Innovation, Science and Economic Development Canada

Innovation, Sciences et Développement économique Canada

Canada

# Evaluation of the Sustainable Development Technology Fund

## Audit and Evaluation Branch

## Evaluation Report

February 2025

# Note on this Evaluation Report

An evaluation of funding to the Sustainable Development (SD) Tech Fund is required every five years under the *Financial Administration Act* and published in accordance with the Treasury Board Secretariat Policy on Results. An evaluation was undertaken covering the period from April 1, 2017, to March 31, 2022.

The Evaluation was initiated in April 2022; however, work was paused in March 2023 once the Department of Innovation, Science and Economic Development (ISED) was informed of allegations of mismanagement at Sustainable Development Technologies Canada (SDTC). Upon receipt of these allegations, ISED engaged an independent third party, Raymond Chabot Grant Thornton (RCGT), to perform a fact-finding exercise. This was followed by an Audit of SDTC by the Office of the Auditor General of Canada (OAG) as well as a rigorous review by third-party law firm, McCarthy-Tétrault, of SDTC's human resources practices which included conducting voluntary interviews with current and former employees.

These reviews identified concerns with SDTC's compliance with the contribution agreement and overall governance. In June 2024, the Government announced a new delivery model for government support for the cleantech sector to strengthen oversight and accountability. SDTC programming will be fully transitioned to the National Research Council of Canada (NRC) in 2025. As a Government of Canada organization, the NRC is subject to rigorous and stringent oversight of its personnel and finances.

This report does not examine the issues brought forward in 2023, which are answered by the aforementioned reports, and for which action has been taken. This report covers the extent to which the SD Tech Fund addressed "a unique and continued need in Canada's sustainable development technology landscape." In this regard, it should be read in conjunction with these other reports.

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# Program Context

**Sustainable Development Technology Canada (SDTC) is an arm's length, not-for-profit foundation established by the Canada Foundation for Sustainable Development Technology Act (2001) to fund the development and demonstration of new technologies that promote sustainable development. SDTC's mission is to act as a catalyst and convenor for the cleantech ecosystem in Canada by supporting entrepreneurs to turn ideas into opportunities, advancing Canadian cleantech in both national and global arenas.**

Clean technology or **cleantech** is any process, product or service that reduces negative environmental impacts through significant energy efficiency improvements, the sustainable use of resources, or environmental protection activities.[1]

1

From 2001 to 2016, the federal government committed a total of $965 million to SDTC. In 2016, the Minister of Innovation, Science and Industry formally assumed the funding agreement for **SDTC's main funding program – the SD Tech Fund**.

2

Budget 2017 allocated **$400 million over five years** to recapitalize the SD Tech Fund, starting in 2017-18.

3

In 2019-2020, SDTC introduced the **Seed funding stream** to expand funding along the commercialization chain from seed to scale-up.

4

**As a response to COVID-19**, SDTC provided **$18 million** in additional funding to companies in March 2020 and **$21 million** in March 2021.

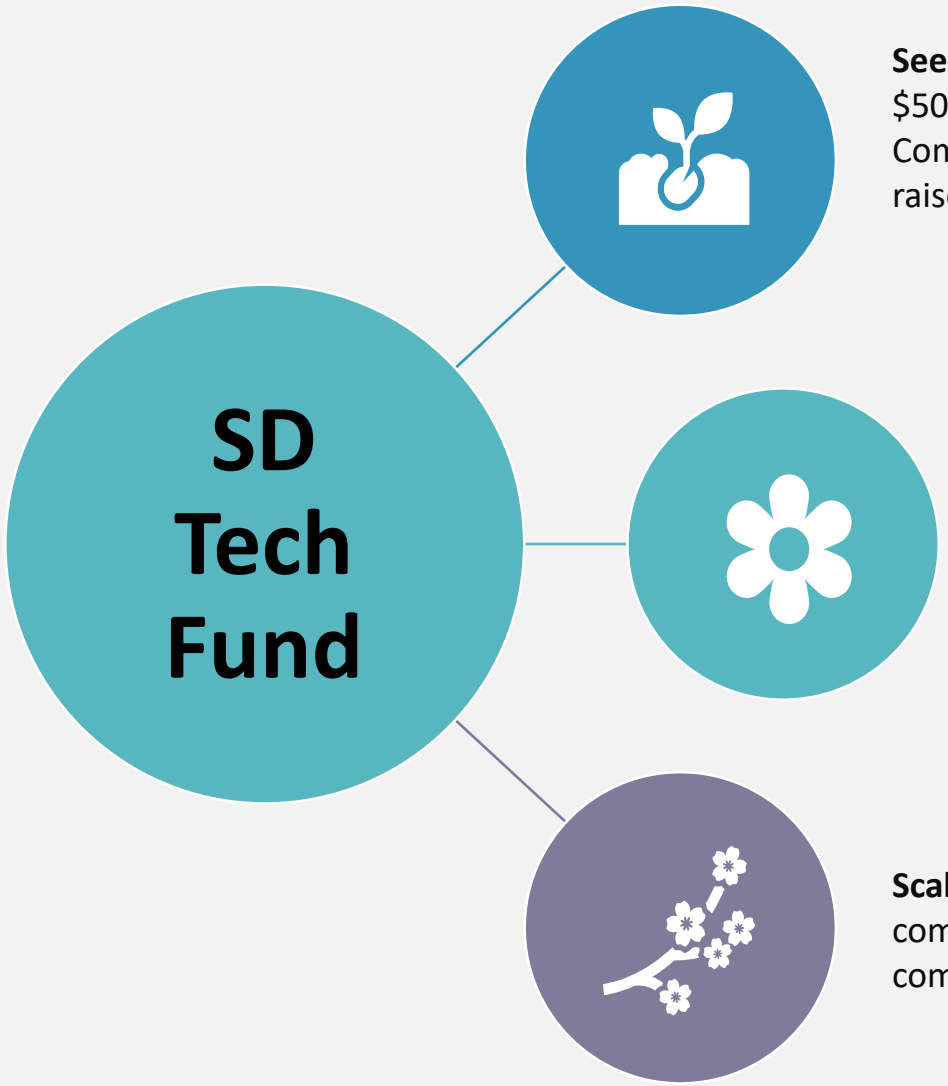
5

The 2020 Fall Economic Statement announced **$750 million over five years** (2021-22 to 2025-26) to recapitalize the SD Tech Fund. This brought the total value of the Government of Canada's investment in the SD Tech Fund to **$2.1 billion** since inception.

