

Product Overview

Planning and Risk Functional Overview



Solution for portfolio analytics and risk assessment

Summary

- Complete portfolio model with full representation of generation assets, markets, constraints, loads and contracts
- Full chronological simulation for optimal dispatch combined within a deterministic and stochastic environment
- Used for budgeting and planning, resource and investment analysis, transaction evaluation and risk assessment
- Robust system architecture support Sarbanes Oxley requirements

Interface and Data Management

- Built on a common interface used by other Ventyx simulation applications
- Easy integration with other EPM modules, including Market Analytics, Generation Management, and System Optimizer
- Flexible and robust application login and database security
- Data audit reporting with query capability
- Windows “style” interface with menu tree navigation with well-structured menus and variable groupings

- Workflow menu creation capability allows users to add frequently used menu items to multiple workflows
- Easily create base case, scenario and sensitivities from base case
- Consistent data management interface used for entering and editing input data for all entity types
- Maintains complete history of changes with full “roll back” features
- Virtually all PROSYM variables and all data types managed with the graphical user interface
- Copy any entity for easy creation of similar entities
- User-defined filtering capability for all entity types
- User-defined views and filtering for display of summary data across multiple entities
- Advanced Mass edit capability with flexible filtering, and in-place grid editing
- Flexible input data reporting in grid format with scenario stacking capability
- Standard and user defined time pattern editor for defining time of use (TOU) periods
- Time series index drivers can be applied to price and volume variables

- Import data via predefined XML routines allows automated updates from Ventyx and third party systems
- Process Server component significantly speeds runs for large numbers of iterations

Simulation Settings

- Maximizes electricity portfolio expected profit (or minimizes expected cost) with simultaneous simulation of one or multiple load, generation, and/or contract assets, while enforcing electrical system constraints, including station operation, transmission, and limited fuel constraints
- Choice of price-based dynamic programming or cost-based Lagrangian Relaxation optimization technique
- Deterministic analysis for traditional planning or intrinsic valuation
- Full stochastic representation of the key drivers of electric system risk (loads, electricity prices, fuel prices, emission costs, hydro energy availability, station maximum and minimum capacity, transmission link capacities, and outages) with up to 1000 Monte Carlo iterations
- Choice of modeling with a single or multiple transmission area topologies
- From 1 week to 40 years of simulation with the PROSYM simulation and mark-to-model engines
- Default hourly computational granularity solution of electric system operation with optional 2 or 4-hour time step and/or typical week (12 weeks per year) simulation for faster execution
- Optional separate price indexes for electricity and fuel prices for mark-to-model accounting than those used for system dispatch

Market Description

- Reflect transmission constraints between multiple transmission areas
- Allows purchase and/or sale of hourly electric energy with single or multiple market locations
- Reflect up to five hourly ancillary service markets with one or multiple market locations for detailed reliability requirements
- Allows specification of firm or non-firm energy markets
- Allows detailed description of pipeline and fuel transportation infrastructure
- Depth-of market modeling of purchases and sales

- Bid/ask spreads and wheeling costs for electric energy market transactions
- Forecast price curves may be imported from other technical or fundamental models or forward market data such as Market Analytics or Data Warehouse
- Supports a library of market price forecast
- Allows separate electric and fuel markets to be used for mark-to-market valuation than for commitment and dispatch optimization
- Ability to model capacity markets

Generation Assets

- Commitment and dispatch simulation of generation assets and dispatchable power purchase contracts
- Models supply of electric energy and five ancillary service capacity products
- Comprehensive coverage of thermal, hydro and renewable asset types including pumped storage, run-of-river pumped storage, combined heat and power, and Wind Power
- Over 50 potential asset characteristics, including startup costs, minimum up and down times, ramp rates, minimum and maximum generation capacities
- Ancillary service capabilities
- Capacity market modeling
- Fuel modeling to represent limited fuels, fuel sequencing, fuel blending, fuel contracts, and fuel spot markets
- Deterministic and probabilistic maintenance outage methods
- Supports full and partial forced outage modeling with choice of Monte Carlo method using variety of outage distributions representing both frequency and duration of outages
- Enhanced Combined Heat and Power modeling
- Modeling of intermittent renewable resources

