

# WATER TECHNOLOGY IN CANADA:

A Snapshot of the Ecosystem

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As Canada’s cleantech ecosystem accelerator, [Foresight](#) supports the identification and validation of cleantech opportunities and the successful commercialization of solutions. We bring together innovators, industry, investors, government, and academia to address today’s most urgent climate issues and support a global transition to a green economy.



[WaterNEXT](#) is Canada’s water technology network. We bring together stakeholders from across the water innovation ecosystem to accelerate the commercialization and adoption of technologies for the world’s most pressing water challenges. WaterNEXT is a strategic initiative of Foresight Canada.



IISD is a Canadian think tank working to create a world where people and the planet thrive. IISD’s water program works with government, civil society, and industry to protect freshwater with innovative policies, new technologies, cutting-edge scientific research developed at Canada’s freshwater laboratory—the IISD-Experimental Lakes Area.

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AquaAction is a charitable organization that engages young innovators and emerging water-tech companies to develop and apply innovative solutions to contribute to the restoration of freshwater health.

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Photo: Global Institute for Water Security

# INTRODUCTION: CANADA'S WATER TECHNOLOGY ECOSYSTEM

*Water technology or water tech refers to processes, products, and services that support sustainable and equitable water quality, quantity, supply, and management across the entire water cycle, as well as the interaction and integration of water with other human and natural systems.<sup>1</sup>*

Canada's water technology ecosystem extends across many of the country's largest sectors, including utilities, energy, mining, agriculture, and manufacturing. This ecosystem has given rise to a number of breakthrough technologies now widely used around the world, including ultraviolet disinfection and membrane filtration, along with competitive engineering companies that design and build world-class water infrastructure.<sup>2</sup>

Despite Canada's strong history of successful water technologies, there is a lack of accessible information around water innovation strengths, gaps, and opportunities, which restrains collaborations across the ecosystem and limits Canada's positioning as a global leader.

There are few readily available and sufficiently granular data on how water technology across multiple sectors drives employment and economic growth in Canada. We are also lacking a clear picture of how water technology can support critical conversations around Canada's net zero commitments and the Indigenous drinking water crisis. This makes it difficult for stakeholders to fully understand the water technology ecosystem, its national importance, and the key role it has to play in Canada's future. With a wide variety of industries, organizations, and applications drawing on water technologies, coordination of the ecosystem is critical to solving challenges and improving efficiencies across sectors, as well as securing the pipeline of future innovation.

# WATER TECHNOLOGY ECOSYSTEM MAP



Figure 1: Canada's Water Technology Ecosystem Map

[Canada's Water Technology Ecosystem Map \(CWTEM / the Map\)](#) was developed in 2020 through a collaboration between the International Institute for Sustainable Development (IISD), AquaAction, and waterNEXT, an initiative of Foresight. As the largest open access resource of its kind in Canada, the Map is a living resource. Its most recent update identifies over 700 Canadian water technology companies, enablers, and knowledge generators across a range of sectors. The Map is an effort to take an inventory of Canadian companies, 'connective tissue' organizations, and research institutions; identify regional and sectoral strengths; and support collaboration across the innovation cycle.

The goal for CWTEM is to serve as an entry point for a range of stakeholders and decision-makers navigating the Canadian water technology

ecosystem and as a tool for organizations within the ecosystem to more easily identify partners and resources. Since its publication, it has attracted significant industry and investor interest, both domestic and international.

While the focus of the current Map is to identify organizations across the ecosystem, future phases of planned development include expanding the Map to include information on company sector, stage, technology readiness level (TRL), technology application, export readiness, and relevant keywords. Once fully built out, the Map will offer a venue for water technology users, stakeholders, and investors across sectors to identify and screen emerging solutions.

This report presents key takeaways from Canada's Water Technology Ecosystem Map. This information is intended to:

- **Showcase ecosystem members** including companies, enablers, and knowledge generators, to paint a picture of the current landscape of water technology and innovation in Canada.
- **Compile ecosystem data** to communicate the impact and value of water technology across multiple regions and sectors.
- **Support the innovation process** by coordinating ecosystem players, identifying gaps, and highlighting opportunities for collaboration.

## DIVING DEEPER

Canada's Water Technology Ecosystem Map identifies:

### Companies:

Canadian water technology companies serve a variety of sectors and industries. The companies identified on the Map range widely in their technologies and applications, from emerging water software startups to well-established water treatment companies, and span both freshwater and oceans. Companies on the Map must have a direct water-related application or benefit; be involved in technology, innovation, research, or development in some capacity; be headquartered in Canada or have a strong Canadian innovation presence; and have a valid website. Based on these criteria, service providers, distributors, and consulting firms have not been included.

