

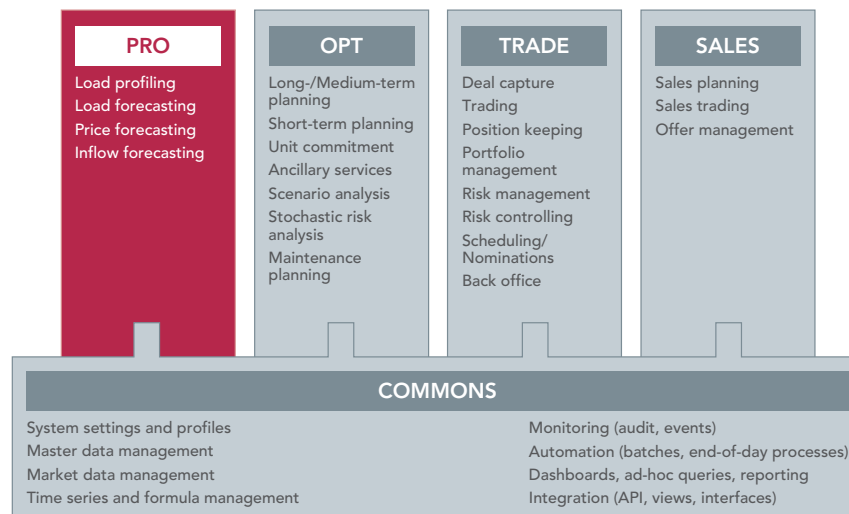
iOPT_PRO



The Forecasting System of the iOPT Energy Industry Solution in the Multi-Commodity Environment

- *Forecasts for load consumption with different methods*
- *Forward curves for prices*
- *Outflow models for inflow forecasts*
- *Standardized time series functions*

iOPT_PRO: FORECASTING TOOLS FOR EFFICIENT AND ACCURATE PLANNING



iOPT_PRO is the multi-purpose forecasting and planning system which is part of the iOPT energy industry solution. It allows for the estimation of short-, medium- and long-term developments of forecast values such as load consumption, market price, and inflow as well as the planning of quantities. Its high degree of automation relieves users from manual tasks but the system also supports the manual processing of the results for refining the forecast quality in the short-term ranges.

Forecasts for different commodities can be made for sales and procurement. The creation of forecasts, depending on the task, uses synthetic load profiling and deterministic or statistical methods that provide the expected value and information about frequency distribution and correlations.

iOPT_PRO allows the definition of any number of forecast models for scenario calculations or for the forecast of grid loads and single loads. iOPT_PRO can be used as a planning tool for depicting planning exercises and scenarios and also as an operation management tool for the automatic creation of forecasts without user interaction.

Results are displayed in graphic and tabular form for analysis. In addition to forecast creation, ex-post analyses (historical analyses), scenario calculations, and model comparisons are also possible.

Benefits

By using established and high-performance methods, iOPT_PRO provides high-precision forecasts which minimize operative risks and serve as reliable input values for planning and procurement.

Results from forecasts are also made available as input values for sales, optimization, and contract/risk management in iOPT or other systems for further processing. This allows easy integration with all business processes and releases long-reaching synergistic effects.

iOPT_PRO provides automatic and integrated bottom-up or top-down forecasting that supports the process from measured data management and forecasting to portfolio management and schedule nomination. Due to an active workflow and alarm system, and in spite of high complexity and numerous process steps, only a few employees are required to operate the system.



Functional Characteristics

iOPT_PRO supports planning horizons from the next few hours up to several years. Different models and methods can be used depending on planning horizons. iOPT_PRO consists of the following functional units which have a common interface:

- Load forecasts and similar day method
- Forward curve builder
- Inflow forecasts

The **Statistical Forecast** method for load consumption uses the ARIMAX (Autoregressive Integrated Moving Average with eXternal variables) method. This method, in combination with the special model composition, allows the flexible creation of forecast models with any number of external variables, resulting in a clear and transparent model structure.

