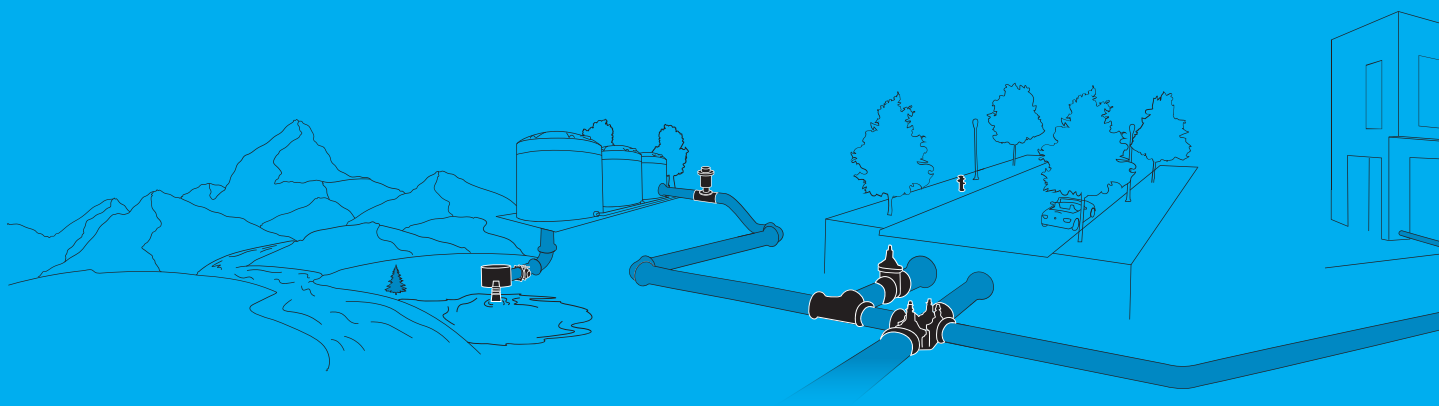
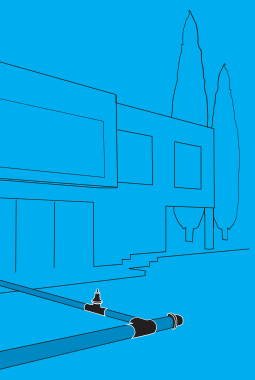
# Blue gold.

Stop water loss now.

made for generations.





