energyTRADE

Software for planning and optimization of the daily electricity and heat production in district heating and CHP plants

EMD International A/S
www.emd.dk

Introduction

energyTRADE is an advanced and user-friendly software for planning and optimization of the daily operation of any type of energy plant. With energyTRADE the plant operator can easily monitor, plan and control the entire production from one system.

From a single screen, the entire plant is operated by energyTRADE. The operator can monitor, plan, control and participate in balancing markets and during holidays, weekends and busy hours enable energyTRADE to automatic bidding according to the operating parameters.

energyTRADE can optimize the planning of simultaneous bidding in the spot, regulating and primary reserve market. The software interacts between the plant and the balance responsible party (BRP) and bidding prices can easily be submitted to the BRP with only one click.

Based on various input data such as weather forecasts, electricity spot price prognoses, expected heat demand, storage content, etc. the software calculates the optimal operation in quarterly, half hourly or hourly time steps. The result is a detailed graphical and numeric production plan containing the proposed operation for each energy unit. The production plan shows the amounts of energy, the estimated economic result for the specified period and the bidding prices. With energyTRADE you are always certain to operate at the lowest possible net production cost.

An additional benefit of an installation of energyTRADE consists also of a precise energyPRO model set-up of the plant. The energyPRO set-up are ready for the plant's consultants to use in feasibility studies whether it is sales, technologies, price levels etc. so time and money in setting up an energyPRO model can be saved.
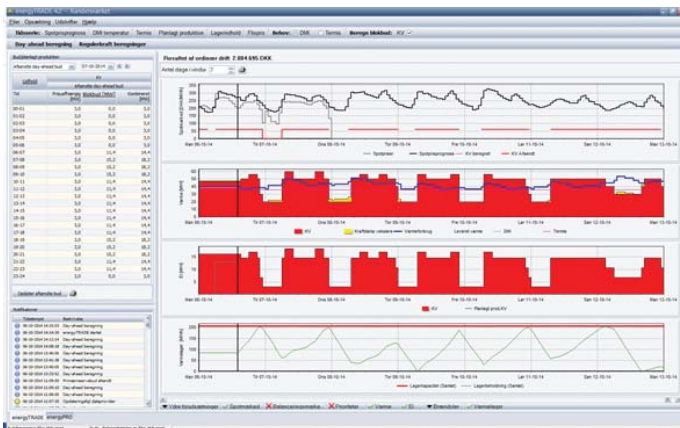
energyTRADE user interface. The top menu shows the preconditions, these differs from set-up to set-up and depend on the requirements of the operation. The main window shows both the historical, current and prognosis for the next days in graphical form. The first graph shows the spot market prices and the bid price [price/MWh], second graph shows the heat output [MW], the third electricity [MW] and finally the content of the heat storage [MWh]. Left window is divided in two. The top is to see and tender different markets, the bottom shows the events in the system and the alarms.

Application and benefits

energyTRADE offers fast and easy economic optimization of the operation of all kinds of energy producing plants. The benefits of this software solution is:

- energyTRADE set-up is customized - each plant set-up is based on each plant pre-conditions and requirements
- Graphical overview of the historic, present and future operation
- Forecasting heat demand based on weather prognoses etc.
- Calculation of the lowest possible net production cost based on weather, price prognoses and efficiencies.
- Schedule plant production and submit bids on electricity markets with just one click
- Calculation of the expected turnover
- Possibility of automatic bid submission
- Upon activation, automatic update of operation schedule

energyTRADE has been developed by EMD International A/S to support combined heat and power plants to fulfill the needs of one tool for planning, operation and bidding in all kinds of plants. All kinds of prognosis tools can be included in the set-up, as well as the connection to the BRP, there are no limits to the number of interfaces.

Reference

Verdo Production A/S in Denmark operate the District heating plant in Randers DK. The plant delivers heat to the city of Randers and the surroundings, it is equivalent to 36.500 addresses, and approximately 94 % of the city of Randers.

The daily business planning can be a complex task that is not always performed by the same person. Therefore Verdo wanted a single, uniform tool that could systematize the planning process and involve the restrictions that apply to their particular work.

Verdo in Randers have relatively small storage capacity and it makes great demands on operational planning, local and precise weather forecasts and prognoses.

Today, Verdo uses energyTRADE to calculate the optimal operation and planning and submitting bids on the spot, the regulating and reserve markets. By having all the information in one place, providing energy trade operator a detailed overview of the system and with the ability to automate bid, the daily routines becomes less time consuming.

Set-up

An energyTRADE set-up is individually made according to the properties of the plant and its interfaces. The figure below shows a set-up with two databases being the interface from the SCADA and the BRP to and from energyTRADE, it is possible depending on the requirements from the plant that the BRP communicate directly with the SCADA and energyTRADE can be set-up using the protocols needed.
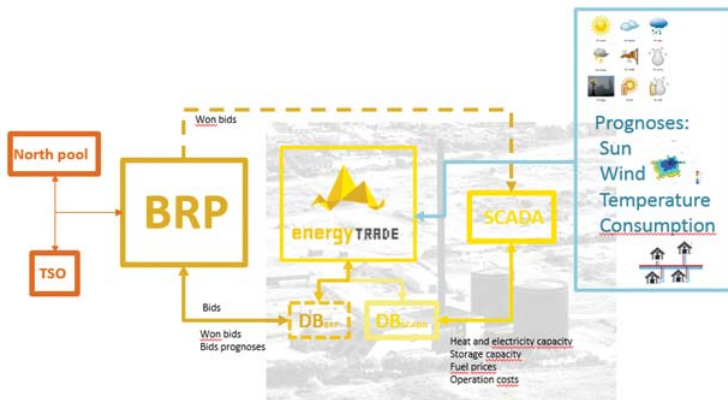
Simplified energyTRADE set-up example at the plant. Each set-up is individually made according to technology, preconditions and other requirements at the plant.

Moduler
PLANNING
The PLANNING module is the basic module in energyTRADE which allows you to calculate the operation for the coming day(s). With the PLANNING module you can optimize trade of electricity on either a day ahead wholesale market or fixed tariffs

BALANCING
With the BALANCING module you have the possibility to include more markets in your calculations. The BALANCING module allows you to add any number, all in all 5 markets, and any type of balancing markets such as intraday, regulating, reserve markets.

COMMINICATION
With the COMMUNICATION module you have the possibility to communicate with the energy plant's balance responsible party and submit bids on trade of electricity with only one click. Once the bids have been submitted, you will receive a notification on the trades made and the production plan will then be updated automatically according to these trades.