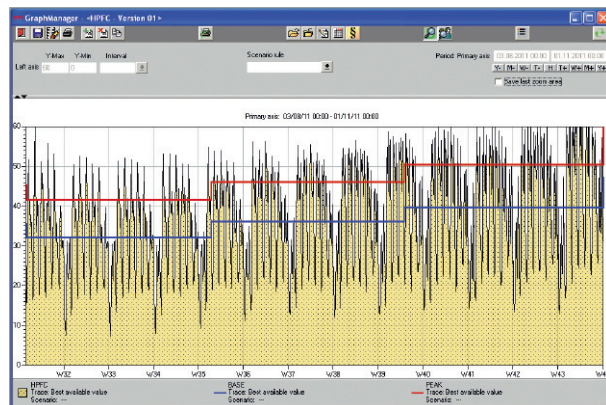
External variables provide parameters whose values are available for the historical period as well as for the future. Number and granularity of the external variables can be freely defined and can be switched on and off during operation. Day types (Saturday, Sunday, holiday, etc.), influencing load and price forecasts, are automatically considered for these forecasts.

Extrapolations of load curves are especially useful for determining single load forecasts without discernible external variables. For this, the averaged values of a day type are inserted for each calendar week within the forecast horizon. This ensures that both seasonalities and structural differences are considered in the forecast.

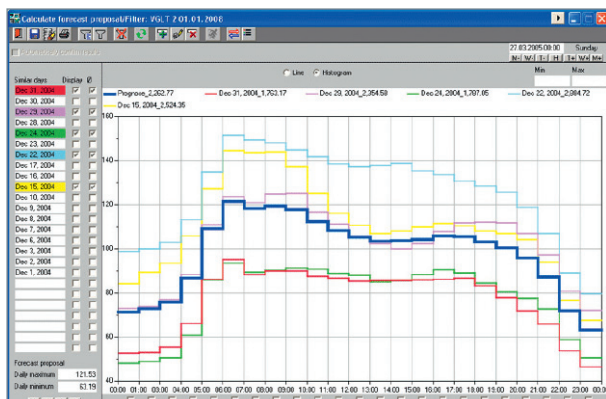
The **iOPT time series management** supports forecast functionalities for load forecasts by means of temperature-dependent regression lines and the roll-out of daily, monthly and yearly quantities from standard load profiles. In addition, yearly quantities can be distributed to months using a profile and considering historical values.

The **Similar Day Method** supports daily planning and creates premium forecasts for a freely selectable day. Appropriate similar days are suggested by the system using different search criteria. These days are graphically displayed and provide the basis for the forecast which can be directly manipulated.

The **Forward Curve Builder** calculates hourly forward market curves. Calculations are based on typical characteristic data in the past and on current market data. In addition, the special treatment of holidays and weekends is integrated.



The **Deterministic Forecast** method calculates inflows, e.g., to reservoirs, based on outflow models, and forecasts values for the inflow to reservoirs or run-of-river power plants. In contrast to typical statistical forecasts, the future inflow is only calculated from weather data over a specific horizon. Here the typical exogenous variables are, among others, temperature, precipitation, or degree of absorption of the subsoil. In addition, catchment areas, which are divided into sub-catchment areas, are used in the forecast for depicting landscape characteristics.





iOPT_System Solution

iOPT is an integrated system solution for the energy industry which, due to its high degree of flexibility, is used all over Europe. It focuses on the markets for electricity, gas, oil, coal, certificates, foreign exchange, and agriculture / soft commodities.

iOPT is completely customized to the requirements of deregulated markets—the experiences of our customers combined with the extensive know-how of our employees continually flow into further developments.

The modular structure allows **iOPT** to be implemented either as a complete solution or in individual subsystems. Due to this flexible approach, **iOPT** can be used by companies of all sizes—from energy producers, industrial corporations to public services. Every

customer receives an **iOPT** system that is entirely customized to their requirements and that increases the added value of their company.

The **iOPT** energy industry solution provides high flexibility, efficiency, and economic versatility due to its multitude of functions which can be activated on demand, no matter which modules make up the individual profile.

Due to its flexibility, **iOPT** can be customized at optimal costs to the individual requirements of companies of different sizes. Furthermore, **iOPT** supports companies in their effort to enter new markets and to react quickly and efficiently to changed conditions.



IRM is a leading software provider for system solutions in the energy sector. The company, which was founded in 1998 in Vienna, has over 120 employees and more than 60 references in numerous countries.

- IRM GmbH
Wienerbergstraße 31–39
A-1120 Vienna
- T +43 1 811 30-0
F +43 1 811 30-700
- office@irm.at
www.irm.at