# CONTENTS


Lost water
NON-
REVE
WATE

# NUE

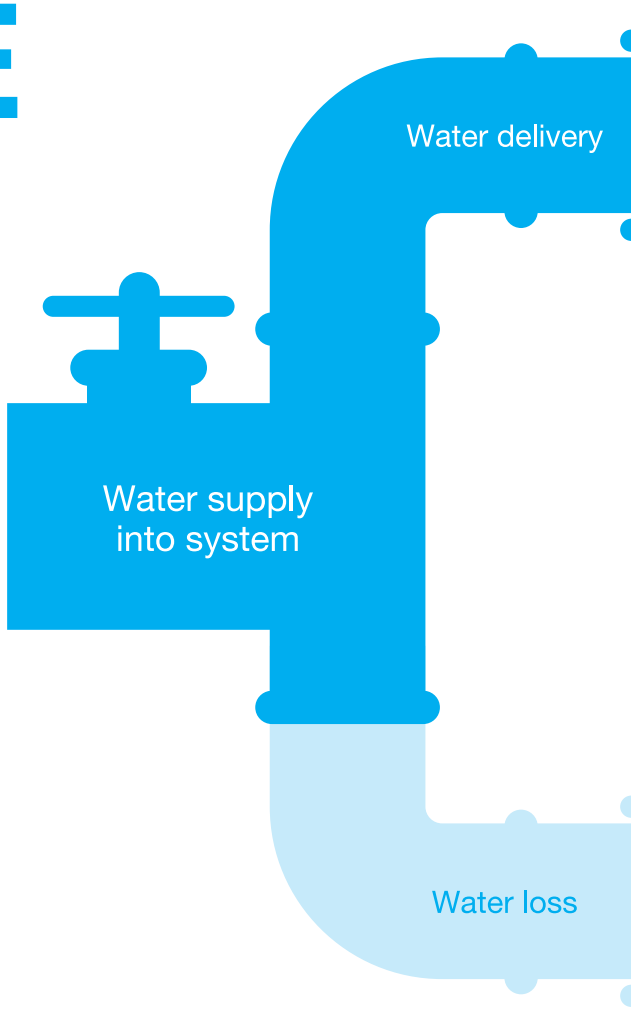
# ER

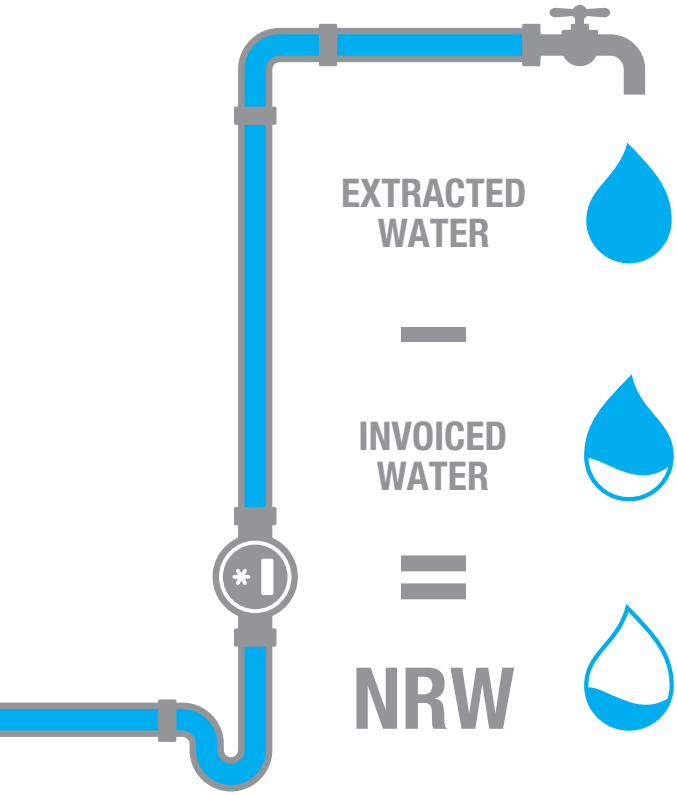
As temperatures rise and rain becomes sparse, water grows scarce around the globe.
Yet nearly one third of our valuable drinking water is lost without being used.

Lost water

# NON-REVENUE WATER

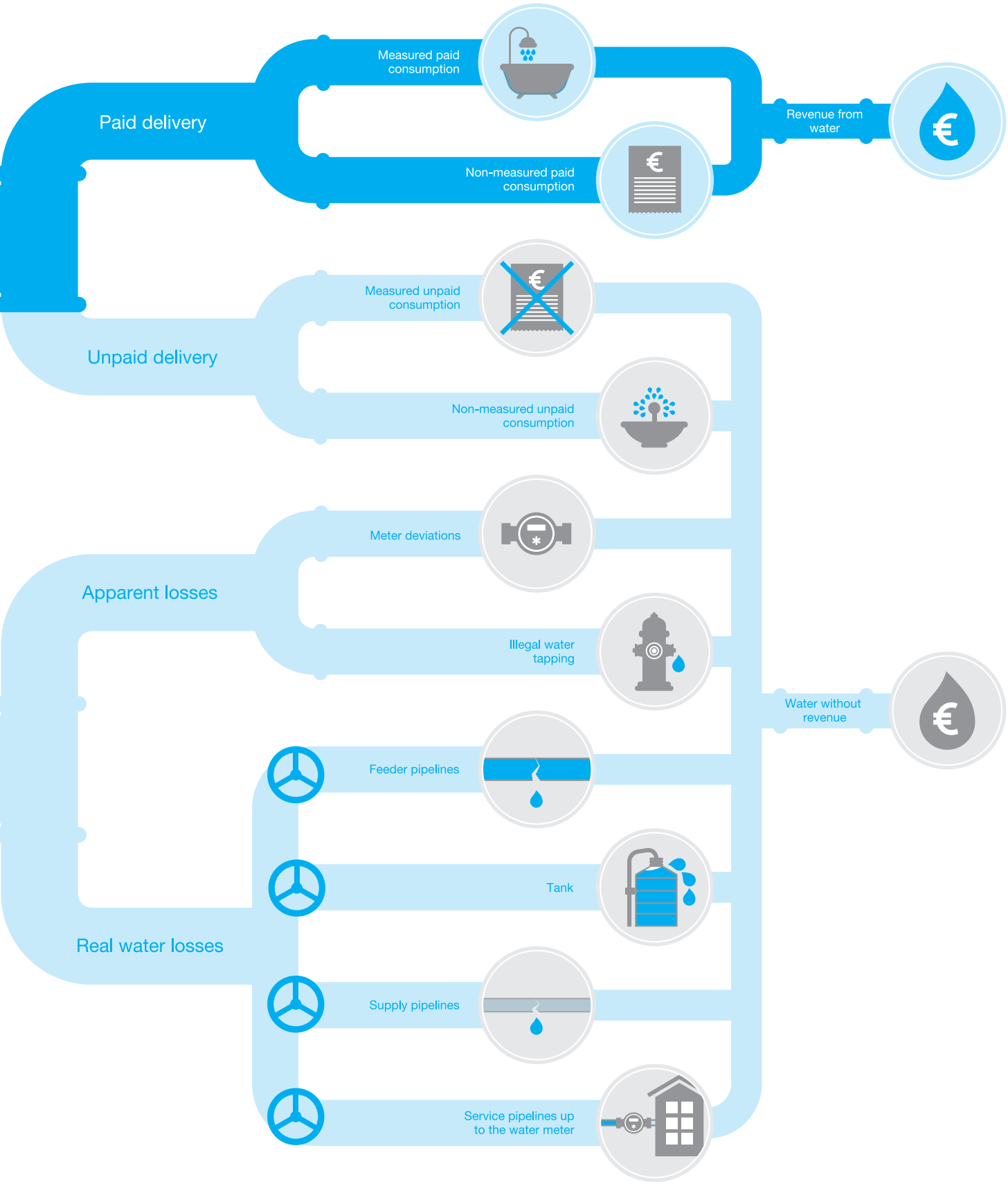
Year after year, we lose huge quantities of clean water on the way to the tap. This water loss is also called “non-revenue water” (NRW) as it means a loss of revenue for the suppliers. It is mainly caused by leakage, but water theft also plays a role.




When we stop valuable water from simply trickling away, everyone benefits. Water prices can be lowered while supply security is improved. As a consequence, more people have access to clean water at all times. For water suppliers, the investment will usually pay off quickly.

