SMART & EASY

The customer magazine of ZENNER International

01 **2026**

THE SMART WATER ROLLOUT IS COMING

How smart cities are implementing water strategies intelligently

ZENNER

Dear readers,

Global warming and extreme weather events are increasingly making water a key issue for smart cities. Ensuring everyone has reliable access to drinking water – as envisaged by global water strategies – is vital. Our mission at ZENNER is to play our part in achieving this goal with our state-of-the-art measurement technology, innovative sensor technology and reliable data infrastructure.

Innovation is of paramount importance to ZENNER. Our product development, digitalisation and project management teams work tirelessly on developing new solutions. In this way, we are systematically driving forward the global goal of integrated water management, together with our partners and customers in over 100 countries.

In this issue of Smart & Easy, we show you how smart cities are implementing their water strategies intelligently – from the basic principles of a resilient water network and smart pipe network monitoring through to specific, real-life smart water projects. We also tell you about our LoRaWAN® network, which is already available in over 15 countries and provides the technological basis for the international smart water rollout.

Alexander Lehmann
Managing Director of ZENNER International GmbH & Co. KG

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WATER: THE LIFELINE OF SMART CITIES

Water has always been the foundation of human civilisation. Most early advanced civilisations originated on rivers that provided them with drinking water, food and fertile land, while also serving as transportation and trading routes. Proximity to water helped ensure their survival, growth and development, and it continues to influence the structure of settlements to this very day. Extreme weather events, increasing periods of drought and ever lower groundwater levels are putting cities worldwide under pressure. These factors often determine whether water supply, wastewater disposal and flood protection measures are effective or are stretched to their limits.

Integrated water management

Especially nowadays, in the smart city context, water plays a key, strategic role. It's no longer about simply supplying water – it's much more about integrated, data-based management for a vital resource in the face of changing conditions.

Climate change is now a particularly important issue when it comes to water management. More frequent periods of drought and lower groundwater levels are making the consequences of global warming increasingly real. At the same time, heavy rainfall events are leading to more frequent flooding. This means municipalities and utility companies are facing new challenges besides ensuring the availability of water. They also need to consider how to coordinate the distribution, storage and drainage of water.

Rainwater, wastewater and drinking water are therefore no longer being viewed in isolation. Instead, they are being linked intelligently. Concepts such as the "sponge city" are becoming increasingly important. This concept actively integrates water into urban planning – by using expanses of water, greening and evaporation effects to cool urban heat islands, for instance. At the same time, intelligent drainage systems are helping to prevent flooding in the event of heavy rainfall.

Water management as critical infrastructure

In cities, the supply of water is the foundation of municipal public services. The absence of a reliable supply of drinking water and effective wastewater disposal poses a risk to health, the economy and quality of life. In smart cities, this means water management

is regarded as part of the closely networked critical infrastructure, along with energy supply and mobility. Since all these systems are interdependent and are also affected by climate change, one key goal takes centre stage – resilience. In other words, water systems need to be resistant to climate change, extreme weather events, environmental pollution and other adverse effects. It's also crucial that operations can be rapidly restored after any disruption. This is where the European Water Resilience Strategy comes in. For example, it defines water losses as a systemic loss of efficiency in the urban water system, one that has both ecological and economic effects. The strategy also sets out specific areas of action. Besides modernising the water infrastructure, these first and foremost envisage using digital and smart technologies. Examples include real-time network monitoring, use of IoT-based sensor technology, and automated leak detection. The introduction of these digital technologies is referred to as the "smart water rollout" (see also the article starting on page 6).

Digitalisation as a key technology

The digital transformation is creating new challenges. In the first instance, this relates to infrastructures – both the actual water networks and the communication networks that are used. This is another area where resilience is becoming increasingly important.

Digital technologies are being used in smart cities to manage water more efficiently. Sensors, data platforms and intelligent control systems make it possible to monitor water networks and technical facilities in real time. Leaks can be detected faster, pumps operated in line with demand and water flows optimised. This reduces water losses, costs and energy consumption, while also boosting security of supply and resilience. In other words, a stable, reliable flow of data is just as important as pipework and pumps.

Using a vital resource more sustainably

A further aspect to consider is that water has now also become a key lever for sustainable urban development. Thanks to digital consumption measurement and data-based analyses, cities and communities can systematically control and reduce their water consumption. Intelligent meters and smart metering systems make consumption transparent – not just once a year, but at frequent intervals. In this context, reusing treated water for industrial processes and the irrigation of green spaces is becoming more important.

Safely managed water supply in figures (as at 2025, source: UNICEF)

Some 2.1 billion people do not have access to safely managed drinking water.

The proportion of the world's population with access to a supply of safely managed drinking water has risen by 74 percent over the past ten years.

Around 1.5 billion people have only a basic supply (e.g. a water source that is within reasonable reach, but not reliably available).