SDTC continues to support the development and demonstration of new cleantech.

# Program Funding

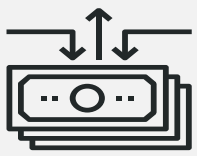
**SDTC supports the development and demonstration of new technologies by providing three funding streams within the SD Tech Fund.**



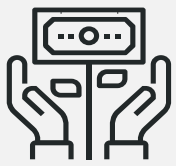

**Seed Stream**: provides early-stage companies with a one-time non-repayable contribution of $50,000 to $100,000 for innovative technological projects with environmental benefits. Companies must be nominated by one of SDTC's approved accelerator partners and have raised $100,000 to $200,000 from accredited investors.

**Start-Up Stream**: a non-dilutive, non-repayable contribution averaging between $2 million and $5 million and paid out over a maximum of five years based on performance. Companies apply to SDTC directly and must have a well-defined project, line of sight to financing their company and the project, be engaged in discussions with potential customers, and be working with customers to test business model viability assumptions.

**Scale-Up Stream**: similar to the Start-Up Stream, but targeted to more advanced, high-growth companies with track records of success that are looking to scale, strengthen their competitive advantage and/or unlock a larger customer base.



On average, the SD Tech Fund provides 33 percent (up to 40 percent) of eligible project costs. The average contribution is between $2 million and $4 million, with funds disbursed in five years or less. Funding from all levels of government must not surpass 75 percent of eligible costs, thereby requiring 25 percent of eligible costs to be funded through private sector contributions (including in-kind). At least 50 percent of eligible project costs must be incurred in Canada.



Funding provided to SDTC for the SD Tech Fund promotes the commercial attractiveness of funded projects by de-risking technology development for both private sector and other partners. In doing so, SDTC plays a role in the Government's mission to help grow Canadian companies into globally competitive ones. In addition, SDTC forges partnerships with interested partners to strengthen collaboration and dialogue and to ensure the provision of support towards the commercialization and cross-industry adoption of sustainable development technologies.

# Target Population

**The SD Tech Fund plays a role in the Government's mission to help grow Canadian companies into globally competitive ones. Within this overall goal, the SD Tech Fund has two objectives:**

1


Helping Canada achieve its environmental objectives.

2


Contributing to sustainable economic growth by enabling Canadian companies to compete globally in the cleantech space.

Eligible proponents for the SD Tech Fund are Canadian for-profit or not-for-profit entities developing and demonstrating an innovative technology to promote sustainable development (e.g., a quantifiable reduction of greenhouse gas (GHG) emissions; reduction in contaminants to water, soil or air; water quality and quantity improvement technologies, etc.). Projects supported under the SD Tech Fund are focused on advancing technologies that are beyond technology concept and pre-commercial as opposed to fundamental research. Using the technology readiness level (TRL) scale, the SD Tech Fund supports technologies between TRL three and TRL eight.

| FUNDAMENTAL RESEARCH | | RESEARCH & DEVELOPMENT | | | PILOT & DEMONSTRATION | | | EARLY ADOPTION |
|---|---|---|---|---|---|---|---|---|
| TRL 1 | TRL 2 | TRL 3 | TRL 4 | TRL 5 | TRL 6 | TRL 7 | TRL 8 | TRL 9 |
| Basic principles of concept are observed and reported | Technology concept and/or application formulated | Analytical and experimental critical function and/or proof of concept | Component and/or validation in a laboratory environment | Component and/or validation in a simulated environment | System/subsystem model or prototype demonstration in a simulated environment | Prototype ready for demonstration in an appropriate operational environment | Actual technology completed and qualified through tests and demonstrations | Actual technology proven through successful deployment in an operational setting |

SD Tech Fund

**Source**: Adapted from the Clean Growth Hub TRL Assessment Tool

# Methodology

- Evaluation Context

# Evaluation Context

An evaluation of Innovation, Science and Economic Development Canada's (ISED) funding to SDTC is required every five years under the *Financial Administration Act*.

The evaluation examines the relevance of ISED funding to the SD Tech Fund in accordance with the Treasury Board Secretariat *Policy on Results*.

The **scope** of the evaluation covered the period from April 1, 2017, to March 31, 2022.

The evaluation was conducted **in-house** by the Audit and Evaluation Branch at ISED.

## Evaluation Questions

**Relevance**

To what extent does the SD Tech Fund address a unique and continued need in Canada's sustainable development technology landscape?

## Evaluation Challenges

**Respondent Bias**: There was potential for respondent bias given that some interview participants were involved in program delivery or were funding recipients. As such, the findings may be positively biased.

To minimize this bias, the purpose of the interview and its strict confidentiality were clearly communicated to participants. Further, responses were cross-validated across stakeholder groups as well as other lines of evidence.

## Evaluation Methodology

Four lines of evidence were used to answer the evaluation question (see Appendix A for more detail).

- **Document and Literature Review**
- **Interviews**
- **Online Survey**
- **Case Studies**

