



**MAZARS**

**2019 U.S. WATER  
INDUSTRY OUTLOOK**

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**MAZARS**

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A composite image featuring industrial water treatment equipment. The left side shows a close-up of a blue-painted metal valve with a hexagonal nut. The right side shows a large, complex piece of machinery with multiple cylindrical tanks and a large handwheel, all in a light, desaturated color palette.

**ABOUT MAZARS USA LLP**  
**WATER GROUP**

AT MAZARS, WE BELIEVE EVERYONE IS A STAKEHOLDER IN THE WATER COMMUNITY, AND WE STRIVE TO BE AN ACTIVE ONE BY CONSTANTLY WORKING TOWARDS ADVANCING SUSTAINABLE WATER SOLUTIONS AND SURMOUNTING THE CHALLENGES IN THE GLOBAL WATER MARKET.


WE LEVERAGE OUR RESOURCES, EXPERTISE AND EXPERIENCE TO ASSIST CLIENTS WITH THEIR MOST SIGNIFICANT CHALLENGES AND HELP THEM ACHIEVE COMPLIANCE, RISK MITIGATION, SUSTAINABILITY, INNOVATION, EFFICIENCIES, GROWTH AND RETURNS ON CAPITAL.





# INTRODUCTION 2019 U.S. WATER INDUSTRY OUTLOOK



The background of the page features a grayscale image of industrial water treatment equipment, including pipes, valves, and a large circular tank. On the right side, there are three horizontal bars in blue, yellow, and red. The text is overlaid on this background.

Seven years ago, we launched the Water Industry Outlook with the aim of playing our part in leading the education and research needed to support sustainable solutions for all forms of water services. Water is essential to the U.S. population and economy. The way in which America addresses its water challenges will be looked at as a global role model for sustainability.

In this year's Outlook, we continue to provide our perspective on key topics surrounding operations, finance, and future trends. In a continuous effort to improve this publication and increase its value, we have focused the operations section on big data and data analytics. The section also offers follow-ups on topics discussed as major priorities for the industry in previous surveys, i.e. energy efficiency and cybersecurity. The future of the industry section is largely focused on water stewardship and sustainability reporting.

The Outlook is built on a 26 question survey, conducted in 2018, through which we captured the perspectives of different stakeholders, including water and wastewater systems and operations management, procurement and other support for water and wastewater companies, government regulators and the investment community (see Figures 1 –4). The demographics section also illustrates the managerial, company size and ownership characteristics of our respondents. We greatly appreciate the support of all respondents, and thank them for taking the time to respond to our survey and for their honest contributions.

We also want to extend a very warm thank you to our two industry-leading interviewees. Cristina Ahmadpour, President of Isle Inc., was very kind to once again share her insights on innovation. Her interview can be found on pages 36 to 38. We are very happy to also present an interview with Stephane Bouvier, CEO of Inframark (formerly Seven Trent) – he offers a very interesting perspective from the contract operations sub-sector, a viewpoint that has not been covered in our previous editions. His interview can be found on pages 20 to 23.

This publication is made possible by the contribution of several of our professionals who we want to recognize and thank for their dedication: our experts on taxation, Faye Tannenbaum (pg. 26), data analytics, Patrick Zerbib (pg. 16), and cybersecurity, Philip Jones (pg. 18).

We always strive for improvement, and welcome any ideas as to how we can continue to improve this publication and deliver more value. If you have any questions, are looking to discuss some of the themes covered in this Outlook, or if you are interested in contributing, we invite you to connect directly with our team, whose contact is provided on the back.

Finally, we remind our readers that the results of our survey are presented solely for informational purposes. Every water or wastewater system is unique and highly influenced by the local political, resource, legal, and customer environment.



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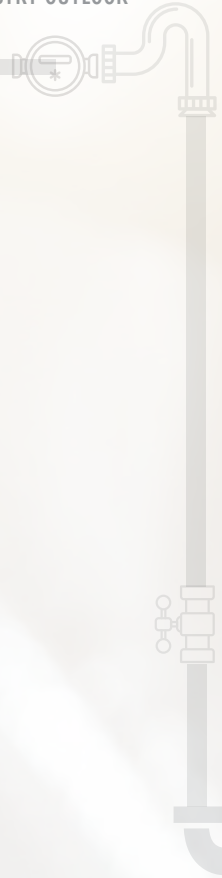
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# EXECUTIVE SUMMARY

## OPERATIONS

In 2018, the move towards leveraging technology to improve operations continued, with respondents stating that smart metering and data analytics will have the most impact on the sector in terms of increasing efficiency and operational cycles.

“Big data” is a hot buzzword across industries, and many companies are seeing substantial benefits from it, and its use is practically ubiquitous in telecom and finance. However, water and wastewater lag behind in the areas of big data and data management. While the need for tapping these future resources has been recognized, the actual implementation is in the early stage.

Before being able to use the large volume of data that utilities already have available to them, water utilities need to implement systems and processes that will allow them to extract, collect, sort by relevance and otherwise interpret this information. Only then can they apply it to their day-to-day operations.

Unfortunately, the primary obstacle to introducing such technology is the difficulty of integrating it into existing systems, a challenge that the sector must collectively address to best move forward.



## FINANCE

The big trends in finance have gone unchanged. Capital remains available, with an increasing number of investors evaluating and seeing opportunities in the water sector. There is, however, mounting impatience from some investors that see financial potential and rewards coming too slowly and at a high risk. A lot of this capital is committed capital that must be assigned to viable projects by a certain date or the funding is lost. This is potentially of concern for both highly capital-intensive projects and the very small projects required to maintain the standards of water and waste water systems.

We note two interesting trends as part of this year's survey results: (1) the perception of availability of capital has slightly shifted to an overall gloomier picture since we started taking the survey in 2012 (see Figure 14); and (2) M&A seems to be taking the driver's seat when it comes to growth, while capital investments and climate events lost ground. The first survey we conducted 7 years ago highlighted the ease of access to capital in the wake of the financial crisis. 10 years after the crisis, access to capital may not be perceived as so easy, particularly in an environment of significant stock market valuation appreciation and rising interest rates.

Finally, the role of government on the financing of the industry seems to be perceived as positive and impactful. The underwriting of WIFIA's first loan has clearly raised confidence in the ability of this program to start benefiting the industry. The effects of the Tax Cut and Job Act of 2017 (TCJA) is still heavily debated, but it received positive responses in our survey. While these are federal initiatives, there is consensus in the industry that solutions must be local to be effective. We expect that in the coming years, there will be more locally-driven initiatives and legislation such as state infra banks, fair-value legislation and water quality/ infrastructure regulation.

## FUTURE OF THE INDUSTRY

The water and wastewater industries continue to face many of the same challenges around infrastructure, sustainability and financing that we have seen in previous years. However, we are also seeing an effective response to those obstacles through the leveraging of technology and broader sustainability initiatives.

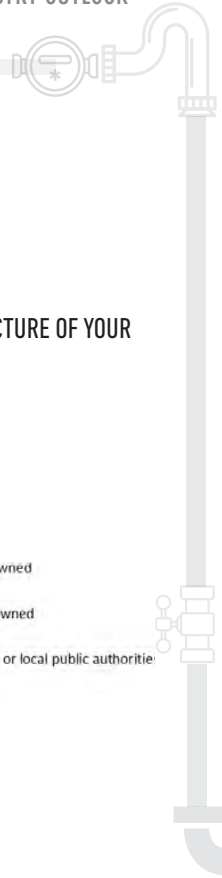
Capital expenditure programs and addressing environmental and compliance risk were key areas where respondents believed that standardized reporting could be enhanced to provide more insight to stakeholders and increase value. Moving forward, we expect there to be continued conversation regarding enhanced reporting on previously undisclosed key metrics such as asset replacement rates, future capex commitments, water main breaks or other infrastructure failures, and non-revenue water loss. However, these enhancements are not expected to advance quickly, due to opposing views on their disclosure.

As environmental regulations are increasingly enforced, participants expected compliance to be a key factor to an increase in water projects and investments. A regulated entity's ownership could impact the direction of future projects, and the capital sources used to fund these projects may shift in order to incentivize investors (such as the use of green bonds).

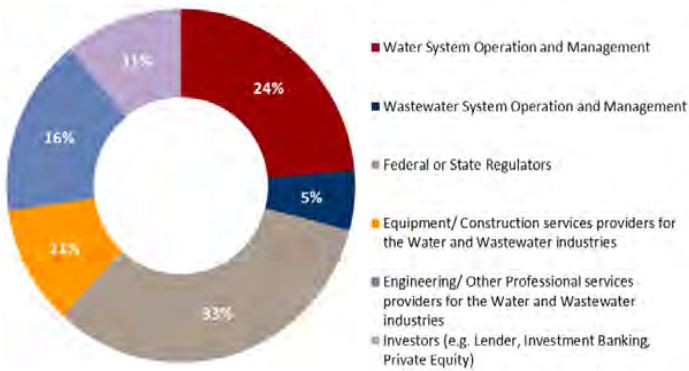
At the same time, more than half of respondents have not taken any action on risks related to sustainability, and more than 60% of respondents have either no clearly measurable sustainability objectives or the objectives need improvement. We are already seeing lender and investor pressures impacting this stance. In the future, we expect to see a significant increase in the adoption of sustainability mindsets, goals and risk orientations with integration into company reporting. Similarly, we expect the national expansion of fair value legislation not only to potentially increase acquisition/merger activity but also to increase companies' awareness of sustainability risks, whether in preparation for an acquisition (post-acquisition), divestiture, or capital raise.



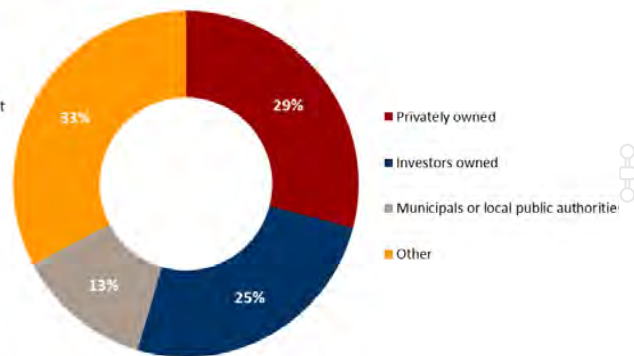
# DEMOGRAPHICS



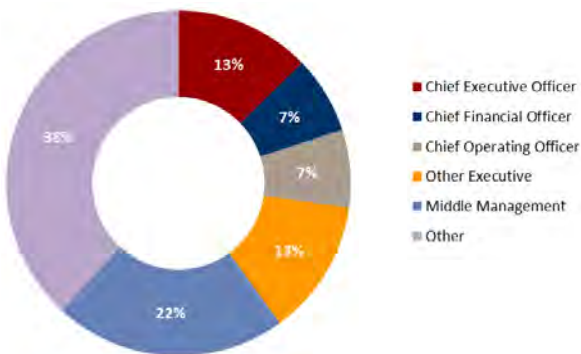
**FIGURE 1** INDICATE THE PRIMARY NATURE OF YOUR BUSINESS:



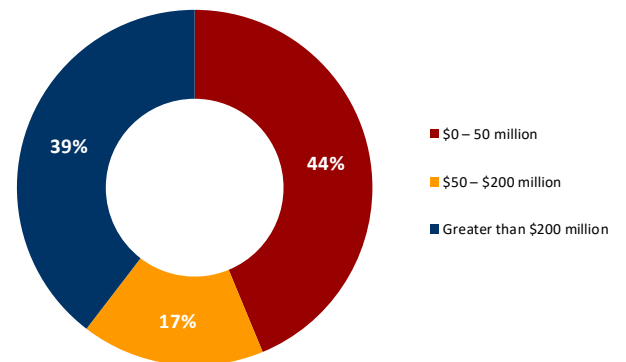
**FIGURE 2** INDICATE THE OWNERSHIP STRUCTURE OF YOUR BUSINESS/ORGANIZATION:



**FIGURE 3** INDICATE YOUR CURRENT POSITION/TITLE (CLOSEST APPROXIMATE):



**FIGURE 4** INDICATE THE REVENUES OF YOUR ORGANIZATION FOR THE MOST RECENT YEAR-END:





# OPERATIONS

In the 2017 Water Outlook, respondents rated advanced data analytics as the second most useful technology for mitigating cybersecurity system risk. These have notably proven useful in assisting companies in complying with transparency and risk management requirements. Data analytics is also perceived as a key tool to overcome the challenges posed by aging infrastructure and asset management of assets (in particular the network), demand forecasting, operational efficiency, segmentation and offer customization, anomaly detection and prevention and water quality management.

