

The Canadian Mosaic

Climate and Social Finance in Canada

Canada's climate policy is unique amongst most in its lack of central federal organization, which can be traced to historical reasons in its economy, Indigenous populations and settler patterns. This paper provides a state of the nation: an overview of current provincial legalization on climate policy (including cap-and-trade, carbon taxes and local, tailored measures) and federal frameworks that guide legislation. We link this to the current state of social finance in Canada, which shows promise but lacks governmental support or significant leadership, tracking trends in environmental impact investing, provincial leadership on climate social finance, and in particular, the peculiar case of Quebec, that has advanced by leaps and bounds compared to other OECD jurisdictions. Although Canada holds a lot of latent promise in climate leadership through social finance, there is a recognition that both fields are still in their infancy when compared internationally, so there is much to work towards through both public and private sectors.

Dr. James Tansey

CEO, Canvas

Bruno Lam

Manager, Research

Colton Kasteel

Associate

Varun Srivatsan

Analyst

Laura Chen

Analyst

Executive Summary

Overview

Canada has made slow progress to respond to the challenges of climate change, and now we see government and businesses explore new forms of policy intervention, financial instruments and sources of capital to explore potential solutions. The complexity of Canada’s resource-dependent economy and relatively autonomous provinces and territories makes it challenging to negotiate absolute emission reduction targets for the country. To understand the role of climate finance to drive climate solutions, we provide a summary of the diverse approaches Canadian provinces have taken to harmonize the Federal government’s commitments to climate policy and programs. We also link this to the current state of social finance in Canada, which shows promise but lacks governmental support or significant leadership.

Provincial Climate Action

- **British Columbia** was the first to transform climate policy in Canada and has the most comprehensive carbon tax across Canadian jurisdictions. The BC government also introduced the concept of a carbon neutral government and created the Innovative Clean Energy (ICE) fund, allocating \$25m annually to new and emerging clean tech investments. BC also released its new climate plan, Clean BC, in December 2018, prescribing measures to cut almost 19 megatonnes (Mt) of GHG emissions by 2030.

- **Alberta** established a carbon pricing and offset system to reduce the intensity of emissions from large industrial sources. The proceeds from Alberta’s levy will be reinvested back into the province to grow and diversify Alberta’s green infrastructure.
- **Western Climate Initiative** established international agreements between US states and Canadian provinces (BC, ON, MB, and QC) to effectively price and regulate GHG emissions by harmonizing their emissions trading program policies. It established allowances that are auctioned to regulate entities through a market that includes a floor on the price that increases each year.

Federal Climate Action

Some of the key initiatives that the federal government is using to address climate change are:

- i. **Carbon Pricing:** The federal government has established pricing of carbon-intensive goods across the national economy which is estimated to reduce Canada’s emissions by 80-90 Mt of CO₂e by 2030.
- ii. **Coal-Fired Electricity Regulations:** The new set of regulations were introduced to set a permanent cap on performance standards to accelerate coal-fired electricity phase-out, which is estimated to reduce GHGs by 16Mt of CO₂e per year, by 2030.

- iii. **Low Carbon Economy Fund:** The fund will direct \$2 billion into projects that will reduce GHG emissions, address climate change while sustaining communities, and encourage innovation amongst different jurisdictions across Canada.
- IV. **Clean Fuel Standard:** Although the final regulations will be published in mid-2019, it will replace the existing Renewable Fuels Regulations and aims to eliminate 30Mt of GHG emissions by 2030.

Social Finance in Canada

The social finance sector in Canada is still emerging; however, to understand the potential demand for investment and risk appetite of social ventures, we highlight different social finance programs ongoing across Canada.

- **Quebec:** Quebec has a distinct approach to mobilizing capital into the social economy through labour solidarity funds and legislation in the 90s that enabled the creation of solidarity cooperatives. Funds like the Fonds des Solidarités du Québec (FTQ) and Fondation, combined with tax incentives of 30% have encouraged reinvestment into Quebec by establishing a strong alignment between the source of capital and local businesses. This is especially prevalent in Quebec's social economy because of its legacy of cooperatives and the active union movement.

- **Aboriginal Finance:** Impact investing in Indigenous communities is at a very early stage, but it is gaining traction within some industry-specific opportunities. The Aboriginal Finance Initiative (AFI) provides access to capital to small aboriginal-owned businesses where traditional financial institutions have failed to do so. In addition, Aki Energy has made strides in social and climate finance through sustainable energy initiatives and local food production that support traditional lifestyles of the indigenous communities. This method of utility financing solves issues of accessing credit for certain households that do not have assets and may be unemployed or have limited incomes.
- **Great Bear Rainforest Carbon (GBR) project:** GBR demonstrates how the engagement of Indigenous communities can serve as a catalyst for more stringent climate policies through sustainable economic development strategy. \$120M was secured and allocated across communities to support greater conservation and economic transition in the form of extending more timber rights to BC's First Nations.

The main finding suggests that the majority of social ventures are relatively small and have a limited appetite for risk financing or debt. Surveys also suggest that for-profit social ventures were three times more likely to use debt financing and indicate that two-thirds of the total sector rely on grants to support their revenues.

Climate Finance

A critical role for climate-related social finance is supporting investments in clean technology. We review a number of funds initiated by the Canadian government that has played a catalytic role in supporting investments in climate solutions:

- **Innovative Clean Energy Fund (ICE):** BC's ICE fund has a mandate to support the development of clean energy to accelerate the development of new technologies. They have allocated \$62.4m to fund 71 projects, and the total portfolio is valued at \$262.2m. This fund has the potential to solve energy and environmental issues, as well as create socio-economic benefits for British Columbians. Our findings show that ICE made the most numerous investments in bioenergy and attracted the most investments at \$26m, including matched funding.
- **Sustainable Development and Technology Canada (SDTC):** The SDTC funds Canadian clean technology projects focused on four issues: climate change, air quality, clean water, and clean soil. They have allocated \$2.53b to fund 363 projects, and the value of the total portfolio is at \$3.76b. The fund focuses on helping projects that require capital to move from stages of fundamental research towards market entry. Our findings show that the SDTC has allocated most of its capital towards Ontario-based projects and is never the sole funder in the projects.

- **Emissions Reduction Alberta (ERA):** The ERA aligns its investments with the Government of Alberta's strategic priorities focusing on reducing GHG emissions and advancing their position to contribute to critical climate change innovation. As of 2017, \$349m has been contributed to fund 121 projects, and their total portfolio is valued at \$2.3b. Similar to SDTC, the ERA fills the funding gap for pre-commercial technologies with the majority of their funding dedicated to developing and demonstrating innovative projects, particularly on improving oil sands production efficiency. Majority of the investments are Alberta-based projects; however, unlike BC's ICE fund, they also invest in projects in other provinces and the UK.

Performance Comparison: ICE, SDTC, ERA

The key performance measure of these funds is based on the leverage ratio, which measures the additional amount of investment dollars raised for every \$1 invested by ICE, SDTC, and ERA. However, the project status shows that the ERA has a far more successful success rate, in which only 1 out of their 117 projects terminated early.

Fund	Average Leverage Ratio
Innovative Clean Energy (ICE) Fund	\$4.55
Sustainable Development Technology Canada (SDTC)	\$2.48
Emissions Reduction Alberta (ERA)	\$2.96

TABLE 1. THE AVERAGE LEVERAGE RATIO/ QUOTIENT REPRESENTS THE AMOUNT OF ADDITIONAL INVESTMENT RAISED IN A GIVEN LOW-CARBON PROJECT, FOR EVERY \$1 INVESTED BY ICE, SDTC, OR ERA.

Canada’s Social Finance Fund

The federal government committed \$755m over the next decade to establish a social finance fund and an additional \$50m over the next two years for social purpose organizations to participate in the social finance market. The proposed fund could generate up to \$2b in economic activity and generate 100,000 jobs over the next decade.

Although Canada holds a lot of latent promise in climate leadership through social finance, there is a recognition that both fields are still in their infancy when compared internationally. Looking forward, we see significant social and climate financing opportunities for both the public and private sectors.

Table of Contents

Overview	8
Canadian Climate Action	11
Resource Dependence in the Canadian Economy	11
Provincial Leadership	12
British Columbia	12
The Federal Position	17
Social Finance in Canada	22
Social Ventures in Canada	23
The Case of Quebec	29
Aboriginal Finance	30
Great Bear Rainforest Carbon Project	33
Other Funds	33
Climate Finance	35
Innovative Clean Energy Fund (ICE) – BC	35
Sustainable Development Technology Canada (SDTC)	40
Emissions Reduction Alberta	42
Performance Comparison: ICE, SDTC, ERA	45
Canada’s Social Finance Fund	46
Conclusion	48
Appendix: ICE, SDTC, ERA Data	50
ICE Fund Data and Performance	50
SDTC Data and Performance	54
ERA Data and Performance	57

Overview

Canada has been a relatively late mover in responding to the challenge of climate change. As a result, we are in the midst of a transition where government, business, and civil society are exploring and mobilizing new forms of policy intervention, financial instruments, and sources of capital to expand the portfolio of solutions available in the country. In the last two years, there has been a transformation in the federal government's commitment to tackling climate change and supporting a transition to a low carbon economy. As part of this transition, there has been renewed interest in the role of social finance in supporting the expansion of the low carbon economy, improving opportunities for Indigenous engagement and enabling the broader transition of the economy to climate-friendly solutions.

This case begins with a profile of the Canadian economy, which has a particularly high level of resource dependence compared to other OECD countries. It is also important to this case to understand the historical consequences of the pattern of settlement of Canada, which was driven by the pursuit and development of natural resources across a challenging and often inhospitable territory. There are two key consequences of this pattern of colonization that have a very strong influence on Canada's capacity to respond to the challenge of climate change. These structures require a different approach to leadership in the country than in more centralized nations such as the UK and France.

First, Canada is a federal nation and the constitution grants a great deal of autonomy to the provinces and territories, particularly over decisions related to the energy sector and the environment. Few examples reveal this delegation of authority more clearly than the push by the Albertan government to develop the Alberta Oil Sands as a provincial resource, with limited need for input and support from other provinces or the Federal Government.

range of policy decisions. Many of these court cases have fought over access to natural resources and have established a precedent where First Nations have the status of another level of government in negotiations alongside provincial and federal governments. The case study will identify illustrative examples where underlying disputes over sovereignty and territory coalesce around issues of resource extraction and energy resource development.

Second, during the colonization of Canada, issues of Indigenous rights and title were neglected and abused in many cases. Recent court cases have created much stronger obligations for government and the private sector to recognize the traditional rights of Canada's Indigenous peoples and have introduced a clear duty to consult over a wide

The main contours of the problem with climate policy in Canada are clear: a vast country, that remains heavily dependent on natural resources for economic growth and exports must negotiate absolute reduction targets with relatively autonomous provinces and territories, while all

levels of government have obligations to respect the rights and title of Canada's First Nations.

The sheer scale of Canada's territory creates inherent challenges in establishing central and universal policies for the country. For instance, after confederation the government sought to unite the country by building railways, but the energy grid across the country is highly diverse and fragmented and remains provincially controlled. The scale of the territory and the differences in resource endowments by region result in very different energy supply mixes across the country, from Alberta, which has a high dependence on coal-fired power generation to BC and Quebec that generate over 90% of their power from hydroelectricity. The upside of this history is that collaboration may come more naturally to Canadians:

“Although we don't talk about it, I make an assumption that collaboration is hopefully easier in Canada than maybe some other countries. That whole notion that the US, you guys have life, liberty and the pursuit of happiness. And we have peace, order and good government. The historic narrative about how our country grew wasn't based on a revolution, it was based on the public and the private sector coming together around creating very specific nation-building activities.”

– Tim Drainin, SiG

Both factors have an immediate impact on the conditions for climate policy-making in Canada. First, unlike most other OECD countries, while the federal government is responsible for negotiating international agreements like the Paris Accord, it has historically been reluctant to commit the provinces to binding targets. This has resulted in an unusually fragmented mosaic of climate policies across the country, developed by provincial leaders in response to their own constituencies and ranging from an economy-wide revenue neutral carbon tax in BC to an intensity-based carbon pricing system in Alberta, originally focused on large final emitters. Quebec and Ontario made unilateral decisions to join the Western Climate Initiative (WCI), a cap and trade system developed with California that establishes targets and an international trading system, but without the direct legislative support of either the US or Canadian Federal Governments.

To properly understand the role of climate finance in driving the climate solutions, it requires an understanding of both the regulatory environment that pushes the public and private sector to act and the sources and forms of capital that attract investors. A number of regulations described in this case create pressure on government institutions to act; this recognizes that federal government spending is around 21% of GDP and total government spending is significantly higher. For instance, both the carbon tax and the carbon neutral government initiatives in BC send a very strong signal to public sector organizations—a current carbon price of \$35 per tonne that will rise to \$50 per tonne by 2021—that reductions in emissions will reduce their costs.

