

# WATER UTILITIES:

## On the Front-Line Fighting Climate Change



A Report by Chris Manganiello, PhD, Water Policy Director | SEPTEMBER 2023

### INTRODUCTION

When people talk about climate change signals in Georgia, they focus on the more frequent [coastal flooding of the highway](#) leading to Tybee Island, [Hurricane Michael's](#) impact on southwest Georgia's agriculture in 2018, the devastating [northwest Georgia floods](#) in 2022, and [the implications of urban heat on public health](#). And then there are examples of weather whiplash: between the Atlanta region's [drought in 2007 and flood in 2009](#), or between the 2022 [Christmas Deep Freeze](#) that burst water lines and [the state's fourth warmest winter](#) in early 2023.

But what does a changing climate hold in store for the **430 mile-long Chattahoochee River** and the more than **five million people** that depend on it?



Photograph by Tom Wilson

Above, Lake Lanier at record low water levels in December, 2007; below, The City of Atlanta's I-75/85 Downtown Connector during the 2009 flood.



Photograph courtesy of The Atlanta Journal-Constitution

# APALACHICOLA, CHATTAHOOCHEE and FLINT BASINS



Because climate change is driven by the burning of fossil fuels and generation of greenhouse gases, most of the conversations about how to stop it center on energy production and consumption: we must transition to renewable generation like solar and wind, and stop burning non-renewable fossil fuels like coal, natural gas, and petroleum products.

Public water utilities—as energy consumers—have a big role to play and are vulnerable to climate change. In all the clean energy and carbon conversations, water is often treated as a co-beneficiary to new energy, infrastructure, and transportation policies. We know climate change is warming the planet, increasing evaporation of water, and holding all that excess moisture in the air. We are witnessing the consequences: when storms and tropical systems strike, more water falls to the ground. Data is beginning to suggest that rainfall intensity—or how much rain falls in a short period of time—in the Atlanta region [is increasing](#) and may [become more frequent](#). And in 2022, record flooding in [eastern Kentucky](#), [Jackson \(Mississippi\)](#), and northwest Georgia not only claimed lives and destroyed property, the flooding compromised the public water utility systems tasked with providing safe drinking water.

Unfortunately, the role public water utilities will play in the climate emergency is less often understood or discussed. Until recently, when water utilities are included in the climate change conversation, it is usually about how to fix chronic urban flooding by implementing green infrastructure in [parks](#) or [streets](#). But the truth is, water utilities use a tremendous amount of energy to provide homes and businesses with clean drinking water, to treat that water after it is used, and to send it back to the Chattahoochee River. *Public water utilities can—and must—reduce their carbon footprints.*



One of two dozen raw water withdrawal intakes on the Chattahoochee River, its lakes and tributaries that are necessary for communities' clean drinking water.

**MITIGATION MEANS REDUCING** the production or generation of carbon dioxide.

**ADAPTATION MEANS ADAPTING** to the conditions we deal with day-to-day.

## RESILIENCY: What Public Water Utilities Can Do

### There is a lot a public water utility can consider

when it comes to being a part of mitigating and adapting to climate change. In the context of responding to climate change, mitigation means reducing the production or generation of carbon dioxide (for example, installing solar panels for a renewable source of energy). And adaptation means adapting to the conditions we deal with day-to-day (building green infrastructure to reduce urban flooding). Implementing both approaches make a community and the resources the community depend upon more sustainable and resilient.

### Here are **THREE EXAMPLES** of how the water industry is responding to climate change.

#### ONE

First, the water utility industry is taking action. For example, the U.S. Water Alliance launched a collective [initiative](#) to identify how the water sector can reduce its greenhouse gas emissions and carbon footprint. And since 2007, the [Water Utility Climate Alliance](#) has worked “to provide leadership and collaboration on climate change issues affecting the country’s water agencies.”

#### TWO

Second, advancing water conservation and efficiency. A research team from U. C. Davis and the Los Angeles Department of Water & Power linked reduced consumer demand for water with a reduction in energy demand. A previous desktop analysis in [Project Drawdown](#) also connected municipal water conservation and efficiency with a reduction in

energy use and thus a reduced carbon footprint. This was confirmed by the narrowly focused Los Angeles study, which [showed](#) “*that customer-focused water conservation programs are just as cost-effective (and in some cases, are more cost-effective) as energy efficiency programs in reducing electricity use,*” greenhouse gases and other energy-intensive operations. A Pacific Institute study reached the same conclusions [in California](#), where approximately 20 percent of the state’s total electricity use is associated with water withdrawals, conveyance, distribution, and treatment.