302 million people have to use unprotected water sources (amongst other things, where the water quality is not tested).

106 million people get their drinking water directly from surface water sources such as rivers or lakes.

Whereas many industrialised nations have achieved virtually full access (over 99 percent), economically weak and unsafe regions lag a long way behind.

In today's cities, this means water is much more than just a supply medium. It is an integral part of intelligent, sustainable and resilient systems – networked, digital and in step with the environment and society. This being the case, the water infrastructure no longer ends at the house connection. Human behaviour is also becoming part of the system. City dwellers can use digital applications to track their water consumption and report leaks directly. Transparent data creates trust, encourages people to be more aware of how they are using this natural resource and, in this way, contributes to a reliable water supply.

From the European Blue Deal to SDG 6

To ensure the long-term availability and quality of water, policymakers are increasingly turning to binding regulatory frameworks. This approach currently centres on multi-level interaction between EU regulations such as the EU Drinking Water Directive and national legislation such as Germany's Drinking Water Ordinance. The objective of the EU's European Blue Deal is to raise the sustainable use of water to a strategic level that is similar to that of climate protection under the European Green Deal. The goals of this strategy are to safeguard the availability of water, protect resources, invest in infrastructure and ensure more efficient usage thanks to innovation and digitalisation. In times of climate change, holistic, preventive water management can play a big part in achieving these goals.

Although these requirements relate primarily to Europe and Germany, it is still important to consider the situation worldwide. The global supply of drinking water has improved in recent years, but assured access to water remains one the world's biggest challenges. Quality, availability and social inequalities are key problems when it comes to achieving one of the UN's Sustainable Development Goals – SDG 6 ("water for all").

Digital water management solutions support various goals, including the following UN SDGs:

SMART WATER ROLLOUT: FIVE STEPS TO ACHIEVE A RESILIENT WATER NETWORK

The water infrastructure is a key element in today's cities, and the requirements relating to planning and operating the relevant networks are growing. Continuous monitoring of this infrastructure is becoming an important prerequisite for futureproof network operation. The focus is on the principle of resilience. Besides offering a high level of performance, infrastructure also needs to be resistant and robust.

LoRaWAN® has established itself as a trailblazing technology for public utility companies and water management. This radio standard offers cities genuine added value by cost-effectively networking thousands of sensors and devices over a large area. The technology combines long-range capabilities with very low power consumption. All relevant data from the water infrastructure is made continuously available via the Internet of Things (IoT). Measurement technology, sensors and communication infrastructure create the basis for resilient water infrastructures and the smart water rollout. "The digitalisation of utility companies is no longer merely a 'nice-to-have', but rather the foundation for true smart city resilience. IoT solutions with LoRaWAN® are all but essential for smart cities," emphasises Jan-Philipp Exner, a smart city expert at ZENNER.

Step 1: Water and level monitoring

Natural water resources such as rivers, lakes and groundwater form the basis of the supply system. Extreme weather events such as heavy rainfall can lead to very high water levels and overflowing rivers. Failure to detect such situations promptly brings with it the threat of substantial damage. LoRaWAN®-based level monitoring automatically captures water levels and transfers this data to the relevant authorities. What's more, additional sensors can be used to ascertain groundwater levels and check water quality. Status updates and warnings help public utility companies and municipal departments take immediate action. This reliably ensures the water fed into the drinking water network is clean.

Step 2: Reliably ensuring availability

A drinking water reservoir located between the source and the distribution network balances out fluctuations in consumption and ensures a continuous supply for the downstream pipe network.

