MaRS Discovery District in partnership with Tailwind Futures

Canadian Adaptation and Resilience Innovation Playbook

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Unlocking the adaptation market

As climate shocks increase, there is a growing demand for adaptation solutions.

The health of the planet is at a critical juncture. Climate change is no longer something for future generations to contend with. The impacts of floods, fires, droughts, famines and other climate-related catastrophes are threatening the wellbeing of communities across Canada and around the globe at increased frequency and severity.

Last year, the Insurance Bureau of Canada calculated that insured damages caused by severe weather events across the country exceeded $8 billion — nearly triple the losses in 2023. And these climate shocks have knock-on effects on our economy: The Canadian Climate Institute estimates that the impacts of climate change will slow Canada's economic growth in 2025 by $25 billion annually, which is equal to 50 percent of projected GDP growth.

While we must continue reducing greenhouse gas (GHG) emissions, we also need to adapt to the realities of our changing climate. Canada's infrastructure, economy and safety depend on our ability to predict, prevent, manage and recover from these extreme events. Research shows that being pro-active in building resilience pays dividends: for every $1 spent on adaptation measures today, it's estimated that $13-$15 will be returned through direct and indirect benefits.

There are still significant gaps, however, when it comes to supporting climate adaptation technologies (also known as adaptech). Our analysis reveals a stark mismatch between where climate risks are escalating and where market-ready, innovative adaptation solutions are emerging. Despite pockets of strong innovation activity, critical gaps in financing, scaling pathways and public-sector adoption are hindering the growth of technologies that could safeguard Canada's communities and economy. Demand for adaptation, however, is rising sharply from municipalities facing unprecedented costs and industrial players seeking tools to protect assets, workers and supply chains.

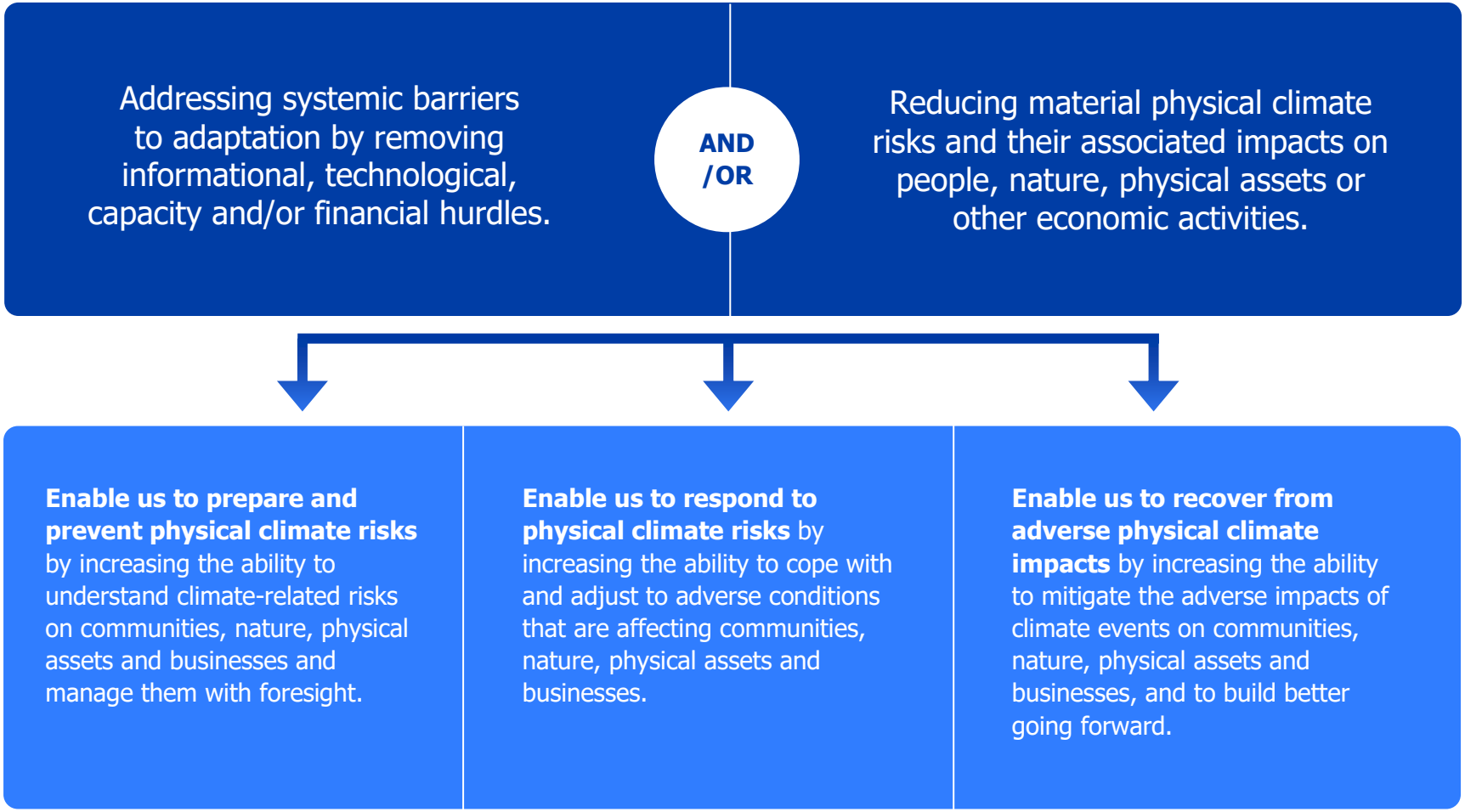
Unlocking this market will require coordination across investors, governments and industry. The payoff, however, could transform the resilience landscape — in Canada and around the world.

"We have a moral duty to identify how scientific and technological innovation can accelerate public and private adaptation to the impacts of climate change."

– **Emilie Mazzacurati**, Founding Partner, Tailwind Futures

Key terms

Adaptation and resilience (A&R) solutions are products or services that prepare, prevent, respond to and/or enable recovery from climate shocks and stressors.

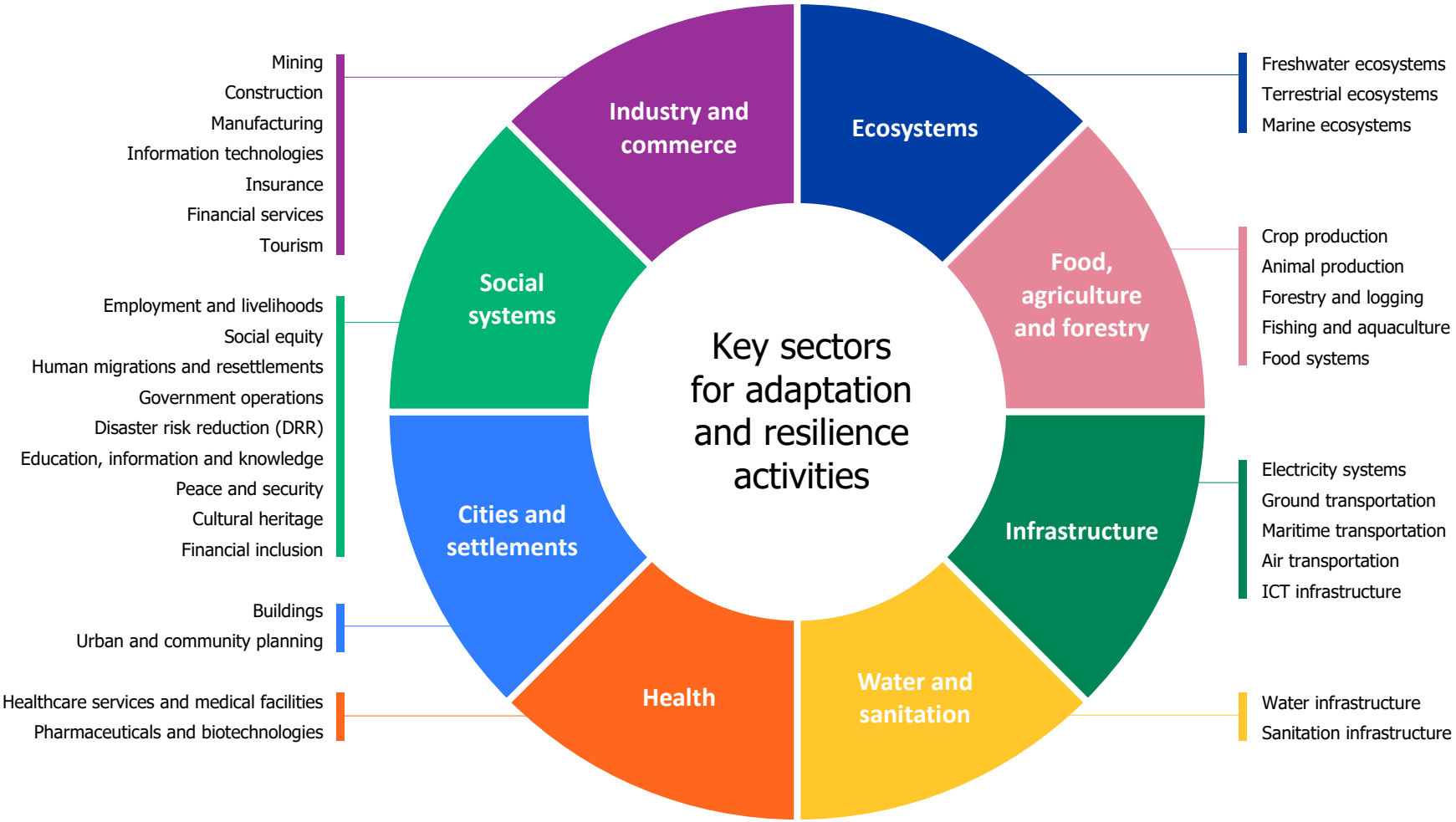


Source: Tailwind Futures, The Adaptation and Resilience Innovation Playbook, 2024.

Taxonomy

Climate change is affecting lives and livelihoods, economic, social and cultural assets, and ecosystems globally.
The Tailwind taxonomy provides a structured breakdown of key sectors where A&R activities and solutions are needed.

See tailwindclimate.com/taxonomy for the full taxonomy, including detailed examples and mapping to common economic taxonomies.



Source: Tailwind Futures

Canadian demand for A&R solutions

A look at the emerging market for new innovations.

While there is demand for adaptation solutions across all three levels of government, as well as among corporations and consumers, our research shows the demand is relatively fragmented and primarily reactive to the impacts of climate change. Canada's challenge — and opportunity — is to convert risk awareness into structured, investable demand for solutions.

This report analyzed how public, corporate and consumer spending on climate resilience needs are translating — or failing to translate — into market demand. Working on the assumption that demand for A&R signals a growing market for new innovations and technological solutions, we looked at the demand for *all* adaptation and resilience solutions (and not just for new technologies from ventures).

This analysis offers an early look at this nascent and developing sector, providing a baseline that can help track progress in the years to come.

Gauging demand

This analysis assessed three primary demand segments:

- **Government**: Federal, provincial and territorial, and municipal expenditures on adaptation and resilience programs or projects in 2024.
- **Corporate**: Adaptation-related planning, investment and risk management among 27 of Canada's largest publicly traded companies.
- **Consumer**: Household-level costs, attitudes and purchasing behaviours linked to climate impacts. (Note: information is relatively limited in this area.)

Tallying up the damages

The last three years have been the worst fire seasons in Canada on record, according to a federal database that started tracking details in 1972. And these extreme weather events may soon become the new normal. In 2024, in addition to devastating fires in Jasper and the Northwest Territories, there were floods in Toronto, a freak hailstorm in Calgary and a hurricane in Quebec. All told, extreme weather events inflicted a record $8.5 billion in damages. This points to the growing demand for adaptech solutions to help prepare for and respond to these increasingly frequent adverse events.

Demand from all levels of government

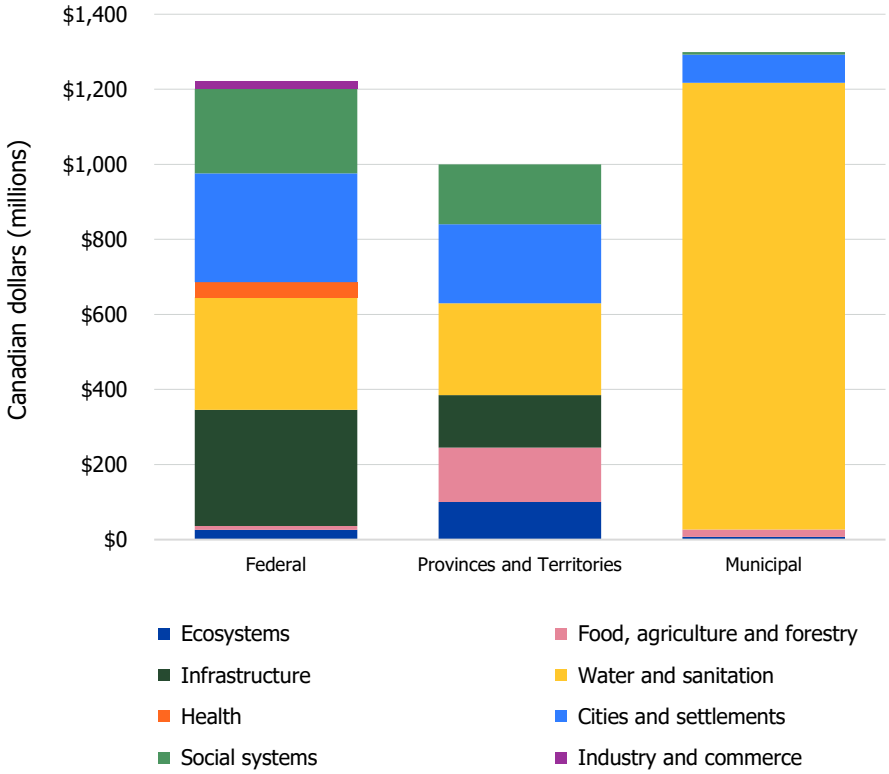
We tallied up all the public sector expenditures made in 2024 on climate adaptation and resilience across federal, provincial and territorial levels, as well as six large municipal governments. In terms of spending on projects and programs that make Canadian systems more adapted and resilient to a changing climate, we identified:

Federal: $1.22 billion

Provincial and territorial: $995 million

Municipal: $1.30 billion

Canadian government spending on adaptation



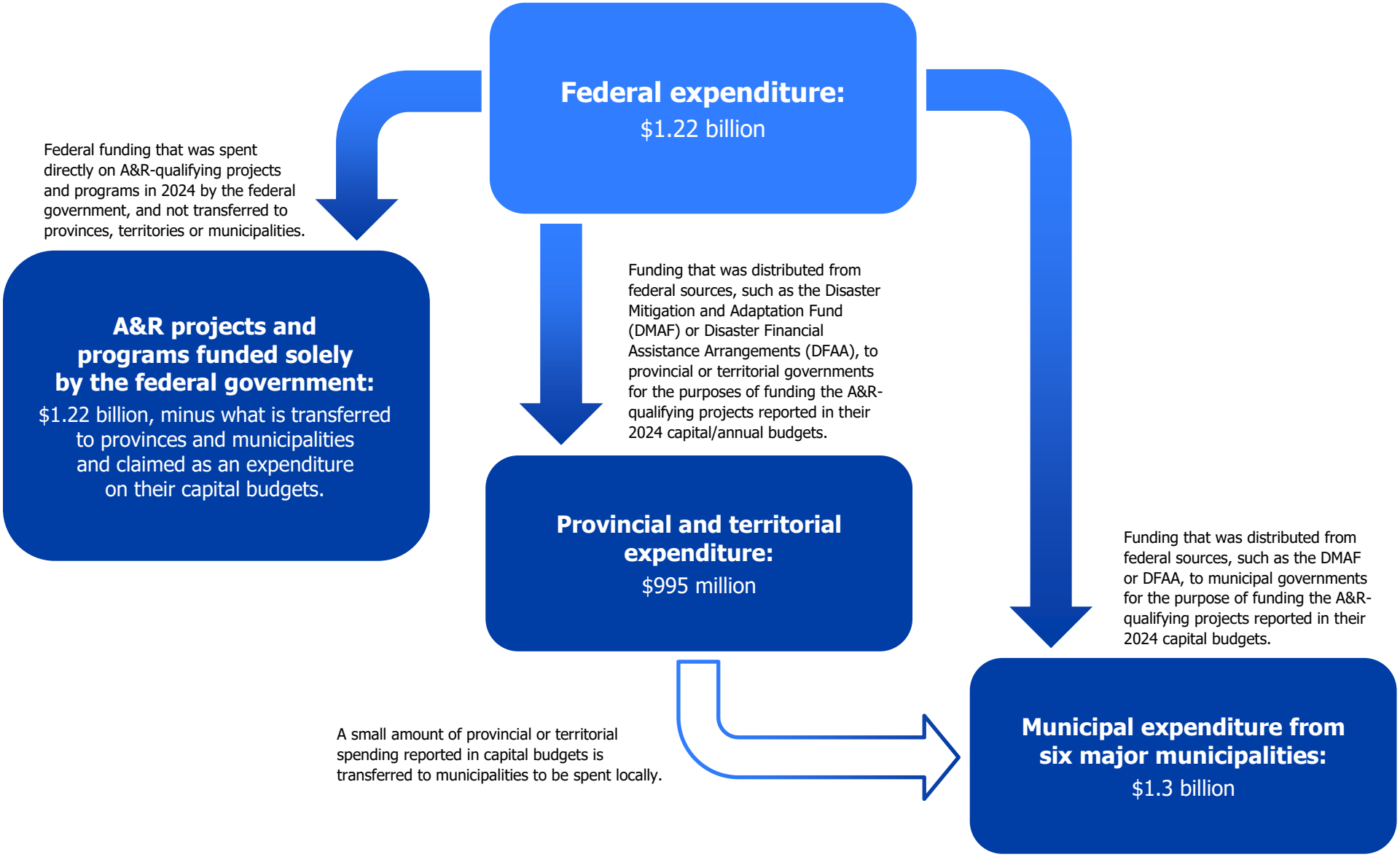
Methodology overview

Spending data was aggregated from the annual or long-term capital expenditure budgets of each government surveyed, along with multiple program budgets at the federal level.

There is considerable overlap between these amounts, therefore it should not be added as a total aggregate amount to avoid double or even triple counting. The majority (at least 72 percent) of federal A&R funding flows to provincial, territorial and municipal governments, and some provincial funding also manifests as financial support for municipal projects.

All spending numbers, unless explicitly stated otherwise, are referring to the portion of the program's spending that occurred during 2024. All dollar values are in Canadian dollars.

The flow of funds between and from Canadian governments for expenditure on climate adaptation and resilience projects in 2024.



Canadian federal government demand

In 2024, disaster response and infrastructure transfers made up the bulk of spending by the federal government on adaptation and resilience solutions. Our analysis shows it spent $1.22 billion in 2024.

62%

Was spent on the Disaster Financial Assistance Arrangements (DFAA) program, which is run through Public Safety Canada. Up until 2025, DFAA focused on response and recovery transfers/cost sharing with provinces and territories. (The distribution breakdown is heavily influenced by DFAA investments due to its large size. For a deeper dive into Housing, Infrastructure and Communities Canada's investments, including DMAF, see page 10)

10%

Was spent on the Disaster Mitigation and Adaptation Fund (DMAF), which is run through Housing Infrastructure and Communities Canada. This funds forward-looking infrastructure projects that increase the resilience of communities against natural hazards and climate change.

~28%

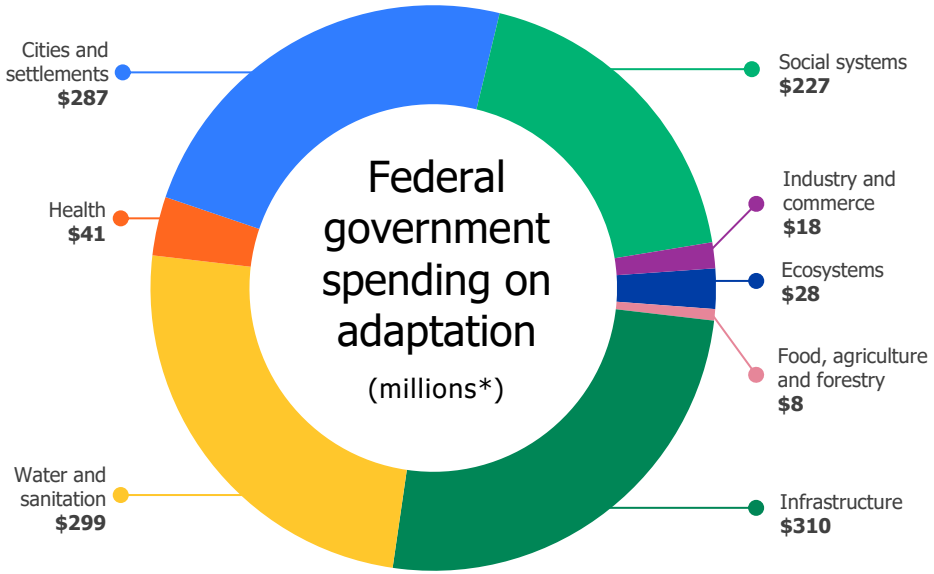
Was spent on a mix of federal programs, including Local Leadership for Climate Adaptation Initiative, the Wildfire Resilient Futures Initiative, First Nations Climate Resilience and Climate Toolkit for Housing and Infrastructure.

Infrastructure; Water and sanitation; and Cities and settlements together account for more than 70 percent of total federal adaptation spending, driven largely by large-scale projects under the Disaster Financial Assistance Arrangements (DFAA) and the Disaster Mitigation and Adaptation Fund (DMAF). This shows a strong emphasis on flood management, drainage and climate-resilient urban systems.

Social systems (19 percent) and Health (3 percent) receive comparatively modest funding, indicating that social and public health resilience measures remain underdeveloped relative to physical infrastructure. There may be other programs and budgets outside the ones explored for this research, however. This could demonstrate that additional investments in these areas are not yet tagged as adaptation.

Ecosystems (2 percent) and Food, agriculture and forestry (1 percent) receive very limited funding, despite their importance in managing climate risks related to drought, wildfires and biodiversity loss.

Industry and commerce (1 percent) also sees minimal federal investment, reflecting limited support for private-sector adaptation at this stage.



* All data is presented in Canadian dollars.

Deeper dive: Housing, Infrastructure and Communities Canada (HICC)

We found $7.1 billion in infrastructure investment projects with estimated project timelines spanning from 2017 to 2033 tagged as "climate resilience" on HICC's project database. We estimate that $165 million of this spending occurred during 2024, based on the 2024 fraction of funding that has flowed to date.

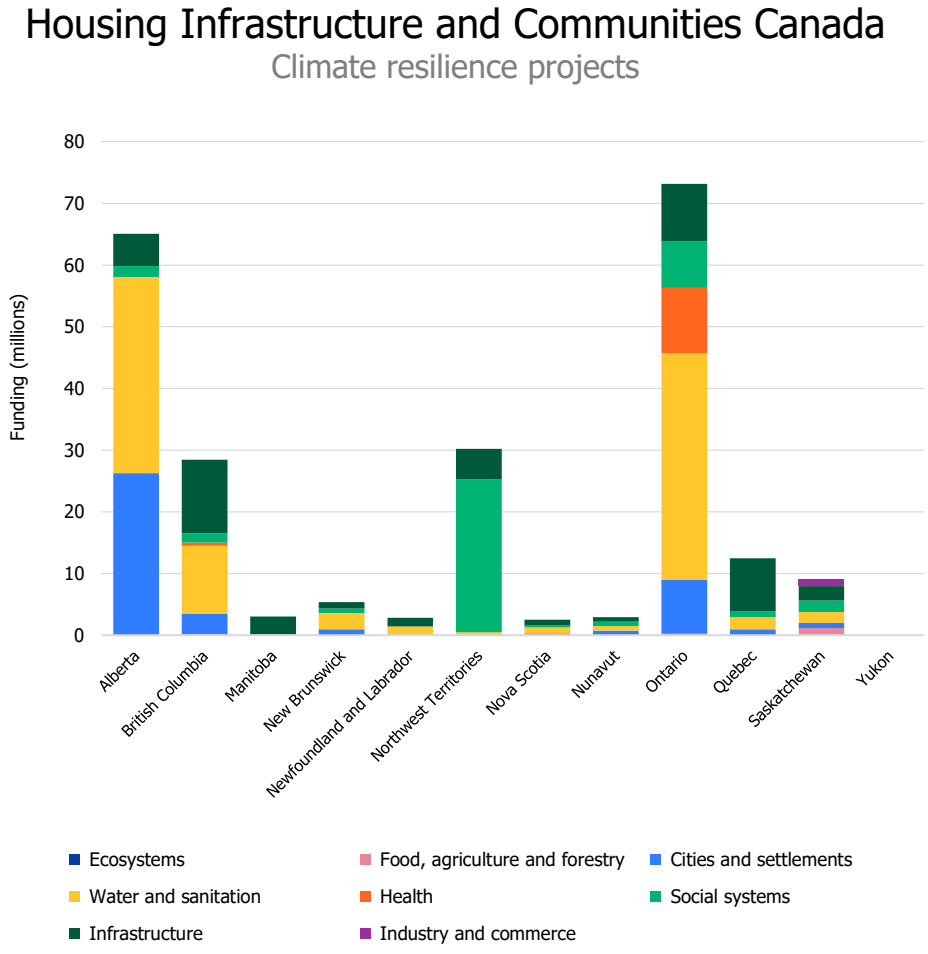
These 2024, climate resilience-tagged investments are divided among:

- Disaster Mitigation and Adaptation Fund (DMAF): $125 million
- Investing in Canada Infrastructure Program: $36 million
- Provincial-Territorial Infrastructure Component, National and Regional Projects: $3 million
- Provincial-Territorial Infrastructure Component, Small Communities Fund: $0.4 million

While DMAF spending constitutes the majority of the spending in 2024 by dollar value, it only makes up 39 percent of the projects in the HICC database. The bulk of HICC funding is directed toward disasters.

More than 80 percent of the spending in this database estimated to have occurred during 2024 was directed to projects in Ontario (31 percent), Alberta (28 percent), Northwest Territories (13 percent) and British Columbia (12 percent). The remaining provinces and territories each received 5 percent or less of the total spending.

This concentration is likely the result of several factors. These regions experienced significant climate-related disasters in the years leading up to this 2024 analysis — floods, fires and severe storms — which sparked the need for high-priority adaptation projects. Provinces with larger populations and infrastructure footprints require higher absolute spending, while in the Northwest Territories spending was driven largely by a major shoreline protection initiative, whose scale and cost reflect the higher expenses associated with building infrastructure in remote areas. It should be noted that as this analysis is based on one year of data, further study in the coming years is needed to identify clear trends.



Provincial and territorial governments demand

Provincial adaptation spending is heavily concentrated in B.C., Alberta and Ontario, driven by wildfire response and recovery. This reflects a reactive focus on recent disasters rather than proactive efforts.

Our analysis found that provinces and territories (P&T) spent $995 million on adaptation in 2024. A significant portion of this funding comes from intergovernmental transfers; these are cost-sharing programs, however, so there are still direct investments made by P&T.

The top three P&T spending on adaptation were:

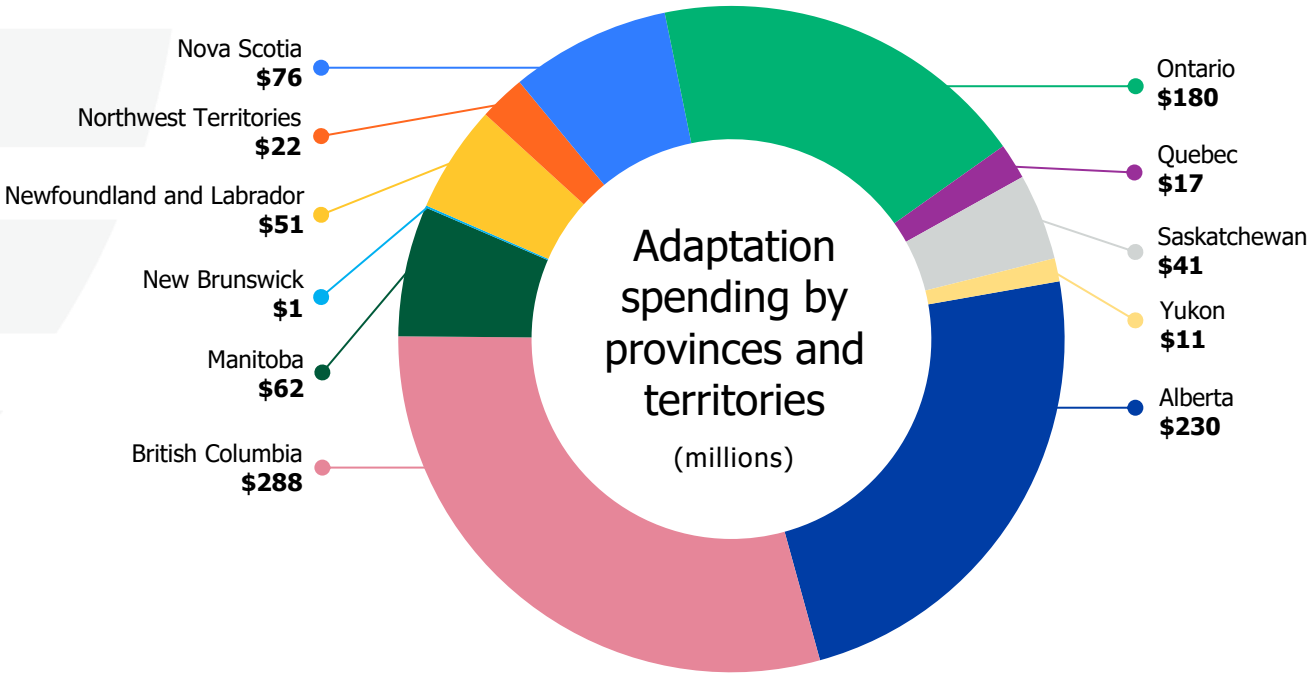
- British Columbia: $228 million (29 percent)
- Alberta: $230 million (23 percent)
- Ontario at $180 million (18 percent)

This concentration aligns with where recent large-scale wildfires, floods and other climate-related events have occurred. The remaining provinces and territories each constitute less than 10 percent of the total provincial/territorial spending found.