#### THREE

Finally, international examples illustrate the range of direct and specific ways a local public water utility can get in the game of arresting climate change. In the United Kingdom, water utilities rank as the “[fourth most energy intensive industry](#).” The utilities have committed to a reduction of greenhouse gas emissions by investing in fixing leaky pipes, advocating for changes to plumbing

codes to reduce consumer demand, generating renewable energy on site, converting fleets to electric vehicles, planting trees, restoring wetlands, finding ways to reduce non-point source pollution (to reduce treatment costs), and improving waste water treatment technologies (to reduce methane and nitrous oxide output).

Energy and water infrastructure projects are expensive. But financial tools and technical assistance is available. [The Infrastructure Investment and Jobs Act](#) (2021) and [Inflation Reduction Act](#) (2022) provide cities and counties with principal forgiveness, tax credit and other opportunities to invest in clean water, clean vehicle fleets, renewable energy, and other climate mitigation projects. Local governments and water utilities can consult with the [Georgia Environmental Finance Authority](#), the [Georgia Funders Forum](#), and the [Southeast Sustainability Directors Network](#) to learn about funding options and project eligibility.



Photograph by Chattahoochee Riverkeeper

Drinking water and wastewater treatment operations consume 31 percent of all of the energy the City of Atlanta’s municipal government uses. The Chattahoochee Drinking Water Treatment Plant (left) and R. M. Clayton Water Reclamation Plant (right) with the downtown skyline in the background.

## WHO IS ADVANCING CLEAN ENERGY IN GEORGIA?

Prior to 2023, state-wide leadership and coordination to advance clean energy was non-existent. [But that will change.](#) After submitting applications “to develop and implement plans for reducing greenhouse gas emissions and other harmful air pollution” through the U.S. Environmental Protection Agency’s [Climate Pollution Reduction Grant program](#), the Georgia Environmental Protection Division and the Atlanta Regional Commission received \$4 million to develop climate plans.

In the absence of state leadership, many communities across Georgia adopted commitments to transition to clean energy and/or have developed clean energy plans.



**Of the 17 communities recognized by the Green Communities Program, 15 are located entirely within the Chattahoochee River basin, or obtain their drinking water from and/or discharge their wastewater into the river, its tributaries or Lake Lanier.**

The Green Communities Program certifies local governments—cities or counties—that have adopted ordinances or policies to reduce energy use, water consumption, and waste in government and private operations. Local governments have invested in electric and hybrid vehicle fleets, developed their own electric generation facilities (for example, solar arrays), adopted enhanced plumbing codes to reduce water use, built green infrastructure, and created land use plans to protect trees.

Collectively, all these communities are taking small steps to reduce their dependence on coal and natural gas to mitigate and adapt to climate change.

Solar installation at a Valdosta wastewater treatment plant.



Photograph by City of Valdosta

The list of communities taking clean energy action includes:

The counties of [Athens-Clarke](#) (2019), [Fulton](#) (2019), and [DeKalb](#) (2021)

The cities of [Atlanta](#) (2017), [Augusta](#) (2018), [Clarkston](#) (2018), [Savannah](#) (2020), [Decatur](#) (2022), and [Winterville](#) (2022)

Some of Georgia’s public water utilities also have taken specific steps to reduce their carbon footprints at drinking water and wastewater treatment facilities.

Utilities in [Athens](#), [Atlanta](#), [Chatsworth](#), [Valdosta](#), and [Vidalia](#) have built solar arrays.

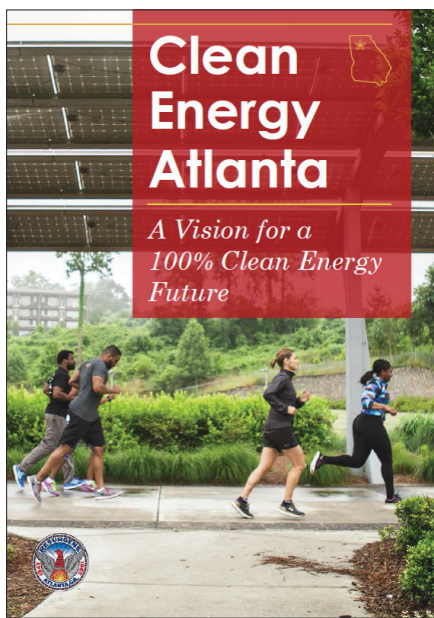
[Gwinnett County](#) can recover methane gas to produce energy.