The case will provide a summary of the diverse approaches Canadian provinces have taken to climate policy and will also address recent commitments by the federal government to harmonize carbon pricing nationally at \$50 per tonne, while allowing the provinces to choose specific measures. This approach was a peculiarly 'made-in-Canada' solution and creates challenges for companies that operate across provincial boundaries, but it also allows for flexibility between jurisdictions with very different emissions profiles. The case study also summarizes efforts by provincial governments and the federal government to stimulate innovation by the private sector to expand the number of low carbon companies. Programs such as Sustainable Development and Technology Canada have played an important role in growing the clean technology sector.

While the US, UK, and a number of other jurisdictions have embraced social finance mechanisms, Canada is still in the process of developing a national strategy. That said, there is evidence of a number of well-developed examples of social finance instruments applied to climate policy across the country, ranging from the Great Bear Initiative, which funded sustainable economic development opportunities with revenues from forest carbon credits generated from conservation commitments to community led investments in Quebec by solidarity cooperatives to energy efficiency companies like Co-Power that reduce power use in commercial buildings. The case will describe the size of the social finance and impact investing sector in Canada and seek to compare the current capacity to other jurisdictions. The case will present emerging policy initiatives at the

federal level that will significantly increase the amount of capital available for new programs and ventures as for discussion, review and evaluation by the class participants. As part of this analysis, the case will identify priority areas for capacity building Canada, drawing on experience from the UK and US as well as from national and provincial surveys.

Canadian Climate Action

Resource Dependence in the Canadian Economy

Canada's transition to an industrial economy occurred much later than other OECD countries. The vastness of the territory and the relative remoteness of the west coast meant that development of the western provinces—where most of the oil and gas resources reside—occurred much later than much of the rest of North America. Vancouver, now home to 2.6 million people had just 1000 residents in 1891 growing to just 14,000 in 1901 and its economy relied heavily on forestry and fisheries for much of the 20th century. While central Canada developed manufacturing capabilities over the same period, the overall profile of the Canadian export sector has remained heavily resource dependent. Although the importance of forest products has declined over the last forty years, oil and gas extraction dominate the export profile, at least for now.

Canada is the fifth largest producer of oil and the fourth largest exporter globally¹. While all exports are traded into the same Canadian dollar, the majority of production occurs in the western provinces and this generates concerns about the impact of the 'petrodollar', which can be a

disadvantage to manufacturing companies. The relationship between the US\$ exchange rate and oil prices has been consistently strong: over the ten years to 2015 there was a 0.78 correlation between oil prices and the exchange rate. When oil prices are high, this undermines the manufacturing sector, making Canadian goods relatively more expensive². It remains to be seen how growth in low cost shale oil and gas sectors in the US will affect this correlation going forward, but it has brought into question the significance of export focused infrastructure like oil pipelines. As Bill Young points out in his interview, the impact of this resource dependence is significant:

"Canada is a divided nation in its environmental positioning...there's vested interests in multiple countries but when you probably have as many natural resources as Canada has, there's this tension between stewardship and economic development that is a fine line for anyone, any leader to walk. We'll see how Trudeau navigates that."

In the case of natural gas, the dramatic expansion of shale gas resources in the US had eroded demand for Canadian natural gas; for instance, the Marcellus field in on the east coast has more reserves than Canada's entire natural gas production. This decline in demand was one of the factors that drove provinces like BC to look to export markets and to Liquefied Natural Gas production. Unfortunately, for now at least, the

¹ Wikipedia contributors. (2019). Petroleum industry in Canada. Retrieved from: https://en.wikipedia.org/w/index.php?title=Petroleum_industry_in_Canada&oldid=878733451

² Investopedia. (2018). How & Why Oil Impacts the Canadian Dollar. Retrieved from: <http://www.investopedia.com/articles/investing/021315/how-why-oil-impacts-canadian-dollar-cad.asp>

market in Asia is oversupplied and low oil prices have also driven down natural gas prices.

Provincial Leadership

Among the Canadian Provinces, British Columbia, under the leadership of then Premier, Gordon Campbell, was the first to transform climate policy, beginning in 2008 with the introduction of a revenue neutral carbon tax, set at initially at \$10 per tonne, increasing by \$5 per tonne for the following four years. The revenue neutral feature of the tax was a significant policy innovation which ensured that any increased in tax revenue would be offset by reductions in corporate and personal income taxes.

British Columbia

BC's carbon tax is the highest and most comprehensive across Canadian jurisdictions. It is set at \$30/tonne, and covers 75% of the province's economy. Essentially, all of the revenues earned from the tax are channeled back into the province through tax reductions³. The tax itself was initially low, and gradually stepped up to ease households and businesses into the transition. The tax itself covers 70% of total GHG emissions in BC and despite an increase in population, BC still has seen a 5.5% reduction in

³ Questions have been raised over the revenue neutrality of the tax, given that unrelated tax credits (on film, TV and scientific research) were included as part of tax reductions used to offset the carbon tax. In response, the provincial government has agreed to exclude these unrelated tax credits.

⁴ Environment, M. O. (2018). British Columbia's Carbon Tax. Retrieved from:

emissions. ⁴ Based on the current tax level of \$35/tonne of GHG emissions, the price of consumer fuels will increase by the following amounts:

Fuel	Price Change from Tax (\$35/Tonne)
Natural Gas	8.95 ¢ / litre
Gasoline	7.78 ¢ / litre
Diesel	6.65 ¢ / cubic meter

TABLE 2. CONSUMER FUEL PRICE INCREASES FROM CARBON PRICING. ⁵

Within the same period, the BC government introduced the concept of carbon neutral government, created legislation that would provide the foundations for a cap and trade system linked to California and a number of other provinces and states and ensured that any new electricity supply would focus on low carbon option such as hydro, wind and biomass. The province also created the Innovative Clean Energy (ICE) fund, which allocated \$25m annually to investments in new and emerging clean technology solutions. This entire programme was led and driven by Gordon Campbell, then Premier of British Columbia, who saw climate finance as a priority and recognized that voters in the political centre in BC were looking for climate leadership.

<http://www2.gov.bc.ca/gov/content/environment/climate-change/planning-and-action/carbon-tax>

⁵ The Province of British Columbia. (2018). British Columbia's Carbon Tax. Retrieved from:

<https://www2.gov.bc.ca/gov/content/environment/climate-change/planning-and-action/carbon-tax>

CleanBC: 2018 Climate Strategy Update

BC released its new climate strategy as a part of the Province's legislated climate targets to cut almost 19 million tonnes of GHG emissions by the year 2030. The *CleanBC* plan has set drastic measures to help shift homes, vehicles, industries, and businesses off their reliance on fossil fuels and towards clean and renewable energy.⁶

The key sectors of the *CleanBC* climate strategy include:

- i. Buildings: All new buildings will be expected to increase efficiency standards so that every new building is “net-zero energy ready” by 2032. Existing buildings will undergo retrofits and renovations through subsidies from the new Efficiency BC program to make homes more energy-efficient and affordable. Furthermore, to increase renewable fuels in consumer gas products, a minimum requirement of 15% renewable gas for buildings will be implemented.
- ii. Transportation: The strategy also pushes towards energy-efficient solutions by subsidizing the cost of new zero-emission vehicles, expanding electric charging infrastructure, and increasing the production of biofuels at the pump. Requirements will be implemented so that by 2030, the transportation sector will

reduce its emission by 20% and by 2040, every new car will be a zero-emission vehicle (ZEV). The government also plans to speed up the switch to cleaner fuels by increasing the low carbon fuel standard to 20% by 2030 and increasing tailpipe emissions standards for vehicles sold after 2025.

- iii. Industry: The new carbon tax revenues from industries that pay above \$30 a tonne will be used as an incentive to reward the lowest GHG performers. New regulations will be implemented to reduce methane leakages and increase electrification in large industries. The government is also helping BC reduce residential and industrial organic waste and turning it into clean resources.
- iv. Waste: Organic waste, which currently makes up an estimated 40% of municipal landfills, is a significant and substantial source of greenhouse gas emissions. To mitigate methane leakage and production, *CleanBC* mandates the following: a minimum of 15% renewable content in natural gas; a 95% organic waste diversion rate from municipal, industrial and agricultural sources; and the capture of at least 75% of landfill gas province-wide – all by 2030.

BC's new climate plan is a major step towards a low-carbon BC; however, the identified measures

⁶ The Province of British Columbia. (2018). CleanBC. Retrieved from: <https://cleanbc.gov.bc.ca/>

are still not enough to meet its legislated 2030 target. Within the next two years, the government intends to make up the 25% gap with additional measures.⁷

Alberta

Alberta established a carbon pricing and offset system that focused primarily on large final emitters, responsible for over 50,000 tonnes of carbon dioxide. The program was designed to reduce the intensity of emissions from large industrial sources by 12% by pricing carbon at \$15 per tonne. Companies that could reduce their emissions below a target price of \$15 per tonne would be credited but they had two other compliance options. Companies could purchase carbon credits, sourced within Alberta, under a regulatory system that originally only required a limited level of verification. That system resulted in millions of tonnes of carbon credit production by farmers in Alberta, who shifted to no till agriculture to reduce emissions from soil. Over time the government raised the bar on those verifications to 'reasonable assurance' levels and that significantly reduced the pool of credits available. Companies that could not make the reductions and could not source offsets paid a \$15 fee into a fund that was established to invest in lower carbon technologies. While ERA (originally CCME) secured over \$180m in funds through this mechanism, they struggled initially to find suitable investments within Alberta.

⁷ Lee, M. (2018). BC's shiny new climate plan: A look under the hood. Retrieved from: <https://www.policynote.ca/clean-bc/>

The ICE Fund and ERA are reviewed in more detail at the end of this report.

Alberta also introduced a levy on all fuels emitting GHGs when combusted. The tax began at \$20/tonne in 2017 and has since been raised to \$30/tonne. Originally scheduled to rise in conjunction with the Pan-Canadian Framework Convention on Climate Change's carbon price floor (\$10/tonne increase per year, rising to \$50/tonne in 2022), Premier Rachel Notley declared that Alberta will no longer be raising its price voluntarily, until the nationalized Trans Mountain pipeline expansion sees construction progress.⁸ Nonetheless, if the Federal Liberal government wins the next election in 2019, and Alberta has not opted back into the national framework by January 1st, 2021 (when the carbon price floor is scheduled to raise to \$40/tonne), the federal backstop will charge producers directly and impose an increased price regardless.

As with BC, the proceeds from Alberta's levy will be invested back into the province, making it (on paper, at least) revenue-neutral. Rebates are also offered (without application) based on income and family size to offset the costs of the carbon levy. With a projected \$5.4 billion to be raised from the levy, the Albertan government has developed a plan for how to use those revenues:

- \$1.5 billion in carbon rebates to help low- and middle-income families

⁸ CBC News. (2018). Premier Rachel Notley pulls Alberta out of federal climate plan over Trans Mountain ruling. Retrieved from: <https://www.cbc.ca/news/canada/edmonton/alberta-jason-kenney-political-reaction-rachel-notley-kinder-morgan-pipeline-1.4805224>

- \$1.3 billion for green infrastructure
- \$998 million for Climate Leadership Plan implementation initiatives
- \$566 million for an energy efficiency agency and associated projects
- \$565 million to pay for a cut in small business tax rate from 3% to 2%
- \$291 million in transition payments for the coal phase out agreements
- \$151 million to assist Indigenous communities' transition to a cleaner economy

Premier Notley announced that the expansion of Edmonton's West Valley Line ERT is going forward after investing \$1.04 billion from carbon revenue. This is an example of how revenue from the Climate Leadership Plan can be reinvested to grow and diversify Alberta's green infrastructure to create affordable and accessible transportation. As the Albertan government levy matches the Pan-Canadian framework carbon pricing plan, there are no additional federal carbon taxes applied to the province.⁹

Ontario

Ontario has gone through a gradual evolution of climate change policies over the past few years. In 2014, Ontario closed its last remaining coal-fired generator and became the first jurisdiction in North America to fully eliminate coal as a source of electricity generation. In 2016, Ontario introduced

the Climate Change Mitigation and Low-carbon Economy Act, expanding initiatives like the implementation of a cap and trade regime, and their Five-Year Climate Change Action Plan (ON Action Plan), which included Ontario's replacement of all coal-fired electricity generation. Ontario's provincial government also established the Industrial Conservation Initiative (ICI), which provides an incentive for eligible large electricity customers to conserve electricity. The province's substantial reductions in GHG emissions resulted in a significant increase in renewable electricity production.

