WATER IS OUR CONCERN

SAVE | WATER & ENERGY

CREATING THE DIGITAL WATER UTILITY

The no-nonsense approach to digital transformation

CLEARING THE PATH TO DIGITALISATION

Five main barriers to creating a digital water utility

A BETTER WATER FUTURE

The benefits of using digital technologies in the water utility sector

DETERMINING YOUR INVESTMENT PRIORITIES

How to identify the approach that best suits your utility

be
think
innovate

GRUNDFOS

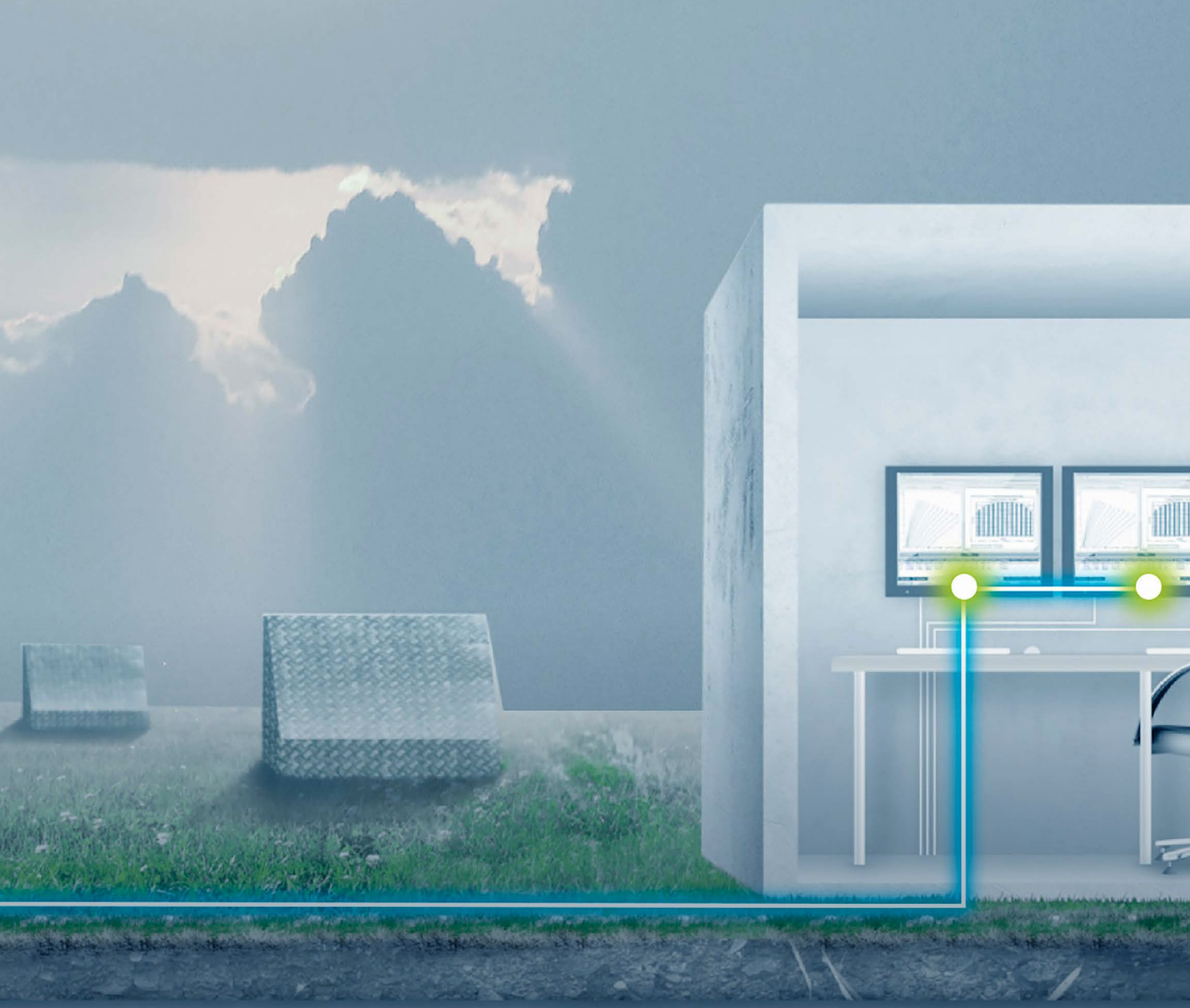
WELCOME

Currently, approximately 4 billion people live in water-scarce and stressed regions with nearly one billion people without access to safe drinking water. The World Economic Forum projects that by 2030, the world will face a 40 per cent "gap" between water supply and demand under business-as-usual practices (e.g., public policy and technology).

As an answer to some of these challenges, the global water sector is beginning to embrace a digital transformation, consisting of the adoption of technologies such as remote sensing (e.g., sensors, satellite and drone), asset management (e.g. inventory of assets and maintenance), customer engagement (e.g., water use and service), predictive analytics (e.g., asset failure prediction), artificial intelligence (e.g., asset management) and more.