The first step to reducing NRW is for suppliers to collect data regarding the extent of the loss and about the pipeline system. Quite frequently, nobody knows exactly where pipes run, what they are made of, and which condition they are in. Already in this step, leaks can be detected in many cases and water losses can be significantly reduced within a short time.


Paid delivery
Measured paid consumption
Non-measured paid consumption
Revenue from water
Unpaid delivery
Measured unpaid consumption
Non-measured unpaid consumption
Apparent losses
Meter deviations
Illegal water tapping
Real water losses
Feeder pipelines
Tank
Supply pipelines
Service pipelines up to the water meter
Water without revenue

# How much WATE

The water running from our taps has often come a long way. After being extracted, it passes through treatment plants, pumping stations, reservoirs, and mile after mile of pipelines which, while robust, are not made to last forever. And whether caused by dripping pipes, pipe breaks, or theft: each water loss will entail cost.


ER
is lost?

# How much WATER is lost?

All over the world, extreme weather conditions and rising temperatures contribute to water scarcity. At the same time, global water consumption is increasing by 1%[1] every year. As a result, limited reserves are already overexploited in many places.

**PRESSURE 5 BAR**

| Hole diameter (mm) | l/hour | m³/day | m³/year | Water loss m³/year |
|---|---|---|---|---|
| 0,5 | 16,7 | 0,4 | 145 | 240 |
| 1 | 66,6 | 1,6 | 582 | 960 |
| 5 | 1665 | 40 | 14548 | 24004 |
| 10 | 6661 | 159,9 | 58191 | 96016 |

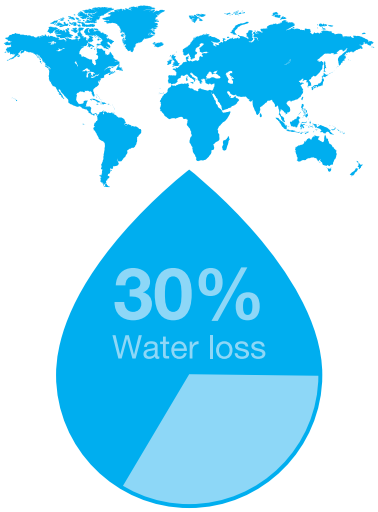
Water price/m³: 1,65 EUR

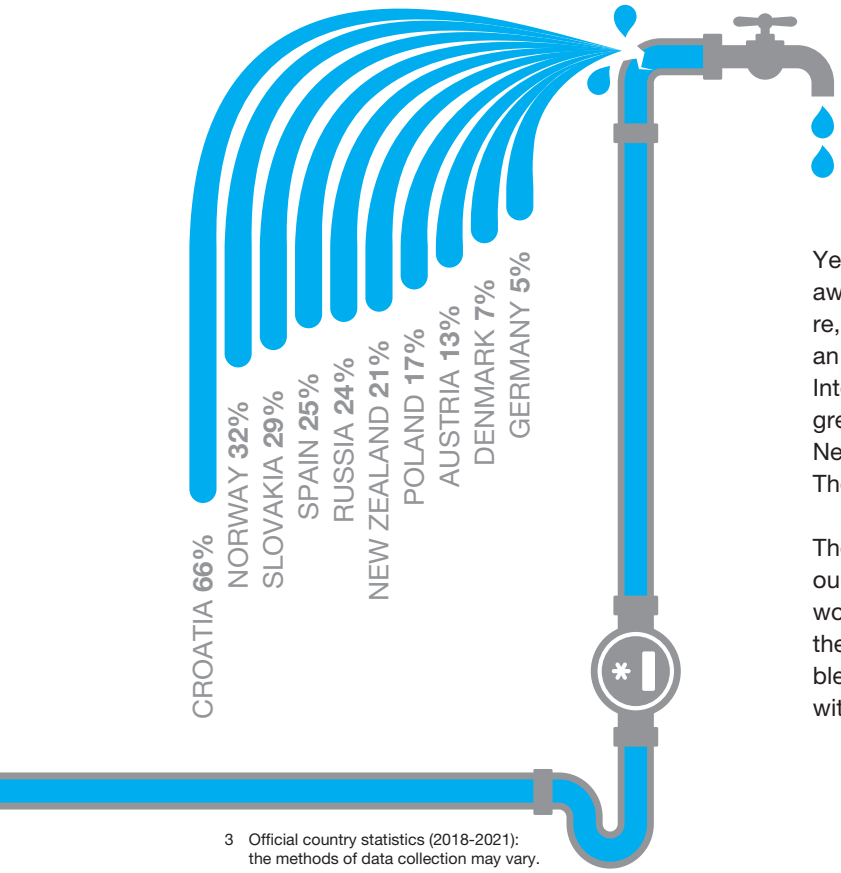
**PRESSURE 10 BAR**

| Hole diameter (mm) | l/hour | m³/day | m³/year | Water loss m³/year |
|---|---|---|---|---|
| 0,5 | 23,6 | 0,6 | 206 | 339 |
| 1 | 94,2 | 2,3 | 823 | 1358 |
| 5 | 2355,1 | 56,5 | 20574 | 33947 |
| 10 | 9420,3 | 226,1 | 82296 | 135787 |

Water price/m³: 1,65 EUR

**Want to know how much water is lost because of a hole in the pipe? Try our leak calculator!**




3 Official country statistics (2018-2021): the methods of data collection may vary.

Yet an immense amount of clean water trickles away long before reaching its destination. Therefore, water companies worldwide do not get paid for an average of 30% of the water supplied by them[2]. Internationally speaking, the respective values vary greatly: from approx. 6% of NRW in the Netherlands to more than 60% in Croatia. The value for Austria is currently 13%.

