ENGINEERING
TOMORROW

Danfoss

10%
heat loss reduction
due to a lower
supply temperature

Plan, visualize and optimize District Energy systems with Leanheat® Network

A thermo-hydraulic modeling tool, developed specifically for use in District Energy systems

Plan, visualize and optimize
District Energy systems to achieve
improved and sustainable
network operation

Ensure
**optimal
and
stable**
distribution

Why use **Leanheat® Network**?

Effectively build and maintain district heating and cooling network models

Simulate hydraulic and thermal conditions in district heating and cooling networks

Optimize network supply temperatures and pressure conditions according to the actual demand needs. Lower your network losses, as well as production & pumping costs

Predict and understand future consumption on your network based on state-of-the-art AI, taking into account historical data and weather forecast

Plan optimal techno-economical production mix, optimizing production costs and increasing income from CHPs while still ensuring quality of supply

17%
Investment
reduction
in new networks,
connections and
refurbishments

District Energy is the most **sustainable approach** for the mitigation of climate change and improving energy efficiency by providing optimization solutions and optimal temperature control for both demand and supply side.

We are already in the **4th generation of District Heating** and the District Energy sector has clearly outlined the future. Today, we are heading towards multi-source energy rather than single sources. This means transitioning from fossil-based energy to renewable and surplus energy and from high temperature to low temperature District Heating. The transition process is rather complex, and not just connected to, but profoundly depending on Digitalization, which is where Danfoss comes into the picture. For the District Heating utilities, the transition implications are both commercial and technical:

Commercial implications
- Source optimization
- Competitiveness
- Sustainability
- Demand planning
- Cost optimization

Technical implications
- ΔT optimization
- Pump optimization
- Peak load management
- Digitalization

50%

of Europe's heat demand could be covered by district heating in 2050

To realize the 50% potential, 21,500 new district heating systems need to be established by 2050 – 16,500 before 2035.

That is why Danfoss developed Leanheat® Network for you **To do more with less**

To face the technical challenges as a result of the constant expansion of the heating networks and the new EU legislation, the District Heating utilities need new tools and software that will allow for improved project planning and cost optimization.

Leanheat® Network is a thermo-hydraulic modeling tool, developed specifically for use in District Energy systems to support the planning, design, and operational processes. Using Leanheat® Network, the planning process for the District Heating utilities will invariably result in a decrease of the cost for CapEx and OpEx.

User **Advantages**

Optimal design of networks

Cost reductions through reduction or elimination of bottlenecks in the distribution system

Overall system optimization setpoints to local control units

Rational operation system based on physical principles and operation to limits

Further **Features**

1. **The Leanheat® Network application suite consists** of a basic UI interfacing to several different data sources that contain the required information to build models from GIS data and run online operations via SCADA.

2. **The Leanheat® Network system is scalable**, which allows for running as a stand-alone system for simple design setup; or running as a more advanced online system using a server to run the cyclic operations interfacing for example to a SCADA system

3. **Hydraulic and thermal model.**
   All network simulations are based on a model of the actual physical network. Leanheat® Network uses the following (multiple) elements for the model creation. Heat plant object; Pipe object; including support for twin pipes; Node object; Pump and Valve objects; including shut-off valves; Accumulators; Heat Exchangers; Shunts and Heaters

Danfoss Leanheat® Network as a **Development Support Tool**

> **Optimization of expansions,** refurbishments and new connections

> **Analysis of impact** of expansion, refurbishments and new connections on the rest of the network

> Development of **contingency plans**

> **Database of knowledge** about network

Danfoss Leanheat® Network as an **Online Operational Support Tool**

> **Calculate** optimal hydraulic parameters and **apply** them

> Overview of the **temperature**, **flow** and **pressure** at any point in the network

> Overview of **the composition of production sources** at any point in the network

> **Simulation of future conditions** based on weather prognosis

> **What-if analysis** for daily operating challenges and critical events

> Planning of interventions with **effective execution** and **quality of services**
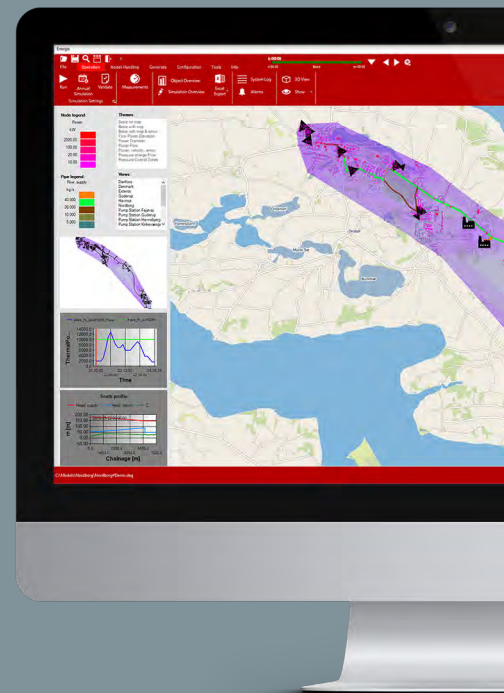
Design and Operate Your District Energy Distribution System **Optimally with Leanheat® Network**

**Overall CapEx and
OpEx Decrease**

Energy and
Cost Savings

Ensure **optimal** and
Stable distribution

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