# Findings

# Findings

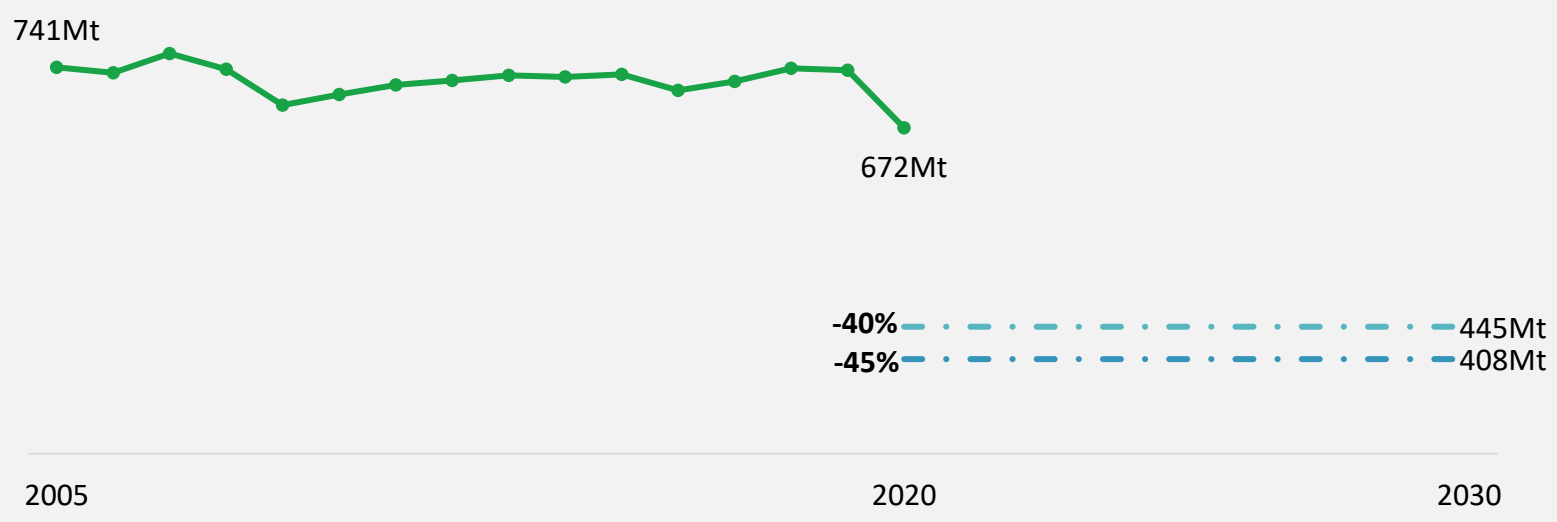
## Finding 1: While Canada has established targets to reduce its emissions, there is a need for government funding to support sustainable development technologies in Canada to tap into the environmental and economic opportunities of cleantech innovation. Public funding can be leveraged to mobilize private sector investment and help firms overcome the market barriers to commercialization.

### The global demand for sustainable development technologies presents a joint environmental and economic opportunity for Canada.

According to a 2018 report, the global cleantech market is projected to be worth as much as $2.5 trillion by 2022.[2] Furthermore, it is estimated that improvements in energy and resource efficiency for resource and manufacturing industries will represent a $3.6 trillion economic opportunity by 2030.[3] In Canada, cleantech goods and services accounted for about $26.8 billion or close to 1.5 percent of Canadian Gross Domestic Product (GDP) in 2020.[4] This is encouraging since oil and natural gas products currently account for about 13 percent of Canada's total merchandise exports.[5] Where fossil fuel reliance is expected to be lessened in a net-zero future, growing cleantech exports is one way of making up for the expected loss in economic activity.[6]

Canada's GHG emissions in 2020 were 672 megatonnes (Mt) of carbon dioxide equivalent (Mt $CO_2$), which is a decrease of 9.3 percent (or 69 Mt CO2 eq) since 2 005 (Figure 1).[7] In 2021, Canada committed to reducing its GHG emissions by 40-45 percent below 2005 levels by 2030[8], meaning more needs to be done to achieve the 445-408Mt target. The oil and gas sector and transport sector made up the largest share of emissions in 2020 (27 percent and 24 percent respectively), and these two sectors are largely responsible for the increase in GHG emissions between 1990 and 2020. Globally, Canada is ranked as the World's 10th largest emitter, accounting for 1.56 percent of global emissions. Canada also ranks 14th in terms of emissions per capita at 20.59 tCO2e/person[9] with GHG emissions per capita being more than twice the G20 average.[10]

**Figure 1:** Canada's GHG Emissions have decreased by 69Mt $CO_2$ from 2005 to 2020.

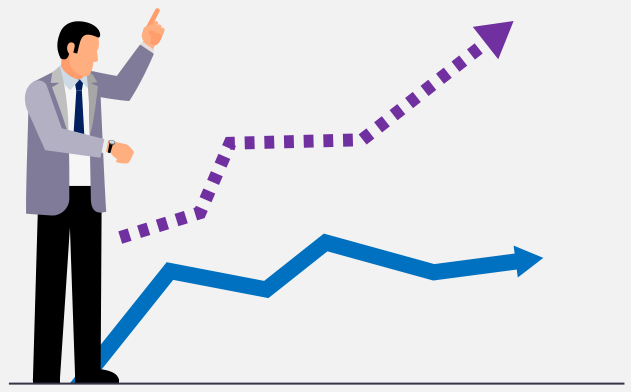



**Source**: Environment and Climate Change Canada, 2022

Given the rapid growth in global demand for sustainable development, accelerating cleantech across all sectors of the economy can help Canada meet environmental commitments as a signatory of the United Nations Paris Agreement, as well as secure competitive advantages for economic growth and job creation. With one of the highest per-capita GHG) emissions in the world, Canada has an even greater impetus to continue advancing technologies that promote sustainable development or cleantech that can use renewable and sustainable sources of energy, emit less pollution, and conserve resources.[11]

