Photon Energy

October–December 2025

BESS Quarterly Financial Analysis

Breaking down revenue potential in the Czech Republic, Hungary, Poland and Romania

What's inside?

Breakdown of income sources, including DAM and aFRR

Operational strategies to maximise profitability

Comparison of results from the previous quarter

Introduction

This quarterly report evaluates the financial performance of standalone 1 MW / 1 MWh and 1 MW / 2 MWh battery energy storage systems (BESS) in four key Central and Eastern European markets: Czech Republic, Poland, Romania, and Hungary.

We consider two main revenue streams:

- **Day-ahead market (DAM)** arbitrage
- **Automatic frequency restoration reserves (aFRR)** – including reservation and activation (Up and Down)

Methodology

All revenue figures are calculated using an advanced optimisation tool that assumes ideal hourly operation. This allows us to simulate how a battery system could perform in each market under realistic conditions, using real market pricing from October to December 2025.

Assumptions

Roundtrip efficiency:	**94%** (charging and discharging 97% each)
Battery availability:	**96%**
Max cycles/day:	**2**
Operational window:	**0–80% state of charge** (to prevent degradation)
Forecasting noise:	**5%**

Monthly average revenues

The tables below compare the average monthly revenues for standalone **1 MW / 1 MWh** and **1 MW / 2 MWh** BESS units across four Central and Eastern European markets. Results are broken down by revenue from **day-ahead market** (DAM) arbitrage alone and revenue from **all-market optimisation** (DAM + aFRR services). The decreasing (negative) or increasing (positive) trend with respect to previous quarter can be observed in columns marked "change".

All figures represent simulated earnings under optimal hourly operation during Q4 2025, based on typical system availability, roundtrip efficiency, and operating assumptions, country and market specification.

Optimisation results and change from last quarter – 1 MW / 1 MWh

	Czech Republic		Poland		Romania		Hungary	
	EUR/MW	change	EUR/MW	change	EUR/MW	change	EUR/MW	change
DAM only	2,278.0	-42.3%	2,958.3	-28.3%	3,775.9	-22.0%	3,488.4	-25.8%
aFRR Up reservation	5,334.9	3.2%	19,498.6	16.6%	1,607.4	13.0%	613.3	2.7%
aFRR Up activation*	1,602.0	390.6%	161.3	-73.1%	3,026.9	57.7%	1,363.0	-44.7%
aFRR Down reservation	1,017.2	-74.7%	13,449.2	21.3%	542.8	-71.6%	165.3	-59.3%
aFRR Down activation*	949.4	-59.2%	740.5	-54.3%	1,614.7	-57.1%	1,618.0	0.4%
DAM within optimisation	1,491.2	-38.5%	1,105.6	-67.5%	2,507.5	-34.7%	1,772.3	-46.5%

