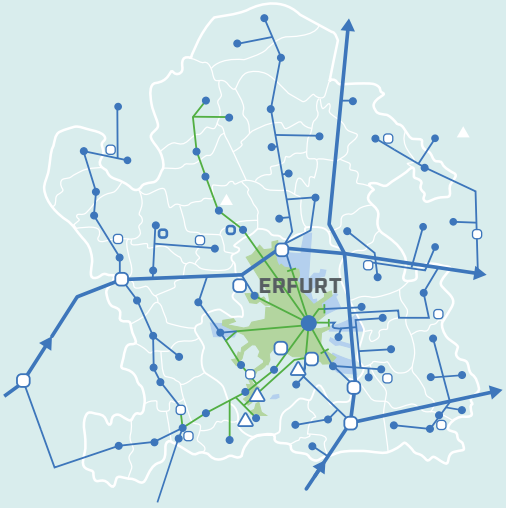
DIEHL
Metering

Meter technology change – IoT smart meters for a sustainable water consumption.

Erfurt (Germany) Case Study



THÜWA
WATER SUPPLY NETWORK

SWE Wasser

ABOUT THE CUSTOMER

ThüWa ThüringenWasser GmbH is part of the Stadtwerke Erfurt Group since 1993 and one of the largest service providers in the water sector in the German state of Thuringia. The water supply company reliably supplies more than 247,000 customers with drinking water in its supply area of almost 600 km^2. In addition to the state capital Erfurt, the supply area also includes the municipalities of the "Erfurt Basin" special-purpose association.

The ThüWa drinking water supply network has a total pipe network length of 1,700 km with 4 water extraction plants and 23 pressure boosting plants and pumping stations.

247 K
CUSTOMERS

In the ThüWa supply area, 247,000 customers are reliably supplied with drinking water.

1,700 KM
DRINKING WATER SUPPLY NETWORK

A pipe network of 1,700 km length supplies the water to the customers.

600 KM²
SUPPLY AREA

An almost 600 km^2 area, including the municipalities of the "Erfurt Basin".

“Improve our customer service and our water network sustainability are part of our strategic agenda. Smart water meters and new connectivity technologies are key tool to achieve it.”

ThüringenWasser GmbH

THE CHALLENGE:
MANUAL READING ONLY ONCE A YEAR, COSTLY AND NON-SCALABLE

About 39,000 mechanical water meters are actually installed in ThüWa’s water supply area, used exclusively for billing purposes. Manual reading – common practice so far – is extremely costly and time-consuming, with high personnel expenditure and a high number of meters. An additional complication are meters that are difficult to access. And: manual reading makes it possible to bill consumers only a specific date. However, a wish of many landlords is to provide their tenants with operating costs.

ThüWa therefore divided its supply area into 12 meter-reading districts in which meters are read at different times of the year. This caused a lot of work, especially in the preparation of the water utility’s annual financial statements, and high costs for IT and auditing companies. Furthermore, the existing water meters with moving measuring parts are susceptible to deposits, e.g., caused by calciferous water. This can reduce their accuracy over their current service life of 6 years and, in the worst case, to differences between actual and measured water consumption. And since data reading is only available once a year for each meter, it is difficult for ThüWa to implement topics such as optimization of the water supply or leakage detection.

KEY ISSUES

- **BILLINGS DUE TO MANUAL READINGS AND ESTIMATED CONSUMPTION**
- **NO REPORTING DATE-BASED BILLING**
- **NO OVERVIEW OF LEAKAGE IN THE DISTRIBUTION NETWORK**

THE SOLUTION:
DM'S IOT NETWORK PLANNING SERVICE RESULTED IN WIRELESS LPWAN mioty® TECHNOLOGY

ThüWa ThüringenWasser GmbH decided to replace all mechanical water meters with Diehl Metering HYDRUS 2.0 ultrasonic water meters over the next 2-3 years. This concerns the domestic water meters as well as the large bulk meters in the network.

The simple plug-&-play installation and minimal maintenance requirements make the HYDRUS static ultrasonic water meter the ideal meter for water suppliers. Thanks to an integrated radio module, drive-by or fully automatic readout via fixed network can be realized immediately.

The choice of communication technology plays a key role in fixed network readout. To evaluate advantages and possible applications of various IoT communication technologies, Diehl Metering's IOT Network Planning Service was used. First, a situation analysis was carried out together with the customer. Targets and future possibilities of the network were defined, and different communication technologies evaluated. Based on this, a detailed network with all required antenna locations was planned.

The comparison of possible technologies showed: the wireless LPWAN mioty® technology convinced with best performance and cost-effectiveness. Thus, ThüWa will implement the mioty® network together with the Stadtwerke Erfurt group within the next 2-3 years. A first site has already been established.

By setting up a network with the mioty® technology and communicating HYDRUS 2.0 domestic and bulk water meters, ThüWa will be able to fully digitalize its meter reading and billing process.

