



(DON'T!)  
**WASTE  
WATER**

Presents:

# RETHINKING WATER 2022

in partnership with: **scienSWATER**  
Making sense of water

**+GF+**

If we portrayed the US Water Sector as a giant Rubik's Cube, here would be some of the tiles:

**1/3** of US drinking water and wastewater operators will be eligible for retirement in the next five years

There are **1.7 million** water professionals in the US.

**85%** of water and wastewater utilities have three or fewer employees

The country features 51,000 Water Utilities (and about 16,000 Wastewater Utilities)

PFOA was determined in 2022 to be **100,000 times** more toxic by the US EPA than they thought in 2009

Treating PFAS would cost **\$370 billion.**

Pipes in "Excellent" condition went from 69% in 1980 to 33% in 2020. "Very Poor" ones went from 2% to 23%.

**63 million** Americans are potentially exposed to unsafe drinking water

**2.2 million** Americans have no access to water at all

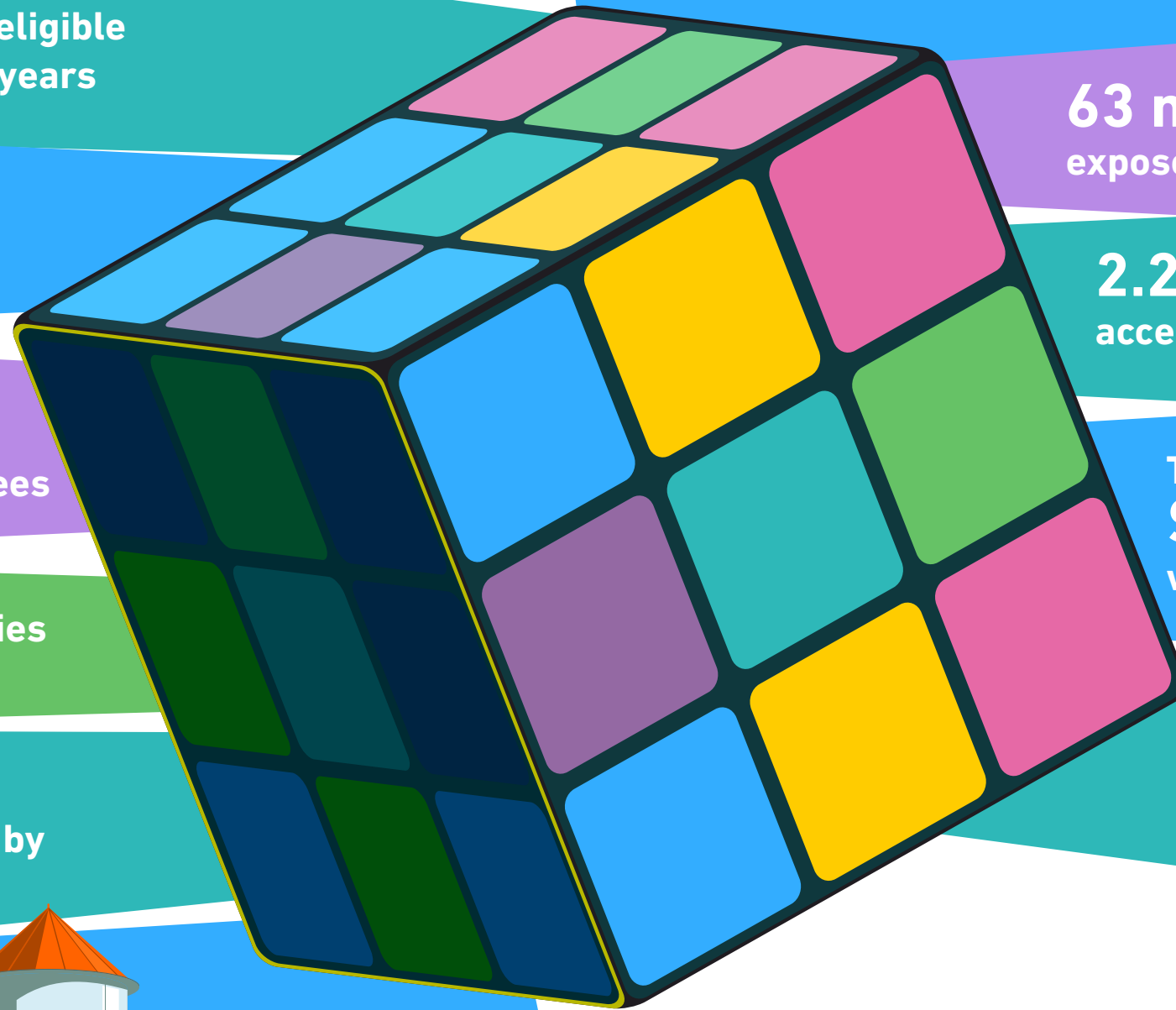
The "American Jobs Plan" proposes a **\$111 billion** investment in water infrastructure.

ESG assets will surpass **\$41 Trillion in 2022** Globally

These tiles are mixed today, yet we might be at a turning point.

What would it take to solve the riddle? Where can we act first?  
Who can help, and how?

Let's figure it out.





To do so, I collected much wisdom from some of the most brilliant stakeholders in this US Water Scene:

## Researchers



**Upmanu Lall**

Professor and Senior Research Scientist  
at the Columbia University



**Paul Gallay**

Lecturer and Co-Director at the  
Columbia Climate School



## Institutional Actors

**Sarah Kapnick**

Chief Scientist at the  
National Oceanic &  
Atmospheric Administration



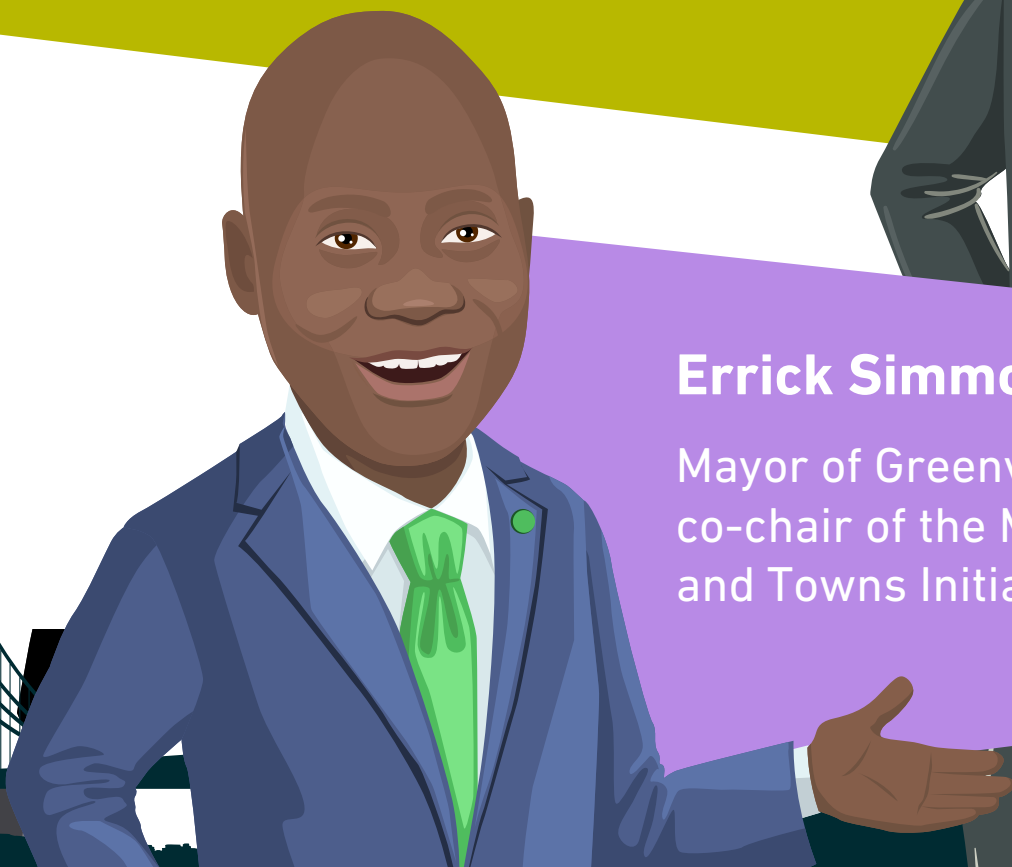
**Nick Shufro**

Deputy Assistant Administrator  
at the Federal Insurance &  
Mitigation Administration

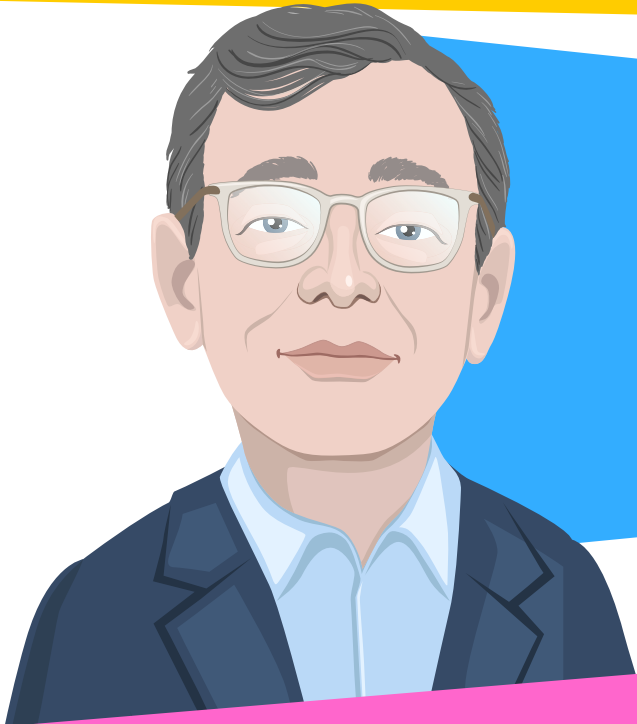


**Errick Simmons**

Mayor of Greenville, Mississippi, and  
co-chair of the Mississippi River Cities  
and Towns Initiative



# Authors, Influencers & Activists



**Seth Siegel**

Writer, lawyer, activist, serial entrepreneur, and an acclaimed public speaker

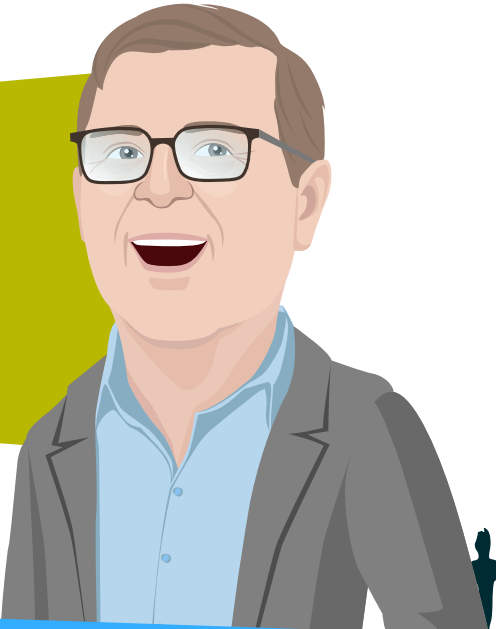


**Patrick Decker**

CEO of Xylem

**Taylor O'Neill**

CEO of Richard's Rainwater



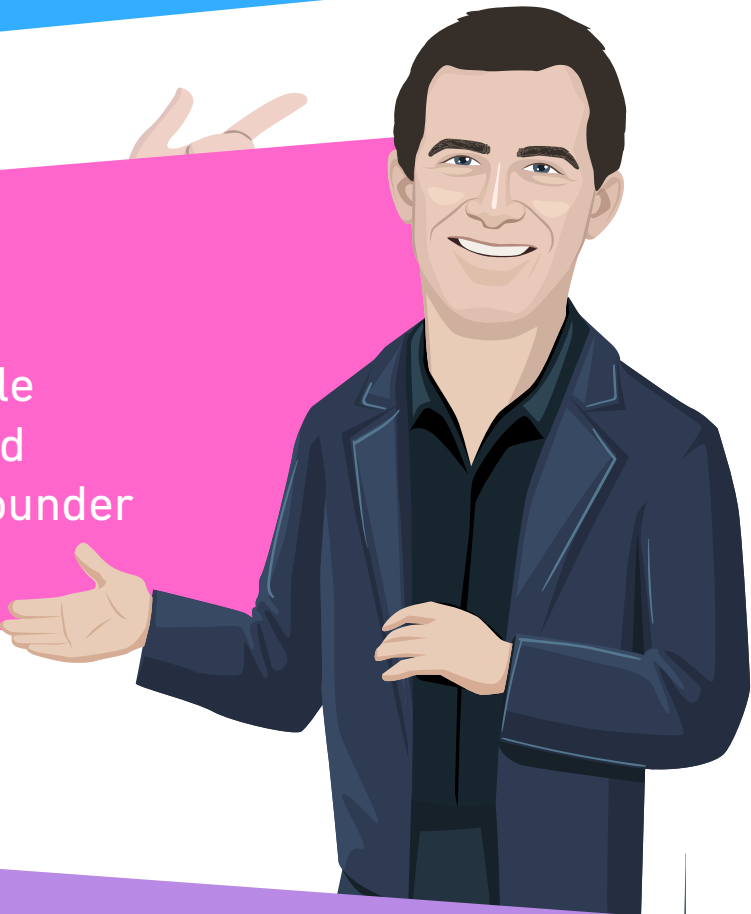
**Mirka Wilderer**

CEO of DeNora Water Technologies



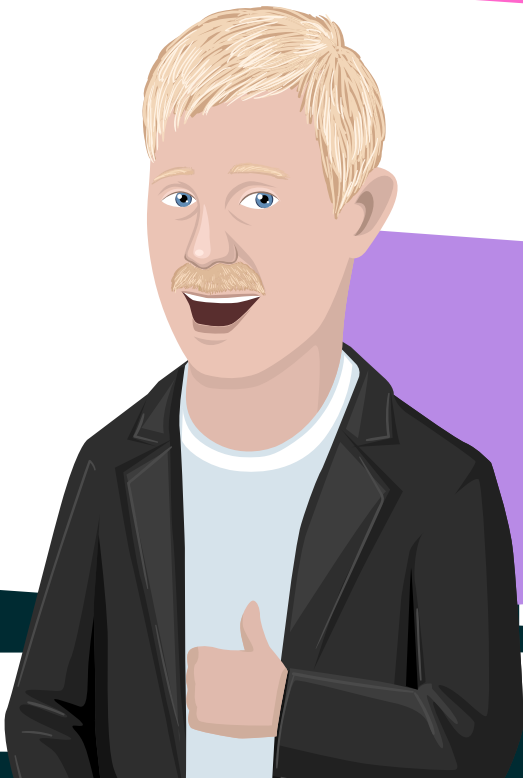
**Josiah Cox**

President at Central States Water Resources



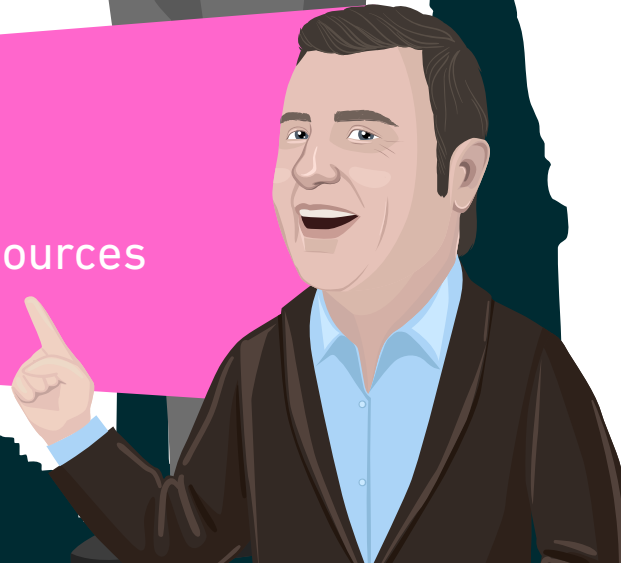
**Kevin Sofen**

Director of Innovation, multiple podcast host, professor, board member, and philanthropic founder



**George McGraw**

CEO and founder of DigDeep



# Investors

## Henry Cordes

Principal and Director of  
Sustainability at Sciens Water



## John Robinson

Partner at  
Mazarine Ventures



## Sean Davis

Founder and Managing Director  
at Merton Capital Partners and  
Book Author



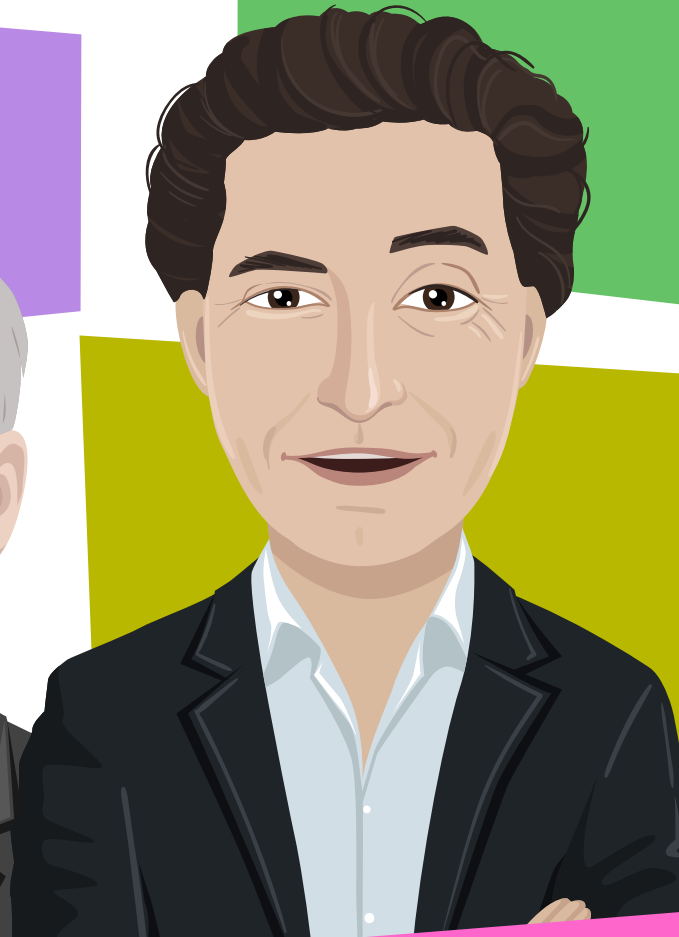
## Meshal Alduraywish

Research Analyst at  
Sciens Water



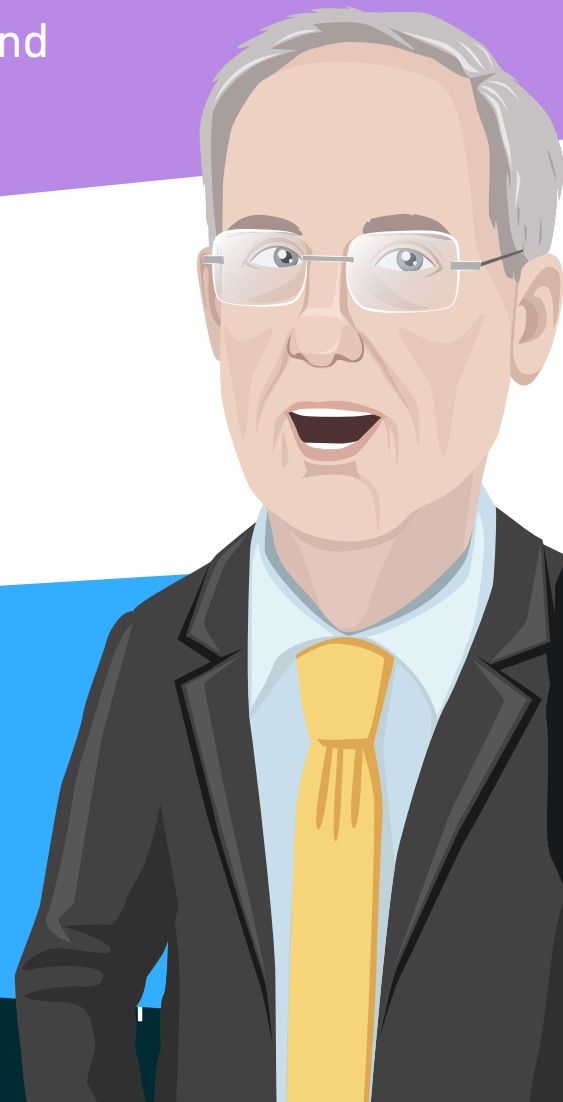
## Alex Loucopoulos

Partner at Sciens Water



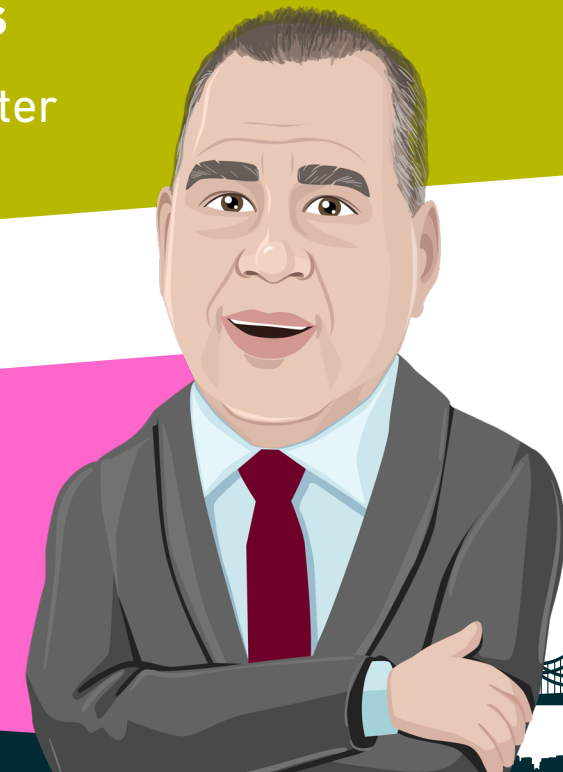
## Tom Rooney

Chairman of Sciens Water's  
Operating Committee



## Damian Georgino

Partner at Womble Bond Dickinson





**Finally, before we start, I shall probably also introduce myself.**

I'm a second-generation Water Professional - thirty years ago, my dad traded excavator sessions for me in river banks against lunch invitations for the ones that would have to repair behind me.