Although the ON Action Plan has taken numerous actions to help individual consumers and businesses transition to a low-carbon economy, the change in government in 2018 has scaled back on Ontario's climate-change targets. The new Ontario government passed legislation to cancel the province's cap-and-trade system, which includes the green infrastructure programs financed through the revenue made in the carbon pricing model. In the end of 2018, Ontario released its new environmental plan, which features a \$400m Ontario Carbon Trust that will provide new funding for emissions reduction projects across the province. The trust replaces the previous cap-and-trade system; however, the new strategy will make it harder for Canada to meet targets made under the Paris climate accord.¹⁰

⁹ Pembina Institute. (2017). What you need to know about Alberta's carbon levy. Retrieved from: <http://www.pembina.org/pub/alberta-carbon-levy>

¹⁰ Dion, J., Arnold, J., Frank, B. (2018). Up in the Air: A look at Ontario's new climate policy. *Ecofiscal*. Retrieved from: <https://ecofiscal.ca/2018/11/29/air-look-ontarios-new-climate-policy/>

Western Climate Initiative

The Western Climate Initiative was originally established by five western US states (AZ, CA, NM, OR and WA) and in 2008 they were joined by Ontario, Manitoba, Quebec and British Columbia. Ultimately, only California, Quebec and Ontario established the legislation that would allow them to operate a cap and trade system. The WCI is unusual in that it involves international agreements between a state and two provinces to effectively price and regulate greenhouse gas emissions through a common trading system. Allowances are auctioned to regulated entities through a market and the system includes a floor on price that increases each year. The floor ensures that the market signal cannot collapse as it did in the EU-ETS during the recession.

Launched in January 2017, Ontario's cap-and-trade system provides a systematic, structured mechanism to tap into carbon markets in order to decrease carbon emissions over a period of 30 years. These benchmarks exceed federal benchmarks and put the province in good stead to reduce GHG emissions.¹¹ Initially, the government will allow large emitters to pollute for free until 2020, with the rationale being to prevent these

¹¹ Ontario Ministry of the Environment, Conservation and Parks. (2018). Cap and Trade. Retrieved from: <https://www.ontario.ca/page/cap-and-trade>

¹² CBC News. (2017). How Ontario's cap-and-trade system works. Retrieved from: <http://www.cbc.ca/news/canada/toronto/cap-and-trade-explainer-1.4035230>

¹³ Ontario Ministry of the Environment, Conservation and Parks. (2018). Cap and Trade: Program Overview. Retrieved from: <https://www.ontario.ca/page/cap-and-trade-program-overview>

emitters to move to jurisdictions without carbon pricing.

After this period, there will be a (declining) cap on emissions from 142 megatons in 2017 to:

- 15% below 1990 levels by 2020
- 37% below 1990 levels by 2030
- 80% below 1990 levels by 2050

Prices are set at a floor of \$17.50 - \$18 per tonne, though demand can push this higher. There are additional early reduction credits for work already undertaken to reduce emissions.¹² The proceeds from cap-and-trade auctions are funneled into a Greenhouse Gas Reduction Account to fund green initiatives that reduce or support reduction of GHGs.¹³

Initially, Quebec introduced a low carbon tax in 2006 with revenues going into a Green Fund that funded green infrastructure and education.¹⁴ Quebec's cap-and-trade system works similarly to that of Ontario, with prices projected at being roughly \$19.40/tonne by 2020.¹⁵

¹⁴ Seguin, R. (2018). Quebec unveils carbon tax. *The Globe and Mail*, Retrieved from: [https://beta.theglobeandmail.com/news/national/quebec-unveils-carbon-](https://beta.theglobeandmail.com/news/national/quebec-unveils-carbon-tax/article18165593?ref=http://www.theglobeandmail.com&)

[tax/article18165593?ref=http://www.theglobeandmail.com&](https://beta.theglobeandmail.com/news/national/quebec-unveils-carbon-tax/article18165593?ref=http://www.theglobeandmail.com&)

¹⁵ Tasker, J. P. (2016). 4 provinces already have a carbon price, here are the details. *CBC News*, Retrieved from <http://www.cbc.ca/news/politics/provinces-with-carbon-pricing-1.3789174>

Quebec's cap-and-trade system has been linked to that of California since 2014, and will be linked soon to Ontario's. However, Quebec's forecasted carbon price is lower than the minimum the federal government projects beyond 2020. This could cause issues with the links between Californian and Quebec carbon markets, as the minimum cap of \$50/tonne would be imposed on Quebec and Ontario, even if the clearing price were lower than that. The potential for the arbitrage that follows could create political and economic repercussions for both markets.¹⁶

Locally-Owned Renewable Energy that are Small Scale (LORESS)

New Brunswick introduced legislation to allow local entities to source electricity through renewable energy. This encompasses universities, non-profit organizations, co-operatives, First Nations and municipalities, that will all be able to contribute to New Brunswick's renewable energy goals.¹⁷ With a wind energy plant generating 300 megawatts, along with biomass and biogas capturing landfills also support New Brunswick's shift towards renewables. Alongside the province is shutting down of a coal and heavy oil power plants, which translates into 75% non-emitting energy sources by 2020.¹⁸

¹⁶ Antweiler, W. (2016). Trouble looming for Quebec's emission permit system. Retrieved from:

<https://wernerantweiler.ca/blog.php?item=2016-10-19>

¹⁷ Government of New Brunswick. (2016). Community Renewable Energy. Retrieved from:

<http://www2.gnb.ca/content/gnb/en/departments/erd/energy/content/renewable/content/CommunityRenewableEnergy.html>

!

¹⁸ Ibid. 3

Nova Scotia, New Brunswick, Prince Edward Island, Newfoundland & Labrador, the Yukon and the Northwest Territories have committed to creating a "made-in-province" solution to carbon pricing.¹⁹

The Federal Position

Canada's federal climate and environmental policy history has been challenging, focusing on issues such as ambient pollution or acid rain, to international leadership on climate policy, such as the Montreal Protocol.²⁰ Today, Canada's federal and provincial policies are organized under the Pan-Canadian Framework for Clean Growth and Climate Change.²¹

Four key pillars inform the current government's perspective on climate change policy:

- i. Carbon Pricing: Encompassing the policies which instrument the appropriate pricing of carbon-intensive goods across the national economy, this pillar considers a wide variety of approaches to reduce Greenhouse Gas (GHG) emissions by internalizing the external social cost of GHG emissions. This includes carbon taxation, cap-and-trade, and hybrid schemes that integrate multiple

¹⁹ Ibid. 3

²⁰ May, E. (2006). When Canada led the way: A short history of climate change. Retrieved from:

<http://policyoptions.irpp.org/magazines/climate-change/when-canada-led-the-way-a-short-history-of-climate-change/>

²¹ Climate Change Canada. (2019). Pan-Canadian Framework on Clean Growth and Climate Change. Retrieved from:

<https://www.canada.ca/en/services/environment/weather/climatechange/pan-canadian-framework.html>

- approaches. This includes a binding price floor of \$20/tonne of CO₂e in 2019, rising by increments of \$10/tonne until 2022.
- ii. **Complementary Climate Actions:** Although carbon pricing does have a significant policy impact on GHG emissions, the government has signalled its intention to address other issues through the form of regulations. These policy actions are directed towards energy use, the built environment, industry, transportation, agriculture/forestry, as well as government and international leadership.
 - iii. **Adapting to Climate Change and Building Resilience:** With the recognition that Canada has to both mitigate emissions and adapt to inevitable climate change repercussions, the government has developed a national adaptation strategy to reduce climate impacts by translating science into action, building climate resilience through infrastructure, protecting human health, supporting vulnerable regions, and “disaster proofing” Canada from climate hazards.
 - iv. **Clean Technology, Innovation and Jobs:** An integral part of any forward-looking climate change policy framework, this pillar considers means through which the government can strengthen the push towards innovation that will provide an environmentally and economically responsible source of growth.
- Underpinning these pillars is a commitment to regular and transparent reporting, and a respect for Indigenous community rights. We use this framework to inform the breadth of policy developments, both federal and provincial, which have arisen and are worth understanding better.

Federal Carbon Pricing Benchmark

When introducing national carbon pricing, the federal government provided provinces with jurisdiction over the specific form and function of their respective carbon pricing schemes, so long as they complied with the scheduled price floor. The federal government has developed a benchmark through the Working Group on Carbon Pricing Mechanisms which monitors compliance with the pan Canadian regime. This benchmark includes a number of measures including timely introduction, common scope, stringent requirements to contribute to national targets and that revenues remain within jurisdiction.

Year	Price (\$/ tonne)
2018	\$10
2019	\$20
2020	\$30
2021	\$40
2022	\$50

TABLE 3. CANADIAN FEDERAL CARBON PRICING SCHEDULE.

Since its first proposal of the pan-Canadian backstop, the political landscape of Canadian climate policy has shifted significantly. A number of provinces with incumbent or recently elected conservative-leaning governments, namely Ontario, Saskatchewan, New Brunswick and Manitoba, have declared intransigent opposition to the federal government’s carbon levy. As a result, the federal government has taken a new approach to recycling carbon tax revenues in the form of household dividends, as it prepares to use federal jurisdiction to impose levies in the aforementioned provinces.

The rebates, delivered through the Canada Revenue Agency (CRA) in the form of tax returns, are aptly named ‘Climate Action Incentive Payments’. By imposing a rising price on GHGs, Canada estimates to reduce its emissions by 80-90 Megatonnes (Mt) of CO₂e, by 2030 (as illustrated in Figure 1).

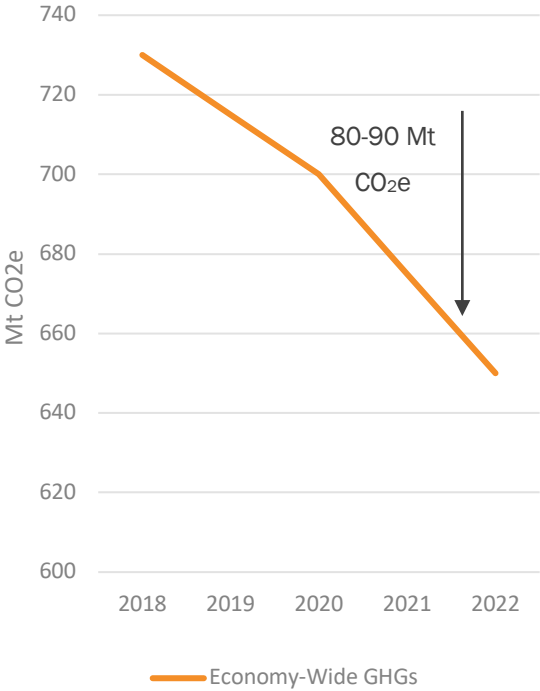


Figure 1. Canadian GHG Reductions from Carbon Pricing.

In the case of Emissions-Intensive and Trade Exposed (EITE) Industries, an output-based pricing system, known as Output-Based Allocations (OBAs) or Output-Based Subsidies (OBS), will be applied.

Output Based Pricing

The federal government’s carbon pricing model targets provinces who don’t implement their own carbon price. Under this pricing model, most types of emissions would pay the full value of the carbon tax, however since carbon pricing can put emissions-intensive industries at a competitive disadvantage, they would only pay part of the price under output-based pricing (OBP). This means that emitters pay the full carbon price on their emissions, but get a rebate back on emissions below a certain threshold, usually the average for the industry. OBP helps to prevent leakage when carbon pricing doesn’t deter a polluting activity that

happens elsewhere. Although this is similar to the system Alberta implemented earlier, the feds applied a benchmark for credits differently to different fuel sources (800 tonnes of CO₂/MWh for coal, 370 tonnes of CO₂/MWh for gas). What is concerning is that the government's carbon pricing plan eliminates hard-earned climate gains by applying stricter limits to gas than coal, despite being a much cleaner alternative. Renewable energy also does not get added incentives despite being emissions free.²²

Coal Fired Electricity Regulations

New regulations introduced on November 2016 set stricter performance standards for new coal fired electricity generators, as well as those approaching the end of their useful life. By setting a permanent cap on performance standards (these generators are allowed to emit a maximum of 420 tonnes of CO₂ per gigawatt hour), there is an incentive for electricity producers to shift to fossil fuels with carbon capture and storage, renewable energy and high efficiency natural gas.

Canada is a founding member of the international 'Powering Past Coal Alliance', which pushes members to be increasingly ambitious in committing to the early retirement of coal-fired power plants. In cooperation with the United

Kingdom, Canada co-chaired the alliance and declared the first formal meeting at the 23rd United Nations Climate Change Conference (COP23), in November 2017, convening both national and sub-national actors.