Big data analytics was used by 53% of companies across all industries in 2017 as compared to 17% in 2015, with the telecom and financial services sectors making the most use of these technologies, with 87% and 76% usage, respectively, followed by technology and healthcare. The water and wastewater industry is far behind on data management. Water utilities generate data (characterized by frequent updates and high heterogeneity) in ever-increasing volumes, thanks to technologies like smart meters and the Internet of Things. However, many water utilities do not know that such data exists, or how to extract, collect and analyze it in order to improve their operations. There is also often a lack of confidence in the data quality, security and reliability.

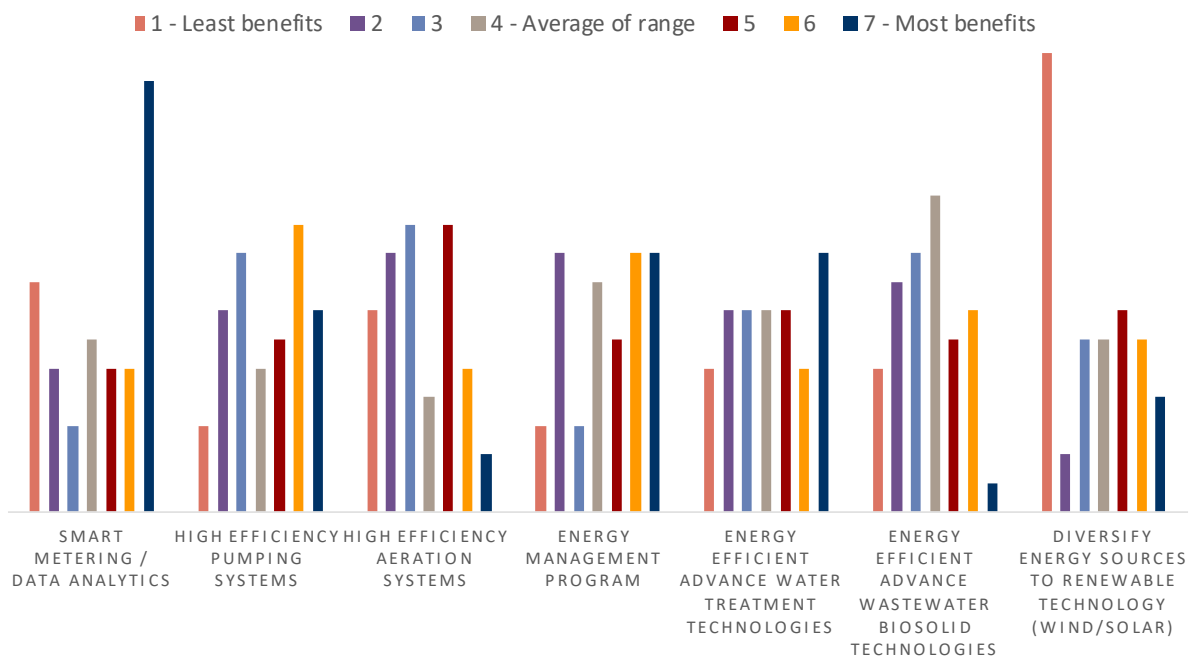
In contrast to other sectors, the water industry is in the early stages of understanding the full potential of data-driven insights. There is a long way to go, but there are also many potential opportunities. The way water utilities operate, manage their infrastructures and are perceived by customers could all drastically change.

“*Big data adoption reached 53% in 2017 for all companies interviewed, up from 17% in 2015, with telecom and financial services leading early adopters.*”  
- Louis Columbus, Forbes

“*According to a study from Markets and Markets, the big data market is expected to grow from USD 29 Billion in 2016 to USD 68 Billion by 2021, at a high Compound Annual Growth Rate (CAGR) of 18.45%.*”



**FIGURE 5** INDICATE WHICH OF THE FOLLOWING ENERGY EFFICIENCY TECHNOLOGY ADVANCES WILL BRING THE GREATEST BENEFITS TO THE WATER INDUSTRY:



In our 2017 Outlook, respondents cited the following technology advances as most likely to bring the greatest benefits to the water industry, a viewpoint which was further supported by conversations we had with industry leaders:

1. Energy-efficient advance water treatment technologies
2. High efficiency aeration systems and pumping systems
3. Smart metering and data analytics

However, in the past year, the trend seems to have moved towards smart metering. Energy-efficient advanced water treatment and high efficiency aeration systems which were considered to be the two technologies with the greatest benefits to the water industry are now ranked 4 and 6, respectively. High efficiency pumping systems remain a key differentiator in improving water industry performance. They help mitigate failures and breaks, and identify outliers (e.g. pumps that are less efficient, require much more power to operate, etc.).

Smart metering and data analytics provide more detailed and accurate data to identify weaknesses and highlight opportunities to improve the water and wastewater operational cycles. For instance, better data analytics can help prioritize tasks regarding leaks and breaks in the water system or change key fixed assets in case of deficiency. These analytics help align resources with the actual data, such as how the price of electricity affects power needs or water storage. As more smart meters are deployed, more data is collected, and the associated models and analytics keep getting more precise, reliable, and thorough. In particular, Machine Learning Solutions performance scales tremendously with the number of examples (for the models to learn), i.e. the amount of data collected. Use of smart metering and data analytics is an important first step in implementing and monitoring efficient technologies.

Another advance that can benefit the water industry is an energy management program. These require the development of tools to evaluate a broad range of energy management goals, including :

- Improving energy efficiency & managing total energy consumption.
- Controlling peak demand for energy.
- Managing energy cost volatility.
- Improving energy reliability.



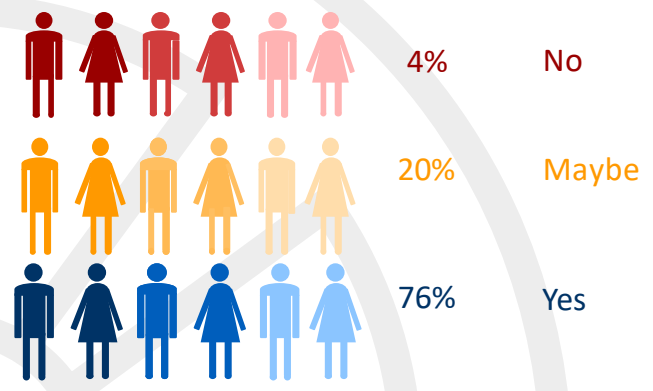
**FIGURE 6** WHAT ARE THE 3 MOST EFFICIENT DRIVERS OF FASTER ADOPTION OF NEW TECHNOLOGY BY WATER AND WASTEWATER UTILITIES?



We highlighted in the previous survey that the water industry is slow in adopting new technology. The delay is commonly attributed to the conservatism of the public sector, but it is also due to the disconnect between innovators/technology providers and the market’s wants and needs.

In order to better understand the processes leading to innovations in the water industry, we asked respondents to provide the 3 most efficient drivers of faster adoption of new technology. Participants are driven by systems optimization, showing benefits or regulatory obligations. For 80% of respondents, investments in new technology would be affected by the ease of integration into their existing system design. New technologies allow data to be collected, embedded and processed throughout the entire value chain to support improved asset allocation and decision-making. Integrated systems facilitate real-time optimization of the whole system. Other important drivers are the improvement of financial results which are affected by high structural costs (73% of respondents) and regulatory obligations (63% of respondents).

**FIGURE 7** DO YOU BELIEVE BIG DATA AND DATA ANALYTICS CAN PLAY A ROLE IN IMPROVING YOUR OPERATIONS, PERFORMANCE, AND/OR EFFICIENCY?



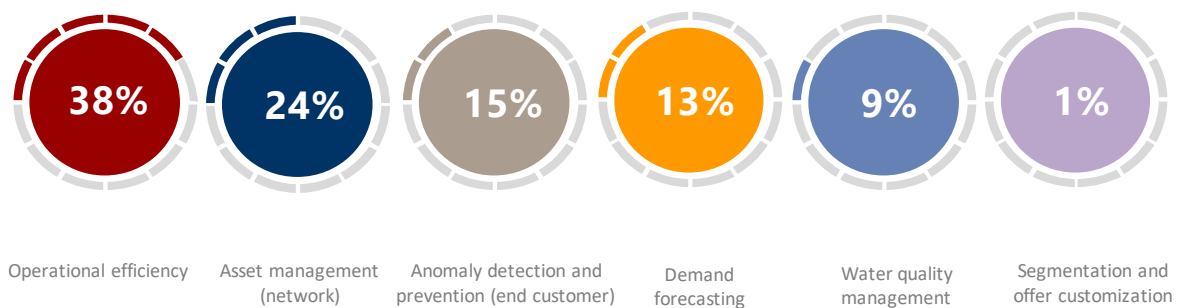
As noted above, smart metering and data analytics are considered to be the most important technology advances bringing the greatest benefits to the industry. Smart metering, considered to be the first step in implementing and monitoring efficient technologies, allows identification of weaknesses as well as opportunities for improving water and wastewater operational cycles through more detailed and accurate data.

This is further confirmed by the 76% of respondents who stated that big data and data analytics can play a role in improving water and wastewater utilities operations, performance, and/or efficiency.

Utilities are under pressure to do more with less. Data analytics can help to better forecast demand, and optimize plant reliability and performance through:

- Asset management and monitoring (e.g. using sensors).
- Maintenance prevention using infrastructure failure predictive models.
- Efficiently deploying resource on field.