I have studied and graduated in Hydraulics and Environmental Engineering. But my real knowledge comes from what I've seen in the trenches of the Water World!



My first professional assignment took me across the Asia-Pacific region to explore, amongst others, water treatment in Hong Kong, desalination facilities in Melbourne, water distribution management in Jakarta, water innovation in Singapore, and social water projects in New Delhi and Gujarat.



I documented all of that in videos, blog articles, radio spots, and conferences in engineering and business schools... which led me to keep this habit of sharing with the World!

I've then been an active member of the Water Industry, drawing the roadmap to SUEZ's ozone and UV products. I've then also been in process development and sales, with an emphasis on micropollutant removal - somewhat turning me into an intrapreneur.



Since 2017 I have been leading GF Piping System's business development for the company's services in Europe, then for all Water Treatment topics worldwide.



Throughout the years, I've been a regular speaker at conferences on four continents, like Micropol Ecohazard in Singapore, the ReUse Symposium in Seattle, the SAPPMA Conference in Johannesburg, the UNESCO Conference in Frankfurt, and a TEDx speaker.



I regularly have the delight of hosting conference sessions to bring brilliant speakers in the best light, as I did, for instance, at the UN-Habitat "Innovate for Cities" Conference, at the Global Water Summit, or at the BlueTech Forum.

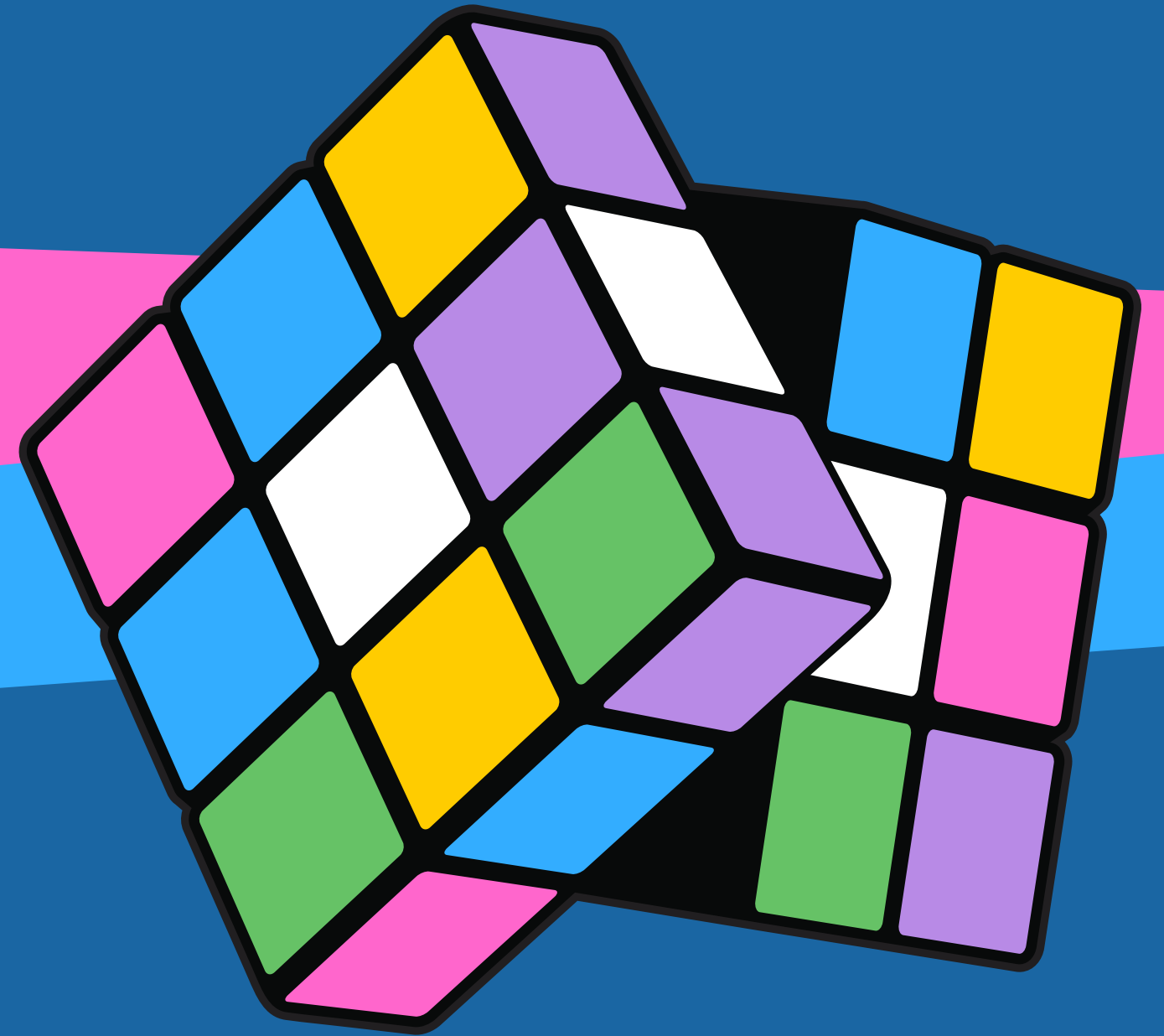


Since 2020, I have hosted the "(don't) Waste Water" podcast, with over 250 episodes published and available on all platforms!

Oh, and I'm married, a happy father of three, and I'm French (nobody's perfect 😊).



**What's to Rethink  
in Water?**



Would you accept “everything” as an answer? Probably not. I would even bet you would be surprised to discover how much there is to rethink in water (especially in the US). Or even that there is something to rethink at all.

All of these challenges are vivid and daunting. Yet they suffer from a fatal disease: they get easily filtered out by our brains. Big numbers that are hard to grasp, challenges in places far away... well, really far away?

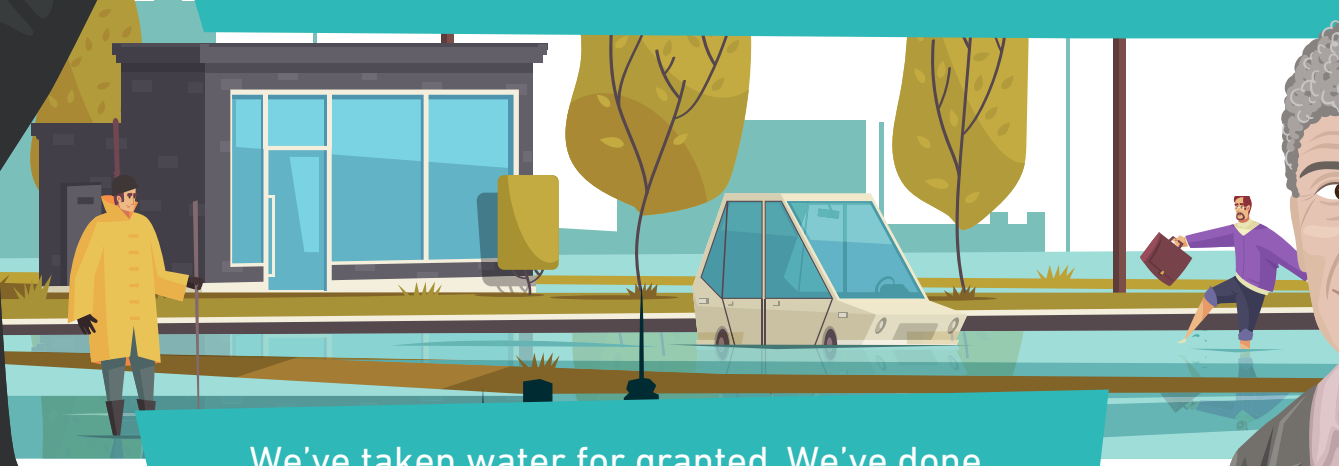
We have people who don't have access to clean water. We have people who don't have access to the ability to discharge wastewater. These are the most publicized problems associated with water.

A few years ago, we had Day Zeros in Cape Town and Rio, so they got a lot of publicity. But it's not that easy for people to connect to these issues in their own lives because they seem remote. Yet let's face it: water issues also mean floods, and water issues also mean that we will have droughts in places that are normally well stocked with water!



Too long, didn't read? Well: it's happening, much closer than you think, and in many more shapes than you'd expect.

Jakarta, despite a lot of pumping, is now going to be replaced by a new city because it sank. *"Oh that's interesting but it's Jakarta, it's not happening here."* Really? But it's happening in California, it's happening in Houston, and it's happening in various places! We just don't realize that sometimes."



Per the United Nations count, and as of 2021, that's **2.2 billion people without clean water worldwide.** And **44%** of the wastewater that gets discharged untreated. But that's not the end of it:

44%

From a sustainability perspective, people start talking to you about scarcity and places where people can no longer grow crops.

We've taken water for granted. We've done a lot of damage both in terms of supply and water quality, but we have also neglected to bring people into the equation.



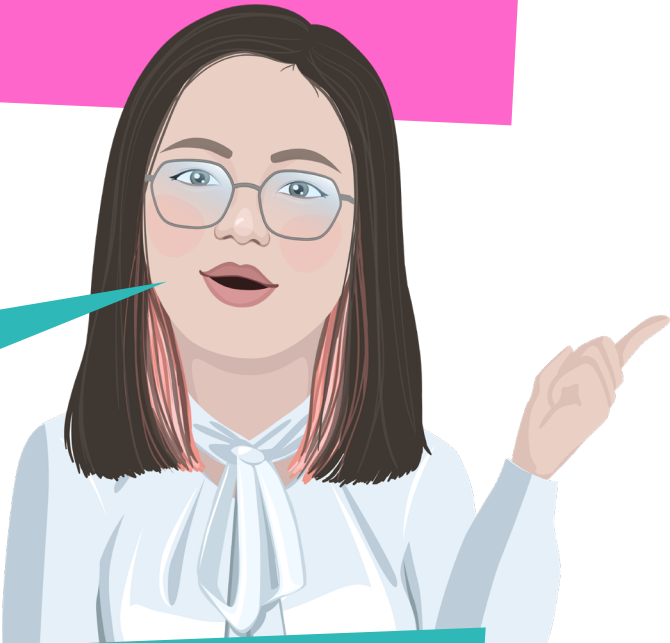


Yet, the water crisis has a bigger sibling that's been relatively successful in bringing people into the equation: **climate change**.



Could you look me in the eyes and tell me you've never heard of "Zero Carbon" or climate change? I hope not - unless you have a much better poker face than Lady Gaga herself.

This conversation is truly related to environmental justice. And while it's a conversation that's getting picked up when we talk about climate change, it's not getting picked up as much when we talk about water resources and access."



The link between siblings rapidly gets apparent, though:



With disasters and climate change related events, the intersection of aging infrastructure and climate is creating an unprecedented level of awareness around the World. But we need to move people beyond fear! Because fear paralyzes and causes political division. We do not need that at this point in time.



We need to get away from our communities and silos and think across different organizations and different businesses!



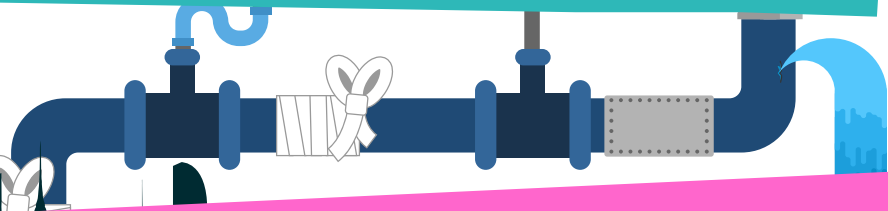
So, would you now agree with me that there is something to rethink in water? I'm sure you do.



And when it comes to what we have to rethink, we start identifying patterns.



We have to rethink what the problem really is with water. Yes, there are broken pipes, and yes, there are systems that don't work particularly well, but to resolve the challenges in water, it's really three-dimensional. So yes, broken pipes, but also broken policy and broken economics.

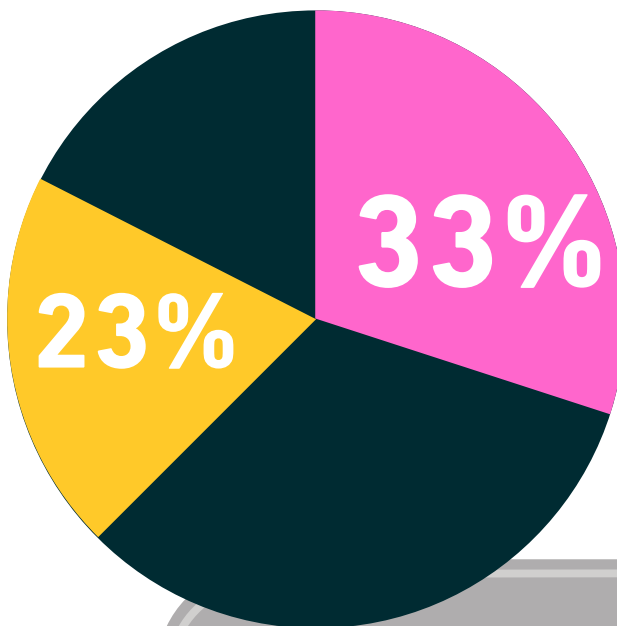
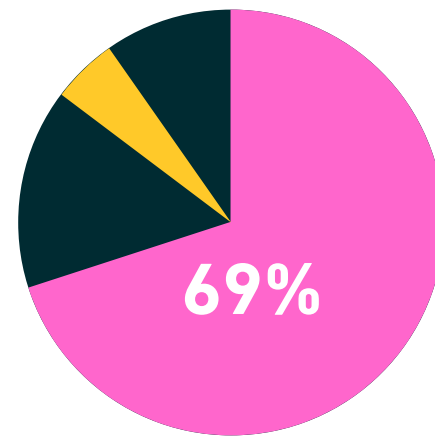


Let's start with these broken pipes.

## 1.1 - Broken Infrastructure

The Environment Protection Agency (EPA) regularly surveys the US infrastructure, providing us with an overview of the current state of the water system but also how it evolves over time. And it's unsettling!

In 1980, 69% of the drinking water pipes were classified as "Excellent" and 2% as "Very Poor."



In 2020, only 33% made it to "Excellent" while the "Very Poor" proportion had been multiplied by more than 10 to reach 23%!

To give you a sense of the challenge, over a quarter of Philadelphia's piping infrastructure was installed before 1900, and recent construction works in downtown Manhattan excavated... wooden drinking water pipes from the early Aaron Burr-Alexander Hamilton times.



When we look beyond the anecdote, we start realizing the size of the challenge:

There are 5,000 water utilities that have been abandoned because they ran out of money. Here's a euphemism: they are not doing well in generating polluted water for 21 million Americans!

According to Maura Allaire, Haowei Wu, and Upmanu Lall, in a 2018 study, 63 million Americans are potentially exposed to unsafe drinking water.



A 2019 study by the Natural Resource Defense Council (NRDC), Coming Clean, and the Environmental Justice Health Alliance (EJHA) even removes the “potentially” adverb by showing how almost 45 million people receive water from 5,634 water systems with a combined 23,040 health-based violations over just three years.

And they’re adding another astonishing statistic:

At Dig Deep, we’re focused on the 2.2 million Americans who don’t have any access to water and wastewater services at home. And I think it’s not so much about rethinking; it’s about thinking maybe for the first time.



That figure is picked up in Dig Deep’s “Closing the Gap” report, co-written with the US Water Alliance.



When the World’s largest economy leaves so many citizens on the roadside, isn’t it a sign of broken policy? Let’s find out.





## 1.2 Broken Policy

On the 15th of June 2022, the EPA published a new Drinking Water Health Advisory for PFAS Chemicals.

That publication was intentional on many levels, notably introducing advisory levels for GenX and PFBS and lowering the threshold for PFOS and PFOA.

Let's focus on these last chemicals to sense the magnitude of that change. Compared to 2016, the EPA now determined PFOA to be 17,000 times more toxic. And compared to 2009, we talk of 100,000 times more toxicity!



If we zoom out from the PFAS topic, the picture that reveals is twofold:



Policies have been lagging behind for a while

Even when policies tend to catch up, they are still lously enforced

Do you think it was just this year that we discovered PFAS was a problem? We've known PFAS is a problem for a while now, and yet we just let it go and let it go and let it go. And that's the model we have used for too long. Things are unregulated or so lightly regulated that they're functionally unregulated.

Now we have the worst of both worlds in America. We have these 50,000 plus water utilities. We have a lot of regulations, and the EPA can't possibly speak with more than a handful of utilities per day, per week, per month, and per year. And so, therefore, a lot of them are just floating along as if they have no supervision at all. The regulatory regime is theoretical, not practical.

But why would policies be so loose if water is so essential for life, economic activities, and safety on all levels?

Back in the battle days with DuPont and 3M, EPA knew the results of a lot of the studies that were being done and did not act. Now we have to play catch up... We have to do everything faster than we would have, had we addressed these issues sooner.



“Simply” because water is undervalued on all levels (we’ll come back to that). So if any kind of leader starts focusing money or efforts on water, it will inevitably be questioned for all the wrong reasons.

I’ve had many mayors and many world leaders tell me that they’re not aware of any politician in the history of mankind that ever got elected with votes for spending money on water.



Yet, many studies show that investing in water - be it in drinking water infrastructure when that’s not existing, in water risk prevention, or in the reconnection of people with water streams is always profitable. And sometimes even highly profitable!

So why this disconnect? Probably because of broken economics.

1.3 Broken Economics

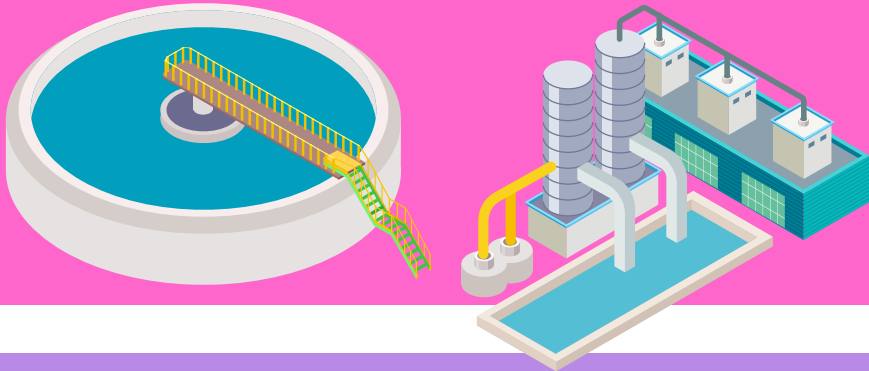
The misunderstanding about the economics of water is the single issue that creates all the other problems. Most people perceive water to be free, and very few actually understand the true value of water.

I talked about many studies just a second ago; let’s just quote some here.



The University of Michigan demonstrated how each dollar invested in river restoration in cities like Buffalo or Detroit yielded a four-dollar windfall for the overall economy.