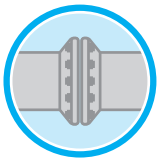
Therefore, it's high time to take action. To protect our water supply, we have to renew obsolete networks and actively fight leaks right away. This is the only way to preserve resources in a sustainable way, to save costs, and to supply more people with clean water.

## Water loss means that…

larger quantities of spring water must be procured to ensure supply

more water tapping facilities are needed to extract water from new sources

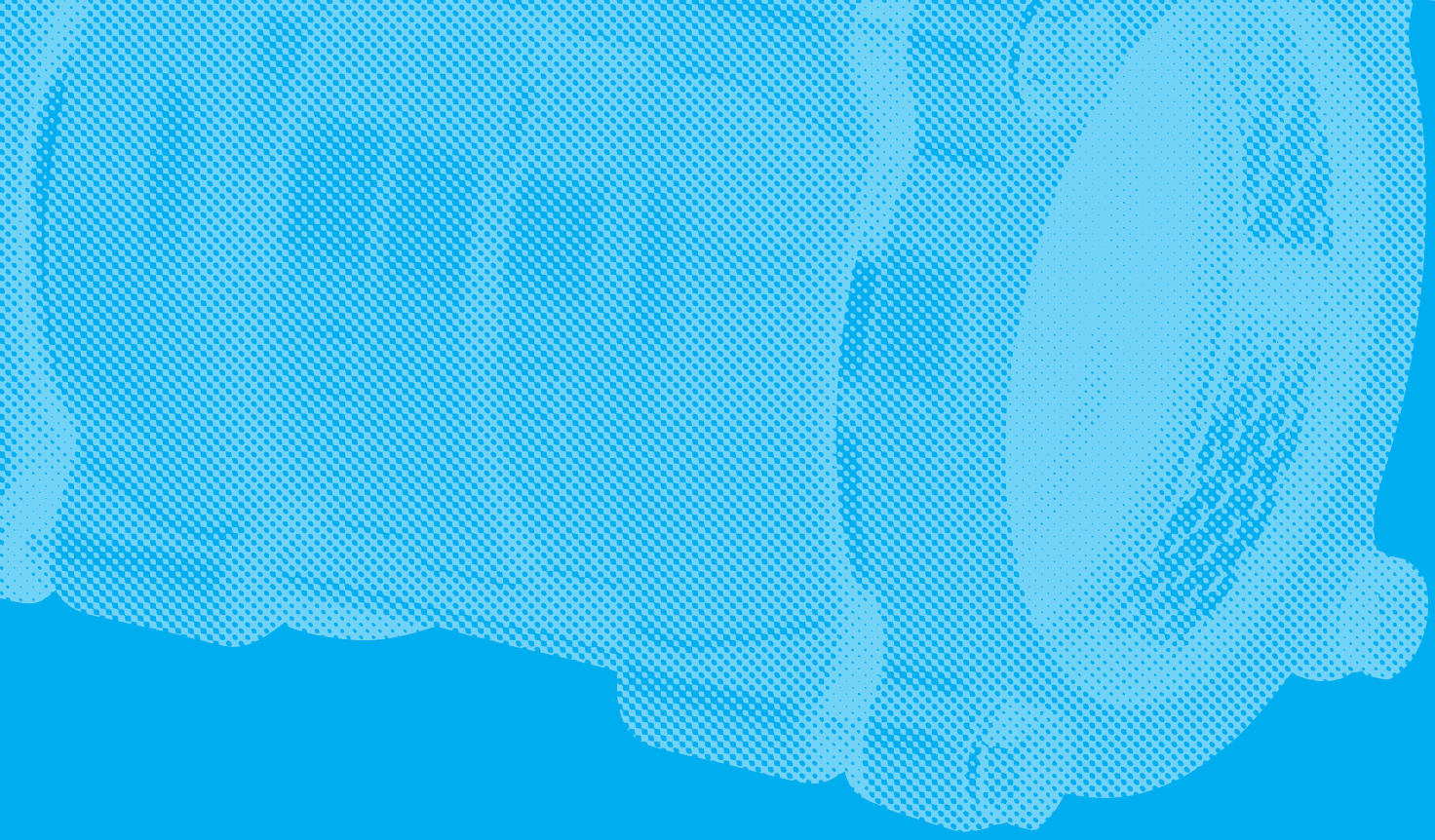
more water tapping facilities are needed to extract water from new sources