**FIGURE 8** PLEASE INDICATE WHICH 2 CHALLENGES ARE MOST LIKELY TO BENEFIT FROM BIG DATA ANALYTICS:



The 2 main challenges emphasized by the respondents of our 2018 survey were operational efficiency and asset management which is consistent with the conversations we had with industry leaders. The use of data analytics is a powerful tool to overcome perennial issues and opens up opportunities for the water sector in two key areas:

- Operational Efficiency by optimizing the deployment of resources and field forces (OPEX impact). Operational efficiency is the most ‘obvious’ use case, as it allows a company to identify the most important parts of the network to focus on:
  - Simple monitoring/dashboards with network data allows the identification of failures and allocation of resources in the field.
  - More complex modeling will allow preventive maintenance (e.g. through weak signals in the data) although there is no ‘clear’ sign yet.
  - Prescriptive analytics will go beyond prediction and actually identify specific scenario types leading to aging infrastructure failures such that distinct measures can be taken for each scenario.
- Aging Infrastructure and Asset Management (Network) through better understanding of infrastructure and aging parts, which will help water companies make better/smarter investments in the long run. In its 2017 Infrastructure Report Card, the American Society of Civil Engineers graded the U.S. water and wastewater systems at a D and D+, respectively. Data science tools will help water utilities to enhance the efficiency of the capital allocation process and improve return on investment through better preventive maintenance (CAPEX impact).

Finally, our survey found four other areas where big data analysis could be beneficial:

- Anomaly Detection and Prevention (End Customer) by improving the utilities’ ability to detect, fix and reduce anomaly occurrences (e.g. meter error, unusual consumption patterns, fraud and non-revenue water issues).
- Demand Forecasting to better capture shifts in customer demand driven by economics and demographics.
- Water Quality Management through data science technologies that allow analysis of root causes and scenarios of potential water quality issues for early detection and prevention.
- Segmentation and Offer Customization.



# TAKEAWAY FROM OUR EXPERT

## *Data Management*

In keeping with last year's results, the survey highlights the growing impact of Big Data on the water industry.

As more than half the organizations surveyed are actively working on improving their Big Data management systems, the industry seems to be at a pivotal stage in which more and more data is being collected, but not yet leveraged at its full potential.

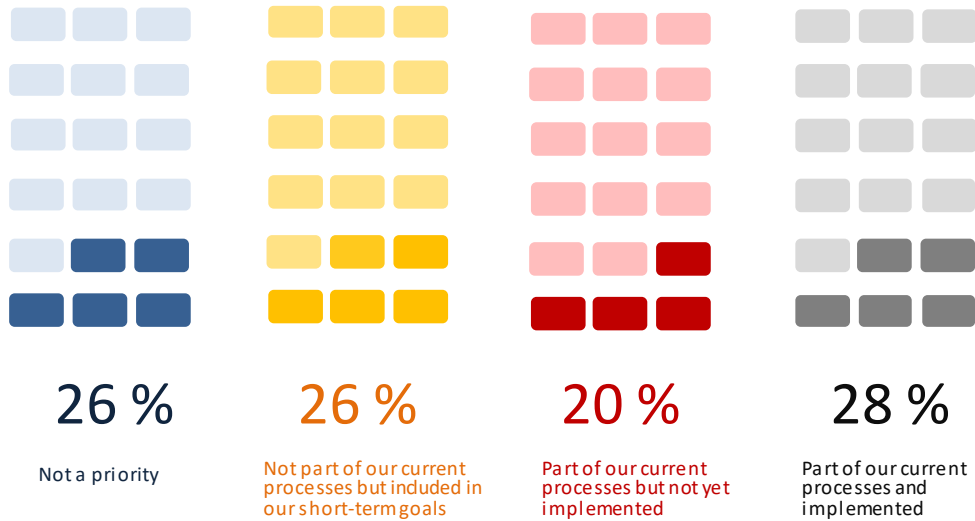
The deployment of smart meters will lead to more and better insights through the use of data analytics and predictive models, particularly by better monitoring the aging infrastructure and allocating operational resources in a more efficient way.

**PATRICK ZERBIB**

PARTNER | ZETTAFOX & MAZARS USA LLP



**FIGURE 9** PLEASE INDICATE WHICH OF THE FOLLOWING STATEMENTS REGARDING BIG DATA MANAGEMENT BEST APPLIES TO YOUR ORGANIZATION AND/OR THE INDUSTRY:



Even though data analytics is increasingly considered a key factor for digital transformation, business growth, and efficiency improvement, 26% of the organizations surveyed did not consider it a priority. However, more than half of the organizations are actively working towards improving their big data management.

The water industry is trailing behind in terms of data-driven maturity compared to other industries (e.g. telecoms). In order to make the right decisions, management needs to have access at the right time to the right level of information. To do so, water and wastewater utilities need to learn how to collect, maintain and protect their data in the face of increasing volume, which has been rising tremendously in recent years.

Modern data science can handle voluminous sets of heterogeneous data flows from operational, financial, and other internal or external sources, to feed efficient, optimized, consolidated, automatically refreshed reporting tools enabling the transformation of “just data” into “intelligent Water Data.”



# TAKEAWAY FROM OUR EXPERT

## *Cybersecurity*

While the survey does show an increase in cybersecurity, the combination of threats and historical lack of investment into IT operations has the water industry in a dire need to catch up at a faster pace. With the growing risk of attacks and new regulatory requirements, there is an increased need to address security of aging IT infrastructure, incident response and risk management tools for security analytics.

In addition to cybercriminals, the FBI, Homeland Security and Deputy Attorney General made a statement that Russia, China, Iran, and North Korea are planning attacks that target the water sector. Intrusion campaigns and denial-of-service attacks against water plants in the U.S., EU and Middle East have taken place against aging systems on networks that are not segmented. In 2018 we have seen Russians exploit ICS (Industrial Control Systems), Iranians take control of dam functions, and cybercriminals manipulate water flow and chemical disbursement, as well as numerous ransomware attacks costing millions in response.

**PHILIP A. JONES**

DIRECTOR, CYBERSECURITY | MAZARS USA LLP

**FIGURE 10** WHICH ADDITIONAL MEASURES OR CORPORATE PRACTICES HAS YOUR COMPANY INTRODUCED IN RECENT YEARS TO MITIGATE IT SECURITY RISK (PLEASE CHOOSE ALL THAT APPLY?)



As in the prior year survey, introducing new internal procedures, corporate policies or codes of conduct, and increasing investment in IT infrastructure and employee training are the most common practices companies use to mitigate IT security risk. And both quantitative and qualitative practices are necessary.

According to our survey respondents, in recent years 31% of companies introduced new internal procedures and/or business processes, and 18% invested in new IT infrastructures to mitigate IT security risk.

Almost half of the respondents' organizations implemented new monitoring systems, corporate policies, or codes of conduct. New information gathering and reporting requirements do not appear to be a top practice in mitigating IT security risk, as only 6% of respondents declared that their companies have introduced these practices.



## INTERVIEW ON OPERATIONS AND RISKS

# STEPHANE BOUVIER



## CHIEF EXECUTIVE OFFICER – INFRAMARK

Since his appointment in July 2014, Stephane Bouvier has been the CEO of Inframark, leading the organization, which spans 19 states. Bouvier is also on the board of the National Association of Water Companies (NAWC) and chairs the Contract Operations Committee, a new platform created to serve as a forum for the exchange of ideas and best practices addressing pressing water challenges in the US. Prior to joining Inframark, Bouvier was Senior Vice President and Chief Financial Officer of Severn Trent International, and served on the Severn Trent Services Board of Directors.

Bouvier served as European CFO for G4S Plc, a FTSE 100 leading security services company, and was a divisional finance director for Xchanging Plc, an international business process outsourcing company.

Born in France, Bouvier achieved a first-class degree at the French School of Management (ESSCA) and a BA (Hons) degree in Accounting and Finance at the University of the West of England in Bristol. He subsequently qualified as a Chartered Accountant after joining an accountancy & advisory service firm.

## 1. WHAT DO YOU VIEW AS THE MAIN OPERATIONAL CHALLENGES FACING THE WATER INDUSTRY IN THE SHORT AND LONG TERM?

The greatest threat to operations that I see today is the rapidly aging workforce.

The U.S. Bureau of Labor Statistics has stated that by 2026, the demand for water and wastewater operations jobs will surpass the available labor force by approximately 45,000 unfilled positions. This could clearly have detrimental effects on the quality and availability of our most critical resource. There are options and solutions available to communities to begin to prepare for, and offset against, this widening gap. Outsourcing to a private firm can help ensure that their trained and certified staff are ready and available for deployment with a wide range of resources and expertise, as needed. One of the other key opportunities is to make it easier for certified operators to work across states by accelerating the number of reciprocity agreements in place between states. This is, in my mind, a key barrier to being able to move talent where it is most needed.

## 2. WITH AGING WATER INFRASTRUCTURE BEING A NATIONAL ENVIRONMENTAL AND SAFETY CONCERN, HOW DO YOU PERCEIVE THE INDUSTRY'S PROGRESS IN ADDRESSING THIS CRITICAL ISSUE?

This is the fundamental question facing our industry. As always, the answer is mixed, with some infrastructure owners having comprehensive asset management and long-range capital improvement plans in place that are well funded. This is particularly true for several large cities and privately-owned systems; the latter being closely regulated on that topic, hence driving an increased level of accountability. Overall, when we look at the 53,000 water systems and 16,000 sewer systems across the country, the picture is very different. There are a high number of infrastructure owners – particularly smaller systems – not able to raise funds or increase rates to finance key upgrades or, in some cases, new systems, yet their needs for reliable and safe infrastructure are more important than ever. The ASCE 2017 Infrastructure Report Card gave a D rating to the overall U.S. water infrastructure, stating that more than \$150 billion in improvements is required.

I think the major opportunity here is for system owners, whether they are public or private, to work more closely to consolidate systems and investments, where it makes sense, to drive long-term quality and efficiencies. We are seeing some green shoots in places with municipalities or counties forming regional water and wastewater authorities to do this, or entering into inter-municipal agreements to leverage each other's assets. However, these are few and far between rather than being a strategic program like other countries have decided to follow.



3. TO ENHANCE OPERATIONAL PERFORMANCE, WHAT TECHNOLOGIES DO YOU BELIEVE ARE BEING EMBRACED BY THE WATER INDUSTRY THAT WILL CREATE THE MOST EFFICIENCIES?

Today, I see two areas where technology can revolutionize the way the industry operates.

The first is remote monitoring and management through SCADA and integrated data management systems. These are typically cloud-based solutions that can be accessed remotely with the ability to easily build additional data capture points throughout the process. This enables management of treatment performance and may reduce labor requirements. The impact of this technology will drive responsiveness to issues and enable the right people to do the right thing at the right time, rather than limiting resolution to available staff on site. The key here is that it's not just about efficiency, but also quality through accurate and immediate diagnosis.

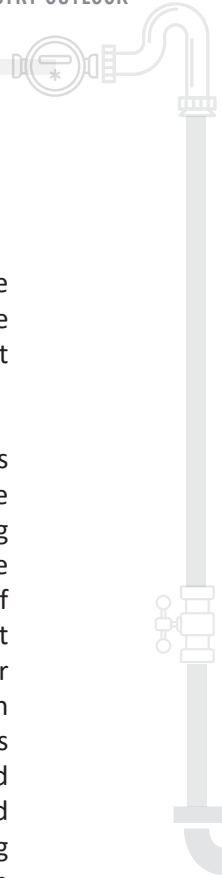
The other is smart meter solutions. The industry is moving more and more toward Advanced Metering Infrastructure (AMI). This enables customers and water suppliers to access real-time data on water consumption. Though the initial investment may be somewhat cost prohibitive, it can yield dividends in terms of transparency and oversight. Looking into the future, I envision the technology taking us a step further, providing not only quantity stats and figures, but also real-time data on the quality of the water entering our homes. For example, imagine for a moment the opportunity to see the levels of chlorine or lead in your water. This would give users the ability to hold their water providers accountable from a quality control standpoint.

