



Optimize
your heat
and power
production!

Powel Optimal CHP - Short-term production optimisation

Powel Optimal CHP (POCHP) is an optimisation tool used for short-term planning of power systems containing combined heat and power plants. Short-term planning is production planning with time horizons of up to a few weeks, with the purpose of utilizing accumulators, available fuel and other flexibility in manner that maximizes the profits for the produced power and heat.

POCHP is based on a deterministic mixed integer optimisation model. It is able to produce optimal solutions with a near-optimality guarantee in a moderate execution time.

About Powel Optimal CHP

Optimal CHP computes production plans for heat and power and unit commitments. POCHP can also calculate bids to the day ahead market as well as bids to the reserve market.

Purpose

The purpose is to produce a plan that maximizes total expected profit over the planning horizon.

The constraints include energy balances, heat balances in accumulators, physical limitations on combinations of power and heat production and fuel consumption, need for oil support when run on low throttle, limitations on cooling, and requirements on reserves up and down. Other constraints are time-dependent limits on heat and power production and ramping of boiler.

Advantages

- Integrated with the Powel Smart Energy
- Short solution times
- Flexible, transparent model

Use areas

- Provide input for dispatch and bidding
- Intra-week and next-day planning (both pre-spot and post-spot)
- Analysis, simulation, what-if
- Revision planning

Main features

- Mixed integer linear optimisation model
- Start and stop costs of plants
- Different fuels
- Different modes of production to handle non-convexities and production combinations which handles reserves
- Flexible time resolution (varying coarseness)
- Time-dependent limits for heat and power production and fuel consumption
- Asymmetric spinning reserve requirements
- Prices and/or constraints for keeping capacity in the reserve markets
- Heat accumulators
- Treats heat as a load or as a marketable commodity
- Limits on cooling
- Optimization engine can be put on separate server

User interface

You can use Powel Optimal CHP together with Powel Nimbus. Nimbus is a process-oriented interface, which supports organizing the planning into tasks consisting of a number of steps. It is fully user-configurable, and Powel consultants can help you build the initial application from templates.

System requirements

Powel Optimal CHP requires the existence of a valid license for IBM ILOG CPLEX. Such a license can be purchased from Powel.

In order to get a fully integrated solution, it is also necessary to install:

- Powel Time series kernel
- Powel Mesh and
- Powel Nimbus

We recommend a Windows server with RAM-memory of minimum 8 GB. The solver (CPLEX) can utilize multiple cores.

Contact

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