Optimization and Accuracy needs for optimal BESS profitability

Stergios Statharas
Head of Energy Market Analysis

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Energy Market landscape

RES Curtailments persist in q1 -Entrance of BESS in EnEx – Market Prices fall

Energy Market related updates

BESS Systems

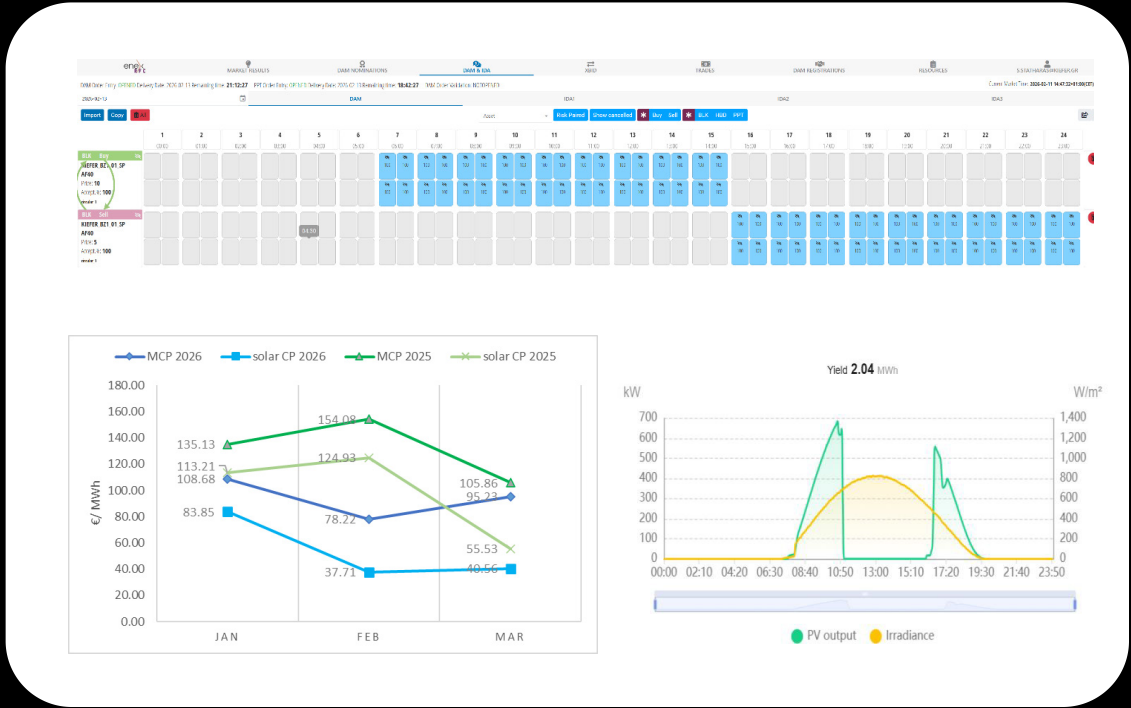
/ BESS integration In Wholesale markets (new orders and assets)

DAM Prices RES Capture Prices

/ Persistence of zero MCPs in q1 drives avg price and solar Capture Price downwards