Here we explore some of the challenges and opportunities for water utilities as they approach digitalisation. With the support of a white paper published by Global Water Intelligence, Global Water Leaders Group and Grundfos, "Accelerating the Digital Water Utility", we will break down some of the main barriers and benefits to digitalisation. We will also take a look at how to determine your investment priorities and how to effectively measure your return on investment.

To discuss any of the information here, please get in touch with Grundfos.



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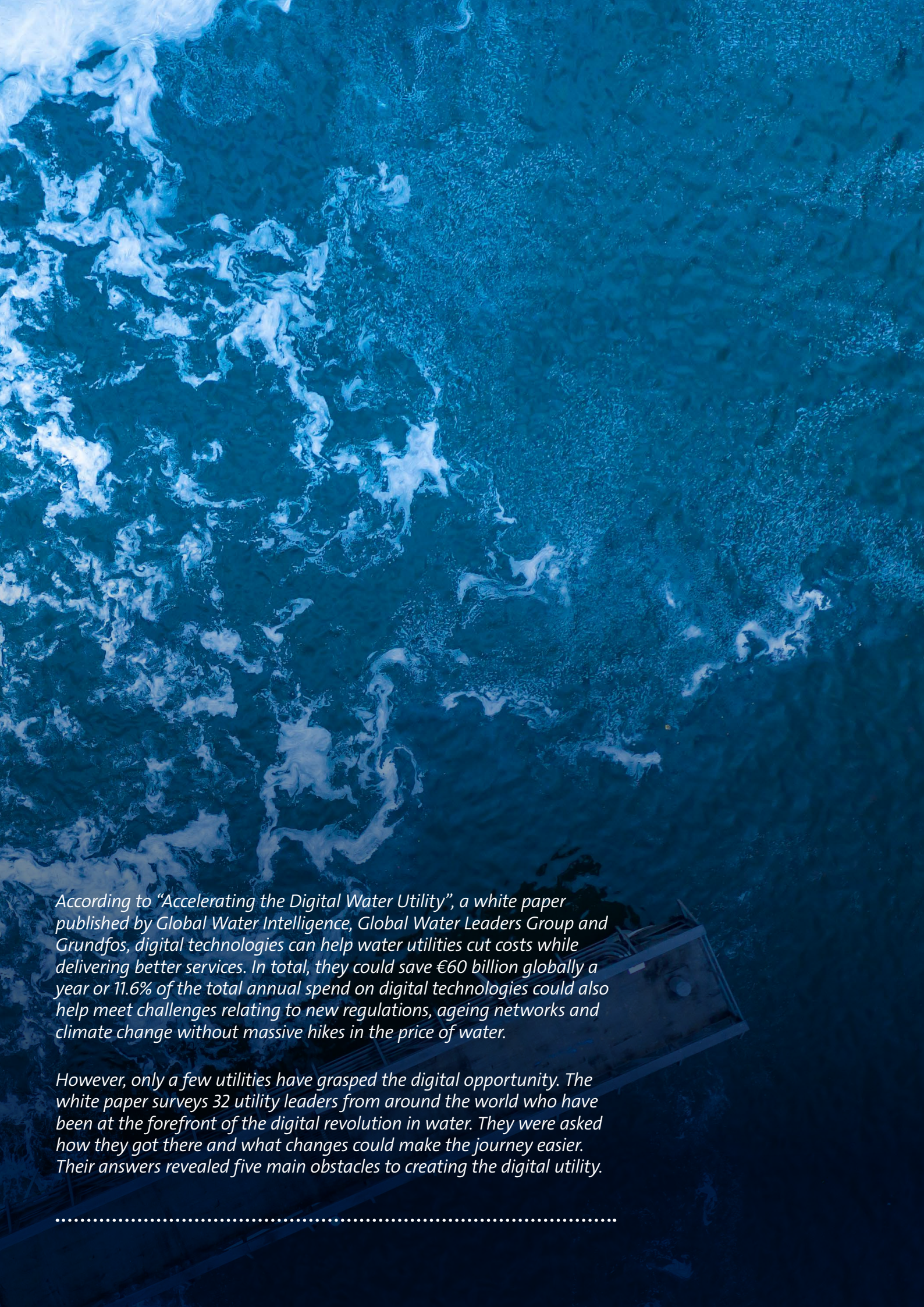
WATER UTILITY:

CLEARING THE PATH TO DIGITALISATION

FIVE MAIN BARRIERS TO CREATING A DIGITAL WATER UTILITY



According to "Accelerating the Digital Water Utility", a white paper published by Global Water Intelligence, Global Water Leaders Group and Grundfos, digital technologies can help water utilities cut costs while delivering better services. In total, they could save €60 billion globally a year or 11.6% of the total annual spend on digital technologies could also help meet challenges relating to new regulations, ageing networks and climate change without massive hikes in the price of water.