### Enablers:

Enablers are organizations of all shapes and sizes that support the water technology ecosystem, including accelerators, funders, industry associations, and others. Across sectors, they work to facilitate innovation, support commercialization of new technologies, and engage technology users, whether domestic or international. Due to the wide variety of organizations that exist across Canada, only enablers with a stated focus on water or with five or more water tech companies in their membership network have been included.

### Knowledge Generators:

Knowledge Generators included on the Map are academic, government, or non-profit organizations, institutions, centres, and other similarly sized entities (the list does not extend to the academic department, research group, or individual lab level). While the knowledge generators mapped here directly support water data, technology, or innovation, Canadian research institutions have a broad range of strengths in water, from environmental health to water supply.

## Company Categories

As companies with direct water-related applications or benefits were mapped, categories were defined based on coding of keywords from company websites. These categories represent technology themes and span across a number of sectors and applications.

### Seven company categories were identified:

1. **Filtration and treatment (244)**
2. **Monitoring and testing (119)**
3. **Water management and infrastructure (83)**
4. **Data and software (77)**
5. **Water supply and use (25)**
6. **Hydropower and tidal power (15)**
7. **Other applications; including aquaculture, brine mining, advanced materials, etc. (32)**



## THE CASE FOR COORDINATION

Canada is globally recognized as a water solutions country, with a successful history of innovative technology development. Canadian water companies are leaders in areas such as advanced disinfection and filtration, real-time monitoring, water security, and “smart” and digital decision support systems.<sup>3</sup> But despite Canada’s strong performance to date, the commercialization and adoption of solutions has been limited by barriers at the ecosystem level.

A 2018 UN University Institute for Water, Environment, and Health report on Canada’s water sector capacity for meeting Sustainable Development Goals (SDG) highlighted the need for better coordination and a national inventory of capabilities of the water ecosystem in order to improve both domestic and international performance.<sup>4</sup>

## SUPPORTING WATER INNOVATION

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In the 2019 report, *Toward the Creation of a Canada Water Agency: Discussion Paper*, it was noted that there are gaps in cooperation between stakeholders involved in freshwater innovation.<sup>5</sup> For example, three hypothetical water innovators, one based in Vancouver, one in Winnipeg, and one in Montreal, would be presented with very different opportunities and resources to support their ventures. Entrepreneurs based in rural, remote, and Indigenous communities may have few business supports available to them. Innovation supports are often siloed by region and sector, with limited connectivity among water technology developers, end users, and stakeholders.

Among more than 70 enablers identified through Canada’s Water Technology Ecosystem Map, there are very few with a national, sector-agnostic mandate to support water innovation. There are also a number of broader government programs such as the National Research Council’s Industrial Research Assistance Program that water technology startups and SMEs are able to access; however, these are not water-specific.

As the federal government continues its commitment to develop a Canadian Water Agency, there is an opportunity for this new organization to play a role in furthering coordination around water research, data, and innovation. Breaking down silos and building connections offers a chance to strengthen the Canadian water solution pipeline, from the earliest stages of ideation to successful technology adoption.

## INTERNATIONAL EXAMPLES

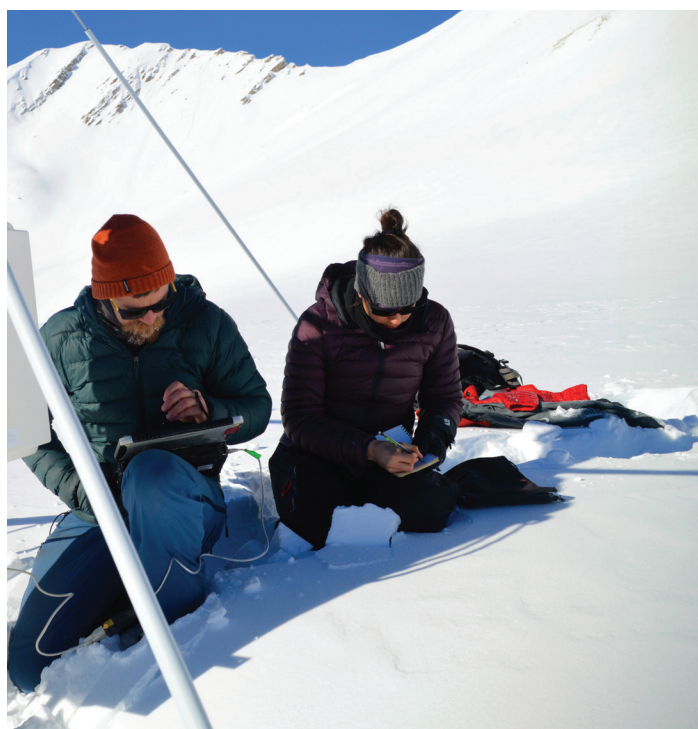
Countries with leading water technology ecosystems have placed a strong emphasis on enhancing collaboration across regions and sectors. In the UK, 19 water utilities came together to release a 2050 Water Innovation Strategy for the sector. The strategy is geared towards addressing challenges that the UK water sector expects to face in the coming decades, with a central vision of boosting innovation through a culture of collaboration.<sup>6</sup>