At the regional level, local governments in the Chattahoochee River basin also have a history of adopting and implementing many “green” initiatives that contribute to climate mitigation and adaptation.

For example, the Atlanta Regional Commission’s (ARC) [Green Communities Program](#) “is a voluntary sustainability certification program that helps local governments reduce their environmental impact through actionable measures.”

# CLIMATE MITIGATION & ADAPTATION FOR THE CHATTAHOOCHEE RIVER

In the **Chattahoochee River basin**, the City of Atlanta is the only local government that has developed a comprehensive clean energy plan with clear goals to reduce the city's public water utility carbon footprint. The City of Atlanta's clean energy goal is like other communities' commitments: a pledge to transition to 100 percent clean energy for all municipal operations and community-wide by 2035.



According to [Clean Energy Atlanta: A Vision for a 100% Clean Energy Future](#), the city consumes approximately 8.1 million megawatts of electricity annually. That is enough electricity to keep the

lights on in 664,000 homes or at 150 indoor athletic venues like Mercedes Benz Stadium or State Farm Arena. Of all the energy consumed within the City of Atlanta, 93 percent is used by businesses, restaurants, hospitals, universities, and residents at home. The remaining 7 percent is used by municipal operations like the city-owned Hartsfield-Jackson Atlanta International Airport, traffic lights, streetlights, and city properties and facilities like fire stations, recreation centers, and offices. [Figure 1] Of all the energy consumed by municipal operations, the Department of Aviation (the airport) is the biggest user (46 percent) followed by the Department of Watershed Management's drinking water, wastewater, and stormwater operations (31 percent).

As the city's second largest municipal energy consumer, the Department of Watershed Management (DWM) is a prime target for carbon burning reduction. DWM operates five energy intensive drinking water and wastewater treatment plants along with the associated drinking water distribution, stormwater and sewage collection, and pumping systems. In 2016, these five facilities used 94 percent of the department's total consumption of 191,000 megawatts.

How will the city's water utility reduce its carbon footprint? DWM's clean energy

transition strategies include ongoing reduction of energy consumption (for example, conservation, facility upgrades, and performance contracts) and development of new on-site energy generation. On-site projects include methane gas energy recovery systems at the R. M. Clayton and Utoy Creek wastewater treatment plants. Additionally, in 2021 the city launched the [Solar Atlanta Program](#), currently the largest municipal solar program in Georgia. To date, Solar Atlanta has outfitted nearly two-dozen facilities across the city with on-site solar. Of those, six DWM facilities—including the Chattahoochee and Hemphill drinking water treatment plants—will generate some electricity via on-site solar panels.

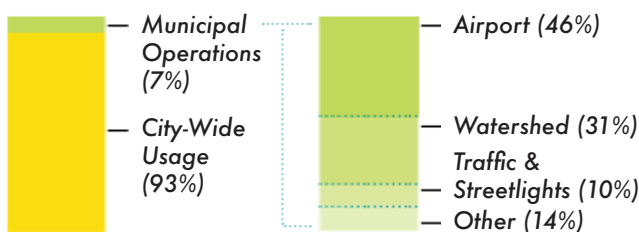
## What would a clean energy transition mean for the Chattahoochee River's water?

According to the Clean Energy Atlanta plan, the amount of water that can be conserved will depend on how aggressive the city pursues carbon reduction and clean energy generation. For example, 34 to 91 billion gallons of water would not be needed by power plants burning coal or natural gas to generate electricity.