## Finding 1 Continued

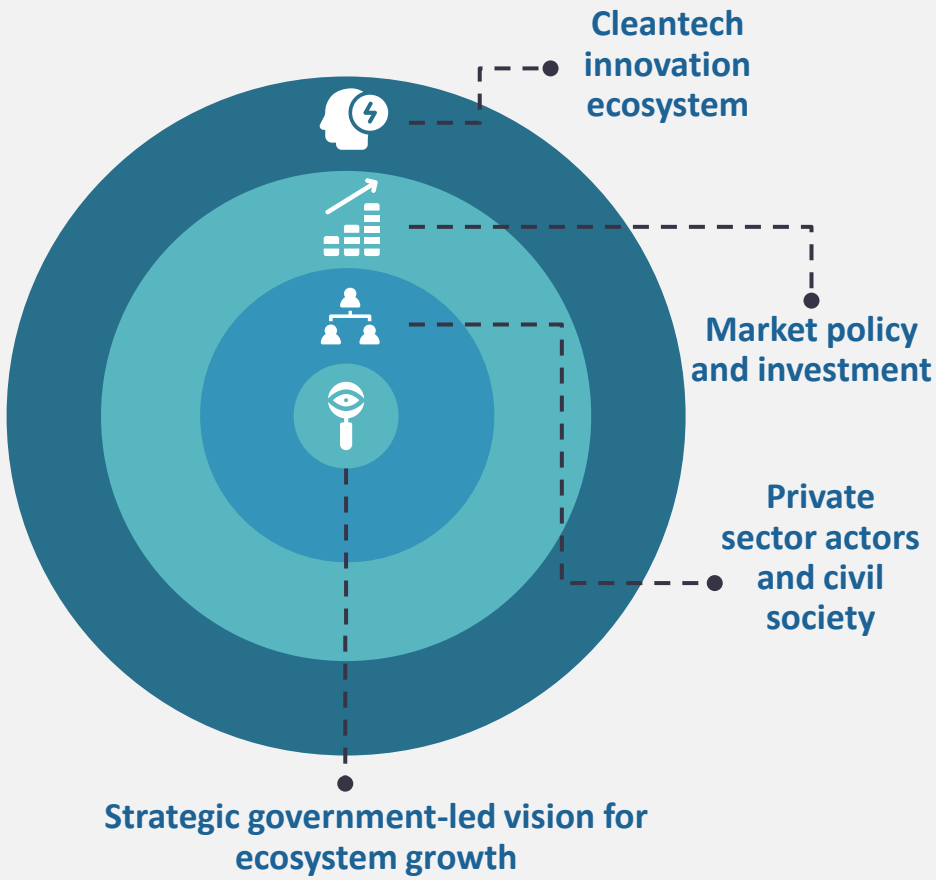
**Government support is key to Canada remaining competitive in the global marketplace for cleantech. It is critical for driving a robust innovation ecosystem and building the pipeline of technologies being developed in Canada.**



**Canada performs comparatively well in the early stages of cleantech innovation, but the performance drops off as budding cleantech moves towards commercialization and market deployment – where the majority of jobs and wealth are created.**

Cleantech is an area where Canada has several competitive advantages, including a sizeable research ecosystem and a skilled workforce.[12] Canada consistently ranks well in generating academic publications that are related to cleantech, at a rate that is 1.5 times higher than those in the United States (US).[13] Yet, there are 2.3 times as many academic cleantech patents per capita in the US than in Canada. Furthermore, while 3.4 percent of the world's environmentally-friendly patents were registered in Canada, only 1.6 percent of the world's clean innovations were developed here. This suggests a significant dissonance between Canada's ability to generate new clean innovation ideas and the ability to get them to market.[14] Moreover, interviewed stakeholders have emphasized that the government must step in to promote the development of cleantech in Canada, or risk losing them to foreign investors that dominate the global market and place greater demands on the equity of Canadian cleantech firms.[15] By having access to government funding, the likelihood of a Canadian cleantech company being sold and moving abroad is diminished, enabling Canada to reap the benefits from potential commercialization.

When compared to cleantech ecosystems in peer countries, there is a case for cleantech-specific government intervention in Canada. US policy has favoured a more mixed approach that is both government and market-oriented so that sustainable technology is more likely to be successful and less reliant on any single actor, institution, instrument, or process. Like the US, Germany's "critical mass" density of non-governmental/civil society (e.g., academic research and development) and private sector actors contribute to a system that is balanced and aligned with the federal government's objectives. Without this critical mass network, Germany's Renewable Energy Act notably saw relatively modest and economically inefficient benefits because green energy sources could not compete on the market without strategic government intervention. While Canada did rank in the top ten for its government-supported investment in renewable energy technology, the literature identified that it ultimately ranked behind the U.S. and Germany because the Canadian federal government plays a comparatively smaller strategic role and the Canadian industry is heavily reliant on a comparatively small number of institutions and actors.[16] For that reason, there is a specific need for a federally-led cleantech innovation driver to promote market adoption.



# Findings

## Finding 1 Continued

### Public funding is important in de-risking cleantech to mobilize private sector investment and help firms overcome market failure barriers.

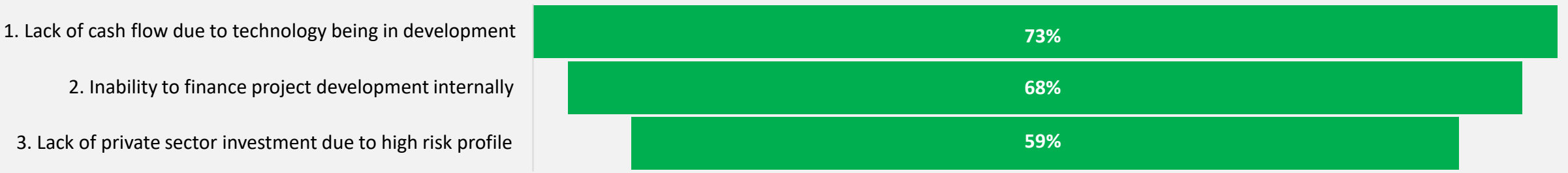
**Cleantech is uniquely affected by a market failure to put a price on most environmental costs and benefits (i.e. "absorbing environmental externalities").**

Although strong in the early stages of cleantech development (R&D), Canadian cleantech companies struggle to transition from pilot stage to commercial operations.[17] Due to the market failure to put a price on environmental costs and benefits, there is little economic reward for most pollution-reducing innovations – and therefore offer little profit incentive to invest in or develop such products. In the absence of these market signals, firms may experience under-investment in clean innovations because early stage cleantech may be perceived as riskier, especially due to its high capital intensity and longer timelines for generating revenues and providing investors with a return on investment (ROI). It can take a cleantech business upwards of 15 years to commercialize and generate revenue.[18] Furthermore, it can be difficult for a business to secure funding for its technology if it has a limited number of demonstrations.[19] Despite overall venture capital supply increasing in Canada over the past few years, these risk profiles discourage the traditional investors (i.e., banks and venture capital) that cleantech companies need. [20] To correct this market failure, the government can make a vote of confidence through public sector investments and policies to de-risk cleantech and encourage investments from the private sector.[21] The literature refers to this as a "PULL" policy—see more in Appendix B.