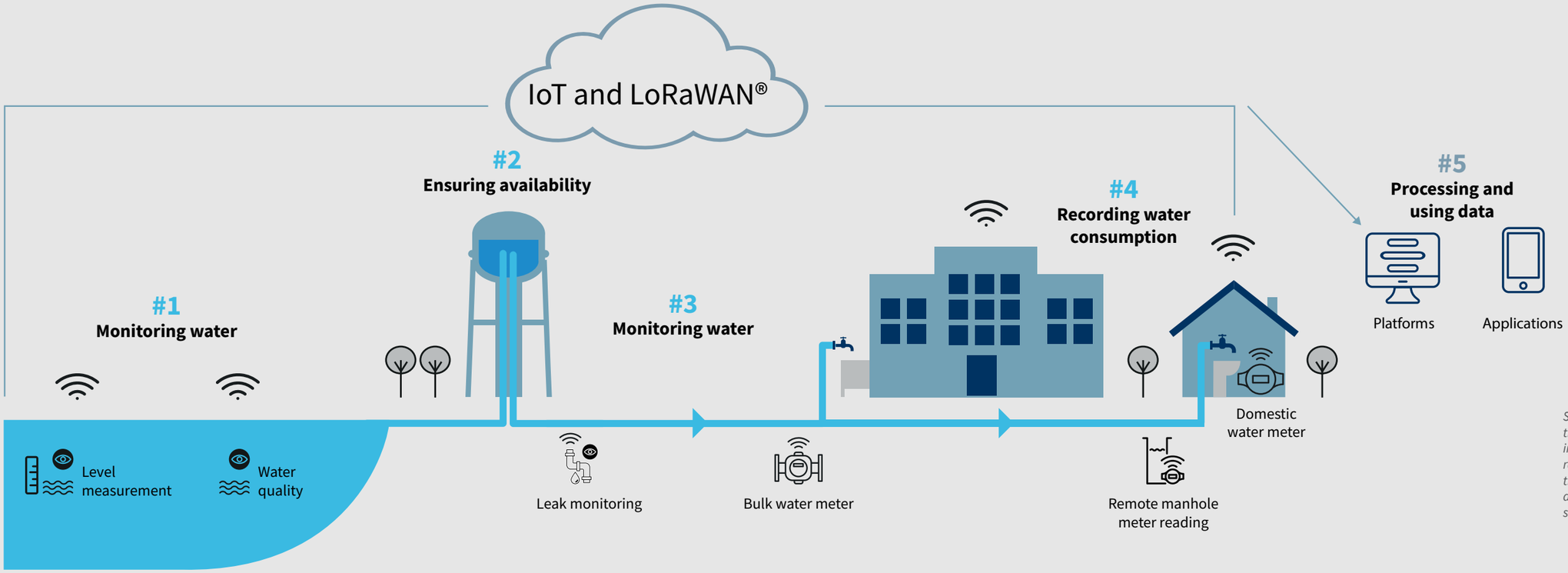
Step 3: Resilient water networks

Germany's drinking water pipe network has a total length of over 530,000 kilometres. Due to network losses, some 126 billion cubic metres of drinking water is lost worldwide each year. The figure for Germany is just under 235 million cubic metres. Intelligent monitoring locates leaks and abnormalities soon after they occur, reduces water losses and creates a pool of data for targeted maintenance work.

To help water utility companies, ZENNER entered into a partnership with FAST GmbH in April 2025 with the shared goal of developing an adaptive solution for digital water network monitoring that is the ideal addition to the existing LoRaWAN® network (for further details, see page 10).

Step 4: Recording consumption

Today's water meters are much more than just measuring devices. ZENNER's IUWS B.One ultrasonic domestic water meter is based on over 100 years of



Sensors capture relevant data throughout the entire water infrastructure. The LoRaWAN® radio standard is used to transmit this information to data platforms, where it is subsequently processed.

experience in developing water meters. Equipped with a “parallel radio” function, this meter transmits measurement data via LoRaWAN® and Wireless M-Bus simultaneously. It also detects leaks and automatically raises the alarm. As a result, the role of the traditional water meter is changing. It is no longer merely being used to record consumption and is instead becoming part of the digital smart water infrastructure.

Step 5: Data platforms and apps

To get the most out of data, it must be usable. ZENNER’s B.One element suite platform compiles and evaluates all measurement data from the water infrastructure and visualises it in real time. This opens up a wide range of possible uses, including submetering, leak detection, network monitoring and variable water tariffs. Looking ahead, new communication options may also be possible, such as providing members of the public with specific information via a dashboard or app.

To help water utility companies worldwide get started with data logging based on radio transmissions, ZENNER has developed a solution package called B.One Metering as a Service (MaaS). The MaaS app visualises key meter, alarm and consumption data. “With the incorporation of further sensors, MaaS can be used to create sustainable and resilient water systems and even integrate flood protection solutions,” explains René Claussen, Head of Business Unit Measurement Systems, IoT and Digital Solutions at ZENNER.

“Smart metering and digital platforms are becoming increasingly important in water management. We take a holistic approach to digitalising water management. As we see it, a smart water rollout goes beyond the digitalised, automated recording of measurements and also covers complementary IoT solutions that make it possible to operate our networks reliably.”

René Claussen,
Head of Business Unit Measurement Systems,
IoT and Digital Solutions at ZENNER

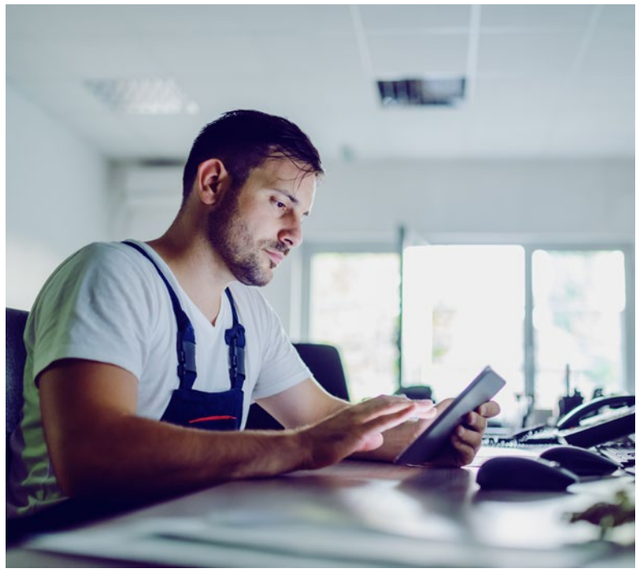
The interaction of measurement technology, infrastructure and data platforms paves the way for the smart water rollout and the creation of resilient water management infrastructure. Consumption is easier to plan, resources can be used and safeguarded in a more targeted way, and potential bottlenecks can be identified early on.