The OECD demonstrated how there is a 7-to-1 benefit-to-cost ratio when it comes to rolling out water and wastewater infrastructures worldwide.



DigDeep showed how you get a five-dollar economic return for one dollar invested in access to toilets and taps for US families.

And that’s just a succinct selection.

So, assuming most of the people in charge are much more clever than I am, what is it that they can’t see in such straightforward economic benefits?

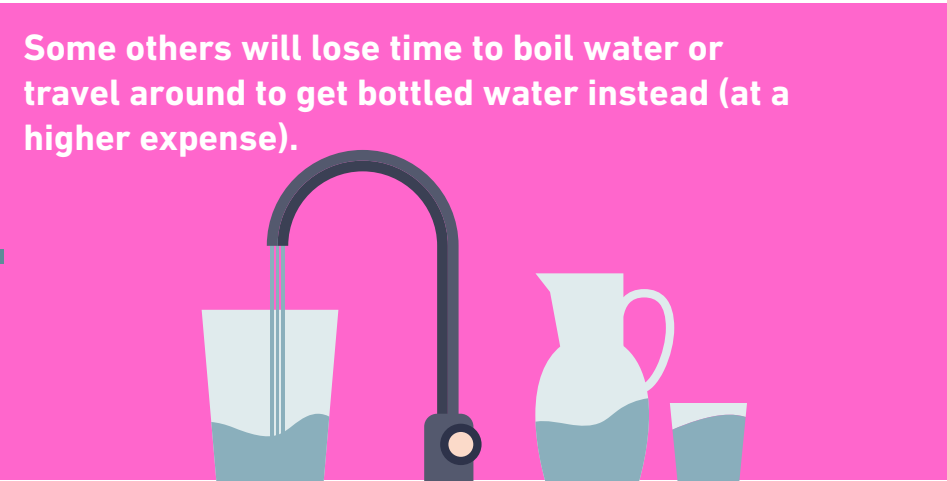
Economists would call this the “wrong pockets problem.” In fact, the societal benefits don’t accrue to the same folks who would make the investment to solve the problem.



Let me give you an example. A community suffers from health diseases because of tap water of doubtful quality. Nothing outrageous, but still cases of diarrhea and similar symptoms.



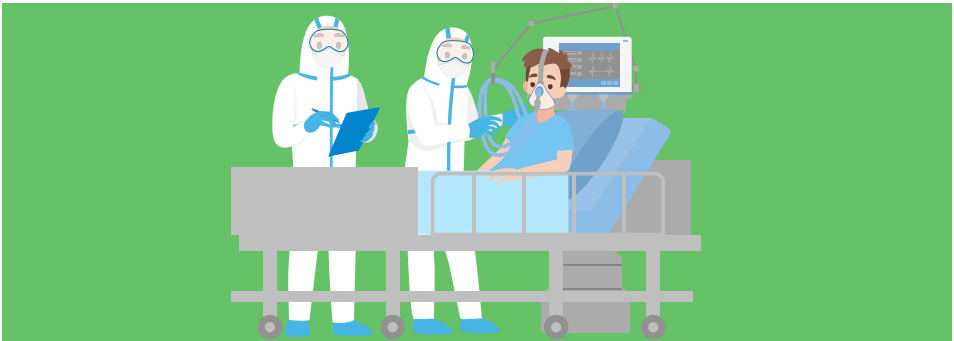
It will impact businesses around because their workers will call in sick.



Some others will lose time to boil water or travel around to get bottled water instead (at a higher expense).



School time will be lost, impacting the community's long-term prospects.



Hospitals will have slightly higher occupations, and so on and so on.

Now, if the local water utility steps in and invests in solving the problem, the overall community will swiftly measure the benefits!

But the utility itself won't get any additional cent for that. Benefits will land in the "wrong pocket."

There is actually a simple symptom that underlines the entire difficulty around the economics of water:



We are not charged the right amount of money for water. That's to say we're not charged enough.



Indeed, utilities could somewhat overcome the wrong pocket symptom if they were allowed to charge an appropriate amount for water - and at least a full cost recovery.

But wait, why should they charge more for something that is freely available almost everywhere on earth? **Maybe because we've done our semantics wrong all that time.**





Water companies don't charge for water; they charge for its collection, treatment, management, and distribution! And unlike water, that doesn't come for free.

Now, that's not the only paradox we face:

The average cost of bottled water in the US is about \$5 a gallon. Meanwhile, the average cost to produce tap water through American infrastructure is slightly less than one penny per gallon. It's a massive difference! People complain about the price they have to pay for water, yet they'll buy bottled water...

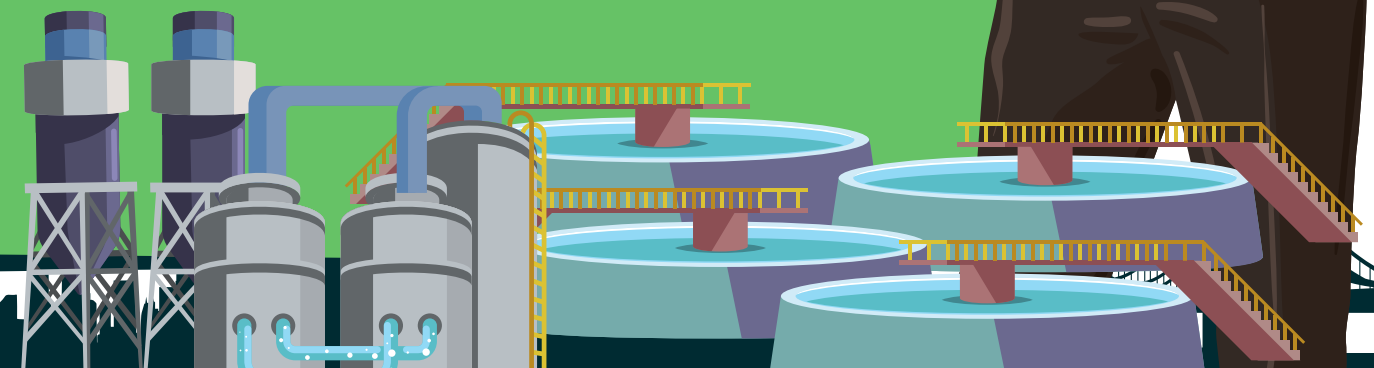
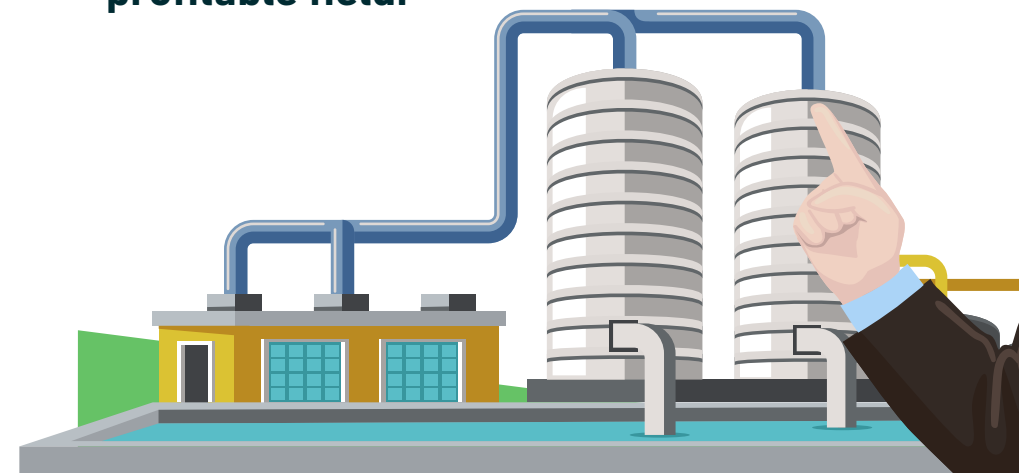
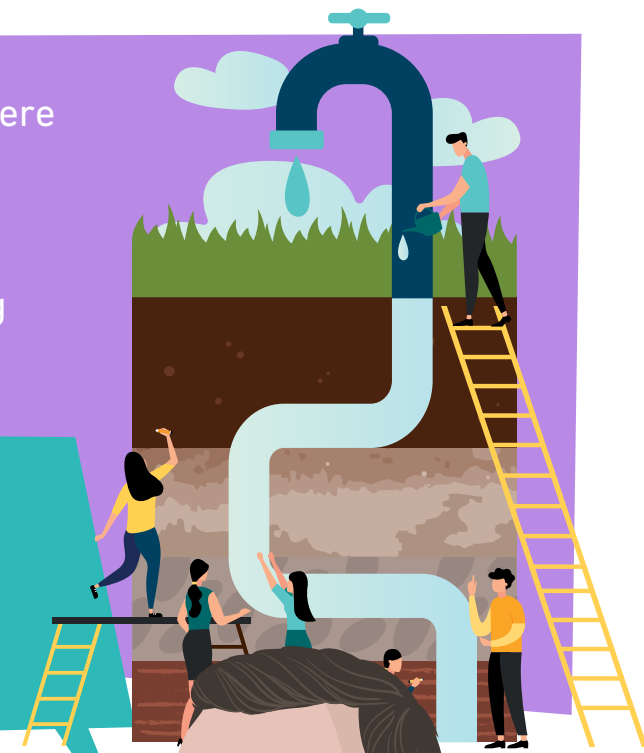
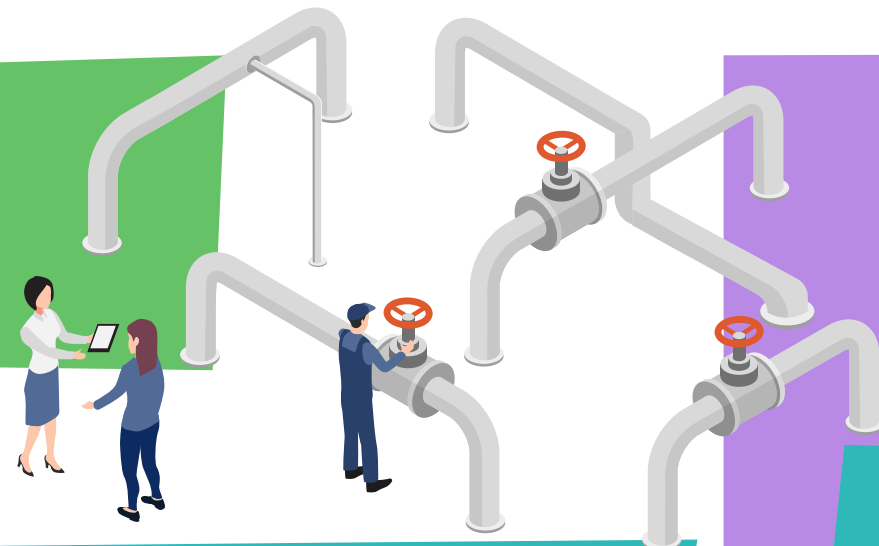
At today's pace and by 2034, the World will spend more on bottled water than it does on utility water. 598 billion dollars a year to be spent on Evian, Aquafina, or Dasani. That's more than the GDP of a country like Belgium!

In countries like Mexico, the inflection point where bottled water investment takes over is already crossed, while the USA is close to it. Indeed, the United States is the largest market globally for packaged water - an overwhelming majority of it for discretionary consumption.

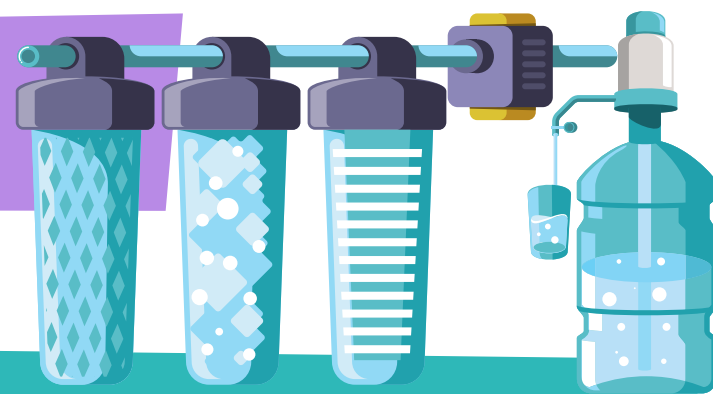
This is why we need to rethink the value of water. Its societal value and its economic value!

For all these reasons and more, it has been difficult to convey that water could be a profitable field.

Yet if we all agree that large conglomerates don't think twice about making a profit from bottled water, we shouldn't shy away from doing so in all infrastructure water and wastewater.



The reason why that matters the most is that it opens new avenues:



If we take a little step back and ask: what is it that we're trying to achieve? The next question is: how can we do that with private capital?



When you rethink it, the private sector is really where you're going to get the most change. Because it's driven by economics and market dynamics, not by a political agenda. That's where things get done!

Fixing broken economics by leveraging new approaches? That sounds like a good prospect! Unless we get dragged into a last major threat: **conservatism**.

## 1.4 Conservatism

You can't think of another industry where there haven't been revolutionary changes in just 20 years and probably several revolutions in the last 20 years.

And yet water, we tend to be doing what we've always done. In terms of municipal water, we tend to be doing what we were doing 75-100 years ago. In terms of agricultural water, lamentably, we're doing what we were doing thousands of years ago...



Sure, the water sector is conservative for a full set of good reasons. You don't want to play with your users' health - and cities like Flint have paid to know that changes that weren't thought through could have dramatic consequences.

Yet, there's also that well-known saying that *insanity is doing the same thing over and over again and expecting a different result*.

The reality is that we live in a changing World, where water scarcity, aging infrastructure, intensified urbanization, and all the other drivers we've been listing so far change the name of the game.

So it might be time to adapt the rules as well:

Should we do what we've done in the past, or should we think a little laterally? I think it's about time to embrace new technology and how we can actually apply that to traditional infrastructure!

Indeed, "new" technologies in water often aren't that new when you look at them. Crossing the chasm in this sector rather takes decades than the months Silicon Valley moguls have accustomed us to.

And that inertia can act as a significant inhibitor for the striving of a specific segment of water actors: **water entrepreneurs**.

We should cultivate more entrepreneurship within water and wastewater. We need more entrepreneurs. We need more people starting companies! And it has to be less scary to do that.

For water entrepreneurs going all-in on a technology they develop and believe in can indeed be quite scary. What if, despite proof of concepts, it suffers from death by piloting? Wouldn't they be better off in adjacent segments like energy or agriculture?

Worse: entrepreneurs aren't the only resource that tends to run scarce in our conservative sector:

How can we attract young folks to begin to look at water and rethink water, but also have careers in water? These young people are our most precious resources!

There are about **1.7 million workers** in the extended water sector in the US, but that number may soon go down.





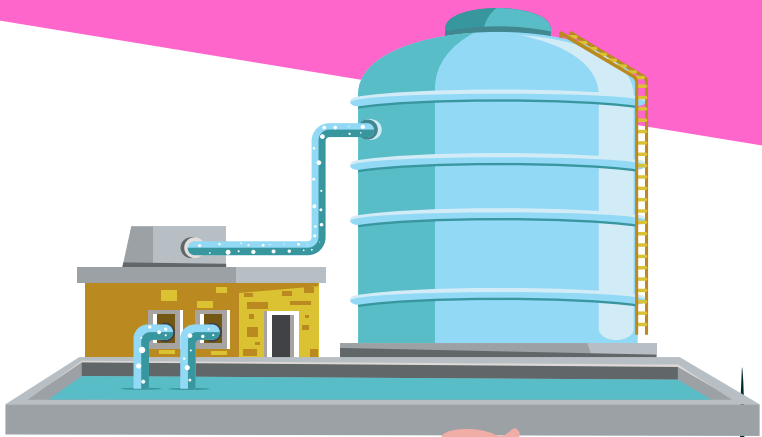
Indeed, the **53% of water workers** that have high school diplomas or less may well get paid up to **50% more** than the national average for similar profiles, but the attractiveness of the sector remains low.



The 85% male, 66% white demography also rounds up with water operators that are, on average, about five years older than the national median.



In 2016, when polled for a Brookings report, many utilities had shared the same alarming message: they were facing up to **50% vacancies**, combined with a **lack of public visibility** that wasn't drawing for a brighter future.



# Conclusion

As we've seen, there's a lot to rethink in water, and it might be scary. Yet, identifying the challenges is also the first step towards solving them!

As an academic institution, we want to bring the solution to those problems, something that's technical, something that's financial, and then how is it going to be implemented and stay fixed.

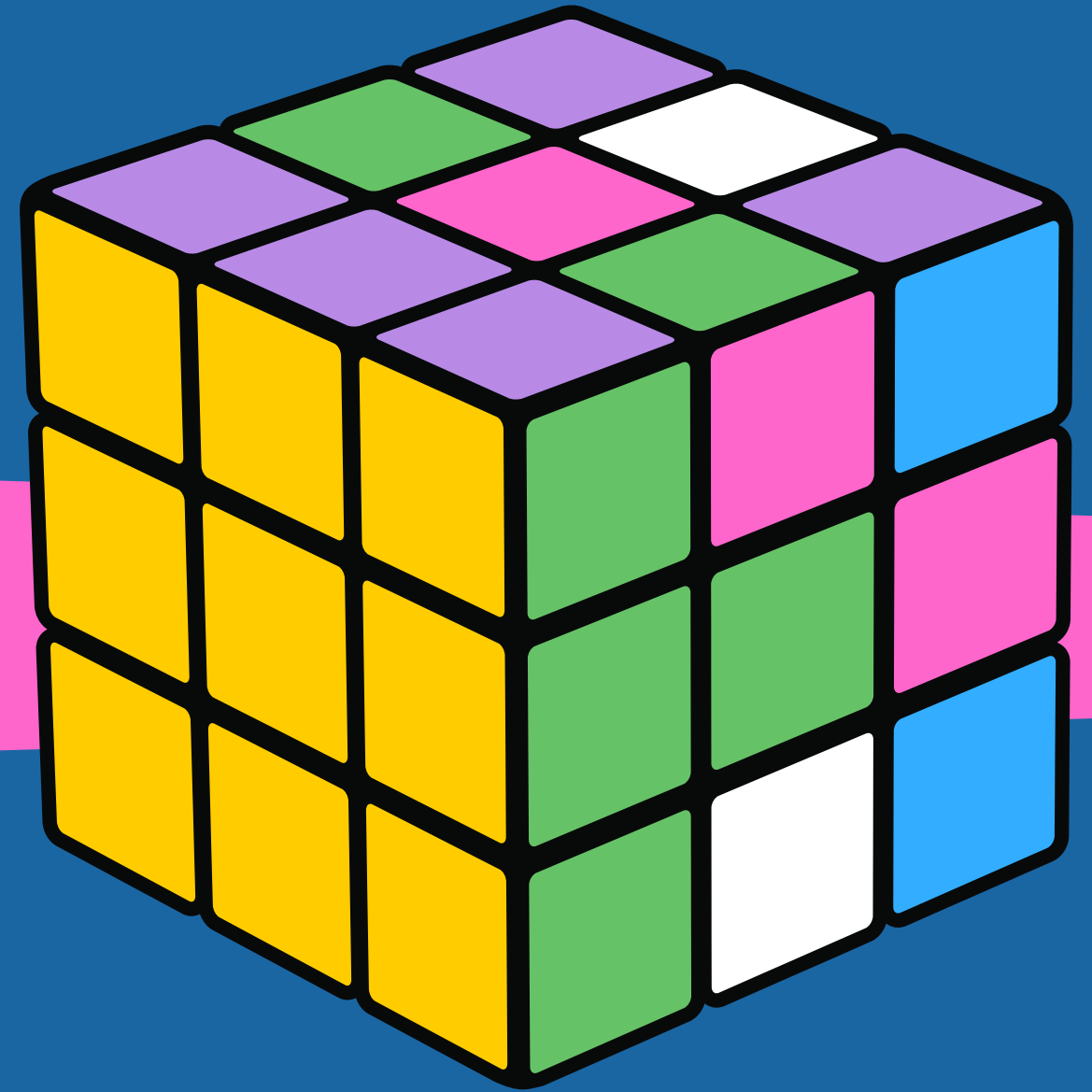


It's an academic field in that sense because we are studying the diagnosis of the problem all the way through to sustainable solutions from an interdisciplinary perspective.

Let's explore these solutions.



**How to fix the  
Broken Economics?**



Let me spit that out:



Water is a profitable investment field.

Private money can do great things.



When rightfully oriented, it is a sure win-win.

And yes, I know, affirming that from downtown Manhattan can awaken ghosts of a time when all the above was proven wrong.



New York has long been infamous for being a city that had everything but water. From its early Dutch times to its British history all the way to its first sixty years of American independence, Big Apple didn't have any reliable source to draw its water from.