In February 2018, Canada released a new set of regulations which would enforce the standards accelerating coal-fired electricity phase out, as well as complementary standards for natural gas-based electricity. The coal phase-out is estimated to reduce GHGs by 16 million tonnes of CO₂e per year, by 2030.²³

Low Carbon Economy Fund

Announced on June 2017, the Low Carbon Economy Fund²⁴ directs \$2 billion into projects that will generate clean growth and reduce GHG emissions towards meeting the commitments under the Paris Agreement. The Fund is subdivided into two component parts:

Low Carbon Economy Leadership Fund:

The Leadership Fund provides \$1.4 billion to provinces and territories towards projects that address climate change while economically sustaining communities. \$30 million is available as base funding to each province and territory, in addition to funding based on population size

²² Dion, J. (2017). Explaining Output-Based Allocations (OBAs). *Ecofiscal*, Retrieved from: <https://ecofiscal.ca/2017/05/24/explaining-output-based-allocations-obas/>

²³ Climate Change Canada. (2018). The Government of Canada outlines next steps in clean-energy transition. Retrieved from: <https://www.canada.ca/en/environment-climate->

[change/news/2018/02/the-government-of-canada-outlines-next-steps-in-clean-energy-transition.html](https://www.canada.ca/en/environment-climate-change/news/2018/02/the-government-of-canada-outlines-next-steps-in-clean-energy-transition.html)

²⁴ Climate Change Canada. (2017). Low Carbon Economy Fund. Retrieved from: <https://www.canada.ca/en/environment-climate-change/news/2017/06/low-carbon-economyfund.html>

Add something about the feds going over Ford (Ontario) to send money directly to cities, households, etc.

Low Carbon Economy Challenge:

The other \$600 million will be directed towards ambitious projects that encourages innovation not just within the provincial and territorial levels, but also within municipalities, indigenous organizations, businesses, and both for-profit and not-for-profit organizations.

Clean Fuel Standard

An underrated, critical component of the federal climate strategy also includes a Clean Fuel Standard (CFS) for both domestic and importing fuel producers, which aims to eliminate 30Mt of GHG emissions by 2030.²⁵ The standard replaces the existing Renewable Fuels Regulations, which require minimum thresholds of 5% renewable inputs in gasoline, and 2% renewable inputs in diesel and heating oil.²⁶ By replacing the previous regulations, the CFS sets out more ambitious standards for the imposition of clean fuel integrations into the production of fuels across the transportation, industrial and building sectors.

The CFS's precise benchmark requirements are:

- Carbon intensity of liquid fuels will have to be reduced by 10g of CO₂e per MJ below their reference carbon intensity by 2030. This is essentially a carbon intensity

reduction of approximately 11% and up to 23 Mt of emissions reductions in 2030.

- Carbon intensity requirements for gaseous and solid fossil fuels primary suppliers will be set at a later date
- Credits can be generated when fuel users switch from higher to lower carbon intensity fuel by either changing or retrofitting combustion devices. This operates like the cap-and-trade system in which businesses can purchase carbon credits to offset their emissions.
- 10% of a company's credits can be traded between fuel streams. This offers compliance flexibility for parties to achieve emission reductions across the fuel types within separate fuel streams.

The CFS is a major element of Canada's climate strategy and will complement the Pan-Canadian approach to pricing carbon pollution. Environment and Climate Change Canada plans to publish the final regulations by mid-2019.

²⁵ Climate Change Canada. (2019). Clean Fuel Standard. Retrieved from: <https://www.canada.ca/en/environment-climate-change/services/managing-pollution/energy-production/fuel-regulations/clean-fuel-standard.html>

²⁶ Legislative Services Branch. (2019). Consolidated federal laws of Canada, Renewable Fuels Regulations. Retrieved from: <https://laws-lois.justice.gc.ca/eng/regulations/SOR-2010-189/index.html>

Social Finance in Canada

The UK and the US have both led on social finance and social innovation, albeit for contrasting reasons. The growth of social finance in the US has been driven by philanthropic interests, often committed to filling gaps left by the lack of a comprehensive welfare system and incented by tax incentives. For Canada, which has a more interventionist state that provides universal health coverage and social insurance, European countries provide a more relevant comparison.

In the UK, the Labour government played a central role in seeking to grow the 'Third Sector' over more than a decade, recognizing that community organizations are often better suited to deliver a range of social and environmental services than large and cumbersome civil service bureaucracies. In this jurisdiction, government was a key driver of social innovation and finance in the social sector with a range of initiatives from investment in UnLtd and Futurebuilders to increase capacity in the social sector, to the establishment of the Community Investment Tax Relief credit and legislation that allow for the creation of Community Interest Corporations that can provide a return to investors while protecting the assets of community groups. In 2012, the UK launched Big Society Capital (BSC), a wholesale investment fund that was capitalized by dormant bank accounts in the UK and was designed to catalyze increased investment in the social sector.

BSC was initiated and led by Sir Ronald Cohen who formulated both the investment approach and

secured the allocation of funds from unclaimed bank accounts to provide £500m to start the fund. The fund was launched in 2012 and the key features of the fund are:

1. It is a fully independent financial institution with a strong social mission
2. It is a wholesale investor, similar to a fund of funds, which means the actual investment into 63 deals is through 45 intermediaries
3. In addition to the government funding, the fund secured commitment from high street banks and also looks for co-investors
4. They are regulated by the Financial Conduct Agency.

The main stated goals of the fund were to drive public sector reform and to encourage civil service reform. Investments are targeted at charities, social enterprises and profit with purpose subject to some form of mission lock. The original terms of reference locked in a target financial return of 4-5.5%.

Social Ventures in Canada

While the social finance sector is still emerging in Canada, there are some strong signals from across the Provinces, and with the establishment of the Social Finance and Social Innovation Strategy Steering Group by the federal government in 2016, a national policy is on the horizon. Since the social sector plays a central role in generating social innovation and supporting social finance, it is helpful to understand the size of the social sector in Canada. In the UK, Big Society Capital reported that part of the expectations gap created by the launch of their fund was a function of the mismatch between the size of their fund and the number of social sector organizations that would be eligible to receive investments. In order to avoid creating false expectations about the potential for social finance in Canada, we need to understand the potential demand for investment and the risk appetite of social ventures.

Total revenues in the charitable and non-profit sector represent around \$104.4b, of which \$49.8b comes from the sale of goods and services and \$20.8b comes from grants and transfers from the federal and provincial governments²⁷. The projections are based on 2008 figures because Statistic Canada stopped collecting this data at that time.

The largest category in terms of sectors in the non-profit and charitable sector is Development and

Housing, which is important from a climate finance perspective, since it implies there may be opportunities to invest in building energy efficiency projects. In terms of the scale of social ventures, two recent surveys provide insights into the typical revenues.

The BC Social Venture Survey, which was funded by the federal LMP programme identified 1,891 social venture organizations in BC including for profit, non-profit, cooperatives and Community Contribution Companies that undertake business activities that allow them to generate revenues from the sale of products or services. Based on responses from 354 ventures, the survey concluded that 57% were non-profits and charities, 23% were businesses, 17% were cooperatives and 1% were CCCs. The largest categories were entertainment and recreation (22%), health and social services (15%), professional, grant making and civic groups (14%) and retail/wholesale trade (11%). Since there are number of much larger social ventures which can distorts the average, the median was used to show typical income of \$250-499,000 for non-profits and \$100-250,000 in for profits. While 55% or more of social ventures stated they were capital constrained on 21% have loans from financial institutions and 20% are funded by founding shareholders. Similar responses were seen in an Ontario survey of social enterprises.

The findings are consistent with experience from the UK, which suggests that the majority of social ventures are relatively small and have limited

²⁷ Emmett, B. (2016). *Charities, Sustainable Funding and Smart Growth*. Imagine, Canada.

appetite for risk financing or debt. While both surveys suggested that for-profit social ventures were three times more likely to use debt financing, both surveys also indicated that two thirds of the total sector rely on grants to support their revenues.

Growth of Impact Funds

The most comprehensive database of impact investing globally is maintained by the Global Impact Investing Network (GIIN). Their most recent annual survey of 208 funds, managing US\$114b in assets globally indicated that US\$22.1b was invested into 8000 impact investments in 2016. The majority of respondents were fund managers (67%), followed by foundations (11%) and Banks (4%). While family offices represent only 4% of respondents, fund managers report that 75% of their capital comes from family offices; in other words, this source of capital is very significant, but is most often managed by professionals.

The largest sectors for investment are housing (22%), energy (16%), microfinance (12%) and financial services (10%) with the most common instrument for investment being private equity (76%). The majority of these investor focus on growth stage investing, which is typical of the sector. A study by Sauder S3i suggested that only 18% invest in the seed/startup stage of ventures, which typically involves smaller ticket sizes and higher risk.

There have been a number of attempts to quantify the supply of impact investing capital in Canada and the figures vary greatly depending on the breadth of the definition. Within Canada, of the

\$1.5tn in AUM, RIA data suggests that 38% includes some form of screen, although it is important to not confuse the presence of a negative screen with active selection for sustainable finance or impact investing. For instance, the vast majority of negative screens would not exclude oil and gas companies or other resource intensive producers that represent a large share of the Canadian public market.

Drawing on a research by the Responsible Investing Association and MaRS, the total Assets Under Management with a broadly defined Socially Responsible Investing and Impact Investing focus could be as high as \$9.2b, including \$3.5b held by Credit Unions. This figure includes funds that simply screen out companies based on exclusionary criteria, for instance cigarette or arms manufacturers. Global trends suggest that 68% of SRI is based on negative screening, 45% includes ESG integration and 38% involves corporate engagement and stakeholder action. The proportion of capital that flows into investments that are positively screened or proactively selected is around 6%, which would include clean technology investments, and active impact investing is around 0.6% of the total.

In terms of the financial performance of these funds, there is now strong evidence that there is no trade-off associated with SRI funds, defined broadly. Equity mutual funds financially outperform their benchmarks 63% of the time (CCCI, 2015) and similar results were confirmed by Morgan Stanley's Institute for Sustainable Investing (2015).

The evidence from the RIA is that there is an appetite for investments that screen out obviously negative products from portfolios and that SRI is growing to a scale that dwarfs any other sector in terms of the capital under management. There is almost five times as much capital in Canada's SRI market as there is in the global Impact investing market as recorded by GIIN. The demographic trends are also positive: millennials are nearly twice as likely to invest in companies and funds that deliver social and environmental outcomes (RII Guidebook) and in the next three decades, up to \$30tn will be transferred to that generation by baby boomers. While this appears positive, the selection of investments primarily through negative screens is the lightest touch definition and few would defend it as a form of impact investing, since the companies typically do not measure non-financial impact metrics, nor do they produce intentional impact; the vast majority of companies that remain after the screening offer conventional goods and services and are traded on the public markets.

Credit Unions have taken the lead in creating retail invest products for the Canadian and one recent report suggested they are responsible for around \$690m in impact investing assets. Many of these products give retail investors exposure to impact investments that would normally only be available to high net worth individuals or institutions. To date, these products have focused low risk investments in community projects and in some cases, such as Resilient Capital in British Columbia, government has underwritten the investments by providing loss reserves. The retail impact investment products identified in Canada have returns of 0-4.5% with minimum investment

sizes as low as \$500 and as high as \$50,000. Among the Canadian funds launched to date, the total fund size remains small: Resilient has \$14.5m and the Jubilee Fund, managed by Assiniboine Credit Union held \$1.7m at the time of the report. While these funds demonstrate that there is some appetite in Canada for low risk retail impact investments, the scale is very small compared to mainstream financial products. By contrast, Calvert Foundation in the US, which benefits from a different regulatory environment that encourages reinvestment into communities has raised US\$1.2b since 1995 into fixed income products, used to support a loan portfolio focused on affordable housing projects in the US.

What is largely missing from the retail impact investing landscape in Canada are products that offer investors exposure to equity impact investment in early stage and growth companies. As Adam Spence points out in his interview: "I think from a corporate perspective, there needs to be a strong basis of support from leadership in large financial institutions...it has to cut across the institutions. Senior management needs to get it; they need to make a commitment to it."

Building a larger market with mainstream institutions will take significant work since they are risk averse and need investments at scale. As Tessa Hebb points out: "For most investors, including these large investors, the more 'plain vanilla' the envelope is, the more likely that they will subscribe to it. The green bond is a good example of that. It's becoming a fairly well known, and it's within an asset class and it conforms to the structure of that class."

