



KySwing: Swing contract

KySwing helps to generate most income from gas contracts by optimizing the contract flexibility. The risk on future income is reduced by forward hedging. The model applies advanced stochastics to find the optimal exercise.

Swing options are typical components of gas contracts, which offer the opportunity to vary the contracted volume under a number of restrictions. They are also known as Take-or-Pay (ToP) contracts.

- ✓ Increase revenue & manage risks of gas swing contracts
- ✓ Capture all indexations and volume constraints
- ✓ Make quick calculations, fully automated
- ✓ Enjoy easy interfaces with market and other data
- ✓ Calculate accurate values and hedges with Monte Carlo simulations

Benefits

Contract valuation What is a fair price?

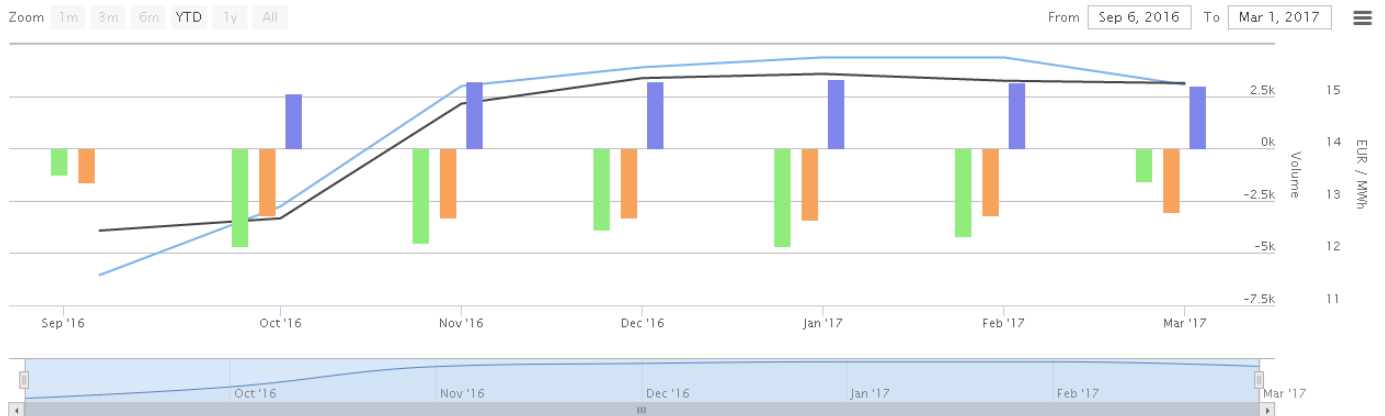
The swing model calculates the fair price of a swing contract. The model shows which part of the value is intrinsic, and can be made easily, and which part is extrinsic, requiring a more active trading strategy. Extrinsic values are derived from an intuitive and realistic Monte Carlo simulation model.

Spot optimization Daily offtake?

Each day in the contract period, the swing valuation advises how much gas should be taken from the contract. Boundary prices show above which price the maximum contract quantity should be nominated, and below which price the minimum quantity should be nominated.

Forward market Keep the risk or lock in profits?

KySwing advises what forward transactions are optimal to hedge the risks and lock in profits. The user can choose between intrinsic 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.

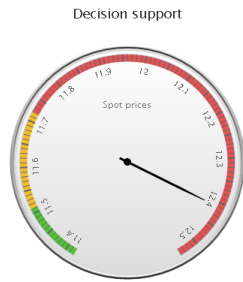


Features

All contract constraints are included in the optimization. This includes volumetric constraints on one or more periods (e.g. daily, monthly and annual contract constraints). In addition, KySwing accepts contracts based on a variety of spot and forward indexed products.

KySwing is fully embedded in the KYOS Analytical Platform.

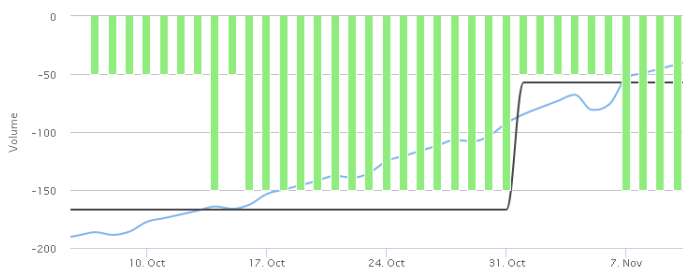
With automated data feeds, up-to-date swing valuations are always available. Further integration with third party ETRM systems can be established.



Methodology

KySwing 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 trading and operating decisions are calculated by applying Least Squares Monte Carlo techniques. 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

KySwing is fully embedded in the KYOS Analytical Platform, and helps to generate most income from gas contracts by optimizing the contract flexibility.

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,
- **KyStore:** optimize a gas storage and calculate values, delta positions and day-ahead trades
- **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 XML protocol.

An installation on a local or cloud server is typically performed in one working day.