

ENGINEERING
TOMORROW

Danfoss

Future of District Energy systems

Ismail Serhan Ozten

**Head of Danfoss HS
ME-Africa**



DIGITALIZATION



ELECTRIFICATION



URBANIZATION



GLOBAL MEGA-TRENDS

transforming our world

CLIMATE CHANGE



District cooling

The energy demand for cooling will rise by **72%** in the period from 2000-2050 – **District cooling** is one of the most sustainable solutions to meet the growing demand for indoor cooling

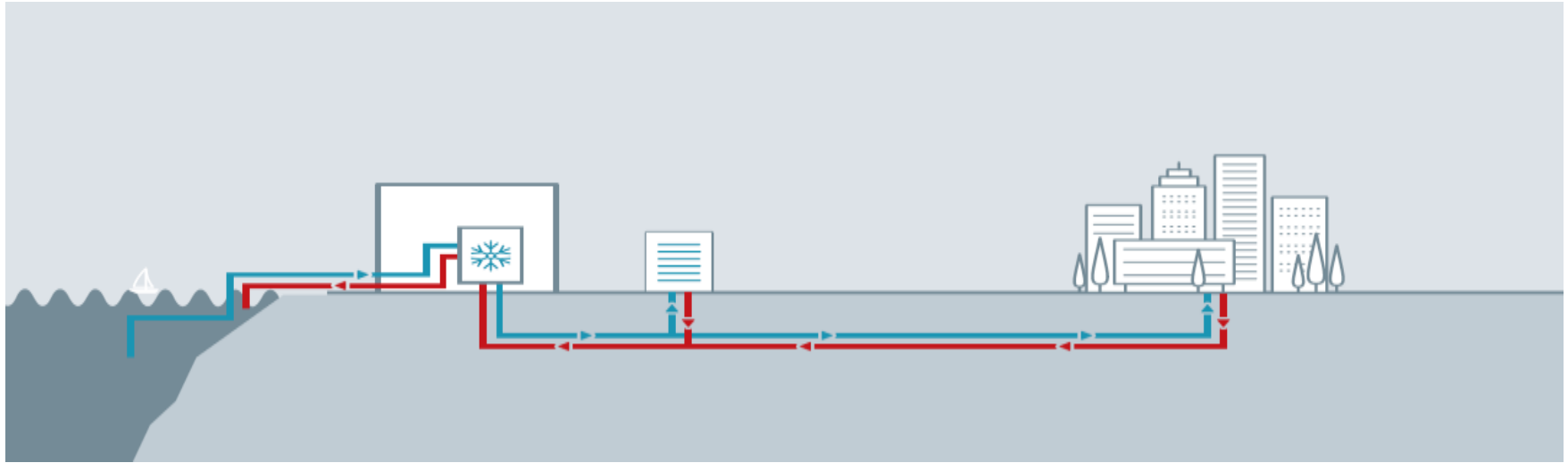
District cooling is a climate-resilient, **resource-efficient** and affordable solution

By investing in district cooling, **cities can become much more energy efficient**

Supporting the objective of reducing Europe's greenhouse gas emissions **by 80-95% by 2050**



Trends in District Energy sector – District Cooling



From Split and stand-alone Chillers to...

DISTRICT COOLING NETWORK

From constant to...

VARIABLE FLOW

From single source to...

MULTI-SOURCING

Trends in District Energy sector



Commercial implications

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

Technical implications

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

MULTI-SOURCE

VARIABLE FLOW
TOTAL COST OF OWNERSHIP

DISTRICT COOLING
NETWORKS

Danfoss District Energy product portfolio

From components to optimization tools & services



Multiple factors influence on network operations

Cooling consumption and primary network hydraulic conditions continually change due to:

Daily

change overs
(morning/
evening)

Seasonal

change overs
(winter/
summer)

Building renovations

(reduction in
energy
consumption)

Network extensions

(increase of
energy
consumption)

Sources dynamics

(switch
in/out)