However, only a few utilities have grasped the digital opportunity. The white paper surveys 32 utility leaders from around the world who have been at the forefront of the digital revolution in water. They were asked how they got there and what changes could make the journey easier. Their answers revealed five main obstacles to creating the digital utility.

1. IT'S DIFFICULT TO ESCAPE DIGITAL POVERTY

The utilities that answered the survey were wealthy in digital terms. They had good basic systems and staff used to delivering change. Each new project built on this base. As they accumulated data and expertise, everything became easier. The reverse is also true. Those utilities without a strong digital endowment are likely to find projects more difficult and less rewarding.

2. A MISMATCH BETWEEN CHALLENGES AND SOLUTIONS

Respondents complained of the mismatch between what vendors want to sell and what they want to buy. Each utility has different priorities and different systems to build on. Vendors, on the other hand, prefer to sell the same thing over and over. That is how they make a profit. There is a compromise to be made but it only happens if the two sides devote time to talk.

3. ASSESSMENT IS DIFFICULT

Respondents reported that it was difficult to make the business case for their digital systems. The costs and the benefits may be spread unevenly across capex and opex and different departments. Even when a project is up and running, it is difficult to know the full costs and benefits. 44% of respondents now have a formal system for assessing projects. All of them felt sharing experience with each other would help more.

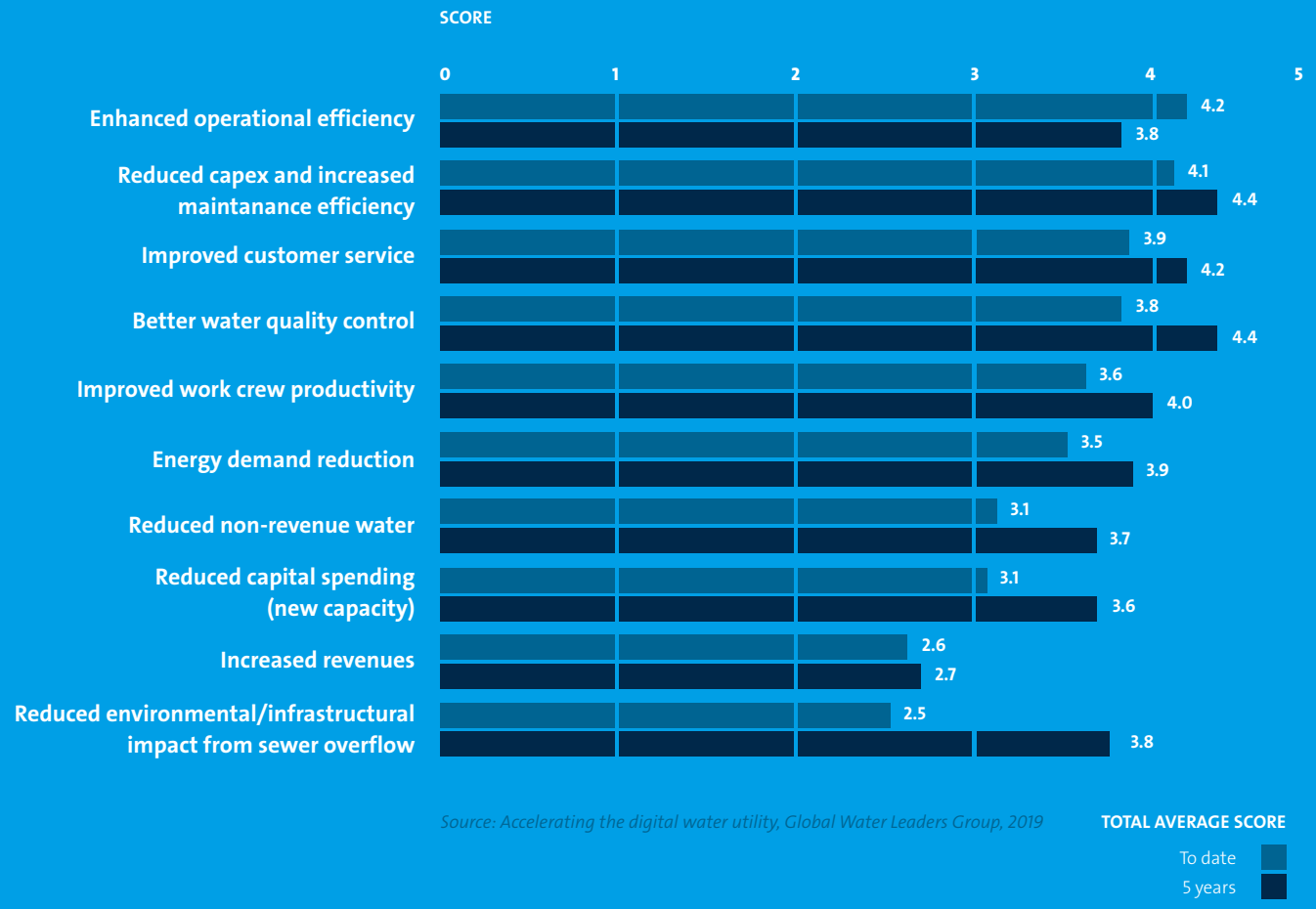
4. THE PROCUREMENT PUZZLE

Most utilities have to buy through public tenders. This does not work well for digital projects for three reasons. First, because no two vendors offer a directly comparable package with a clear price tag. Secondly, because compatibility with existing systems is often more important than price. Thirdly, because the endpoint of the journey is often not visible from the starting point. That is why 71% of respondents preferred to work with long-term partners. Evolving the procurement model to meet this need would help.

