PRIVATE CAPITAL

Investing in Water Infrastructure

Discussion

January 10, 2023

Guy Haselmann, Head of Thought Leadership at MetLife Investment Management, recently sat down with Filipe Cunha, AVP of Infrastructure and Project Finance to discuss global opportunities in the rapidly growing—but under resourced—area of water infrastructure. The discussion covered areas such as clean waters journey, treatment plants, wastewater, storage, droughts and floods, and the technology that makes it all work.

Guy: ***I doubt anyone would dispute just how essential water is to households, communities, and the economy. It is particularly vital to the smooth functioning of dozens of industries like farming, manufacturing, healthcare and mining, to name a few. The public health benefits from safe drinking water and wastewater treatment are, no doubt, also immeasurable. With so much water infrastructure buried underground or out-of-sight, the proper functioning of this vast and essential network is under-appreciated by most. With all this in mind, there are many aspects we can discuss, but let's start with safe drinking water. How does that get delivered?***

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Filipe: You summed it up nicely. Let me add that water-supply infrastructure consists of all those elements that allow water to flow from where it's naturally sourced and stored to where it finally ends up. Many water infrastructure construction projects consist of aspects of what it takes to pump, transport, store, divert, treat, and deliver water. This infrastructure includes ground water wells, reservoirs, storage tanks, dams, and pipelines.

For potable water to end up at the taps of our home, it can take a long journey from its original source. And, then a complicated process begins. But, simply stated, water is pumped from its origin including watersheds fed by surface water from rainfall and snowmelt, wells, and groundwater aquifers, delivered via pipelines. Water passes through many substances and channels that could expose it to possible sources of contamination, so there is a significant cleansing process. Therefore, it is then transported to required treatment plants, before moving through local pipes into our homes.

Guy: ***I'd think water treatment to ensure clean water is the most important part of the journey. Can you tell us more about that? And can't water become contaminated after it leaves the treatment plant as it travels to its final destination?***

Filipe: Let's start with how water might be or become contaminated. Groundwater can pick up contaminants from fertilizers, septic tanks, city rainwater runoff, mine drainage, industrial usage, or naturally occurring elements, and other similar means. Rivers and streams can also contain dangerous microorganisms. Therefore, water must end up at a treatment plant to remove both solid particles and to disinfect harmful pathogens. At the federal level, the EPA and standards set forth under the Safe Water Drinking Act mandate how water is cleaned before being delivered. State and local/municipal regulation can further augment water treatment requirements.

After leaving the treatment plants, water passes through two major pipe systems: the main lines and service lines. Main lines are operated and maintained by cities and municipalities and bring water to the street in front of residential, commercial and industrial customers. Services lines within a customer's private property are generally their responsibility and carry the water into their homes from the main lines.

As to the last part of your question, some homes built before 1985 are still using lead pipes. Unfortunately, water treatment facilities can't protect consumers against lead toxins from pipes.

Guy: ***It seems possible then that Cities and Municipalities, and not just homes, have aging water infrastructure too. I've read that some might be as much as 100 years old. If this is correct, then they might be using asbestos-cement pipes and wood storage tanks which are outlawed in newer systems. I suspect that homes or cities that have these older— and may I say more dangerous systems—have probably not been upgraded, either because they don't know what's there, or because of the potential expenses. Either way, it suggests that either more money and/or water quality monitoring requirements are needed, correct?***

Filipe: That's basically correct. Maintaining and operating aging infrastructure, like many other things, is becoming more costly, so many municipalities have been deferring maintenance, and often choose to spend money from limited budgets on what they consider more pressing needs. Sometimes upgrades or pipe replacement only happens when something breaks. This is a problem but can also lead to an opportunity.