RES Curtailments

/ Physical and market induced RES Curtailments continue in q1



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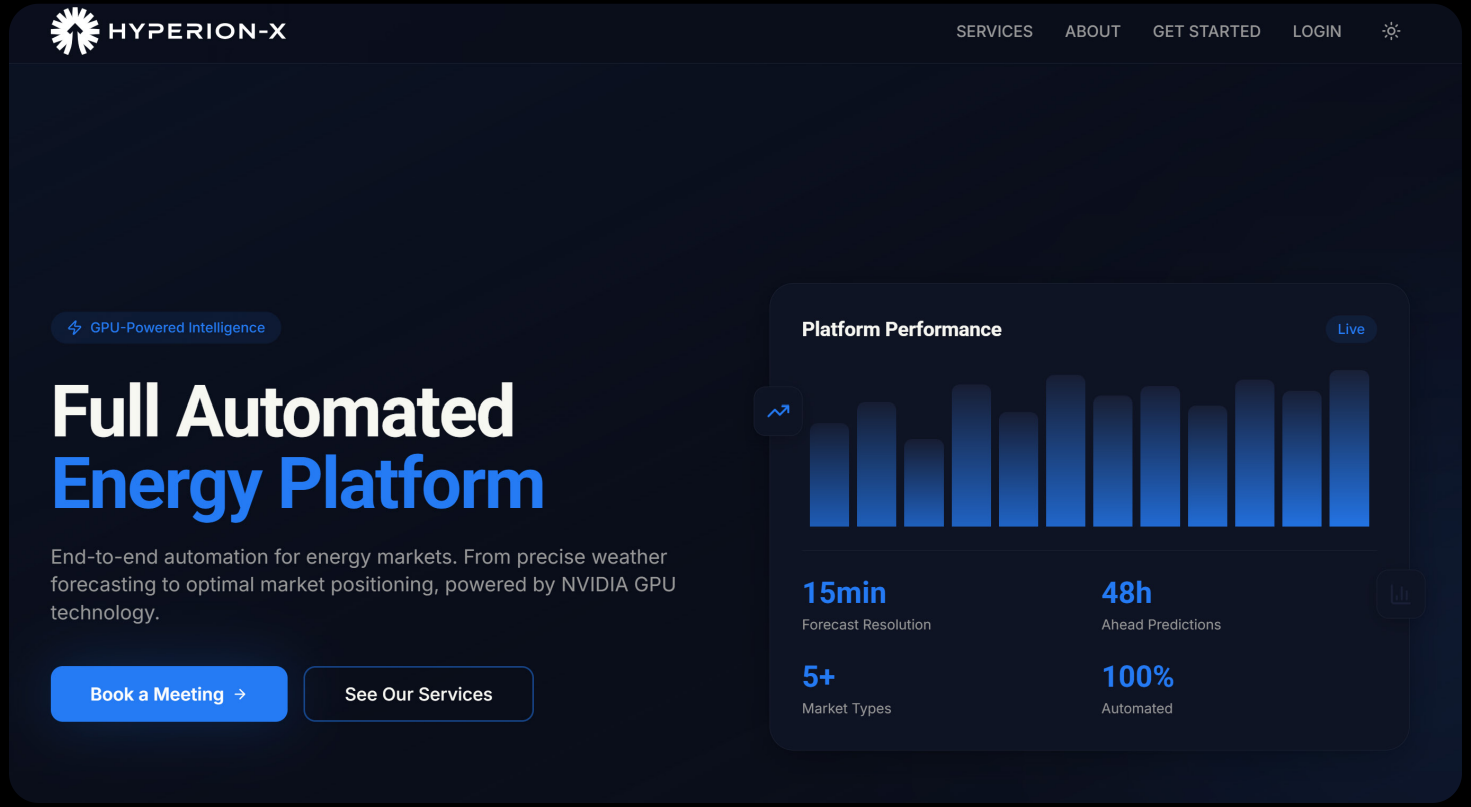
Hyperion–X