Smart water solutions with ZENNER

The digitalisation of water management is becoming increasingly important. From communication infrastructure, measurement technology and sensor technology through to the associated software, ZENNER provides everything from a single source. This makes it possible to implement a whole host of smart water solutions:

Water monitoring: Intelligent level monitoring with LoRaWAN®

The consequences of climate change are becoming increasingly apparent and call for new solutions. Monitoring to detect and report imminent risks – resulting from flooding, for instance – is particularly lacking at critical locations. LoRaWAN®-based monitoring uses sensors to automatically capture water levels and transfer this data to the relevant authorities via a data platform such as ZENNER’s B.One element iot. Public utility companies, the fire service and Germany’s Federal Agency for Technical Relief (THW) automatically receive status updates and warnings and can act immediately.



Leak detection in buildings

Leaks and burst pipes in water networks often go undetected for long periods. In most cases, damage to buildings is very costly and can increase water consumption. Smart leak detection involves networking a LoRaWAN®-enabled water meter with a smart valve. If the back-end system detects that a preset maximum flow value is being breached, the platform sends a signal to the smart valve, which then automatically closes and stops the flow of water.

Using IoT sensors to monitor water quality

Manual monitoring of the water quality in bodies of water and reservoirs is a costly and labour-intensive process. Intelligent IoT sensors significantly reduce the outlay involved. They continuously and reliably measure parameters such as conductivity, temperature, water level, dissolved oxygen, pH and nitrate content. If specific limit values are exceeded, the relevant authorities are automatically alerted.

Intelligent remote reading of underground meters with LoRaWAN®

The manual reading of underground meters regularly poses challenges for water utility companies, as it is costly and also very time-consuming for the staff involved. LoRaWAN® puts an end to this laborious process by offering an easy and reliable way of obtaining readings from water meters, other measuring equipment and sensors installed in locations that are difficult or impossible to access. The meter data can be viewed at any time – including remotely – and is then available online for further processing on ZENNER’s B.One element suite platform.

Multi-utility readout of consumption meters

The multi-utility readout function enables automatic remote reading of water, gas and heat meters via an IoT gateway (e.g. via LoRaWAN®). Besides eliminating the need for manual readings, the scheduling of these readings and multiple visits, this also improves efficiency and the quality of data. What’s more, consumption data can be processed centrally and used for energy monitoring or billing purposes – a key factor for digitalised, cost-efficient supply networks.

Intelligent pipe network monitoring with LoRaWAN®

By using smart water meters, utility companies can make the water network more transparent in terms of flow and consumption profiles. Moreover, modular LoRaWAN® sensor technology ensures acoustic analysis processes can be used to pinpoint the location of characteristic noises made by leaks in the pipe network (find out more on page 10).

VIDEO ON THE TOPIC

How does the smart water rollout work?

Smart water solutions support various goals, including the following UN SDGs:

PIPE NETWORK MONITORING: A PARTNERSHIP FOR SMART LEAK DETECTION IN WATER NETWORKS

Water distribution systems in Europe lose around 50 litres of water per capita every single day. This water has a name – non-revenue water (NRW). It is water that is produced and pumped into the networks, but is then lost, usually due to leaks. This is where ZENNER and FAST GmbH come in.

Leaks in distribution networks often go undetected for long periods of time. Manual meter reading cycles or reactive maintenance processes make early detection more difficult. This results in high levels of physical water loss and burgeoning operating and energy costs from treating and pumping water that is ultimately wasted. At the same time, there is a growing risk of consequential damage to the infrastructure. What's more, water utility companies are coming under increasing regulatory pressure to document and actively reduce losses from their networks.

Smart water meters ensure transparency. They not only provide precise flow and consumption profiles, but also reveal anomalies at an early stage. Modular LoRaWAN® sensor technology supplements the data by using acoustic analysis processes to pinpoint the location of characteristic noises made by leaks in the pipe network. All the data is collated in a central IoT platform, such as B.One element iot from ZENNER, where it is correlated, analysed and prioritised so that critical incidents can be detected soon after they occur. The data is transmitted via LoRaWAN®, thus ensuring energy-efficient and scalable connectivity of the distributed measurement and detection points.