5. OTHER INTERNAL ISSUES

Then there are various other internal issues. The utility leaders ranked 13 problems they might face in implementing digital projects. The results are shown here. The Global Water Leaders Group, which was set up to help make the world of water work better, is working on dissolving some of these barriers and supporting the digitalisation of water utilities around the world.

INVESTMENT DRIVERS IN THE PAST AND IN THE FUTURE



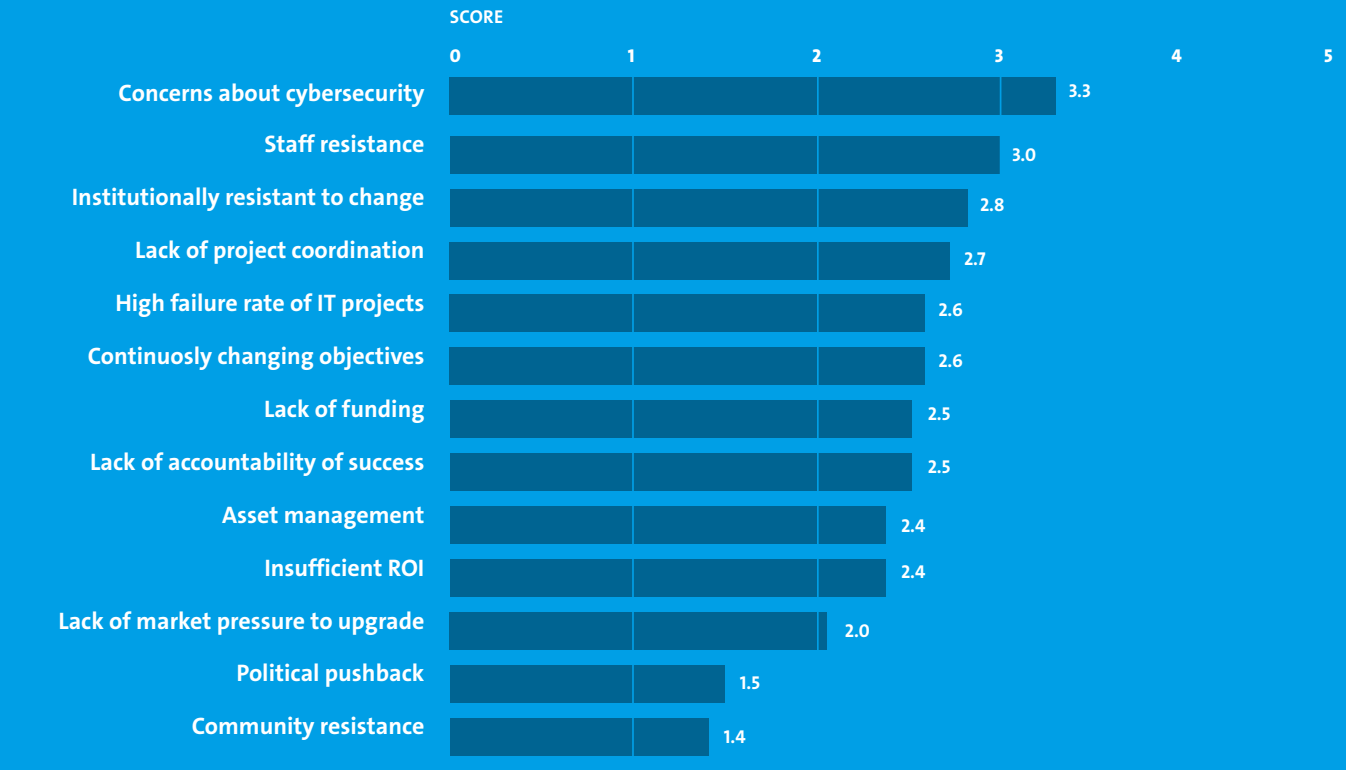
Source: Accelerating the digital water utility, Global Water Leaders Group, 2019

TOTAL AVERAGE SCORE

To date

5 years

CHALLENGES IN IMPLEMENTING DIGITAL SOLUTIONS IN WATER UTILITY



Source: Accelerating the digital water utility, Global Water Leaders Group, 2019

WATER UTILITY:

A BETTER WATER FUTURE

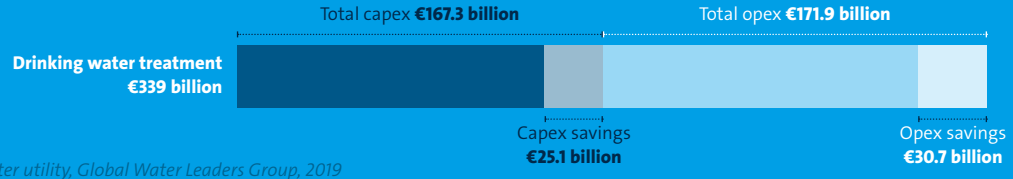
THE BENEFITS OF USING DIGITAL TECHNOLOGIES IN THE WATER UTILITY SECTOR

In 2016, Global Water Intelligence published a report entitled "Water's Digital Future". It aimed to put a number on the value of using digital technologies in the water and wastewater utility sector. The following is a synopsis of the benefits the report identified.

DRINKING WATER TREATMENT:
IMPROVED EFFICIENCY AND PUBLIC HEALTH

- **Reduced chemical use**
  Process optimisation and raw water monitoring can significantly reduce the amount of chemicals needed through accurate and frequent sampling.
- **Energy efficiency**
  Reductions in energy consumption are a straightforward way for a utility to save on operational costs and can be achieved by monitoring and optimising individual treatment steps or non-treatment processes such as pumping.
- **Reduced downtime**
  Digitalisation allows for predictive maintenance by helping a utility decide when repairs are necessary. This can save time and labour by avoiding unnecessary maintenance and outages that lead to long downtimes.
- **Improved abstraction compliance**
  Monitoring of raw water volumes destined for drinking water treatment can help ensure that utilities do not overproduce and stay within necessary abstraction limits. The public benefits from a healthier and well-regulated watershed.

POTENTIAL SAVINGS DUE TO DIGITAL SOLUTIONS IN DRINKING WATER TREATMENT

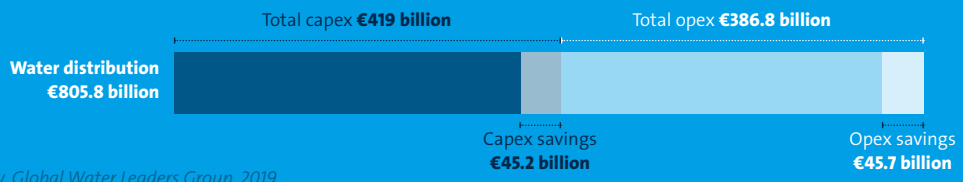


Source: Accelerating the digital water utility, Global Water Leaders Group, 2019

DRINKING WATER DISTRIBUTION:
FEWER DISRUPTIONS TO THE NETWORK AND THE PUBLIC

- **Leakage reduction**
  A holistic leak management strategy, implemented through techniques such as leak detection and active pressure management, can reduce the amount of water lost in distribution and prevent stresses that can lead to pipe bursts.
- **Reduced labour costs**
  Enhanced leak detection and inline quality monitoring reduce the amount of time needed for labourers to manually perform these tasks. It also reduces the amount of unnecessary or preventative repairs that can be better utilised elsewhere on the network
- **Network optimisation**
  Other network optimisation savings stem from reducing pump loads, which can have significant opex savings.
- **Water quality testing and alerts**
  Digitised water quality testing can alert operators and/or the public to contamination, either from upstream water treatment or from integrity problems such as infiltration.

POTENTIAL SAVINGS DUE TO DIGITAL SOLUTIONS IN DRINKING WATER DISTRIBUTION

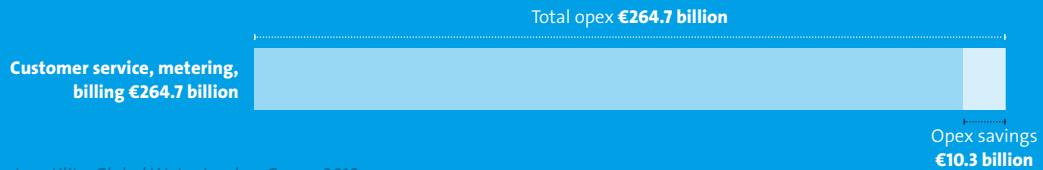


Source: Accelerating the digital water utility, Global Water Leaders Group, 2019

CUSTOMER SERVICE, METERING AND BILLING: IMPROVED CONTROL AND CUSTOMER EXPERIENCE

- **Domestic wastewater meters**
  Advances in wastewater-appropriate meters could provide a consistent revenue stream for utilities through accurate measurements of household wastewater production.
- **Billing**
  Automation and digitalisation can help reduce the amount of non-revenue water (NRW) that arises from several types of billing issues.
- **Reduced labour costs**
  Automatically reading and transmitting meters and billing will save labour costs associated with reading meters and customer service inquiries.
- **Demand control**
  Accurate usage information can give operators a better understanding of customer demand and incentivise conservation, helping to inform utility-wide decision-making in order to optimise operations and prevent service disruption.

