

Climate and Water Toolkit

7 Value Propositions for Water Tech Ventures



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Table of Contents

Water: The Medium of Climate Change	3
Water–Climate Connections: Value Propositions	8
Mitigation	9
Adaptation	14
Case Studies	18
Livestock Water Recycling	19
Novion	20
Rainstick	21
Recommendations & Resources	22
Water and Climate Facts	25

Water: The Medium of Climate Change

It's hard to get people — whether investors or end-users — to pay for water solutions. This guide is intended to help water tech companies identify and articulate their climate value proposition as climate change increasingly drives public and private sector investment and impact priorities.

Water is inextricably linked to climate change. Water and wastewater treatment, distribution, and management are significant contributors to global greenhouse gas (GHG) emissions. Drought, flooding, and coastal erosion as a result of climate change are expected to cost C40 network cities alone **\$194 billion annually**, presenting risks to healthcare, energy systems, and infrastructure, and exacerbating social inequities.¹ Ultimately, climate change cannot be solved without addressing water issues.

>10% of global GHG emissions are estimated to come from these six water-related categories: ²

1

Energy required for water and wastewater treatment and distribution

2

GHG emissions from wastewater and sludge

3

GHG emissions from surface water bodies

4

Decomposition of organic material in reservoirs

5

Degradation and destruction of wetlands and peatlands

6

Irrigation of rice paddies by flooding

Water technology can provide solutions to climate-related risks. Therefore, it's important to clearly communicate this to investors, end-users, and governments who are prioritizing resources toward addressing climate change.

Positioning water solutions through the lens of addressing climate risk — securing clean water access, adapting to drought or flood conditions, or helping to meet net zero emissions targets — can help highlight their importance.

“...water is both a climate risk and a critical resource for countries that are looking to boost their adaptive capacity. But water is often invisible in the climate conversation.”

- UNFCC, 2022 ³



Water-Climate Connections: Value Propositions

Water tech applications can address various risks associated with climate change.

Consider what climate **value proposition** your solution can address, and by which action pathway, and build on this connection when communicating the climate benefits of your solution to stakeholders.



The 7 Value Propositions

Mitigation

1. Energy Use Reduction
2. Clean Energy Generation
3. GHG Emission Reduction
4. Nature-Based Carbon Sequestration

Adaptation

1. Mitigation of Extreme Weather Risk
2. Mitigation of Water Supply Risk
3. Mitigation of Water Quality Risk

Mitigation



Climate Value Proposition	Action Pathway	Potential Water Tech Applications	Examples
<p>Energy Use Reduction</p>	<ul style="list-style-type: none"> ● Improves efficiency of water treatment or distribution systems ● Informs water system process optimization through data collection ● Reduces water system energy requirements through component or process innovation ● Improves water use efficiency or reduces the need for water treatment ● Reduces energy required for water heating 	<ul style="list-style-type: none"> ● Advanced industrial/municipal wastewater treatment ● Data analytics /process optimization ● Leak detection /rehabilitation ● Water monitoring /testing ● Commercial and residential water management 	<p>Metro Vancouver is testing a high-efficiency aeration technology to improve wastewater treatment efficiency and reduce energy consumption by approximately 25%. Read more</p> <p>Pani Energy is optimizing wastewater treatment processes to improve efficiency and reduce emissions. Read more</p>

Climate Value Proposition	Action Pathway	Potential Water Tech Applications	Examples
Clean Energy Generation	<ul style="list-style-type: none">• Offsets demand for non-renewable energy or fuel through recovery of methane, biocrude, heat, etc.• Offers a secondary revenue stream to customers via carbon credit generation	<ul style="list-style-type: none">• Resource recovery	Saltworks is testing waste heat to power desalination technology, which has the potential to reduce GHG emissions by 81% while saving costs. Read more