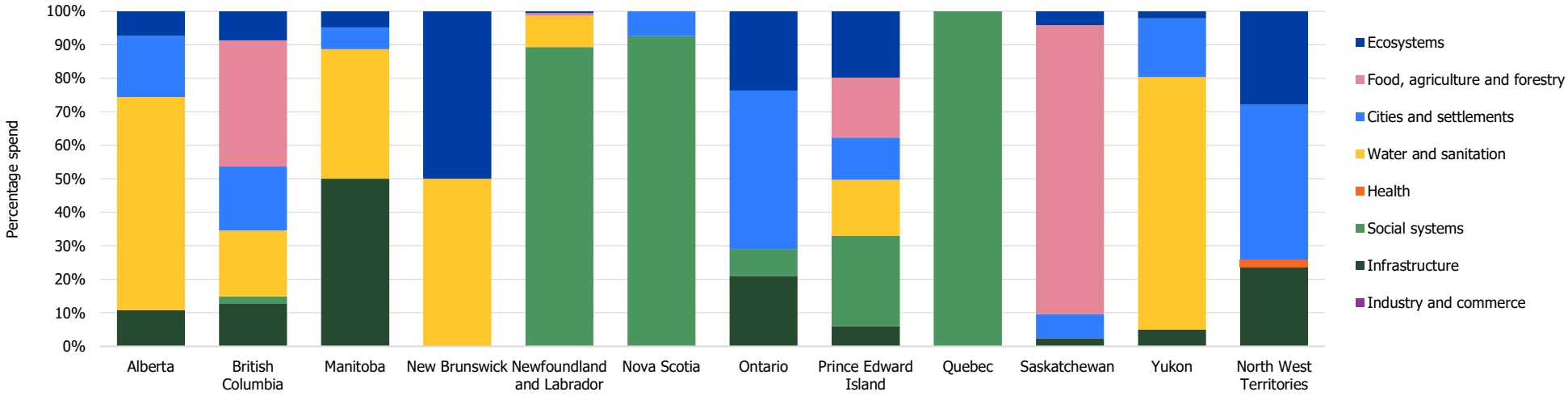
On a per capita basis, this pattern shifts, showing a higher spending in smaller provinces and territories but this should be interpreted with caution. Small population sizes, the presence of single large projects and the high cost of delivery, particularly in remote and rural areas, all distort per-capita comparison. Likewise, a lower spend per capita shouldn't be assumed to signal underinvestment, particularly considering densely populated provinces where, for example in cities, the same dollar of adaptation can protect more people. Per capita comparisons therefore offer only directional insights but should be read with caution.

The sectoral distribution shown through the stacked proportional analysis (see page 12) shows how uneven and hazard-specific provincial spending remains. Most provinces and territories allocated the majority of their funds to one or two sectors, with limited investment across the others. For example, Ontario's spending profile is particularly narrow, with 80 percent of its adaptation funding directed to wildland firefighting (divided across three taxonomy themes: Cities and settlements; Ecosystems; and Infrastructure), despite significant flood and storms events.

Overall, wildfire response and prevention was most consistently present across provincial portfolios, making up 28 percent ($274 million) of total P&T adaptation expenditures and reflecting the growing cost of extreme fire seasons across western and central Canada. Taken together, the sectoral patterns show that P&T adaptation remains highly reactive to hazards with limited investment in multi-sector, forward-looking resilience.



Proportional provincial and territorial spending



* Nunavut territorial spending was not available.

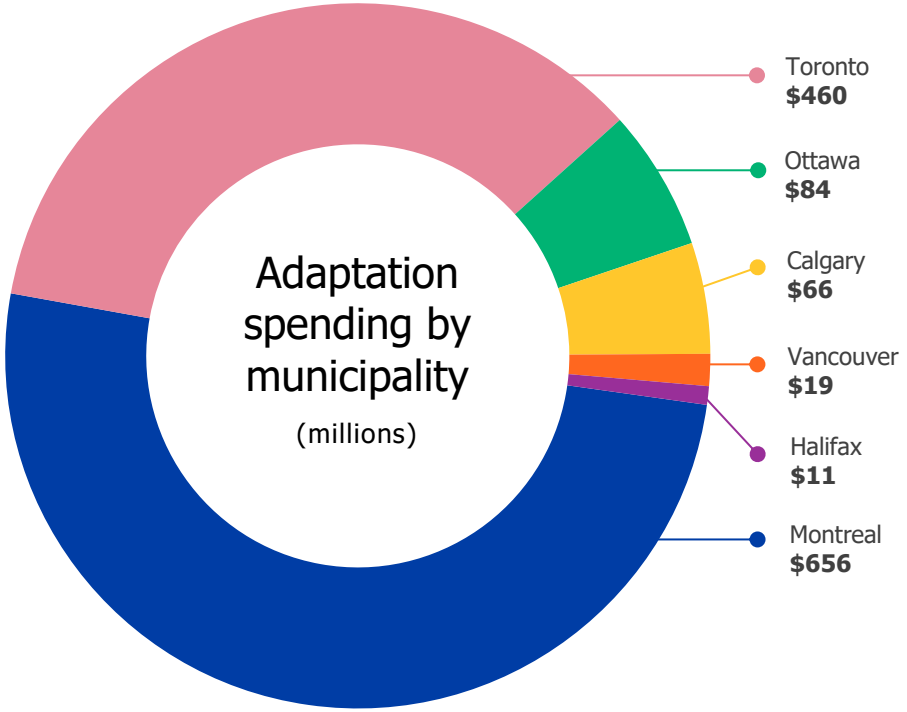
Canadian municipal governments demand

Municipal adaptation investment remains highly concentrated and reactive, addressing known infrastructure deficits rather than broader municipal resilience needs.

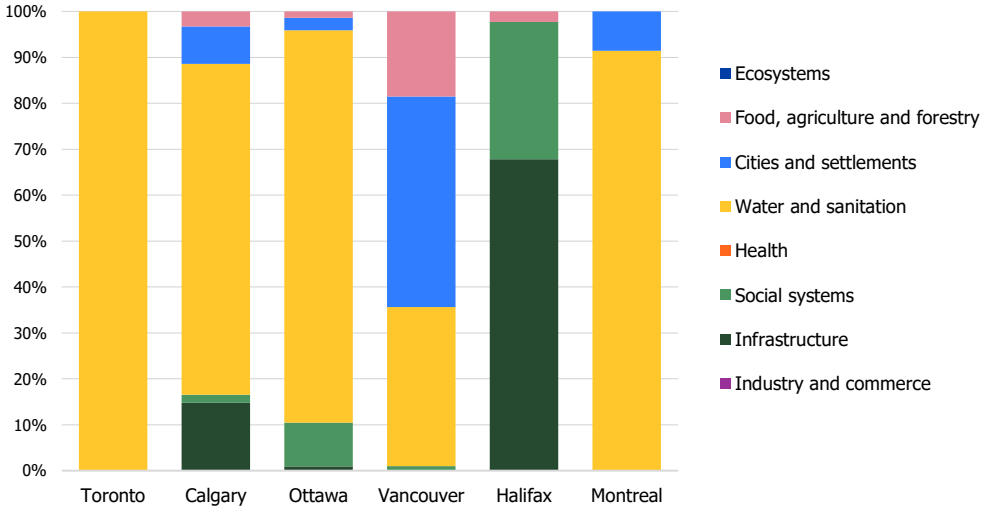
The analysis focused on six major municipalities: Toronto, Montreal, Ottawa, Calgary, Vancouver and Halifax. Part of the Low-Carbon Cities Canada (LC3) network, these cities represent about half of Canada's population and serve as a proxy for large-urban climate investment trends. We found that they spent $1.5 billion on adaptation in 2024, with two cities accounting for the bulk of that amount.

Toronto ($460 million) and Montreal ($656 million) represent 86 percent of total municipal spending, which was driven by multi-hundred-million-dollar water infrastructure improvement projects.

The proportional sectoral breakdown shows how narrow and infrastructure-focused municipal adaptation portfolios are. The vast majority — 92 percent — of municipal spending was directed to Water and sanitation. This concentration reflects urgent investment needs in aging water systems: According to Statistics Canada, 10 percent of Canada's water infrastructure is rated "poor" or "very poor." As the OECD notes, "water management infrastructure failures in Montreal during summer 2024 underscored overdue investment in upgrading ageing sewer infrastructure and stormwater management systems. Major storms that caused massive floods in the streets of Toronto during summer 2024 also point to infrastructure vulnerability in the wake of increasingly heavy rainfall events."



Proportional municipal spending by theme



Canadian corporate demand

Corporations, which face significant physical, operational and financial risks from climate impacts, play a central role in building Canada's climate resilience. Adaptation at the corporate level not only helps to ensure business continuity, but also supply-chain stability, employment and community infrastructure.

As major asset owners and investors, large companies help shape demand for adaptation and resilience solutions across sectors from flood-proof materials and water security systems to insurance and analytics. Yet, if poorly targeted, corporate actions can lead to maladaptation. Unintentionally, this can result in adverse outcomes to the communities in which they operate by transferring instead of reducing the risk.

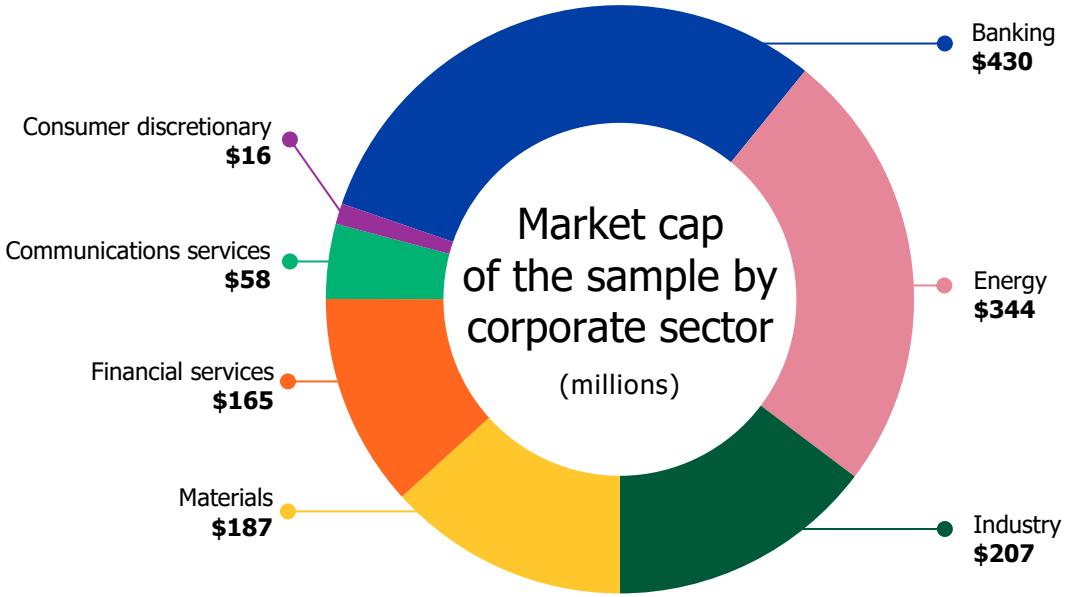
31%

Of small and medium-sized enterprises were negatively impacted by severe weather events in 2024.

Source: Insurance Bureau of Canada

Methodology

We reviewed climate disclosures from 27 of Canada's largest publicly traded corporations, representing $1.52 trillion in market capitalization across eight sectors with significant exposure to the physical impacts of climate change. The sample was determined by selecting companies with a large market size, prioritizing a diversity of sectors and companies operating in sectors known to have high exposure to the physical impacts of climate change.



Climate risks cut across the corporate value chain, including physical assets, operations, workforce and supply chains (including underlying raw commodities), as well as public and third-party infrastructure (such as water, energy, ICT and transportation).

Climate risks are especially relevant for companies with:

- Long-term fixed assets
- Operations in climate-sensitive regions, such as flood- or heat-prone zones
- High dependencies on natural resources, including water

Value chains reliant on any of the above

Most exposed industries	Physical assets	Operations and workforce	Public and third-party infrastructure	Supply chain	Examples
Agriculture and food	●	●	●	●	The agricultural supply chain is particularly vulnerable to even small changes in temperature and precipitation.
Manufacturing	●	●	●	●	Workers can be exposed to extreme heat, face challenges with water scarcity. High-value assets are exposed to extreme weather and flooding.
Healthcare and pharmaceuticals	●	●	●	●	Pharmaceutical manufacturing requires high-quality water. Heat affects the cold chain for storage and transportation of products.
Utilities	●	●	●	●	Extreme weather events and wildfires affect infrastructure, exposing workers to heat and limiting water availability for hydropower.
Telecom	●	●	●	●	Telecom infrastructure is vulnerable to extreme weather events, and workers are also exposed to extreme heat.
Real estate	●	●	●		Buildings are exposed to floods, extreme weather events and increased operational costs due to heat.
Construction	●	●	●	●	Workers and worksites are exposed to extreme weather and heat.
Transportation	●	●	●		Roads, railroads, bridges and airports are exposed to extreme weather events, floods and sea level rise.
Information technology	●		●		Data centres have high water and cooling requirements.

Source: Tailwind Futures, The Adaptation and Resilience Innovation Playbook (adapted)

Demand from Canadian corporations

While there is high awareness of the problem among corporate leaders, there is also low quantification and limited spending.

Nearly all corporations in our sample acknowledge that climate change poses a business risk, but few translate this recognition into measurable investment.

- 96 percent of companies recognize climate change as a material threat
- 86 percent conduct climate hazard scenario analyses
- 15 percent have a formal adaptation plan
- 11 percent disclose quantifiable spending on adaptation

This pattern mirrors findings from Tailwind's 2024 U.S. Playbook. There are similar distributions, but a slightly higher share of Canadian firms is investing in physical risk reduction and bringing new resilience products to market. (These differences are modest and may not be statistically significant.)

To note, the absence of quantifiable spending does not necessarily imply inaction. It may also reflect a reporting and classification gap, recognizing most corporate adaptation investments are voluntarily disclosed and may not be clearly "tagged" as adaptation.

Recent regulatory scrutiny under Bill C-59, which legislated new rules against misleading environmental claims, may also have contributed to under-reporting, particularly among energy companies cautious about framing climate-related expenditures.

Protecting assets

Both rail transportation companies surveyed — Canadian National (CN) and Canadian Pacific Kansas City (CPKC) — report developing firefighting trains that can be deployed along their networks to combat wildfires as a climate resilience strategy. As the OECD notes: "Wildfires often impact forestry and the extraction industries. In 2023, in response to spreading wildfires several Canadian forestry, and oil and gas producers suspended operations, causing significant losses of output. Wildfires can compromise critical infrastructures, which can disrupt trade, as seen in 2023 in British Columbia with the shutdown of rail transportation at Fraser Canyon blocking thousands of rail cars."

Corporate actors are facing growing pressure

While adaptation awareness is high, activity remains limited or underreported.