POTENTIAL SAVINGS DUE TO DIGITAL SOLUTIONS IN CUSTOMER SERVICE, METERING AND BILLING



Source: Accelerating the digital water utility, Global Water Leaders Group, 2019

WASTEWATER COLLECTION AND DRAINAGE: IMPROVED ENVIRONMENTAL AND PUBLIC HEALTH

- **Energy savings**
  Optimisation of wastewater network pump operation, such as in pumping stations, is the area with the greatest potential for operational cost savings.
- **Reduction of labour costs through network health**
  Digitalisation can aid significantly in monitoring physical pipe condition, such as defects or corrosion level, and aid in inflow and infiltration assessments.
- **Flood damage prevention and mitigation**
  Network modelling combined with accurate flow and level information and regular weather updates can help utilities prepare for, and mitigate the effects of, flooding events either within the network or by protecting downstream equipment in wastewater treatment plants (WWTPs).
- **Environmental quality**
  Reduction in the number of combined sewer overflows and stormwater sewer overflows increases watershed health.

POTENTIAL SAVINGS DUE TO DIGITAL SOLUTIONS IN WASTEWATER COLLECTION AND DRAINAGE

Source: Accelerating the digital water utility, Global Water Leaders Group, 2019

WASTEWATER TREATMENT:
RELIABILITY AND ENVIRONMENTAL QUALITY

- **Energy efficiency**
  Reductions in energy consumption are straightforward way for a utility to save on on operational costs and can be achieved by monitoring and optimising individual treatment steps or non-treatment processes such as pumping.

- **Reduced chemical use**
  Process optimisation and raw water monitoring can significantly reduce the amount of chemicals needed through accurate and frequent sampling.

- **Labour cost savings**
  The processes within Wastewater Treatment Plant are often more complex than those involved in drinking water treatment. Inline quality testing optimises operations and reduces the reliance on infrequent manual testing.

- **Wastewater Treatment Plant connectivity**
  Utilities can optimise their entire network of Wastewater Treatment Plant regardless of number, size or location. Areas with poorer treatment quality, for example, can be identified and informed decisions can be made as to how to improve consistency across all plants, particularly in low-staffed or unmanned locations.

- All of these benefits become dramatically more affordable as a result of major advances in technology, such as the Internet of things, big data management and artificial intelligence. As the cost of these technologies comes down, so does the cost of your digital investment. Read on to learn more about digital investment priorities.

POTENTIAL SAVINGS DUE TO DIGITAL SOLUTIONS IN WASTEWATER TREATMENT

Source: Accelerating the digital water utility, Global Water Leaders Group, 2019

WATER UTILITY:

DETERMINING YOUR INVEST-MENT PRIORITIES

HOW TO IDENTIFY THE APPROACH
THAT BEST SUITS YOUR UTILITY

Utilities around the world are experiencing a similar combination of drivers for developing digital integration strategies and solution portfolios. Yet, a standardised 'one-size-fits-all' procurement model for digital solutions does not fit the reality of the water market. Despite similar procurement drivers, the precise needs of utilities will vary, and so will the solutions that meet those needs.

The clear communication of the digital capabilities available and how they might be applied is essential to utilities understanding the potential of digital solutions, how digital might work within their existing structures, and how to maximise the positive impact of new solutions.

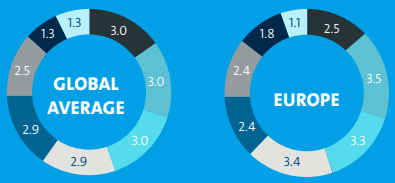
GLOBAL DIGITAL INVESTMENT TRENDS

In the white paper "Accelerating the Digital Water Utility", utility leaders were asked to detail their utility's short-term investment priorities. Respondents ranked data aggregation and application, real-time network monitoring and control, and customer services as the most urgent areas of development.

Continued interest in increased multi-variant Geographic information system mapping and hydrological modelling will form a significant aspect of realising digital's value potential in these areas, as utilities seek to understand their services and processes in line with tightening regulations and increasingly complex environmental conditions. See the full results of the ranking here.

These investment priorities alongside the digital drivers mentioned above indicate a trend toward fundamental data gathering and handling capabilities underpinning further digital service developments.