A partnership for digital water network monitoring

ZENNER and FAST GmbH have pooled their strengths – FAST is bringing its decades of expertise in acoustic leak detection to the table, while ZENNER is providing the IoT platform. The two companies are working together to develop an adaptive solution for digital water network monitoring that will benefit water and public utility companies and smart cities. This sensor technology solution is the ideal addition to the existing LoRaWAN® network.

The FAST mobile acoustic loggers can be directly integrated into the ZENNER IoT platform, thereby creating a complete modular system for monitoring the condition of the pipe network – a system that not only detects leaks, but also pinpoints their precise location. "As experts with 40 years of experience in acoustic leak detection, we offer precise and reliable leak monitoring in water networks with our BIDI LoRa loggers. Thanks to the efficient transmission of data to a central platform, we are establishing the basis for forward-looking network monitoring," explains Edmund Riehle, Sales Manager at FAST. René Claussen, Head of Business Unit Measurement Systems, IoT and Digital Solutions at ZENNER, adds: "By combining the BIDI loggers from FAST with our B.One element suite platform, we are providing our customers with genuine added value for their water infrastructure and giving them an even clearer understanding of their water loss situation."

The system helps water and public utility companies reduce their water losses, optimise their maintenance processes and boost their network transparency. This means these companies have a dependable decision-making tool for ongoing operations at their disposal and also ensures supply reliability. Moreover, it creates a further use case that makes even better use of the digital infrastructure.

"FAST GmbH and ZENNER are a strong team in the LoRaWAN® environment because our skills and expertise complement each other perfectly. Together, we enable water utility companies to detect water losses at an early stage, monitor their networks efficiently and conserve resources. To put it in a nutshell, precise sensor technology from FAST plus reliable networking from ZENNER equals genuine added value for the digital water industry," adds Marco Leichnitz, Head of Sales at FAST.

As already demonstrated by successful pilot projects with municipalities in Germany and Luxembourg, the solution works well in practice. There are plans for further market expansion, which will take place in stages.

VIDEO ON THE TOPIC

Leak detection with LoRaWAN®

Intelligent pipe network monitoring with LoRaWAN® supports various goals, including the following UN SDGs:

3 QUESTIONS FOR...
ALPER YEGIN, CEO OF THE LORA ALLIANCE®

For the digital transformation of the energy and water industry, LoRaWAN® has become a key enabling technology. Behind this communication standard stands the LoRa Alliance®, a global non-profit organisation where companies collaborate on an open, interoperable ecosystem for the Internet of Things. ZENNER has been a member of the alliance since its early years and operates the world's largest LoRaWAN® network, with network availability in 15 countries and its 10 millionth sensor integrated in September 2025. How LoRaWAN® is transforming the water sector, why strong partners like ZENNER matter, and where the standard is heading next – these are the topics we discussed with Alper Yegin, CEO of the LoRa Alliance®.

Mr. Yegin, why is LoRaWAN® gaining so much importance in the water sector – and how can this critical infrastructure be reliably secured at the same time?

Alper Yegin: The requirements for wireless technology in the water sector are demanding: signals must cover long distances, reach reliably from meter pits and basements to the outside, and sensors should operate for several years without battery replacement. This is exactly where LoRaWAN® comes into its own. It not only meets the classic requirements of an LPWAN – that is, a long-range, deep indoor and low power wireless technology – but it also goes far beyond it. LoRaWAN® operates in unlicensed frequency bands, allowing networks to be deployed and operated flexibly. The infrastructure remains manageable, and the sensors are economically attractive thanks to their long battery life. LoRaWAN® is also based on an open standard developed by the LoRa Alliance® and endorsed by the International Telecommunication Union (ITU). This is complemented by several open-source implementations that make it easier to get started.

The ecosystem behind it is equally important: there are more than 650 certified devices and almost 1,000 products listed on the LoRa Alliance® Marketplace – from meters and sensors to gateways and platforms. The current figures speak for themselves: around 125 million LoRaWAN® devices have already been deployed worldwide. We are seeing annual growth rates of about 25 per cent – a clear indicator of how strongly the market is embracing LoRaWAN®. In my view, this is also due to the broad range of deployment models. Almost any scenario can be supported, whether public or private networks, municipal community networks, satellite-based applications or international roaming agreements. For the water industry, this is a key advantage, because every supply area has its own specific characteristics. With LoRaWAN®, the network model can be precisely tailored to the existing infrastructure, the size of the service area and the level of digitalisation.

ZENNER brings extensive field experience to the LoRa Alliance®, with millions of connected water meters and sensors. How does this experience feed into the further development of LoRaWAN®?

ZENNER is a very special partner for us: the company not only operates the world's largest LoRaWAN® network with more than ten million devices but also brings extensive expertise in metering, sub-metering and smart city. This combination of hands-on experience and deep industry expertise is extremely valuable for the continued development of LoRaWAN®.