**Fig 1.** The City of Atlanta's Energy Distribution.  
Source: [Clean Energy Atlanta](#)

### Energy Distribution

7 percent of Atlanta's electricity is used for City of Atlanta municipal operations. 93 percent of electricity is used by the rest of Atlanta. (Source: The Greenlink Group)



## What Are Other Chattahoochee River Basin Water Utilities Doing?

Local governments and public water utilities have adopted many climate mitigation and adaptation practices, ordinances, and policies to make the Chattahoochee River basin's communities and water resources more resilient. *But the process and implementation are not comprehensive in nearly every case.*

### 1. SUSTAINABILITY PLANNING

Fulton County—Georgia's largest county according to the 2020 U.S. Census (1,066,710 people)—adopted a [Sustainability Plan + Resilience](#) in 2019 and [approved new targets to accelerate sustainability efforts](#) in 2022. Rather than build out renewable or other energy generation sources, the county will focus on other strategies. For example, by 2030, the county will reduce energy usage by 50 percent and transition 25 percent or all light-duty vehicles to electric or plug-in hybrid electric vehicles.

Gwinnett County is actively working on a county-wide sustainability initiative. The [Gwinnett County Commission](#) established a Sustainability Commission and a “green team” to develop recommendations for the county. The Commission has an unprecedented opportunity to recommend the expansion of existing strategies and incorporate new ones in a county-wide sustainability plan and clean energy road map to guide the Gwinnett County

government's decision making when it comes to energy and water, and climate mitigation and adaptation measures for Georgia's second largest county (957,062 people).

[Cobb](#) and DeKalb counties, the third (766,149 people) and fourth (764,382) largest counties by population in Georgia, have many sustainability initiatives, policies, and programs. But each county currently lacks a unified vision or strategy. DeKalb's 2050 [comprehensive plan](#) indicated the community will develop a “Climate Resiliency Plan.” To meet that goal, DeKalb is moving forward with [Southface](#) to develop a “[Clean Energy Transportation Transition Plan](#).” *While the plan is transportation focused, the project will also develop a “Greenhouse Gas Inventory” for all county government facilities, which should include all operations of DeKalb County's Department of Watershed Management.*

### 2. CLEAN ENERGY PROJECTS

Gwinnett County is completely dependent on Lake Lanier for drinking water and a majority of the county's wastewater is returned to Lake Lanier. The Gwinnett County Department of Water Resources currently has the capability to transform wastewater from homes and businesses into energy at the F. Wayne Hill Water Resources Center. This facility is one of the largest wastewater treatment plants in the region. Biosolids derived from wastewater and organic waste can be diverted from landfills and converted into methane gas. Then the energy recovery system burns the methane gas—as opposed to burning

natural gas piped in from another part of the country—to provide energy for plant operations. When running consistently, the facility can generate one-third of its own daily on-site energy demand.

Fulton County has installed solar panels on a half-dozen county properties including libraries and [health centers](#) to meet their clean energy goals. These installations are part of the county's “[Resilience Hubs](#)” initiative, and the [Metropolitan Public Library](#) was the first site. Resilience Hubs are physical locations that already serve significant community purposes and will be upgraded to include valuable services during emergency events such as major heat/cold events, storms, loss of electricity/water, etc. The library has been outfitted with solar panels, and eventually will have battery storage, rainwater harvesting, electric vehicle charging, and community garden capabilities in addition to all the services public libraries already provide.

### 3. SAVE WATER + SAVE ENERGY = SMALLER CARBON FOOTPRINT

Municipal water conservation and efficiency programs reduce consumer demand for water, which leads to a reduction in energy demand and a reduced carbon footprint. *Water conservation is one of many tools to arrest climate change.*

The Cobb County Water System is the first in Georgia to offer smart water devices to detect leaks in residential homes. In 2022, Cobb Water launched a “[Leak Detector Loaner Program](#)” for customers. For up to 90 days water



Photo courtesy of Gwinnett County

flume

Get Flume For Just \$80 after Cobb County Rebate (reg. \$249)

GET OFFER

Cobb County Water System & Flume

Special Offer! Get Flume for just \$80 (plus shipping) after rebate from Cobb County!

GET OFFER

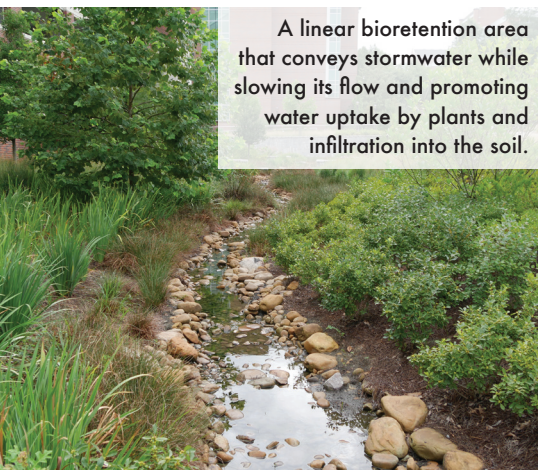
flume

customers can check-out a Flume Smart Home Water Monitor like a book from the library. The WiFi connected Flume monitor is strapped onto a customer's water meter to monitor water use in real-time and inform customers about water consumption and possible leaks. Customers are also eligible for a \$100 rebate if they choose to purchase their own device.