In the world’s first sector-wide commitment of its kind, UK water companies also released a Net Zero 2030 Routemap – a plan to deliver a net zero water supply for customers by 2030, with innovation as a core component. This target is estimated to save 10 million tonnes of greenhouse gas emissions by reaching net zero two decades ahead of the UK Government’s 2050 target.<sup>7</sup> As the host of the 2021 United Nations Climate Change Conference (COP26), which has seen the first appearance of a water-focused pavilion, the UK has taken a clear leadership role in centering water in climate conversations.<sup>8</sup>

One of the world’s foremost water leaders, the Netherlands’ water ecosystem also has a strong culture of collaboration.<sup>6,9</sup> The Dutch water sector refers to itself as a “network” and actively

promotes both global and domestic partnership opportunities, stating how important the sharing of knowledge and global and domestic partnerships, emphasizing the importance of knowledge sharing and cooperation.<sup>10</sup>

These examples, as well as those set by other leading jurisdictions such as Israel and Singapore, offer models for Canada as it looks to strengthen its water technology ecosystem.



*Photo: Global Institute for Water Security*

# ECONOMIC BENEFITS

Investment in the Canadian water technology ecosystem drives four key economic benefits across the country – green jobs, clean growth, global value, and environmental impact.

Data collected from startups in the waterNEXT network provides a snapshot of these benefits for a small fraction of the Canadian ecosystem. Thirteen water technology ventures reported performance in 2021, spanning from technology readiness level (TRL) 4 to 9 and ranging in size from 1-19 employees.

 <h2>GREEN JOBS</h2>	 <h2>CLEAN GROWTH</h2>
<p>Across 13 startups reporting from the waterNEXT network, <b>53 full-time equivalent (FTE) jobs</b> were added in 2021.</p> <p>In 2019, the watershed sector (a subset of the multiple sectors that make up the Canadian water ecosystem) directly <b>employed 27,200 people</b> in British Columbia alone.<sup>11</sup></p>	<p>Domestic revenue for Canadian water technology companies totaled well over <b>\$30 billion CAD</b> in 2019*.<sup>12</sup></p> <p>Across <b>13 startups</b> reporting from the waterNEXT network, total revenue in 2021 was <b>\$5.7 million CAD</b> and total capital raised was <b>\$28 million CAD</b>.</p>
 <h2>GLOBAL VALUE</h2>	 <h2>ENVIRONMENTAL IMPACT</h2>
<p>Nearly <b>80%</b> of Canadian water technology companies are exporters.<sup>3</sup> Export revenue for Canadian water technology companies totaled well over <b>\$7 billion CAD</b> in 2019*.<sup>13</sup></p> <p>Across <b>13 startups</b> reporting from the waterNEXT network, export revenue in 2021 was <b>\$3.3 million CAD</b>.</p>	<p>Water is critical to achieving Canada’s net zero target. Water and wastewater systems account on average for <b>38% of energy consumption</b> by Canadian municipalities and contribute <b>32% of reported municipal GHG emissions</b>, nearly half of that coming from sewage treatment.<sup>14</sup></p> <p>Companies from the waterNEXT network are working across multiple sectors to reduce water use, improve water quality, limit water-related GHG emissions, and advance multiple SDGs.</p>

*\*This is an aggregate of Statistics Canada water technology ecosystem data in the categories of industrial wastewater and municipal sewage treatment technologies; water management, recycling and treatment of drinking water technologies; remediation of ground and surface water, leachate, soil, sediment and sludge technologies; and water management and efficiency services. Revenue from water technology companies in closely related sectors such as agriculture, mining, and waste management may not be included as separate categories exist for these sectors.*



## HIGHLIGHTING THE ECOSYSTEM

595

**companies:**  
water technology startups, SMEs,  
and established companies serving  
a variety of sectors and industries

68

**enablers:**  
organizations supporting the  
water technology ecosystem,  
including accelerators, funders,  
industry associations, and others

# Canada's Water Technology Ecosystem<sup>15</sup>

65

**knowledge generators:**  
academic, government or non-  
profit research organizations  
with a focus on water data,  
technology or innovation

With more than 700  
organizations and counting,  
Canada's water ecosystem  
continues to grow, solidifying  
Canada's global position as a  
water solutions country.

