

Introducing Reflex - BESS optimization software

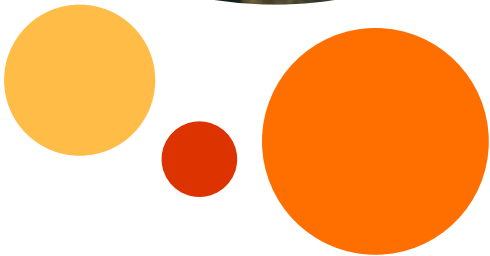
Ewout Eijkelenboom – KYOS

Manual Mosleitner - FlexPowerHub

17 June 2025



Agenda



1	Welcome and Introduction	15:00 – 15:10
2	Introduction KYOS and FlexPowerHub	15:10 – 15:15
3	REFLEX – Real-time Battery Optimizer	15:15 – 15:30
4	Use cases	15:30 – 15:40
5	Q&A and discussion	15:40 – 15:45



Challenge for BESS owner

Optimization of the asset

Who?

In-house
Outsource to optimizer

Revenue model?

Revenue sharing
Indexed/formula
Toll



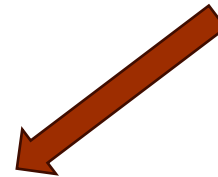
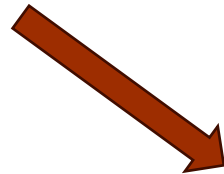
Challenge for BESS owner

Outsource to optimizer

**Who is good?
Is optimizer performing?**

In-house optimization

**Trading capabilities
Trading algorithm**



KYOS

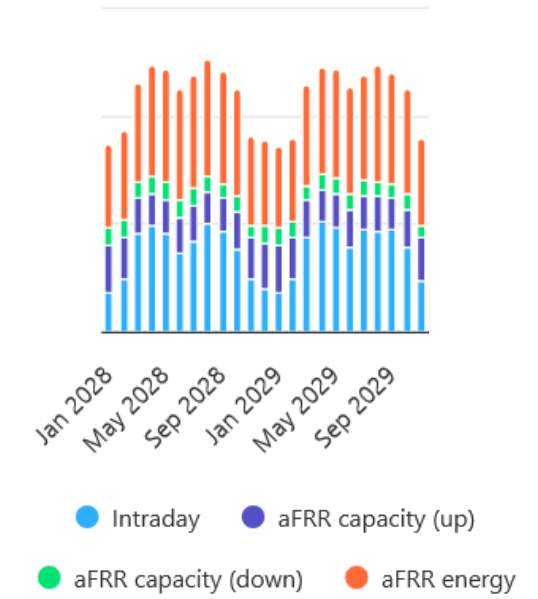


Introduction KYOS



KYOS services for energy storage assets

Cash flow by market



KyBattery

- Energy storage valuation software
- SaaS solution
- Multi-market strategies
- For both stand-alone and co-located assets
- Full control of input parameters:
 - Asset parameters
 - Price/vola inputs
 - Trading strategies

Software

- Full access to KyBattery
- Includes KYOS support
- Ideal to test sensitivity of valuation to inputs

Consulting

- Bankable revenue projections
- Asset specific
- Benchmarking services



Introduction FlexPowerHub



About cognify - Creating customized data-driven solutions



Intelligent Algorithms

- Data Engineering
- Machine Learning Solutions
- Real-time Optimization



Data Analysis

- Ad-hoc Analysis
- Complex Business Analysis
- Visualizations (Reports, BI, Dashboards)



Consulting & Development

- Tools, System-architectures, Data Pipelines, Process design
- Ideation- and Concept workshops
- Stand-Alone Application, Front- & Backend, Full-Service-Portfolio