And while Philadelphia would strive as a result of a collective effort to bring pure water into everyone's home, New York fell victim to some high elite's greed, biased policy, and misuse of capital.

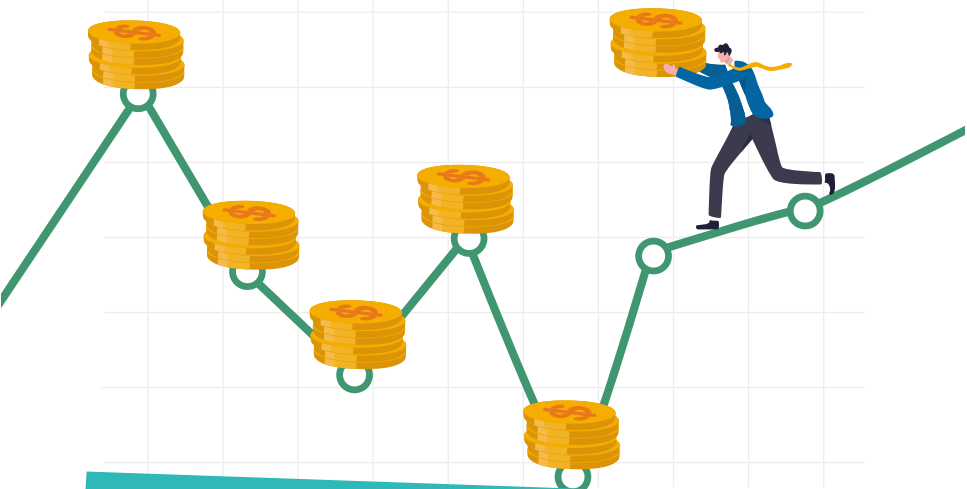


That would hamper the city's effort to get water, indirectly cost millions in devastating fires, and significantly impact its population several times through water-based epidemics.



I've already shortly mentioned the culprits in the previous chapter: Aaron Burr, Alexander Hamilton, and a bunch of their acquaintances.

Just before the turn of the 19th century, they created the "Manhattan Company," a group with broad rights and few obligations. Under the false nose of supplying the city with "pure and wholesome water," it leveraged a "surplus capital" clause which, indeed, allowed it to become... a bank.



Over the decades of its "water business," the Manhattan Company barely crossed financial breakeven, which was already a significant accomplishment, as they had no real durable access to a water source.

Making money selling water without water? That was possible with a simple trick: not investing in a water network either. The rest is banking history, and it was proven to be incredibly profitable!

Bottom line: it's only when New York decided to make the water topic a public one again that it finally got its first safe water deliveries from the Croton Watershed.



Is that proof that nothing positive can result from private capital's involvement in water? Thankfully, not at all.



Had the Manhattan Company not been created by Senators, General Attorneys, and future Vice-Presidents, it would probably not have been able to distort policies thus far.

The real lesson to remember here is that Water Economics and Water Policies are a powerful duo that has to work hand in hand.

I'd illustrate this with a race car analogy. If you want to develop the fastest race car, you want to put an engine in it with immense horsepower. That's the private sector! But the government's role is the steering wheel, the tires, and that which sits around it.



So how do you develop that immense horsepower? Actually, it starts with finding the right blend.

## 2.1 Blending Capital

When you think of it, if handled right, tap water has a strong value proposition:

Tap water is clean, reliable, healthy, and on-demand! Plus, it has a profound price differential towards bottled water, less than one penny a gallon versus \$5 a gallon. If utilities can make that marketing value proposition pitch, they will win the battle!



You know that: in marketing terms, a strong value proposition leads to a good market share, great service, happy customers, and, ultimately, profit.

Now, that path isn't always so straightforward: you REALLY have to handle water right. And to do so, you need to rightfully invest twice.

First, by laying down the appropriated infrastructure. In most US cases, this was done a while ago, yet, appropriately revamping that said infrastructure is equally important.

(and when infrastructure doesn't exist yet, other approaches might be more effective – but that's a story I'll keep for later)

The problem is that this means a lot of money to sink in upfront, especially when you're a relatively small community.

The trap, though, is that under-investing ultimately results in even higher costs, so counterintuitively, no one should be rich enough to go cheap.

Indeed, that's the second investment: allocating reasonable operating costs to run your system over time efficiently. The secret? A compound of maintenance effort and infrastructure management.

As a result, the key to success in that endeavor is a matter of scale. It would be best if you had deep pockets upfront and the soundest know-how all the way after that. Two characteristics that appeal to the private sector.



Private money's involvement in Water isn't all new in the US:

85% of the industry is publicly held, which by extension means that 15% is in private hands.



A good portion of these private water utilities are on the smaller end or even operated as a side business of a different industry. And for long, it had consequences.

The water infrastructure crisis is not looming: it's already here. Over and over again, I've seen lead in the drinking water serving daycares. I've seen receiving water bodies that were biologically dead. I've seen places with intermittent water service or water that you can't even use to do your laundry because there's so much iron in it. All that is happening right now! After being exposed to that multiple times, I realized there's gotta be a private solution to this very public problem.



This private sector's involvement would take the shape of Central States Water Resources, (CSWR) Josiah Fox created in 2014.

Last year, there were 208 M&A water utility transactions. We were 80 of those! We're really focused on rolling up these small systems. We've gone to the states with the highest amount of fragmentation, the most amount of small systems, and the highest amount of regulatory non-compliance. So we're trying to solve a problem that obviously exists in every state we're in!

Interestingly, CSWR has been regularly topping the M&A leaderboard in the number of deals in the year... but never in the number of connections or customers. There's a simple reason: the company focuses on small, distressed, non-compliant plants.

That's where actually the flip is the most effective - it enables a consolidator to unlock a scale effect among a scattered cluster of systems (and we'll see in Chapter 3 how that approach may do well in the long run).

And as it takes a losing situation - bad water in the wrong hands - to turn it into a win-win - good water at a profit - it sounds like a no-brainer positive move.

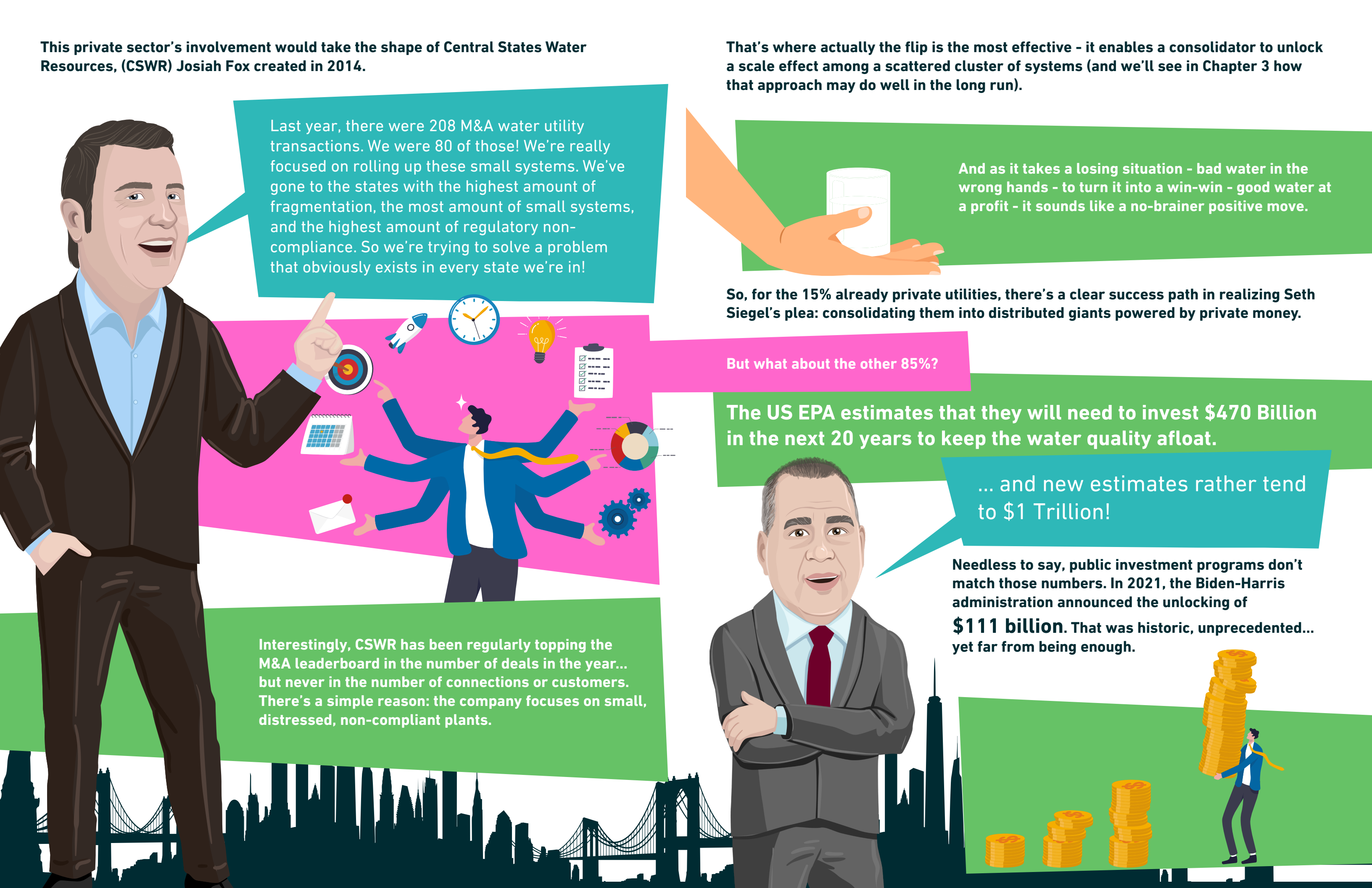
So, for the 15% already private utilities, there's a clear success path in realizing Seth Siegel's plea: consolidating them into distributed giants powered by private money.

But what about the other 85%?

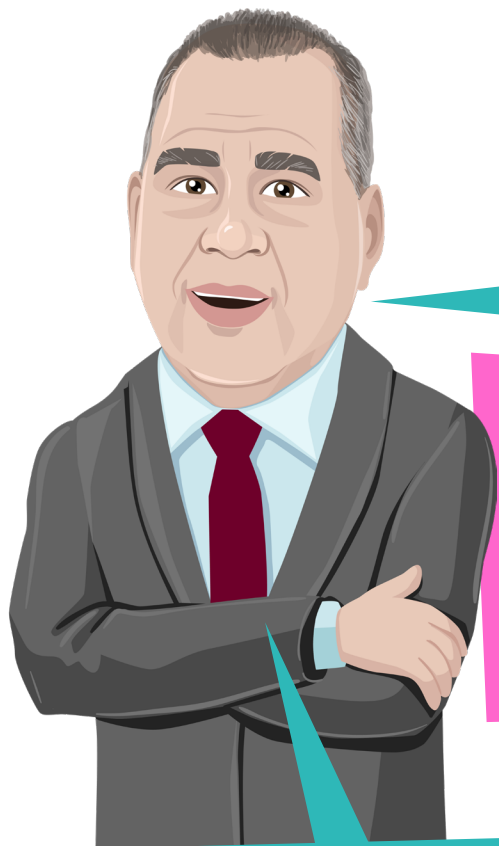
The US EPA estimates that they will need to invest \$470 Billion in the next 20 years to keep the water quality afloat.

... and new estimates rather tend to \$1 Trillion!

Needless to say, public investment programs don't match those numbers. In 2021, the Biden-Harris administration announced the unlocking of **\$111 billion**. That was historic, unprecedented... yet far from being enough.







That can't be done by governments alone! This is why the advent of infrastructure funds, specifically focusing on water, is a nice convergence of capital, technology, and need. That should really accelerate the growth of the industry.



**Succeeding in that endeavor may require breaking a taboo in the US:**

Around the world, people tend to be okay with private ownership of water utilities. The UK, Manila... there are plenty of examples. In the US, we're somewhat afraid to attack that issue.

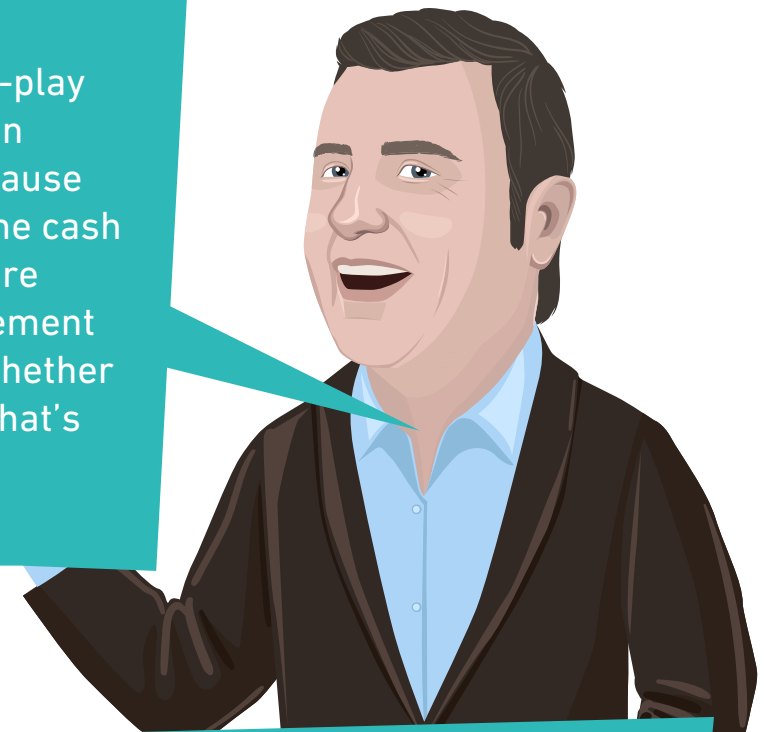


A way forward will be about finding the right blend of private and public capital, or said differently; it will be about Private Public Partnerships.



**Will these PPP players still be the same as the private consolidators?**

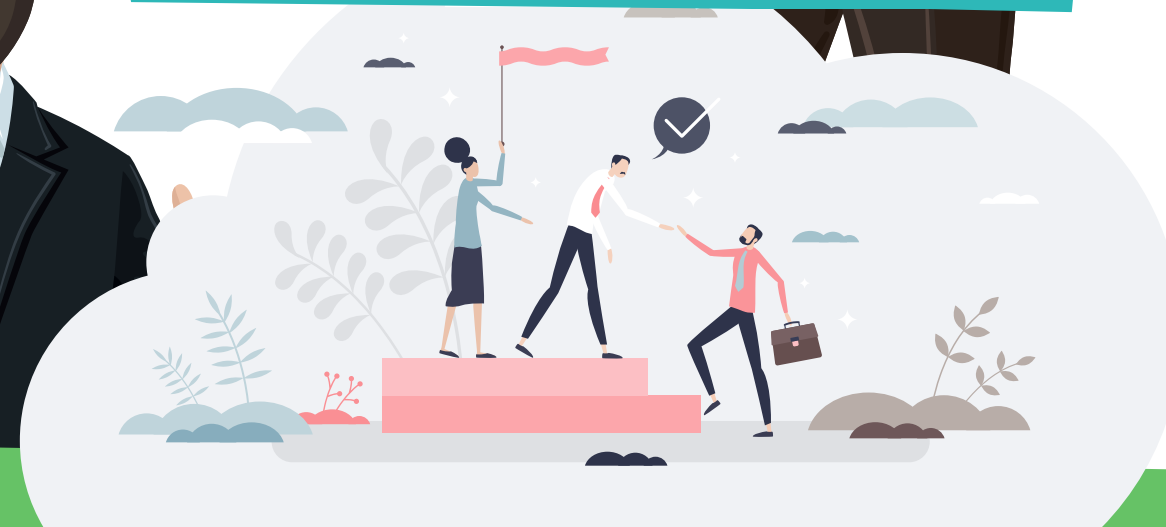
We're a privatization play. We're a pure-play water and wastewater utility investor on utility. We'll see if that gets traction because these small municipalities don't have the cash flows to make the improvements that are necessary. So can there be a rapprochement engagement with the private sector? Whether the municipality still owns the assets, that's yet to be determined.



**If CSWR was to enter this new extension of the game, it would get backing from its current investor:**



Today we're investing in the private piece of utility companies. But we think that private capital has a role to play across the industry!



**But aside from private consolidators, that new approach will also require the involvement of new players.**



We are big believers and proponents of that public-private partnership because it's more than just the financial capital. It's aligning objectives and measurements of success for a community beyond purely the financial metric.

Multifaceted partners have skin in the game together to drive success. It also often reduces the noise and the conflict based on the legacy of the past rather than facts. And I think it can galvanize!



**This partnership can come in many shapes, but the conventional approach is to have a private company financing upfront an infrastructure asset against a revenue-based contract that repays it over time - typically 15 to 30 years.**

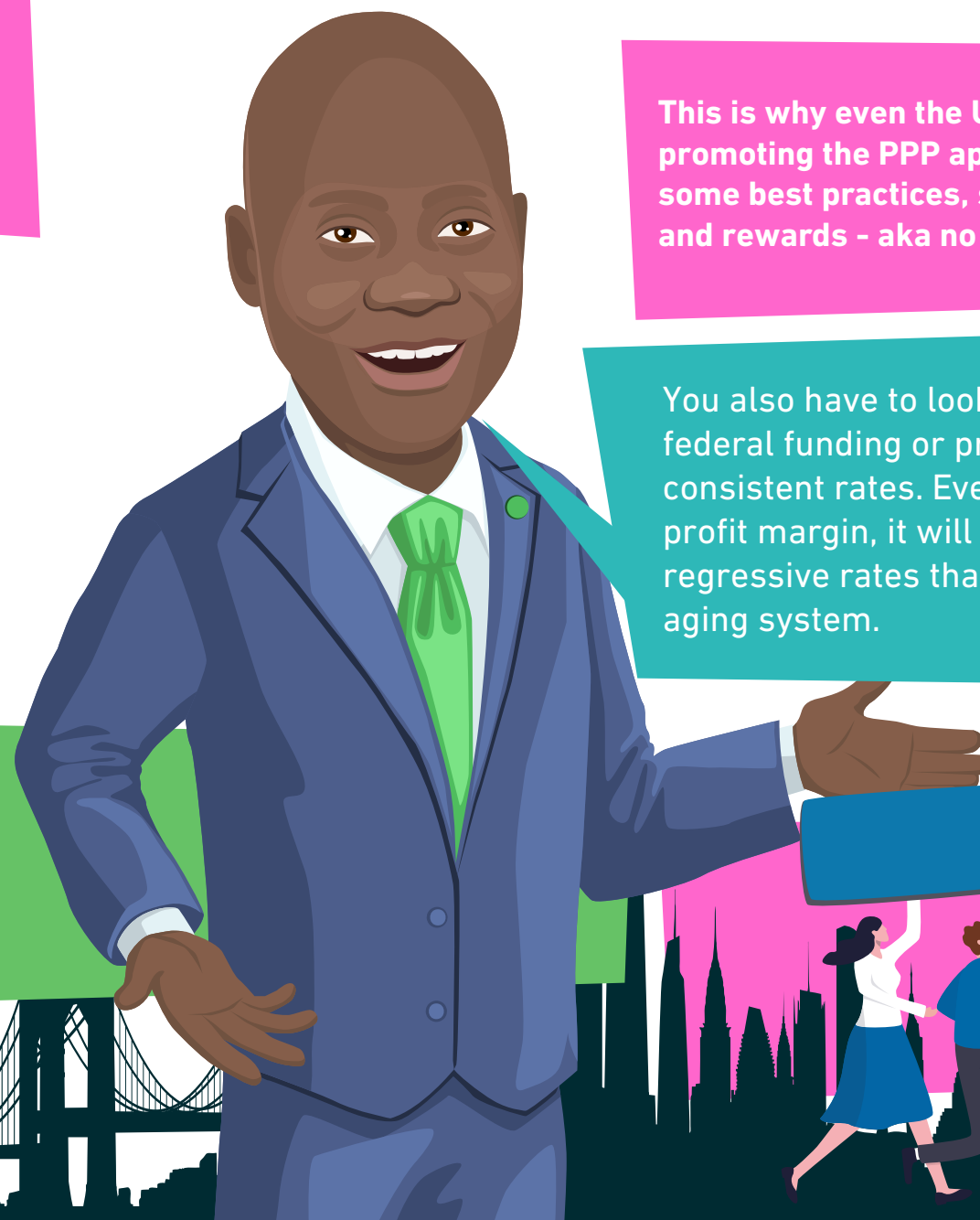
Before the popularization of PPPs, a public body designed a new water infrastructure, with private companies then bidding on it, building it, and transferring it.