4. CYBERSECURITY IS A MAJOR AND GROWING RISK FACING THE WATER INDUSTRY. OVERALL, DO YOU BELIEVE THAT THE INDUSTRY IS TAKING THE APPROPRIATE STEPS TO ADDRESS THIS OPERATIONAL RISK?

Cybersecurity threats are not fully understood or appreciated by a number of utilities and, as a result, have not risen to the level of significant investment as they have in other sectors. Private water companies are leading on this issue.

Although most realize the threat is real, few are investing in preventive measures. Despite a common concern voiced by municipalities around disruption of service, or worse, overdosing of chemicals producing unsafe water, there does not seem to be enough urgency to ensure sufficient encryption levels and security to protect access to key systems. As hackers get more and more sophisticated, process control system (PCS) managers need to continually improve processes and awareness, including: dedicated back-up systems, system vulnerability assessments, remote access controls, segregation of networks, strong password management, intrusion detection, and employee training.

At Inframark, we take cybersecurity very seriously and are incorporating key required controls into our technical solution as part of our service offering to work more closely to consolidate systems and investments, where it makes sense, to drive long-term quality and efficiencies. We are seeing some green shoots in places with municipalities or counties forming regional water and wastewater authorities to do this, or entering into inter-municipal agreements to leverage each other's assets. However, these are few and far between rather than being a strategic program like other countries have decided to follow.



## 5. HOW WOULD YOU DESCRIBE THE FUTURE ROLE FOR PRIVATE WATER COMPANIES IN SUPPORTING MUNICIPALITIES AND INDUSTRIES?

As Chairman of the Contract Operations Committee within the National Association of the Water Companies (NAWC), a newly-formed platform for collaboration and best practice sharing across private companies, our primary objective is to educate and provide best practices and custom solutions for municipalities and industries.

Municipalities now have many solutions available to them for the various challenges they face. As discussed in the above answers, some of the more critical issues facing the industry are the aging workforce, deteriorating infrastructure, competing priorities (having to do more with less) and cost constraints, among others. A private partner can provide tailored solutions, depending on the specific needs of the utility. Three typical models of public-private partnerships (PPPs) are: engineering/design and build services, contract operations and asset sale. Each solution solves a different problem, and it is important for municipalities to identify which problem they are looking to address so the right solution can be deployed. In all cases, however, these PPPs are capable of helping municipalities transfer risks, access resources and know-how and drive efficiencies in an unparalleled way. It is a shame that in a number of cases, public opinion becomes more concerned about the level of profit a private entity may be able to realize than the actual value being delivered to the community. We all know there is no real innovation or performance in any market without some form of incentive. The important principle is that the solutions need to be win-win for all parties involved and I strongly believe PPPs can deliver that when they are implemented in the right way.

On the other hand, the industrial market seems to still be in its infancy with respect to leveraging services from a water partner. Most industrial organizations are managing their water operations in house, which can mean a lack of visibility due to the highly fragmented local operations. Given the rising importance and emphasis of corporate sustainability and environmental responsibility in boardrooms, these organizations could greatly benefit from partnering with water experts to help drive their corporate water optimization agenda. Looking holistically at the portfolio, with an integrated view, can provide much needed visibility while driving significant synergies and efficiencies in ways that a site-by-site level management may not be able to do. Veolia's global partnership with Danone on water and energy is a great example of the opportunities in this space, although this is still a new concept for the industry.





# FINANCE

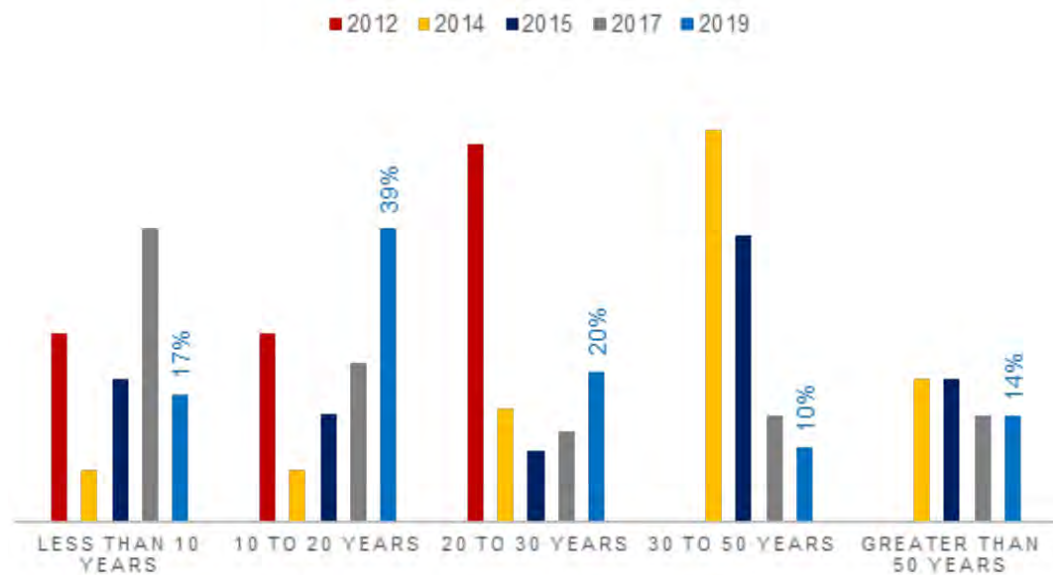
The financing of the water industry is a major recurring topic of our outlook because of its significance to the industry. Two years ago we emphasized how focused industry organizations were on advancing the water agenda in light of major events and a presidential campaign that raised the discussion around the need for infrastructure investment to the national level. This section is not meant to be a report card on the progress over the last two years, but it does provide information on trends related to aging infrastructure and access to financing.

This section also reflects on the perceived impact of federal legislation and other market events that affected financing over these two years. If the previous Outlook came out during a period of rising concerns around climate and water pollution events, we are publishing this year's Outlook in a different context. The TCJA, the continued progress of federal programs like WIFIA, and "big" corporate mergers and acquisitions are the highlights of the past couple years.

Finally, some of the discussions on reporting to the future of the industry section of our outlook. While this is a finance topic, we consider it a very important one and we have focused this year on the future of reporting as a means to elevate value for the industry.



**FIGURE 11** WHAT IS THE AVERAGE REMAINING USEFUL LIFE OF THE DISTRIBUTION AND/OR COLLECTION NETWORK IN YOUR SYSTEM OR THE SYSTEMS IN WHICH YOU ARE INVOLVED?



39% of respondents indicated that the average remaining useful life of the distribution and/or collection network in their systems or the systems in which they are involved is 10 to 20 years, followed by 20% for which it is 20 to 30 years, and 17% who claimed it is less than 10 years. This gives us 76% of systems with a useful life of below 30 years, which seems consistent with the information available in the market place.

Compared to our previous surveys, this shows significant increases in the 10 to 20 years and 20 to 30 years buckets. However, the 2017 survey found that 39% of respondents indicated less than 10 years of remaining useful life for their systems, which seems to indicate that older pipes are being taken care of either through more effective risk management practices or breaking pipes' replacement being at record highs.

There is mounting demand and investment in asset management standards, software and processes, which all aim at improving capital allocation decisions. Best practices in this area should improve the management of distribution assets and the services provided through these assets in a more proactive and sustainable manner. This is, however, a continuous effort and there hasn't been a magic solution, such as incentivizing legislation or enforcing regulation that should generate considerable progress for our surveys or others – the next American Society of Civil Engineers (ASCE) Report Card, due in 2021, will provide an indication of the improved condition and performance of American infrastructure.

We continue to monitor, and emphasize in discussions on this topic, the importance of indicators such as asset replacement rate, number of breaks, and non-revenue water (to name the most critical ones). Operating for years at levels well below those necessary for sustainable asset management has led the build-up of what is assessed as a \$1 trillion infrastructure investment gap. And there is still not enough data or benchmarking information on the performance of systems around these critical indicators.



# TAKEAWAY FROM OUR EXPERT

## *Tax*

### WHAT ARE SOME OF THE KEY BENEFITS OF THE US TAX REFORM ON THE WATER INDUSTRY?

The largest domestic benefit is the drop in corporate tax rates, since many water industry companies are filing tax returns as corporate taxpayers. While this benefit will likely be passed on to the customers, it is still a significant cash flow benefit. Tax paying water companies will also benefit from many of the general corporate provisions such as the elimination of alternative minimum tax on corporations. Finally, such entities will not be subject to an interest expense disallowance under the new tax reform rules to the extent that the interest expense relates to debt incurred to operate a regulated water utility business.

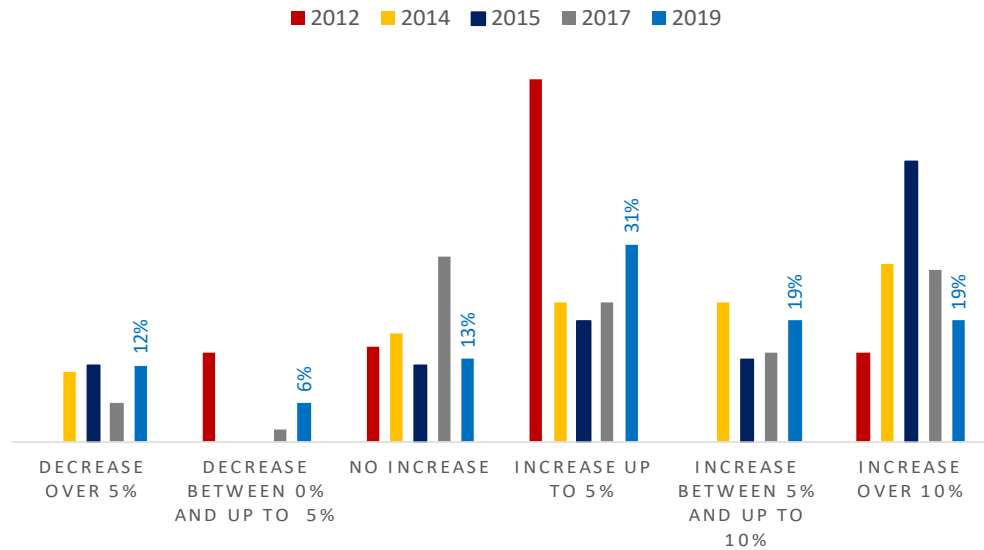
### WHAT WOULD YOU VIEW AS SOME POTENTIAL DISADVANTAGES WHICH WILL IMPACT THE WATER INDUSTRY?

Water companies will generally not be able to take advantage of the accelerated depreciation afforded to most entities. Further, they will now have to recognize taxable income related to any income contributed to infrastructure development by a non-shareholder (e.g., a governmental entity). Such adjustments to taxable income will likely be passed on to the customer as well, so these detrimental rules may not have as much of an impact on the long-term income of such companies. However, the period over which the rebates/reduction of rebates to customers will occur and be recognized for tax purposes may not match the timing of income and expenses related to the tax reform rules. This may result in a cost related to the time value of money. Finally, and because of some of the wide-ranging provisions of the tax reform, municipalities are now prevented from refinancing tax-exempt debt. The issuance of advance refunding bonds has been used to take advantage of favorable interest rate environments and as a tool to extend repayments schedules over time and increase financing capacity for other projects.