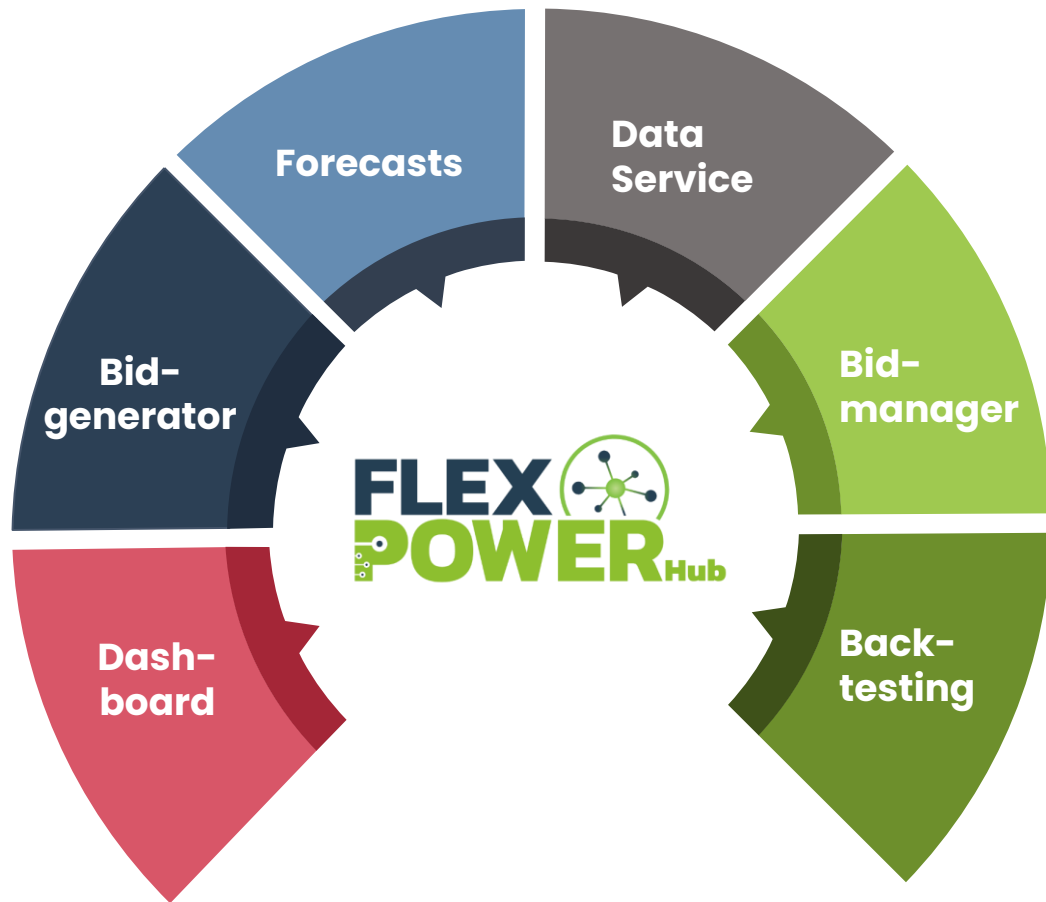


DATES & FACTS

- Founded 2017, more than 20 employees
- Over 30 completed projects
- Automotive, Energy, Industry, Trade, Production, Gastronomy



FlexPowerHub – your partner for ancillary services



- One of the leading SaaS tools for ancillary services in Europe
- 15 years of experience with forecasting models and architecture
- Several active customers in Austria and Germany
- Completed several individual customer services for companies in the energy sector
- Direct API connection to the TSOs in Austria and Germany for bid submission – soon more countries connected

KYOS

FLEX
POWER Hub



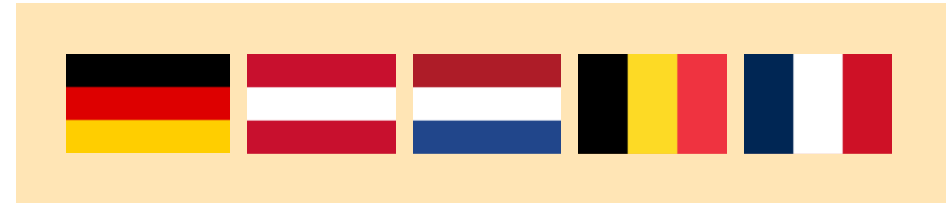
Reflex software



What is Reflex?

Real-time BESS optimization platform

- SaaS based software
- Modular: ancillary services + wholesale markets
- Actual prices and trading strategies
- Benchmark or real trading execution algo





Module 1 - Ancillary services module



Bid generator

Creating individual strategies per asset and market for FCR, aFRR & mFRR



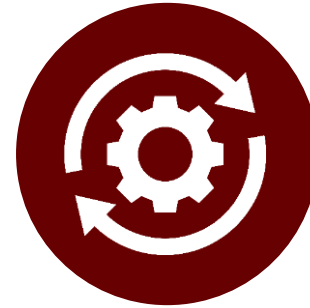
Backtesting Service

Continuous evaluation of your strategies.



