

# CAN DISTRICT HEATING BE SELF-LEARNING?

## Intelligent data use in Smart Cities



In recent years, developments in IoT devices such as temperature sensors and remotely read smart meters have accelerated very quickly.

The area of district heating technology is already enjoying great savings, for example, with the entry of remote metering. But the introduction of smart meters, temperature sensors and other IoT devices in the heating supply network, has provided untapped potential to make district heating greener and more economically sustainable.

### It's all about data

Today, flow temperature is adjusted based on a combination of different data sources. This can be weather forecasts, historical consumption data and information about how the weather usually is on that particular day or time. This forms the basis for flow temperature adjustment, which is often done manually, supported by software developed specifically for the purpose. The problem is that this software is often more than a decade old, meaning it can't take advantage of newer, more detailed data.

### Greener and more competitive district heating

Leading experts in data and artificial intelligence have uncovered the potential of using more data-intelligent systems to adjust the flow temperature. They estimate that not only will supply companies be able to improve temperature optimization, they will also have a more detailed overview of the nature of the supply

network. This includes the surrounding soil, pipe insulation, leaks and other deviations. At the same time, a more intelligent district heating system will enable us to store and utilize surplus renewable energy in the heat supply network.

If the opportunities are fully exploited, the new systems can help make the district heating cheaper while saving large quantities of CO<sub>2</sub>, thus helping to support municipal climate objectives. It is also estimated that the payback time by switching to more data-intelligent systems will be just a few years.

### IDASC uncovers potential

The IDASC project aims to collect and disseminate experiences about opportunities surrounding the self-learning systems. As part of the project, IDASC will test different models for using more real-time data in district heating, meaning senior executives, decision-makers and politicians involved in district heating can be given the best possible conditions for assessing its potential. This includes technical advantages and economic savings, as well as its CO<sub>2</sub> reduction potential.

HOFOR – Greater Copenhagen Utility is the test partner for the project, testing a district heating network serving 25 apartment buildings. Here, a method will be developed to use smart meters from district heating customers for data-driven temperature optimization. The trial period will begin with the start of the 2019 heating season.



WITH NEW AND MORE INTELLIGENT METHODS FOR TEMPERATURE OPTIMIZATION, WE CAN USE METEOROLOGICAL DATA BETTER, MINIMIZE PEAK LOAD PRODUCTION AND GAIN GREATER INSIGHT INTO THE LOSS OF HEAT IN THE TRANSMISSION GRID AND THE REAL NEEDS OF THE END-USER – ALL FOR THE BENEFIT OF BOTH THE ECONOMY AND THE GREEN TRANSITION.”

HENRIK MADSEN, PROFESSOR, DTU COMPUTE



## THE SELF-LEARNING DISTRICT HEATING SYSTEM CAN:

- optimize temperature and flow control
- enable peak load reduction.
- improve link between sustainable energy sources and district heating supply.
- create significant reduction in costs and CO<sub>2</sub> emissions.
- reduce maintenance costs, as the system is continuously and automatically adjusted.

## PROJECT PARTNERS



## TESTPARTNER



## FURTHER INFO:

Project period: 2019 - 2020

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AT HOFOR, WE HAVE INCREASED OUR COMMITMENT TO USING DATA IN A MORE ADVANCED WAY WITH NEW TECHNOLOGY. USING DATA FOR NEW PURPOSES WILL ENABLE US TO REDUCE HEAT LOSS IN THE DISTRICT HEATING AND REDUCE CO<sub>2</sub> EMISSIONS AND ULTIMATELY THE COST FOR THE END USER.”

CHARLOTTE SØNDERGREN, DEPARTMENT MANAGER, HOFOR