According to "Public Works Financing" research, adopting Design-Build approaches, where private companies were allowed to submit their own designs, enabled the US Water sector to save 39% on capital.

Adding a third initial to the acronym with **Design-Build-Operate** enabled a further 26% reduction in life cycle cost!



Hence, when a public body enters into a private-public partnership, it unlocks the benefits of this private sector's involvement minus the profit the private company is planning on over the contract.



This is why even the United Nations have been promoting the PPP approach, assuming it would follow some best practices, such as the fair sharing of risks and rewards - aka no extreme risk transfer or profit.

You also have to look at these vehicles, be it federal funding or private equity, as a way to get consistent rates. Even with the private entity's profit margin, it will level out versus the increased regressive rates that you're gonna see to fix an old aging system.



Another perk of the PPP approach is that a municipality avoids cashing out upfront, alleviating the burden on mayors.

Politicians are doing an amazing job, but they're only appointed for a short period. With that in mind, do they make the appropriate investment, particularly if it's in a pipe that no one can see?

To get that fair share of risks and rewards, something has to change around fines and prosecutions. We don't want the industry to be scared of making a front step forward, but we need to penalize those doing it recklessly. You must always think about the community or the people that you serve.

There are many, many, many examples of the success of PPPs around the world. Far more successes by a factor of exponentially than any failures along the way. It doesn't mean it's always perfect, but it has proven itself to be a significant alternative!



These successes have led PPPs to jump by a 146% increase between 2020 and 2021 in the Water and Sanitation sector worldwide. Another sign that the tool, when used right, is a clear asset in water management's toolbox.



Now let's face it: PPPs also come with a bad rap. The mechanism may have been overused in the 1990s on projects that were probably too broad and left a lot of space for the "reckless manners" James alluded to.

Now, as promising as the private consolidation and the private-public partnership paths may be, they won't solve the world alone.





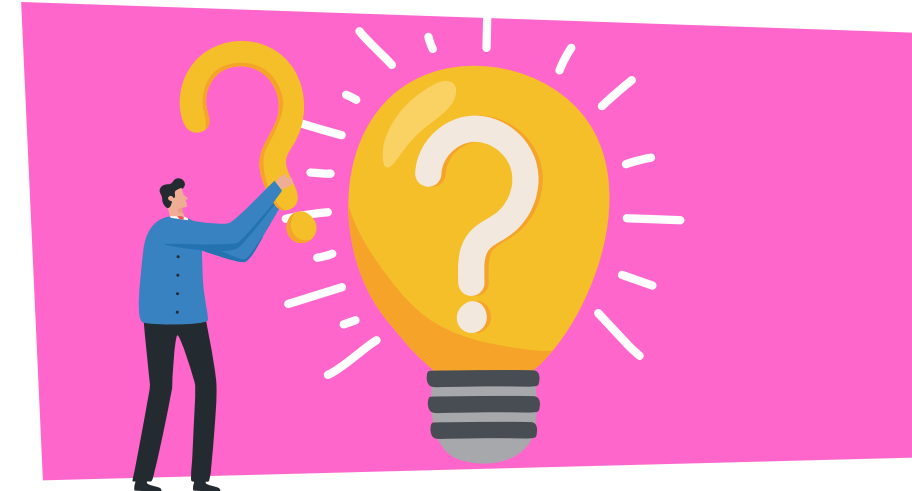
Private Public Partnerships are not the only alternative for funding, but it is one.

I think right now, due to the systematic issues that climate change and water pose, these solutions can't grow in isolation.

This speaks to the dichotomy I was alluding to earlier: we need one trillion dollars, and we get a historic yet insufficient 111 billion.

But why should more money come from the governments when I earlier demonstrated that investing in water was profitable? Why wouldn't private infrastructure funds foot the bill?

It's actually, as already mentioned, a matter of wrong pocket.



There's a 5-1 expected return on investment for water and sanitation infrastructure, but the societal benefits don't accrue to the same folks that would necessarily invest in the first place.

In the US, in most cases, that's either municipalities leveraging federal funds as loans that they have to prove their eligibility for, or private water companies that are economically disincentivized because of this wrong pockets problem from extending these systems.

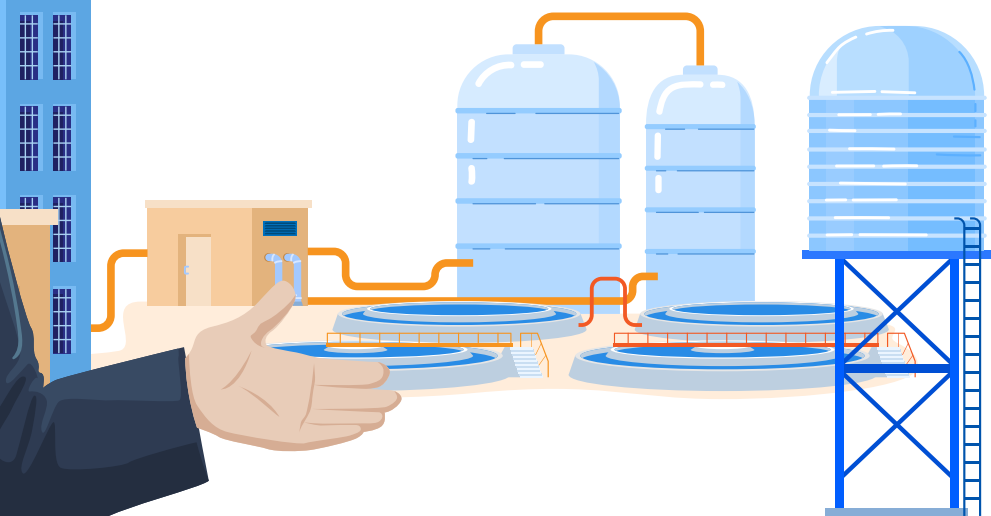
This is where a third mechanism comes into play: government funding.

The second alternative has to be much more federal money, whether in the US, Europe, or China, where large infrastructure funding discussions are happening. Obviously, I may not be objective. But when I look at the return on investment, both economically and socially, of redirecting more of those dollars to water infrastructure, we're not doing it enough. It's the basic human right to access it and the impact it has on the economic value of businesses when facing water stress; versus the already approved overall infrastructure packages. Clearly, not enough of that money is being directed toward water.



On the other end, more state money would push us into the next challenge: federal infrastructure or inflation regulation plans naturally call for large projects when the appropriate scale might be different.

How are we going to efficiently and equitably deploy these funds? No doubt, big infrastructure is important. But as I've seen being in the weeds for the past six years doing grassroots water projects in Flint, Michigan, Navajo Nation, Tanzania, you really gotta get on the ground and understand the local context.



In short: we will need more federal funding as that's the level where the windfalls will be collected. But we then also need the entire value chain to transfer as much power as possible from the engine to the wheels:

It's gonna take a coordinated response; It's gonna take federal investment, understanding that when we make that investment, it's gonna achieve an incredible economic return for us. But we would all do well to keep our eyes on the way that investment is getting pushed out the door.

That way, we will avoid the famous pitfall Reinhard Hübner expressed on my podcast microphone: having “too much stupid money chasing too few good projects.”

But before we wrap up this chapter, we have to address one more pocket of money.

We've seen:

- how private money can do well in consolidating private assets.
- how private money, technology, and know-how can join forces with public bodies to build successful partnerships
- how, eventually, we'll need more federal investment

Yet, there's a fast track to efficiency that can put the rollout of these solutions on steroids: philanthropic capital.



Philanthropy has that incredible feature: it is meant to be “lost.” Yet, I'd bet donors wouldn't complain if that money were to achieve a maximized impact!

That's where players like Merton Capital Partners play a new role:

We're basically creating deals where philanthropy can be invested with later-stage private companies that allow them to do things with much greater impact.

Two water areas Merton has been looking into so far are the 5,000 abandoned water utilities that ran out of money and contributed to the 44 million Americans that got exposed to safe-drinking water act violations and the coastal wastewater treatment plants (or rather the absence of it).

With 300 or 400 million of philanthropy, you can probably increase the wastewater capacity in South Florida to bring back the reefs and have an explosion of seagrass that is incredible!

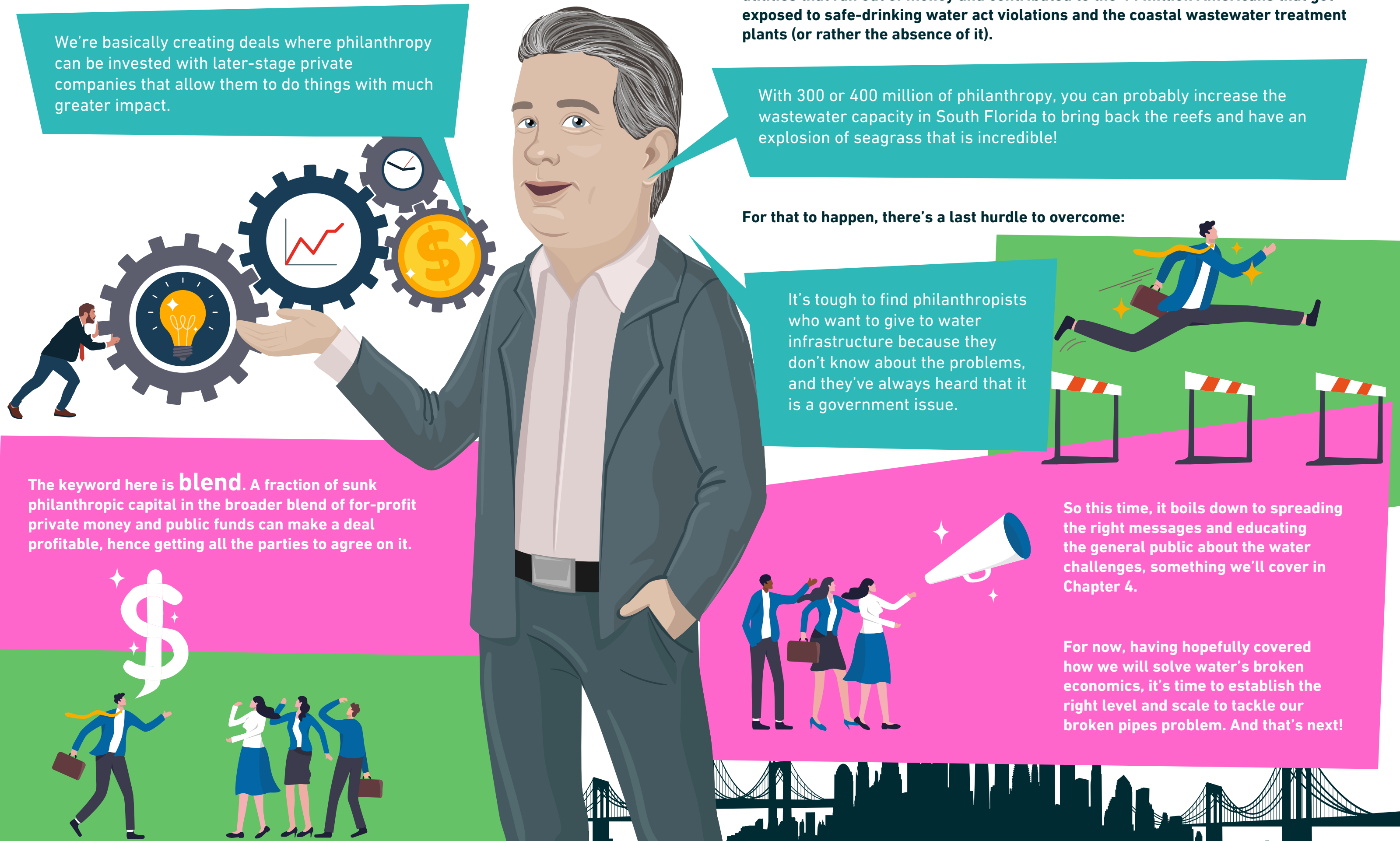
For that to happen, there's a last hurdle to overcome:

It's tough to find philanthropists who want to give to water infrastructure because they don't know about the problems, and they've always heard that it is a government issue.

The keyword here is **blend**. A fraction of sunk philanthropic capital in the broader blend of for-profit private money and public funds can make a deal profitable, hence getting all the parties to agree on it.

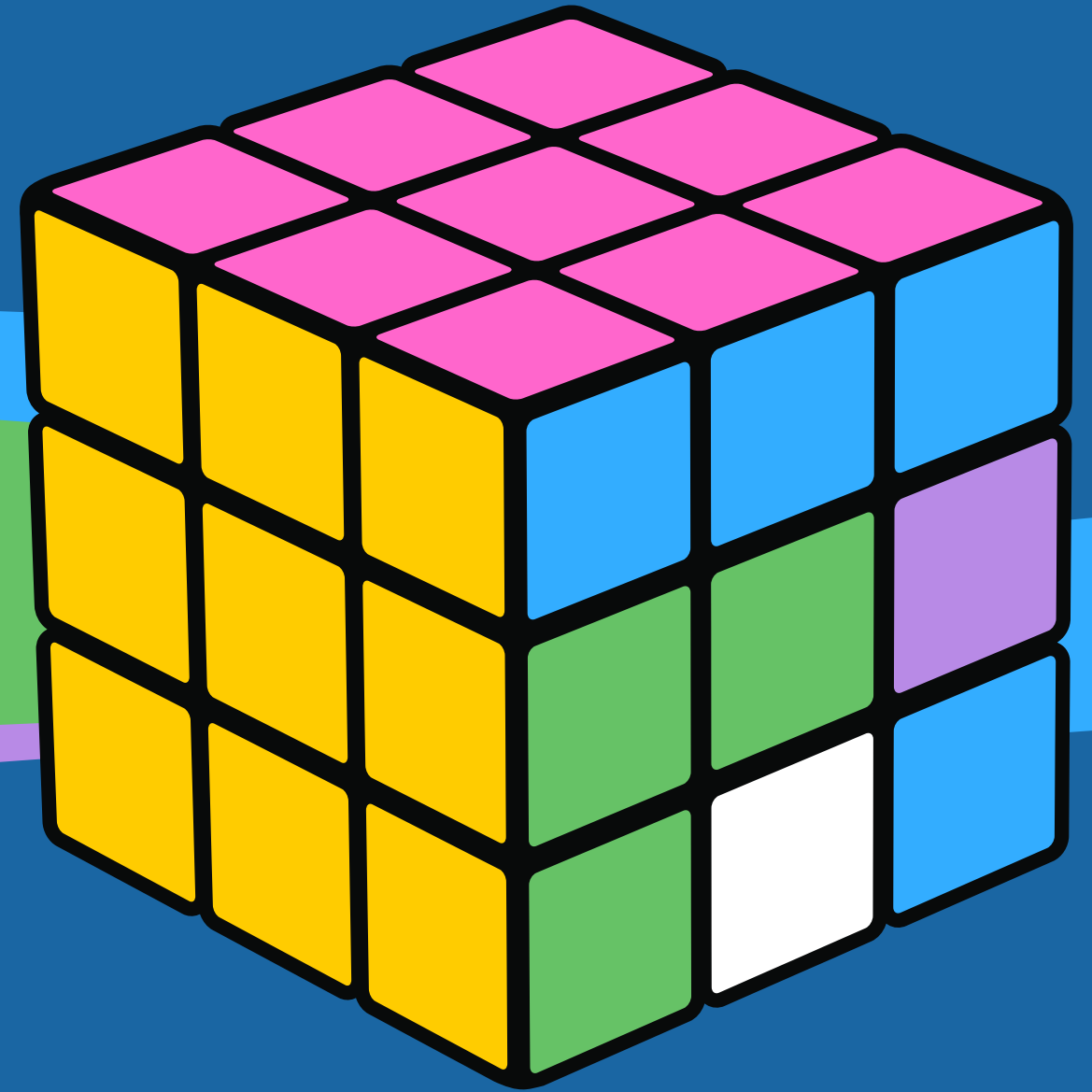
So this time, it boils down to spreading the right messages and educating the general public about the water challenges, something we'll cover in Chapter 4.

For now, having hopefully covered how we will solve water's broken economics, it's time to establish the right level and scale to tackle our broken pipes problem. And that's next!





**How to fix the  
Broken Pipes?**



The centralized sewer is the single largest contributor to life expectancy increase over time!



When *Homo Sapiens* turned into Cavemen, he soon realized he needed access to good drinking water.

This is why he established his homes near sources, rivers, and lakes. But when it came to disposing of his droppings, some holes in the ground used to “do the trick.”



How should we blame him? The importance of proper sanitation wouldn't have been discovered before the 19th century!



The thing is, humankind had to learn the hard way how important wastewater collection and treatment is.

For centuries, wastewater was disposed of in the streets and close to high population densities. This had obviously serious impacts on public health, along with the environment.

But while numerous epidemics ravaged Europe through the Middle Age and until the 19th century, humans still tended to have short memories and easily forgot that inappropriate sanitation wasn't helping – at all.

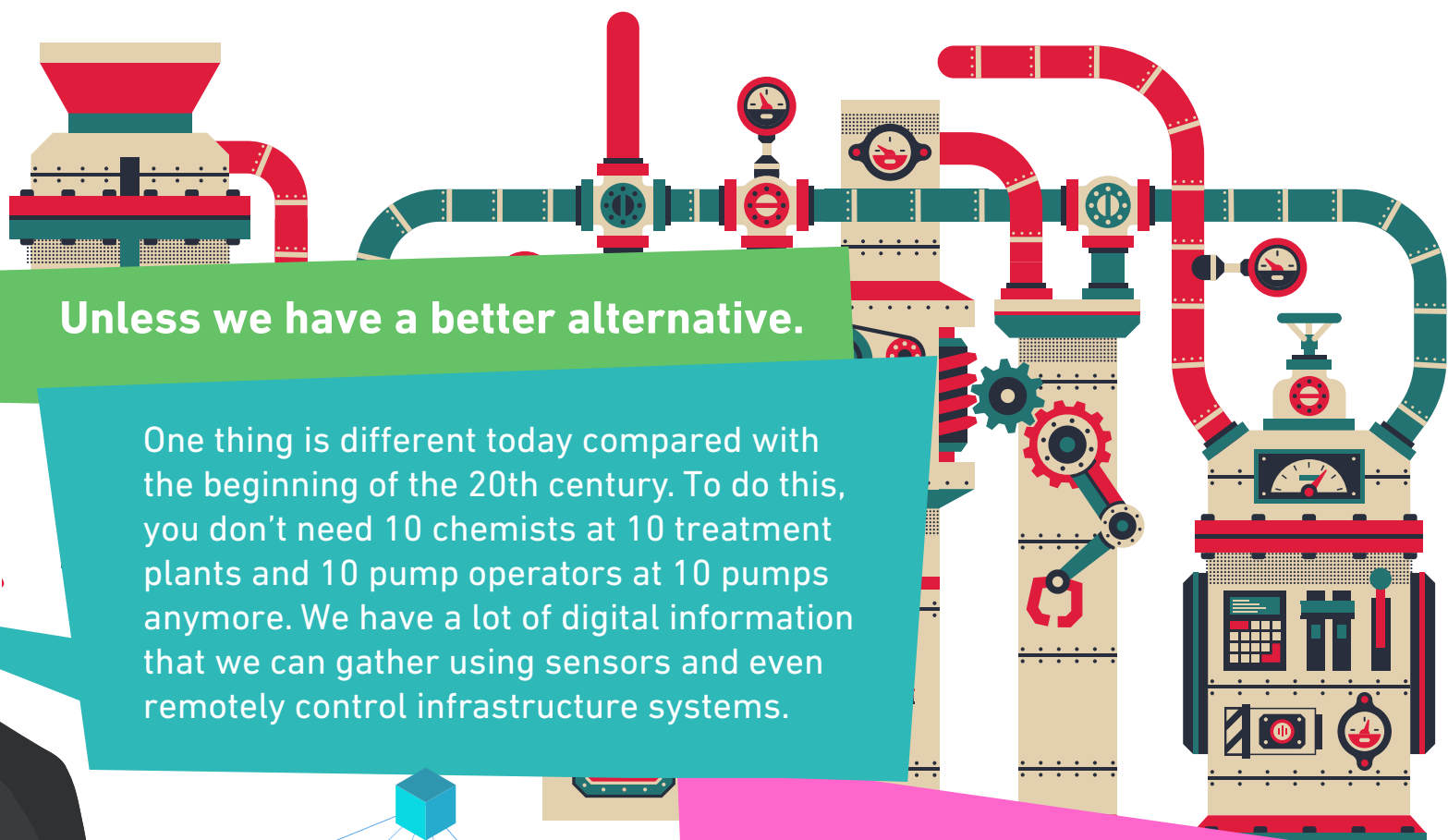
They also forgot that a centralized sewer used to be a thing as far as in the Babylonian ages in the Mesopotamian Empire (3500 BC).