AI Forecasts

Dynamic AI forecasts with approx. 80 influencing factors for capacity and energy merit order curves (MOC)



Data Service

Full control of the bidding via APIs and time-based control of the bidding process via schedules.



Bid manager

Create customised workflows and automate the entire auction process.



FlexPowerHub – individual bidding strategies

Edit strategy

RESET FIELDS ↻

Name: BESS_1 | Market: SRE-POS | Zone: DE | Amount MW: 10 | Split (MW): 2 | Unit: MWh | Free bids:

Capacity price

Set risk percentile: 65 % ⓘ ⓘ

Forecast: FPH AI ⓘ

Type of bid distribution: stepwise + ⓘ ⓘ

Bid distribution along the risk percentile: 3 %

Price limit ⓘ ⓘ

Capacity price: bids SRE-POS in zone DE

Delivery date: 16.06.2025 ⓘ ⓘ

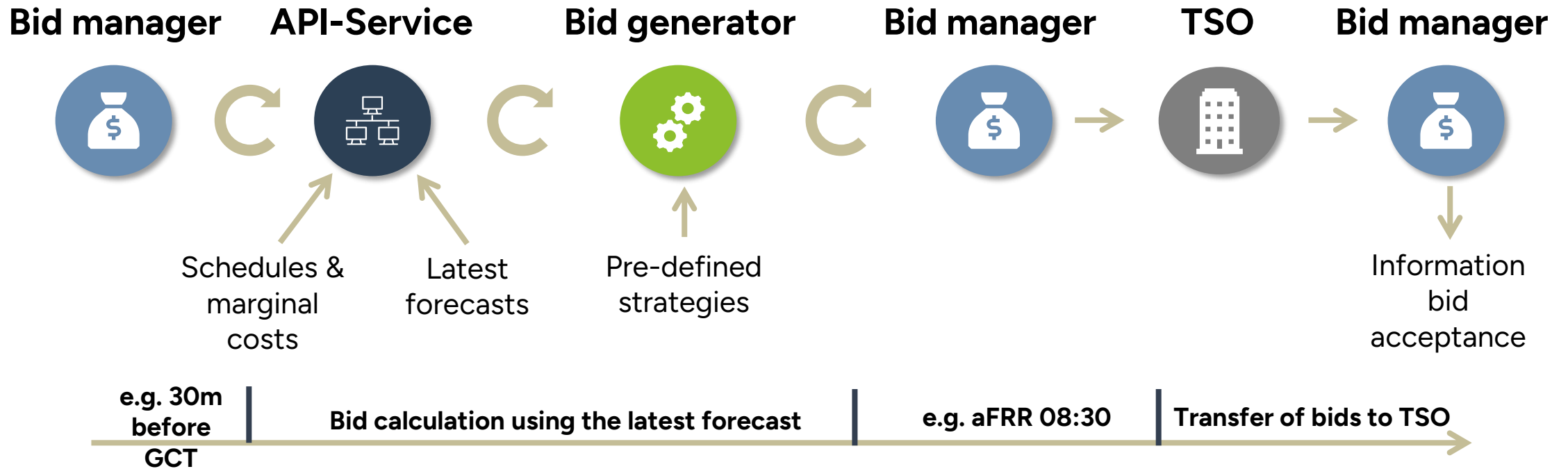
Quality: good ⓘ

bids
5.33€/MWh
5.36€/MWh
5.40€/MWh
5.44€/MWh
5.47€/MWh

- **Custom Strategies:** Customers can create their own strategies without system limitations.
- **Merit-Order Curve Forecast:** Division of the forecasted MOC into percentiles for bid placement.
- **Percentile Selection:** Higher percentile = higher risk (no award in capacity markets), but higher potential remuneration.
- **Risk Management:** Targeted control of risk and bid placement.
- **Additional Parameters:** Minimum price, staggered bid distribution (multiple bids at intervals).
- **Automated Marketing:** Once set up, automatic calculation of bids