Gwinnett County's Department of Water Resources has been conducting water conservation and efficiency research for decades. Over the last five years in a neighborhood containing approximately 500 homes, the department installed different smart water meters to measure water loss in customer's homes. One experiment revealed that 15 percent of the homes had small leaks or "running" toilets. And an ongoing experiment indicates that lowering the water system's pressure results in less real water loss and background leakage.

#### 4. GREEN INFRASTRUCTURE

The City of Atlanta has invested significant resources to develop [green](#)



A linear bioretention area that conveys stormwater while slowing its flow and promoting water uptake by plants and infiltration into the soil.

[infrastructure](#) sites all over the city with a goal to reduce urban stormwater runoff. [When it rains](#) in a city, impervious surfaces, like rooftops and asphalt prevent rainwater from soaking into the soil. The resulting stormwater runoff collects litter, chemicals, and sediment as it flows across the ground. Cities have traditionally dealt with stormwater runoff using a system of drains, underground pipes, and culverts.

In a highly impervious urban area like Atlanta, the amount of runoff generated in even a small rainstorm is a major source of pollution and erosion in waterways. Larger storms can produce enough water to overwhelm a city's stormwater system as well as its sewers, causing flooding of streets and homes and hazards to public health. In contrast to the conventional approach to managing stormwater, green infrastructure manages rainwater where it falls and can restore the natural flow of water through a landscape.

Green infrastructure often uses plants, engineered soils, and other technologies to capture and reuse stormwater, infiltrate water into the soil, and increase stormwater uptake by plants. This approach can be implemented in tandem with conventional gray infrastructure approaches and provides added benefits of removing pollutants present in stormwater runoff and improving water quality. By slowing and infiltrating stormwater, green infrastructure can also recharge base flows in creeks and rivers.

What does green infrastructure have to do with climate change and energy? The City of Atlanta's [Clean Energy Atlanta](#) plan recognizes that *green infrastructure*



*reduces the amount of stormwater that enters the wastewater treatment system and helps reduce the demand for energy needed in the treatment process.*

Green infrastructure, like water conservation, is one of many tools to arrest climate change and reduce a water utility's carbon footprint.



#### 5. PURCHASING PROGRAMS

Many communities have environmentally friendly and sustainable purchasing policies. These policies require, where applicable, the purchase of [Energy Star](#) and [WaterSense](#) labeled products certified by the U.S. Environmental Protection Agency and U.S. Department of Energy.

Energy Star products use less energy and have smaller carbon footprints. And, WaterSense labeled products use less water than non-labeled products, reducing the amount of water a public water utility must withdraw and treat from the Chattahoochee River to produce drinking water for customers. If a utility uses, treats and pumps less water, then the utility uses less energy and reduces their carbon footprint.

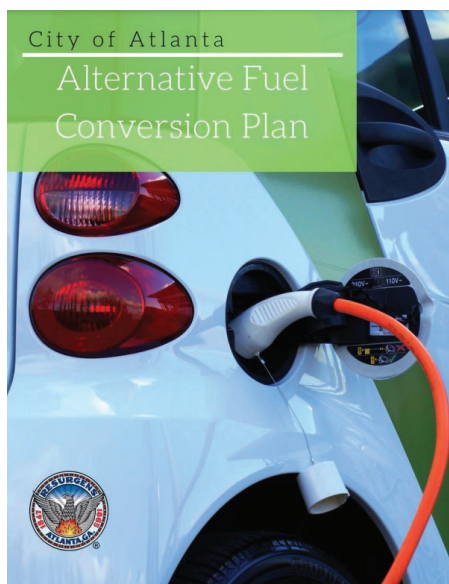
Cobb County instituted an "Environmentally Preferable" [purchasing policy](#) in 2009. The policy guides staff to consider a product's lifecycle: how it was manufactured, transported, and packaged, and how it will be disposed

of. The policy was amended to require, where applicable, the purchase of [Energy Star](#) and [WaterSense](#) labeled products—like computers, monitors, imaging equipment, televisions, tablets, and other appliances—that consume less energy than non-labeled products.