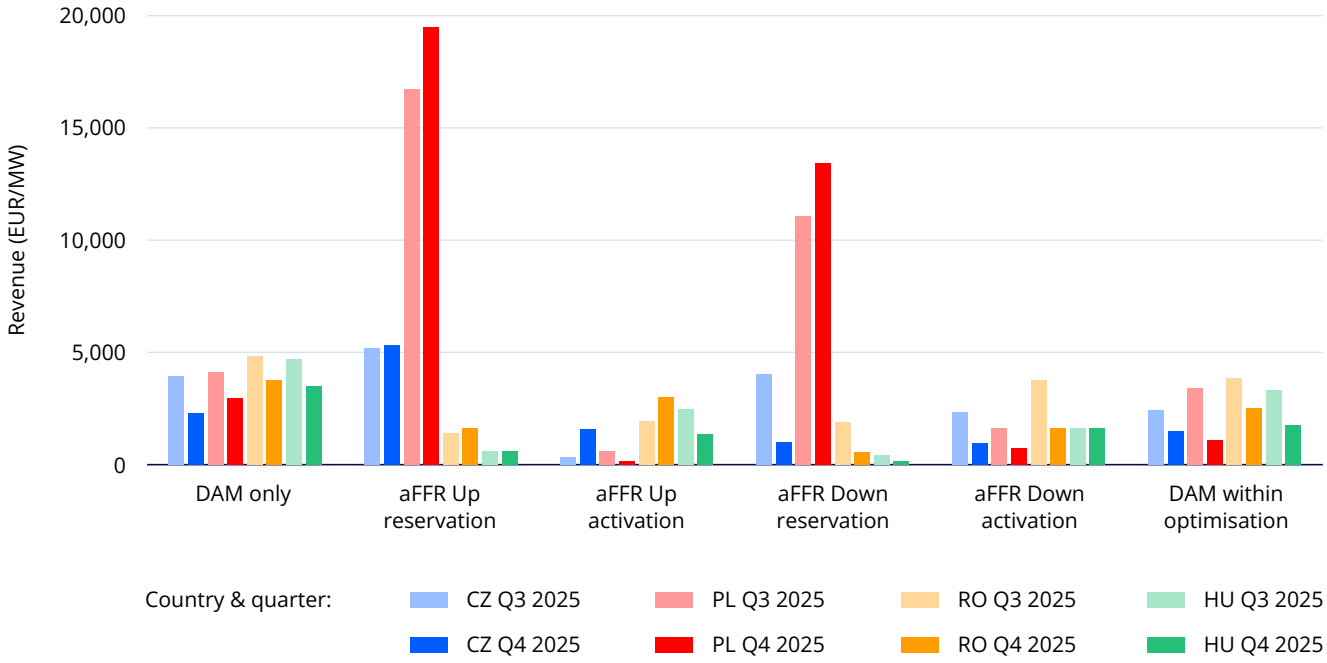
Optimisation results and change from last quarter – 1 MW / 2 MWh

	Czech Republic		Poland		Romania		Hungary	
	EUR/MW	change	EUR/MW	change	EUR/MW	change	EUR/MW	change
DAM only	4,009.2	-43.5%	5,497.5	-25.2%	7,065.3	-22.0%	6,557.2	-25.3%
aFRR Up reservation	6,633.1	-2.4%	22,108.3	6.6%	2,070.6	16.5%	762.1	0.7%
aFRR Up activation*	1,235.5	369.8%	1,614.3	136.0%	4,466.7	66.0%	4,755.5	63.6%
aFRR Down reservation	1,174.2	-74.7%	14,114.7	-5.5%	693.9	-69.4%	236.3	-55.0%
aFRR Down activation*	1,445.8	-17.9%	857.4	-63.4%	1,867.5	-55.0%	1,933.0	10.1%
DAM within optimisation	2,665.4	-47.6%	3,617.8	-40.0%	4,628.5	-39.3%	3,731.8	-44.0%