**FAYE TANNENBAUM**

PARTNER | MAZARS USA LLP

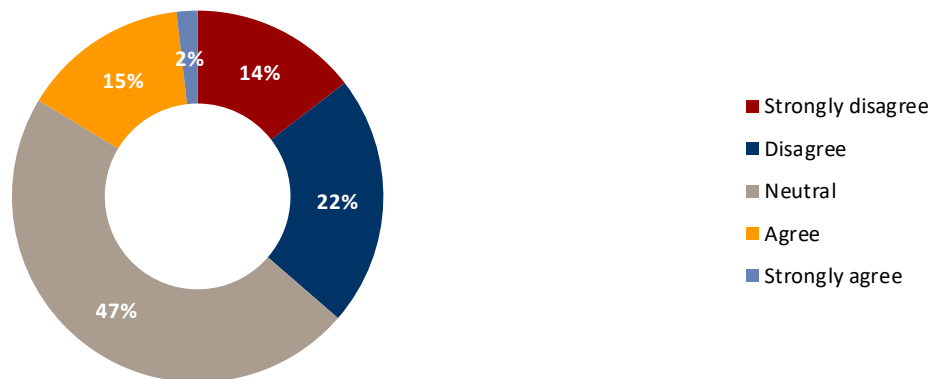
**FIGURE 12** INDICATE WHICH STATEMENT BEST APPLIES TO THE TREND OF YOUR ANNUAL CAPITAL EXPENDITURES IN 2018 COMPARED TO THOSE IN 2017:



69% of respondents expected an increase in capital expenditure, compared to 63% in 2016. This can be interpreted as an acknowledgement of the need for further investment and an awareness and positive view of the impact of recent government initiatives. There is also robust correlation, especially within investor owned utilities, between capex increase and value appreciation. This is the result of the incentive created by rate designs and the recovery of capex investments through rate increase mechanisms.

There is, however, growing concern that the market can accept only a finite increase in water rates. Customers’ understanding of the value of the services they receive, their willingness to pay higher bills, or affordability questions in lower income areas create pressures on utilities and regulators to maintain tariffs at reasonable levels and control annual increases. In this context, and in the absence of other major incentives, it is expected that new alternatives to long term financing will be looked for more intensively in the coming years.

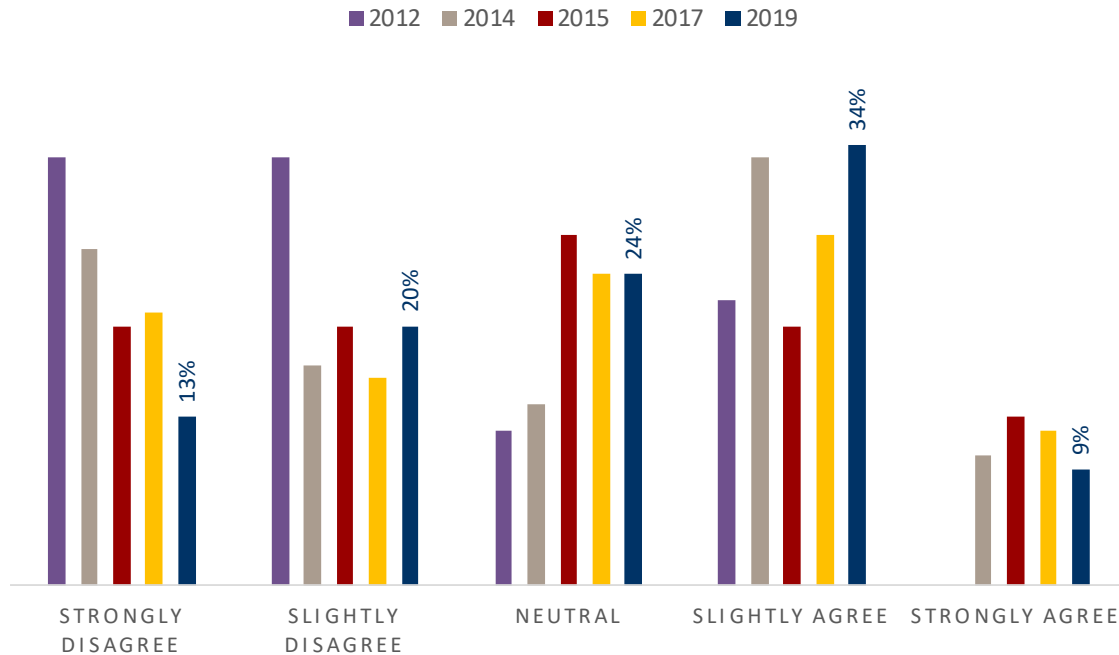
**FIGURE 13** INDICATE YOUR LEVEL OF AGREEMENT WITH THE FOLLOWING STATEMENT: THE TAX CUTS AND JOBS ACT OF 2017 WILL HAVE A POSITIVE IMPACT ON THE WATER AND WASTEWATER INDUSTRIES’ FUTURE CAPITAL EXPENDITURES:



There have been numerous publications on the impact of the TCJA on utilities, including notable actions by ratings agencies. Consistent with this perception, only 17% of respondents agreed that the TCJA will have a positive impact on the water and wastewater industries’ future capital expenditures.



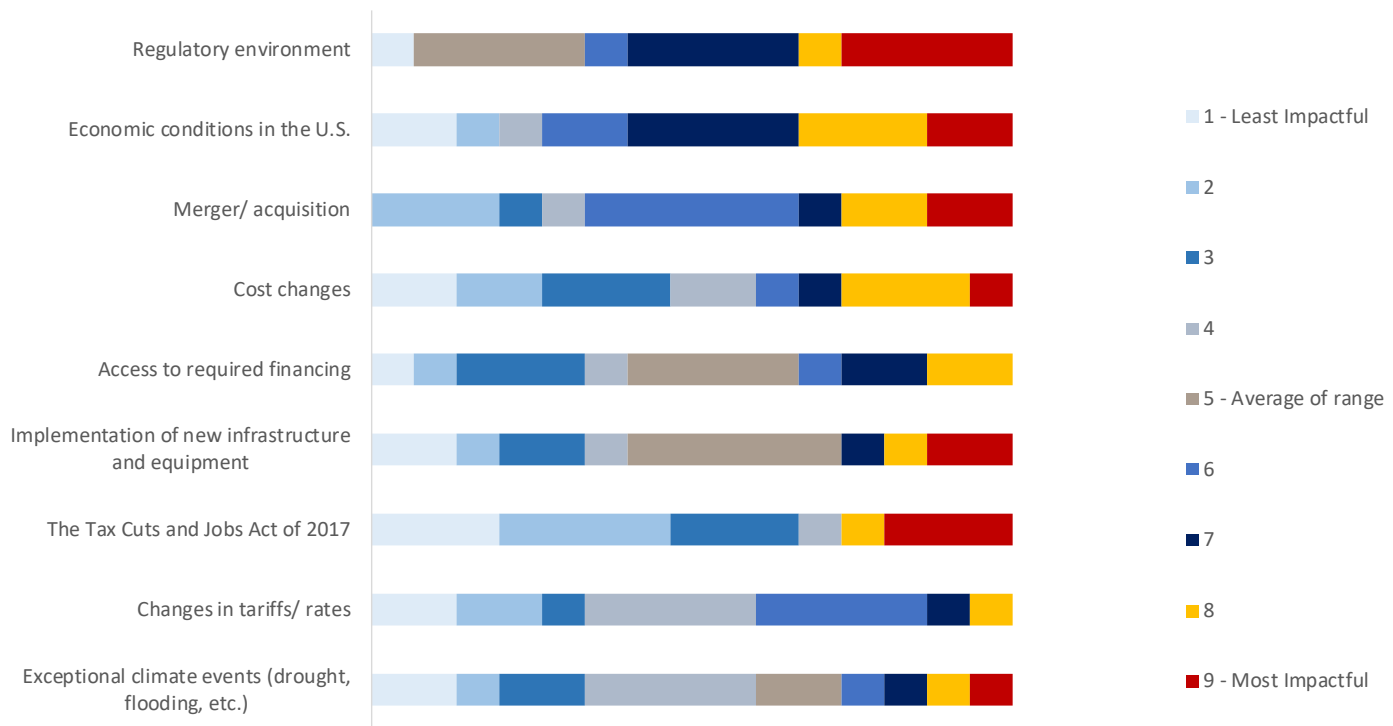
**FIGURE 14** INDICATE YOUR LEVEL OF AGREEMENT WITH THE FOLLOWING STATEMENT: FINANCING FROM POTENTIAL INVESTORS AND LENDING INSTITUTIONS FOR CRITICAL UPGRADES/MODERNIZATION OF FACILITIES AND INFRASTRUCTURES WITHIN THE WATER UTILITIES INDUSTRY IS DIFFICULT TO OBTAIN AND LIMITED IN AVAILABILITY:



43% of respondents agree that financing is difficult to obtain, compared to 39% in our 2017 survey and 33% in our 2015 survey. This shows that it is becoming harder for the industry to attract financing. We still believe that plenty of capital is available from a large number of sources – following are several factors to be considered in analyzing this trend:

- The Federal Reserve increased the target for the bank's benchmark rate in September 2018 by 0.25%, to a range of 2%-2.25%. Due to the strength of the labor market and rising economic activity, interest rates will most likely continue to increase. Higher interest rates will have a direct impact on the industry's financing activities.
- In our 2014 survey, we discussed proposed legislation to remove state volume caps on private activity bonds, arguably the largest source of capital for the industry. These so-called tax exempt bonds (under Section 146 of the Internal Revenue Code) provide low-cost capital for the industry. Bonds issued for water, sewage, and solid waste disposal facilities are still subject to volume caps.
- As indicated by our tax expert, the TCJA has impacted the ability of the municipal sector to refinance bonds early. This wide-ranging effect has led to reduced issuance levels in 2018 and diverted the attention of some of the players toward federal and state programs such as WIFIA and State Revolving Funds.
- Likewise, the TCJA reduced a major source of financing for privately owned utilities. These have historically benefited from the accelerated depreciation of asset to finance infrastructure investments. The reduced tax rate has affected this source of financing as of January 1, 2018 and going forward.
- Finally, new sources of financing have emerged – see our WIFIA discussion under Figure 16 - and one has established a foothold in the US capital market in the last few years. Green bonds, which broke through with the San Francisco Public Utility Commission and DC Water issuances a few years back, are now a real alternative in the municipal market that responds to investors' expectations for more transparency and sustainable investments. Corporate issuance of such bonds is holding back so far in the US.

**FIGURE 15** INDICATE THE IMPACT OF THE FOLLOWING ON YOUR OPERATIONS IN 2018 (RANK ON A SCALE TO 1-9, WITH 9 BEING THE MOST IMPACTFUL):



Above, we rank the responses from the most impactful at the top (Regulatory environment) to the least impactful (Exceptional climate events) at the bottom, based on number of times responses were rated 7 to 9 by respondents.

