Artelys Crystal Energy Planner

Short to mid-term optimization and planning of energy systems

Artelys Crystal Energy Planner is a proven and innovative software. It enables electricity producers to model realistically their generation resources, taking into account all operational and market constraints. Thanks to its powerful optimization engine, the software takes advantage of all flexibilities of the system. Then it automatically generates reliable least cost production plans together with optimized market bids.

Maximize your operating profit

Key features

- State of the art **optimization engine**
- User-friendly, ergonomic interface
- Multi-scenarios/**stochasticity** handling
- Techno-economic optimization
- **Ready to run**: pre-built assets models and workflows (day ahead/weekly optimization, update of schedules following markets closing or equipment breakdown, storage management, annual plans, …)

- Fully **customizable** model and workflow
- Web diffusion and visualization of results and operators guidelines
- Study management, what-if scenarios and comparison with historical data
- 3-tier architecture : client, server and database for more robustness and integration to your IT system

Some applications

Artelys Crystal Energy Planner is used by various generation managers, from merchant independent power producers to regulated utilities, in America, Europe and Africa to generate more value from their portfolio. Some use cases:

- Optimization of power generation schedules, from day-to-day to mid-term, under annual constraints
- Integrated management of multi-energy portfolio, such as cogeneration plants or district heating and cooling networks
- Stochastic optimization of market sales for intermittent renewable energy sources
- Analysis of production, investment and fuel supply strategies, including risk management
- Daily optimization of hydro turbine loading and dispatch for day-ahead and real-time markets

A customizable workflow that reflects operational processes and increases their reliability

Import ➡ Model ➡ Optimization ➡ Analysis ➡ Export

Import   Export

- Automated data import/export
- Interaction with databases, web services, ...
- Integration in an existing architecture
- Reports automation

ORACLE

PostgreSQL   SQL

X (Excel)   Artelys Crystal Energy Planner   **Web services**

Model

Accurate and complete modeling of the system taking into account a wide range of units, contracts and constraints, with editable parameters

- **Thermal:** min/max generation, efficiencies, fixed and variable costs (fuel costs, no-load costs, start-up costs...), min on/off durations, up/down ramps, start-up curves...
- **Hydro:** (cascaded reservoirs, pumped storage, run-of-river): Head/tail water levels, reservoir levels, net head and discharge-dependent efficiencies, min discharge constraints, rough zones, set points, availability of onsite operators
- **Renewables:** wind, solar, run-of river, geothermal, biomass
- **Storage:** capacity, losses, min/max input/output
- **Load:** electricity, gas, heat
- **Fuel supply contract:** gas, oil, coal, ...
- **Power-to-X:** heat pumps, electric boilers, electrolysers
- **Markets:** Regulated/deregulated markets, Power Purchase Agreements. **European markets**: day-ahead, intra-day, primary and secondary reserve, balancing. **North American markets:** day-ahead, real-time, regulation, reserve

Optimization

- Co-optimization of assets dispatch, fuel management and market bids that significantly increase revenue taking into account all constraints
- Uses the most powerful optimization engine to automatically build schedules within seconds

Analysis

- Quantitative tabular or graphs indicators
- Detailed or aggregated configurable Key Performance Indicators: financial balance, equipment utilization, GHG emissions, fuel consumption...
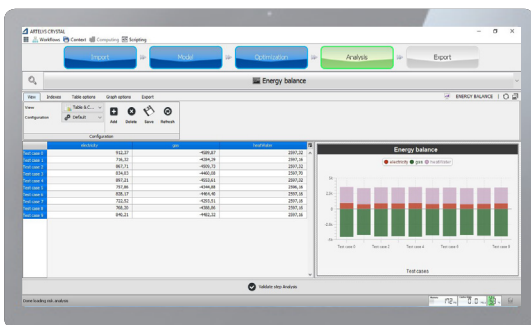
Integration, maintenance and training

Artelys' experts in simulation of energy systems manage the whole process from software development and client customization to installation, integration, training, maintenance, support and evolution.