the need for pipes, pumps, and valves is rising

more personnel is needed to ensure water supply

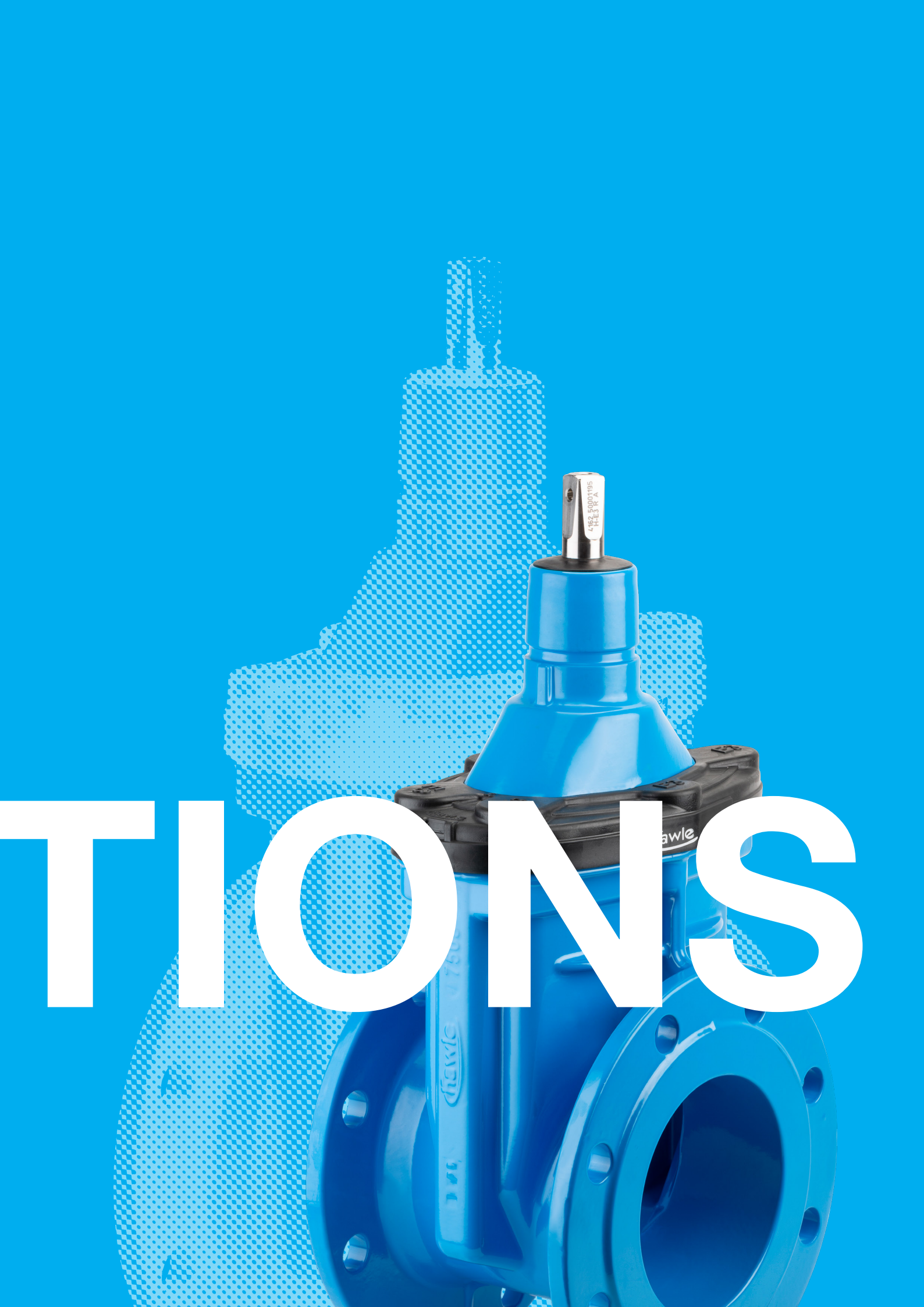
maintenance costs are rising because of a growing infrastructure



# SOLU

Water losses cannot be completely prevented but can be significantly reduced. Thus, the resource of water is preserved, and costs are saved in the long run. A number of solutions are available for water suppliers to draw on.

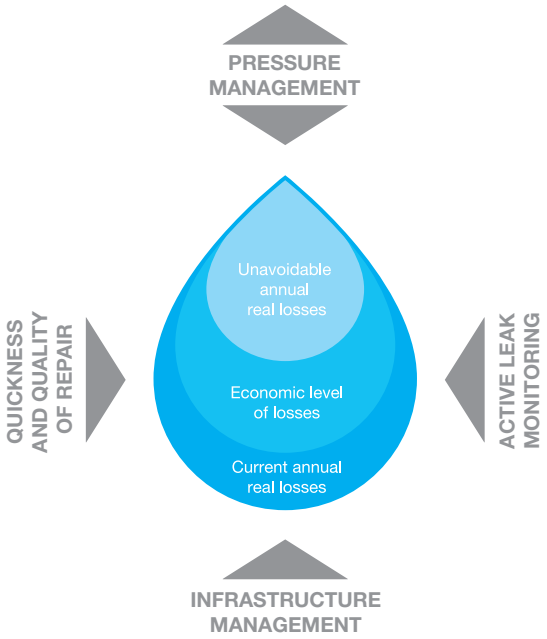
# TIONS



# SOLUTIONS

Due to modern water meters and measuring devices, water suppliers can quickly and precisely spot any leaks. Modern repair solutions are both easy and quick to apply and also flexible to use.

Other important aspects are regular maintenance, an intelligent pressure management, and a timely renewal of pipes and valves. And last but not least, smart hydrant caps will discourage water thieves.




## Maintenance, exchange, rehabilitation

Usually, the water infrastructure will last about 50 years. Because of this long service life, water suppliers will have to renew 2% of the infrastructure each year to prevent water loss. However, the rate is often only 1%. Therefore, the complete renewal of the network will take more than 100 years.

## Efficient leak detection

The longer it takes to detect a leak, the more water will escape. With district metered areas (DMAs) and advanced detection technology, leaks can be detected quickly, cost-effectively, and accurately.

## Rapid intervention in case of leaks

Rapid leak detection is not enough on its own. It is also necessary to repair leaks quickly and permanently.