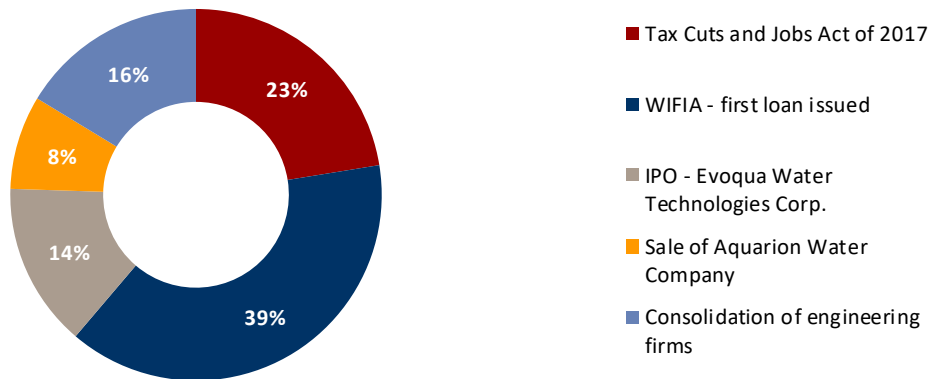
The two most impactful effects, regulatory environment and economic conditions, were consistent with prior years' surveys, while merger and acquisition and cost changes (which we interpreted as control of costs), were ranked as more impactful drivers of operational performance. This trend highlights an industry-wide increase in corporate and financial management that is improving results, growth and efficiency.

Also noteworthy are:

- The median ranking of access to financing, which remains a major topic.
- The very divided responses on the TCJA, which collected the second most "Most Impactful" rankings and the most "Below Average" rankings by quite a large margin.
- The ranking as "Least Impactful" of exceptional climate events, which is surprising as, for example, we know how much storm water management has been a concern in the industry, and how much a dry summer improves the financial performance of utilities.



**FIGURE 16** WHICH OF THE FOLLOWING EVENTS FROM 2018 CREATED THE MOST VALUE TO THE WATER INDUSTRY:



At 39%, the WIFIA loan is considered by respondents to have created the most value to the water industry. The appropriation of funds early 2017 and the underwriting of their first loan in the spring of 2018 (see below) has given the industry a lot of confidence in this program as illustrated by this quote from the president of the American Water and Wastewater Association (AWWA) and the success of the second round (see below):

“For many years before WIFIA became law, AWWA envisioned the program as a significant step toward addressing the enormous water infrastructure challenge in the United States. It’s great to see the hard work of so many AWWA members and our many partners in the water sector paying dividends for our communities.” said AWWA CEO David LaFrance.

Another federal legislation, the TCJA, ranked second with our respondents. The two federal pieces of legislation are perceived as much more valuable than the big corporate events that have shaped 2018, the IPO of Evoqua, the sale of Aquarion, and the consolidation of two engineering giants.

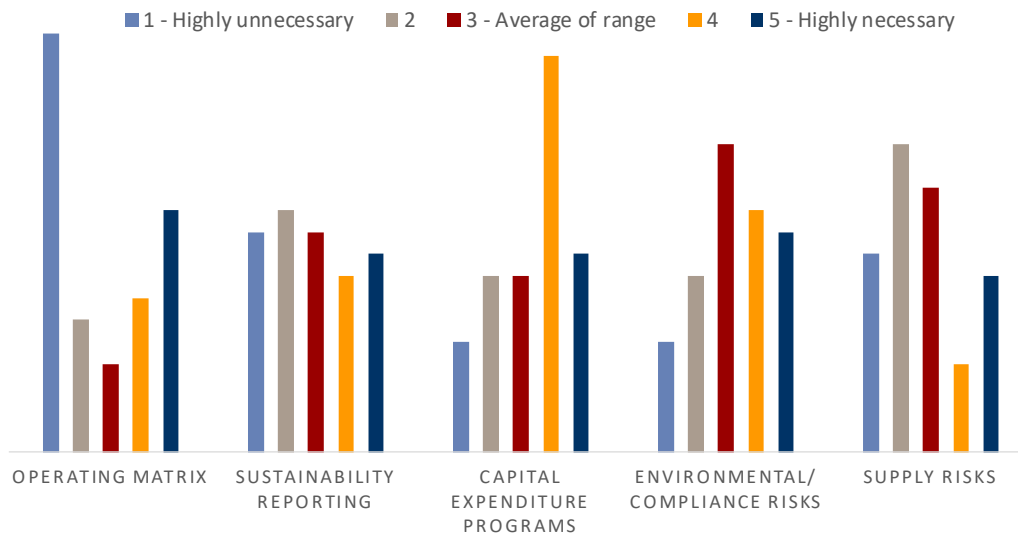
## UPDATE ON WIFIA

The Water Infrastructure Finance and Innovation Act of 2014 (WIFIA) was a major development for the industry that aimed at providing low-cost credit assistance to qualified water infrastructure projects – some of these projects would not attract private financing absent this support.

In April 2018, the U.S. Environmental Protection Agency (EPA) issued its first loan from the Water Infrastructure Finance and Innovation Act (WIFIA) program to King County, Washington, to help finance its Georgetown Wet Weather Treatment Station.

In April, the EPA also announced the availability of additional WIFIA funding as a result of the new appropriation of funds that could provide as much as \$5.5 billion in credit assistance focusing on reducing exposure to lead and other contaminants in drinking water systems and updating aging infrastructure. The EPA ended-up receiving 62 letters of intent requesting \$9.9 billion in loans.

**FIGURE 17** IN WHICH OF THE FOLLOWING AREAS DO YOU BELIEVE CURRENT REPORTING STANDARDS FOR WATER COMPANIES SHOULD BE ENHANCED TO PROVIDE USERS/INVESTORS WITH MORE RELEVANT INSIGHT (ON A SCALE OF 1-5, WITH 1 BEING HIGHLY UNNECESSARY AND 5 BEING HIGHLY NECESSARY)?



Transparency and disclosure through reporting is especially critical for investor owned public utilities ('IOU'), regulated operations, and other municipal operations because there is an increased need to provide clarity to investors and regulators, as well as to ensure compliance with fiduciary responsibilities for operation of public utilities. The value of enhanced reporting could be most beneficial to the investor community, providing additional insights into company performance and strategic mindsets. The availability of this additional information would allow non-public and municipal operations access to enhanced industry data which could be used to benchmark against its own business plans. The availability of additional data would also benefit those engaged in industry research and reporting, which could potentially lead to better overall coordination among industry service providers who could be better prepared to address company needs.

Resistance to enhanced disclosure is to be expected, especially from IOUs, due to the potential for additional disclosure to expose proprietary or confidential information. IOUs would want to prevent situations which could add volatility to stock value or bond offering capabilities. This might be evidenced by the lack of concentration of a 5 ranking (most important), which was dispersed relatively evenly among the options.

Capital expenditure program reporting received the highest average ranking of enhanced reporting items. In this CAPEX intensive industry, it is no surprise that the weight of disclosure regarding infrastructure investment would prevail as a key enhanced reporting item. It is interesting to think about what the reporting would look like and how the industry could transition. An example of a key performance indicator could be simply the required disclosure of the current and projected asset replacement rates which could be integrated with disclosure of material changes in financing and future commitment disclosures. Another KPI for disclosure could include the non-financial and financial disclosure on number and amount of water main breaks or distribution infrastructure failures. This disclosure could be linked to added disclosure on non-revenue water loss (which is already required in some cases by regulators during rate case filings).

Environmental/compliance risks were reported as the second most important enhanced reporting matter. This result complements findings from the 2017 Outlook which indicated that respondents expected increased regulatory compliance standards within the next 5 to 10 years, with more than 80% persuaded that additional regulatory compliance would be imposed. Among the many evolving risks that will require compliance consideration for example:

- Convergence of ASTM standards on environmental liabilities, required for those reporting in accordance with GAAP – essentially the valuation process and conclusions have been refined to align with GAAP, which adds an additional focus on compliance of environmental liabilities reported.
- The 2017 Water Quality Accountability Act in New Jersey, which mandated several operational and specific testing and maintenance objectives and timelines.

The discussion on enhanced reporting can be seen as an evolution to GAAP reporting disclosures (potentially under disclosure requirements within ASC 980 – Regulated Operation) or amendments to current reporting requirements of state commissions or other regulatory bodies. If additional monitoring and reporting is eventually required, it will surely add additional pressure on companies and regulators during rate review considering many respondents already believe the process has not significantly improved over the past three years.



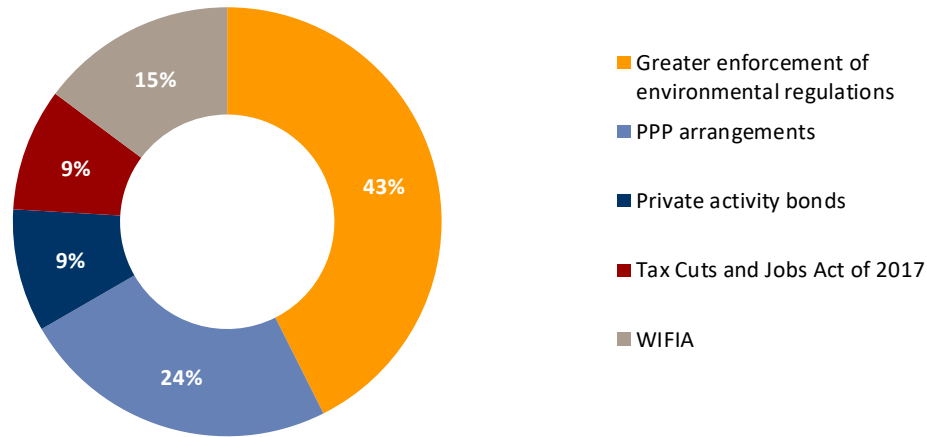
# FUTURE OF THE INDUSTRY

Because this section of the Outlook was developed to gauge respondents' perspectives on the future of the water industry, it is important to maintain relevancy by providing questions that are forward looking. To accomplish this, we have refreshed this section for 2019 to include trending industry themes including sustainability, and enhanced or integrated reporting. As you will see, this resulted in varying levels of interest, advancement, and commitment, particularly when disaggregated at the demographic level.

In the previous Outlook, we surveyed participants regarding future risks related to water sourcing and scarcity, identifying key disconnects between current operating practices and building threats. Although not a specific focus for the 2019 Outlook, participants did rank their perspective on supply risks in the context of all challenges facing the industry. Supply risk ranked 4th on average, behind capital expenditure programs, environmental/compliance risk, and sustainability reporting (previous Figure).