RELATIVE IMPORTANCE OF DIGITAL INVESTMENT AREAS, GLOBAL VERSUS REGIONAL



Source: Accelerating the digital water utility, Global Water Leaders Group, 2019

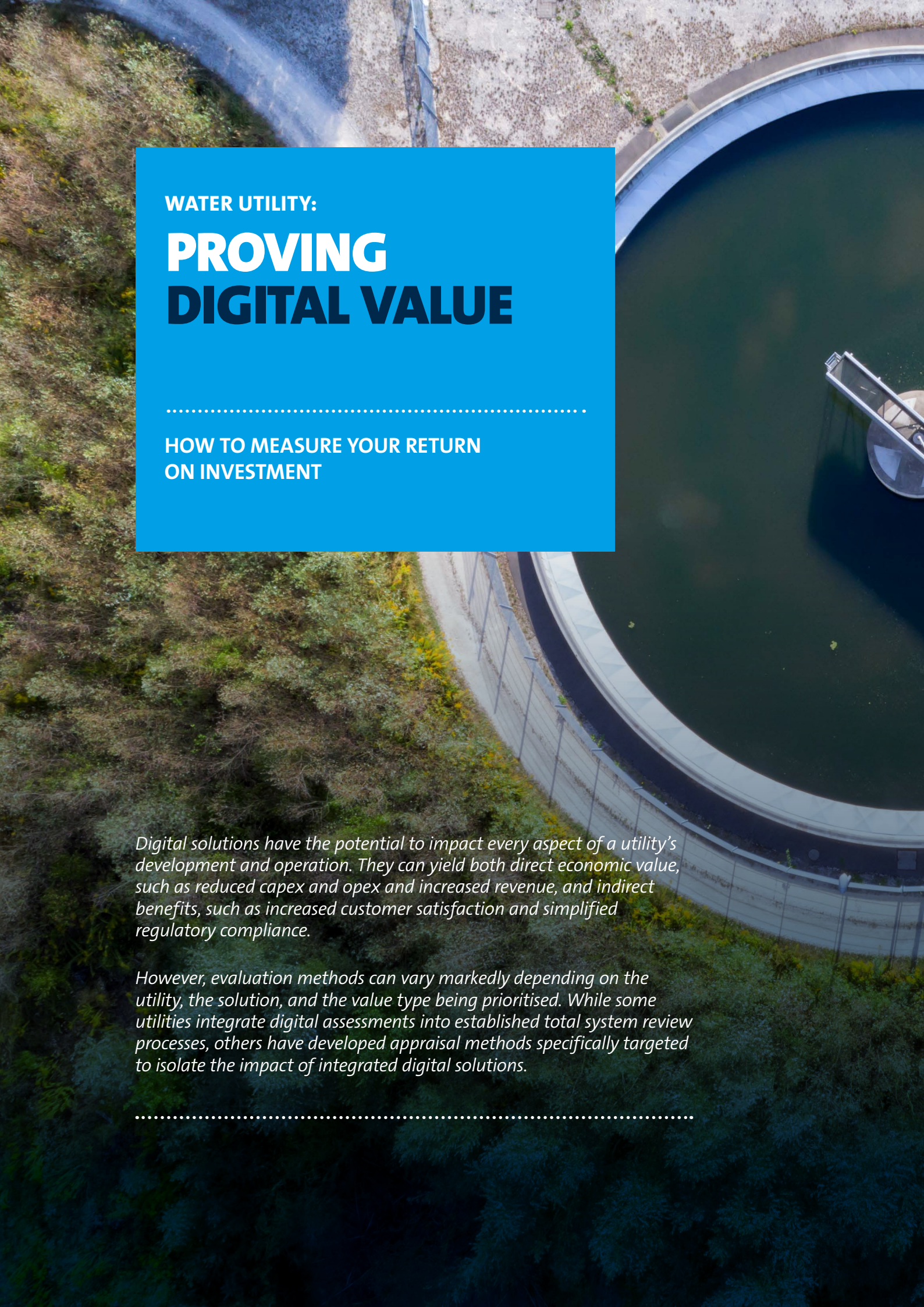
DATA: A FUNDAMENTAL INVESTMENT PRIORITY

Digital solutions rely on data. The better your data and the more of it you have, the more you can do with it. Data gathered to address one set of needs will grow over time, allowing users to hone their responses, but when individual datasets are combined and coupled with ever more advanced computational capacity, they can support digital systems far beyond their original purpose.

Since utilities need to be able to assess digitalisation impact accurately in order to justify further investment, they should build assessment structures into their digital procurement and deployment initiatives. Solutions should be identified that serve real needs and solutions' projected ability to achieve targeted outcomes should be used to determine investment priorities.

"The approach we take to digital solutions is about business value and the early identification of opportunities to digitally enhance our operations. The pace of adoption is determined by the particular solution and the benefits it will bring our organisation. As part of the procurement process, we determine which adoption method will prove the best outcome for the company."

Louise Dudley, CEO, Queensland Urban Utilities, Australia



WATER UTILITY:

PROVING DIGITAL VALUE

HOW TO MEASURE YOUR RETURN ON INVESTMENT

Digital solutions have the potential to impact every aspect of a utility's development and operation. They can yield both direct economic value, such as reduced capex and opex and increased revenue, and indirect benefits, such as increased customer satisfaction and simplified regulatory compliance.

However, evaluation methods can vary markedly depending on the utility, the solution, and the value type being prioritised. While some utilities integrate digital assessments into established total system review processes, others have developed appraisal methods specifically targeted to isolate the impact of integrated digital solutions.