**Due to these national gaps in private investment, public funding has become the most common source of investment for cleantech companies in Canada.**

The literature indicates that there is a wealth of private capital available for late-stage cleantech deals globally, but it is concentrated in the US and Europe. While Canadian funds top out at $100 million to $200 million, the larger US-based cleantech funds typically deploy billions in financing. For instance, Blackrock recently raised $4.8 billion for a renewable energy fund, almost double its initial target of $2.5 billion.[22] The literature review of the Canadian cleantech investment landscape between 2015 and 2020 shows that private equity and debt financing deals went to only 21 companies, which are the more established companies that can leverage the late-stage venture financings and large injections of capital needed to become world-class competitors. In contrast, a total of 283 public grants were disbursed between 133 unique companies, and 87 of these companies have yet to reach maturity to raise a venture round — suggesting that many innovative companies are not securing enough funding to reach scale, and public funding is an important element to their survival.[23]

Findings from the SD Tech Fund recipient survey underscore the importance of government support in meeting these sustainable development challenges. The top three financial challenges identified by surveyed recipients were as follows:



# Findings

## Finding 2: The SD Tech Fund aligns with the federal government's role in driving sustained cleantech growth by supporting the pre-commercial needs of cleantech companies at various innovation stages.

### The Fund aligns with ISED's role in supporting cleantech innovation and achieving decarbonization targets by bridging the gaps in policy congruency between all governments, the private sector, and civil society.

**Well-designed policies that reduce barriers to innovation and offer targeted incentives can strengthen Canada's economic competitiveness.[24]**

**The SD Tech Fund's role is to help promising technologies move from the R&D stage to the point where they are ready for large scale market entry.**

**The ecosystem-strengthening policies magnify the impact of the other PULL/PUSH/GROW policies.[28]**

The literature indicates that there has been a historic lack of policy congruency when it comes to driving cleantech innovation.[25] Clean innovation is dependent on many policies, including those that target different stages of technology readiness, different economic sectors, different technologies and/or different types of companies. Further, different policy regimes – from trade policy frameworks to skill and immigration policies to financial regulations – all impact cleantech companies. If these oppose one another or are not well aligned, they risk creating a barrier for clean innovation.[26] SDTC is one of the "GROW" policy levers that form the interconnected cleantech policy landscape—see more in Appendix B.

With the market failures and barriers facing cleantech, governments play an important role in leveraging different policy levers to facilitate the diffusion and deployment of riskier innovations.[27] The literature review has found that the best tool to enable cleantech scale-up is targeted public investment (e.g., grants, loans, and access to growth capital) that are weighted across different sectors and innovation stages. In line with this finding, the Seed to Success Strategy was introduced in 2018, which entails three funding streams: Seed (finding emerging entrepreneurs), Start-Up (getting pre-revenue companies to market), and Scale-Up (accelerating commercialization). Case studies determined that while there are many sources of public sector funding for research, there are few sources aside from SDTC to support the development and demonstration of pre-commercial cleantech projects.

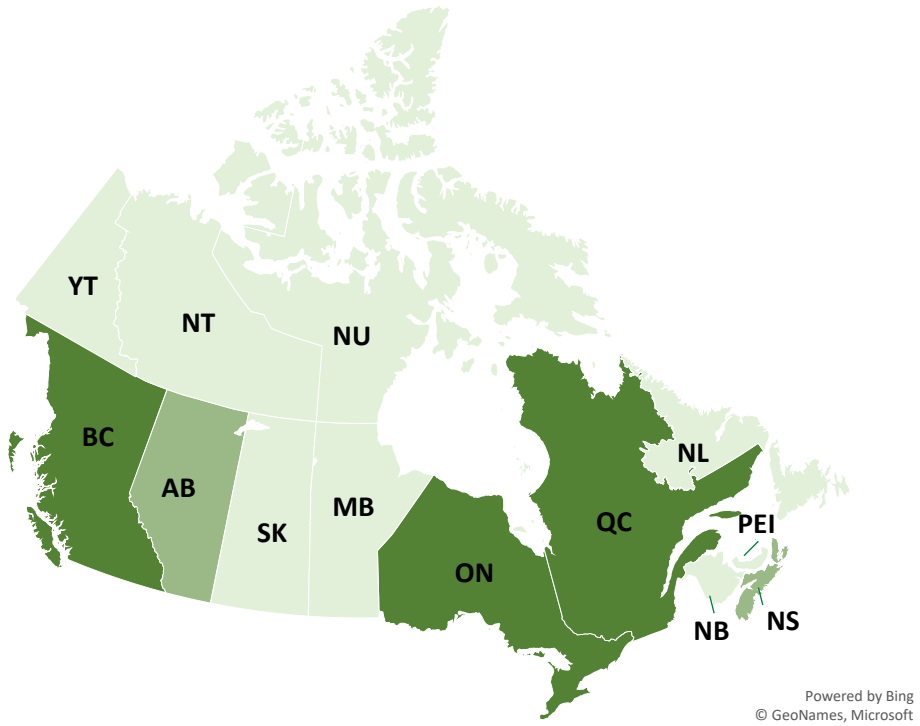
On the national level, there are a number of important roles for government to strengthen the overall cleantech innovation ecosystem's health, including skills, data/information, connections, accountability, and vision/strategy. ISED as a whole is driving intergovernmental coordination with federal portfolio partners to modernize regulations on all levels and develop programs that support the deployment of cleantech more broadly (see Appendix C). The document review found that SDTC underwent several changes in more recent years to align with the federal government's overarching goals around innovation policy congruency, as well as decarbonization targets (see Appendix D). Most recently, the Emissions Reduction Plan (ERP) was released in 2022 to increase the 2030 emissions reduction targets from 40-45 percent in order to reach net-zero by 2050. SDTC's objectives support the ERP by advancing cleantech innovation to reduce GHG emissions, supporting Canadians with jobs, growing the clean economy,[29] and by strengthening the quality of key emissions data which can help inform decision-making.

# Findings

## Finding 2:

**ISED works closely with portfolio partners to support the coordination of programs and regulations related to the cleantech sector. With its unique vantage point, SDTC employs a "one-window" approach to collaborate on applications that also cover funding sources from complementary regional and private sector programs.**

Stakeholders noted that SDTC aims to avoid duplication with programs in established cleantech regions and private sector programs with complementary mandates (see Appendix E). With a unique vantage point between industry and government, it instead focuses on building relationships to leverage other investments and amplify the groundwork already there.