full automated energy management platform



Automated Market participation & RES asset owner payments

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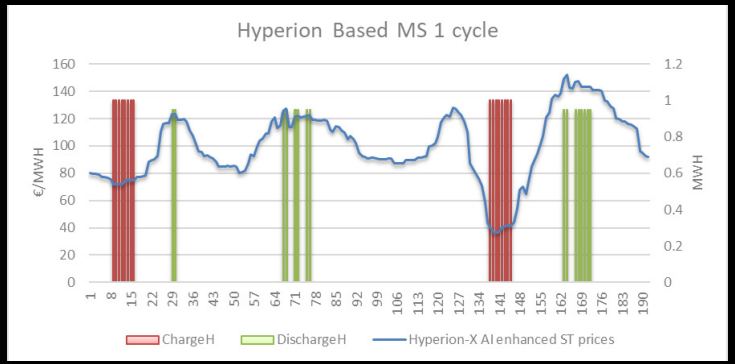
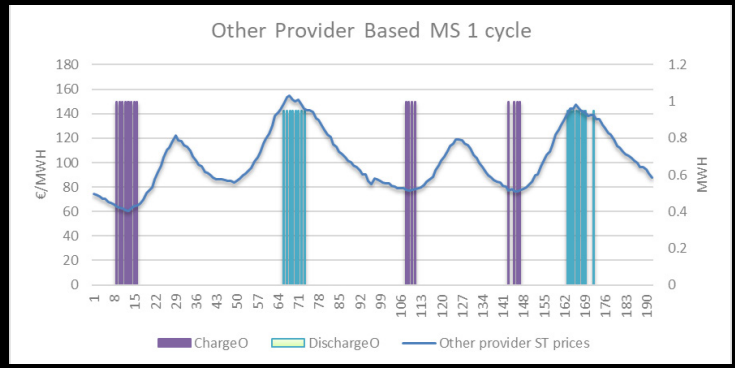
BESS revenue stacking

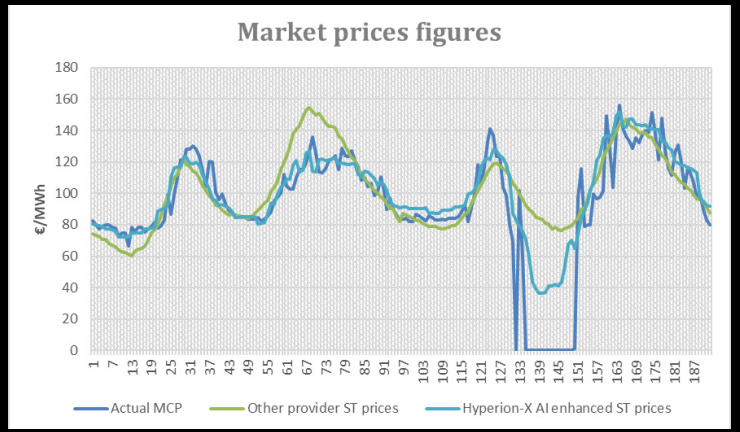
The importance of Forecasting and Simulation precision (example 4 MW / 8 MWh BESS)

/ Although ST forecasted prices express similarities, the difference in best charge timeslots and discharge timeslots create differences in actual realized revenues

Charge Cost H (€)	600.79
Dicharge revenue H (€)	1965.693
Net revenue H (€)	1364.903
Charge Cost O (€)	935.01
Dicharge revenue O (€)	1970.956
Net revenue O (€)	1035.946
diff (€)	328.957
diff (%)	**32%**