Sectoral patterns reflect differing material exposures:

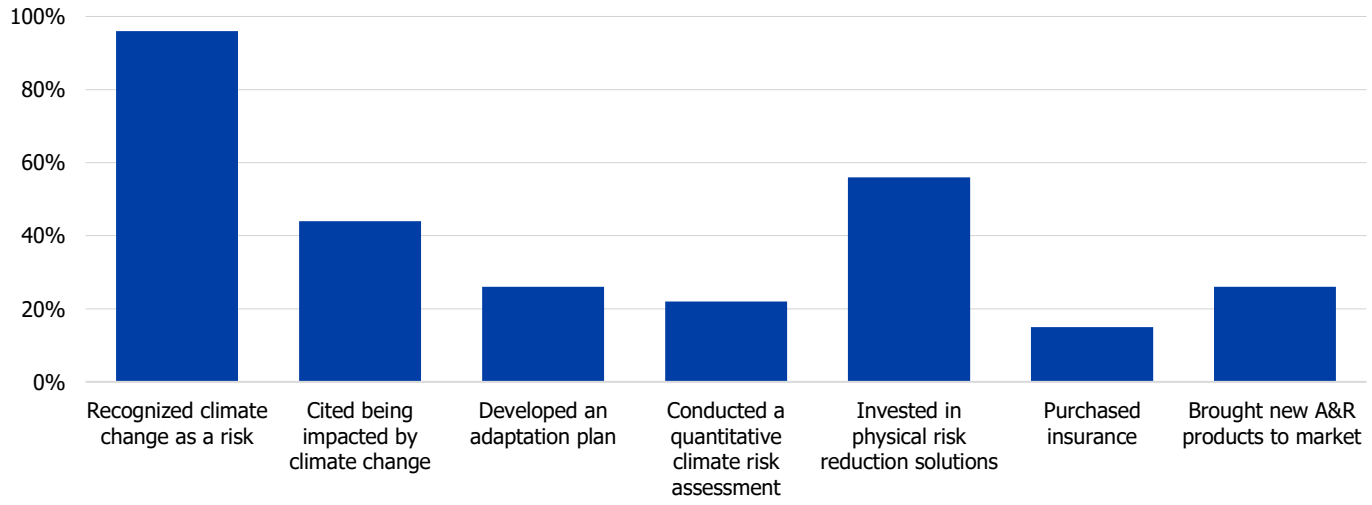
- Mining and rail companies are the most advanced in recognizing and responding to physical impacts; all reported being directly affected by climate change.
- Banks show the opposite profile. None reported direct exposure, which is expected given their relatively low physical exposure. Yet, they presented the highest rate (100 percent) of quantitative financial risk modeling, well above the average 22 percent across the sample.
- Consumer staples and energy firms report comparatively low immediate impacts, suggesting under-recognition of supply-chain vulnerability. Suncor Energy was the only company not publicly recognizing climate change as an operational risk.
- Water scarcity is a leading concern with all four mining companies citing climate-driven water risk as material to their operations.

Examples of disclosed adaptation spending include:

- TELUS has allocated $125 million over five years on climate resilience. Its corporate venture capital arm's investment thesis explicitly includes "solutions that improve early detection and response to extreme climate events."
- Intact Financial has spent $27.4 million since 2010 on adaptation research and resilience programs.
- Teck Resources has directed $1.3 billion toward a desalination and water-pipeline project securing long-term water supply.

These examples demonstrate that when climate risk directly intersects with core operations, companies are willing to invest at scale, but most remain at the stage of assessment rather than action (at least as can be discerned from public reporting).

Proportion of companies that have implemented the following actions



Canadian consumer demand

Limited data, high exposure: consumer demand for adaptation remains largely unquantified.

Consumer spending to adapt to climate change can be thought of as an aggregate of many small and large purchases that often cannot be explicitly attributed to climate change and is rarely tracked as such by centralized data collectors. This analysis did not attempt a bottom-up summation of all consumer spending attributable to climate changes but rather sought to present a qualitative analysis of how we expect consumer demand to manifest based on publicly available Canadian survey data, locally relevant climate hazards and our industry experience.

This still proved to be challenging, however, given scarce publicly available information. The findings presented below are qualitative and illustrative, but not conclusive.

Key takeaways

- Publicly available data is insufficient to estimate total consumer spending on adaptation in Canada. Available evidence suggests meaningful exposure but limited measurable market activity.
  - According to a survey conducted in June 2025 by Canadian polling firm Leger, 23 percent of Canadians have been personally impacted by an extreme weather event in the previous 12 months. Of those who report being personally impacted:
    - 65 percent report being forced to stay indoors due to air quality concerns (from wildfire)
    - 20 percent report suffering property damage
    - 8 percent report being evacuated due to floods
    - 7 percent report being evacuated due to wildfire
  - The Canadian Climate Institute estimates that climate-related damages increase the average household cost of living by approximately $700 per year. However, this is an estimate of economic cost, not spending. This, for example, includes indirect costs such as increases in grocery bills due to supply-chain disruptions, rising home insurance premiums and tax hikes to pay for disaster recovery and infrastructure repairs. We were unable to separate direct out-of-pocket climate-related spending for households.

"The single biggest asset most of us will ever have is our home. And for the last few years, the cost of protecting that has been less than the cost of an iPhone. So as that doubles, triples, quadruples, consumers are going to be desperately looking for avenues that help them build better in the first place to avoid the cost."

– **Paul MacDonald**, EVP, Personal Insurance and Digital Channels, Definity

Canadian supply of adaptation solutions

Adaptation startups represent a sizeable — and growing — segment of Canada's climate tech startup sector.

MaRS partnered with Vibrant Data Labs, leveraging the AI model developed with Tailwind Futures to identify A&R Canadian startups and map them to the Tailwind Taxonomy. The startups included MaRS's portfolio of companies as well as databases Crunchbase and Pitchbook.

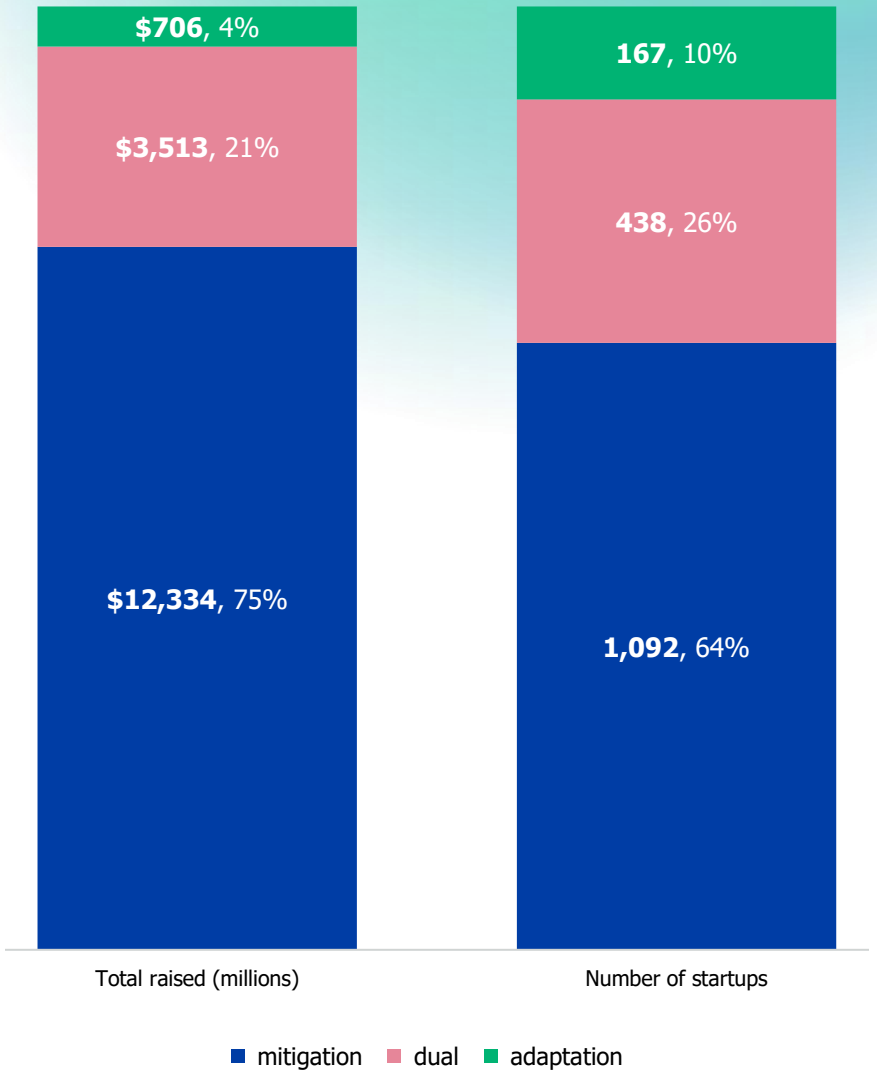
The analysis shows that 36 percent of Canadian climate-relevant startups have adaptation and resilience benefits.

However, when MaRS's portfolio companies were asked if their "products or services contribute or could they potentially contribute to climate change adaptation," 46 percent responded yes and 12 percent were unsure. This may indicate that more ventures across Canada may perceive their products or services as at least dual-benefit, but their communications don't reflect that yet.

Pure-play adaptation startups, including technologies focused on supporting climate risk and resilience activities with little or no mitigation benefits, make up 10 percent of all funded climate startups, yet receive 4 percent of total funding ($706 million). Examples include water sensors, early warning systems and climate risk analytics.

Dual-benefit startups include those with mitigation co-benefits. Often seen, for example, through food and agriculture and grid resilience. Our research showed that in Canada, dual-benefit startups accounted for 25 percent of all climate-relevant startups, accounting for 21 percent of the total funding raised.

Distribution of Canadian climate-relevant startups and funding allocation



Supply: Pure-play startups

Pure-play adaptation startup investment is narrowly concentrated in Food, agriculture and forestry systems.

Pure-play adaptation investment in Canada remains heavily concentrated in Food, agriculture and forestry, which together account for more than 85 percent of total capital raised ($608 million of $706 million) and roughly half of all identified pure-play startups. Activity is led by crop production and food systems innovations, reflecting sectors with clearer ROI pathways, access to R&D funding and subsidies, and established financing networks through organizations such as Farm Credit Canada and Protein Industries Canada.

By contrast, Cities and settlements; Water and sanitation; and Ecosystems account for less than 3 percent of total capital raised, despite addressing some of Canada's most pressing physical climate risks: flooding, wildfire and urban heat. Within these categories, innovation activity is fragmented and early stage. For instance, fire-related ventures often fall under forestry or ecosystem restoration, while urban adaptation and infrastructure startups remain sparse. Structural challenges, such as fragmented regulation across jurisdictions, lengthy public procurement cycles, and limited commercialization pathways continue to constrain growth for built-environment and municipal-scale adaptation solutions.

Industry and commerce ranks a distant second, with $56 million raised, driven largely by ventures in IT, insurance and financial services. This emerging segment signals growing corporate attention to resilience and risk management, though total investment remains small compared to the U.S., where similar ventures attracted approximately $2.25 billion and nearly half of all pure-play adaptation capital.

Overall, the Canadian adaptation innovation landscape remains narrowly concentrated and misaligned with national climate hazard exposure. The innovation road map (see page 32) identifies opportunities to diversify the venture supply base and strengthen linkages between high-risk sectors and emerging adaptation markets.

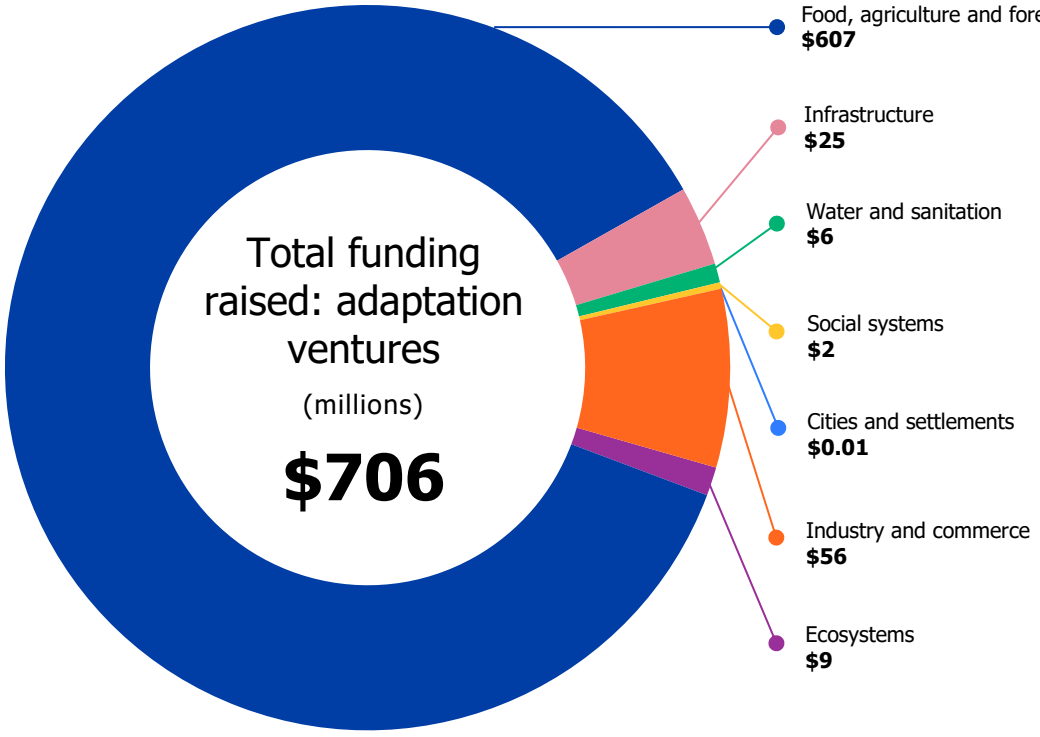
"We're at the beginning of an inflection curve around the incentives for a return on resilience and adaptation. And the more models where a property owner or a property manager can make an investment and know that they can finance that investment, the better."

– **Chris Godsall**, CEO and Co-founder, NOAH Intelligence

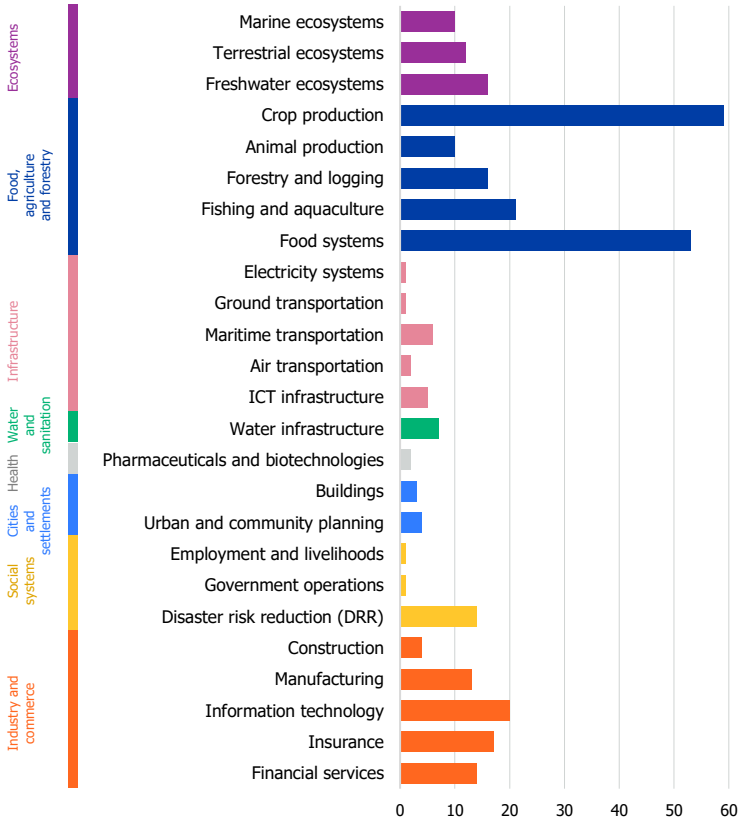
"Only 7 percent of global climate finance goes to adaptation. The proportions are roughly similar in Canada as well. Federal and provincial programs that help municipalities and communities strengthen infrastructure and build resilience to climate change are massively oversubscribed.

