KyStore: Gas storage

KyStore supports traders and portfolio managers in natural gas markets. The gas storage optimization software raises revenues from gas storage trading operations, provides accurate valuations and reduces risk with adequate hedge recommendations. The model uses advanced stochastics including Least Squares Monte Carlo techniques to capture the full optionality in gas storage facilities.

✓ Increase revenue & manage risks of gas storage products

✓ Captures all storage characteristics

✓ Quick calculations, fully automated

✓ Easily interfaced with market data

✓ Accurate valuations and hedges via LSMC methodology

Benefits

Storage valuation
What is a fair price?

The storage model answers the question: how much should I pay for storage? The model shows which part of the value is intrinsic, and can be made easily, and which part is extrinsic, requiring a more active trading strategy. Extrinsic values are derived from an intuitive and realistic Monte Carlo simulation model. This type of valuation provides a fair assessment of the future value. Backtesting is another feature: it shows how much money you would have made in the past, following a specific trading strategy.

Spot optimization
Inject or withdraw?

Each day, the gas storage optimization model tells you what is optimal to do: inject or withdraw. Boundary prices indicate below which price you should inject and above which price withdraw.

Together with boundary prices of other storage assets and swing contracts, a portfolio manager can rank assets from low opportunity cost to high opportunity cost, creating an internal merit order for portfolio optimization.

Forward hedging
Keep the risk or
lock in profits?

KyStore shows which forward transactions are optimal to hedge risks and lock in profits.

The user can choose between intrinsic hedging and delta hedging, two strategies to secure profits. It can provide hedge recommendations for the asset alone, for multiple assets together or for a portfolio of assets and existing trading positions.

Our analytics
Your advantage

Features

All storage characteristics are included in the gas storage optimization software. This includes time and volume dependent injection and withdrawal rates, time varying costs, interruption rights and reduced availability because of maintenance.
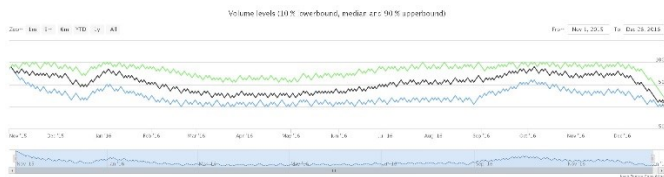
KyStore is fully embedded in the KYOS Analytical Platform. Automated data feeds ensure that you get up-to-date trading recommendations every day. Transparency is guaranteed, because analysts can evaluate each individual price scenario.
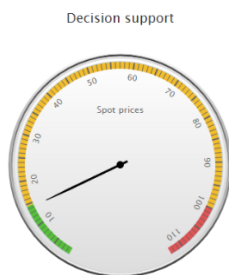
Methodology

The gas storage optimization software is based on advanced Monte Carlo simulation techniques. Important characteristics are a mean-reverting multi-factor model with long-term, short-term and seasonal dynamics. Users can also import their own price simulations or use those of KySim.

Optimal storage trading and operating decisions are calculated with Least Squares Monte Carlo. The volatility term structure and other simulation inputs are easily derived from historical data with the accompanying calibration tool. Implied option volatilities may be used as well, by overwriting the historical volatility estimates.

KYOS Analytical Platform

KyStore is fully embedded in the KYOS Analytical Platform. With automated data feeds, up-to-date plant valuations are always available.

All KYOS Analytical models are developed in Matlab, and part of the KYOS Analytical Platform. Other software modules include:

- **KyPlant**: determine the value of a (portfolio of) power plants by quickly calculating the optimal dispatch,
- **KySwing**: helps to generate most income from gas contracts by optimizing the contract flexibility
- **KyCurve**: create detailed hourly price forward curves for power, gas and other commodities
- **KySim**: generate Monte Carlo price simulations, relying on a hybrid approach of statistics and fundamentals
- **KyPF**: generate hourly price forecasts and simulations for one or more power markets.
- **AtRisk**: calculate both Cashflow and Earnings-at-Risk. Both metrics show the distribution of future results over longer horizons.

The KYOS Analytical Platform is developed in PHP. A MySQL or MS SQL database is used for data storage. Compiled Matlab models perform the analytical calculations.

Technical information

The Platform can run on a Windows and on a Linux environment. The platform is delivered by default as cloud solution, and it can also be installed on a local server.

The Platform can operate as a stand-alone software application. Automated price connections are possible and recommended. Connections to other systems for contract data and calculation results can be developed based on customer specifications and the An installation on a local or cloud server is typically performed in one working day.

Our analytics
Your advantage