Accordingly, ZENNER plays a key role within the LoRa Alliance®. The company holds several strategic positions – including a seat on the Board of Directors with responsibility as Treasurer, and the chair positions of the Certification Committee, the Smart Cities and Buildings Working Group, and the Device and Solution Makers Forum. In this way, ZENNER helps shape both the strategic direction and the execution of the LoRa Alliance®.

ABOUT ALPER YEGIN

Alper Yegin is the CEO of the LoRa Alliance®, where he drives the strategic development and global adoption of LoRaWAN®. Previously, he held senior roles in the IoT and wireless industry, including as CTO of Actility, and is regarded as one of the key voices shaping the future of LoRaWAN®.

What topics is the LoRa Alliance® currently focusing on most intensively to ensure that the LoRaWAN® ecosystem continues to grow?

At present, we are driving the further development of LoRaWAN® in three main directions. First, we want to make integration into a wide range of IoT application domains even easier. Our goal is for LoRaWAN® to fit seamlessly into existing systems and processes – for example in industry, building automation or the energy sector. That is why we are working to support communication standards from these domains. These include, for instance, UI-1203, a data communication protocol for water meters, as well as OPC UA, the central communication standard for Industry 4.0 and industrial IoT applications.

Second, we are improving the plug-and-play character of the technology. Devices should be able to join the network as automatically as possible, applications should be ready for use quickly, and the effort required for commissioning in the core network should be significantly reduced. In other words, those who deploy LoRaWAN® should spend less time configuring and more time using.

The third focus is on tools that accelerate network expansion. These include solutions for walk-by and drive-by reading, which are particularly attractive in the metering environment, as well as improvements in the use of satellites. This enables us to make LoRaWAN® available even in places where traditional terrestrial networks reach their limits.

ADAPT YOURSELF: ACTIVELY SHAPING THE FUTURE WITH B.ONE

“There is nothing permanent except change.” This Heraclitus quote from around 2,500 years ago has never been more apt than it is today. Being able to adapt makes you resilient – and that’s exactly the idea behind our “Adapt yourself” motto. It means being flexible and having the vision and courage to address new challenges with intelligent solutions.

The demands on towns and cities, energy suppliers, property managers and industrial companies are growing at breakneck speed. Once a vision for the future, climate neutrality, resource conservation, and high living standards in urban environments have long since become an expectation. At the same time, companies and municipalities are facing ever growing challenges due to climate change, extreme weather events and increasing cost pressure. The answer to all this is adaptability – and this is exactly where the Minol-ZENNER Group comes in with its new B.One solution world.

Under the motto “Adapt yourself”, B.One creates a holistic digital ecosystem by combining innovative technologies. The aim is to help customers in various sectors – energy, real estate, industry and municipalities – respond flexibly to changes and make their processes futureproof.

Lots of solutions combined into one world

B.One is all about benefits for customers – simplifying processes, making data more transparent and providing a more reliable basis for decision-making. All this is made possible by a modular solution world combining all the relevant components – from compatible measuring devices and open radio standards such as LoRaWAN® and Wireless M-Bus to high-performance data platforms and applications. The result is end-to-end digitalisation without any discontinuity or isolated solutions. This offers customers maximum flexibility coupled with a high level of investment security.

“Here at the Minol-ZENNER Group, we set out on our digitalisation journey more than ten years ago and have developed innovative solutions at all relevant levels, carefully coordinating them on a technological basis. The fact that we also operate the largest LoRaWAN® network worldwide today speaks for itself. It is only logical that we are now bringing these together in a uniform solution environment. The B.One brand is primarily intended to provide customers with guidance in setting up their own digital ecosystems,” explains Alexander Lehmann, Managing Director of the Minol-ZENNER Group. “In this way, we’re creating the basis for resilient business models and sustainable growth,” he continues.

“The B.One brand is primarily intended to provide customers with guidance in setting up their own digital ecosystems.”

Alexander Lehmann,
Managing Director of the Minol-ZENNER Group

How B.One is benefiting every sector

Public utility companies benefit from more efficient processes and a central database for multidisciplinary applications. Municipalities can network their infrastructure intelligently and make decisions that are informed by data – for greater sustainability and better quality of life. In the real estate sector, B.One supports both transparent, digital billing for utilities and the development of smart buildings.

Ready for the transformation

With B.One, the Minol-ZENNER Group is not merely supplying technology – it is providing a holistic concept for digital resilience. Customers are given the tools that enable them to actively shape changes, instead of just responding to them.

In other words, organisations that adapt not only remain competitive – they also shape the future.

THE BENEFITS AT A GLANCE:

- Open standards: Futureproof technologies prevent dependencies and can be extended with ease.
- Central availability of data: All information can be retrieved and evaluated at any time.
- Customised applications: Solutions can be precisely tailored to meet specific requirements.