There is not enough public funding to go around. So the result is a widening gap that leaves people, businesses and local economies exposed to growing climate risk."

– **Ryan Ness**, Director, Adaptation, Canadian Climate Institute



Startups by theme and sector



Note: A company can be mapped into multiple categories, not mutually exclusive. Sectors with zero startups are excluded from the graph.

Deeper dive: Pure-play startups in Food, agriculture and forestry

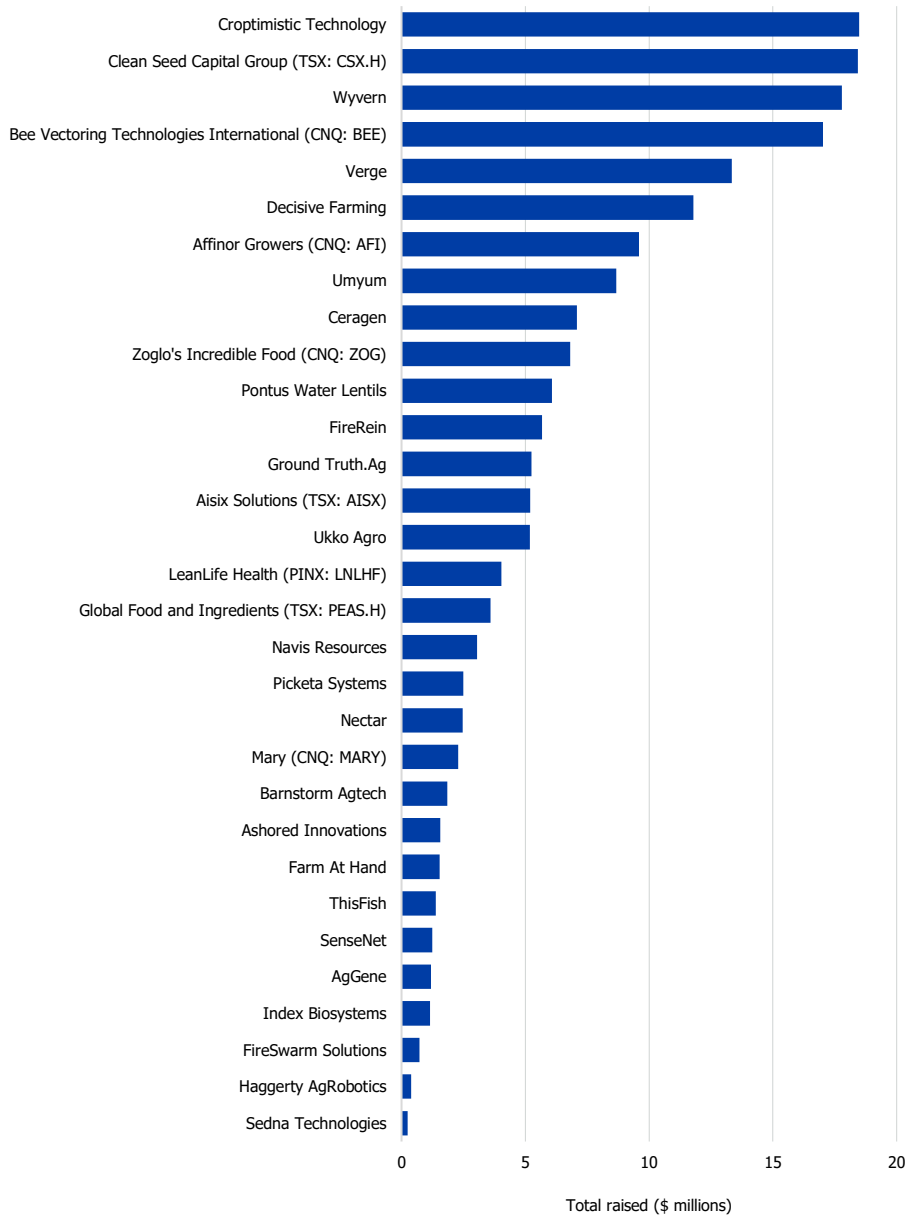
To better understand the high proportion of funding directed toward pure-play adaptation startups in Food, agriculture and forestry, we conducted an analysis of the active investors in these companies and their total funding raised. Of the 123 companies, 57 have "Total Funding Raised" data available in PitchBook.

Of the 57 companies with available total funding data, Semios, which works in farm management systems accounts for 43 percent of the total $608 million raised in this industry. The top five companies by total funding raised collectively represent 69 percent of funding in this sub-sector of adaptation startups.

Key takeaways

- When the top five companies by total funding are excluded from the analysis, the mean total funding per venture ($3.6 million) is three times the median ($1.2 million). This indicates that there are still a number of more successful Food, agriculture and forestry companies driving the average higher, while the majority of companies remain at the very earliest stages. As a result, it is no surprise to see some of the most active investors in this space, such as Creative Destruction Lab, Cultivator and i.d.e.a. Fund, specialize in very early-stage investments.
- Across the 16 most active investors assessed, nine are government-funded or government-aligned programs, indicating that Food, agriculture and forestry's outsized presence in Canada's adaptation pipeline is being driven in large part by publicly backed early-stage support rather than strong private-market pull.

Total raised by the Adaptation – Food, agriculture and forestry companies
(top 5 excluded) (n = 52)



Supply: Dual-benefit startups

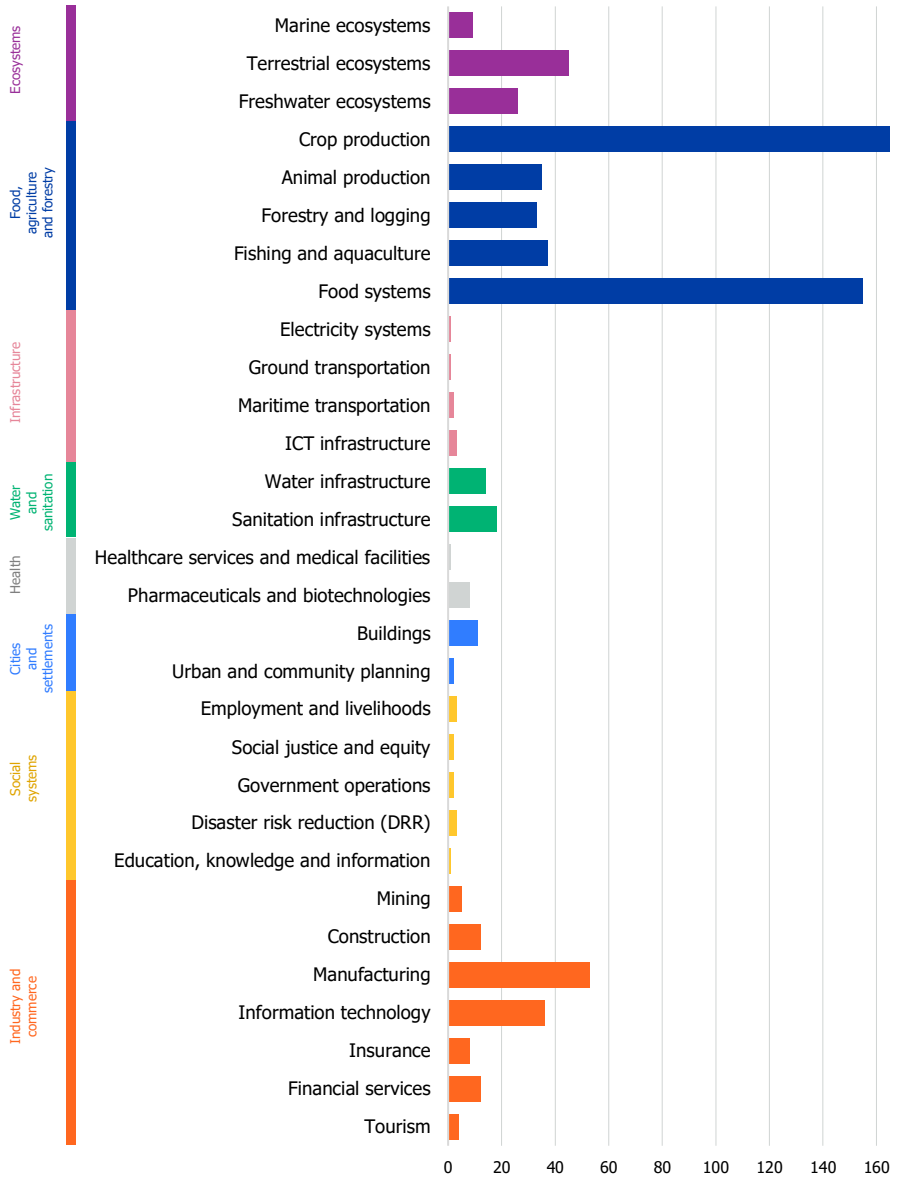
Dual-benefit capital broadens the pool of funds but not the diversity of sectors, with nearly two-thirds of funding flowing to Food, agriculture and forestry.

Dual-benefit startups represent a meaningful pool of resilience finance; $3.5 billion in aggregate. Investment is strikingly concentrated in Food, agriculture and forestry, which captures $2.33 billion, or about two-thirds (66 percent) of total dual-benefit capital. This mirrors the pattern seen in pure-play adaptation ventures, underscoring Canada's comparative advantage in agricultural innovation.

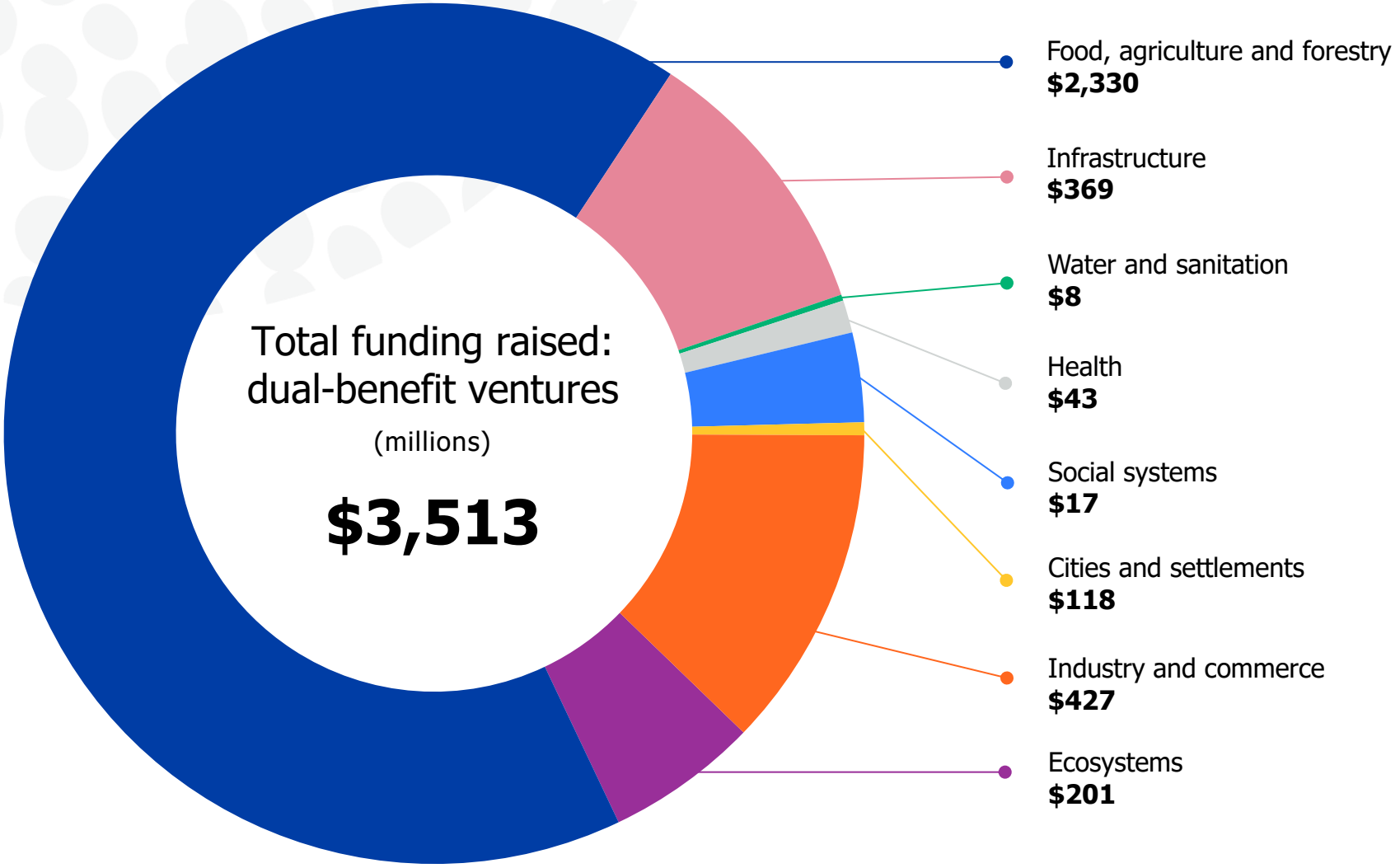
Industry and commerce ($427 million) and Infrastructure ($369 million) form the two secondary clusters, driven respectively by manufacturing, information technology and construction ventures that integrate resilience into industrial processes and the built environment. However, despite these emerging nodes, critical resilience sectors remain undercapitalized. Water and sanitation ventures, for instance, raised only $8 million, highlighting a persistent mismatch between areas of public-sector demand (flood, stormwater and wastewater management) and the private investment landscape. The Ecosystems and Cities and settlements categories show modest yet growing startup activity, particularly around terrestrial restoration and building-scale innovation, but overall remain small relative to the scale of urban and environmental adaptation needs.

These findings suggest that Canada's dual-benefit innovation economy is strong but unevenly distributed, with depth in Food, agriculture and forestry systems but limited diversification into infrastructure, water and urban resilience.

Count of startups by theme and sector



Note: A company can be mapped into multiple categories, not mutually exclusive. Sectors with zero startups are excluded from the graph.


