



Brønderslev Forsyning

Market optimization of local energy plants

Local energy plants are able to deliver needed flexibility for integrating fluctuating productions from wind and solar, when operating in whole sale markets and balancing markets and being equipped with CHP, electrical boilers, heat pumps and large thermal storage.

The investment in this flexibility is complex to analyse, and the market based operation handling large thermal storage require new tools for optimizing the daily market biddings in both whole sale and balancing markets. EMD provides the energyPRO software package for the investment analysis and the energyTRADE software package for daily market biddings. To meet the new requirement of the energy market and the increased application of multi-fuels strategies, the HEAT 4.0 project has further developed component models and MILP solver. within the software delivered by EMD.

EMD's energyPRO software package

energyPRO is the leading software for modelling and analyzing complex energy projects dealing with the

supply of combined heat (process heat, hot water and cooling) and power.

energyPRO is used for detailed technical and financial analysis of both existing and new energy projects, and has a very user-friendly interface providing the user with a clear overview of the project. The software offers a long range of technical and economic reports including graphical presentation of the simulated operation which provides both a general overview and an in-depth understanding of the dynamics in a complex energy system.

EMD's energyTRADE software package

energyTRADE is an advanced software tool for planning and optimising daily operation of energy plants to achieve the lowest production cost of heat. With its user-friendly interface, energyTRADE allows the plant operator to easily monitor, plan and control the entire production from just one screen.

energyTRADE intelligently optimises planning of simultaneous bidding in both the day-ahead and balancing markets.

PARTNERS:

NIRAS (project manager), Dansk Fjernvarme, Brønderslev Forsyning, Trefor Varme, Hillerød Forsyning, Danfoss, Kingspan/Logstor, EMD International, Enfor, Neogrid Technologies, Danfoss Leanheat, NorthQ, Kamstrup, DESMI, Center Denmark, DTU, and Aarhus University.



Key results within HEAT 4.0

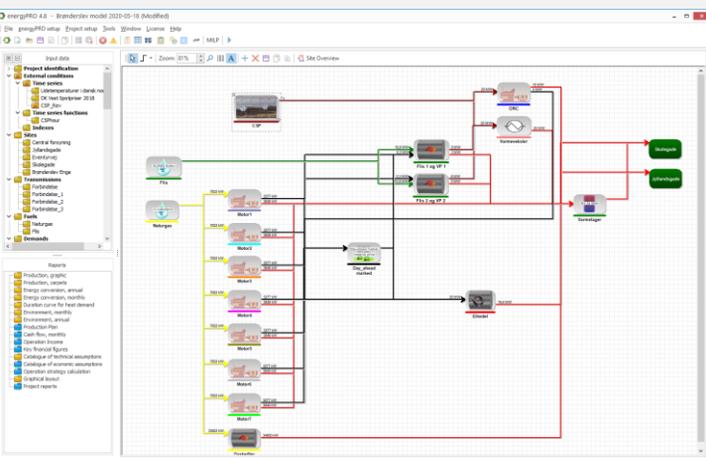
Within the HEAT 4.0 project, we have cooperated with complex district heating plans, and it has been exceptionally attractive having this possibility to develop new solutions and test our software, energyPRO and energyTRADE in order to match the new requirements in the energy market.

For example, we had made major adaption of our software solutions to be able to calculate the complex plants participating in the project. Amongst others, improved HP and concentrating solar power, and implemented a new MILP solver 5 times faster.

Furthermore, we have succeeded in making our data providers capable to communicate with the balancing responsible parties of the plants.

Due to the cooperation with other partners in the project, our own software solutions are now as well adjusted to communicate with other software solutions, which is a big advantage for the district heating companies in general.

As a positive consequence of this adaption of our software, energyPro and energyTrade are today custom designed to a much larger group of district heating plants, for easy planning their heat production and market biddings or when the need for a complex investment analysis arises.



More about HEAT 4.0

- Innovation Fund Denmark's investment: DKK 25 million
- Total budget: DKK 36 million
- Duration: 3 years
- Official title of Innovation Fund Denmark's project: HEAT 4.0 – Digitally supported Smart District Heating

EMD International A/S (EMD) is a software and knowledge center supplying software, consultancy, training and know-how to companies and institutions worldwide in the pre- and post-construction phases of wind farm projects, hybrid power solutions and complex energy systems schemes.

The software solutions are Commercial-off-the shelf (COTS) products, that are able to be adapted to the conditions worldwide.

EMD have worked with district heating for more than 20 years. More than 2000 companies have worldwide bought EMD's solutions.

Get in touch with us:



Ext. Ass. Professor and
PhD Anders N. Andersen

ana@emd.dk

+4540198066