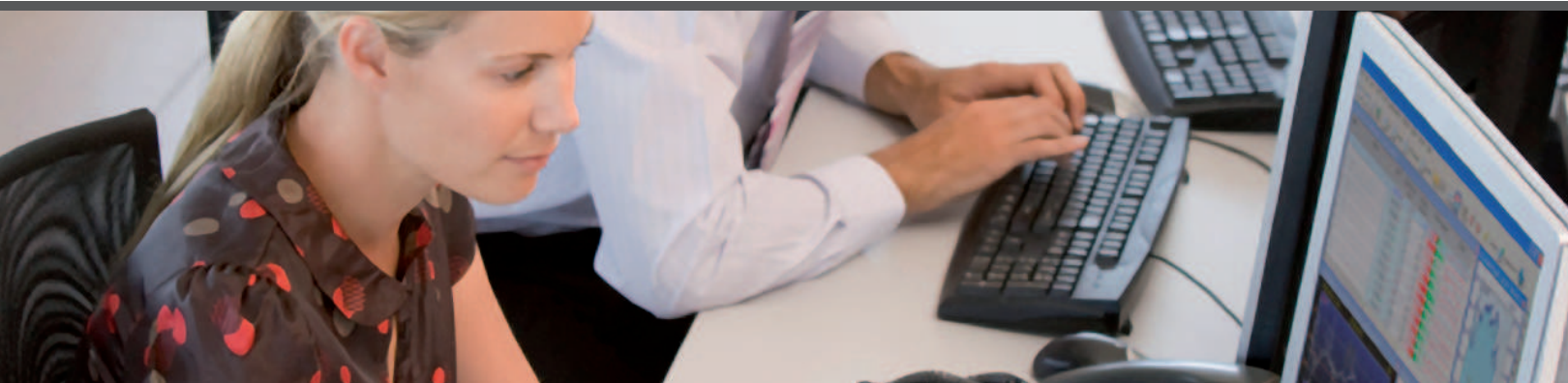


Product Overview

Market Data Warehouse 5.0 Functional Overview



A single centralized repository designed to store, manipulate, and analyze market data.

Market Index Setup

Commodity and foreign exchange price indices supported

- Cash and “forward” index types
- Multiple user-defined commodities and FX rates
- Multiple user defined physical (volume) units
- User time-of-day definitions (when applicable)

Individual index aspects defined at setup

- Index name, symbol, and service type (e.g., spinning capacity)
- Commodity type
- Multiple units (e.g, MW, kWh, MMBtu)
- Market type (cash or forward)
- Data type (e.g. actual or forecast)
- 15 minute, Half hour, hour, day, BOW, week, BOM, month, and annual duration supported
- Delivery time period, pattern, and holiday calendar for hourly products (e.g. 5x16 with NERC holidays)
- Data source recorded
- Trading symbol and service zone

Market Data Management

Index Manager view for filtering or sorting available indexes, and drilling down to data grid view for a selected index

- Filter by commodity, delivery duration, market type, or data source
- Sort by index name, symbol, delivery duration, market type, user data type (e.g., forecast), data source, or service type
- Data availability graph shows available data dates for all indexes

Multiple data grid views for selected index

- All trade dates
- Forward curve
- Forward average strip curve
- Settlement price curve
- Continuation curve
- Life of contract curve

- Trade date or contract date selection for forward market data
- Sort data in ascending or descending order
- Import Wizard to create or edit an import template to import data
- Export hourly data to an Excel workbook pivot table from data grid
- Copy and paste data to or from grids
- Note fields for each index and trade date
- International date formats supported

Graph Types

Multiple types of time-series graphs of prices, volumes, basis spreads, and volatility

- User-selectable date range and index variables (close, open, high, low, bid, ask, volume, open interest)

Cash market graphs

- Continuation curve graph
- Seasonal graph – a line for each year for non-hourly indices

Forward market graphs

- Forward curve graph
- Forward Average Strip graph – displays simple moving average of user-selected contract strip of length N for selected trade date
- Settlement price curve graph
- Life of contract curve graph
- Continuation curve graph
- Seasonal graph – a line for each year for non-hourly indices
- Forward curve and Life of Contract data views only