And indeed, when the centralized sewer made its comeback at the turn of the 19th century, Josiah was proven right: the adoption of wastewater collection was singlehandedly responsible for 4 years of additional life expectancy.



But shall we really consider the costs for something deeply linked to people's well-being? Theoretically no.

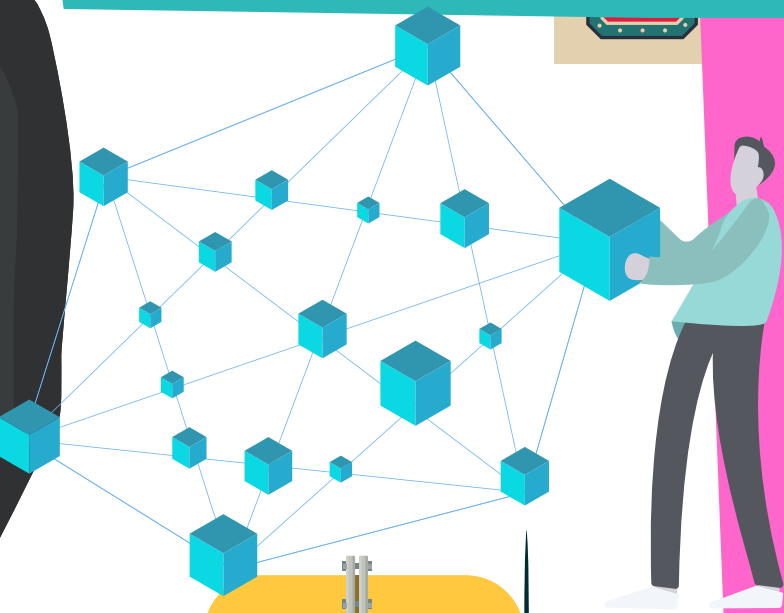


Unless we have a better alternative.

One thing is different today compared with the beginning of the 20th century. To do this, you don't need 10 chemists at 10 treatment plants and 10 pump operators at 10 pumps anymore. We have a lot of digital information that we can gather using sensors and even remotely control infrastructure systems.

So why would anyone in his right mind even question the pertinence of centralized sewers?

Well, for one simple reason: they're very expensive.



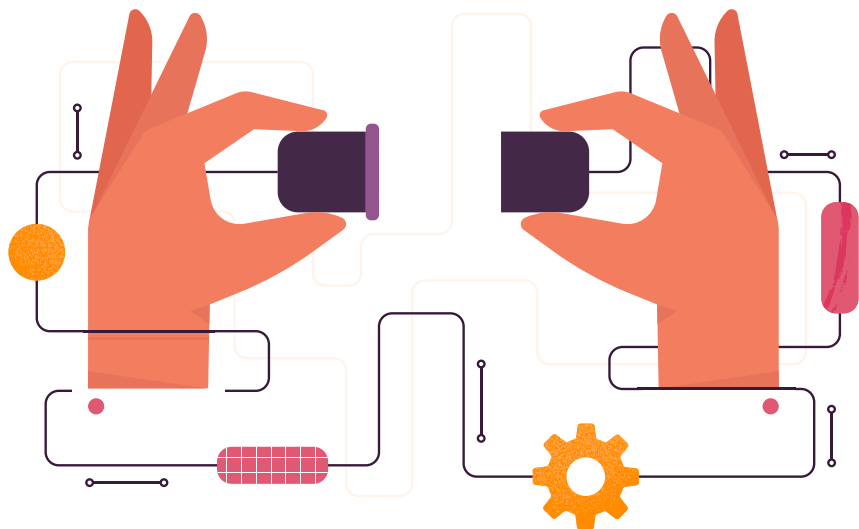
In other words, we can drop a tremendous portion of the 75% of costs linked to pumping water around long networks while operating similar treatment steps, just at a smaller scale.

When you look at the existing systems, around 70 to 75% of the cost is in the pipes and pumps, not in the treatment or storage. And when these pipes fail, they cost half a million a mile to replace.



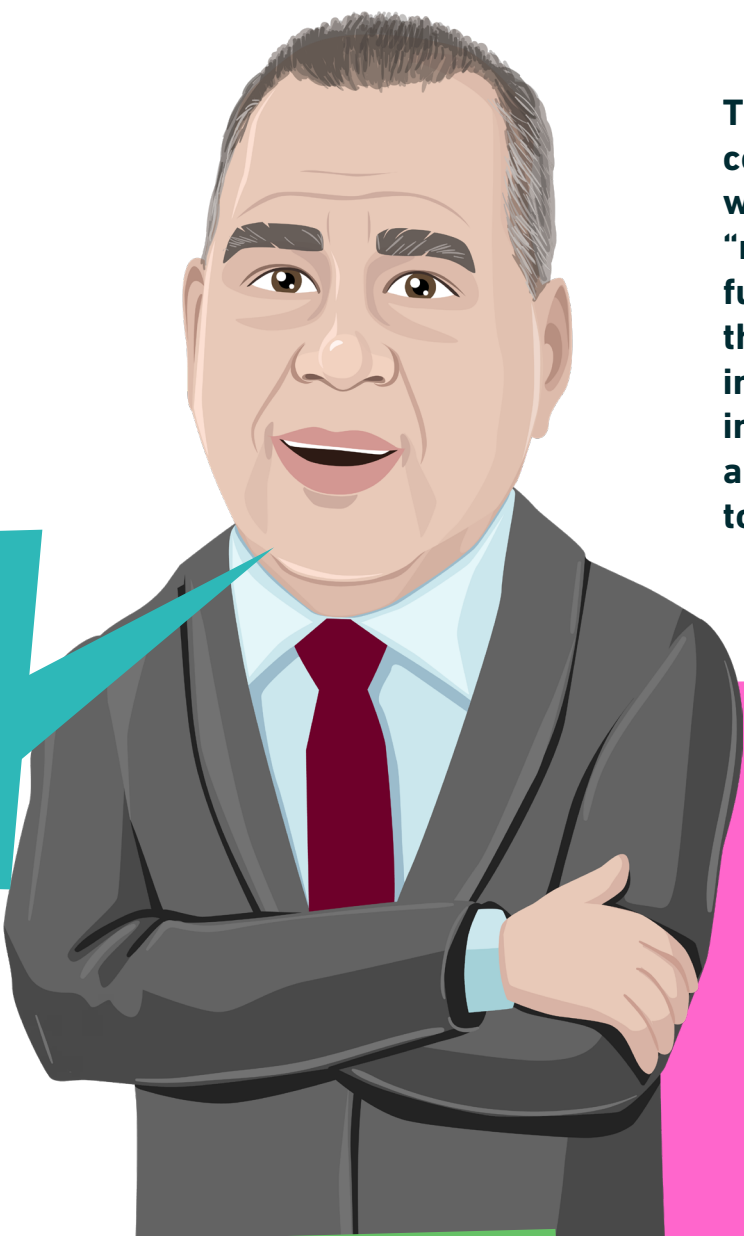


Now, if we're honest, we haven't really invented that concept in the water sector. We've rather been looking up the shoulder of our bigger brother: the energy world.



With the advent of technology and deregulation, they ended up with microgrids that then turned into distributed energy.

The same concept, applied to water, translates into a decentralized infrastructure close to people's homes and industrial processes but centrally connected thanks to the digital revolution.

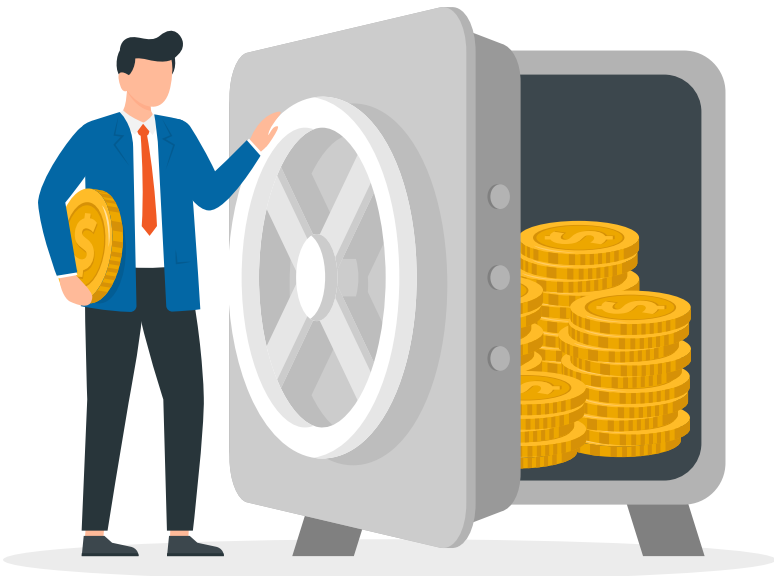


And the name for it is straightforward: distributed water!



\$7.8 Billion will be invested in distributed water and wastewater systems in 2023 in North America. That's a sizeable number, even though arguably lower than the \$111 Billion Water Infrastructure Package we discussed in the previous chapter.

The difference reduces when you consider that those \$111 Billion will be spent over five years, hence "reducing" to \$22 Billion a year. It further reduces when you compound the implementation speed. While large infrastructure projects are rolled out in years, the agility of the distributed approach allows for reducing that time to impact to months.



Something else reveals when you further split down these \$7.8 Billion - growing at a 6% CAGR. There's a faster-growing sub-segment: the Point of Use application - aka all the shades of filters you'd install under your kitchen sink.

That specific sub-segment grows double-digit every year and is expected to nearly triple between today and 2030.

In other words, investment in distributed treatments grows twice faster than investment in central infrastructure, and the specific Point of Use sub-segment grows three times faster!

There's a simple way to tell those filters are the new cool kid on the block:

Five years ago, if you went to Amazon to buy a reverse osmosis filtration system for your kitchen, you were looking at spending \$500 for the unit, you would buy filters separately, and it would reject two-thirds of the water as waste.

Today, if you go to Amazon, there will be more vendors than you saw five years ago. And for between \$100-200, you'll get a system exactly like that with one year of filters included.

And for \$500, you get something that rejects less than 25% of the water coming into it and performs much better than any other system, with all kinds of sensors to tell you what you're actually consuming.

Now, Point of Use treatments also propose an ambivalent picture of the future.



Yes, they unlock a World of water fit for purpose, where your kitchen tap gets to the highest level of drinking water - even knocking off PFAS and the like as a welcome side effect. And your toilet flush now can happily be done with lower-quality water.

But that's also a double-sided sword. If the water infrastructure doesn't need to deliver drinking standards to every tap, investments may further decline when we just saw in the previous chapter that the opposite must happen...

And central networks being slowly abandoned to turn into the post-utility era isn't exactly science fiction:



In India, at this point, there is no household that is middle class and above, that does not have a reverse osmosis system in their kitchen.

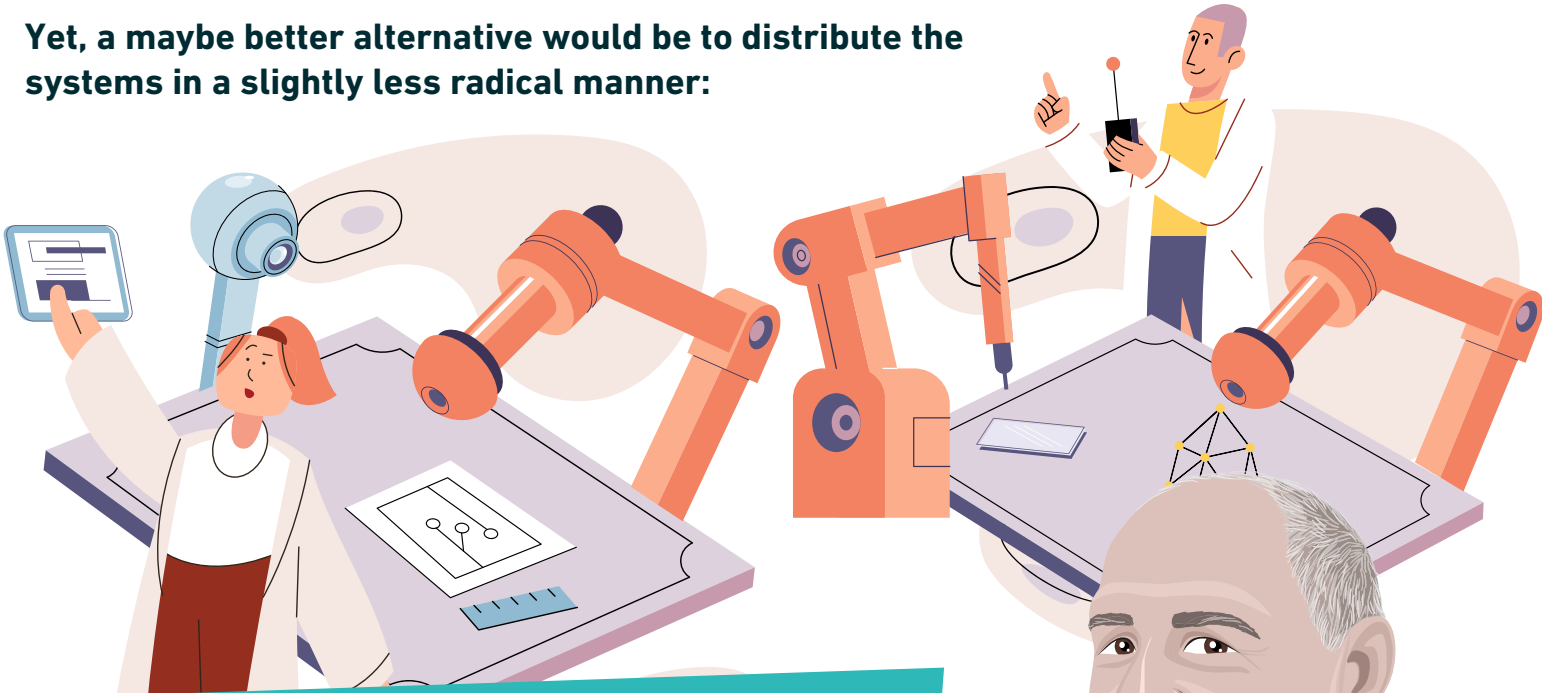


These radically decentralized treatments hence potentially offer a better service level at a lower cost - but with possible class discrimination as all households won't invest in it at the same speed - and won't always maintain it appropriately.

Sure, we can imagine workarounds:

I'm speaking now very fancifully, very Jetsons-ish future. Still, we could have a situation where somebody comes knocking on your door and says: "we've noticed from our internet chip that you haven't changed the filter. Is there a reason for that?" I don't wanna be too "Big Brother." If somebody wants to toxicize their system, they should be allowed to do that! But I think there are solutions we could have without being too fanciful or crazy.

Yet, a maybe better alternative would be to distribute the systems in a slightly less radical manner:



The wastewater that I'm generating could be treated and reused, maybe not just at my house scale, but maybe at my neighborhood scale. If that is possible, I'm really shooting for a much higher quality of service and safety for myself!

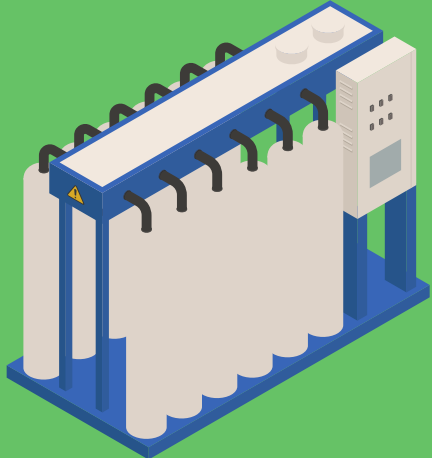


We're talking here of systems to be located in a collective building's basement (if you allow me that shameless plug, you may want to listen to my conversation with Aaron Tartakovsky from Epic Cleantec by Season 4, Episode 3 of my podcast to learn more about that approach!)



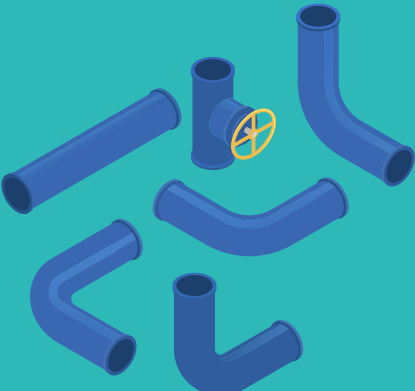
An alternative yet close approach would be to aim for the size of the condominiums we see in other parts of the World. It may sound weird in the American context, yet what's a condominium, if not a newly built suburban housing estate?

So, in a nutshell:  
Distributed Water and Wastewater already receive a third of the Infrastructure investment today and grow twice faster than “conventional” central alternatives



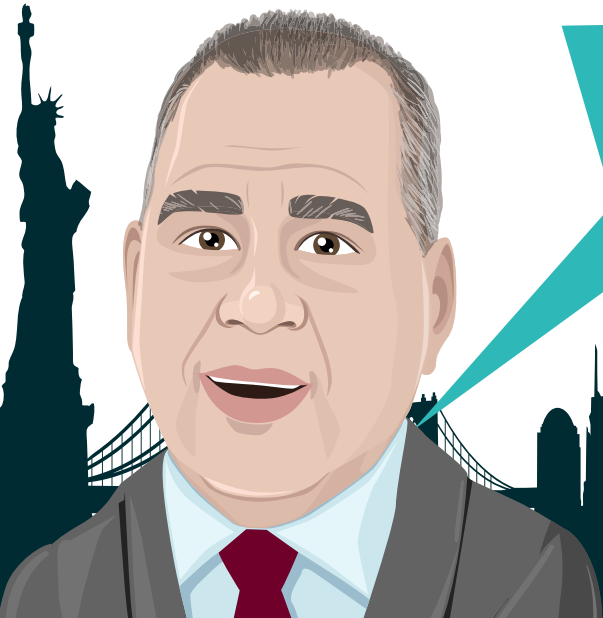
Technically, the best size may be up to each Point of Use, yet if we compound in sociology, a better approach may be the small-collective layer.





As they skip a sizeable portion of the network rollout (or revamping), they arguably offer a considerably better value for money

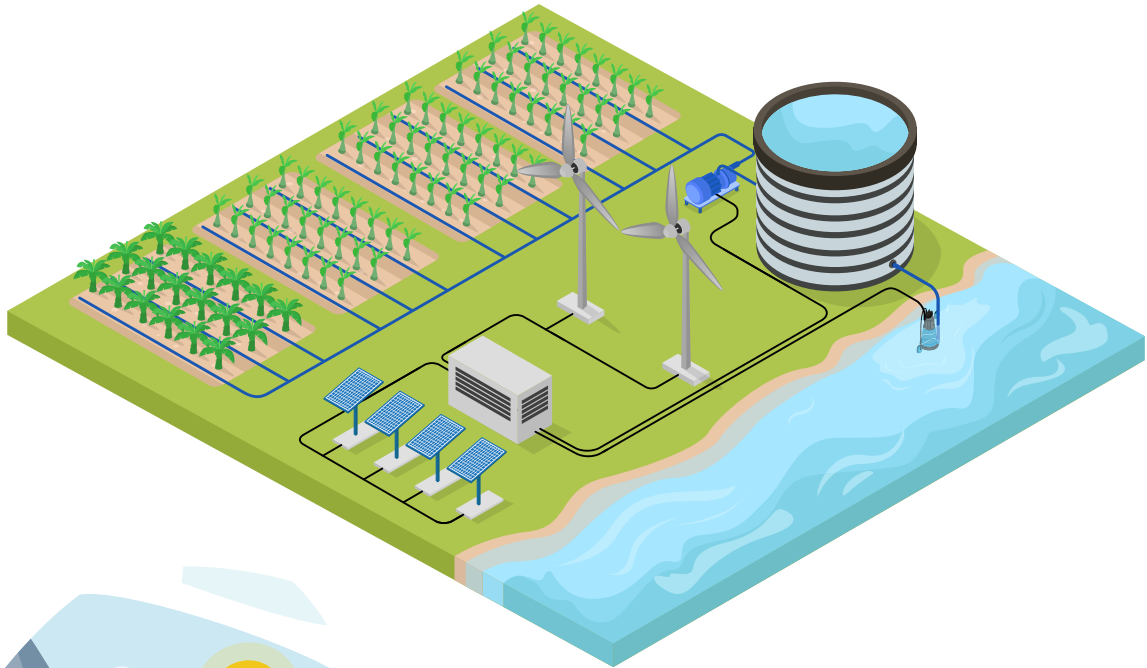
I feel like we’re really making a huge step forward here in our quest to rethink water! But let’s make sure we don’t miss the Elephant in the room:



What if your only focus is municipal? You’re missing the largest piece from a volume standpoint!