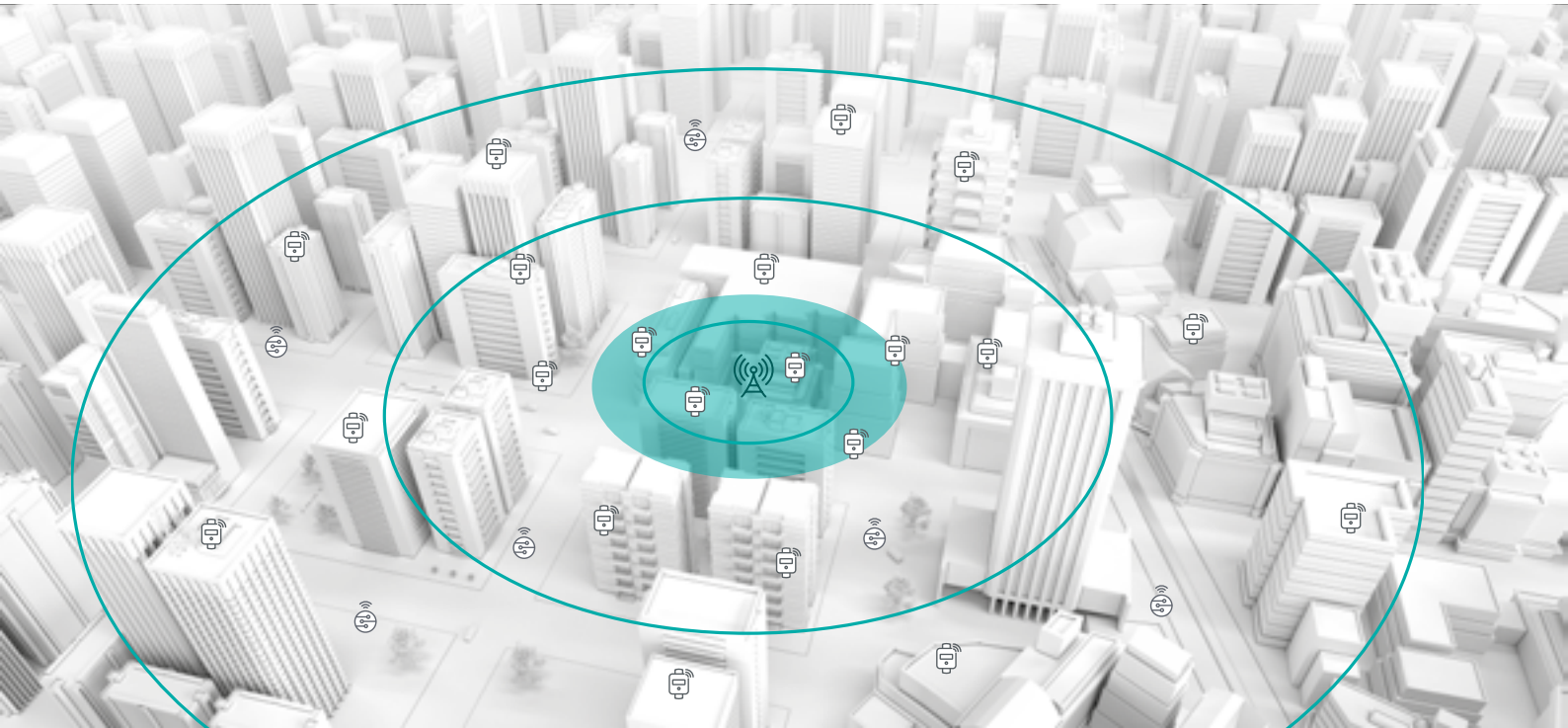
FIXED NETWORK VIA MIOTY – HOW IT WORKS?

HYDRUS 2.0 Domestic, Bulk

IZAR IoT GATEWAY Compact

IZAR PLUS Portal

ENDPOINT → **BASE STATION** → **METER DATA MANAGEMENT**



THE BENEFITS:
RELIABLE DATA TRANSMISSION, FAST & SECURE BILLING, COST-EFFECTIVE AND FUTURE-PROOF

Reliable, robust and ready for Smart city

The mioty® network will allow metering applications to merge with the IoT world. Special features of the technology are extreme radio ranges of up to 11 km and good radio penetration, allowing to read out meters in difficult installation situations without errors. Another advantage is the high robustness. The mioty® telegram splitting ensures reliable data transmission of the meter data: Captured data is not sent in one piece, but is split into many small pieces. If one data snippet gets damaged on the way to the receiver, the meter telegram can be found and restored completely thanks to error correction. This ensures a high level of operational reliability for the water supplier.

Optimized radio range with only a few antennas

The optimized radio range plays a key role in terms of investment and operating costs. For radio coverage of the entire city of Erfurt, mioty® requires far less antenna sites than other technologies. A small number of antenna sites is needed to meet various requirements for a setup, like access authorization, installation permit, etc.

Billing processes run faster, more secure and stable

End consumers are billed only for their actual consumption as of the due date. From the recording of meter readings to the transfer to ThüWa's billing system, the overall process is faster, more secure and more reliable. An interim statement can be generated paperless at any time.

Balance sheet accruals and the costs for ThüWa to prepare annual financial statements are also a thing of the past.

ROBUST AND ACCURATE
METERING TECHNOLOGY

The HYDRUS 2.0 ultrasonic meter is resistant against deposits and measures consumption reliably, even at smallest flow rates. Non-revenue water is minimalized, for more sustainability and more profit.

POWERFUL
& DATA SECURE

mioty technology features extreme radio ranges of up to 11 km, with lower receivers at the same time needed. Data splitting ensures reliable data transmission.

COST-EFFICIENT
& DIGITALIZED PROCESSES

Exact billing on any given day, paperless interim statements, digitalized processes and cost savings.

Further potential

The advantages of the HYDRUS 2.0 ultrasonic water meter come into play. Since there are no moving measuring parts in the static meter, it is immune to deposits and measures the customer's exact water consumption stably over its entire service life – even at the smallest flow rates. With a service life of up to 16 years, the HYDRUS series represents enormous economic potential for the utility company.

Last but not least, mioty® offers a broad technical basis for future digital applications of the ThüWa and enables further steps in the field of SmartCity.

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Empower a sustainable future