Total funding raised: dual-benefit ventures
(millions)
$3,513
Food, agriculture and forestry
$2,330
Infrastructure
$369
Water and sanitation
$8
Health
$43
Social systems
$17
Cities and settlements
$118
Industry and commerce
$427
Ecosystems
$201

Dual-benefit ventures capture momentum while adaptation startups begin to break through

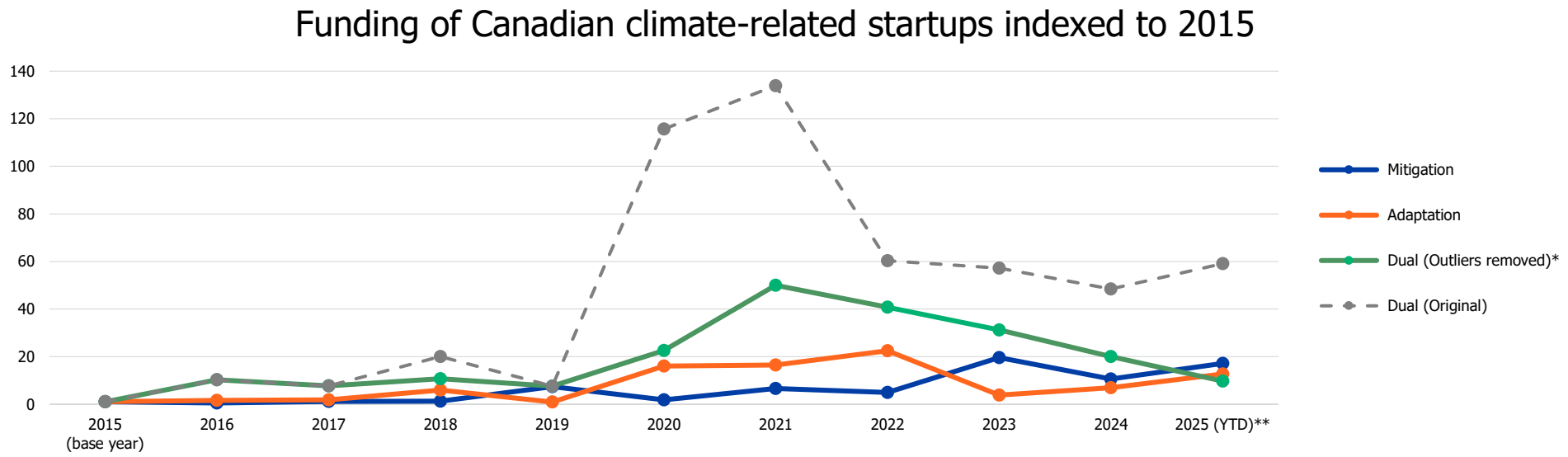
Growth has favoured clearer markets, with adaptation solutions emerging unevenly from a low base.

Since 2015, the Canadian climate innovation landscape has grown unevenly. Dual-benefit ventures have captured the largest share of climate-related growth, outpacing both adaptation- and mitigation-only startups.

Dual-benefit ventures saw sharp gains between 2020 and 2022, driven largely by large agtech and infrastructure investments, reflecting investor comfort with solutions that align with existing climate mitigation markets. Even after 14 mega deals (deals that are worth more than $100 million each) were removed, dual-benefit ventures still maintain a stronger growth curve, suggesting genuine ecosystem momentum rather than just outlier activity. Mitigation startups continue to see a steady, incremental rise, likely buoyed by mature policy incentives and investor familiarity.

Pure-play adaptation funding, while historically low, shows a clearer upward movement after 2020, peaking modestly in 2022 before dipping again. This suggests that adaptation is beginning to emerge from a low base but remains the least consistently capitalized part of the climate innovation stack.

The overall picture shows that investor capital continues to flow toward categories with clearer markets and established metrics (dual-benefit and mitigation) while adaptation, although beginning to register more activity since 2020, still lacks the consistent capital flows seen in other segments. This leaves adaptation as both the least mature and the most opportunity-rich part of the climate innovation stack, poised for growth as climate impacts intensify and demand becomes more visible.



* Outliers are 14 mega deals (i.e., deal size >= $100M)
** As of October 2, 2025

Capital stack: Pure-play

There is a notable funding gap between validation and scale.

There is capital concentration at later stages, with 13 deals accounting for more than 60 percent of total dollars invested ($394 million of $633 million), a sign that only a small subset of ventures is breaking through to scale.

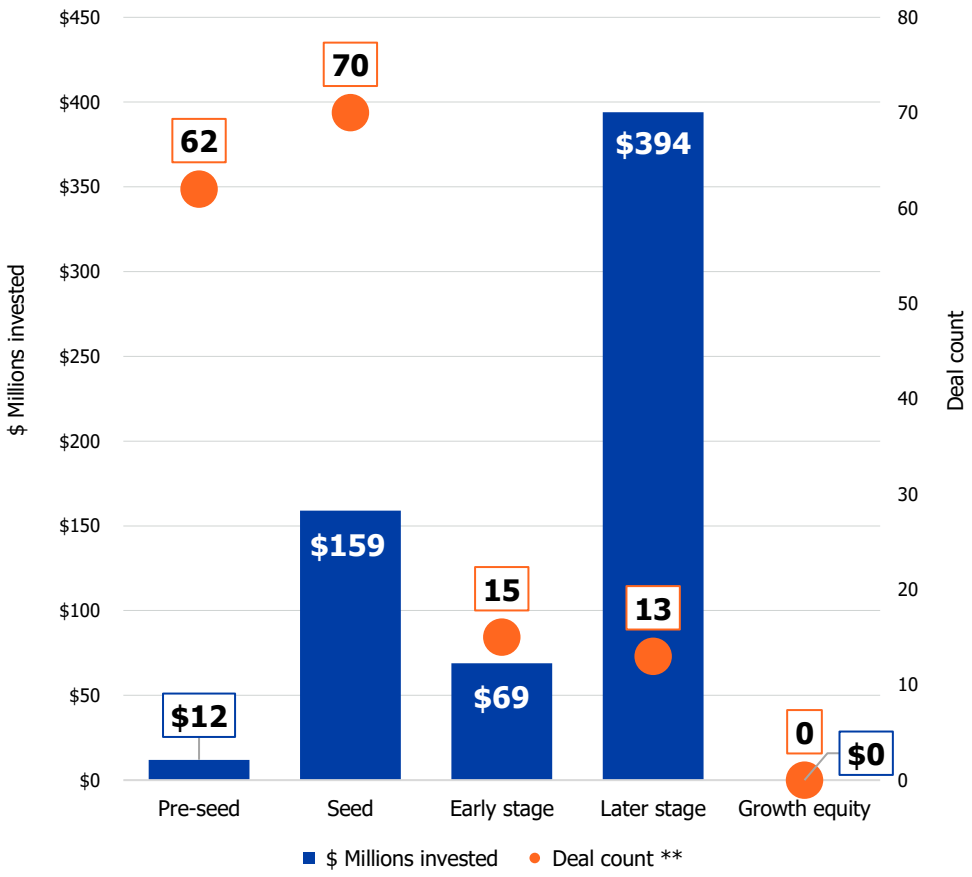
Pre-seed and seed-stage deal counts are high (62 and 70 respectively — 83 percent of all deals) but drop sharply at early stage (15), revealing strong early activity but a fragile pipeline and limited investor continuity between validation and scale.

While this dataset captures only completed investment deals (not grants), the sharp drop between seed and early-stage suggests limited follow-on capital and few mechanisms to bridge public or catalytic funding with private investment. This indicates that ventures could struggle after early validation (funding is often very scarce at the mid-stage).

The clustering of capital in a few large later-stage rounds indicates that institutional and corporate investors engage only once ventures are highly de-risked, reflecting limited understanding of adaptation business models.

Notably, we saw no growth equity activity in pure-play adaptation to date on PitchBook, underscoring how few ventures are progressing beyond later-stage VC.

Cumulative deal amount and count by stage
(2015–2025 YTD*)



* As of October 2, 2025
** Deals with unknown amount are excluded from the analysis
Note: Only completed deals are included

Breakdown of pure-play ventures

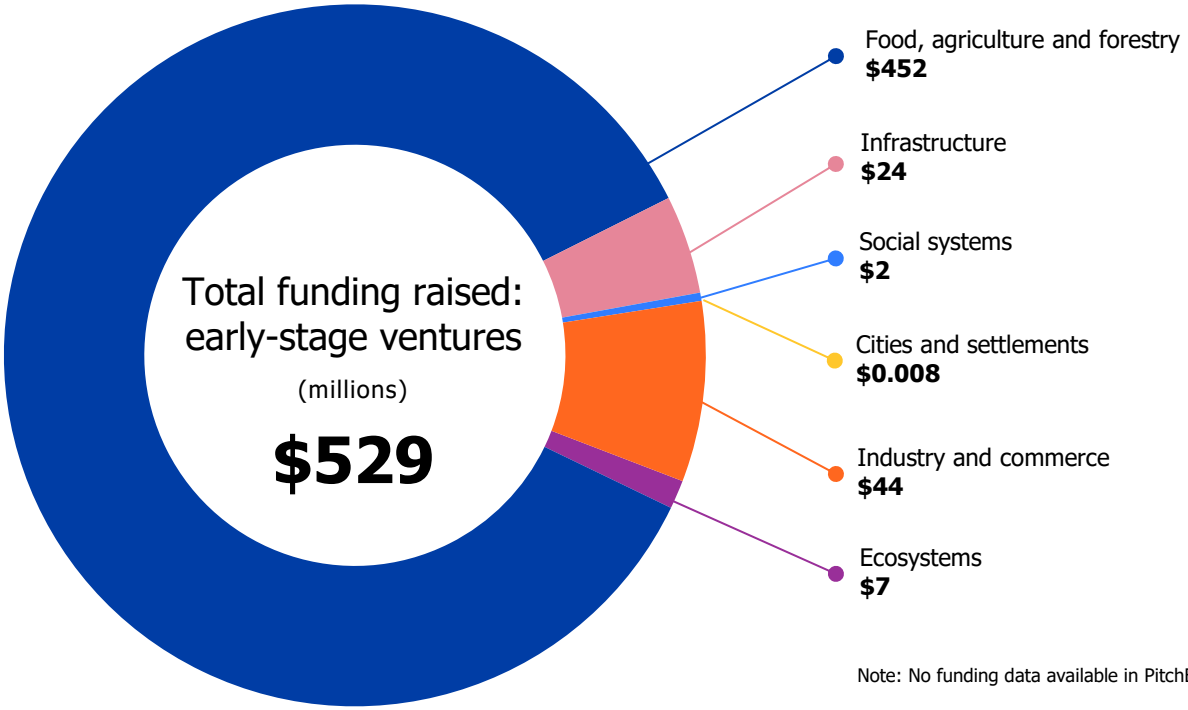
Agriculture emerges as a focal point as other segments remain underdeveloped.

To assess whether sectoral concentration persists at earlier stages of venture development, we isolated ventures whose last financing deal type was one of the following: accelerator/incubator, angel, early-stage VC, equity crowdfunding, later-stage VC or seed round. This narrowed the sample to 81 pure-play ventures, compared with 167 when later-stage deals are included.

Early-stage investment activity in pure-play adaptation ventures remains heavily concentrated in Food, agriculture and forestry, accounting for $452 million of $529 million (85 percent) raised. This confirms that the sector's dominance is not limited to mature projects, but it extends deep into the startup pipeline.

Smaller but visible activity appears in Industry and commerce ($44 million) and Infrastructure ($24 million), while Ecosystems ($7 million) and Social systems ($2 million) register marginal participation. Cities and settlements as well as Water and sanitation remain nearly absent, despite their relevance to Canada's top physical climate risks and demand as seen in the public capital flows.

Compared with the full dataset, this early-stage subset shows similar structural imbalances; capital continues to cluster in Food, agriculture and forestry ventures with clearer business models and returns, while innovation in built environment, water and urban resilience remains underdeveloped.



Note: No funding data available in PitchBook for Water and Sanitation and Health

Capital stack: Dual-benefit startups

Analysis shows a more mature funding pipeline.

Dual-benefit ventures display a more even distribution of capital across stages, reflecting more investor confidence in solutions that deliver both mitigation and adaptation value.

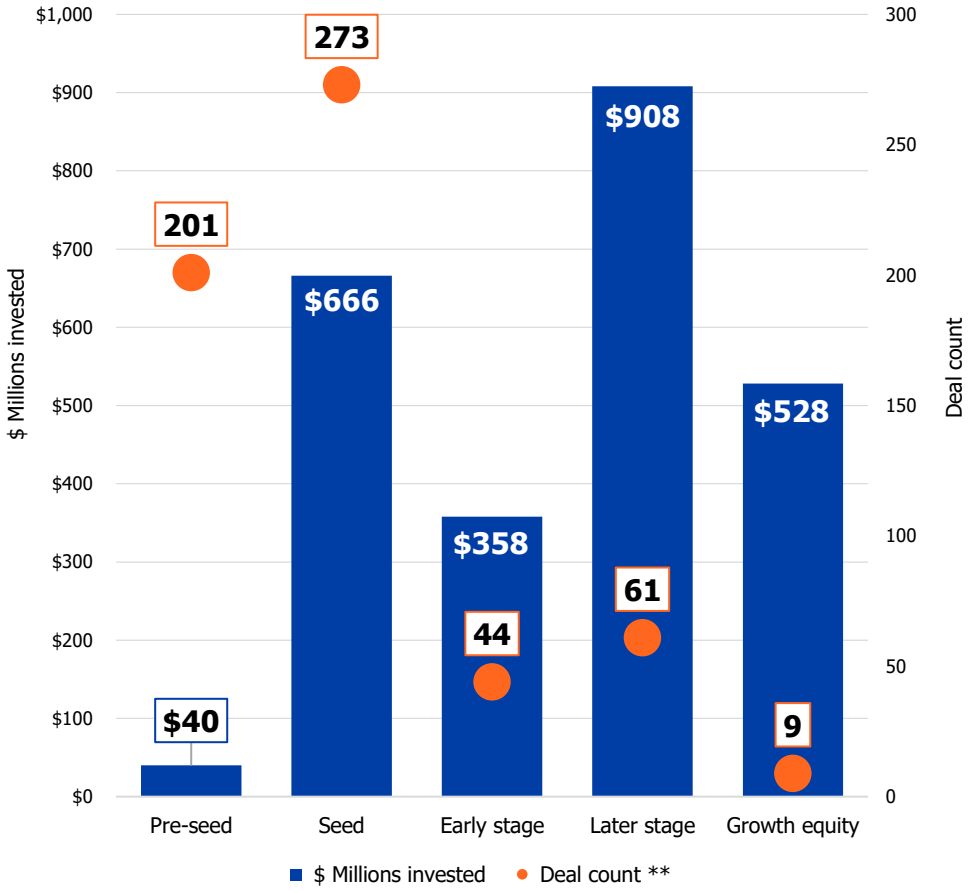
Later-stage and growth-equity rounds together account for more than $1.4 billion (57 percent of all investment), showing that investors are willing to finance scaling once traction and market fit are proven.

Pre-seed and seed-stage deal counts are high (201 and 273 respectively, 81 percent of all deals) and followed by consistent investment at early and later stages ($358 million and $908 million), suggesting greater investor continuity and a more mature funding pipeline compared to pure-play.

This steadier capital flow deals suggests that ventures framed with a dual-benefit model face fewer barriers in attracting follow-on financing, benefiting from clearer commercial narratives and a longer track record in adjacent mitigation markets.