VARIED EVALUATION PROCESSES

Digital systems assessment allows utilities to adjust their operations to maximise digitalisation's benefits, better understand the limitations of specific technologies, and develop more effective procurement, deployment and future investment strategies.

Despite this, only 44% of the utilities surveyed in the white paper "Accelerating the Digital Water Utility" reported deploying clearly defined evaluation processes as part of their digital development strategy. See the full results here.

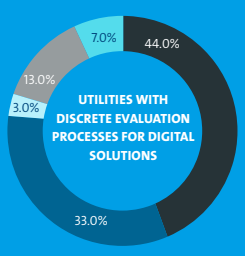
VARIED ASSESSMENT METHODS

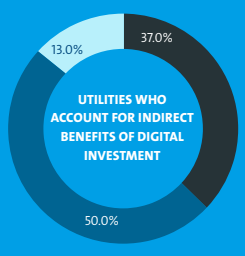
Even when discrete evaluation processes have been designed and instigated, there is little consistency in how assessments are carried out between utilities. The level of performance that constitutes 'adequate returns' will vary depending on the utilities' specific circumstance or performance targets, as will the metric deemed most appropriate for measuring success.

Similar inconsistencies can be seen across the key digital investment areas surveyed. Seven out of nine key investment areas were listed as generating the greatest and least return by nearly identical proportions of respondents (+/-2%).

UTILITY EVALUATION PRACTICES

- Yes
- No
- In development
- Incorporated with other assesment areas
- Communicational

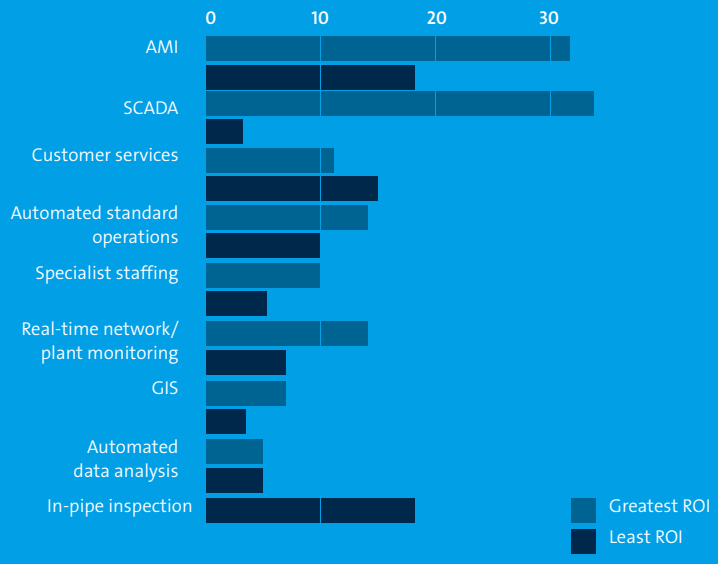




Source: Accelerating the digital water utility, Global Water Leaders Group, 2019

KEY INVESTMENT AREAS

LEAST/GREATEST RETURN ON INVESTMENT IN KEY DIGITAL INVESTMENT AREAS



Source: Accelerating the digital water utility, Global Water Leaders Group, 2019

THIS HIGHLIGHTS TWO THINGS:

1. The necessity for utilities to tailor their adoptions of digital solutions to address their specific needs.
2. The need for utilities to communicate exactly what they mean by value. Whether a utility values a technology for its enhanced opex saving capabilities or because it makes their maintenance team's lives easier may have a huge impact on how it reports 'value'.

"There's no one way of looking at ROI. The details of your evaluation process should depend on the solution, its timeline, the level of investment, its expected outcomes, and how I might be expected to develop in future."

– Biju George, Executive Vice President, Operations and Engineering, DC Water

EVALUATION STARTS WITH PROCUREMENT

The most effective evaluation structures assess both individual solutions and utilities' overarching digital strategies, accounting for each step of the digital transformation process from procurement to deployment operation.

By benefit forecasting and establishing intended outcomes at the procurement stage, utilities generate a clear set of targets against which to assess the efficacy of digital solutions. By establishing a clear timeline of incremental performance targets, utilities can analyse the effectiveness of digital solutions over an extended period, all related to a pre-established framework of expected returns.

CLEARLY IDENTIFIED KPIS AND TARGET OUTCOMES

Of the leading utilities surveyed, several have developed effective assessment structures that involve pre-deployment performance targeting, consistent lifetime assessment and overall strategy evaluation.

To account for digital investment returns, utilities should implement discrete evaluation structures. These structures should identify clear KPIs and target outcomes prior to deployment and track the performance of digital systems in line with those KPIs, both in isolation and as part of utilities' integrated operations.

BOOK A MEETING TO GET STARTED

One of our water utility specialists we will give you solid, professional advice that you can use to take the next step, completely free of obligation.

Book a meeting

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