## 6. GREEN FLEET MANAGEMENT

Public water utilities operate thousands of cars, trucks, and other types of equipment. This includes heavy and medium duty trucks (front/rear loaders, cranes, bucket, forklifts, etc.) and light duty vehicles (pickups, vans, SUVs, sedans, etc.). Depending on the vehicle, it could be powered by gasoline, diesel, compressed natural gas (CNG), propane, fully electric, or hybrid (plug-in). Utilities and their associated local governments can adopt fleet management and purchasing policies to “right type” and “right size” fleets to reduce transportation related carbon emissions. *Green fleets—which have lower fuel, operating, and maintenance costs—also save utility departments money.*

The City of Atlanta operates more than 3,725 pieces of equipment. In 2018, the city produced an [Alternative Fuel Conversion Plan](#) to set goals for transportation generated emissions reductions. The city aspires to transition 20 percent of the fleet to alternative fuel and electric vehicles. To date, the city



has purchased 34 battery-electric and 36 plug-in hybrid light-duty vehicles, and two battery electric trucks. The Department of Watershed Management has been an active part of this transition. In 2017, DWM studied the use of 50 vehicles and determined that 40 vehicles could be replaced with electric vehicles like the Ford Focus and Nissan Leaf. Approximately half of DWM’s fleet includes light-duty pick-ups and the goal is to adopt electric pick-ups as they become available in the marketplace. To date, DWM has purchased one-dozen alternative fuel and electric vehicles.

The City of Roswell’s [vehicle policy](#) includes specific “Sustainability Goals.” When the city needs to replace a vehicle, “it shall be replaced with a hybrid vehicle” under certain conditions. A hybrid vehicle must not diminish the use and function of the vehicle. For example, it would be difficult to justify the purchase of a hybrid police cruiser or other first responder equipment. And the city analyzes the “life-cycle cost;” the total expense of the vehicle cannot “exceed the total expense of the cheapest option by more than ten percent.”

[DeKalb County](#) maintains a fleet of 3,500 vehicles and pieces of equipment and is committed to a transition to cleaner transportation options. The county’s Fleet Management division operates a [nationally recognized](#) “Green Fleet” of over 370 alternative fuel vehicles. The county’s [Green Fleet Policy](#) directs county staff to “procure units with the lowest emissions and/or Hybrid/Alternatively Fueled units when it is in alignment with the intended use of the Fleet unit and is reasonably cost competitive over its useful life.” In late 2021, the DeKalb County commission [passed a resolution to adopt](#) a “Vision and Transition Plan of 100% Clean Energy and Clean Transportation powering the County’s needs by 2050.” To meet that goal, DeKalb is moving forward with Southface to develop a “Clean Energy Transportation Transition Plan.”

## CONCLUSION & RECOMMENDATIONS

**When we use less water,** we put less demand on public water utilities. In turn, the utilities use less energy to move water around and reduce their carbon footprint in the process. Individual behavior and utility operational decisions combined can help fight climate change. And that’s good for the Chattahoochee River and the communities that depend on it.

*To achieve these objectives, Chattahoochee Riverkeeper offers the following recommendations:*

**1. COLLABORATION:** Public water utilities AND local governments should work together to identify their carbon footprints and develop comprehensive climate resiliency and sustainability roadmaps that include clean energy plans. These plans should be strategic, attainable, and challenging.

**2. LEADERSHIP:** The Governor of Georgia and Georgia General Assembly should establish and fund a state-level office of resilience to coordinate implementation of statewide mitigation AND adaptation strategies. Other southern states—including [South Carolina](#) and [Florida](#)—have offices focusing primarily on adaptation. Georgia has a history of a state administered sustainability office; the Department of Natural Resources formerly managed a “sustainability division.”

**3. FUNDING:** The Georgia Environmental Finance Authority and other relevant state agencies can help communities unlock federal funding. The Infrastructure Investment and Jobs Act (2021) and Inflation Reduction Act (2022) present once-in-a-generation opportunities for public water utilities to invest in climate-forward water and energy projects. 