One attempt to mobilise capital is the MaRS Social Venture Connexion (SVX), which offers accredited investors exposure to early stage companies. Since the alternative for many investors interested in this sector is through crowdfunding, this innovation could represent a novel approach that taps into the desire of millennials to manage their capital differently. SVX is in its very early days, but certainly has potential to attract capital to the many impact ventures that are emerging across Canada.

To speak meaningfully about the size of the impact investing sector in Canada means focusing on the subset of funds that have a clear, intentional impact focus and, ideally, track and measure those impacts over time. A number of studies have sought to estimate that figure and the broadest estimate is that the total sector in Canada will invest \$370m in 2017 and will have \$3.2b AUM²⁸. The state of the nation report on impact investing, produced in 2014 described the priority areas for impact investing in terms of the capital volumes: 33% focused on clean technology and renewable energy, 22% on non-profits and social enterprises, 17% on emerging markets and 11% on housing and community facilities. These figures are likely to be distorted by the fact that clean technology and renewable energy projects are more capital intensive.

Recognizing that number represents a very small proportion of the total capital in Canada the Task Force on Social Finance made the following

recommendations, which were intended to increase the total pool of funds available for impact investing:

1. Foundations should invest at least 10% of their capital in impact investments by 2020
2. Government should partner with investors to establish a national impact investment fund
3. Government should support the development of new financial products including Social Impact Bonds, Community Bonds and Green Bonds
4. Pension funds should mobilize in support of impact investing
5. Modernize the frameworks governing non-profits and charities to allow them more ability to invest in a way that is aligned with their missions.
6. Explore tax incentives that reward investors for placing capital in social finance and impact investing vehicles
7. Make SME business development programs more accessible to social enterprises.

A more recent study looked at 59 Canadian Funds that meet impact investing criteria and selected those that generated social, economic and environmental returns for investors. Each of the funds was profiled by the team and the data indicates that Quebec is home to the largest number (35% of the total). This is largely for

²⁸ National Advisory Board to the Social Impact Investment Task Force. (2014). *Mobilizing private capital for public good: Priorities for Canada*. MaRS Discovery District.

historic reasons that we will be discussed later; Quebec has a strong tradition of supporting solidarity cooperatives and provincial development funds. The largest number of funds supported individuals with barriers to accessing capital; in the context of this paper, only three of the funds identified focus on environmental objectives. Overall, the landscape and social finance ecosystem is evolving across the country. Many interviewees recognized the growth in the funds over the last ten years. But there is still a strong sense that a large-scale engagement with mainstream financial institutions is required:

“I think we, some of the people in the social finance area, could be justifiably criticized for thinking the leadership has to come from purpose-built smaller organizations rather than mainstream institutions. I think our best hope is to get those mainstream institutions involved and their distribution networks. I think that would be where leadership has been missing.”

- Bill Young

The study also replicated a finding from other studies: government plays a critical role in setting up and in some cases, sustaining the funds. Of the 59 funds receiving one-time capital injection, 29 were funded by provincial governments and 36 received recurring capital injections from government. In addition, 21 funds benefited from fiscal measures such as tax credits. The survey recognizes that there is richness in the diversity of

funds and approaches in Canada that reflects the political and geographic diversity of the country:

“If we're going to create some sort of a social finance instrument or a fund of funds, we must take into account the diversity of this country; the differences between the provinces and regions. Needs vary considerably and those who are best able to identify and express the needs are those who live in those regions.”

- Marguerite Mendell

This finding is very consistent with other studies, including a landmark report by Clark et al (2015) which studied 12 international funds with a strong impact focus including Bridges Ventures, Deutsche Bank, Elevar Equity, Calvert and RSF. Of the 12 funds, government played a central role in the establishment of 8 of them through funding and policy changes. A detailed evaluation of the funds resulted in the creation of a typology that characterizes the role they can play, which is helpful for defining the role government could play in the case of climate related finance.

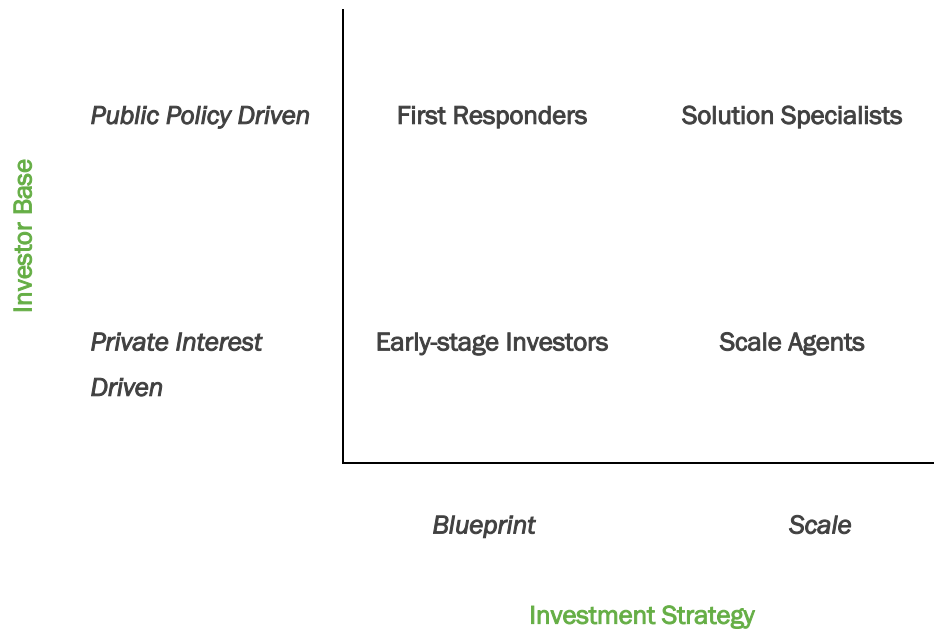


Figure 2. For more information about this framework, refer to “The Impact Investor: Lessons in Leadership and Strategy for Collaborative Capitalism”, by Cathy Clark, Jed Emerson, Ben Thornley.

The study also demonstrated that the leverage from funds can be significant. The Community Development Finance Initiatives (CDFI) in the US acted as First Responders and were able to attract up to \$15 for every \$1 invested. The overall program operated by Calvert Foundation resulted in 24,825 loans totaling \$2 billion.

The other key finding from this review of 12 impact funds and from other studies is the role of foundations in seeding and supporting impact investing. The general conclusion is that there is not a single source of capital or approach that is going to mobilize the sector; it requires a blended approach:

“We should be looking at finance as a continuum from everything from 100% write-off which is a grant to risk adjust

rates of return and we should be using every part of that continuum and can use every part of that continuum, and that's where the creative financing [comes in], and not enough brain power has been applied to that.”

- Bill Young

According to the 2017 GIIN survey, foundations represent 11% of the \$114b global impact investing assets under management. In Canada, the McConnell Foundation has played a central role in building the social infrastructure to support impact investing across the country along with Tides Foundation, Pembina, The Natural Step, Tides Foundation Canada and Equiterre, Sustainable Prosperity and David Suzuki Foundation. Stephen Huddart, CEO of the McConnell Foundation, recognized that the

ecosystems has been supported through the efforts of all of these organizations. Tim Draimin argues similarly in his interview that, “Tides and SiG and McConnell occupy what I call the ‘missing middle’. We need the actors in the ecosystem who try to connect the dots between the different centers of resources and players and policies, cultural triggers that help build the mindset, etc. to be able to pull things together to make things happen dots between the different centers of resources and players and policies, cultural triggers that help build the mindset, etc. to be able to pull things together to make things happen.”

The 2014 State of the Nation report on impact investing noted that 31% of foundations surveyed indicated they had a strong understanding of impact investing, although only 16% had stated policies. Within that survey, 29% of foundations had allocated funds towards Mission Related Investment (MRI) and 20% towards Programme Related Investments (PRI) for a total of around \$290m. That survey and the Task Force on Social Finance both recommended that the Canada Revenue Agency issue stronger guidance to Foundation directors on their fiduciary obligations with respect to PRI and MRI.

A general observation is that directors take a very conservative approach to managing the capital of the foundations, preferring conventional investment products with lower risks and predictable returns. In a sense, the approach to granting is almost the opposite, where the emphasis is entirely on the social or environmental impact of the capital is primary and, by definition, the grant represents a loss of that capital. This puts foundations in a challenging position with

respect to impact investing: most opportunities to invest in real impact, as opposed to SRI, at the scale of a foundation are likely to be smaller, private and will present higher risks due to the nature and size of the enterprises. A foundation investment manager will struggle to reconcile these risks with the rest of the portfolio. At the same time, the part of the foundation responsible for granting may struggle to evaluate the financial performance of a social venture that it supports under a PRI programme, even if the investment counts towards its disbursement quota.

The Case of Quebec

In any profile of impact investing in Canada, it is important to acknowledge the successes in Quebec in mobilising capital into the social economy. The province has a distinct approach not just in Canada, but across the OECD, that was driven by labour solidarity funds and legislation in the nineties that enabled the creation of solidarity cooperatives. Combined with tax incentives of 30% provided to investors as a rebate on their income and designed to encourage reinvestment into Quebec, this legislative framework has resulted in a rich ecosystem of 7000 enterprises employing over 200,000 people with a turnover of \$33b. One of the largest funds, Fonds des Solidarités du Québec (FTQ) is a labour sponsored patient capital fund that supports entrepreneurs in Quebec. FTQ has secured assets of \$9.3b, has over 600,000 shareholders and has invested \$5.7b in 2,239 ventures. Another fund, Fondaction, established by CSN and dedicated to social and environmental businesses has assets of \$940m. While the vast majority of these ventures provide normal business

products and services to customers and members, the strong alignment between the source of capital and regional business creates good conditions for impact investing. While the cooperative model is common across Canada and results, in general, in a higher alignment between capital and ventures, it would be difficult to replicate the scale of the Quebec social economy elsewhere, since it is built on a long legacy of cooperatives and a large and active union movement.

Aboriginal Finance

Another special category of fund that is common in Canada is the Aboriginal Finance Initiative which has provided over \$1.8b in financing to small businesses that are aboriginal owned or controlled²⁹. In 2012, AFIs provided 1,395 loans valued at \$122m, leveraging a further \$80m and maintaining 2,869 FTEs. One of the leading examples of climate finance that aligns with social and environmental goals is Aki Energy.

Aki Energy is a social enterprise working in Manitoba First Nations communities to develop and implement sustainable energy and food solutions. Through their solutions-based approach, Aki Energy aims to 'plug the holes' of First Nations economies by ensuring the benefits of energy and food consumption stay within the community.

The foundational philosophy is that of resilience and self-support; First Nations communities recognize that even though the cause of many

issues within their communities are outside their control (including history, political systems and power structures), the ability to spot and act on opportunities to benefit these communities sits with them.

Aki Energy was founded by a group of Indigenous and non-Indigenous people and was inspired by social enterprise models in the UK that were using utility financing to support renewable energy projects. The founders are Kate Taylor, Shaun Lomey, an Ashoka Entrepreneur, and Darcy Wood, former chief of Garden Hill. With this philosophy in mind, the organization works in two key verticals that critical to the sustenance of these communities.

The first vertical is sustainable energy, where Aki Energy primarily focuses on transitioning households towards geothermal power systems, and away from the grid electric systems. Through this investment, Aki Energy seeks to make communities self-sufficient for power, while providing opportunities for local employment during the deployment process.

The founding team was able to take a financial instrument established by Manitoba Hydro, called a pay-as-you-save financing, which was developed for urban areas and apply it to Indigenous communities. Specifically, pay-as-you-save (PAYS) allows Aki Energy to effectively sell geothermal and solar energy systems, with Manitoba Hydro paying for the upfront costs and with this cost being recouped through monthly payments over 20 years. The added costs are also guaranteed to be

²⁹ Harji, K. (2014). *State of the Nation: Impact investing in Canada*. MaRS Centre for Impact Investing.

lower than the savings offered by renewables. The legislation that allowed this, the Energy Savings Act, proved to be a game-changer for the organization.³⁰

They chose geothermal because the systems are highly reliable, even in the North, where access for maintenance is expensive and challenging during the winter. The systems also start to generate savings immediately.

The challenge that utility financing solves is that many of the target households have problems accessing credit because they do not have assets and they may be unemployed or have limited incomes. The founders of Aki also learned that many community members move frequently between houses, so they have no long-term incentive to improve the homes. Because the utility financing is paid back out of reductions in the energy bills of the house, no additional security is needed. The program is “attached to the meter,” to quote Kate Taylor, one of the founders of Aki Energy. This means that if the tenant moves house, the new tenant continues to finance the installation through their (reduced) energy bills. The program offers 20-year financing for the full cost of geothermal installation at 3.95% interest, with an additional \$4,000 subsidy per house. Manitoba Hydro also provided grants of \$4,000 per installation, as part of their public

mandate, which reflects 50% of the value of the energy savings on the open market. The benefits have been significant to date, with typical annual savings of \$1,100 per house.