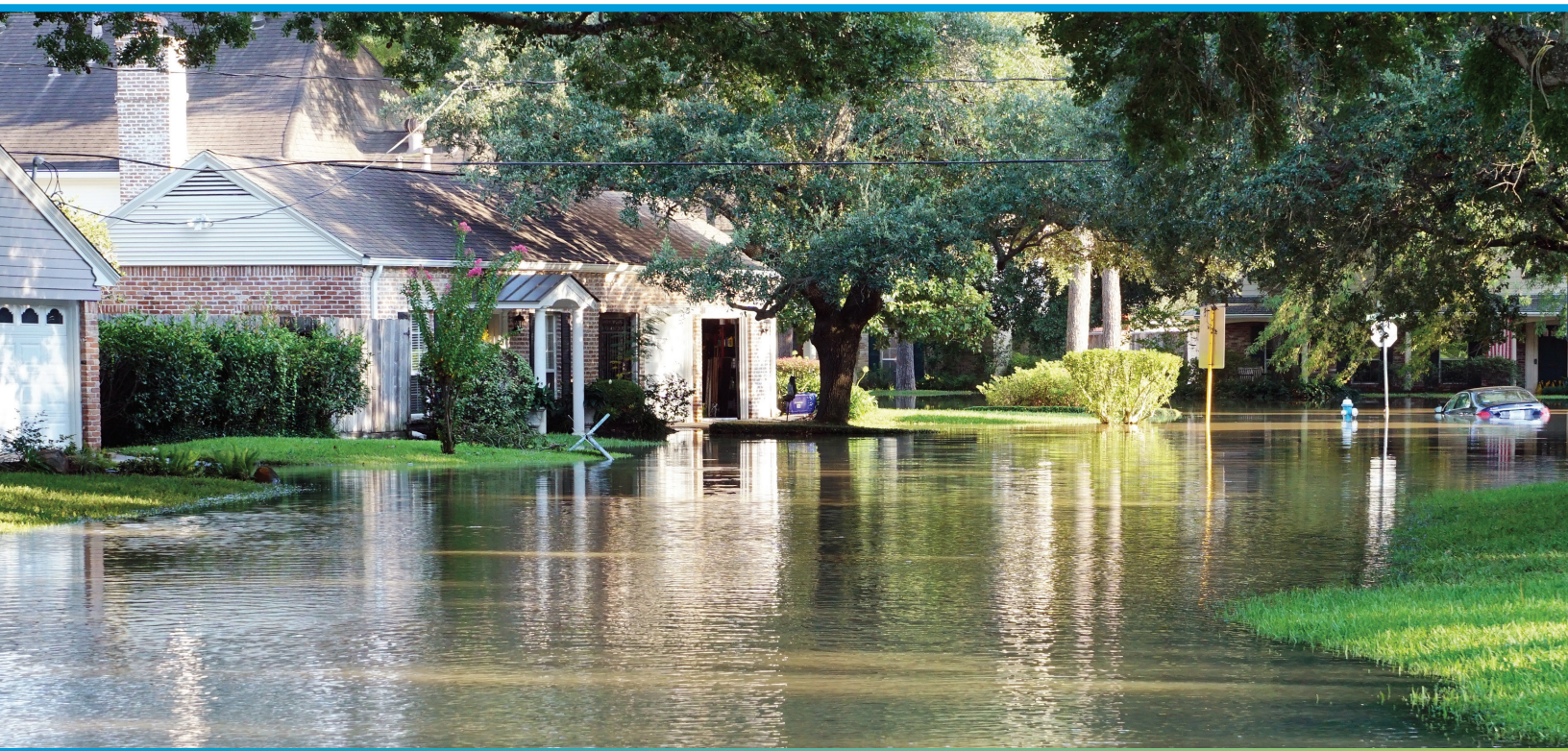
To provide some statistics, according to the American Society of Civil Engineers, a water main breaks every 2 minutes leading to an estimated total loss of six billion gallons of treated water every day.[1] And unfortunately, an estimated 10 million homes still receive drinking water through lead pipes and service lines.[2] Recent events in Jackson, Mississippi[3] and Flint, Michigan[4] are case in point.

Guy: ***Didn't the bipartisan Infrastructure Bill earmark money toward these types of problems?***

Filipe: Yes. The Biden Administration's Lead Pipe and Paint Action Plan legislation (part of the Infrastructure Investment and Jobs Act ("IIJA")) seeks to replace lead pipe still in service in the approximately 10 million homes over a decade and has earmarked billions toward this effort.[5] And the statistics I just mentioned are telling, but there are many signs that decades of underfunding have left US water systems in a dangerous state. The amount of investment though is beginning to change. As you mentioned the infrastructure bill earmarked $55 billion of investment to the sector. This is a huge amount and a good start, but I should mention that amount is ½ of what was set aside in the original bill.

There is also a large increase in private players too, some of whom are using PPP's (public-private-partnerships) to initiate funding for projects. According to McKinsey, private equity, M&A activity, and infrastructure fund-led activity, increased by 26% annually from 2018-2020 after being relatively flat for the prior 5 years.[6]

There are huge opportunities in many sub-sectors of infrastructure including social and digital which you addressed recently with a few of my colleagues. I feel the same away about water infrastructure projects, but I will add that many of these projects offer a unique combination of size, fragmentation, and investability.



Guy: ***Please elaborate and also tell us about some of the challenges for potential projects.***

Filipe: In order to provide safe and reliable services, countless systems need to replace aging infrastructure. If that isn't bad enough, new water-safety challenges are emerging including the need to protect against cybersecurity or other types of attacks as well as to prepare for climate resiliency, scarcity, and the deployment of new technology to improve effective and affordable services.

Regulatory scrutiny is rising with enforcement and the creation of new standards. It is a focus of the US government, partially brought-on as a result of the frequency and intensity of extreme weather events such as droughts, floods and extreme temperatures.

