



KyVar: Value-at-Risk

Value-at-Risk (VaR) helps risks managers and traders to manage market risk on a portfolio of positions. It is the standard risk concept in most trading organizations.

It gives insight in potential future losses and helps to take the right measures: positions may be adjusted, new transactions (hedges) executed, or more capital employed as a buffer.

- ✓ Calculate the market risk of a complete portfolio
- ✓ Locate and analyse the key risk drivers
- ✓ Enjoy user-friendly interface and fast calculations
- ✓ Choose between different methodologies

Benefits

Foresee potential losses

VaR calculates by how much the market value of the portfolio may change over a given horizon with a certain confidence level. For example, a 10-day 95% VaR of 1 mln USD means that the drop in market value over a 10-day period will not be more than 1 mln USD in 95% of the cases.

Positions arising from all contracts and assets (power plants, gas storage, swing contract) are fully included in the KYOS VaR model.

The VaR can be compared with the market risk on previous trading days, thereby highlighting potential trends. The VaR is displayed in a flexible format, so the user can identify the main sources of risk: per book, per commodity or per period.

Locate the drivers of market risk

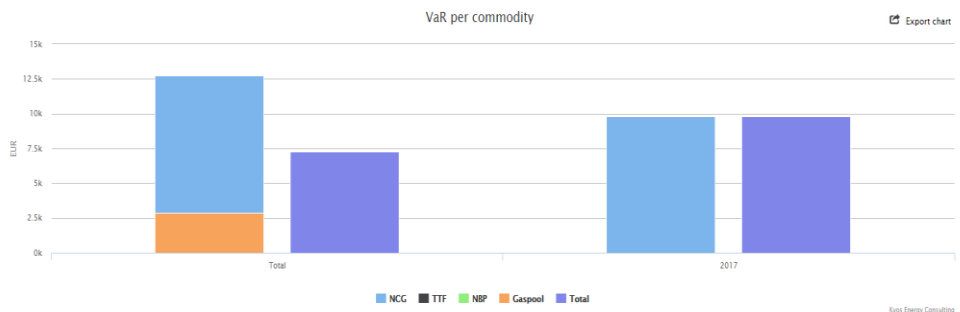
The main drivers for the VaR are (i) the positions and (ii) the price volatility of commodity markets.

The VaR model shows both the positions and the volatility per month, giving full insight in the risk drivers.

Check if trading limits are not breached

Each day the VaR is compared with the appropriate VaR limit. The limit can be set on the total portfolio, but also on a sub-level (book, commodity, etc.).

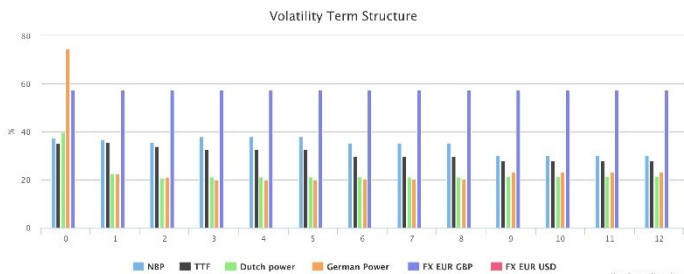
In case a VaR limit is breached, a clear signal is given which can be used to reduce market risk.



Features

All exposures are included in the VaR model: not only contracts, but also positions from energy assets including power plants, swing contracts and gas storages.

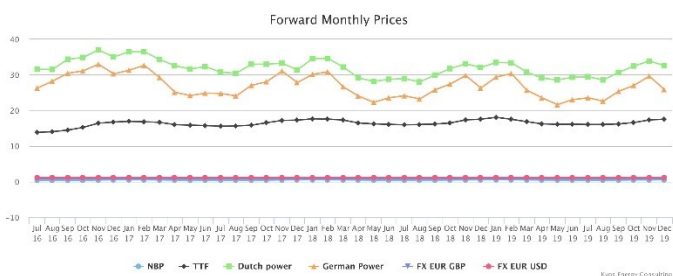
KyVaR is fully embedded in the KYOS Analytical Platform. Automated data feeds ensure that you get up-to-date VaR calculations every day.



Methodology

The standard VaR model in the KYOS Analytical Platform is based on the variance-covariance matrix. It is referred to as parametric VaR, normal VaR or varcovar VaR. It is actually the most easy to use and interpret results. As an input it requires the volatilities and correlations of all monthly prices. These parameters are automatically calculated in the model based on historical market prices. The user may overwrite the volatility estimates, either to test sensitivities or because he has more accurate estimates from option markets.

As alternative methodologies, KYOS offers the Monte Carlo simulation approach and the historical simulation approach. Especially when the market price returns do not have a very nice Normal distribution, this may be more accurate. For the Monte Carlo simulation approach, the price simulations from KySim are used. For the historical simulation approach, the model takes the variations in market prices directly from the history, without any distribution assumption; that is therefore the non-parametric VaR approach.



KYOS Analytical Platform

KyVar is fully embedded in the KYOS Analytical Platform. With automated data feeds, up-to-date financial evaluations 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,
- **KyStore:** optimize a gas storage and calculate values, delta positions and day-ahead trades
- **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 XML protocol.

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