Since 2018, SDTC has also embarked on a partnership strategy which evolved quite significantly around ecosystem-building and understanding the areas of strengths in different regions (see Appendix E for examples of programming within established and emerging regions):

1. **"Established regions" (BC, ON, QC)**: Since there are already a number of supports, the approach is to build relationships and leverage what exists already.
2. **"Emerging regions" (AB, NS)**: Targeted outreach to help grow awareness of SDTC funding supports, and more team members/regional staff base to meet needs on the ground.
3. **"Early stage regions" (SK, MB, NL, PEI, NB, NVT, NWT, YK)**: Identifying opportunities to build regional capacity and trust.

SDTC collaborated with regional governments and organizations to generate various "off-ramping activities" to ensure that companies find the best program through one-window applications, which covers a number of funding sources. SDTC has recently undertaken partnerships with provincially-managed funds in Quebec, Alberta and British Columbia. For example, the agency's partnership with **BC's Innovative Clean Energy Fund** increases the funding available for clean energy projects in the province, including prototype deployment, field testing and commercial-scale demonstration projects. The larger size of the fund, supported by $20 million each from SDTC and BC-ICE, will be helpful to those seeking to develop industrial-scale cleantech projects. Firms must develop partnerships with potential customers, technology co-developers or academic institutions. Similar cooperation between SDTC and the Atlantic provinces – specifically with **Innovacorp, NBIF, Innovation PEI,** and provincial funds in Newfoundland and Labrador – could help create a new regional funding vehicle, which could help to support corporate research and build stronger connections both to the marketplace and to the region's research institutions.

# Conclusions

- Summary of the Evaluation

# Summary of the Evaluation

## The evaluation led to two findings that addressed the continued need to support the development of sustainable (clean) technologies in Canada.

**Finding 1:** While Canada has established targets to reduce its emissions, there is a need for government funding to support sustainable development technologies in Canada to tap into the environmental and economic opportunities of cleantech innovation. Public funding can be leveraged to mobilize private sector investment and help firms overcome the market barriers to commercialization.

**Finding 2:** The SD Tech Fund aligns with the federal government's role in driving sustained cleantech growth by supporting the pre-commercial needs of cleantech companies at various innovation stages.

# Appendices

- Appendix A: Evaluation Methodology
- Appendix B: Canadian Cleantech Policy Landscape
- Appendix C: Examples of Complementary Federal Programs
- Appendix D: Timeline of Policy and Programming Changes
- Appendix E: Examples of Regional Programs
- Appendix F: End Notes

# Appendix A: Evaluation Methodology

To address the evaluation questions, information was triangulated from multiple lines of evidence, including the following qualitative and quantitative sources.

**Document and Literature Review**

The document review included key government priority setting documents (i.e. Pan-Canadian Framework on Clean Growth and Climate Change), program foundation documents (i.e. Performance Measurement Strategy), and SDTC reporting documents (i.e. annual reports). The literature review was comprised of pertinent literature to gain a thorough understanding of trends and issues in sustainable development technologies in Canada and globally.

**Virtual Interviews**

A total of 30 interviews were conducted using either MS Teams across the following stakeholder groups to gather diverse perspectives on the relevance of SDTC:

- Cleantech and innovation experts;
- SDTC Board of Directors, executives, and investment team;
- Provincial governments and other federal government departments;
- Accelerators and incubators;
- Investors; and
- ISED management and staff.

**Online surveys**

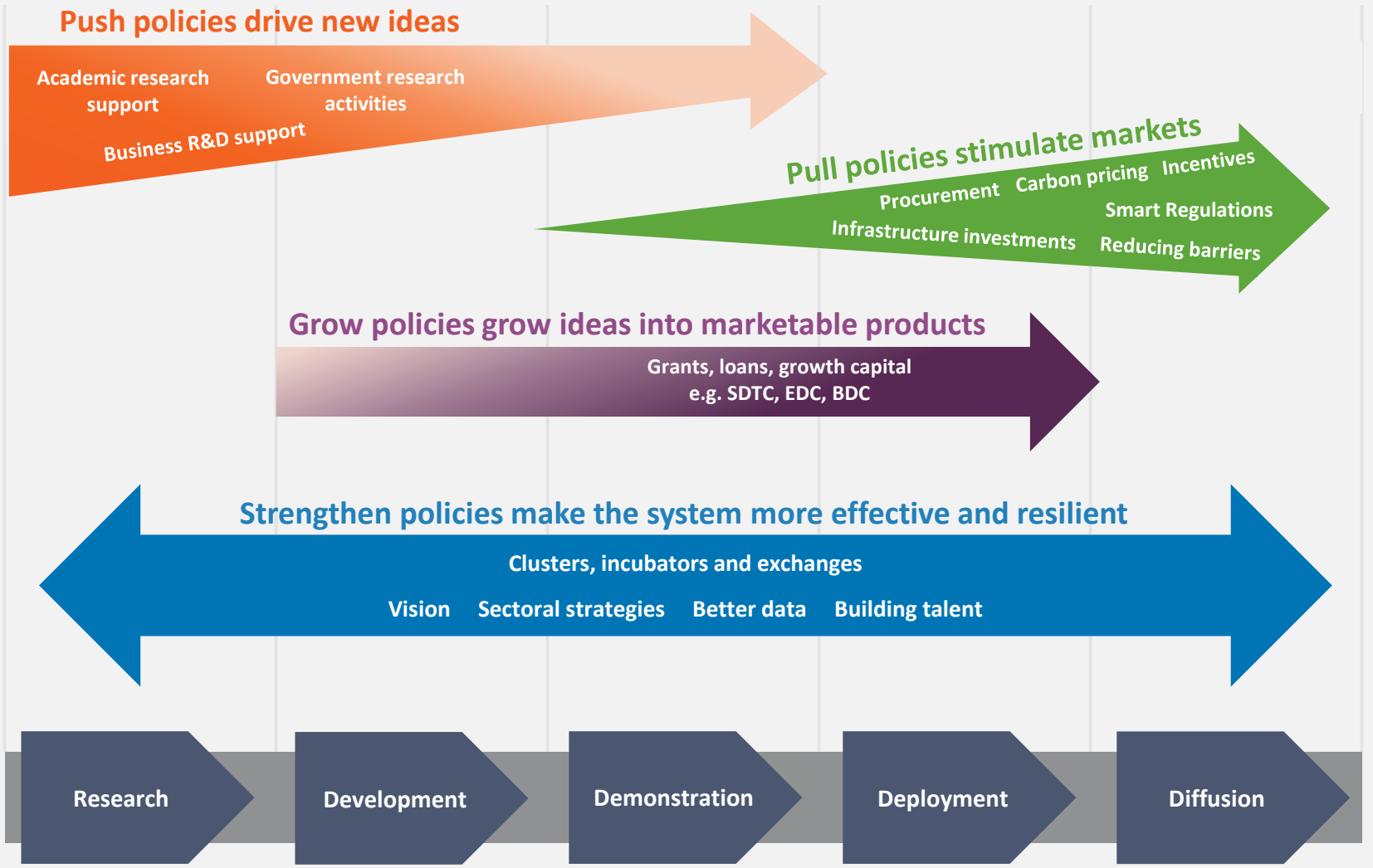
An online survey of recipients was used to capture quantitative and qualitative evidence to complement other lines of evidence by asking recipients questions pertaining to the unique and continued need for SDTC support. There were 152 respondents to the survey (140 completed) out of a total sample of 309 – representing a response rate of 49 percent (45 percent completed).