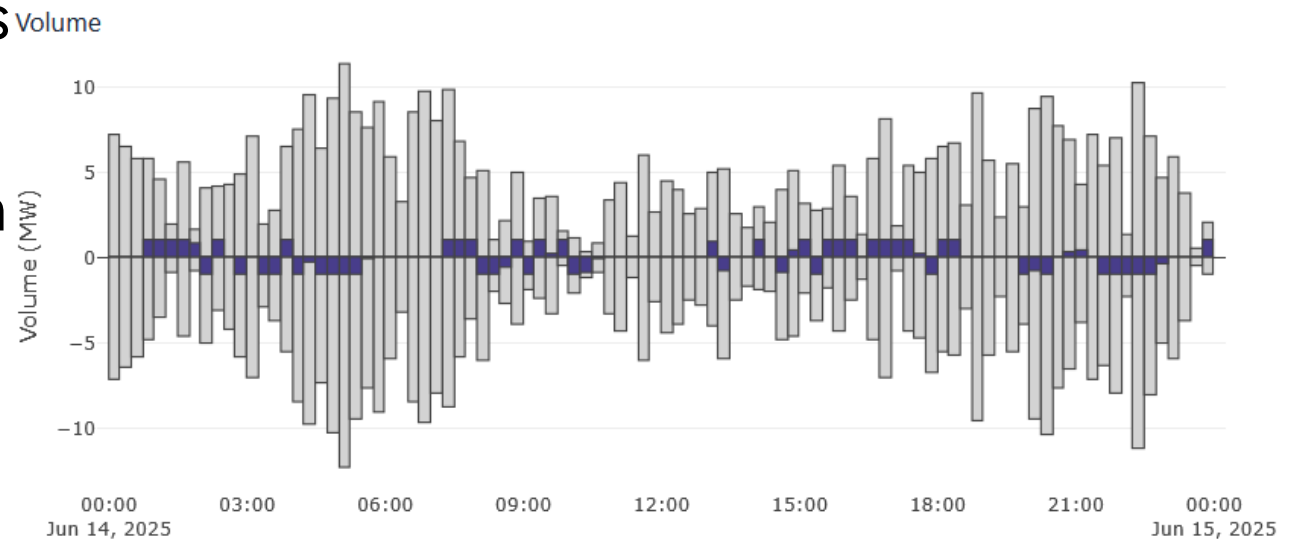
FlexPowerHub – Workflow





Module 2 – Wholesale markets module

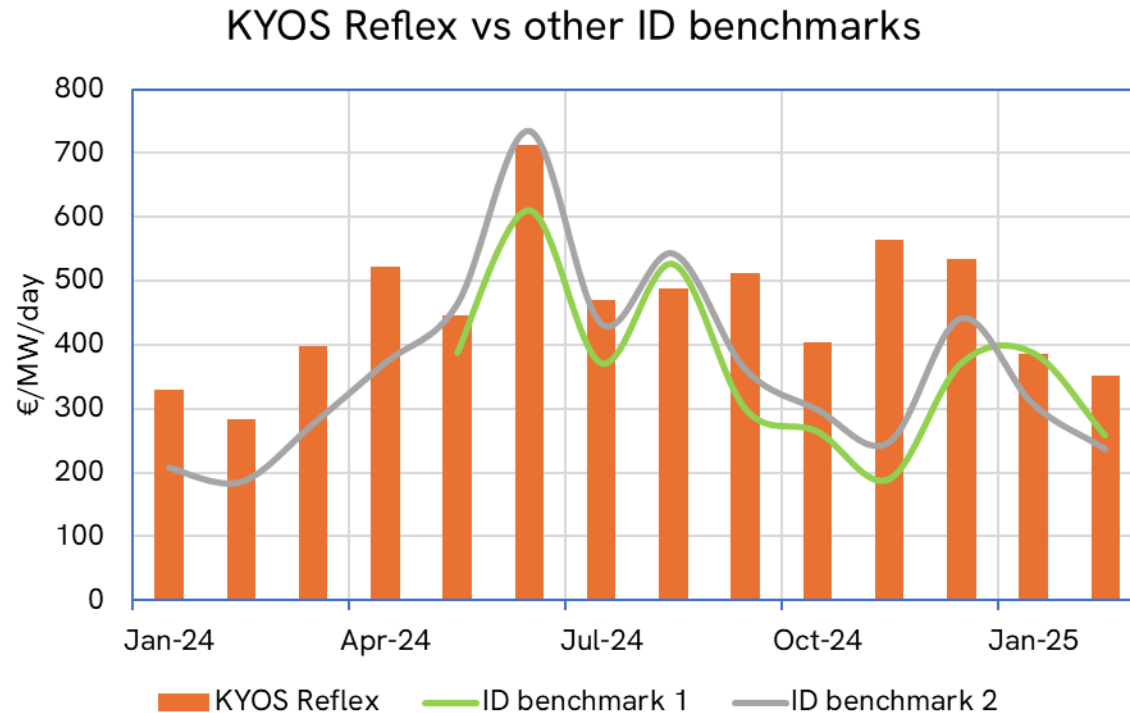
- Use actual order book information to decide about trades in continuous intraday market
- Only allow asset-backed net positions
- Advanced trading algorithms to select the best combination of orders
- Use detailed battery characteristics
- Combine with day-ahead trading
- Shadow trading or actual execution





