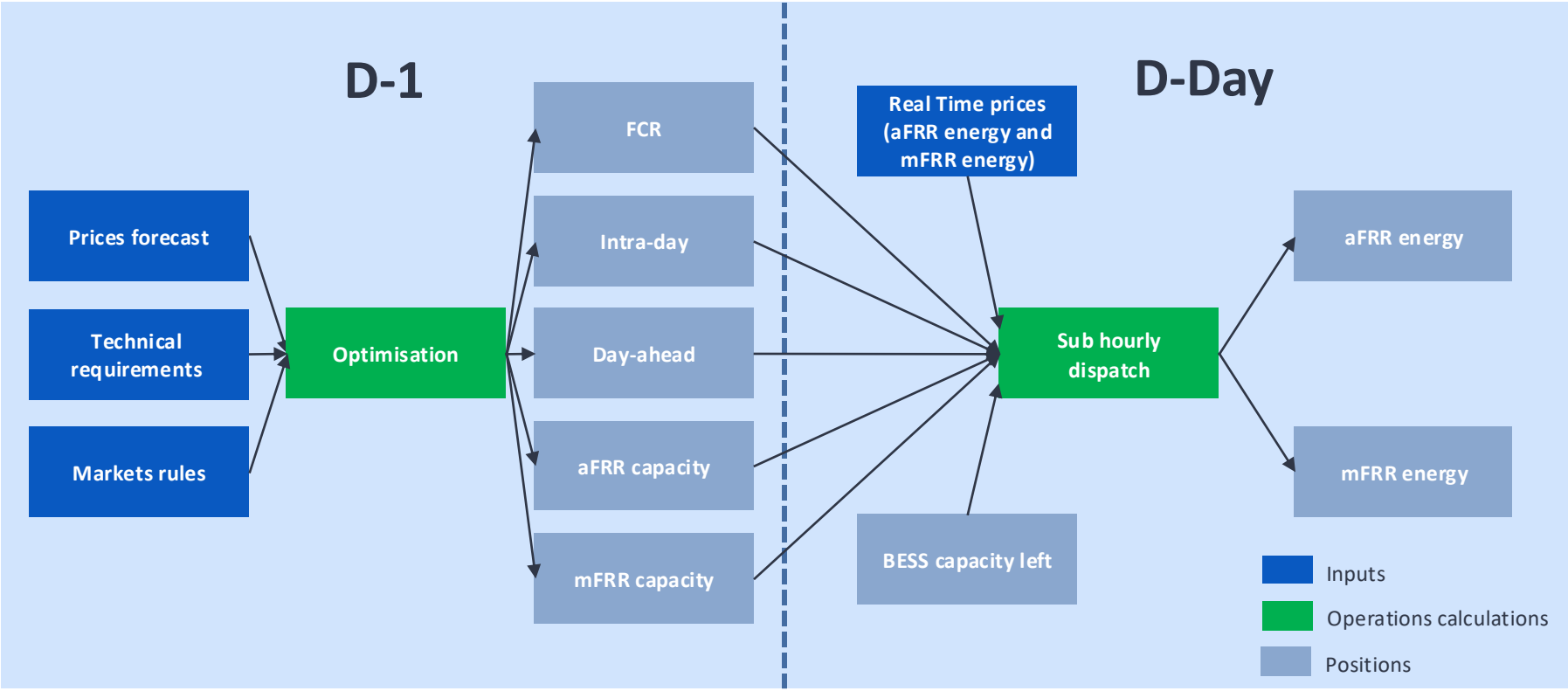
Forecast provided	Granularity
Day-ahead market	1h
mFRR reservation	1h
mFRR activation	15min
FCR	1h
aFRR reservation	1h
aFRR activation	15min
Intraday revenues	15min

Trading Model: COSMOS optimizes battery revenue by simulating market participation decisions across D-1 and D-day markets throughout the project's lifetime

We are using COSMOS to simulate the dispatch and maximize the revenue.

COSMOS runs a simulation over the lifetime of the project and decides for each timeslot in which market the battery should participate. The considered markets are divided into two types:

- D-1 markets which are markets where the decision is taken one day before delivery: **day-ahead, FCR, aFRR and mFRR capacity, ID (capacity reserved for the participation in this market)**
- D markets which are markets where the decision is taken on delivery day: **aFRR energy, mFRR energy**



To take positions for D-1 markets, a **D-1 optimization model** under constraints is solved. The model chooses for each time period what the battery usage should be to maximise its revenues, based on the market prices forecasts, technical requirements and market rules.

Once the D-1 markets positions are taken, the trading model takes decisions for the D-day markets in order to maximise the revenue. Having a forecast of D-day market prices is an unrealistic assumptions, therefore, the **D-day simulation** is based on **logical decisions** that use thresholds that determine when to buy or sell energy (logic control when a certain price is reached).

These thresholds are calculated based on historical prices and they modulated as a function of the state of charge and the consumed cycles during the year

In the trading simulation, it is decided to sell (respectively buy) energy if the real-time price is higher (respectively lower) than the upper (respectively lower) threshold of the given month if the state of charge of the battery permits the operation.