

# USING MODELING TO BETTER EXPLOIT DISTRICT HEATING UTILITIES PRODUCTION PLANTS

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## **Summary**

Industrial domains concerned by the combined production of heat and electricity (among other utilities) from fossil fuels are numerous: petrochemical plants (refining), large chemical transformation plants, paper mills, but also district heating networks.

District heating networks stand out with a production process that involves specific equipment such as DHN process feeds, deaerators, water heaters.

It is important for district heating companies to be able to optimize the production on a daily basis but also throughout time. This must take into account an environment characterized by changing regulations, a volatile economic context and strong external and internal constraints.

The presentation is based on the case of the French UEM (Usine d'Electricité de Metz) district heating project and illustrates how software modelling, simulation and optimisation can help respond to such questions. It describes a practical and accessible method to manage energy production in a rational and economically beneficial way, within the context of complex production plants in which both real time and projected choices of production must be made.

Ariane is the software that was used during the project. In particular, it was used for the following purposes:

- Technical and economical modelling of the plant
- Online optimization (real time, at a given time)
- Automation of repetitive calculation (predictive, retrospective) with the integration of the notion of time horizon (hour per hour, day per day, annual balance split into weeks...)