**Case Studies**

Six SD Tech Fund projects were selected as case studies based on the following criteria: type of organization, industry sector, levels of funding, types of funding leveraged (e.g., federal, provincial programs, private sector sources) and projects that were completed or not completed as planned.

# Appendix B: Canadian Cleantech Policy Landscape

This diagram outlines an interconnected ecosystem of policy interventions, to fully capture the various stages of cleantech innovation development and diffusion.




Adapted from: Smart Prosperity Institute. 2017. Accelerating clean innovation in Canada.

# Appendix C: Examples of Federal Partners (1/2)

ISED's key portfolio players include:

- **Natural Resources Canada (NRCan)** has multiple funding programs (e.g., Investment and Forest Industry Transformation program, programs run through the Office of Energy Research and Development, etc.) and research labs, so there's some complementarity but also some overlap. In particular, the **Clean Growth Hub**, co-led by ISED and NRCan, is a whole-of-government focal point for cleantech focused on supporting companies and projects, coordinating programs and tracking results. In its first four years, the Hub has helped over 2,000 cleantech stakeholders—including small and medium enterprises, cleantech innovators with high potential for disruption, and large adopters in critical, heavy-emitting industries—navigate the federal ecosystem of supports and services available to them. The Hub leverages its 16 member departments and agencies, bringing their knowledge, expertise, and networks to provide real-time, tailored advice and information regarding policy, regulation, standards, and procurement issues related to cleantech.
    - The mandate letter for the Minister of Natural Resources also sets out the priority to position Canada as a global leader in cleantech, with the 2021 supplemental mandate letter prioritizing building retrofits, reallocating surplus power within regions, promoting zero-emissions vehicles and investing in vehicle charging stations as key focus areas. As such, NRCan is expanding existing programs to provide cost-shared contributions to standards development organizations and industry to address gaps in codes, standards, and regulations for end-use equipment (e.g., vehicle components) and infrastructure that produces, distributes, or uses low-carbon fuels (e.g., pipeline and refuelling nozzles). In addition to these cost-shared contributions, NRCan will continue to work with federal partners and stakeholders to harmonize codes and standards, develop performance-based standards, and lead international standard and certification efforts. This work also contributes to commitments made through the Canada-United States Regulatory Cooperation Council.
    - NRCan also plans to explore new approaches to evaluating innovative electricity system projects, and elaborate pathways for scaling successful innovations through stakeholder consultations in support of net-zero by 2050 targets. The Innovation and Electricity Regulation Initiative will leverage federal expertise and experience from electricity grid modernization and research, development, and deployment programs. In addition, NRCan will consult with interested regulators, provincial governments, and electricity stakeholders to develop options to accelerate grid modernization within the regulatory construct in support of a high-electrification future. It would also enable the federal government to collaborate with provincial and territorial regulators to generate the data to inform benefit/cost models to evaluate business cases for wider deployment of piloted solutions.

- The **National Research Council (NRC)** has complementary programming more related to R&D and is also a signatory party to the Regulatory Reconciliation and Cooperation Table (RCT) Reconciliation Agreement on Construction Codes. Through this work, the NRC is working with provincial and territorial jurisdictions to modernize the National Code development system to reduce variations between provincial and territorial codes while ensuring faster adoption – within 24 months of 2020 National Model Code publication and within 18 months for subsequent code cycles. For example, the 2020 edition of the National Model Codes is expected to introduce performance tiers enabling provinces and territories to move towards net-zero energy ready building codes consistent with commitments under the Pan Canadian Framework on Clean growth and Climate Change. Minimum energy efficiency requirements for the design and construction of all new buildings will incentivize the adoption of cleantech solutions and reduce regulatory compliance costs for companies operating in multiple jurisdictions.

# Appendix C: Examples of Federal Partners (2/2)

- **Canadian Intellectual Property Office (CIPO)** offers an accelerated prosecution of patent applications relating to environmental (green) technologies at no additional cost. This initiative helps to expedite commercialization of technologies that could help to resolve or mitigate environmental impacts or to conserve the natural environment and resources. CIPO also collaborates with the World Intellectual Property Organization (WIPO) and is a member of the WIPO GREEN network, which facilitates commercial relationships and transactions by connecting green technology providers and seekers.
- **Measurement Canada (MC)** is undertaking a review of its legislation and regulations to ensure it has an agile regulatory system that enables innovation and cleantech adoption, particularly in the energy and clean sectors as well as small businesses. Examples of new measuring technologies include charging stations that measure the amount of electricity used to charge an electric vehicle. Modernizing the legislative framework is part of a broader initiative at MC to move to a more digitally enabled environment and a more risk-based operational model.
- **Environment and Climate Change Canada (ECCC)** invests considerable resources and effort in following developments in emerging cleantech related to issues such as energy efficiency, decarbonization, greenhouse gas emission sequestration, vehicles, engines, fuels, plastic waste, and water and air pollution. For instance, the **Low Carbon Economy Fund** supports projects that help to reduce Canada's greenhouse gas emissions. To supplement this work, ECCC is collaborating with the Centre for Regulatory Innovation to carry out a cleantech "foresight exercise." This initiative will enhance cooperation between regulators and stakeholders in the cleantech sector. The use of foresight analysis has potential to shape policies and regulations related to cleantech, which will support the ability of the cleantech sector to innovate and grow. This cleantech foresight exercise is underway and its findings will be reported in 2022.