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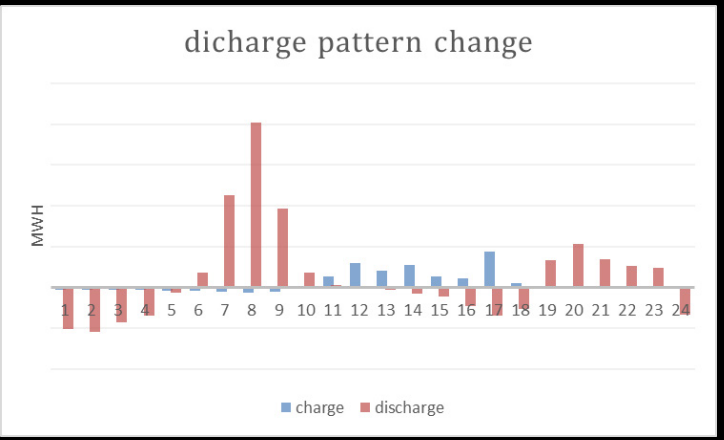
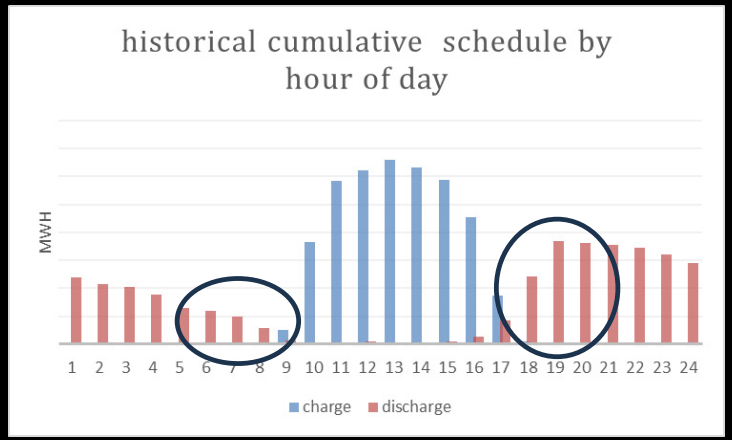
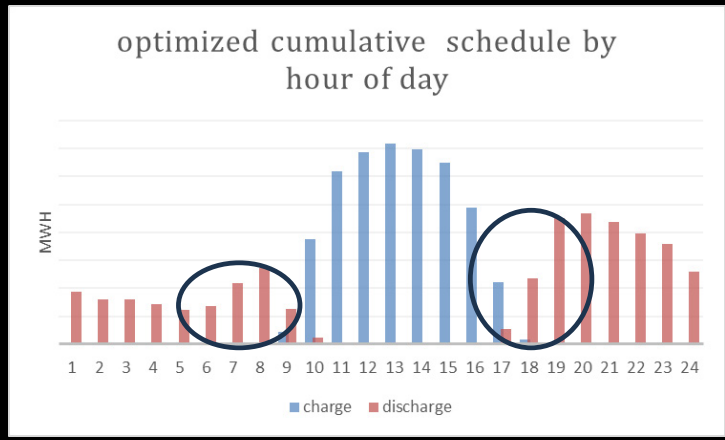
BESS revenue stacking

The importance of Forecasting and Simulation precision (self consumption optimization)

Naïve Self consumption vs Optimized Self consumption







/ Theoretical max benefit increase: **25%**

/ Actual change -including self consumption induced deviations as well as asset unavailability : **15%**

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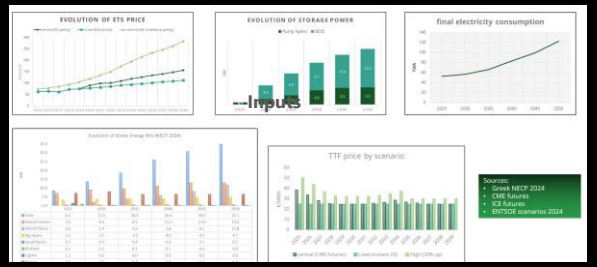
BESS Revenue Optimizer for maximum profitability

Feeds on fundamental market Inputs



Step 1: Short term forecasts
Volumes and prices

Optimization problem

PV generation

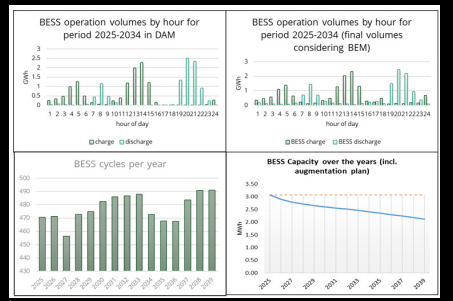
Consumer Load Consumption

Energy Storage System

/ Accounts for all technical (asset related) and market related constraints to solve a profit maximization problem

Step 2: Optimization model run
Optimal Market Schedule -Repositioning

- Optimal BESS operation schedule (charge-discharge)
- Market Positioning
- Capacity Degradation
- Optimal cycling
- Energy Cost and profit Calculation
- Cost Benefit Analysis



Step 3: Output results

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Thank You !

Stergios Statharas
Head of Energy Market Analysis

s.statharas@kiefer.gr

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