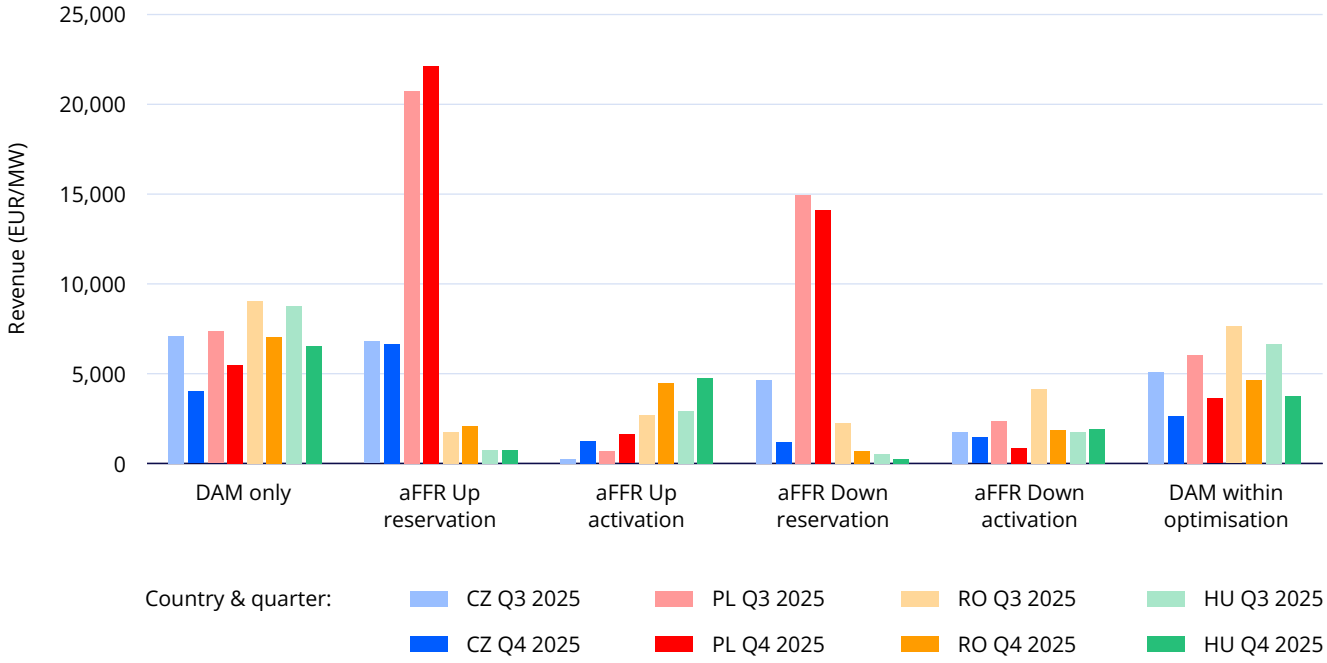
**Note: The activation portion of income includes the cost of recharging the battery after aFRR Up activation, and the revenue earned from discharging after aFRR Down activation.*

Quarter-on-quarter comparison

Monthly average revenue for October–December 2025: 1 MW / 1 MWh standalone battery compared to previous quarter



Monthly average revenue for October–December 2025: 1 MW / 2 MWh standalone battery compared to previous quarter



Market price summary

October–December 2025

This section presents pricing data from Q4 2025 across day-ahead and ancillary service markets. These prices form the basis for the revenue modelling presented earlier and help explain changes in financial performance across Central and Eastern Europe.

All prices are reported in **EUR/MWh (or EUR/MW in case of reservation) as monthly averages** and include:

- Day-ahead market (DAM) prices
- aFRR reservation (Up and Down)
- aFRR activation (Up and Down)

This table provides detailed pricing information (in EUR) for different countries and different energy market mechanisms. The table captures a range of statistics for each country, including the **mean**, **minimum**, **maximum**, and **standard deviation**.

Country	Market type	Mean	Min	Max	Std dev
Czech Republic	DAM	104.6	-1.7	400.6	40.6
	aFRR Down reservation	2.2	0.0	25.9	4.0
	aFRR Up reservation	11.5	0.3	95.5	13.7
	aFRR Down activation	-62.9	-3,511.9	2,974.9	158.3
	aFRR Up activation	122.9	-16.8	5,828.0	187.8
Poland	DAM	116.0	-4.0	445.8	46.7
	aFRR Down reservation	26.2	5.0	201.6	30.1
	aFRR Up reservation	38.9	7.9	330.3	36.8
	aFRR Down activation	-78.4	-1,974.9	2,775.0	117.1
	aFRR Up activation	126.1	-258.8	5,695.0	209.9

Market price summary

Country	Market type	Mean	Min	Max	Std dev
Romania	DAM	120.4	0.3	478.9	47.6
	aFRR Down reservation	2.4	0.4	10.4	1.3
	aFRR Up reservation	7.1	4.5	12.5	1.2
	aFRR Down activation	-22.3	-87.4	757.5	77.5
	aFRR Up activation	185.6	0.0	1,634.2	213.7
Hungary	DAM	120.2	0.3	491.2	48.2
	aFRR Down reservation	0.4	0.0	6.7	0.7
	aFRR Up reservation	1.8	0.0	42.5	3.5
	aFRR Down activation	-16.0	-88.3	145.5	21.8
	aFRR Up activation	107.9	-174.0	9,528.2	317.0

Note: The positive Down activation prices represent a situation when the client is paying for charging the battery during activation, the negative Down activation prices represent a situation when client gets paid for charging the battery during activation.