Climate Value Proposition	Action Pathway	Potential Water Tech Applications	Examples
<p>GHG Emission Reduction</p>	<ul style="list-style-type: none"> • Reduces fugitive emissions from wastewater or sludge treatment • Avoids emissions related to water, soil, or sludge transport • Removes fat, oil, grease, or organic components sent to landfills that release GHGs during decomposition • Reduces emissions related to irrigation practices, lagoons, or other agricultural water use • Offers a secondary revenue stream to customers via carbon credit generation 	<ul style="list-style-type: none"> • Sludge treatment • Advanced industrial/municipal wastewater treatment • Soil/water remediation • Agricultural water management 	<p>University of Calgary is studying the potential of a biochar additive to oil sands tailings ponds that prevents methane release. Read more</p>

Climate Value Proposition	Action Pathway	Potential Water Tech Applications	Examples
Nature-Based Carbon Sequestration	<ul style="list-style-type: none">• Provides carbon sequestration through restoration or management of land and water systems• Offers a secondary revenue stream to customers via carbon credit generation	<ul style="list-style-type: none">• Reclamation /restoration• Green infrastructure /stormwater management	Ducks Unlimited Canada is collecting data on carbon storage and GHG emissions from wetlands on agricultural lands to determine their ecosystem services and serve as a basis to inform offset programming. Read more

Adaptation



Climate Value Proposition	Action Pathway	Potential Water Tech Applications	Examples
Mitigation of Extreme Weather Risk	<ul style="list-style-type: none">• Provides information or supports decision-making around urban or regional flood risks• Increases resiliency of infrastructure to flood and other water-related weather damage• Reduces the likelihood of catastrophic damage during extreme weather events	<ul style="list-style-type: none">• Environmental modeling• Remote and real-time monitoring /sensing• Data analytics /decision support systems• Green infrastructure /stormwater management	GeoSapiens is supporting municipalities to better predict and map floods, identify vulnerable infrastructure, and quantify the actions needed to prevent damage, estimating 5x cost recovery. Read more

Climate Value Proposition	Action Pathway	Potential Water Tech Applications	Examples
<p>Mitigation of Water Supply Risk</p>	<ul style="list-style-type: none"> • Provides information or supports decision-making around water supply risks • Secures access to potable water in areas of water scarcity • Improves water conservation, water use efficiency, or access to alternative water sources 	<ul style="list-style-type: none"> • Environmental modeling • Remote and real-time monitoring /sensing • Data analytics /decision support systems • Desalination • Water reuse • Commercial, residential, or agricultural water management • Leak detection /rehabilitation 	<p>Digital Water Solutions is partnering with FIDO Tech to tackle water insecurity by locating and sizing water leaks in municipal systems. Read more</p>

Climate Value Proposition	Action Pathway	Potential Water Tech Applications	Examples
<p>Mitigation of Water Quality Risk</p>	<ul style="list-style-type: none"> • Provides information or supports decision-making around water quality risks and threats • Reduces contamination from agricultural, industrial, or urban pollution sources • Strengthens water treatment system performance 	<ul style="list-style-type: none"> • Environmental modeling • Remote and real-time monitoring /sensing • Data analytics /decision support systems • Advanced industrial /municipal wastewater treatment or disinfection • Green infrastructure /stormwater management 	<p>FREDsense is piloting the use of their sensor device for monitoring of stormwater contaminants in San Diego Bay. Read more</p>

Case Studies

Learn how Canadian water technology developers are gaining momentum by focusing on their climate benefits.



Livestock Water Recycling



Based in Calgary, Alberta, Livestock Water Recycling (LWR) has developed a treatment technology for manure that reduces the impacts of waste liquids, recovers nutrients for use as fertilizer, and recycles clean water for reuse. With livestock farmers and energy producers being their primary customers, highlighting their climate benefits in addition to their core water treatment offering has been a successful strategy for LWR to date.