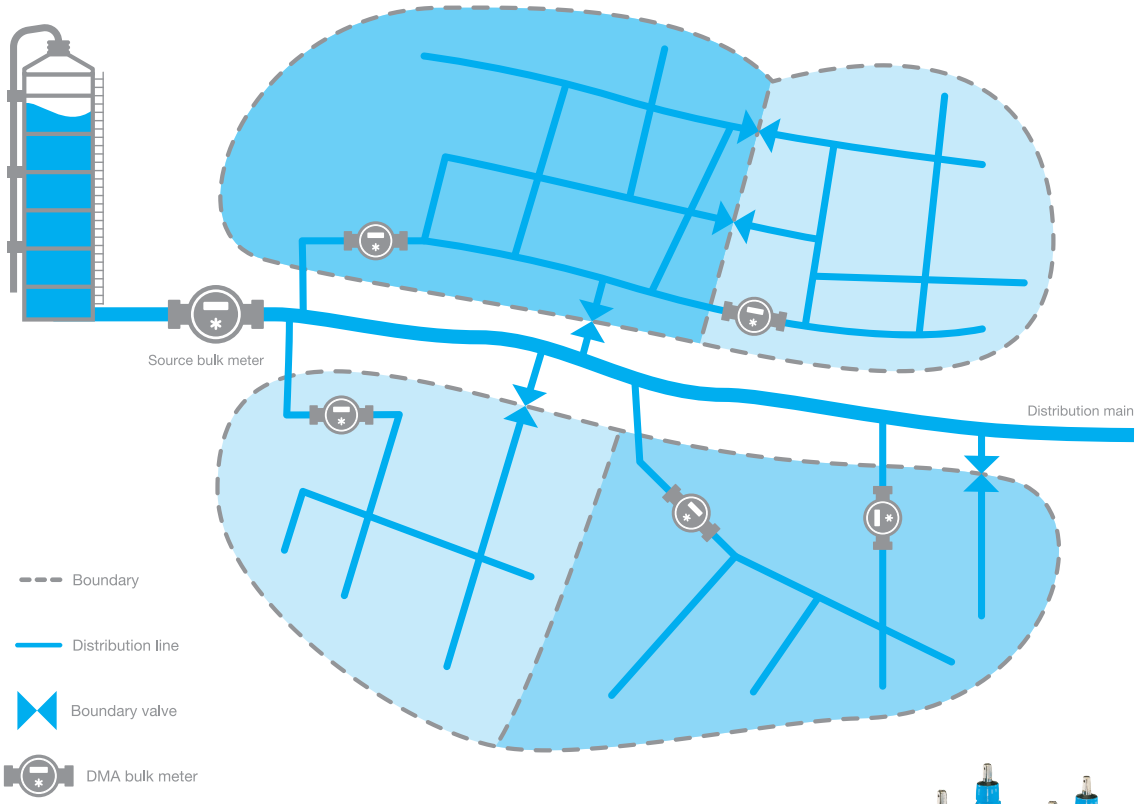
## Lower and steady pressure

The higher the pressure, the more water will be lost. Pressure fluctuations and surges will put strain on the distribution network and cause more leaks.

# District metered areas

District metered areas facilitate leak detection for water suppliers. To this end, they use gate valves to subdivide their pipeline systems into smaller sections, each of which should ideally have only one supply line. Each supply line is equipped with a water meter.

Measurements are taken by night when consumption is at its lowest and steadiest. A sudden increase in consumption during night-time measurement suggests a new leak in this supply section.




## Gate valves & Combi valves Hawle E3 series

Hawle gate valves are excellently suited for closing off and isolating pipe networks. They feature perfect corrosion protection and, due to their durability, are in use for decades.

# Leak detection

Since water pipelines run underground, leaks are seldom visible. However, they cause characteristic noises, which can be turned to account for leak detection.

For generally monitoring and roughly locating leaks, so-called noise loggers are used. If there is a leak between two noise loggers, they will record the same noise but not at the same time. This allows a rough calculation of the position.

To pinpoint the leak, the service teams will use electronic listening sticks and ground microphones which they touch directly to pipes and vavles.

They may also move a camera through the pipe or fill the line with helium - which will then be detected by a measuring device right above the leak.

**Solution:** Hawle Service GmbH has decades of experience in leak detection. We offer a number of services for acoustic leak detection and other methods, including:

- Pre-location
- Pinpointing
- Acoustic pipe location
- Visual pipe location
  (camera moved through the pipe)
- Multi-frequency pipe location

**Scan and learn more about our leak detection methods!**

# Pipe repair

Many water supply networks are very old and thus prone to leaks. But even newer pipes can leak or burst because of inferior materials, incorrect installation, design errors, or natural disasters.

While pipe bursts in water mains may be dramatic, they also occur in supply lines and service lines. And yet, when it comes to repair, service pipes are often not in the focus of interest. In fact, in many cases, they are downright neglected.

## Repair and renewal of pipelines

Quality repair will reduce water loss permanently. By means of pipe repair clamps, fitters can seal small holes in next to no time. By using flexible pipe couplings, they can exchange whole pipeline sections quickly and easily.

### System2000

The proven, easy-to-insall restraint connection system for PE and PVC pipes. Regardless of the weather and without any special tools or special personnel, pipe connections can be established to old and new pipes.

### Synoflex

Reliable, safe, corrosion-resistant multi-range couplings. Quick and easy repair of all common pipe materials.

### Pipe repair clamps

We always have pipe repair clamps in several dimensions stocked for urgent pipe repair.

## Repair and renewal of water mains

Leaks In case of leaks in water mains there is a risk of enormous damage to infrastructure and buildings. In this case, therefore, every minute counts.