Indeed, municipal water in the US represented 13% of the Water Use in 2015, while agricultural uses accounted for 37% and Industrial ones for the remaining 50%.

We can further split down this 50% by taking out the large chunk of water used in Thermo-electrical power generation. Like the toilet flush in our households, that water just needs to exist - not really to be treated to a high standard. (The same would be valid with irrigation water in Agriculture).

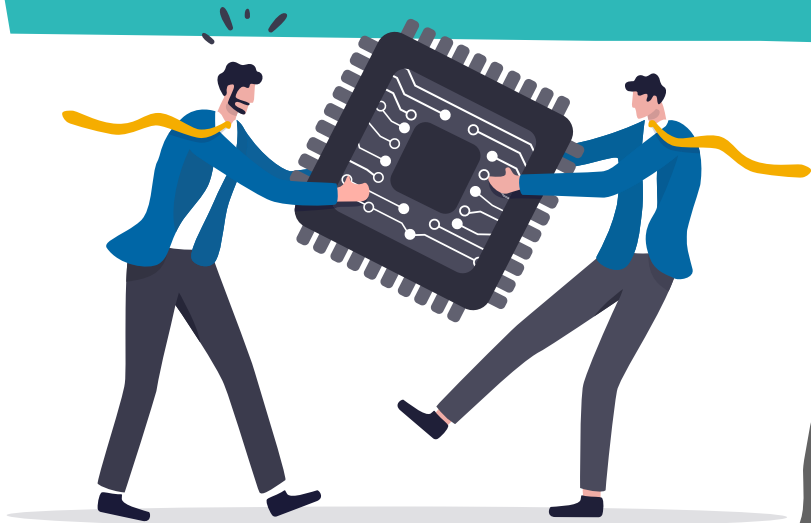


And in the remaining waters used in Industrial processes, but also Aquaculture or Mining, there’s a fascinating trend to observe. Between 1985 and 2015, the volume of water abstraction was reduced by 43%!

How is that even possible? Well, sure, some industries have moved out of the US, and some others have become more water-efficient. But the big chunk of that reduction is linked to water reuse and recycling within industrial facilities, both driven by environmental regulations and limited availability of freshwater resources in some areas.

As these constraints are here to stay in the new realm of Climate Change, that trend will keep on developing!

Let's pick an industrial system, say a chip manufacturer. By the way, we worry about chips: 60% come from Taiwan. Taiwan has its worst drought in 60 years. Wonder why there's a chip issue?



With all these drivers (water scarcity, environmental regulations, industrial resilience...), water reuse and short-loop treatments have a lot of wind in their sails.

Remember the \$7.8 billion distributed water and wastewater systems investment I mentioned earlier in this chapter? Well... 65% of it is going to industrial systems!

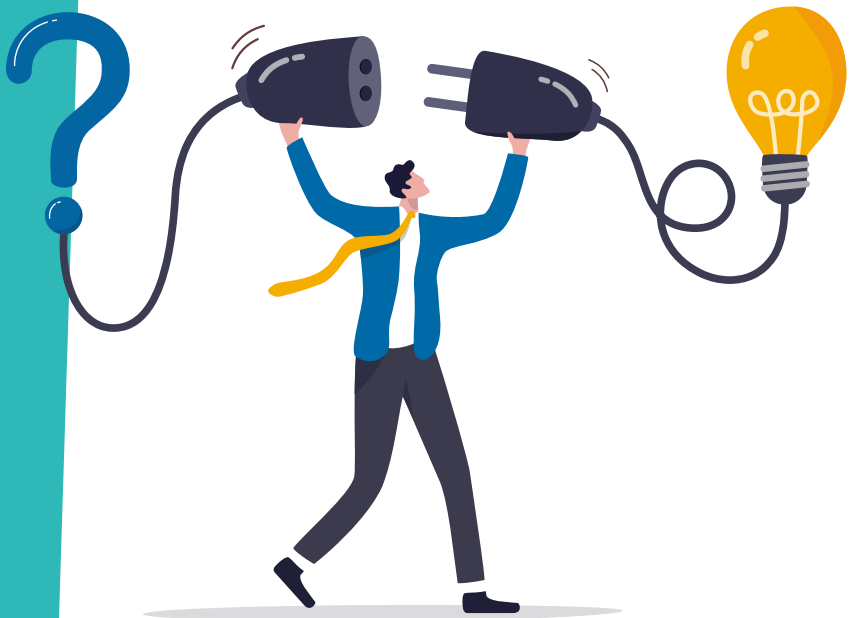
Now, that doesn't mean either that industrials suddenly all became water and wastewater treatment experts. Their core competence remains in their industrial tool - so how can they ensure their water safety?



Simply by establishing Private-Private partnerships. Ok, that term doesn't exist; I totally made it up to reflect on the Private-Public model we discussed in the previous chapter!

Still, the principle remains - a large entity (the industrial player) delegates the water topic to a specialist (a water industry player).

It's now an operating expense on a long-term contracted basis. You take it away from "I have to worry about this system" to a CFO-type of decision to outsource. And I use outsourcing generically. You can call it integration, EPC, or Water-as-a-Service. Whatever is normally inside the fence turns into a third-party contracted arrangement.



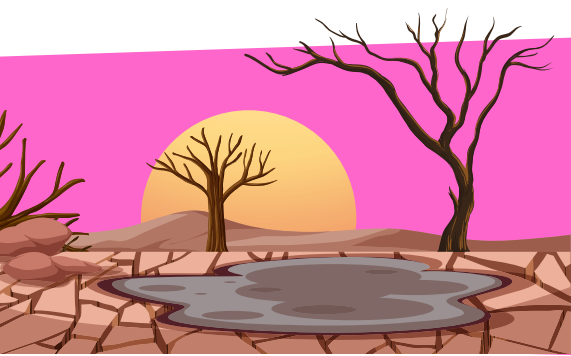
Industrials that follow that route prove to get better water resilience, environmental compliance, and overall integration within the community. What, you think that's not an industrial's first key performance indicator? Well, they get their water and wastewater sorted at a better cost too.

But wait, if distributed approaches get widely adopted, what does that mean for the existing networks and infrastructures? Is it a sunk cost that can't be valorized anymore?

Not really; there's still value to extract from our century-old workhorses.



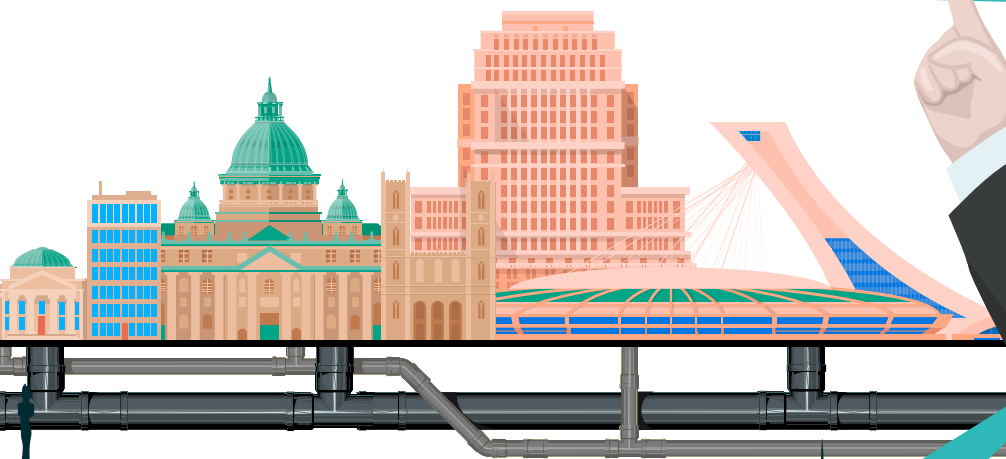
Climate Change's effect on the Water Cycle actually doesn't stop at Water Scarcity: it also comes with more extreme climate events with higher frequency.



In that context, cities will not only have to mitigate the periods of droughts (the famous "Day Zeros" we've seen in Cape Town, Chennai, or Sao Paulo) but also deal with increased floods.

Nature-Based Solutions represent a potent complement to existing grey engineering approaches - yet they won't be suited in every context. Think of New York City - where would you build the next green space on top of Central Park?

We don't have storage in a place like Manhattan, but we have an extensive sewer network with large pipes. If you think about storms, the storms move from the south through the north or from the east to the west.



Montreal has already done some experiments with gates and pumps, and the sewer system is used for storage. When you don't yet have that much rain coming in one place, you pump water from other areas to those sewers. And then around in other ways when the storm moves.

Guess what that builds up for? Exactly, distributed sewer management with several decentralized pump and gate stations and one centralized digital layer that follows meteorological trends and predictions to actuate and automate the network.

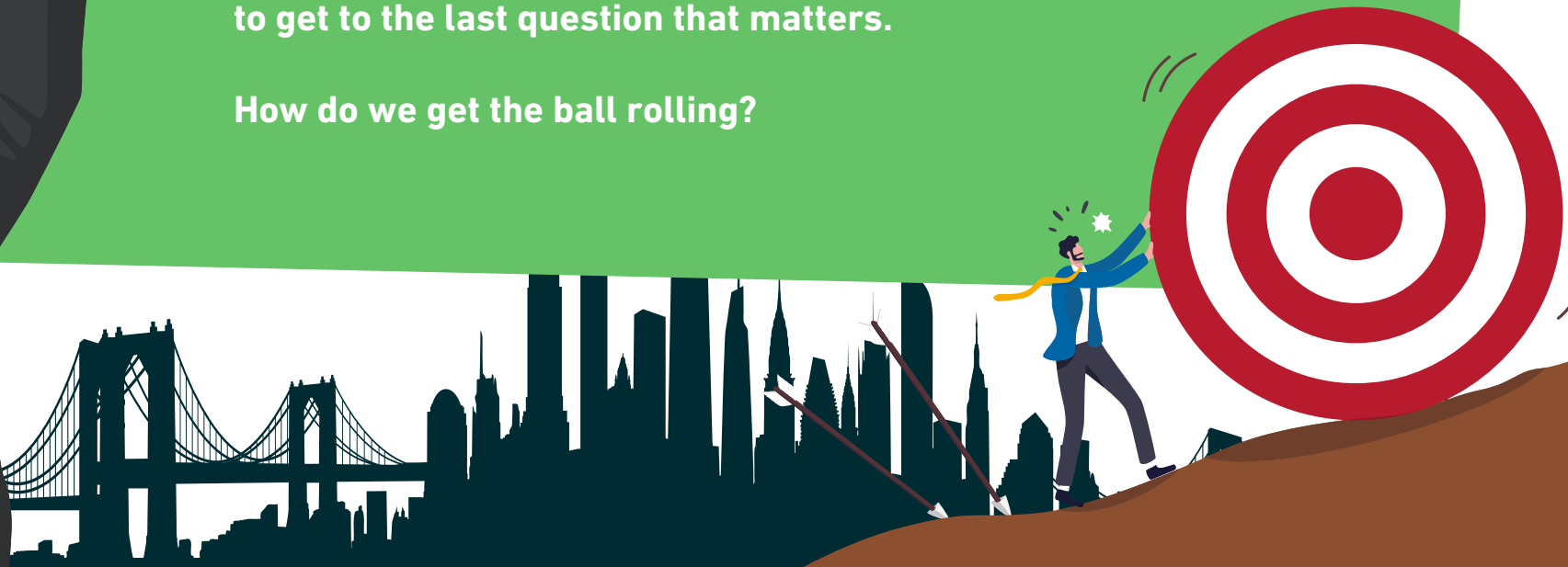
In the end, it's not about opposing the centralized approach to the distributed one. Both assets have perks and limitations.



Leveraging the sunk cost of the one while redirecting more investment and beefing up the second will deliver an amazing synergy that finally allows the rethinking of water - and not disrupt it.

And now that we've agreed on the problem and examined how we may fix the broken economics and the broken pipes, it's time to get to the last question that matters.

How do we get the ball rolling?





**How to get  
the Ball Rolling?**



What do “Survivor,” “Fear the Walking Dead,” or “Naked and Afraid” have in common? Well, as soon as survival starts, they look for Water.

It's literally the first thing a human does when returning to his primal instinct.

How do we bring that sense back into the life of 330 Million Americans? That's the question we'll try to answer with my first tip.

## 1. Better communicate about the water challenges

Oh bravo! That's so easy; it's a pity no one ever thought of it before a french genius suggested it!

I know. Don't be mad; let me explain.

To get a sense of what we're discussing here, see what a student I met in New York shared:

Water is an issue that people don't realize is a problem, or they don't understand how complicated it is. They also don't realize that there is a whole industry invested in trying to make things better. I think the industry is not intentionally closed off; it's just harder to find. My classmates in school talk about energy, they talk about carbon, they talk about the renewable transition. Some of them talk about reducing waste... Those are all incredibly important conversations, but admittedly they get way more attention than the water conversation does.

We get it; the water sector is lame at communicating the challenges it faces. But to quote Mark Zuckerberg: “don't be too proud to copy!”

Why would we always want to reinvent the wheel? Let's just apply what worked for other sectors and verticals.

Look at Climate Change Mitigation: its "Zero Carbon" rallying call is known to everyone. Where's our equivalent for Water?

If we find it, Meshal Alduraywish's plea will come true:

## 2. Explain how the Private Sector can and is willing to help

One risk with the daunting water challenges we face is to give people the impression that it's a lost cause. Doom and gloom only work to a certain extent; we also need hope.

So now, imagine that a significant portion of the solution comes with a bad rap.

People have seen Netflix's "Rotten" and are now convinced "Big Water," and the private bottled water moguls are Mephistopheles' reincarnation.

You know what? It may be, I honestly don't know - and don't bother.

Because private capital's involvement in solving the water infrastructure, quality, and delivery challenge is an entirely different topic!

There is also a knowledge gap or educational gap around private capital.

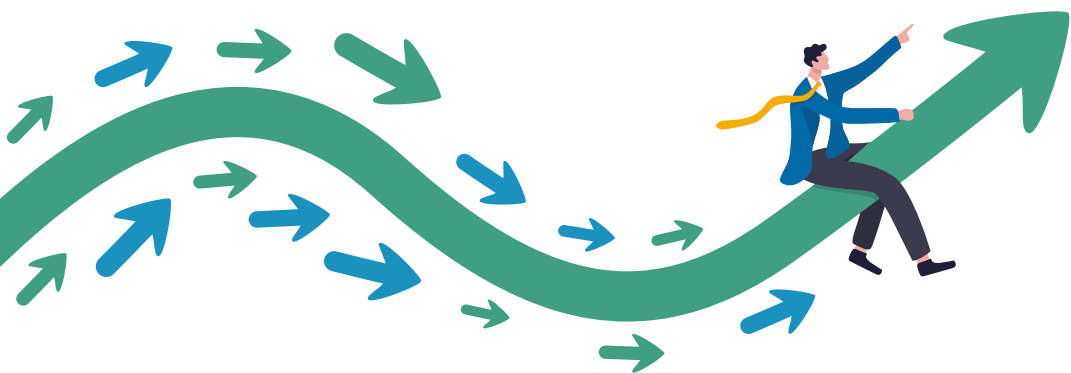
Hopefully, in 10 years, people will get why Water is something essential. And not just the Water we drink but also the water infrastructure and everything around it!





**We have to know where we're starting from:**

I've often been very quick to dismiss the role of the private sector. I've been led to believe that the privatization of Water is inherently and unequivocally harmful. It is going to limit access. It is gonna make Water more expensive.



And indeed, those are the kind of things we hear on a regular basis. While I was in New York, I got contacted by the Epoch Times to comment on private capital's rampant takeover of America's Water. Bonus points if it were foreign money!

All concerns are always legit- I believe having a critical eye is always beneficial. Yet, one must also remain objective: the recent catastrophes that hurt the American Water Infrastructure had much more to do with repeated public underfunding and natural disasters than with a greedy private sector taking over.



People are afraid. When I talk about this consolidation issue. What happens if this leads to monopolization? What happens if it leads to corporations taking advantage of us? And I say, why would you necessarily think that it's all or nothing?

As James Rees and Seth Siegel suggest, we will have to keep explaining how it will take a village to solve the mess we're in. And that the private sector is an essential stakeholder in this village willing to do its part.

I hope I can convey that message as efficiently as the "Rethinking Water" conference did for some of the students I met:

I listened to kind of the harsh realities of how the water sector or water infrastructure is extremely underfunded in the United States. And one way to overcome it, very pragmatically and feasibly, is by privatizing elements of it. That was a hard pill to swallow because it's acknowledging that what I've been told in class might be wrong!

Now to spread the message, we may also need to...

3. Get better at Communication

There are a lot of people working in Water. There are 1.3 million Americans who work in Water, but there are not a lot of water people who are writers and speakers.



That's absolutely true, and it is probably not so much of an issue, as Seth Siegel and his peers are doing a terrific job at representing us on these bigger scenes.

But that doesn't prevent every single of the 1.3 (or 1.7 - depending on the definition) million water professionals from contributing to the communication effort.

How can it be that if anyone's vegan or investing in crypto, all his relatives know about it while people living with water professionals still believe Water appears by magic at the tap and disappears when we flush?

I'm being extreme on purpose, but there's pride to have in providing 330 million US citizens with reliable, pure, and wholesome Water. And in protecting the environment with state-of-the-art wastewater treatment.



That's step 1 in better water communication: global sector advocacy. But it doesn't stop there:

We found people couldn't access a lot of the wealth of data that was out there. And so it's not just a rethinking of our operations, but also how we access the data? How do we use it, and how do we start manipulating it for the future to figure out how to put it into action?



**That's step 2: more and better transparency.  
There's hardly an element that's as closely tested  
and monitored as drinking water - why is it still so  
difficult for an end user to know about it?**

**And that's just the tip of the iceberg. Digital tools are ready  
to help; it's about time to reap their benefits!**

## **4. Get better at Marketing**

**Yet another communication topic? Not at all.**



**What's marketing? Is it a billboard? Is it a press  
release? No, it's actually understanding a value  
proposition. There is a value proposition to fairly  
anything that is sold. And so there is a value  
proposition for Water that the water industry needs to  
address, like what is the value of Water?**

**That sounds so trivial when Tom Rooney explains it. But it is the critical hurdle we have  
to overcome as a sector to finally unlock the trillion dollars we discussed in Chapter 2.**

**Why would anyone in his right mind invest such an amount in Water without expecting  
at least a minimal return on investment?**



**Water is a profitable investment  
space, and we must  
repeatedly outline its value  
proposition so that anyone  
gets convinced first that  
it's true and second that it's  
excellent news!**

**We've seen in Chapter 1  
how there's a 5-1 expected  
return on investment for water  
projects in the US, given we solve  
our wrong pocket symptom.**

**And if everyone agrees that there's a value proposition justifying a 500x more  
expensive bottled water without a frown, it shouldn't be impossible to do the same for  
tap water!**





## 5. Increase the Water Sector's attractiveness

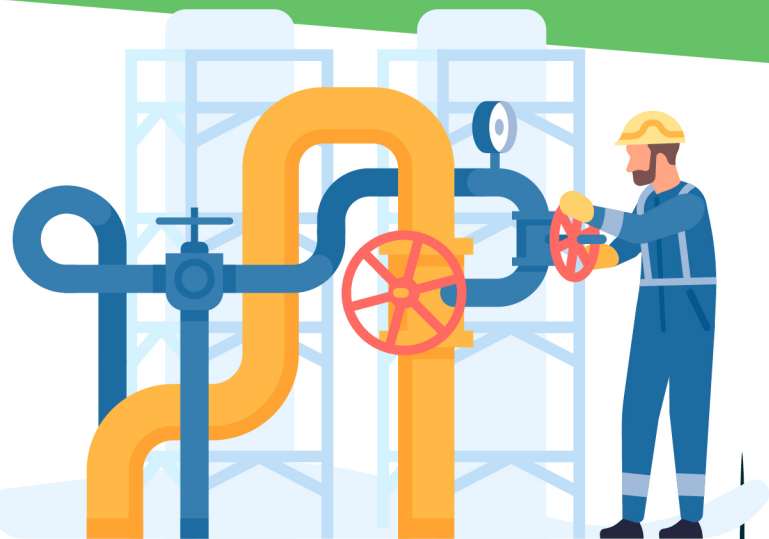
We've seen how money is not the only good we struggle to attract in the Water Sector: we also face a Silver Wave.