Other governmental support systems included \$150,000 granted to Aki Energy to expand geothermal, biomass and solar energy projects while also offering community members the training to install these energy systems to create employment opportunities.³¹ The geothermal systems were suitable to the skills of the local communities and they were able to start quickly with communities with higher capacity. As they moved to smaller communities they had to take a more active role in capacity building and project management.

To date, Aki has invested over \$6m through this mechanism across four communities. The primary barrier has been a regulatory one, rather than a financial one. The agency responsible for implementing the Indian Act, Indigenous and Northern Affairs Canada (INAC), has bureaucratic oversight of all reserve lands. Under their rules, social assistance should not be used to finance capital projects and so they have concerns about the expansion of the Aki Energy programme. While they have been successful under an exemption that grants the ability to run pilot projects, until this issue is resolved, their growth will be constrained.

³⁰ Aki Energy. (2015). Social Enterprise and the Solutions Economy in First Nation Communities. Retrieved from: <https://www.scribd.com/document/271068431/Social-Enterprise-and-the-Solutions-Economy-in-First-Nation-Communities>

³¹ Purdy, B. (2015). Province hopes \$150,000 will heat up geothermal energy on Manitoba First Nations. *CBC News*,

Retrieved from: <http://www.cbc.ca/news/canada/manitoba/manitoba-pledges-150k-to-heat-up-geothermal-energy-on-first-nations-1.3317939>

This case shows how social finance and social innovation needs to be addressed at the system level. Aki Energy founded strong partnerships with communities and the energy utility and were able to mobilize significant amounts of capital through an innovative financial instrument. But with regulatory innovation, no amount of capital will allow the programme to scale across all communities.

As Chris Henderson of Lumos Energy argues:

“...social capital or capital by itself is irrelevant, without the right policy frameworks and the right capacity building frameworks. This is the triangle of change. One point of that triangle is capital that is disposed to investing in clean energy ventures that combat climate change, which also generate economic development, social development for local communities. However, the missing link is actually much more importantly: the policy environment and the capacity environment.”

In addition to the sustainable energy initiatives, Aki has also looked at local food production. By creating opportunities for local hunters and harvesters to sell their produce, Aki Energy also provides much needed cheap, healthy produce and meat for communities accustomed to expensive food shipped from the South. With health issues of key concern within First Nations communities,

access to locally grown food can serve as the first step towards a ‘prevention, not cure’ strategy for solving these issues.

Consistent with the sustainable energy approach, supporting local food systems also gives the opportunity to support traditional lifestyles and the hunters and harvesters that make it possible. With strong demand for local food present as imported food from the South is significantly more expensive, simply providing the avenue for exchange (i.e. a marketplace can make all the difference).³²

In terms of opportunities for growth, Aki is looking for other sources of investment to support their work with a particular focus on philanthropic organizations that may be able to provide support through programme and mission-related Investments. This will require an investment in social infrastructure to enable philanthropic organizations to build trust and familiarity with Aboriginal Investments. As Melanie Goodchild points out, this may involve some difficult conversations:

“My exposure to the philanthropic sector has been that there is capital and they want to support Indigenous communities; they want to support climate change adaptation but they are not entirely sure how to do it. The other thing is, people don't want to really talk about the

³² Purdy, B. (2015). Province hopes \$150,000 will heat up geothermal energy on Manitoba First Nations. *CBC News*, Retrieved from:

<http://www.cbc.ca/news/canada/manitoba/manitoba-pledges-150k-to-heat-up-geothermal-energy-on-first-nations-1.3317939>

uncomfortable decolonization process, which is divestment and who has capital.”

Great Bear Rainforest Carbon Project

The GBR provides a critically important example of how climate policies can also address the need for aboriginal reconciliation through a sustainable economic development strategy. The Great Bear agreements were fought for and won over a decade by the First Nations in the region and environmental groups seeking protection for one of the last remaining intact areas of temperate rainforest in the world. The final agreement to protect at least 50% of the region from logging was extended to cover around 75% of the region.

As part of the agreement, funding was provided to help communities in the region transition away from dependence on forestry and fisheries and towards a sustainable economy. Around \$120m was secured from a mix of sources including the provincial and federal governments and from philanthropic organizations in the US and Canada. The capital was managed by Coast Opportunity Funds and allocated across the communities based on a formula that was agreed by all the communities. The agreement acknowledged that while First Nations communities in the region supported greater conservation, they would also need investment to support their economic transition.

In parallel, beginning in 2007, the Provincial government established a suite of new policies including a commitment to ensure that the

government operations achieve carbon neutrality through investments in carbon credits, sourced from British Columbia. By expanding the protection of the Great Bear Rainforest agreement around 1 million tonnes of credits were generated each year beginning in 2012. These funds created another pool of capital that was invested into regional sustainable economic development projects at the community level, including sustainable seafood, shellfish aquaculture and ecotourism. This approach represents a model that aligns reconciliation with the transition to a conservation economy since protection of the temperate rainforest also enhances the storage of carbon within forest ecosystems.

Other Funds

A number of private funds have been established that support clean technology development in Canada. The MaRS Cleantech Fund manages \$30m and provides early stage funding of \$1-3m to companies. Investeco has invested \$35m in North American companies with revenues over \$1m alongside other funds like Renewal Funds. In the section below, we will review a number of funds that have played a catalytic role in supporting investment in Canada, including SDTC and the ICE fund.

Models for the social sector in other jurisdictions include Calvert Foundation which has benefited from the Community Reinvestment Act, Bridges Ventures and Big Society Capital, a wholesale investment fund that was funded by capital from dormant bank accounts in the UK and will be discussed further below.

While we tend to look the role of government in providing finance, it is important to recognize that the catalytic role of government can also be expressed through policy changes that increase the flow of capital into the sector. Clear guidance from tax authorities on Program and Mission Related Investment lowers a key barrier to foundations and charities investing in the social sector. Changes to procurement rules, some of which are currently being considered in Canada can enable social ventures to generate revenue from services and goods that also provide broader social benefits.

Climate Finance

A critical role for climate-related social finance is supporting investment in clean technology. This is an area where government is able to take a risk on new and emerging technologies, and to demonstrate and show how new technologies can create change. The energy sector is highly regulated because most governments have a duty to provide high levels of energy security while protecting consumers from excessive energy costs. The energy sector is also very capital intensive, has high technical barriers to entry and in most cases, low rates of return. It is for this reason that government's role in easing regulations for alternative energy systems can be as important as their role in providing capital.

For instance, Feed-In-Tariffs and net metering regulations created markets in many jurisdictions that allow alternative energy suppliers to compete with the incumbent energy producers. Carbon prices through cap and trade systems or a carbon tax provide long term incentives to decarbonize energy supply without government directly selecting technologies or providing capital. Here, we consider three examples of government-led Canadian investment vehicles that were designed to stimulate investment in climate solutions, using a typical fund structure: Innovative Clean Energy Fund (ICE), Sustainable Development Technology

Canada (SDTC) and Emissions Reductions Alberta (ERA).

Innovative Clean Energy Fund (ICE) – BC

The ICE Fund was established in 2007 with a mandate to “support development of clean energy, to accelerate the development of new technologies with the potential to solve everyday energy and environmental issues, and to create socio-economic benefits for British Columbians.”³³

Projects funded:	71
ICE funding allocated to projects:	\$62.4 million
Total portfolio value:	\$262.2 million

More specifically, the ICE Fund tried to fulfill the priorities identified in the BC Jobs Plan, the Clean Energy Act, BC Energy Plan, and the Natural Gas and LNG Strategies:³⁴

- Energy Production: The ICE Fund helps increase British Columbia's production of clean or renewable energy
- Energy Transmission: The ICE Fund helps improve the way energy moves from producers and British Columbia users

³³ The Province of British Columbia. (2014). Innovative Clean Energy Fund: developing clean energy solutions. p. 4. Retrieved from: http://www2.gov.bc.ca/assets/gov/farming-natural-resources-and-industry/electricity-alternative-energy/ice-fund/2014_ice_fund_performance_report.pdf

³⁴ The Province of British Columbia. (2014). Innovative Clean Energy Fund: developing clean energy solutions. p. 11. Retrieved from: http://www2.gov.bc.ca/assets/gov/farming-natural-resources-and-industry/electricity-alternative-energy/ice-fund/2014_ice_fund_performance_report.pdf

- Energy Use: The ICE Fund helps improve the ways energy is used in British Columbia’s communities and across all sectors of the provincial economy

In addition to the sector focus, the ICE Fund focuses on supporting pre-commercial clean energy technologies, acting as a “critical bridge to the financial barriers to commercialization” for these early-stage projects.³⁵

Funding

Between September 1, 2007 to June 30, 2010, the ICE fund received its capital commitment of \$25 million annually, raised through a 0.4% levy on the final sales of electricity, natural gas, fuel oil and grid-delivered propane, excluding fuels taxed or exempted from tax under the Motor Fuel Tax Act.³⁶ When the Harmonized Sales Tax (HST) was introduced in 2009, the levy – and subsequently, funding for ICE – was terminated. In 2013, however, with BC’s rejection of the HST and the return of the Provincial Sales Tax (PST), the levy was re-instated with a few adjustments: it no longer applied to electricity sales, although it is still assessed on residential, commercial, and industrial customers alike. This change reduced

the amount of ICE funding to \$6.5-\$7 million annually.

In March 2017, the Government of Canada and the Government of British Columbia both committed \$20 million (total \$40 million) to support pre-commercial clean energy projects. The federal government’s funding comes from the SD Tech Fund (managed by Sustainable Development Technology Canada), while BC’s funding is disbursed through the ICE Fund. The three-year partnership has the mandate of seeking out “clean-energy projects and technologies that will mitigate or avoid provincial greenhouse gas emissions, including prototype deployment, field testing and commercial-scale demonstration projects.”³⁷

British Columbia’s government change in spring 2017 may also have implications on the future of the ICE Fund. In Premier Horgan’s ministerial mandate letter to the Minister Michelle Mungall (Minister of Energy, Minds & Petroleum Resources), a key priority was to “reinvigorate the Innovative Clean Energy fund to boost investments in ground-breaking new energy technologies and climate change solutions.”³⁸

³⁵ The Province of British Columbia. (2017). History of the Fund. Retrieved from: <http://www2.gov.bc.ca/gov/content/industry/electricity-alternative-energy/innovative-clean-energy-solutions/innovative-clean-energy-ice-fund/history-of-the-fund>

³⁶ The Province of British Columbia. (2014). Innovative Clean Energy Fund: developing clean energy solutions. p. 7. Retrieved from: http://www2.gov.bc.ca/assets/gov/farming-natural-resources-and-industry/electricity-alternative-energy/ice-fund/2014_ice_fund_performance_report.pdf

³⁷ The Province of British Columbia. (2017). ICE Fund and SDTC \$40 Million Funding Partnership. Retrieved from: <http://www2.gov.bc.ca/gov/content/industry/electricity-alternative-energy/innovative-clean-energy-solutions/bc-sdtp-partnership-in-clean-energy-technology>

³⁸ Horgan, J. (2017). Ministerial mandate letter to Minister of Energy, Mines, and Petroleum Resources [Letter to Honourable Michelle Mungall]. Retrieved from: <http://www2.gov.bc.ca/assets/gov/government/ministries-organizations/premier-cabinet/mlas/minister-letter/mungall-mandate.pdf>

Disbursement

We can break down ICE-funded projects into the following streams:

- General Demonstration Projects: Projects aimed at piloting and demonstrating clean technologies in communities across BC.
- Ministry Priorities: Projects commissioned by the Minister of Energy and Mines that are important in assisting the Province in meeting its energy, economic, and environmental priorities.³⁹
- Clean Energy Vehicles: Projects focused on proliferating adoption of clean energy vehicles (i.e. vehicles running on alternative fuel – electricity, hydrogen etc.)
- Community Energy Leadership Program: Established in 2015 to support local government and First Nations investments in energy efficiency and clean energy projects.⁴⁰
- Post-Secondary Clean Energy Partnership Program: Launched in 2015 to support research in clean energy science and technology projects undertaken by post-secondary institutions in BC.⁴¹
- Non-technology Projects: Projects focused on regulatory or financial aspects of the low-carbon economy (e.g. policy, financial incentives, industry standards).

Appendix 1 includes a database of ICE investments which presents an accurate picture of the types of investments and progress made so far. Based on a review of the \$63m of projects that were supported, investments in bioenergy were the most numerous (15) and attracted the most investment from at \$26m including matched funding.