Retail Customer Load and Tariffs

- Assign customer types to specific load shapes or forecasts
- Flexible assignment of one or multiple customer segments to one or multiple transmission areas
- Support for an hourly load shapes library
- Inclusion of one or multiple customer segments in the portfolio
- Three-part tariff representation (monthly fixed charge, monthly demand charge, and seasonal by TOU energy charges) by customer segment

- Fixed or indexed energy tariff rates
- Able to utilize externally created load forecasts or internally forecast hourly loads from base year load shape and annual (or monthly) peak and average growth rates
- Full stochastic modeling of customer segment loads or load index values
- Load forecasts may be obtained from the Load Forecasting module

Electricity and Fuel Contracts

- Comprehensive coverage of physical and financial contracts
- Contract types include standard forwards, options including complex physical options, swing and tolling agreements
- Data manager for existing and potential physical and financial electricity and fuels forward and option contracts and contract portfolios
- Choice of market location for financial contracts and source/delivery location for physical contracts
- Fixed or indexed strike prices
- Simulation of electric physical forward, swap, and existing electric physical option contracts, including unit contingent backup generation, demand management (load or price strike), and economic simulation results
- Physical transmission contracts between zonal locations and financial firm transmission right (FTR) obligation and option contracts between zonal and nodal (generator) locations
- Detailed Tolling Contract capabilities
- User-definable time patterns with flexible delivery dates and delivery (swing) volumes for electric and fuel forwards and options
- Integrated with scheduled transactions from the Trading and Scheduling module
- Extendable architecture for future inclusion of more contract types

Stochastic Modeling

- General time-series index creation capability, with choice of deterministic (non-random) or stochastic (with random component) indexes
- User may create hourly or non-hourly derived indexes as a function of primary (stochastic or deterministic) indexes and/or other derived indexes

with an Index Equation Builder (to use, e.g., as contract price index formula or basis spread)

- Index drivers (stochastic or deterministic) may be mapped to loads, electricity prices, fuel prices, emission costs, hydro energy availability, generation station maximum and minimum capacity, and transmission link capacity
- Distinct volatility rates by TOU period may be modeled
- Stochastic modeling of correlated entities via short-run and long-run random shocks and mean-reversion
- Choice of lognormal, Markov regime-switching (limited to one entity per study), or normal distributions for stochastic driver entities
- Support of user-defined distributions by importing externally generated random draws
- Short-run stochastic parameters may be statistically estimated with the integrated tool
- Choice of daily, weekly, or monthly random draws (with hourly scaling for electricity prices and loads)
- Automatically estimate volatility and correlation parameters by season for one or more time-series of daily, weekly, or monthly historical data
- Allows user to select from 1 to 12 calendar seasons for estimating season-specific parameters
- Allows for growth rate control term when estimating parameters for loads
- Choice of three types of mean-reversion model distributions: (1) Normal (2) Lognormal (3) Two-state Markov regime-switching (empirical distribution)
- All models include parameter estimates for rates of mean reversion, volatility, and correlation
- Allows user to save parameter estimates to a specified scenario

Results Management

- Output detail controlled from simulation settings to facilitate effective system use
- Output database can be queried using Study Viewer to create one-off views, standard views and export files for deterministic and iteration level data
- Index and Stochastic graphing capabilities
- Flexible output reporting in grid format with Data Explorer and enhanced visualization tool

- Built in Gross Margin Reports and graphs for user defined selection of units in a line graphs and in distribution graphs.
- Marginal cost grid report for up to 400 incremental and decremental capacity levels
- Choice of iteration level hourly results aggregation for storage by daily or monthly time periods
- Time-of-use periods
- Export via XML to Ventyx, Corporate Finance or Third Party systems

Integrating with EnerPrise ETRM

- To provide an combined reporting of physical assets and traded transaction (both physical and financial) both for position and risk reporting utilizing the Planning and Risk Engine for asset assessment and ETRM for deal capture and in ARA reporting.

Integrating with EnerPrise System Optimizer

- Create an Integrated Resource Plan (IRP) with optimized expansion plan from System Optimizer
- Develop corporate emission compliance plans
- Data transferred from System Optimizer to Planning and Risk is expansion plans, emission prices and optimal fuel mix



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