Other funding-oriented programs include:

- The **Natural Sciences and Engineering Research Council of Canada NSERC** provides complementary funding for companies and technologies at a stage that is too early for SDTC.
- **Canada Infrastructure Bank (CIB)** is deploying $35 billion to deliver outcomes such as sustainable economic growth, connected communities and climate change action. EDC and BDC have been noted as complementary "back end" sources for cleantech funding.
- The **Net Zero Accelerator** supports Canada's net zero goals to help transform the economy for clean and long-term growth (up to $8 billion to support large-scale investments).
- The **Canadian Environmental Technology Advancement Centres (CETACs)** are a federal initiative which aims to develop the market for cleantech and verify environmental performance claims. The three centres; CETAC-WEST, the Bloom Centre, and Enviro-access are funded to support the development, demonstration and deployment of cleantech innovation in Canada. The federal government, through the Canadian Trade Commission, supports Canadian Technology Accelerators that provide Canadian high-growth market-ready companies in the sustainable technologies industries with access to foreign markets.
- **Innovative Solutions Canada (ISC)** is a pilot demonstration program that periodically issues challenges and competitions that help small businesses compete for government funding.

# Appendix D: Timeline of Policy and Programming Changes

**2015**: The federal government aligned SDTC with ISED (previously reporting to the Minister of Natural Resources), recognizing that the commercialization of cleantech was key to our innovation and industrial policy.

**2016**: After committing to the Paris Agreement, Canada developed the **2016 Pan-Canadian Framework on Clean Growth and Climate Change** to reduce GHG emissions by 30 percent below 2005 levels by 2030. SDTC supports the framework through one of its four pillars: "actions to accelerate innovation, support cleantech and create jobs". SDTC is accelerating a pan-Canadian cleantech ecosystem through its partnerships with federal, provincial and municipal organizations.

**2017**: The federal government further emphasized the urgency of commercializing capital-intensive technologies and committed approximately $400 million in **Budget 2017** to recapitalize the SD Tech Fund, as well as $1.4 billion over an accelerated 3-year period in financing to invest in the scale up and commercialization of cleantech firms, to be administered by the Business Development Bank of Canada (BDC) and Export Development Canada (EDC).

- Also marked closer relationships with BDC, EDC, the Strategic Innovation Fund (SIF), etc. to support the emergence of a more robust and vibrant intrapreneurial ecosystem that is creating a growing cohort of globally competitive companies.
- SDTC doubled disbursements over the three-year period and generated $500+ million in follow-on financial support, improved timelines to first disbursements, and became the largest vendor of fintech SMEs in Canada

**2020**: The federal government introduced **Bill C-12**, the *Canadian Net Zero Emissions Accountability Act* to achieve net-zero emissions by 2050. To operationalize the 2016 Clean Growth and Climate Change framework and ensure Canada reaches net-zero emissions by 2050, the Government developed the 2020 "Healthy Environment and Health Economy" plan (the "Plan"). SDTC supports the Plan through the Plan's "Building Canada's clean industrial advantage" pillar. For instance, Canada's industrial advantage is dependent on the speed and commercialization of cleantech projects to support decarbonization (i.e. carbon capture, utilization, and storage technologies (CCUS)).[64]

**2021**: The federal government continued to expand the focus on commercialization; Contribution Agreement Nine took SDTC to around $750 million. Here, a lot of the funding was shifted to providing larger sums to highest-potential and shifted from long five-year projects to shorter projects with smaller and more streamlined funding amounts.

# Appendix E: Examples of Regional Programs

- **Ontario:** Ontario is an "established" region and major hub for cleantech activity in Canada, where regional initiatives have been modelled after entrepreneurial culture and risk capital activity present in the U.S. Silicon Valley:
  - The **MaRS Cleantech Fund** and venture services assist in the building of globally competitive cleantech companies.
  - The **Federal Economic Development Agency for Southern Ontario**: delivers programs and services to support innovation and economic growth in southern Ontario.
  - The **TSX Cleantech Index**, a composite of the leading Canadian companies with a strategy of marketing the Canadian cleantech industry to prospective clients.
- **Quebec**: Quebec was the first province to implement a carbon tax, which was designed to promote public transit in addition to other government-led cleantech programs and funds.
  - **Technoclimat** is the biggest program for cleantech demonstration in Quebec (support for companies is $20 million a year).
- **British Columbia (BC)**: In 2008, BC followed Quebec by implementing a revenue-neutral carbon tax. The B.C. Clean Energy Act aims to leverage the province's already established hydroelectricity generation into a leader in North America, and the B.C. Research and Innovation Strategy aims to strengthen emerging clusters. Other funding options include:
  - **BC's Innovation Clean Energy (ICE) Fund** is funded through a levy on certain energy sales and is designed to support BC's energy, economic, environmental and GHG reduction priorities ($110 million committed since 2008).
  - **InBC Investment Corp** has a $500 million dollar fund for clean innovation.
  - **Clean BC Fund** which has the capacity to recycle carbon tax revenues and put them into funding.
- **Alberta:** As an "emerging" region, **Emissions Reduction Alberta** was established in 2009 to help deliver on the province's environmental and economic goals by investing in the pilot, demonstration and deployment of cleantech solutions. The **Climate Change And Emissions Management Fund (CCEMF)** also has various compliance options for emitters such as purchasing offsets, trading in credits and contributing to the province's technology fund.
- **Nova Scotia**: The only emerging region among the Atlantic provinces.
  - **Innovacorp** provides venture capital at a very early stage, which is higher risk and longer term than what other venture capital organizations might be interested in. Innovacorp also does a lot of work at the pre-investment stage helping to de-risk companies through support for their technology through their business team.

# Appendix F: End Notes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