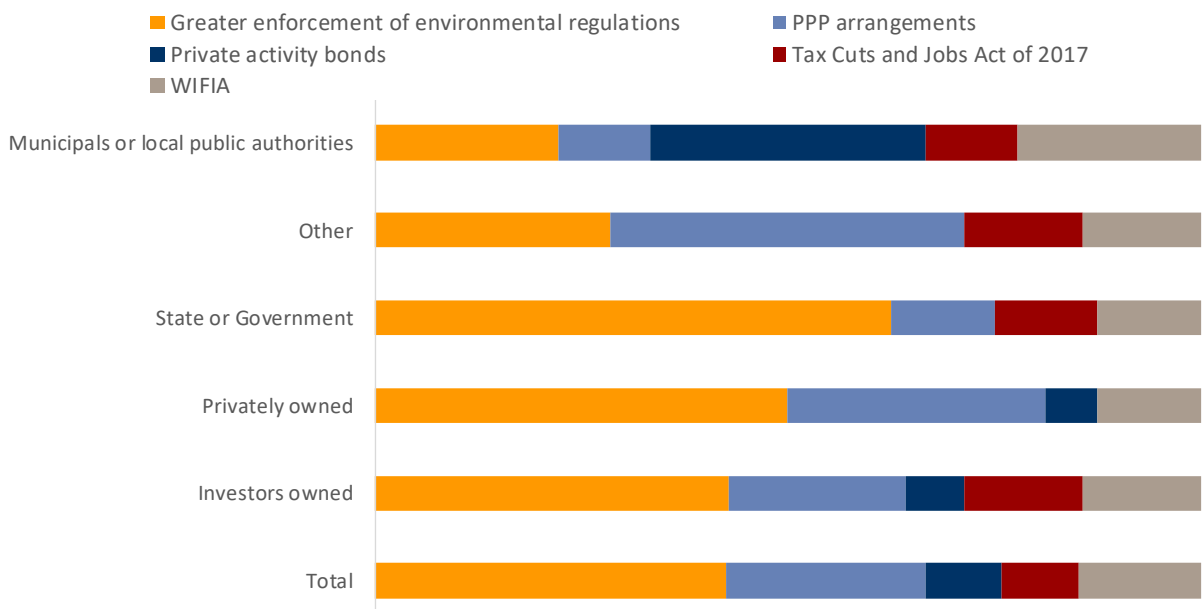


**FIGURE 18** WHICH OF THE FOLLOWING WOULD DRIVE A GREATER NUMBER OF WATER PROJECTS TO BE COMPLETED IN THE UNITED STATES:



Responses to this question showed where industry minds were focused in 2018. By far, respondents believed that greater enforcement of environmental regulations will drive the greatest number of water projects in the U.S. Likely contributing to this result was consideration of water quality issues such as the Water Quality Act for those respondents from New Jersey and the expected CAPEX investment required by many to be in compliance with the new regulations.

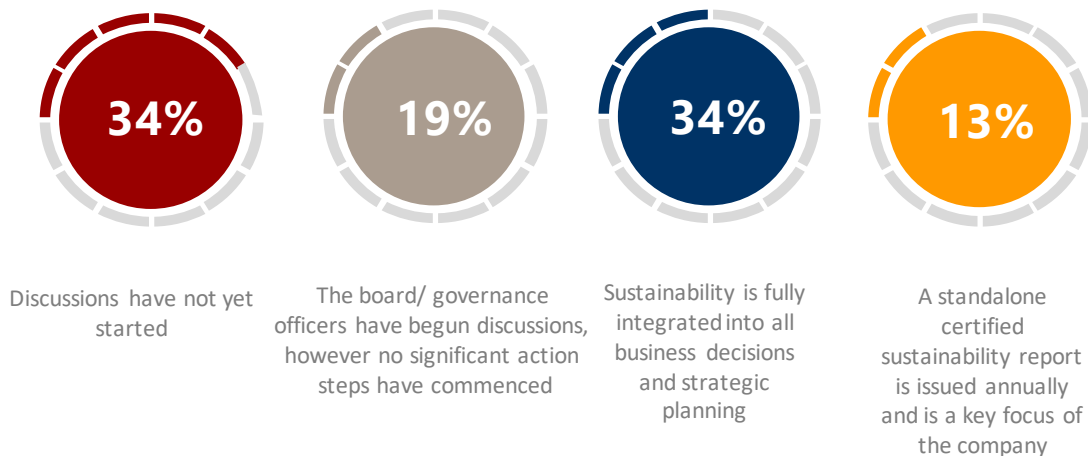
The difference in mindset based on ownership structure can be observed clearly in the following chart, which presents the same information as in the previous figure, but broken down by investor type. Investor and privately owned operations favored greater enforcement of environmental regulations to drive water projects (ranking private activity bonds last) where municipals favored private activity bonds as the primary driver. Most likely a combination of access to capital and investor pressure drove this difference.



Considering the results, which predict that water projects will be driven primarily by greater enforcement of environmental regulation, can we expect to see financing through green bonds and similar instruments continue to grow? The green bond market has grown exponentially over the past few years and is one driver of future water projects. The difference between a conventional bond and a green bond is that companies will earmark the proceeds for projects intended to improve the environment. The fact that these types of instruments are becoming more appealing to banks and other investors is another indication of where there could be a shift in investments over the next several years.



**FIGURE 19** WHAT STEPS HAS YOUR COMPANY TAKEN TO ADDRESS SUSTAINABILITY RISKS (OR, WHEN APPLICABLE, WHAT STEP WOULD MOST CLOSELY APPROXIMATE YOUR OBSERVATION OF THE INDUSTRY AS A STAKEHOLDER)?



Sustainability includes risk considerations for the governance of environmental impacts and human rights, as part of a long-term strategic plan to support the continuation of a business and its local and global community. Sustainability risks sometimes are discussed separately from a company's general enterprise risk management because of their standalone importance. However, these risks are generally included in governance discussions on overall business risk.

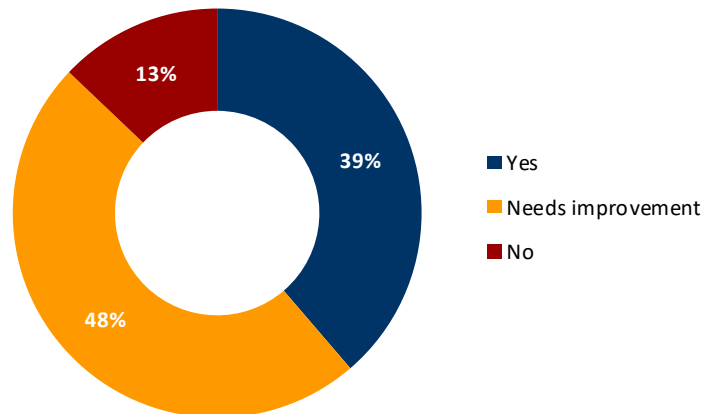
More than half of respondents have not taken any action for risks related to sustainability. We expect the number of respondents who indicated that sustainability is fully integrated in their business planning (34% -shown in blue in Figure 19) to substantially increase over the next few years as the importance of addressing sustainability risks continues to increase. The half of respondents who have not started or only begun to discuss the topic will transition into the 'Fully Integrated' category, as they better define risks and create clear strategic action plans. Some of the factors we expect to influence recognition of sustainability risks include:

- Financial institution pressure: lenders/debtholders.
- Water scarcity/resource availability.
- Changes in water quality standards.
- Increased scrutiny of environmental liabilities/new regulations.
- Change in mindset of customer base/customer advocacy demands.

Pressure from financial institutions is beginning to push companies who previously have not addressed sustainability to make the assessment before it becomes a barrier to obtaining financing. One example of this pressure is the public letter written to CEOs by Blackrock's Chairman & CEO, Larry Flint, which included; "...a company's ability to manage environmental, social, and governance matters demonstrates the leadership and good governance that is so essential to sustainable growth, which is why we are increasingly integrating these issues into our investment process," (<https://www.blackrock.com/corporate/investor-relations/larry-fink-ceo-letter>). This letter was issued as a warning to companies to get on board or find other financing.

Some leaders of industry sustainability reporting also participated in the survey, with 13% of respondents indicating that they issue a standalone certified sustainability report. Although there are several sustainability standard setting bodies (SASB, IIRC, GRI etc.), all are completely voluntary and currently there is no requirement for companies to report on or monitor sustainability. For this reason, there is a lot of variability in reporting on sustainability topics, whether within standalone sustainability reports or within financial statement disclosures of key risks included in a company's 10K filing. However, the next several years will potentially see an increase in sustainability reporting and disclosure, which will likely drive the need for a convergence of frameworks.

**FIGURE 20** DO YOU HAVE CLEARLY MEASURABLE SUSTAINABILITY OBJECTIVES (OR, WHEN APPLICABLE, WHICH RESPONSE WOULD MOST CLOSELY APPROXIMATE YOUR OBSERVATION OF THE INDUSTRY AS A STAKEHOLDER):



The responses to this question indicate some uncertainty with regard to the quality of measurement of sustainability objectives, especially in light of the 8% difference between those who stated that they have fully integrated sustainability risks and reporting (47% in Figure 19), and those who believe the objectives of such reporting are clearly measurable (39% in Figure 20).

The lack of one clear, unified reporting objective for sustainability is a current issue that will certainly become more pronounced as companies and stakeholders become more focused on these risks over the next few years. The U.N. Guiding Principles on Business and Human Rights includes a set of broadly defined areas of sustainability under three main pillars; State Duty to Protect, Corporate Responsibility to Respect, Access to Remedy. These principles can be used by companies to identify, develop, and categorize areas of risk applicable to their business. The principles are not rules and are therefore open to interpretation by each user. However, the theme of responsibility is an important concept to true engagement. Like everything else, a balance must be determined by each company to the extent of integration of the principles in their strategic planning.

As business and society evolves over the next 5 to 15 years, we expect there to be a much higher engagement in sustainability as consumers, investors, lenders, leaders, and regulators come into more alignment with the currently evolving discussions. Compliance will eventually play a role, potentially significant. However, determining the proper balance will take a lot of thought and frequent fine-tuning adjustments. To supplement this, it is also expected that increased disclosure and reporting to the public will be required whether through regulation at the state level or through enhanced GAAP reporting for private entities.

As larger IOUs expand and the industry consolidates (supported by laws such as the fair value legislation engagement by state), we would expect the resources of these companies to be shared nationally, so that each new acquisition falls under the ongoing enhancements taking place in the larger entity, whether those objectives relate to sustainability, reporting and disclosure, or water quality.

On the other hand, municipal owned and managed operations will have to continue to be innovative and wise with their fiscal budgets and they will have to optimize their bond issuances to balance out their commitments to future strategic plans, which hopefully include maintaining and developing more sustainable operations.



## INTERVIEW ON INNOVATION

# CRISTINA AHMADPOUR



## PRESIDENT OF ISLE INC. AT ISLE UTILITIES

As President of Isle, Mrs. Ahmadpour is driven to accelerate positive change through the application of emerging and novel technologies and the development of frameworks for furthering innovation. Her time in the industry has been focused on supporting the commercialization of qualified technologies by working with water utilities, clusters, regulators, investors, technology developers, contractors, sales representatives, and other salient players critical to the innovation ecosystem framework.

Cristina graduated, summa cum laude, from Vermont Law School with a Master in Environmental Law, emphasis in Energy, and received her Bachelor of Science Degree in Business Administration, emphasis in Global Business Management from California State University. Cristina is also a graduate of the Water Environment Federation's Leadership Institute and has been recognized in 2016 and 2018 as a Top Professional in Water by Water and Wastewater Digest.

1 CONGRATULATIONS ON MAKING THE WATER & WASTEWATER DIGEST – YOUNG AND WORLDLY PROFESSIONALS LIST FOR 2018! HOW WOULD YOU DESCRIBE YOUR PASSION AND FOCUS WITHIN THE WATER INDUSTRY?