LWR's Climate Value Proposition:

- **Reduction of GHG emissions.** LWR's solution minimizes the need for manure lagoons — the second-highest source of GHG emissions from livestock — by recovering nutrients and reducing the volume of waste. This can generate carbon credits for customers in certain jurisdictions.
- **Generation of clean energy.** Biosolids recovered through LWR's treatment process can be sold as a feedstock for RNG production. This reduces downstream emissions while offering an additional revenue stream for LWR's customers.
- **Nature-based carbon sequestration.** Nitrous oxide and methane emissions are sequestered through LWR's technology, which produces fertilizer. When applied to cropland, the fertilizer, which is composed of organic matter, sequesters carbon in the soil for the long term.

Key Lessons:

LWR has focused on leveraging its technology to help customers and investors reduce agricultural GHG emissions in addition to meeting their nutrient needs and treating wastewater.

One example of this involved LWR collecting carbon metrics from a dairy operation that had deployed their technology. This data can then be used to show the emissions reduction they can provide, and can also validate carbon credits, providing additional financial value to their customers.

Vancouver-based Novion positions their green infrastructure (GI) monitoring technology as a way for municipalities to mitigate climate risk through real-time asset monitoring. Novion's technology can help increase asset owners' capacity to deal with increased rainfall and lessen flood risk by helping them understand the performance of green infrastructure and inform decisions on design, maintenance, and planning.

Novion's climate value proposition:

1. **Mitigation of extreme weather risk.** Novion's monitoring technology enables municipalities to identify whether their GI require maintenance or are flooded for prolonged periods. This allows them to effectively maintain their GI and reduce the need for construction of expensive grey infrastructure.
2. **Mitigation of water quality risk.** By improving the effectiveness of GI, Novion can increase the volume of rainfall retained and filtered by each asset. This enables cities to reduce the amount of pollutants entering the stormwater drains and improves the quality of water within the City.

Key Lessons:

Though monitoring technology is ubiquitous, Novion's technology has a unique ability to use their collected data and knowledge of green infrastructure to convey insights on infrastructure-based climate risk reduction.

Climate adaptation is an emerging market which Novion has accessed by positioning their value proposition with a climate angle. Given the wide range of needs, challenges, and metrics around climate adaptation and green infrastructure, Novion is working to expand its value to multiple stakeholder groups.

RainStick



RAINSTICK

The RainStick Shower appliance filters and re-circulates shower water in residential homes without sacrificing flow rate or aesthetics. RainStick's climate philosophy focuses on educating their customers on the impact their shower technology has on reducing water use and energy consumption. By clearly showing their customers they can reduce 80% of water and save 80% of energy in an accessible way, while highlighting the link between water and energy, RainStick is accessing a growing number of consumers and bathroom professionals who want to do their part for climate change and live sustainably.

RainStick's climate value proposition:

1. **Energy use reduction.** Water treatment, pumping, and heating are energy-intensive processes. By improving water use efficiency and re-circulating heated water, RainStick's shower system reduces the amount of energy consumed by 80%.
2. **Mitigation of water supply risk.** RainStick follows a mantra of, "the best drop of water saved is the water never used in the first place." Rather than addressing water scarcity through capital-intensive, infrastructure-related solutions, RainStick focuses on the end-user side and reducing consumption at the household level.

Key Lessons:

In countries where water is abundant and consumers pay low water rates, there is often limited awareness of household water use and water-related energy demand. As homeowners begin to make more sustainable choices, RainStick has focused extensively on educating their customers and investors on the potential water and energy savings their technology can provide.

In addition, RainStick provides detail on how their appliance provides almost double the flow of a typical shower today, providing a much better showering experience and not forcing sustainability-related "compromise". RainStick draws on a number of communication tools, including clear metrics such as, 'number of water bottles saved', an online calculator for customers to estimate the cost and amount of annual water savings, and case studies and testimonials to clearly link water to energy savings.

Recommendations and Resources

The following are recommended when considering how to better communicate your solution's climate benefits.



Identify Your Climate Value Proposition(s)

How do your technologies, services, and projects align with the climate value propositions in this guide? Make sure you can clearly communicate this.

