

DIEHL
Metering

Transitioning to Smart District Heating

Støvring Kraftvarmeværk a.m.b.a.

37° C

17,212 kWh

64° C





Støvring Kraftvarmeværk a.m.b.a. is a typical Danish district heating company. The utility is publicly owned and supplies district heating to the small town of Støvring. Through its 64 km network of main pipelines, it serves more than 2,600 households. The company has its own thermal power plant, which features a unique architecture, and uses three gas engines to produce electricity and 65,000 MWh of heat annually.

For Støvring Kraftvarmeværk a.m.b.a., environmental concerns are a priority. In Europe, heating and cooling account for 51% of total energy consumption, generating considerable CO₂ emissions. The utility recently took the innovative step of building Denmark's largest heat pump to no longer use any gas, coal or oil. The Diehl Metering fixed network solution and the pioneering new air-to-water heat pump enable the utility to reduce its CO₂ emissions by 80% from 21,674 tonnes/year to 4,324 tonnes/year. This helps it actively contribute to the Danish government's target of achieving a 70% reduction in domestic CO₂ emissions by 2030.

However, before modernization began, the company's network depended on mechanical heat meters that had to be read manually by the consumers. To update the system, a new smart metering solution was designed by Diehl Metering, based on ultrasonic energy meters and data analysis using the powerful IZAR@NET2 software. Today, reading and billing are fully automated, and anomalies such as water loss and inefficient consumer behaviour are quickly identified and resolved.

Furthermore, the intelligent analysis of its data allows the utility to improve its network efficiency, further contributing to reducing CO₂ emissions and addressing the sector's energy consumption issues.



80%
REDUCTION OF
CO₂ EMISSIONS

The fixed network solution and a new air-to-water heat pump enable the utility to significantly reduce its CO₂ emissions.



67,000€
COST SAVINGS

Every degree reduction in return temperature is equivalent to a major cost saving of DKK 500,000 (approx. €67,000) per year.




10 M³
REDUCTION
OF WATER
LOSS PER DAY


Water loss has been reduced in the network and in households from 15 m³/day to 5 m³/day.




THE CHALLENGE: INCREASE ENERGY EFFICIENCY FOR GREATER SUSTAINABILITY

The aim of the project was to increase energy efficiency for a more sustainable heat supply and improve the operational efficiency of the extensive pipe network.

 Prior to the solution, Støvring Kraftvarmeværk a.m.b.a. was using mechanical heat meters. These relied on a postcard procedure to transmit meter readings. Consumers had to read the meter values themselves, write them in a form and send it by post. The meter data was then entered manually into the billing system by employees of the utility. The whole process was time-consuming and heavy on resources. It was also highly susceptible to human error.

 In addition, Støvring Kraftvarmeværk a.m.b.a. was repeatedly confronted with costly water losses averaging 15 m³ per day. Consumers had to deal with leaks and pipe bursts in their homes. If not detected in time, these could cause major damage to the buildings. The problem was exacerbated by the fact that the mechanical heat meters, many of which dated back to 1992, were not equipped with integrated communication. This meant consumption data could not be automatically transmitted, making timely detection of leaks almost impossible.

 Furthermore, outdated insulation in the pipe system meant that Støvring Kraftvarmeværk a.m.b.a. was continuously losing energy, resulting in higher operating costs and low energy efficiency throughout the heating network. Since the mechanical meters were not capable of providing up-to-date readings of temperature conditions in the distribution network, the utility was unable to control the forward and return temperatures efficiently. This resulted in unfavourable (low) temperature spreads and high return temperatures, further increasing costs.



THE NEED AT A GLANCE

The Danish district heating company Støvring Kraftvarmeværk a.m.b.a. wanted to improve its meter-reading process to save time and reduce costs. Its key requirements were to detect water losses more quickly and optimise the difference between forward and return temperatures. To achieve this and the overall target of a sustainable energy supply with a corresponding reduction in CO₂ emissions, it needed regular, up-to-date meter data, enabling it to better analyse and manage its network.



THE SOLUTION: SMART AMR INFRASTRUCTURE SOLUTION WITH SHARKY 775 ULTRASONIC ENERGY METERS

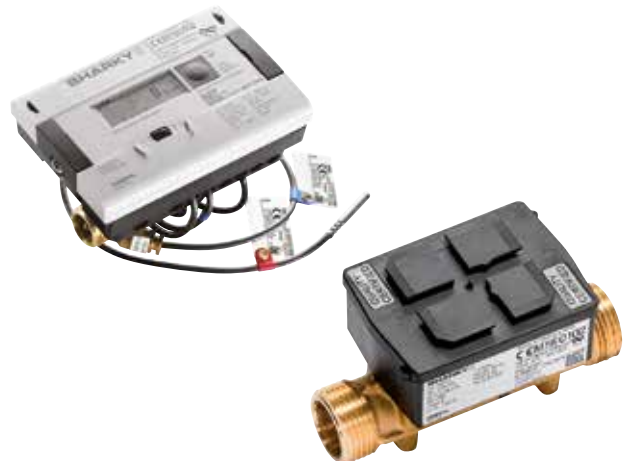
Working with Diehl Metering, Støvring Kraftvarmeværk a.m.b.a. implemented a comprehensive smart metering solution. The old mechanical heat meters were replaced by a total of 3,065 SHARKY 775 ultrasonic energy meters. In addition, SHARKY FS 473 ultrasonic flow sensors were fitted in the return pipe of each house to offer consumers the benefit of intelligent leakage protection.