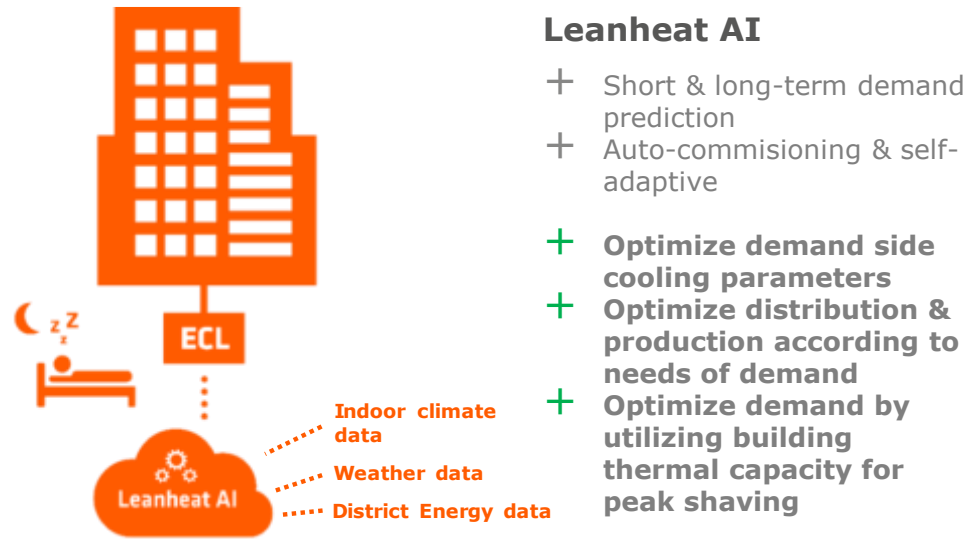
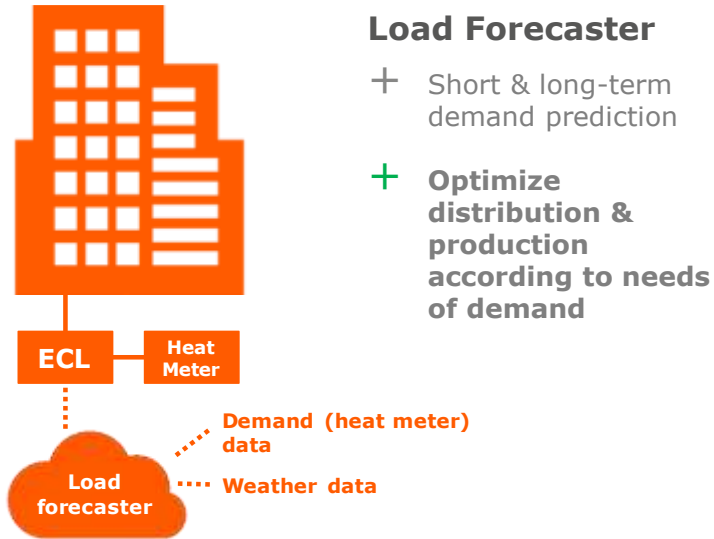


Predict and **optimize** your demand

DEMAND PREDICTION

VS.

DEMAND PREDICTION & OPTIMIZATION



Knowing how your consumers will behave is the basis for optimal operation of your district energy system.