WEBLINK

B.One

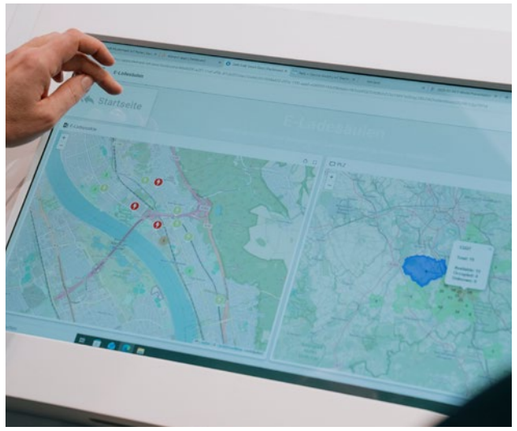
SMART CITY BONN:
SCALABLE INFRASTRUCTURE AS THE FOUNDATION FOR THE SMART CITY

Working in collaboration with ZENNER, Bonn public utility company Stadtwerke Bonn has set up an extensive LoRaWAN® network and laid the strategic foundations for the city's digital transformation. The solution interconnects the fields of smart utilities, smart cities and smart buildings.

The city of Bonn is an important hub of administration, science and international collaboration. With its rich history, lively culture and state-of-the-art infrastructure, it offers an attractive environment for urban projects and innovative solutions. Bonn is currently ranked in 38th place in Bitkom's Smart City Index.

Scalable smart city foundations with LoRaWAN®

Working in collaboration with ZENNER, Stadtwerke Bonn is setting up an open, interoperable LoRaWAN® network to serve as the technological basis for the city's digital development. LoRaWAN® wireless technology offers many benefits, especially in municipal environments. For example, it boasts long-range capabilities combined with low power consumption.



A variety of smart metering, submetering and smart city applications can be implemented with the help of a single network. What's more, the architecture can be extended on a futureproof and flexible basis. The city of Bonn can therefore integrate a whole host of use cases into the urban environment with ease.

In operating its LoRaWAN® network autonomously, Stadtwerke Bonn is boosting its digital independence while also expanding its own specialist knowledge. As it has full control over sensitive measurement and infrastructure data, it can operate thousands of sensors throughout the entire urban area securely and cost-effectively. What's more, thanks to long battery lives, maintenance intervals can be increased and ongoing expenses can be kept low.

Holistic data strategy for smart utilities, smart cities and smart buildings

Just under 1,600 meters and 400 smart IoT devices are currently deployed in the LoRaWAN® network. The city of Bonn's consumption, environmental and operating data is collected centrally on the ZENNER B.One element iot platform, thus creating one integrated pool of data for network operations, infrastructure management and building control.

"Stadtwerke Bonn is implementing a whole host of projects and use cases with ZENNER. As an infrastructure supplier and utility company, we are working with ZENNER under the joint digitalisation strategy of the city and Stadtwerke Bonn to roll out use cases of all kinds – whether that means metering, submetering or smart city applications," explains Christian Roosen, Senior Project Manager at Stadtwerke Bonn.

Stadtwerke Bonn has used B.One element apps to set up a dedicated city dashboard – Bonn Connect. This visualises selected data and makes it available for use by various target groups, such as internal administration staff, partners and the public. Over and above the IoT sensor data, external data sources can also be integrated to create a fully comprehensive digital representation of the city.

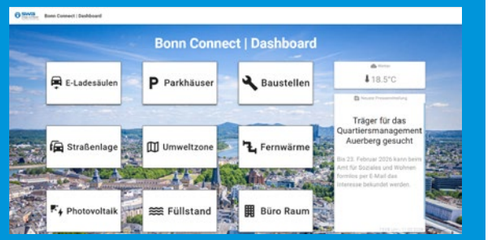
Christian Roosen (left), Senior Project Manager at Stadtwerke Bonn, and Patrick Leiner (right), Senior Project Manager IoT at ZENNER.

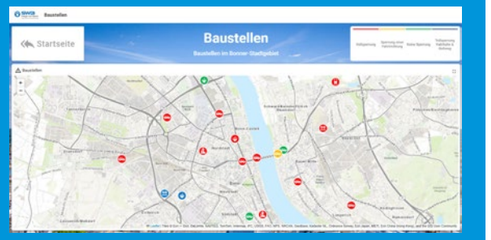
Digital sovereignty and sustainability thanks to IoT

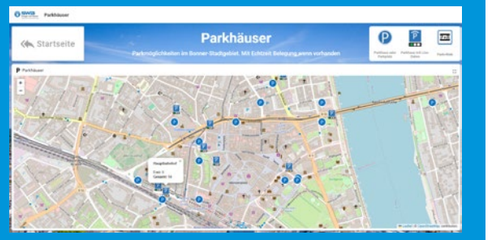
By digitalising meter reading and monitoring processes in smart metering, the city is tapping into important savings potential. The intelligent interlinking of LoRaWAN®, smart metering and the Urban Data Platform is creating a high-performance ecosystem for the sustainable further development of Bonn as a networked smart city.