Nova Siria offers multi-range couplings and flange adaptors for large diameters, both restraint or non-restraint options are available.

When repairing damaged pipes by piecing in a new section, regardless of the material & diameter, the Multigrip is your ideal solution.

For the repair of pipe joints or flanges without interrupting the water supply, the **Duofit** is the suitable product. The damaged pipe is encapsulated under full pressure.

### Nova Siria Duofit

Repair without interrupting water supply. Reliable and corrosion-resistant repair couplings for the quick and easy repair of large pipelines **(up to max. DN 2000, larger on request)** of all common materials. Custom products possible.

### Nova Siria Multigrip, Nova Siria Large Size

Reliable, restraint or non-restraint, and corrosion-resistant multi-range couplings. Quick and easy repair of all pipe materials. Custom products quickly available. **(up to max. DN 2000, larger on request)**.

## Leaks in service lines

In the long run, leaking service lines often cause substantial water losses. As several pipes of different materials and sizes are connected here, small leaks may occur that are hard to spot.

Because of the small pipe dimension and the low pressure, the noise caused by these leaks is so low that it cannot be detected by a noise logger.

Therefore, water suppliers will exchange service lines after some time. Such exchange will take place within the scope of replacement schemes or renovation work and will simultaneously reduce leakage, line breakage, and maintenance cost.

**Solution:** Hawle offers a wide range of proven service line solutions for each pipe and each application - including the threadless ZAK system.

### Hawle ZAK service line system

Corrosion-resistant clamp saddles with a permanently reliable sealing function and flexible ZAK sockets. Shut-off saddles for drilling under pressure.

### HAKU clamp saddles for plastic pipes

Corrosion-resistant clamp saddles with a permanently reliable sealing function and flexible ZAK sockets. Shut-off saddles for drilling under pressure.

### ISO pipe fittings

Solid ductile iron pipe fittings with proven epoxy powder coating. Simple, restraint, all-weather PE pipe installation in ISO pipe socket. Wide range.

# Network monitoring

More and more water suppliers use digital solutions to fight water loss. Networked sensors allow real-time monitoring from any location while providing reliable data for further measures. Apart from leaks, digital products will also detect water theft.

For many suppliers, a substantial portion of the non-revenue water is caused by the illegal opening of hydrants. By means of network monitoring, they can monitor hydrants very precisely which allows them to take action quickly.

## Hawle.live CAP

The Hawle.live CAP can be retrofitted to all existing hydrants. Any activation of a hydrant is registered and documented immediately and can be received as an alert notification. All hydrants provided with the Hawle.live CAP can be monitored in the Hawle.live APP. Thus, no opening and no water theft will pass unnoticed.


## H4.live

The first digital hydrant for real-time monitoring is based on our proven H4 hydrants. The digital H4.live notifies you of any actuation of the hydrant. You get real-time data and can obtain information about the activities and condition of your H4.live hydrant anytime and anywhere.

## Hawle.live BOX

The new Hawle.live BOX for the IoT-based remote monitoring of water supply facilities. Data transmission via mobile radio network. Permanent storage and notification when values exceed or drop below alarm and warning limits. Visualization and evaluation in the Hawle.live APP.


## Hawle.live APP

The Hawle.live APP is a digital platform connecting all hydrants, gate valves, air valves, and control valves of your water supply system. Comprehensive information regarding the state, location, leak detection, and test reports.

# Pressure management

The higher the pressure, the higher the water loss. Pressure fluctuations and surges will also cause further leaks. Therefore, it is vital for water suppliers to apply an intelligent pressure management. For example, they can reduce losses by decreasing the pressure at night, when consumption is low, and they can minimize the effects of pressure surges by using air valves and slow-closing valves.

**Find out how far you can reduce water loss by lowering the network pressure during the night.**

## Needle Valve

Needle valves offer maximum protection of your water pipeline system thanks to simple, proven and easy maintain technology.

## Air Valves

Air accumulating in the water pipelines, as well as the formation of vacuum may put the whole water supply system at risk, causing leakage, pipe corrosion, and deformations. Hawle dynamic air valves with a 3-way function can help to preserve the pipeline by either removing excessive amounts of air or, if necessary, by admitting air automatically.

## Filters

Upstream of each water meter, an easy-to-maintain filter must be installed. Hawle offers a wide range of reliable and maintenance-friendly products.

# Maintenance of control valves

Control valves must withstand toughest conditions: constant pressure fluctuations of 40 bar and flow rates of 1,000 l/s are not uncommon. This will put strain on the valve diaphragm and gaskets. Therefore, specialists must inspect and maintain them regularly. The inspection interval can be adapted precisely to the application through individual maintenance agreements.

**Hawle Service GmbH will be glad to help you choose the proper control valve. You can also use our online calculator to find the right valve for your application.**

# CONCLUSION

To protect our water, we have to significantly reduce non-revenue water right now. In many places, our water infrastructure is very old. Water suppliers can prevent leaks by implementing an intelligent pressure management, performing regular maintenance, and renewing facilities in time.

District metered areas, modern measuring instruments, and digital solutions can help them to detect leaks quickly and precisely. These measures will also put an end to water theft.
Last but not least, pipelines can be repaired quickly and easily by means of the right material.

## Quality since 1948

The Hawle Austria Group produces and sells heavy-duty valves all over the world. The products, which are made for generations, are used in urban water management from the source to the service connection.