# DIVING DEEPER

## BRITISH COLUMBIA

- 106 companies
- 9 enablers
- 10 knowledge generators

Hubs: Greater Vancouver, Victoria



**Spotlight:** **Saltworks Technologies** provides innovative products and solutions for industrial wastewater treatment, desalination, and lithium extraction.

## PRAIRIES

- 87 companies
- 10 enablers
- 8 knowledge generators

Hubs: Calgary, Edmonton, Saskatoon, Winnipeg



**Spotlight:** **Global Water Futures** is a pan-Canadian research program with the goal of delivering risk management solutions to manage water futures in Canada and other cold regions where global warming is changing landscapes, ecosystems, and the water environment.

## ONTARIO

- 238 companies
- 28 enablers
- 19 knowledge generators

Hubs: Greater Toronto Area, Guelph, Hamilton, Kitchener-Waterloo, Ottawa



**Spotlight:** **Ontario Water Consortium** enables water solutions that address the big challenges of today by connecting leaders at the forefront of innovation from industry, academia, government, and end-users.

## QUEBEC

- 103 companies
- 10 enablers
- 15 knowledge generators

Hubs: Greater Montreal, Quebec City



**Spotlight:** **AquaAction** is a non-profit organization with a mission to restore freshwater health in North America by engaging talented young innovators, activating their technologies, and supporting them as they turn their ideas into on-the-ground impact.

## ATLANTIC CANADA

- 62 companies
- 12 enablers
- 15 knowledge generators

Hubs: Halifax, St. John's



**Spotlight:** **Sentry** is a biological activity and water quality monitoring sensor platform that provides real-time microbial performance monitoring in anaerobic and aerobic wastewater treatment systems.



# MAPPING THE ROAD AHEAD

CWTEM is the most comprehensive resource of its kind on water technology and innovation in Canada. But while it effectively identifies organizations across the ecosystem, much of the detailed information needed to support coordination and decision-making has yet to be collected.

**Compiling detailed data on water technology companies is the next step in mapping the ecosystem. This includes:**

- 1. Number of employees**
- 2. Revenue and capital raised**
- 3. Technology readiness level (TRL)**
- 4. Technology sector and application**
- 5. Investment and export readiness**
- 6. Environmental impact and emissions reduction potential**
- 7. Equity, diversity, and inclusion among senior leadership**

Ecosystem level parameters are also needed for Canada as a whole, as well as individual regions and sectors. These include jobs, economic growth, investment, export, technological strengths, and environmental impact. Having more readily accessible information on water technology ecosystem capabilities and strengths would provide the necessary pull for more investment and support for innovators, startups, and SMEs, enablers across the country.

As this ecosystem map is further developed, we hope to find ways to reflect the full diversity of the companies' senior leadership teams, including BIPOC, gender diversity and representation of LGBTQ2S+ individuals, and other measures of diversity, equity, and inclusion within Canadian water technology companies. This includes working to support innovators in regions currently underrepresented on the map, including rural, remote, Northern, and Indigenous communities.

While this Map provides a snapshot of water technology in Canada, it is the enabler organizations and knowledge generators who are in the best position to meaningfully advance the national ecosystem and remove barriers to innovation. Many of these organizations serve critical roles, both regionally and nationally, but are capacity-constrained as few funding mechanisms exist to support initiatives at the ecosystem level. With adequate and appropriate funding and resources, these ecosystem builders can strengthen the connective tissue needed to drive innovation and increase economic benefits.

*Photo: Global Institute for Water Security*

# CONCLUSION

Through developing the Ecosystem Map, Foresight, IISD, and AquaAction are working to build bridges from industry to government, funder to innovator, sector to sector, and Canada to the world. Managing water as our most precious resource poses unique challenges, involving stewarding large amounts of data and coordinating ecosystem players across multiple sectors. It also opens up tremendous opportunities for innovation as the demand for water solutions around the world grows over the coming decades. Through ongoing development of CWTEM, we will continue to amplify conversations on national strengths and priorities, build strategic connections to increase collaboration, and collect the critical data needed to solidify Canada's position as a water solutions country.

Learn more about the

Canadian Water Technology Ecosystem

by exploring the [Map](#)



Photos: Global Institute for Water Security

Water Technology in Canada: A Snapshot of the Ecosystem





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