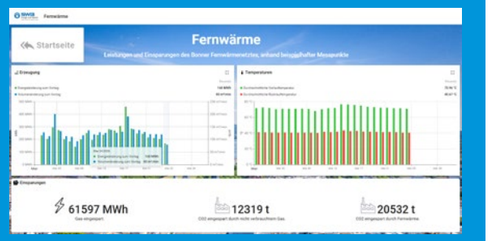
"As a project manager, I really value the close collaboration we have with our customers such as Stadtwerke Bonn. The many use cases give rise to lots of subprojects, which we successfully implement together step by step. All that plays towards the ultimate goal – the smart city," explains Patrick Leiner, Senior Project Manager IoT at ZENNER. Roosen adds: "In ZENNER, we have a truly pioneering partner for submetering and infrastructure digitalisation. ZENNER also has extensive experience in widespread connectivity and meter reading. It is on this basis that we have implemented our initial pilot projects together. These successful projects have given rise to a strong and sustainable partnership."

BONN SMART CITY DASHBOARD







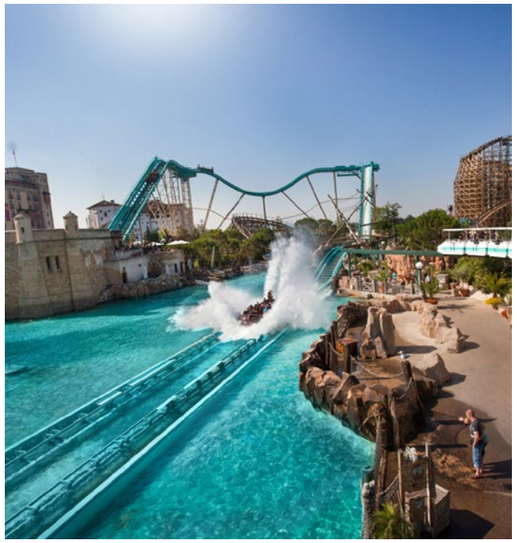


Source: Stadtwerke Bonn

BEST PRACTICE:
SMART WATER PROJECTS

Municipality of Mersch (Luxembourg) – flood protection measures

- Monitoring water levels for the early detection of flooding events.
- Initial situation: Flooding events were difficult to predict, so greater certainty was wanted.
- Solution: Use of ultrasonic water level sensors and LoRaWAN® to monitor rivers (the Mamer and Alzette) as well as a lake in Mersch public park.
- Thanks to early warnings, faster action can be taken and there is greater resilience in the face of extreme weather.

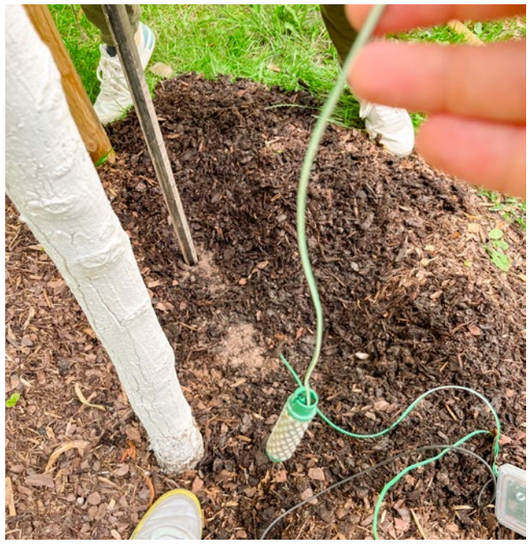


Europa-Park in Rust – water level monitoring at the theme park

- Monitoring water levels in pools, attractions and watercourses in the park via a dedicated LoRaWAN® network.
- Initial situation: The pools and water features of the individual water-based attractions in the park are reliant on consistent water levels, and these needed to be checked manually in the past.
- Solution: LoRaWAN®-based water level measurements with ultrasonic sensors. Automated measurements are taken at half-hourly intervals. If any anomalies are detected, staff are notified, so manual inspections are no longer necessary.
- Fast and efficient response to extreme weather events and waterlogging.

Stadtwerke Dillingen (Saarland) – digital water meters in the LoRaWAN® network

- Remote readings of water meters in buildings and underground.
- Construction of a LoRaWAN® network, including wireless water meters and other smart city applications.
- Installation of wireless water meters (e.g. underground), automated readings without any need for on-site access.
- Substantial savings in terms of both time and money, lower personnel costs and better data availability.



Stadtwerke Amberg – submetering and soil moisture at a glance

- Construction of a LoRaWAN® network as the basis for numerous smart city applications. First use case: Submetering with LoRaWAN®.
- Smart City Dashboard in B.One element apps from ZENNER to gather together all measurement values.
  Example: Sensors record the soil moisture content to enable more efficient watering and healthy green areas.

FIND OUT MORE HERE

Further smart city use cases in Dillingen

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