Understand and optimize your consumers

Traditional building



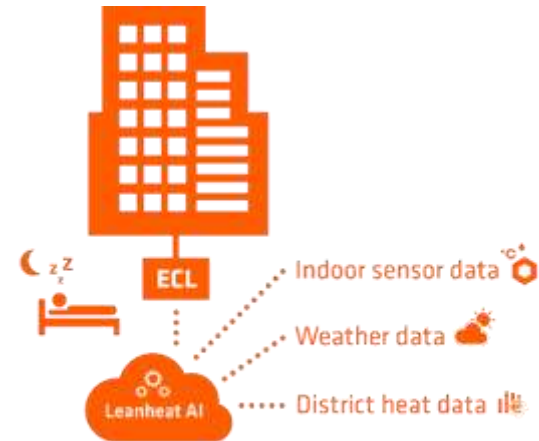
Heating curve + settings

$$T_{ref} = T_{VK} + (2,5 \times VK \times (T_{rum.set.quirn} - 20)) + RI$$

- ➖ Manual configuration
- ➖ Not predictive



AI-controlled building



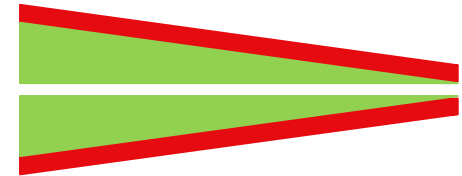
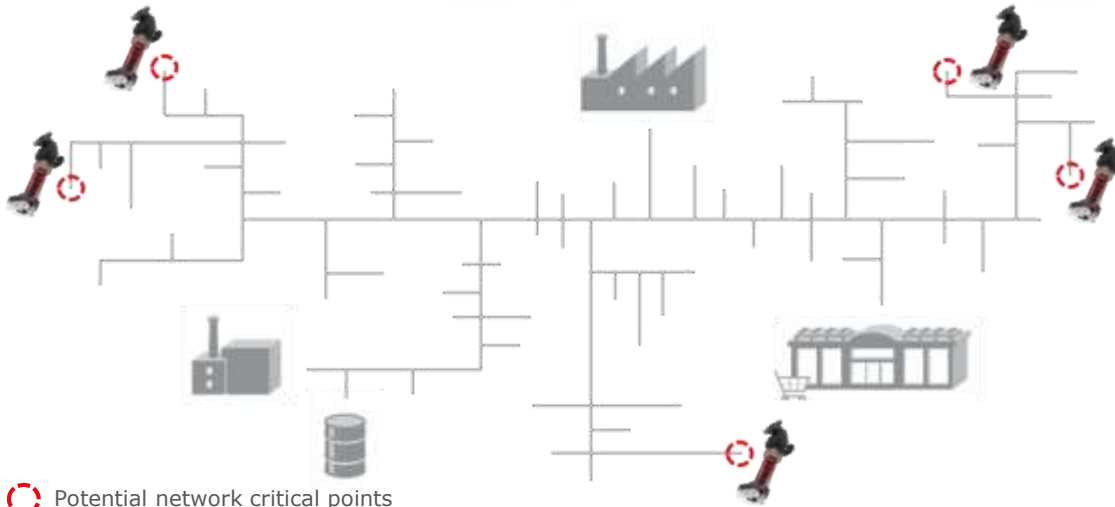
- ➕ Adaptive (no configuration)
- ➕ Predictive

Intelligent network balancing

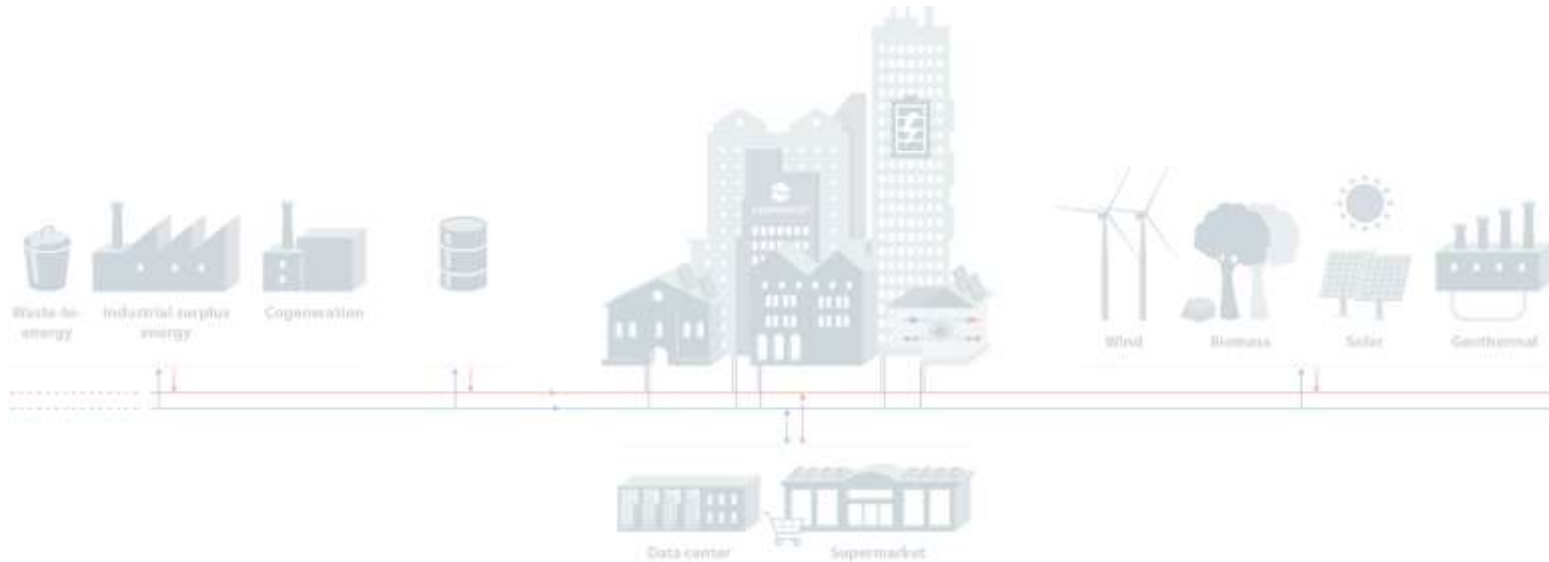
Remote adjustment of diff. pressure on branches or end points

Maximize optimization of network hydraulic modes

Improved distribution stability, lower pumping costs and return temperatures



Danfoss, **your partner** for urban efficiency.



Thank you!