It's also useful to think about any questions that might come up about your climate benefits to ensure you can answer them.

Know Your Audience

Which climate value proposition would resonate best? Whether it's government, end-users, or investors, research your audience's climate goals or impact thesis. Show how your solution helps achieve them.

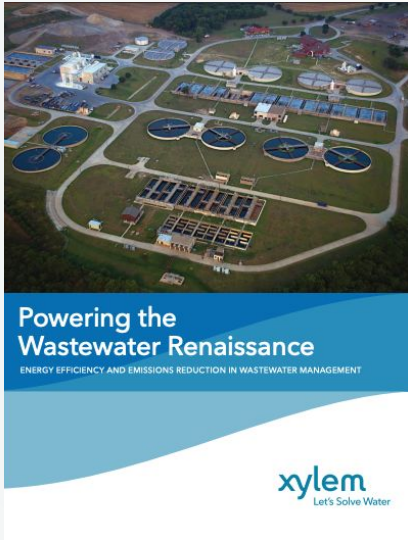
Tell Your Climate Story

Consider communications tools you can deploy to better link your technology and its climate value. Creating a blog post that discusses the climate benefits of your solution, altering your website to include your climate value propositions, developing case studies of recent projects that showcase your metrics, or partnering with a trade publication to write a similar article would provide credibility to your brand as a climate solution.

Conduct a GHG Audit

Leverage internal expertise or work with external partners to assess the carbon footprint, measure GHG emissions reduction, and/or estimate the cost savings of your solution. This may be an expensive undertaking, but having concrete environmental performance indicators will be a valuable asset for future funding proposals, sustainability reporting, etc.

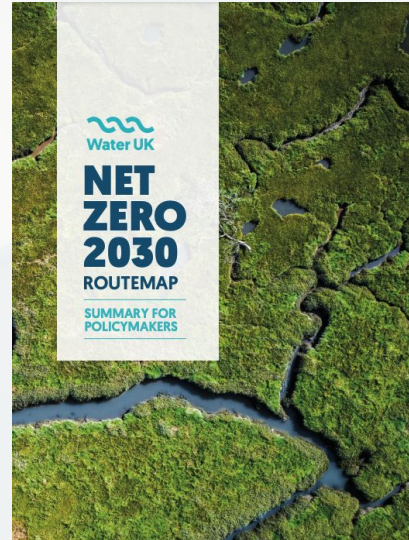
Resources



Powering the Wastewater Renaissance: Energy efficiency and emissions reduction in wastewater management

Xylem Inc.

[Click to Download](#)



Net Zero 2030 Routemap

Water UK

[Click to Download](#)

Water and Climate Facts

- **>10%** of global GHG emissions are estimated to come from water-related categories.² **8%** of these emissions are related to water and land use. **2%** of global GHG emissions are attributed to water utilities, and this figure is projected to more than double by 2040.⁴ The global shipping industry emits approximately the same amount.
- **2%** of US national energy use and **30–40%** of total energy consumption of US municipalities comes from water utilities.⁵ **19%** of electricity in California is used by water utilities as well as **30%** of natural gas.⁶
- **32%** of municipal GHG emissions and **38%** of municipal energy use in Ontario come from water utilities.⁷
 - **47%** of water utilities' energy use is from wastewater treatment, **25%** is from drinking water treatment, **25%** is from water pumping, and **3%** is from wastewater pumping.
 - **55%** of the energy used in water collection and treatment is attributed to secondary treatment and activated sludge aeration.
- **50%** of energy-based emissions in wastewater can be eliminated with existing technologies. **~95%** of this is achievable at zero or negative cost.⁸
- Global Water Intelligence is tracking **81** water and wastewater utilities around the world that have net zero emissions and carbon neutrality targets as of April 2022.⁹
- Global Water Futures estimates that **\$28 billion** was spent in response to climate-related water disasters in Canada between 2000 and 2017.¹⁰ Floods, droughts, storms are projected to cost Canadian economy **\$139B** in next 30 years.¹¹

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