Cumulative deal amount and count by stage

(2015–2025 YTD*)



* As of October 2, 2025
** Deals with unknown amount are excluded from the analysis
Note: Only completed deals are included

Breakdown of dual-benefit ventures

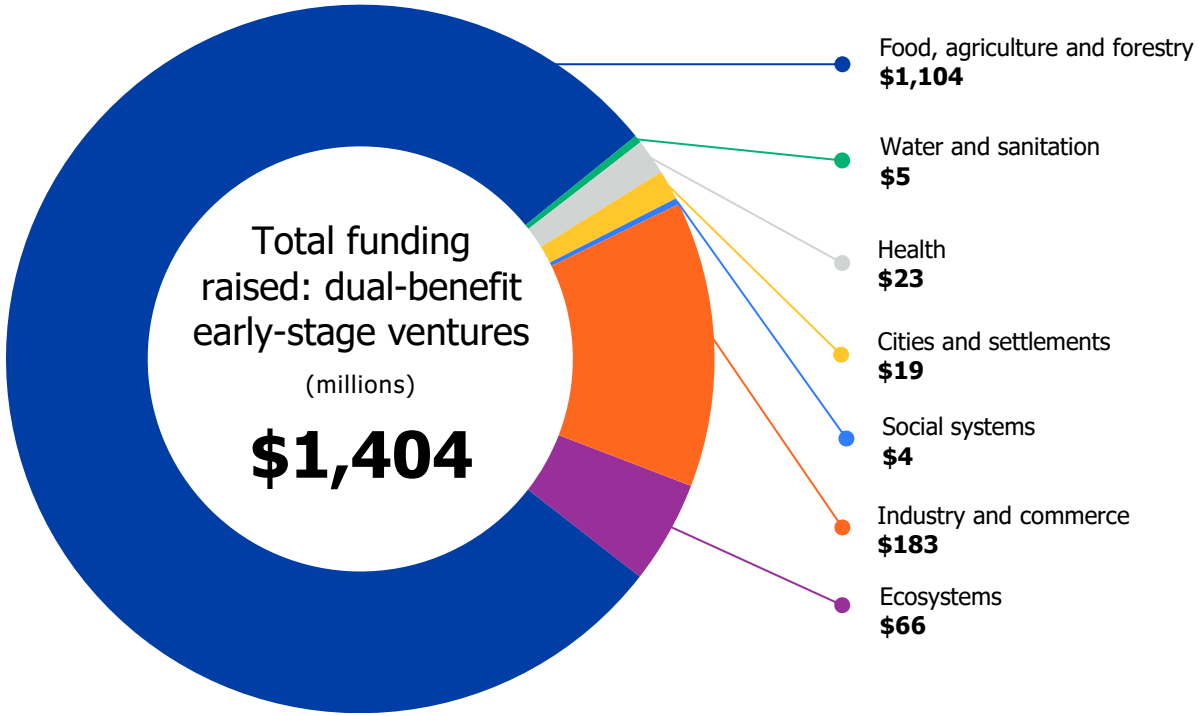
Early-stage dual-benefit funding reveals a more balanced sector compared to pure-play adaptation.

Using the same approach as for pure-play ventures, we isolated dual-benefit ventures whose last financing deal type came from an accelerator/incubator, angel, early-stage VC, equity crowdfunding, later-stage VC or seed round. This narrowed the sample to 267 dual-benefit ventures, compared with 438 when later-stage deals are included.

Early-stage investment across dual-benefit ventures shows a slightly broader and more balanced sector distribution than in pure adaptation. Food, agriculture and forestry still leads but accounts for a smaller share of total capital, indicating that diversification begins earlier in the dual-benefit pipeline.

By contrast, Infrastructure, previously one of the largest categories in the full dual-benefit portfolio, shows no early-stage investment. This suggests that ventures addressing infrastructure resilience face structural barriers to early private capital, such as longer payback periods, reliance on public procurement and limited venture-scalable models.

Overall, the early-stage view underscores that while dual-benefit framing broadens investor engagement, adaptation-aligned sectors tied to physical assets remain underrepresented. This points to an opportunity for catalytic and blended instruments to crowd in earlier risk-taking capital.



Building up the A&R capital stack

Public and private funders need to work in lockstep to increase funding across the capital stack.

To scale A&R companies, we need more capital at every stage of startup funding, but especially at the pre-seed and seed stages. Making sure sufficient pre-seed and seed stage funding exists will enable us to catalyze companies into subsequent venture stages. In the chart below, we outline which funders we believe have a primary responsibility to fund at a given stage and which funders can help advise those funders.

Funder type	Research and development	Pre-seed	Seed	Early venture	Late venture
Government	Funding role: Government is the largest funder of R&D and must continue to ramp up directed funding to support those efforts in A&R.	Funding role: Non-dilutive government grants are essential to A&R companies' growth. Public money for accelerators and incubators is essential.	Consultative role: Public funders have unique insights into what needs funding that can inform use of other types of capital and ensure long-term impact. The public sector is often also a buyer of A&R solutions, meaning they will fund projects as they exit the late-venture stage. This makes private sector collaboration with government essential, as technologies scale.		
Philanthropic	Consultative role: Philanthropic funders have unique insights into what needs funding that can be used to inform use of public funds.	Funding role: Philanthropic funders can provide non-dilutive grants to catalyze companies and incubator or accelerator programs.	Funding role: Philanthropic capital has a critical role to play in the creation of impact and market rate funds investing in A&R.		
Private investment	Consultative role: Private investors (especially those who may be eventual buyers) can advise R&D spending to maximize venture success.	Consultative role: Private investors can support public and philanthropic investors by providing insight into where private capital will and won't fund startups and programs.	Funding role: Private investors have the right resources and mandates to cover all venture phases of the capital stack.		

Source: Tailwind Futures, The Adaptation and Resilience Innovation Playbook, 2024.

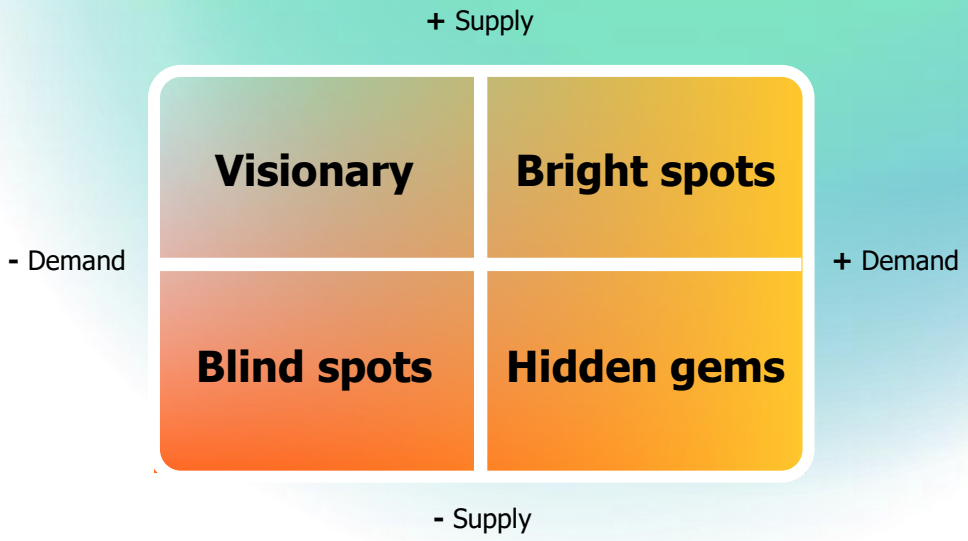
Legend: ○ = funding role, ○ = consultative

Methodology

The following innovation road map uses a supply/demand matrix to assess where Canada's adaptation innovation ecosystem is most active and where critical gaps remain.

Each taxonomy category was scored from 0–3 on (1) innovation supply (the depth and maturity of startup and investment activity) and (2) market demand (scale and clarity of public, corporate and consumer spending related to resilience, recognizing data gaps named earlier). Using these scores, we classified each sector using Tailwind Futures' definitions of Bright spots, Hidden gems and Blind spots, and introduced a fourth category, Visionary, where innovation activity is high (early-stage ventures) but not yet matched by demand.

This framework highlights where solutions can scale today, where demand is strong but innovation is underdeveloped, and where climate risks have yet to translate into investable markets. The following pages outline the sectors falling into each category and the implications for Canada's adaptation and resilience economy.



Supply

3 = top quartile of activity/funding
2 = some deal flow
1 = few ventures or very early-stage
0 = negligible

Demand

3 = sustained, diversified, proactive demand
2 = reactive or narrow demand
1 = latent or small-scale demand
0 = unquantified / negligible

"Even if we went to net zero tomorrow, there is a lot of unavoidable risk baked in. And I think that is going to drive demand and drive venture formation."

– **Lori Collins**, Strategic Advisor, Global Adaptation and Resilience Investment Group

Bright spots: Sectors with proven demand and high investment levels

Under our scoring methodology, startups in Food, agriculture and forestry would fall into the "visionary" category: innovation activity and capital flows are high, while quantified public-sector demand appears comparatively low. However, Food, agriculture and forestry clearly behaves like a "bright spot," with a mature venture ecosystem, recurring investment and strong commercial traction. This suggests that significant demand exists but that it was not fully captured in our demand analysis through the assessment of formal adaptation budgets, likely occurring/tracked in other types of accounts outside of the scope of this research (e.g., private operational budgets).

A review of the investment ecosystem reinforces this. Food, agriculture and forestry hosts the deepest venture pipeline across all adaptation (pure-play and dual) themes, and many of the most active investors in pure-play include government-led or government-adjacent funds, accelerators, and R&D programs (e.g., Farm Credit Canada, Protein Industries Canada). Their participation signals both market confidence and public-sector prioritization, even if spending is not consistently tagged as "adaptation" in government accounts.

Toronto-based startup New School Foods has developed a novel process that simulates the muscle fibres and connective tissue of animal proteins in its vegan products.

What's needed?

- Greater visibility into where else demand may be occurring, particularly private or operational budgets, that may give the ventures and investor better understanding of the market available.
- More diversified capital participation to support growth without concentrating in a few large ventures.
- In the case of Food, agriculture and forestry, ensuring alignment between public programs and commercial adoption — so that government reinforces (not replaces) market pull.

What makes a Bright spot?

Dimension	Rating
Demand	High
# Active startups	High
$ VC invested	High
# Acquisitions and exits	High

Noteworthy deals

- Semios: $262 million
- BinSentry: $70 million
- Deveron: $35 million
- New School Foods: $25 million

Examples

- No Meat Factory: Plant-based proteins replicating the taste and texture of meat.
- Concentric Agriculture develops innovative microbial technologies that improve soil and plant health to boost crop yields.

Hidden gems: Areas of opportunity

Hidden gems are sectors where climate impacts and public-sector spending generate clear demand, yet innovation ecosystems remain limited and undercapitalized. These are areas where Canada is already investing heavily, particularly at the municipal and provincial levels, but startup activity and venture investment have not kept pace.

Water and sanitation illustrates this imbalance most clearly. The sample of municipalities reviewed directed the majority of their adaptation budgets to stormwater and drainage upgrades yet venture activity in water resilience remains minimal.

Cities and settlements show a similar pattern. While it drives substantial public investment, innovation is stunted, potentially as a result of limited commercialization due to challenging public procurement processes.

Infrastructure also presents strong demand signals through DMAF and other public programs, but early-stage venture activity is thin and concentrated.

Social systems demonstrate clear need based on community-level impacts, yet limited innovation activity is visible. It's mostly concentrated on disaster risk reduction, including wildfire prevention. Note, firetech can be found under a few of these themes, and given its proven and rising demand, with emerging supply of technology, it is worth highlighting as a hidden gem.

Industry and commerce showed limited public demand, but high and growing corporate exposure to climate risks (supply chains, operations and physical assets) — yet limited adaptation-specific innovation has emerged to meet the demand (consistent with the fact that awareness of risk hasn't necessarily translated in investment for corporates).

These sectors represent significant opportunity for entrepreneurs and investors: Demand already exists, but supply has not yet formed at the scale required.

What's needed?

- Mechanisms to translate public demand into clearer market pull for innovation, particularly through public procurement pilots that reduce barriers of adoption and demonstration projects.
- Capital that can enter earlier in the venture lifecycle (including research funding), addressing lack of early-stage funding and limited follow-on pathways.
- Adaptation-focused accelerators that can support companies in bridging this gap. To that end, MaRS is launching a comprehensive cohort program in partnership with Definity.

What makes a Hidden gem?

Dimension	Rating
Demand	High
# Active startups	Medium
$ VC invested	Low
# Acquisitions and exits	Low

Noteworthy deals

- Wyvern raised $35.58-million later-stage VC for their hyperspectral satellite imaging technology for environmental monitoring from Earth's low orbit.
- Manifest Climate raised $36.54-million from accelerator funding for their AI-driven solutions for managing climate-related risks and opportunities.

Examples

- Skyward Wildfire: AI-driven weather models and cloud neutralization technologies to prevent wildfires caused by lightning strikes.
- Intelligent City: Prefab mass timber building systems.

Blind spots: Areas of further development

Blind spots can be found in sectors where expected climate impacts have not yet translated as budget or a strong demand signal. Innovation is driven by the fundamental need but lacks funding. As a result, venture activity is sparse, technologies are early or absent and commercialization pathways are not well formed.

Health illustrates this gap: While climate-related risks such as heat stress, poor air quality and vector-borne diseases are increasing, few ventures explicitly target climate-health resilience and public budgets rarely classify health-related adaptation spending. Ecosystems show a similar pattern. There is mounting pressure to address wildfire recovery, biodiversity loss and landscape degradation, yet early-stage venture activity remains highly limited and faces a difficult business case proposition.

What's needed?

- Public and philanthropic early-stage catalytic funding to enable initial R&D, prototyping and pilot projects where private investment is not yet viable.
- Pathway-creating programs such as challenge calls/mission-driven procurement to translate emerging needs into investable opportunities.
- Integration of adaptation considerations and metrics into existing systems (e.g., health) to give innovators defined entry points.

What makes a Blind spot?

Dimension	Rating
Demand	High but latent
# Active startups	Low
$ VC invested	Low
# Acquisitions and exits	Low

Examples

- Clean Valley CIC: Algae-based biofilters and hatchery support to purify water in aquaculture practices.
- PathoScan: Advanced AI and DNA amplification diagnostic technologies for rapid and accurate detection of crop diseases.

The way forward

Recommendations for funders

Canada's adaptation and resilience innovation economy requires different funders to play distinct but complementary roles across the capital stack. Government and philanthropic funders are critical in the earliest stages (R&D, pre-seed and seed) where market signals remain weak, and venture formation is thin. Private investors become increasingly important at seed, early venture and later venture stages, where patient, structured and scale-oriented capital is needed. By diversifying capital flows beyond Food, agriculture and forestry and directing investment toward high-need sectors, funders can help close early-stage gaps and address Canada's pronounced "missing middle," ensuring promising adaptation solutions can grow and scale.

All funders (including philanthropy)

- Canada's early-stage ecosystem is deep in Food, agriculture and forestry, but sparse in many other high-demand/high-risk areas. As identified in Hidden gems (see page 34), there is an opportunity to build programs and support ventures in such areas as stormwater and wildfire prevention to address some of our most pressing needs.
- In coordination with policy-makers, invest in measurement, data and frameworks that showcase a clearer picture of adaptation demand: it is challenging to assess and understand spending in the Canadian adaptation space. Funders can play a role in accelerating market visibility by supporting tools for measuring impact and avoiding maladaptation.
- Canadian adaptation markets are highly dependent on public spending. Funders can de-risk commercialization by supporting pilots and providing testbeds with cities to reduce barriers to adoption.

Capital gap #1: Pre-seed to seed outside of Food, agriculture and forestry

- Seed innovation (through grants, concessionary capital) in sectors where government is already spending billions, yet there is not much venture activity, such as wildfire response and flood infrastructure.
- Expand investment thesis beyond Food, agriculture and forestry, backing founders earlier with small, targeted pre-seed/seed cheques where there are gaps in the venture pipeline.
- Support translational research and talent pathways (lab-to-market programs, fellowships and university commercialization) to grow venture formation in categories where startup activity is thin.

Capital gap #2: Early venture to later stage

- Encourage follow-on capital for ventures working with public sector by providing patient capital or milestone financing that can support ventures while they go through lengthy sales cycles, particularly if serving public sector buyers.
- Support scale-up capital for ventures, especially in stormwater, wildfire, health and infrastructure resilience.