Due to an integrated radio module, the ultrasonic meters are ready for automatic reading immediately after installation. Permanently-installed receivers regularly collect data recorded by the SHARKY 775 meters, including forward and return temperatures, flow rate, energy consumption and alarm alerts. The optimized cost-effective positioning of receiving antennas at strategic locations, such as on the chimney of a taller building, ensures that all data is reliably transmitted.

The data recorded by the receivers are automatically forwarded to the IZAR@NET2 Meter Data Management Software (MDM) installed on site at Støvring Kraftvarmeværk's a.m.b.a. headquarters. The software not only provides the utility with central monitoring of its distribution network; it also interfaces with the company's billing system, allowing it to automatically bill consumption on predefined dates.

The SHARKY 775 meters in the forward pipe are connected to the SHARKY FS 473 ultrasonic flow sensors, allowing them to automatically record and compare flow rates in the forward and return pipes. If any value deviates from a predefined range, the ultrasonic energy meter sets off a leakage alarm. This means a burst pipe can be detected within just 90 seconds. The system also identifies low flow rates caused by other sources, such as a dripping heater.

Using IZAR@NET 2, Støvring Kraftvarmeværk a.m.b.a has access to all meter data including the flow and return temperature for more detailed analyses. Thanks to the the swarm analysis function of the MDM software, the difference between forward and return temperature (spread) of each SHARKY 775 meter is displayed and weighted with the energy consumption. Unfavourable - low - temperature spreads can be detected automatically and promptly.





THE BENEFITS: IMPROVED REACTIVITY, REDUCED WATER LOSS AND INCREASED CUSTOMER SATISFACTION

📡 The SHARKY 775 heat meters deliver fully automated reading of the distribution network, making manual readings a thing of the past – and meaning consumers no longer have to be solicited. With up-to-date consumption data automatically transferred to the company's billing system, the whole process is faster, easier and less susceptible to human error.

💧 High-resolution data and alarms from the SHARKY 775 meters are analysed by the IZAR@NET2 Meter Data Management Software. In the event of a pipe burst or leak, an alarm is sent directly to Støvring Kraftvarmeværk a.m.b.a. This empowers the company to immediately take action and address the water loss to prevent further damage.

With Diehl Metering's comprehensive AMR (Automatic Meter Reading) solution, water loss in the network has so far been reduced from 15 m³ per day to less than 5 m³ per day, and further optimisation is already in progress.

After the solution was installed, it became apparent that many households were having to deal with leakages. Using Diehl Metering's smart system solution, Støvring Kraftvarmeværk a.m.b.a. was able to offer its customers an additional safety service in the form of a leakage alarm. As soon as utility employees are alerted to a leakage by the IZAR software, the affected consumer receives an automatic alarm via SMS. This service has been very well received by consumers, helping to boost customer satisfaction and preventing costly damage to residential buildings.

🔧 Through a continual analysis of data in IZAR@NET2, Støvring Kraftvarmeværk a.m.b.a. has succeeded in increasing energy efficiency in its heating network. Using the swarm analysis function of IZAR@NET 2, the utility can now quickly detect anomalies such as defective heat exchangers, unfavourable settings at the transfer stations, or suboptimal consumer behaviour (e.g. the use of only a few radiators on the maximum setting). By repairing faulty equipment and advising consumers on inefficient heating habits, Støvring Kraftvarmeværk a.m.b.a. has succeeded in reducing the return temperature and continuously increasing the temperature spread.

"Thanks to the smart analysis features of IZAR software, we can analyse the return temperature for each household and provide tailored advice to consumers to help them improve their heating habits."

"The solution not only delivers extensive cost savings; it also allows us to boost transparency by offering additional services, such as access to a web portal or an app that gives our customers insights into their daily data including consumption and temperatures."

**Claus Haparanda, Operator,
Støvring Kraftvarmeværk a.m.b.a.**



ABOUT DIEHL METERING

Diehl Metering is a worldwide leader in the design, manufacture and supply of smart metering solutions. With over 150 years of experience, we empower utilities, municipalities and industries to take control of their infrastructures, bringing new efficiencies to the way they manage water and energy.

Our extensive range of services and solutions includes data-driven insights, IoT connectivity, fully-flexible software, and seamless intelligent metering. We also utilise artificial intelligence to boost performance and deliver cost savings for our customers.

Headquartered in Germany, we are a family-owned business with an international reach. We are proud to maintain our founding principles of quality, reliability and customer proximity while proactively shaping a better future for our customers and the communities they serve. Our approach is to think global and act local.

By anticipating trends and remaining agile, we adapt and develop our strategy with our customers and for them.

In supporting their long-term growth, we also contribute to the sustainability of the planet, crafting innovations that enable our customers to make ever better use of the natural resources we all rely on.