In 1948, the pioneer Engelbert Hawle had the idea for a revolutionary pipe connection for drinking water pipelines and founded the enterprise in Vöcklabruck. Abuzz with ideas and full of passion, the company's founder worked away in his modestly furnished workshop, always striving for customer-oriented solutions. In the following decades, Hawle used his pioneering spirit and the ambition to consistently advance his products to set milestone after milestone. Today, the enterprise is the quality leader in the field of heavy-duty valves. While operating on a global level by now, the Hawle Austria Group, has been family-owned since the day of its foundation. Through a forward-looking mindset and an international orientation, the company aims at a sustainable and positive development.

### Contact us

E. Hawle Armaturenwerke GmbH
Wagrainer Straße 13 | 4840 Vöcklabruck | Austria | hawle.com
Tel. +43 7672 72 576-0 | E-Mail: hawle@hawle.at

# Sources


1. World Meteorological Organization. Significant trends affecting water availability | World Meteorological Organization. (n.d.). Retrieved on 26 September 2022 from https://community.wmo.int/activity-areas/water-resources-assessment/significant-trends-affecting-water-availability

2. Liemberger, R., & Wyatt, A. (2019, May 1). Quantifying the global non-revenue water problem. Water Supply. Retrieved on 23 November 2022 from https://iwaponline.com/ws/article/19/3/831/41417/Quantifying-the-global-non-revenue-water-problem

3. Croatia: Oen-2022-1-2 collection, purification and distribution of water, 2021. Croatian Bureau of Statistics. (n.d.). Retrieved on 23 November 2022 from https://podaci.dzs.hr/2022/en/29091

   Norway: Municipal Water Supply. SSB. (2022, June 15). Retrieved on 23 November 2022 from https://www.ssb.no/en/statbank/table/11791/

   Slovakia: Public water-supply and sewage systems as of Dec. 31. Statistical Office of the Slovak Republic. (n.d.). Retrieved on 23 November 2022 from https://datacube.statistics.sk/#%21/view/en/VBD_SLOVSTAT/vh2004rs/v_vh2004rs_00_00_00_en

   Spain: Water distribution registered by Autonomous Cities and Communities, groups of users and amount and period. The INE - Statistical Organisation of Spain. (n.d.). Retrieved on 23 November 2022 from https://www.ine.es/jaxi/Tabla.htm?tpx=53448

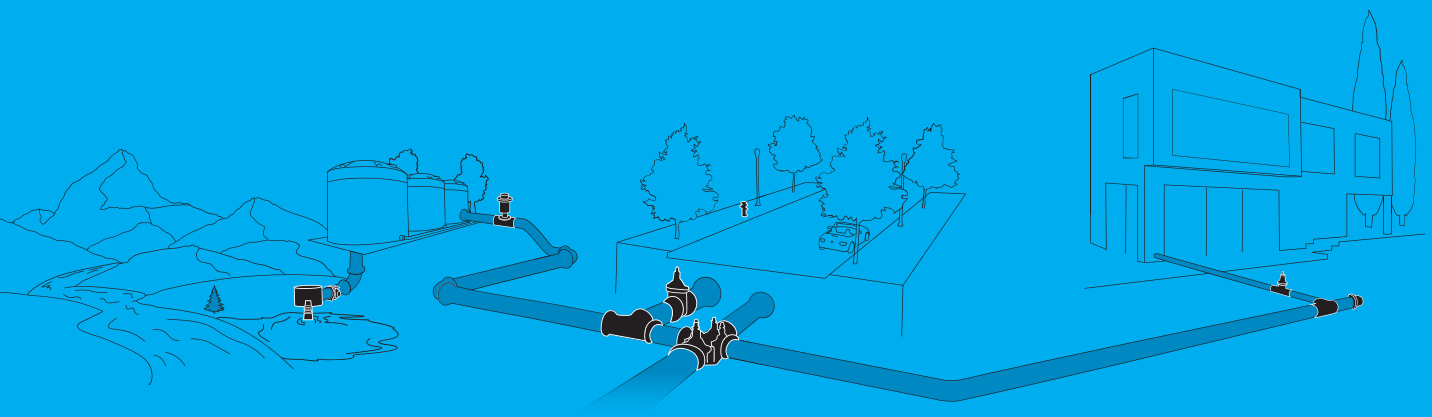
   Russia: Утечка и неучтенный расход воды. ЕМИСС. (n.d.). Retrieved on 22 November 2022 from https://www.fedstat.ru/

   New Zealand: National Performance Review. Water New Zealand. (n.d.). Retrieved on 22 November 2022 from https://www.waternz.org.nz/NationalPerformanceReview

   Poland: Water supply systems. Central Statistical Office of Poland. (n.d.). Retrieved on 23 November 2022 from https://bdl.stat.gov.pl/bdl/dane/podgrup/tablica

   Denmark: Danish Environmental Protection Agency. (n.d.). Water Loss. Retrieved on 23 November 2022 from https://eng.mst.dk/nature-water/water-at-home/water-loss/

   Germany: Wasserverluste in der öffentlichen Wasserversorgung bis 2020. Statista. (2022, June 20). Retrieved on 23 November 2022 from https://de.statista.com/statistik/daten/studie/155684/umfrage/wasserverluste-in-der-oeffentlichen-wasserversorgung-seit-1991/

**E. Hawle Armaturenwerke GmbH**
Wagrainer Straße 13 | 4840 Vöcklabruck | Austria | **hawle.com**
+43 7672 72 576-0 +43 7672 78 464 hawle@hawle.at