Thank you! My focus within the industry has been, and continues to be, maximizing potential to achieve improved outcomes. While I've been traditionally centered around emerging technologies and regulatory frameworks, my recent efforts have been focused on supporting owners and operators on their innovation programs. More specifically, supporting a gap analysis of needs, then identifying, evaluating and integrating technical solutions responding to top priorities. I'm proud to work in a sector that is so critical to quality of life and the existence of life itself, and I am passionate about ensuring we are leveraging the best available solutions to do the best we can in managing our water resources.

2. MANY INDUSTRIES, INCLUDING WATER & WASTEWATER ARE DISCUSSING ARTIFICIAL INTELLIGENCE AS ONE OF THE NEXT BIG TECHNOLOGIES THAT WILL HAVE SIGNIFICANT IMPACT. WHERE DO YOU SEE THE MOST OPPORTUNITY FOR AI IN THE WATER INDUSTRY AND WHAT TYPE OF TIMELINE DO YOU ANTICIPATE FOR WIDESPREAD ADOPTION?

Oh yes, this is a very hot topic in the water sector today. AI is not new, Alan Turing brought life to this concept in the 50s, yet we are now starting to see the rapid growth of its application as technology rapidly develops. For the water sector specifically, I believe the opportunity for AI is going to be mainly around the processing of data versus the collection of data. Opportunities will be driven by the end user (utilities and water companies) who will seek ways to take existing data to make better decisions in real time, as well as improve strategic planning and allocation of resources. AI can benefit utility operations related to source water/wastewater collections, treatment, and distribution networks. If a utility with wastewater assets, the greater opportunity will likely be in the collection system, whereas for a water utility it will be in the distribution system. These assumptions are tied to capital improvement planning and investment under consent decree and stormwater infrastructure projects, as well as pipe rehab and replacement efforts. It's hard to estimate a timeline for widespread adoption, although I suspect we'll see accelerated growth in the 5-15 year time frame.

3. HOW IMPORTANT IS INNOVATIVE TECHNOLOGY TO SUPPORT SUSTAINABILITY GOALS IN THOSE COMPANIES WHO ARE/OR WANT TO BE LEADERS IN THE INDUSTRY?

Innovation in the context of continuous improvement and seeking the best available solutions to meet the highest standards of performance are critically important behaviors. Utilities do not need to be on the bleeding edge of technology adoption, and in most cases it's not sustainable to implement the sleekest widget that emerges in the market. Rather than technology, holistic process frameworks that evaluate and procure the best available solution are a greater area of opportunity and importance. For technology solution providers, a focus on driving down costs and barriers to implementation will create a more favorable business case.



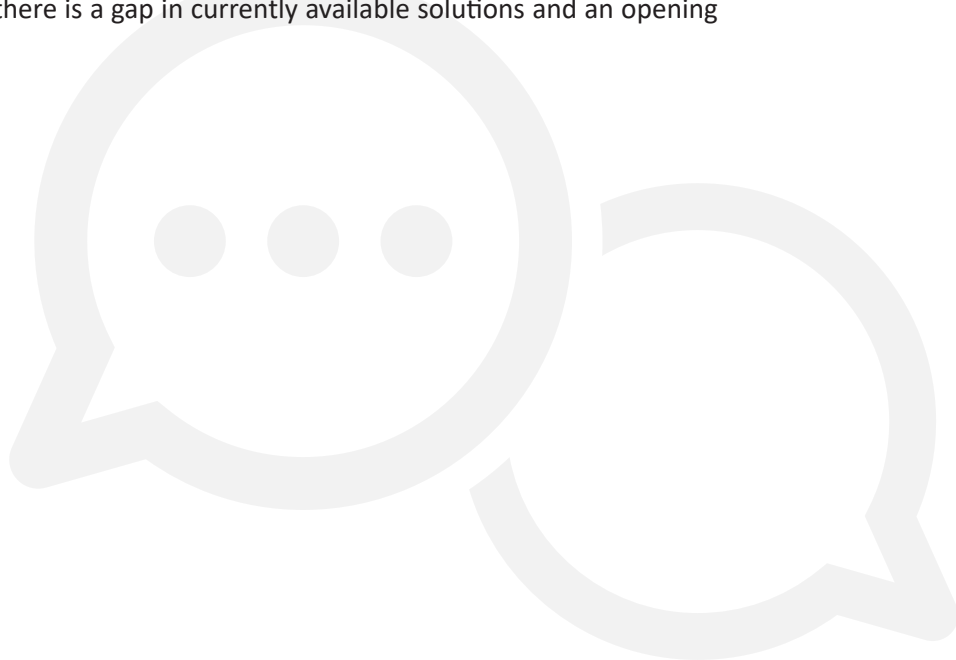
4. IN 2017, YOU DISCUSSED RESILIENCY AS AN OVERALL THEME WITHIN THE WATER AND WASTEWATER INDUSTRY. SINCE THIS INTERVIEW, HAVE YOU OBSERVED ANY NEW THEMES OR TRENDS IN THE INDUSTRY? HAS THERE BEEN ANY CHANGE IN THE DYNAMIC OF MANAGEMENT TO ADOPT CHANGE?

This continues to be a primary theme and point of discussion at many industry conferences and regional gatherings. While federal funding for municipal systems has declined in recent decades (compared to when the Clean Water Act was first passed), 2018 seems to have more activity in terms of public sector investment for owners and operators of water systems, not to mention the continued growth of private sector investment to finance larger scale projects. For example, the US Bureau of Reclamation awarded 8.3 million for various drought resiliency-focused projects in the southwest region of the US in June 2018. Moreover, we've seen projects under the Water Infrastructure Finance and Innovation Act (WIFIA), in review or awarded, following the appropriation of funds in 2017 from Congress. Although WIFIA is not limited to resiliency, various projects include infrastructure rehab/expansion, and indirect and direct potable reuse. Also, the introduction of H.R. 5596 - Water Infrastructure Resiliency and Sustainability Act, which would authorize the Administrator of the Environmental Protection Agency to establish a program of awarding grants to owners or operators of water systems to increase resilience and adaptability of systems. This currently remains in the review process. Utility leaders and water sector professionals continue to be vocal at the federal level, whether working with their congressional representative or advocacy groups like NACWA, to illustrate the need and importance of providing investment and financial resources for the country's water system.

5. CAN YOU PLEASE LEAVE US WITH A FINAL THOUGHT ON WHAT YOU BELIEVE WILL BE THE MOST IMPORTANT INDUSTRY CHALLENGE OR OPPORTUNITY FOR US TO FOLLOW OVER THE NEXT 2-3 YEARS?

In terms of challenges, utilities are reaching the end of life for many of their assets and are facing high capital infrastructure projects against falling revenues and a retiring workforce - they have no choice but to do more with less, all while managing growing public scrutiny. These challenges present an opportunity to quickly transform areas for innovation that lead to achieving improved outcomes cheaper, faster and better than business as usual.

While there are various areas of opportunity, I would follow the development of asset management and distribution related solutions as there is a gap in currently available solutions and an opening for disruption.



# MAZARS WATER THOUGHT LEADERSHIP

## STUDIES

### 2018 MAZARS GLOBAL WATER RISK SURVEY RESULTS

By Mazars Global

### THE TAX CUTS AND JOBS ACT: PUBLICLY TRADED WATER UTILITIES IMPACT AND DISCLOSURE

By Mazars USA Water Group

## ARTICLES

### ON THE WATER

By Jerome Devillers

### USING THE SDGS TO ADD VALUE TO BUSINESS

By Jerome Devillers

### STORMY FORECAST

By Jerome Devillers

### THE GAME-CHANGING IMPACTS OF REVISED AND NEW ASTM STANDARDS FOR ENVIRONMENTAL LIABILITY VALUATION, RECOGNITION AND DISCLOSURE

By Chase Drossos

### THE TAX CUTS AND JOBS ACT: PUBLICLY TRADED WATER UTILITIES IMPACT AND DISCLOSURE - A SUMMARY

By Chase Drossos

VISIT <http://mazarsusa.com/insights/> TO VIEW ALL OF OUR THOUGHT LEADERSHIP AND SIGN UP FOR OUR QUARTERLY NEWSLETTER.

## WEBCAST

### NEW LEASE STANDARD IMPACT ON THE WATER INDUSTRY

Speakers: Ron Lagnado, Chase Drossos & Pierre Menard |  
Mazars USA

## PODCASTS

### TRANSFORMING WATER & WASTEWATER UTILITIES WITH DATA ANALYTICS

Speakers: Pape Ka and Vincent Van de Maele | Mazars USA

### MAZARS WATER GROUP: WORLD WATER DAY 2018

Speakers: Jerome Devillers & Chase Drossos | Mazars USA



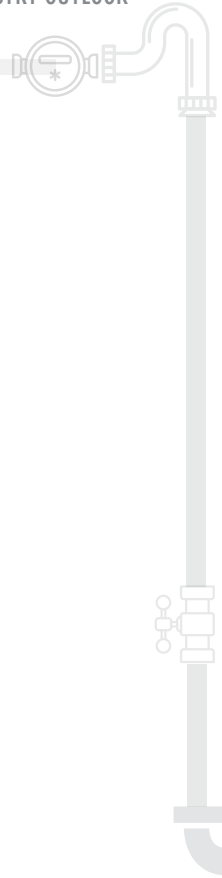
# ABOUT MAZARS USA

MAZARS USA IS A HIGH-PERFORMING NATIONAL FIRM WITH SIGNIFICANT PRESENCE IN STRATEGIC US GEOGRAPHIES. SINCE 1921, OUR DEDICATED PROFESSIONALS HAVE LEVERAGED TECHNICAL INDUSTRY EXPERTISE TO DEVELOP CUSTOMIZED SOLUTIONS FOR CLIENTS, CREATE VALUE, AND OPTIMIZE THEIR PERFORMANCE.

WE DELIVER DEDICATED GROUP OF INDUSTRY SPECIALISTS PROVIDING ACCOUNTING, AUDIT, TAX, CONSULTING AND ADVISORY TO GROWTH-ORIENTED ENTERPRISES AND INDIVIDUALS. OUR CULTURE OF DIVERSITY, COLLABORATION AND COMMUNITY IS DRIVEN BY OUR GUIDING PRINCIPLES OF ASSOCIATION RESPECT AND EXCELLENCE.

AS THE INDEPENDENT US MEMBER FIRM OF MAZARS GROUP, WE DELIVER SEAMLESS ACCESS TO THE EXPERTISE OF 23,000 PROFESSIONALS IN 89 COUNTRIES.





# ABOUT MAZARS GROUP

MAZARS USA LLP IS THE INDEPENDENT U.S. MEMBER FIRM OF MAZARS GROUP, AN INTERNATIONAL, INTEGRATED ORGANIZATION SPECIALIZING IN AUDIT, ACCOUNTANCY, ADVISORY, TAX AND LEGAL SERVICES

## KEY FIGURES AS OF JANUARY, 1<sup>ST</sup> 2018



1,000  
PARTNERS



89  
COUNTRIES



310  
OFFICES



23,000  
PROFESSIONALS

## UNINTERRUPTED GROWTH



Professionals in Mazars' Global Organization



Revenue in Million Euros in Mazars Global Organization



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