Real-time optimizer – results

- Market: Germany (Tennet)
- > Real-time Optimizer outperforms published battery indices





Real-time optimizer – example of dashboard





Reflex multi-market optimization

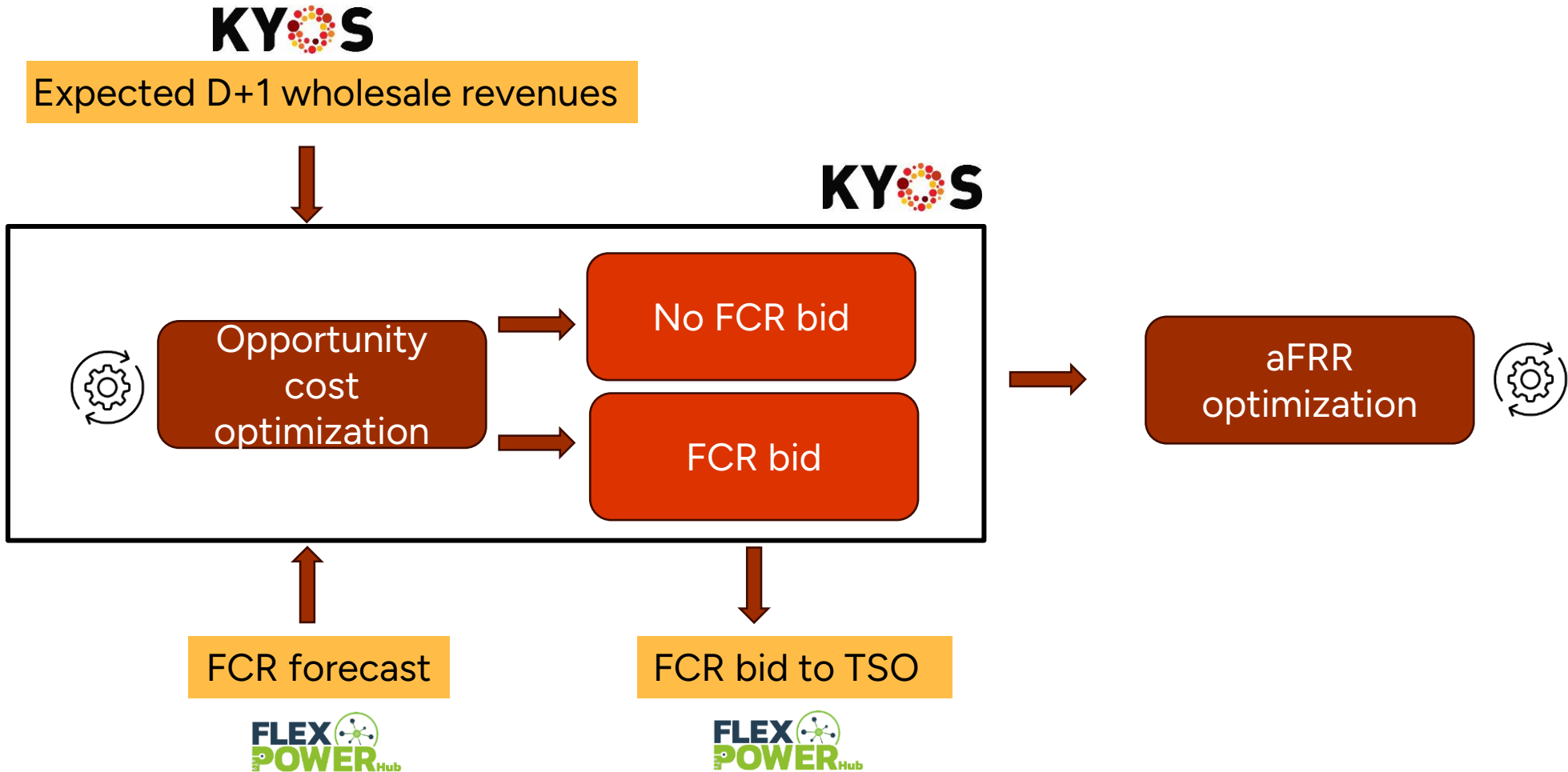


- Multi-market BESS optimization software
- Combining ancillary service and wholesale market optimization
- Different decision moments
- Continuous optimization between markets





Example FCR process



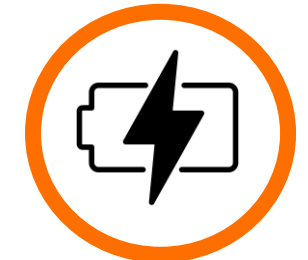


REFLEX – use cases



Modes to run Reflex

	Trade execution	Example
Historical benchmark	virtual	Run optimization for 2024, using actual prices, not indices
Real-time benchmark	virtual	Run live optimization against actual order books. Shadow trading
Real-time BESS optimizer	real	Run live optimization against actual order books. Actual deal execution
Modular set-up		
	Ancillary	Wholesale
	Multimarket optimization	





Use case 1 – realistic revenue benchmark