- Use structured and blended finance tools (revenue-backed financing, project-finance hybrids, guarantees) to support capital-intensive adaptation deployments.
- Review dual-benefit portfolio performance; many companies already deliver resilience value. Investors can use this pattern recognition to continue engaging in dual and start backing pure-play ventures.

Recommendations for innovation adopters (corporate and public)

Adopters shape the pace and direction of adaptation innovation across Canada. Public and corporate actors have different yet complementary levers in the market. Clearer demand signals, early engagement with innovators and streamlined procurement processes can accelerate the deployment of solutions that meet the scale of climate challenges.

- **Improve visibility of adaptation demand:** Consistent use of tags and disclosures when it comes to adaptation-related spending can signal to innovators and investors where to build and what solutions to back.
- **Partner early with innovators to reduce integration barriers:** Pilot projects and providing access to data can shorten validation timeline and accelerate proof of concept.
- **Be conscious of maladaptation risks:** Ensure interventions address risks in ways that enhance equitable community resilience instead of worsening vulnerabilities for local-level actors.

Corporate:

- **Understand climate risks:** Undertake basic climate-risk scans to identify operational vulnerabilities and where emerging solutions could support resilience and continuity, while reducing future financial impacts.
- **Turn awareness into investment:** Develop clear investment priorities in line with highest exposure and risks. Clear priorities reveal innovation gaps researchers and entrepreneurs can fill.
- **Quantify adaptation spending:** Tag and disclose adaptation-related investments to strengthen demand signals and guide innovation ecosystems.

Public:

- **Reduce procurement friction:** Complex and lengthy public procurement processes may limit the adoption of new technologies. Use innovation-friendly tools to make it easier for public agencies to test and adopt new adaptation solutions in a timely way.
- **Aggregate requests:** Procurement can help shape and drive markets by articulating clear priority needs. Consider aggregating or standardizing procurement calls across regions facing similar hazards to accelerate scaling of solutions.

Recommendations for entrepreneurs

Canada needs more founders building solutions in areas where climate impacts are rising fastest yet where innovation is currently behind. There is an exciting opportunity to shape emerging markets, particularly knowing demand is and will continue to be strong.

- **Focus on untapped areas:** Founders should look beyond crowded sectors, and concentrate instead on Hidden gems and Blind spots in areas where we understand there is a high level of climate demand or need that hasn't translated into spending, such as Water and sanitation, Infrastructure, Industry and commerce, and Health. Example technologies in these areas include smart metering systems, rainwater harvesting programs, AI-powered climate risk assessments, air quality sensors, and disease prevention and surveillance technologies.

- **Communicate the benefit of the solution:** Position and communicate your value proposition in ways adopters and funders can understand. For example, for prevention/preparedness solutions, frame value around avoided costs, risk reduction, compliance and long-term asset resilience. For response/recovery solutions, address the challenge of event-driven demand through standby agreements, subscription readiness models or recurring partnerships that ensure availability between events.
- **Work together:** Collaborate with public-sector and community actors to ensure solutions reduce — not shift — risk. Engage with municipalities, Indigenous communities and other local stakeholder groups early to understand needs.

Recommendations for policy-makers

Policy-makers create the enabling conditions for adaptation markets. Robust policies and plans, clear standards, aligned priorities, and dedicated public investment can accelerate the development, deployment and export of Canadian resilience solutions. Recommendations below are aligned to advance Canada's Federal National Adaptation Strategy (NAS) and build on Tailwind's U.S. calls for stronger adaptation governance.

- **Set the standard:** Mandate adaptation tagging, risk disclosure and governance; ensure all levels of government are using standardized adaptation tags, taxonomies and climate-risk disclosures. Strengthen governance by embedding adaptation responsibilities across departments and budgets, supported by clear NAS-aligned targets and progress reporting.
- **Streamline procurement:** Reform procurement and infrastructure programs to foster adaptation innovation adoption; ensuring all new infrastructure funding integrates resilience considerations, including maladaptation screenings. Consider the adoption of innovation-friendly procurement tools to enable the adoption of much needed emerging technologies across all levels of government while simplifying and shortening the sales cycle for suppliers.
- **Coordinate efforts:** Develop and align adaptation plans and investment strategies across jurisdictions; support federal, provincial/territorial, municipal, Indigenous governments in developing adaptation plans where they do not yet exist, grounded in local hazard profiles. Encourage all levels of government to create adaptation investment plans that allocate funding toward priority risks and resilience solutions. Once plans are in place, align priorities and standards across jurisdictions so solutions can scale in regions facing similar climate impacts.
- **Ensure on-going development:** Fund the full innovation pipeline in line with NAS commitments; support R&D, fellowships, accelerators, early-stage capital and demonstration sites, especially in sectors identified as national priorities that we also identified as Hidden gems or Blind spots (Infrastructure, communities, Ecosystems, Health). Ensure programs include community engagement standards to advance equitable resilience.

Methodology: Demand

We conducted the following research to assess Canadian government, corporate and consumer funding for climate adaptation. We acknowledge our findings are incomplete due to sample size, data limitations and limited disclosures. We support calls for better research, tracking and disclosures of adaptation spends globally in the public and private sector.

Government:

- We conducted desktop research on the climate adaptation spending of the federal government of Canada, all Canadian provinces and territories, and six cities: Toronto, Calgary, Ottawa, Vancouver, Halifax and Montreal. These cities, part of the LC3 network, were selected for geographic and population representation (together they represent 50 percent of the Canadian population).
- We defined climate adaptation spending as investments into physical infrastructure or government programs that help predict, prevent, mitigate or enable recovery from climate impacts, such as floods, heatwaves, storms and wildfires.
- All spending numbers unless explicitly stated otherwise are referring to the portion of the program's spending that occurred during 2024. If the source document did not identify an annual contribution, a linear spending distribution was assumed (e.g., $500 million program over five years, one of which is 2024 would be assigned as $100 million of spending in the data):
    - There are $7.1-billion infrastructure investment projects with estimated project timelines spanning from 2017 to 2033 tagged as climate resilience on the Housing and Infrastructure Canada project database. We isolated the projects with funding flowing to date, took the federal contributions and estimated how much of the spending occurred during 2024. All numbers in the report are based on this 2024-isolated estimate for consistency.
- In addition to the 2024 Federal Budget, The OECD's Economic Surveys: Canada 2025, "adapting to climate change challenges" section and National Adaptation Strategy Independent Auditor's Report provided significant insight into federal spending.
- Spending data was aggregated from the annual or long-term capital expenditure budgets of each provincial, territorial, or municipal government surveyed.
- Due to the nature of tracking expenditure alone, our methodology does not track intergovernmental transfers from the federal government that are claimed as both federal expenditure and also provincial or territorial or municipal expenditure. We explored matching the intergovernmental transfer revenue received by provinces, territories, and municipalities from the federal government to their specific projects being executed in 2024, but this was not feasible due to constraints in the granularity of intergovernmental transfer reporting and accounting. As a result, we do not aggregate federal, provincial and territorial, and municipal expenditure sums into a singular dollar amount for all of the Canadian government to avoid double or triple counting of funds.
- We assigned budgets to our taxonomy sectors based on available information about stated priorities (e.g., flood management) and expert judgement.

Corporations:

- We reviewed climate disclosures from 27 corporations that collectively make up $1.52 billion in market cap and are amongst the largest publicly traded companies in Canada.
- We selected these companies with a preference for large market size, a diversity of sectors and companies operating in sectors we know have high exposure.
- Unlike governments, which are mandated to publicly report spending, corporations provided primarily qualitative information on their approach to assessing and mitigating climate physical risks. Our data was sourced primarily from corporations' voluntary CDP or TCFD-aligned disclosures that describe the company's acute and chronic climate-physical risks. This information came from the company's sustainability report if a separate document for these disclosures was not available.

Consumers:

We did not attempt a bottom-up summation of all consumer spending attributable to climate changes. Instead, we presented qualitatively how we expect consumer demand to manifest based on publicly available Canadian survey data, locally relevant climate hazards and our industry experience.

Methodology: Supply

MaRS Discovery District partnered with Tailwind Futures and Vibrant Data Labs (VDL) to identify A&R startups in Canada using PitchBook data mapped to the Tailwind Taxonomy (originally published in May 2024).

A broad PitchBook search using nearly 800 climate-related terms was used to minimize false negatives, despite yielding many false positives. The analysis looked at companies that received funding from 2019 to 2024, including equity and non-equity financing, which includes debt and/or grants.

Some companies included in the analysis may have received funding from private equity sources or public markets. Companies with total funding of more than $100 million were reviewed individually on a to ensure we didn't exclude startups piloting hard technology such as innovative energy storage systems or transportation infrastructure that require significant up-front investments. Companies that were flagged by PitchBook as out of business or bankrupt were filtered out.

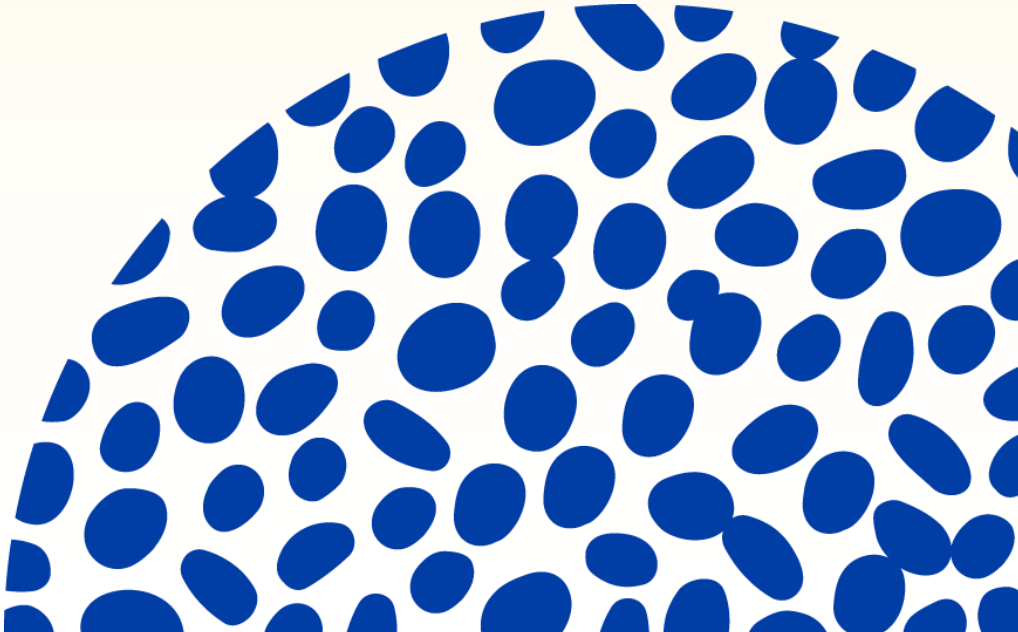
The LLM model trained by Tailwind Futures and Vibrant Data Labs identified climate tech companies and tagged them as mitigation, dual-benefit or adaptation. Manual review was undertaken by project partners to identify false positives that didn't fit the criteria of being an innovative startup commercializing clean technologies such as:

- municipal waste contractors
- mining exploration and pure-play natural resource companies
- pure-play produce growers and suppliers
- consumer product companies with no clear innovative cleantech product (i.e., organic juices, vegan apparel)
- engineering and consulting firms without a climate focus
- utilities

A further analysis was undertaken using stricter criteria to define startup in order to create an additional data subset, which we refer to as early stage. This analysis placed a particular emphasis on a company having received venture capital, accelerator or incubator, or grant funding. Below is the criteria used for the early-stage data subset.

PitchBook last funding deal type:

1. Accelerator/incubator
2. Angel
3. Early-stage VC
4. Equity crowdfunding
5. Later-stage VC
6. Seed round



Methodology: Capital stack

PitchBook funding categories from the dataset were condensed to align with the subcategories from The Adaptation and Resilience Innovation Playbook, 2024.

Report category	**Latest funding type** (PitchBook)
Pre-seed	University spin-out
	Product crowdfunding
	Equity crowdfunding
	Accelerator/Incubator
	Angel (Individual)
Seed	Seed round
	Corporate
	Grant
Early stage	Early-stage VC
Later stage	Later-stage VC
Growth equity	PE growth/expansion

Company name	**Industry**	**Market cap** ($ billions)
Royal Bank of Canada	Banks	180
Toronto-Dominion Bank	Banks	160
Bank of Montreal	Banks	90
BCE	Communication Services	46.7
Telus Corporation	Communication Services	35.9
Rogers Communications	Communication Services	25.4
BRP	Consumer Discretionary	8.5
Gildan Activewear	Consumer Discretionary	7.6
Loblaw Companies	Consumer Staples	42.6
Saputo	Consumer Staples	10.9
Maple Leaf Foods	Consumer Staples	3.5
High Liner Foods	Consumer Staples	0.9
Enbridge	Energy	110.5
Canadian Natural Resources	Energy	95.2
Suncor Energy	Energy	72.8
TC Energy	Energy	65.4
Brookfield	Financial Services	75
Manulife Financial	Financial Services	50
Intact Financial	Financial Services	40
Canadian Pacific Railway	Industrials	105.8
Canadian National Railway	Industrials	95.6
Bombardier	Industrials	5.7
Nutrien	Materials	60.7
Barrick Gold	Materials	45.9
Agnico Eagle Mines	Materials	32.4
Teck Resources	Materials	28.3
First Quantum Minerals	Materials	20.1

About MaRS Discovery District

MaRS Discovery District is a charitable organization and North America's largest urban innovation hub, dedicated to helping Canadian technology companies succeed. With a focus on climate, health sciences and other emerging technologies, MaRS supports startups tackling some of the world's most pressing issues. MaRS spans more than 1.5 million square feet of cutting-edge office, lab, meeting and event space in downtown Toronto across two locations — the MaRS Centre and MaRS Waterfront. Since 2010, MaRS has helped ventures generate $11.5 billion in cumulative revenue, raise $19 billion in funding, and create and maintain more than 33,000 jobs. The MaRS platform also includes MaRS IAF, one of Canada's top seed-stage venture funds. Through its world-class facilities, strategic programs and partnerships, MaRS accelerates the adoption of groundbreaking Canadian technology and bolsters a globally competitive innovation ecosystem. For more information, reach out to the MaRS climate team at mfm@marsdd.com

About Tailwind Futures

Tailwind Futures is an investment firm and ecosystem builder focused on climate resilience solutions. Our mission is to accelerate the development and the deployment of climate adaptation and resilience solutions. We invest in early-stage technologies companies that help corporations futureproof the infrastructure, workforce, and supply chain of today and tomorrow. We also provide research and advisory services to corporations, foundations, financial institutions, government and startups. Specifically, our work focuses on addressing three market gaps:

- **Innovation gap**: Current climate adaptation and resilience solutions often fail to leverage innovation in technology and science that could power better resiliency outcomes through efficiency gains, higher performance and better systems.
- **Capital gap**: Adaptation technology companies have insufficient access to flexible and appropriate capital to launch and scale their businesses. The vast majority of early-stage funding in the climate space goes to mitigation companies.
- **Demand gap**: Governments and corporations who understand their climate risks still struggle to identify and procure the solutions they need to address those risks. Without a clear demand signal and with uncertain funding for adaptation programs, solutions providers struggle to chart a path to market.

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