Basis Comparison for 2-5 indices or series

Forward market graphs

- Different physical units converted to reference index units

- User-defined units conversions factors for automatically converting to a common unit (e.g., barrel to MMBtu)
- Graph underlying indices and/or their bases from reference index
- Basis calculated either as spread or ratio

Price Volatility graph □ simple and exponentially-weighted moving average volatility measures computed and graphed

- Continuation and Life of Contract data views only
- Daily and less frequent markets

Volume graphs for cash or forward market data

- Choice of traded volume or open interest graph for non-hourly indices
- Traded volume graph for half-hourly and hourly indices

Graph Management

- Store and retrieve user-defined comparative graph definitions
- Can mix index types and data views within same Basis or user-defined comparative graph
 - Cash and forward markets
 - Continuation, life of contract, forward curve, and settlement curves
 - Different product durations
- Display individual observation information by clicking on the graph
- User control over display of graph(s)
 - Selectively graph any of open, high, low, close, bid, and/or ask prices
 - Volume or open interest graph may be viewed below price graph
 - Graph data display types include line, candlestick, or bar (stock)
 - Graphs with multiple Y axes may be shown overlaid or stacked
 - Format properties of individual graphs
 - Zoom/unzoom on selected date range
 - Selectable display of basic statistics in single index graph
- Print graph or store graph image for use in other applications

Statistics

Basic and advanced statistics for 1-5 indices and correlation matrix displayed in grid

- Available for price data with single index or basis comparison graph
- Statistics include mean, geometric mean, median, standard deviation, mean absolute deviation, maximum, minimum, range, skewness, excess kurtosis, Jarque-Bera (normality test) and its prob level, largest and average absolute change, average change, volatility, count, count of non-positive values, and last value
- Correlation statistics are with respect to levels, changes, and absolute changes
- Print statistics report or save to Excel workbook

Price volatility computed for simple and exponentially-weighted moving average volatility rates for user-defined length and decay rate

- Graphs both volatility measures
- Export moving average volatility data from price volatility graph

Index Baskets

- User-defined index baskets
- Mix commodities, product durations, or time-of-day definitions in a basket
- Scale (multiplier) and shift (adder) individual indices in the basket
- Specify reciprocal for individual indices (for uses such as implicit heat rate)
- Create basket index as average, sum, product, max, or min of its component indices (for uses such as spark spreads, basis shifts, and basis spreads)
- Select specific index data for inclusion in the basket based on the scenario associated with the basket
- Store the results of basket computations in another index for subsequent processing
- Display results of the basket computations on demand

Price Scenarios

- User-defined price scenarios
- Specify one or multiple indices for inclusion in a scenario specification
- Scale (multiplier) and shift (adder) individual indices in the scenario
- Utilize scenarios to drive index baskets and stress tests (e.g., high or low price forecasts)

Market Groups

- User-defined market groups
- Associate indices with the same commodity and currency in a group
- Scale (multiplier) and shift (adder) individual indices in the market group
- Display the resulting index from within the group on demand

Import Manager

- Acquires data from LAN, internet, or intranet locations, and imports into Marketplace
- Can be set to run at scheduled times using Microsoft "Scheduled Tasks" or equivalent scheduling program
- Manage multiple web sites and data files in single job
- Supports both text and zip file formats
- Allows running external process to pre-process data prior to import

Manual Data Import

- Create, manage and use templates to import data from text files
- Import delimited text files containing one or multiple indices
- Supports multiple file formats
- Guides user on selecting file format
- Uses template to save all information regarding data import
- Close price, volume, open price, high price, low price, bid, ask, and open interest can be imported for non-hourly indices.
- Price and volume can be imported for indices with half-hourly or hourly duration.

Price Advisor Component

- Short term price forecasting using weather forecast
- Estimate statistical forecast equations for hourly prices using weather data as independent variables (Note that actual prices or other economic variables are not used in the forecast equation)
- Develop hourly price forecast using forecast weather data and the statistical parameters
- Save forecast into index

LAN Deployment Security

- Any access to the system controlled by database level security
- NT security inheritance for database access
- Data source level security for view, update, addition or deletion of data series
- Management per user per data source access supported by the security system
- User control of access to user created data series (typically forecasts)
- Workstation user source access and passwords
- Commodity types, units, currency, holiday calendar, time patterns, and time zone administered in the administration module



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