Example client

- BESS asset owner

Running mode

- Real-time
- Actual asset parameters
- Real prices



Goal

- Realistic idea of potential market revenues
- Compare with current



Use case 2 – optimize BESS

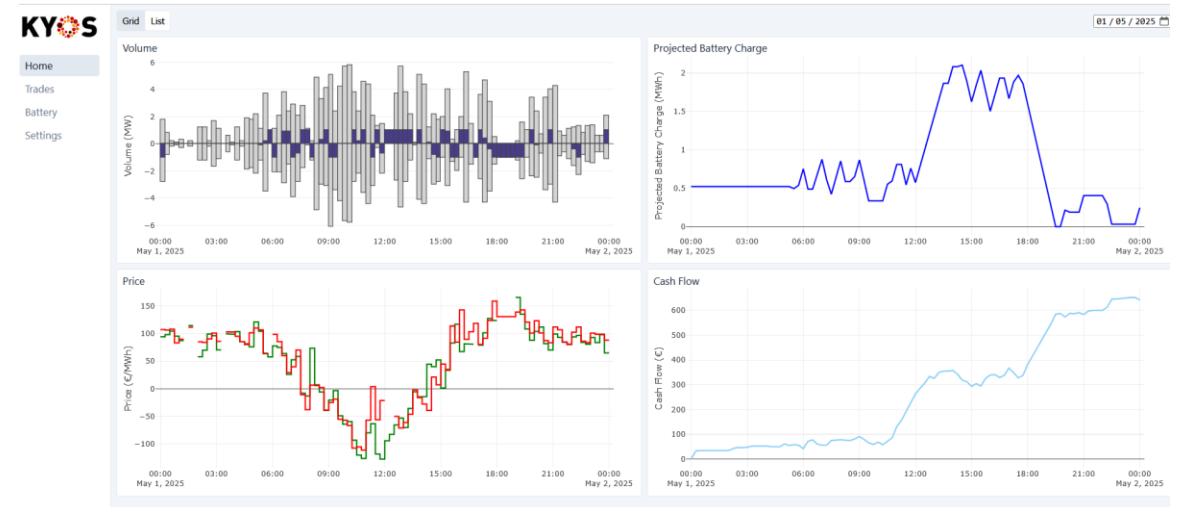
Example client

- BESS asset owner
- BESS optimizer

KYOS supports with creating required

Running mode

- Real-time
- Actual asset parameters





Summary



Summary

- Introducing KYOS Reflex together with FlexPowerHub
- Multimarket BESS optimization software platform
- Combining KYOS analytical and optimization knowledge with FlexPowerHub ancillary services expertise
- Usage
 - Benchmark BESS optimizers
 - Benchmark own BESS trading strategies
 - Optimize BESS
- Clients
 - Asset owners
 - Optimizers





Q&A

- Time for questions!





Contact Details

We look forward to supporting you with the right tools and advice in the rapidly changing energy sector!



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