³⁹ The Province of British Columbia. (2014). Innovative Clean Energy Fund: developing clean energy solutions. p. 6. Retrieved from: https://www2.gov.bc.ca/assets/gov/farming-natural-resources-and-industry/electricity-alternative-energy/ice-fund/2014_ice_fund_performance_report.pdf

⁴⁰ The Province of British Columbia. (2017). Community Energy Leadership Program. Retrieved from: <https://www2.gov.bc.ca/gov/content/industry/electricity->

[alternative-energy/community-energy-solutions/community-energy-leadership-program](https://www2.gov.bc.ca/gov/content/industry/electricity-alternative-energy/community-energy-solutions/community-energy-leadership-program)

⁴¹ The Province of British Columbia (2017). Post-Secondary Clean Energy Partnership Program. Retrieved from: <https://www2.gov.bc.ca/gov/content/industry/electricity-alternative-energy/innovative-clean-energy-solutions/innovative-clean-energy-ice-fund/post-secondary-clean-energy-partnerships-program>

Technology	# of Projects	% of Projects	Total Funding Amount	Average Funding Amount
Solar PV and Thermal	2	3%	\$582,075	\$291,037.50
Solar PV	5	7%	\$1,099,598	\$219,919.55
Solar	5	7%	\$2,974,154	\$594,830.80
Energy Management	5	7%	\$6,781,407	\$1,356,281.40
Energy Conservation	3	4%	\$4,328,338	\$1,442,779.33
Energy Storage	1	1%	\$203,775	\$203,775.00
Waste to Energy	3	4%	\$2,666,666	\$888,888.67
Geoexchange	2	3%	\$1,075,115	\$537,557.50
Bioenergy	15	21%	\$26,646,364	\$1,776,424.27
Ocean - Wave/Tidal	2	3%	\$2,469,622	\$1,234,811.00
Hydro	1	1%	\$44,000	\$44,000.00
Clean Energy Vehicle	2	3%	\$8,500,000	\$4,250,000.00
Charging Station Infrastructure	4	6%	\$1,756,000	\$439,000.00
General	1	1%	\$500,000	\$500,000.00
Energy efficiency retrofit	7	10%	\$384,780	\$54,968.57
Biomass	1	1%	\$47,000	\$47,000.00
Community electrification	1	1%	\$36,000	\$36,000.00
Vacuum Insulation Panels	1	1%	\$49,967	\$49,967.00
Wave Energy Converter	1	1%	\$96,000	\$96,000.00
Smart Grid	1	1%	\$100,000	\$100,000.00
Electronic Data Exchange (EDX)	1	1%	\$100,000	\$100,000.00
Home Energy Performance (HEP) accreditation and training	1	1%	\$200,000	\$200,000.00
Cold climate heat pump water heaters (HPWHs)	1	1%	\$30,000	\$30,000.00
Windows	1	1%	\$25,000	\$25,000.00
All Electric Air Source Heat Pump	1	1%	\$1,200,000	\$1,200,000.00
Passive House	1	1%	\$100,000	\$100,000.00
Regulation	1	1%	\$300,000	\$300,000.00
Geothermal	1	1%	\$100,000	\$100,000.00
Total:	71	100%	\$62,395,861	\$16,218,240.59

TABLE 4. ICE INVESTMENTS BY TECHNOLOGY.

ICE funding could be combined with other sources of capital and grants and so the fund was able to achieve significant leverage. The average ICE contribution was \$878,815 while the average ICE-funded project size was \$3.7 million.

Investment Amount	\$CAD	Project Size	\$CAD
Average investment amount	\$878,815	Average project size	\$3,692,846
Highest investment amount	\$7,500,000	Highest project size	\$50,000,000
Lowest investment amount	\$20,000	Lowest project size	\$45,000

TABLE 5. ICE FUNDING DISTRIBUTION.

Sustainable Development Technology Canada (SDTC)

SDTC is an arms-length foundation that funds Canadian clean technology projects. Created in 2001, SDTC has directed \$989 million towards 347 projects, leveraging an additional \$2.53 billion in funding as of 2018.

363	Projects funded
\$1.02 billion	SDTC funding allocated to cleantech projects
\$2.53 billion	Estimated total follow-on financing
\$3.76 billion	Total portfolio value
\$2.7 billion	Estimated annual revenues from SDTC-funded companies

The technologies that receive SDTC funding are focused on four issues: climate change, air quality, clean water, and clean soil. SDTC seeks to fill a funding gap for technology development and pre-commercialization projects and they fund projects that are moving from the stages of fundamental research and towards market entry, but require the capital to demonstrate the technology in a real-world setting.

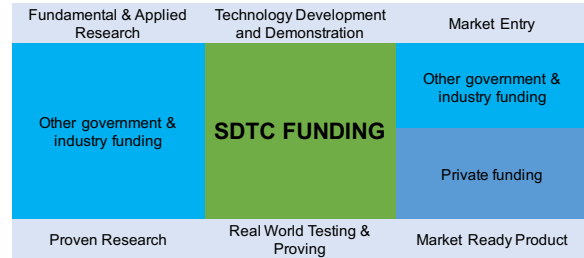


Figure 3. SDTC Funding.⁴²

SDTC runs two separate funds: (1) SD Tech Fund and (2) NextGen Biofuels Fund. The SD Tech Fund “supports the development and pre-commercial demonstration of clean technologies that contribute to clean air, clean water, clean soil and climate change mitigation, while improving the productivity and the global competitiveness of Canadian industry.”⁴³ The NextGen Biofuels Fund supports “the establishment of first-of-kind, commercial-scale, demonstration facilities for the production of next-generation, renewable fuels and co-products from non-food feedstocks.”⁴⁴

Funding

Their funding mainly comes from the federal government:

- \$400 million over five years to recapitalize the SD Tech Fund proposed in Budget 2017⁴⁵
- \$20 million allocated from the Ministry of Innovation, Science, and Economic Development for joint investments with British Columbia’s Innovative Clean Energy (ICE) Fund

⁴² Adapted from: <https://www.sdtec.ca/en/about-sdtec/sdtec-fills-funding-gap>.

⁴³ SDTC. (2018). Annual Report 2017/2018. p. 3. Retrieved from: <https://www.sdtec.ca/en/about-sdtec/reports>

⁴⁴ BCTech Association. (2017). Federal Budget 2017 The Innovation and Skills Plan. Retrieved from:

<https://wearebctech.com/federal-budget-2017-the-innovation-and-skills-plan/>

⁴⁴ Possibly because most of the applications came from Ontario. We do not, however, have the adequate data to derive insights on this.

Disbursement

Since its inception, SDTC has disbursed \$989 million to 347 projects. 2016 was a record year for allocating funding (\$92.2 million) and disbursement of funding (\$100.5 million). Using SDTC's database of completed and active projects, we were able to analyze its capital allocation decisions, investment amounts, and the sectors they invested in.

Economic Sector	Projects (#)	Projects (%)	SDTC Funding (\$)	Funding (%)
Agriculture	22	6%	\$49,061,829	5%
Energy Exploration & Production	56	16%	\$206,612,860	21%
Energy Utilization	92	27%	\$226,867,310	23%
Forestry	17	5%	\$60,592,826	6%
Power Generation	56	16%	\$167,684,076	17%
Transportation	52	15%	\$133,266,513	13%
Waste Management	45	13%	\$148,893,676	15%
Total:	340	100%	\$992,979,089	100%

TABLE 6. SDTC PROJECTS BY ECONOMIC SECTOR.

SDTC has allocated the most capital towards Ontario-based projects, followed by British Columbia and Albertan projects:

Province	Projects (#)	Projects (%)	SDTC Funding (\$)	Funding (%)
British Columbia	77	23%	\$238,677,600	24%
Alberta	41	12%	\$194,298,821	20%
Saskatchewan	7	2%	\$22,634,930	2%
Manitoba	5	1%	\$13,702,910	1%
Quebec	69	20%	\$165,256,583	17%
Ontario	126	37%	\$322,395,743	32%
Newfoundland and Labrador	1	0%	\$102,400	0%
New Brunswick	2	1%	\$2,354,774	0%
Nova Scotia	11	3%	\$31,721,844	3%
Prince Edward Island	1	0%	\$1,833,482	0%
Total:	340	100%	\$992,979,089	100%

TABLE 7. SDTC PROJECTS BY PROVINCE.

SDTC was never the sole funder in the projects. The SDTC committed an average investment amount of \$2,937,808, while the average project value was over three times the investment amount, at \$10,802,701.

Investment Amount	\$CAD	Project Size	\$CAD
Average investment amount	\$2,937,808	Average project size	\$10,802,701
Highest investment amount	\$63,600,000	Highest project size	\$217,488,811
Lowest investment amount	\$51,937	Lowest project size	\$208,573

TABLE 8. SDTC FUNDING DISTRIBUTIONS.

Emissions Reduction Alberta

Born out of 2008’s climate strategy, Emissions Reduction Alberta (ERA) – formerly known as Climate Change and Emissions Management (CEMC) – aligns its investments with the Government of Alberta’s strategic priorities. As of 2016, their investments focus on two overarching goals⁴⁶:

1. Reduce GHG emissions: Fund innovative solutions that result in meaningful greenhouse gas emissions reductions in Alberta and contribute to a lower carbon world.
2. Advance innovation system priorities: Leverage our strengths to contribute to critical climate change innovation priorities in Alberta.

Since beginning to fund projects in 2010, 121 projects were supported with \$349,000,000 coming from ERA.

121	Projects funded
\$349 million	ERA funding contributions
\$2.3 billion	Total portfolio value
8 million	GHG reductions (tonnes of CO ₂ e by 2020)
1400	Additional jobs in Alberta from 2011-2021

Like Sustainable Development Technology Canada (SDTC), ERA fills a funding gap for pre-commercial technologies. The majority of their funding is dedicated to developing and demonstrating innovative projects. Given Alberta’s unique economy, in which oil and gas operations are one of the leading sources of greenhouse gas emissions, ERA is different from SDTC and BC’s Innovative Clean Energy fund funds in that they have a focus on “improving oil sands production efficiency”.⁴⁷

⁴⁶ ERA Alberta. (2016). Climate Change and Emissions Management (CEMC) Corporation: 2016-2019 Business

Plan. p. iii. Retrieved from: <http://eralberta.ca/wp-content/uploads/2017/05/CEMC-Business-Plan-2016.pdf>

⁴⁷ Ibid. 5

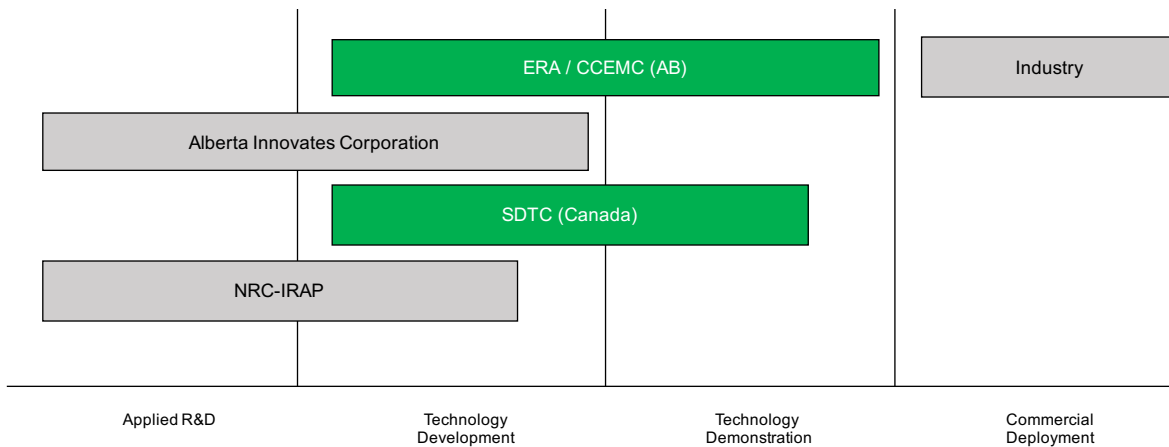


Figure 4. ERA/CCEMC & SDTC Funding Gap.⁴⁸

Funding

The Climate Change and Emissions Management Act established the Climate Change and Emissions Management Fund (CCEMF). The fund receives payments from Alberta’s largest emitters “who choose to pay into CCEMF as a compliance option if they are unable to meet emissions reductions targets.”⁴⁹ The mechanism was created as part of the wider system to price carbon emissions from large final emitters in Alberta. If emitters cannot find emissions reductions at below the carbon price, which was originally \$15 per tonne and was increased to \$30 per tonne under the NDP government, they either purchase carbon credits or pay into the fund. The fund is managed by the government and disburses annual grants to ERA,

which receives an annual funding allocation of \$70,000,000.⁵⁰

Disbursement

Since its inception, ERA has disbursed over \$330 million in funding to 121 projects. Using data from their website, we were able to analyze 117 projects. The majority are related to reducing GHGs in the fossil fuel industry. Overall, the reduction of GHGs in fossil fuel operations has received the most funding approvals. With 45 approved projects in this issue area, it represents 37% of all projects.