Yet, there are incredible stories to write about the coolness of our sector!

On the material side, it's one of the best-paying sectors for the lowly qualified workforce - according to the Brookings Institute, it pays up to 50 percent more to workers at lower ends of the income scale.



Starting a water business doesn't require a marketing make-up to turn a "Candy" into a "Vitamin" - as a standard, almost every water business is by definition a "Painkiller!"



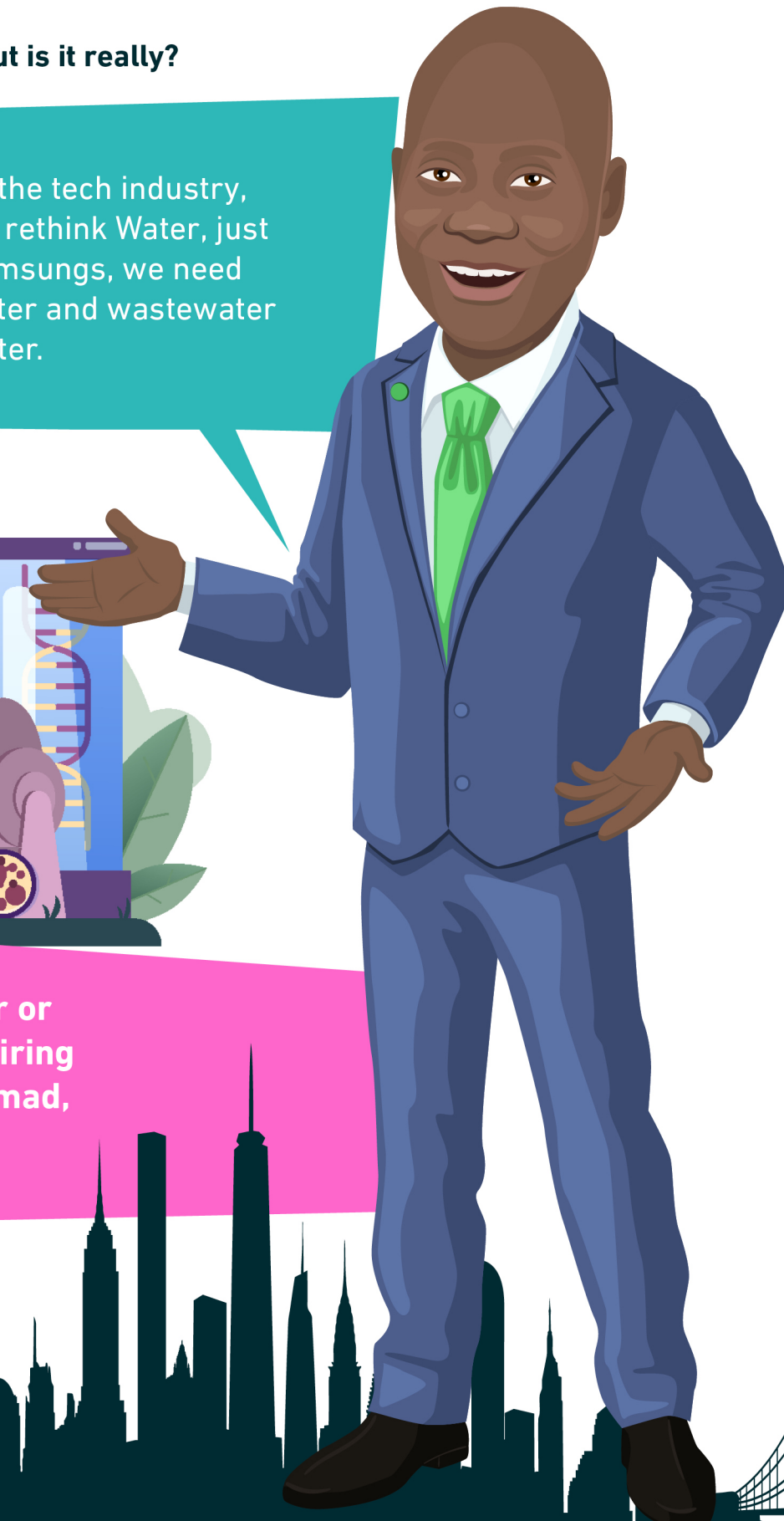
And what's cooler than explaining to everyone that you simultaneously save their lives on a daily basis by providing safe drinking water, save their jobs by ensuring the American industry stays Water and climate-change resilient, and protect the environment and its natural services by treating wastewater?

Oh, I see; Silicon Valley's cooler. But is it really?

You got a lot of folks getting in the tech industry, but if you're gonna digitize and rethink Water, just like folks have iPhones and Samsungs, we need people to be thinking about Water and wastewater at the same scale or even greater.



And unlike Amazon, Twitter or Facebook, our sector isn't firing anyone anytime soon. You mad, Tim Cook?



## 6. Empower a New Generation

On the same line of thought, we need not only to attract *people* to the Water Sector, but also to get **young people**.

First, as we've just seen because we simply need more workforce. But also and above because we need a fresh breeze, mindset, and rebalance of the age pyramid.

We need universities around the world to begin to offer scholarships to young folks to get into the Water and wastewater industry. You're also gonna need, even at a local level, whether it's mayors, youth councils, or even in high school, in elementary school, to begin to talk about the importance of Water.

I've explained how solving the water challenges will take a village: universities will have to play their role in this village.

We tell the communities they deserve better and tell the communities that the university will support them in seeking to achieve better. And then we work with the agencies to say: you're going to deliver better.

If we follow the traditional approach and climate change doesn't impact us beyond what we expect, we need one trillion dollars to bring the system in balance.

Yet, that's two strong conjectures: hoping for climate disruption to go as planned and betting on a trillion dollars when a once-in-a-lifetime infrastructure bill just capped at ten times less.

A way to take control of our destiny here may be to double down on innovation, speed of adoption, and replication of best practices.

Who better than a young generation to help achieve precisely this?



## 7. Copy what works

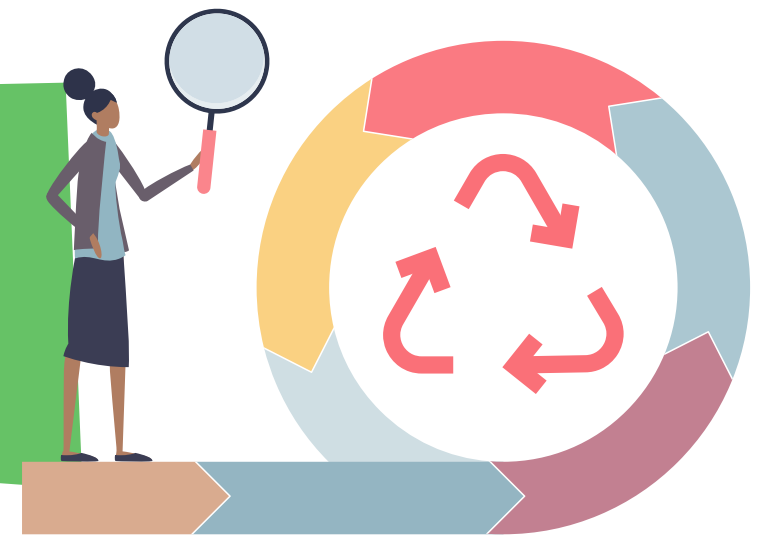
I just mentioned this replication of best practices, and I already quoted Mark Zuckerberg's famous unofficial Facebook motto: "don't be too proud to copy."

Well, really, we shouldn't bother reinventing the wheel when it already exists in our cousin or adjacent sectors:

... and it's on you to take this as good news. Are they seven years ahead? Awesome, that means we already have a seven-years plan!

Is decentralized water and wastewater treatment a good idea? Well, if energy's microgrid is, that's a clear hint.

Is circular water management going to hold Water? Well, if the entire World switches to reinforced circularity, why would it be any different for us? And so on!



That also means we shouldn't behave as a silo. Many of the most brilliant minds I got to meet on my podcast have built awesome things in Water coming from an adjacent or sometimes even entirely different sector.

The water sector, if you compare it to the energy sector, it lags like seven years. It'll take the water sector, today, seven years, assuming the energy utilities stop their digitization as they are now; it'll take seven years to catch up with it.

That's not a threat: that's a blessing!





## 8. Walk the Talk

I know, it's annoying to hear me preaching what shall be done. It's so easy, right?

This is why walking the talk is so important. Sure, the water sector by itself doesn't consume so much water, but still:

we are a business. So what I'm saying others should be doing, we're doing ourselves in terms of our own sustainability commitments and goals.



We're all getting familiar with the concept of a footprint - be it carbon or water. What Patrick Decker suggests here is that we shall take care of our handprint.

Not that it significantly changes the balance, but because it sends a message: what we suggest others to do, we first apply it to ourselves!

## 9. Strive to Influence

For all of this to be successful, we need to get the word out. I already mentioned how each water professional shall make it his mission to explain to everyone he's coming across what needs to be said about water.

But we also need to invest in the next stage:

We need advocates, people like me, people like you, venture capital, and even the government. We heard the EPA and the FEMA saying: we need people coming out of university. We need new talent with new ideas to help solve this!



I'm not saying we need a Kim Kardashian of water; I'm not even sure that would help much. But we need to empower water professionals to go past the Dunning-Kruger syndrome and share their knowledge.



The water challenges won't solve themselves all alone, and governments, corporations, or trade associations won't succeed on their own.



We need each of us to surpass our fears, overcome the apprehension to speak up, and tell the World what we know best: there are solutions to these daunting water threats.



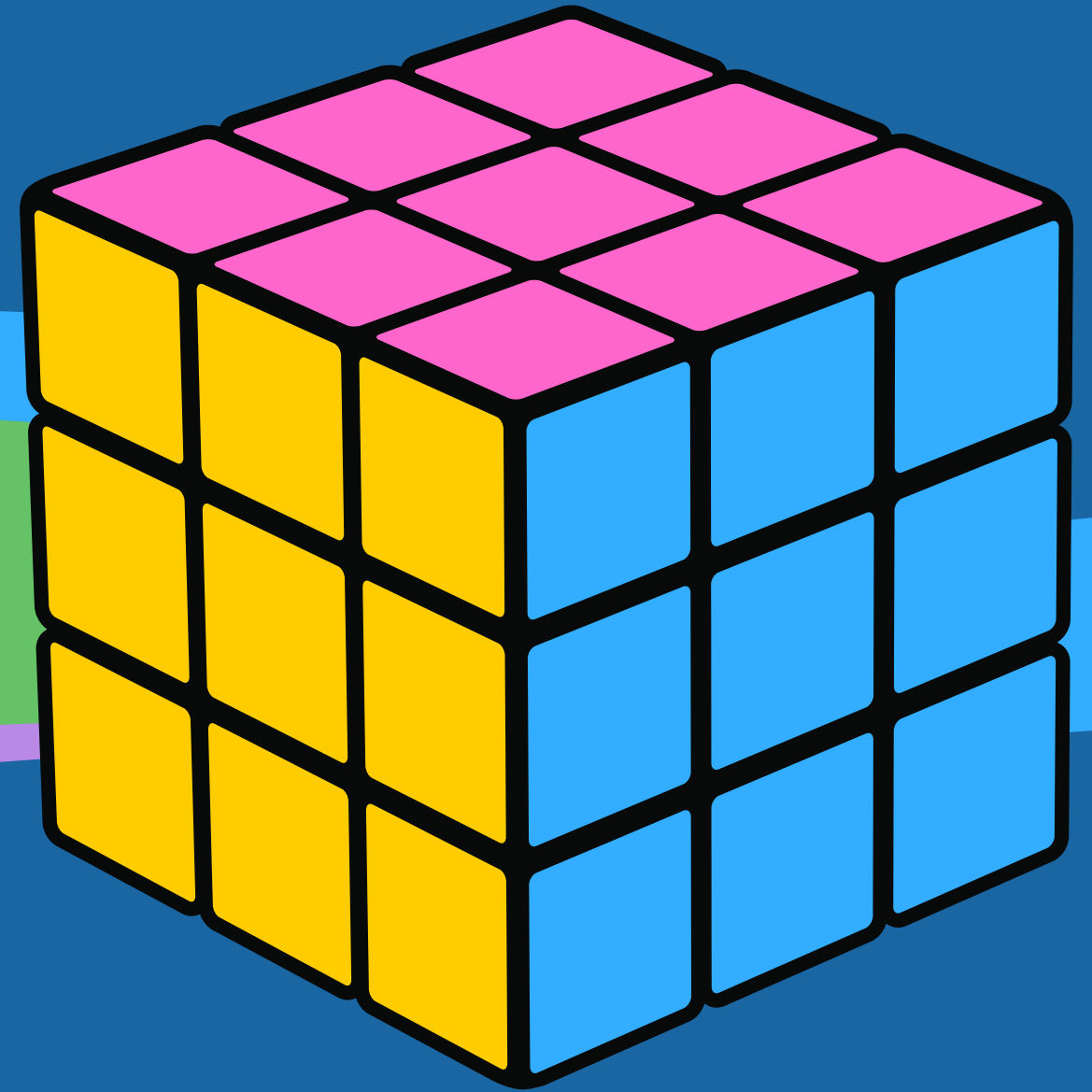
To that extent, we shall get inspired by approaches like Seth Siegel's:

I never wanted to write a book about, "Oh my God, the World is falling apart." I wanted to write a book about, "Oh my God, the World is falling apart, and here are the solutions!"



Doom and gloom have their merits: it's an opportunity to open everyone's eyes. But once they're open, we have to also show solutions - and we know plenty, as I exposed in this entire series.

**Conclusion**





**Good news:** it turns out that Rubik's Cube is possible to solve! Yes, the tiles are mixed, and yes, it might sometimes be quite intricate, but there is a path to success.

First, we have to acknowledge the challenge: the broken infrastructure, broken policy, broken economics, and the sector's conservatism.

But that's not a definitive doom! Each of these challenges comes with its own solution. If we fix the broken economics, we will have the leverage to fix the broken infrastructure and prevent it from breaking further. And if policies get installed and enforced, the economic layer will have its ideal counterpart to grow sustainably.

Now, for the conservatism, I guess if you've read thus far, you're probably part of the sector's fraction that wants to move the needle and get things done. Let's not worry too much about the others: if we're convincing enough, they will follow our steps. We can do this, right?

Let's prove to everyone that water can be a sustainably profitable field where the right blend of the right capital can make the most impact.

Private capital and private know-how will do miracles if allowed to, while public means will round it off, supported with new approaches like philanthropic involvement, when needed.

None of these sources have the power to rock the boat all alone, but blended, we know them to be unstoppable.

Will tomorrow's infrastructure resemble the existing one? Probably not. The World's digitization also opens new perspectives for the water sector and from point of use treatments to point of entry or distributed assets; one thing's for sure, the solution will be widely decentralized.



This doesn't mean we shall disrupt what works - the system will simply evolve over time and tend to that new equilibrium where water fit for purpose will be produced much closer to its users.



To get the ball rolling, we will need to become world-class at communication, marketing, and education. I guess it boils down to allowing us to influence the World we live in for the better.

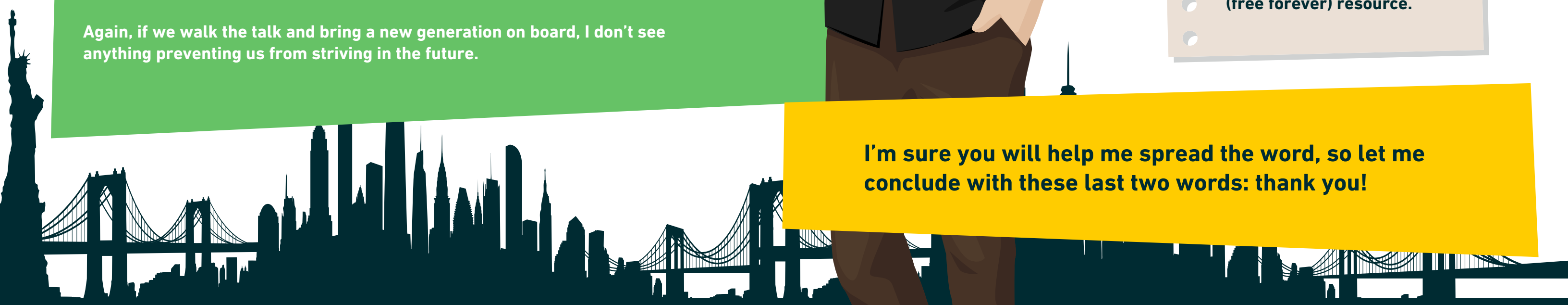
Again, if we walk the talk and bring a new generation on board, I don't see anything preventing us from striving in the future.

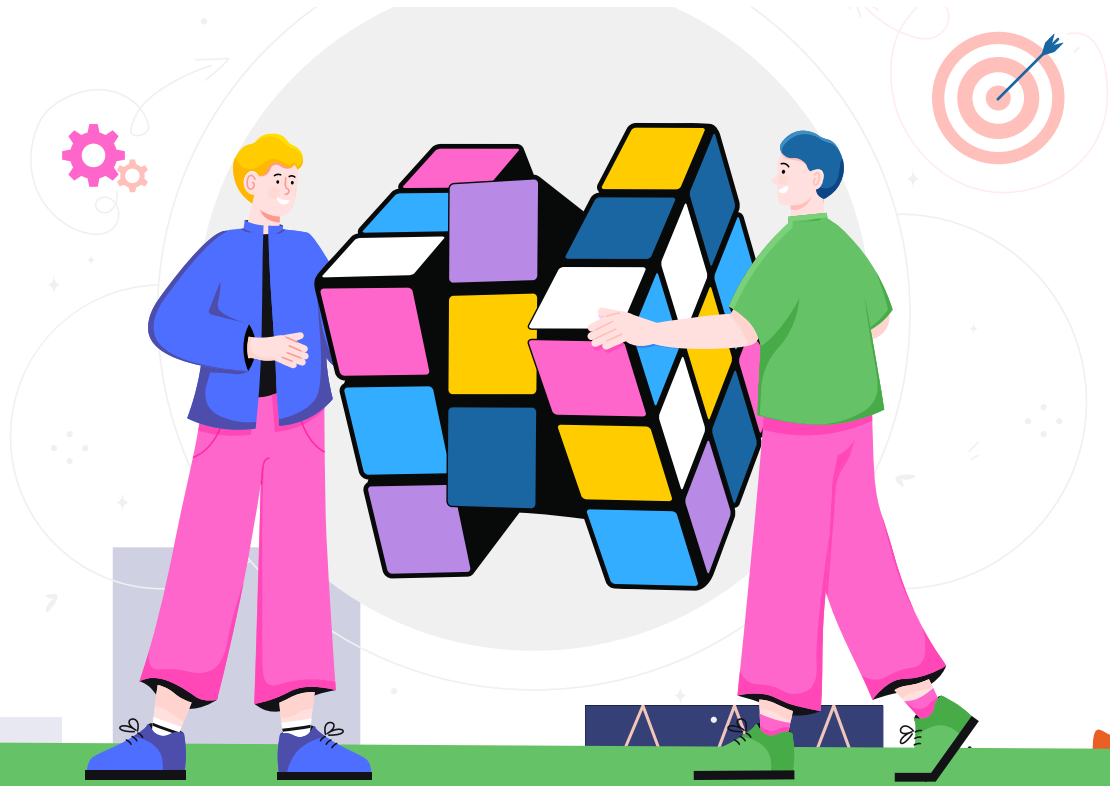


Yet, the water world is a moving target, and it keeps evolving under the influence of a lot of internal and external factors. So, if you want to keep up with that wind of change, I'd be happy to support you: just subscribe to my podcast, and I'll have you covered.

These final words conclude 6 months of intense work on the rethinking the American water scene shall undergo. I hope you've enjoyed hopping on that journey with me - if you did, the best reward you can give me is to link to this (free forever) resource.

I'm sure you will help me spread the word, so let me conclude with these last two words: thank you!





**How did the rehabilitation needs for the US water service networks rise from \$140.5 billion in 1995 to \$345.1 billion in 2015 and \$470 billion over the next 20 years?**

**How can almost 45 million people receive water from 5,634 water systems with a combined 23,040 health-based violations in the World's most robust economy?**

The Water Crisis in America is the symptom of a broader systemic problem at work: one that involves water policies and economics. As the dozens of the finest water minds in America confirmed along the writing of this book, it is time to rethink water, change the paradigm and rebuild for the better.

**This piece devises a solution and sets the path to execute it!**