One example was the severe damage to water pipes in Dallas in February 2021 due to an unusual and extended cold period combined with lack of winterized pipes.[7] Earlier we mentioned cybersecurity and during that same month, hackers targeted a water-treatment plant in Florida and took control of operations demanding ransom.[8]

The bottom line is that funding for a majority of fragmented US water utilities has consistently lagged the bare minimum investment needs just for basic maintenance and flood or drought management, let alone modernization.

Guy: ***If the US is chronically underfunding what is needed, then I assume problems could become lar ger and more frequent; potentially with devastating consequences. Is that right? Can you put it in perspective for us?***

Filipe: To put it in perspective, according to the EPS, 50,000 drinking water systems distribute 39 billion gallons of potable drinking water every day, while 15,00 wastewater utilities collect and treat approximately 32 billion gallons daily before returning it to the environment in some capacity.[9] Just image the spillover impact that would occur due to a break in the system in terms of economic output—or specifically on hotels, schools, restaurants, manufacturing plants, bars and households.

Earlier, I talked about some new challenges, many of which are aggregating due to chronic under-funding year after year. Leaks and breaks currently account for the loss of 2.1 trillion gallons of treated water per year which as I mentioned translate directly into economic loss.[10]

It is estimated that $129 billion to $136 billion is needed per year through 2039. In 2019, the US spent $48 billion which was only about 37% of the nation's total water infrastructure capital needs. At the current rate, the gap will aggregate to $2.2 trillion over the next 15 years which amounts to around $6,250 for every person in the US.[11]

Guy: ***That is a simple average of the cost per person. Earlier you mentioned the loss in terms of economic output. Can you elaborate?***

Filipe: Yes, the same EPA study said underinvestment would lead to a cumulative $2.9 trillion decline in GDP by 2039. The report also said that the costs incurred by US households due to water and wastewater failures would be seven times higher in 20 years than they are now and would result in $7.7 billion in cumulative household healthcare costs. The cumulative costs due to service disruption on water-reliant business is estimated to exceed $250 billion.

Guy: ***It seems to me that there are two sources of capital outlay for these projects: government spending from taxes and private capital? Is that right, and where has most of the money come from?***

Filipe: Another way to address your question is to say that projects need to be affordable so governments can find the money, while also incentivizing private capital with a proper return on their investment.

In addition, a funding gap will likely persist without improvements in efficiency and effectiveness in the system: improvements that address modern challenges of climate, cyber, and scale of system design. To date most funding has come in the form of low-interest loans to utilities that need to be repaid.

Capital planning, like in most investments will require an understanding of the final asset, what is being replaced, and anticipating upcoming regulatory commitments and requirements. Length of use and maintenance requirements can help assess long-term costs, while procurement and vendor contracting during construction can help assess some short-term factors to determine cost of capital. Like with many projects, productivity equals profits, and so upgrades rather than full replacement might be a preferable alternative.

Guy: ***Investment isn't just about preventing loss but also about the economic benefit. Can you talk about that from an investment perspective?***

Filipe: I believe I've clearly outlined how a proactive investment approach in water infrastructure that eliminates investment gap would have enormous benefits to trade, the economy, quality of life, and general health. The same study projects that over the next years the aggregated impact would mean an increase of $4.5 trillion in GDP, US trade would be better from more competitive products, 800,000 jobs would be created, and household disposable income would rise over $2,000.[12]

Private investors can partner with governments in Public-Private-Partnerships (PPPs) for synergies and local and regulatory support. This allows investors to better assess the risks and determine return assumptions.

Guy: ***Any final words?***

Filipe: The Infrastructure Bill was a great start to getting essential dollars into the US water and wastewater systems. I hope affordability remains in place, whether led by productivity gains, new technologies, or government subsidies.

I believe those that do the proper homework, are strategic, efficient, and partner wisely with the public sector, can find outstanding idiosyncratic investment opportunities that modernize the system for resiliency, safety and affordability for decades to come.

Endnotes

1 https://www.asce.org/
2 FACT SHEET: The Biden-Harris Lead Pipe and Paint Action Plan | The White House
3 https://www.wsj.com/articles/storm-brings-more-problems-to-jackson-miss-water-supply-11672164819
4 Flint Water Crisis: Everything You Need to Know | NRDC
5 FACT SHEET: The Biden-Harris Lead Pipe and Paint Action Plan | The White House
6 US water infrastructure: Making funding count | McKinsey
7 More than one million in Texas lack drinking water after winter storm | The Texas Tribune
8 Florida Water Plant Hackers Exploited Old Software And Poor Password Habits (forbes.com)
9 Home | Environmental Protection Agency (epa.ie)
10 IBID
11 US water infrastructure: Making funding count | McKinsey
12 IBID

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