⁴⁸ ERA Alberta. (2017). Adapted from: <http://eralberta.ca/wp-content/uploads/2017/05/CCEMC-Business-Plan-2016.pdf>

⁴⁹ ERA Alberta. (2017). ERA Governance – Climate Change and Emissions Management Act. Retrieved from: <http://eralberta.ca/about-era/era-governance/>

⁵⁰ ERA Alberta. (2016). Climate Change and Emissions Management (CCEMC) Corporation: 2016-2019 Business Plan. p. 18. Retrieved from: <http://eralberta.ca/wp-content/uploads/2017/05/CCEMC-Business-Plan-2016.pdf>

Investment Area	Projects (#)	Projects (%)
Reduced GHG footprint of fossil fuel supply	45	37%
Low emitting electricity supply	12	10%
Biological resource optimization	36	30%
Industrial process efficiency	25	21%
Adaptation	3	2%
Total:	121	100%

TABLE 9. ERA INVESTMENTS BY SECTOR.

Project demonstration projects receive the most funding, although there are more R&D projects in the portfolio. ERA argues that it fills a funding gap for projects that require demonstration and piloting. To date, they have funded 39 such projects, allocating \$185.0 million out of the \$335.8 million (55%) reviewed to date. Looking instead at the number of projects (instead of amount of funding), research and development projects dominate their portfolio – 52 of the 117 projects (44%) are focused on R&D.

Project Type	Projects (#)	Projects (%)	ERA Funding (\$CAD)	Funding (%)
Research & Development	52	44%	\$42,513,142	13%
Implementation	18	15%	\$104,748,097	31%
Demonstration	39	33%	\$185,048,187	55%
Development	8	7%	\$3,486,465	1%
Total:	117	100%	\$335,795,891	100%

TABLE 10. ERA SUMMARY BY PROJECT.

Unlike BC's ICE Fund, the ERA does not solely invest in Alberta. It is not a surprise that the majority of investments are in Alberta-based projects. Interestingly, unlike BC's ICE Fund, ERA also invests in projects outside of the province – mainly in other provinces and in the United Kingdom.

Geography	Projects (#)	Projects (%)	ERA Funding (\$CAD)	Funding (%)
AB	79	68%	\$293,890,221	88%
Non-AB	38	32%	\$41,905,670	12%
Total:	117	100%	\$335,795,891	100%

TABLE 11. ERA SUMMARY, BY GEOGRAPHY.

Similar to ICE and SDTC, ERA is rarely the sole funder of a project. Its average investment amount is \$2.9 million, while the average project size was \$19,418,051.

Investment Amount	\$CAD	Project Size	\$CAD
Average investment amount	\$2,870,050	Average project size	\$19,418,051
Highest investment amount	\$25,000,000	Highest project size	\$600,000,000
Lowest investment amount	\$52,076	Lowest project size	\$57,000

TABLE 12. ERA SUMMARY, BY INVESTMENT AMOUNT & PROJECT SIZE.

The key performance measure is the leverage ratio. The average is \$2.96 matched funding for each dollar raised although 11% of projects achieved ratios of 5-10. This is analysed further in Appendix 1.

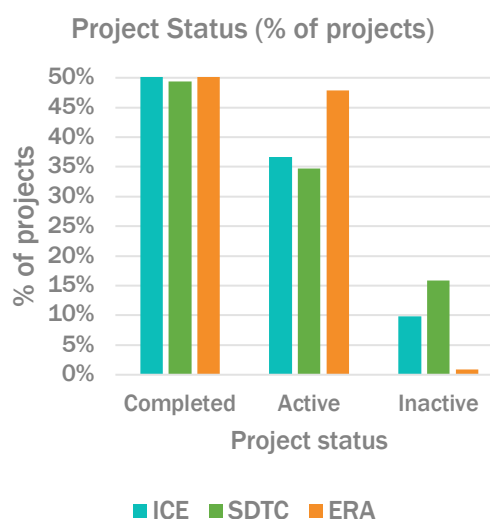
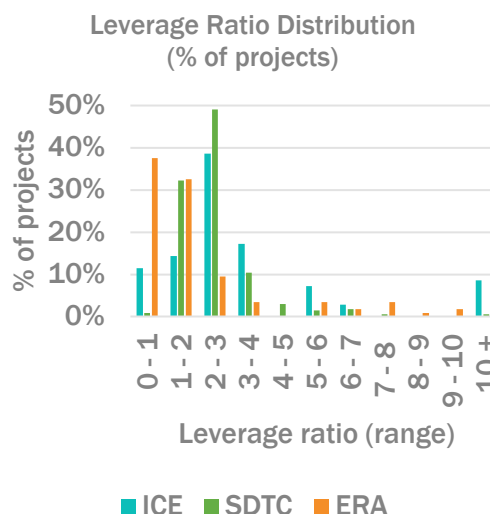
Performance Comparison: ICE, SDTC, ERA

We measure performance based on two metrics: leverage ratio and project status. The leverage ratio measures the additional amount of investment dollars raised for every \$1 invested by ICE, SDTC, ERA, and is calculated with the following formula:

Fund	Average Leverage Ratio
ICE	\$4.55
SDTC	\$2.48
ERA	\$2.96

TABLE 13. THE LEVERAGE RATIO FOR ICE, SDTC, ERA.

Note that the average ratio does not tell the whole story, as there were some projects that raised over \$5 for every \$1 invested. A better representation is seen through a distribution of leverage ratios. The figures to the right summarize the distribution of leverage ratios and status of ICE, SDTC and ERA projects.



Canada's Social Finance Fund

In June 2017, the government established a Co-Creation steering group compiled of non-profit and industry leaders to guide the development of a Canadian Social Innovation and Social Finance strategy. One of the report's key recommendations was to create a Social Finance Fund to help improve the access to capital for social purpose organizations working to address social and environmental challenges.

In response to the recommendations put forth by the committee, the government of Canada committed \$755 million over the next decade to establish a Social Finance fund that will support innovative solutions to some of Canada's most persistent and complex social challenges. They have also committed an additional \$50 million over the next two years to help private-sector initiatives that provide a social benefit to successfully participate in the social finance market. The proposed Social Finance Fund is expected to generate up to \$2 billion in economic activity and create over 100,000 jobs in the next 10 years. This fund would help accelerate the growth of the existing social finance market in Canada, and also help social purpose organizations connect with non-government investors and access new financing.

By bringing together Canada's private and institutional investors to finance proven solutions

led by not-for-profit organizations and charities, positive social impact can be made. The social fund has the ability to help Canada solve some of the country's most challenging community issues, including affordable housing, employment opportunities for youth and persons with disabilities, and infrastructure projects in Indigenous communities. With the federal government's financial support, it has the potential to leverage the work that is already taking place across all sectors in Canada and accelerate these achievements. This plan also helps stimulate innovation in the private sector, helping the economy grow by reshaping financial markets to create positive outcomes for communities while also creating financial returns for investors.

The Social Finance Fund aims to:⁵¹

1. Support innovative solutions on a broad range of social challenges through a competitive, transparent and merit-based process.
2. Attract new private sector investment to the social finance sector. It is expected that the Fund would achieve matching funding from other investors.
3. Share both risks and rewards with private investors on any investments.
4. Only support investments that are not yet viable in the commercial market.
5. Help create a self-sustaining social finance market over time that would not require ongoing government support.

⁵¹ Department of Finance Canada. (2018). Fall Economic Statement 2018. p. 39. Retrieved from:

<https://budget.gc.ca/fes-eea/2018/docs/statement-enonce/fes-eea-2018-eng.pdf>

The social innovation space has been lacking for the past few years; however, this new fund will help Canada become a global leader in social financing. The government will continue to work on exploring the other recommendations made in the Steering Group's report, but for now Canada has made a step in the right direction towards equipping communities with new tools to achieve better social, economic and environmental outcomes.

Conclusion

Over the last few years, Canada has made significant strides to address climate change through different policy strategies and programs. Historically, the government has faced difficulty in negotiating absolute emission reduction targets for the country because of Canada's autonomous provinces and territories and resource dependent economy. Although Canada faces a unique situation, the current provincial legislation on climate policy and federal Pan-Canadian framework on clean growth and climate change has set the country in the right direction towards fulfilling its commitment to reducing emissions under the Paris agreement. Furthermore, although the social and climate finance sector is still in its infancy and is underfunded, efforts are being made across the nation to continue to expand this area.

Canadian Climate Policy

Canada has come a long way in establishing both carbon taxes and cap-and-trade systems that are reducing GHG emissions while maintaining strong economies. Done right, these carbon pricing regulations can change household and business behaviour, reduce GHG emissions, and provide an incentive for the development of innovative technologies that can play a key role in a low-carbon economy. We looked into different provincial and federal legislation that highlights the climate efforts being made across the nation. Noticeably, BC has established a comprehensive carbon tax and has continued to play a leadership role in climate action in Canada. Even Alberta, one of the more notorious oil dependent provinces, has

also made significant shifts towards green infrastructure through carbon pricing and an offset system. The federal government has developed ambitious climate change policies and measures with their new Clean Fuel Standard and Low Carbon Economy Fund, dedicating \$2b into projects to reduce Canada's emissions by 30% below 2005 levels by 2030. These new regulations will encompass all economic sectors, demonstrating the effectiveness of Canada's climate plan.

Social Finance

The federal government has created momentous opportunities while supporting social finance to help Canada reimagine economic growth and social inclusion. Canada has made strategic investments in support of the many ecosystems working across the charitable and non-profit, public and private sectors to strengthen communities through social finance. The federal government has committed \$755m to establish a social finance fund that could respond to the long-standing gaps in early-stage support, capacity-building, and knowledge sharing. As the government implements these new measures to support social innovation and finance, it must also engage Indigenous communities to create a more inclusive, prosperous and sustainable future.

Climate Finance

Canada's climate finance contribution supports the commitment to advance the development and deployment of clean technologies to address the effects of climate change. We reviewed the ICE, SDTC, and ERA funds that are dedicated to

supporting Canada's transition to a low-carbon economy that is greener and more climate resilient. Based on the project status, we see that the ERA has a far more successful success rate, in which only 1 out of their 117 projects terminated early. Canada needs to continue to make a sustained effort in supporting these new regulations and funds over the long term if it is to deliver better social, economic, and environmental outcomes for Canadians.

Appendix: ICE, SDTC, ERA Data

This data is compiled through public data available on ICE, SDTC, and ERA websites. Analysis was performed by Canvas.

ICE Fund Data and Performance

Data Sources

Source	Year	Description
Innovative Clean Energy Fund: 2014 Update	2014	Overview of ICE Fund, history, background, policy updates, and investment list as of 2014.
Innovative Clean Energy Fund: 2015 Update	2015	List of investments made in 2015, including milestones and program updates.
Community Energy Leadership Program Website	2016	List of investments made in Round 1 (2015/16) and Round 2 (2016/17) of the CELP program.
Post-Secondary Clean Energy Partnerships Program	2015	List of investments made to post-secondary institutions.

TABLE 14. ICE DATA SOURCES.

Overall, we found most of the investments were made towards General Demonstration Projects.

Project Type	# of Projects
General Demonstration Projects	39
Ministry Initiatives	1
Clean Energy Vehicle	4
Community Energy Leadership Program	14
Post-Secondary Clean Energy Partnerships Program	5
Non-Technology Project	8
Total:	71

TABLE 15. ICE SUMMARY BY PROJECT.

When we analyze by type of technology, we find that most of the investments were focused on technologies such as bioenergy (15 projects), Solar (12), and Waste to Energy (3).

Technology	# of Projects	% of Projects	Total Funding Amount	Average Funding Amount
Solar PV and Thermal	2	3%	\$582,075	\$291,037.50
Solar PV	5	7%	\$1,099,598	\$219,919.55
Solar	5	7%	\$2,974,154	\$594,830.80
Energy Management	5	7%	\$6,781,407	\$1,356,281.40
Energy Conservation	3	4%	\$4,328,338	\$1,442,779.33
Energy Storage	1	1%	\$203,775	\$203,775.00
Waste to Energy	3	4%	\$2,666,666	\$888,888.67
Geoexchange	2	3%	\$1,075,115	\$537,557.50
Bioenergy	15	21%	\$26,646,364	\$1,776,424.27
Ocean - Wave/Tidal	2	3%	\$2,469,622	\$1,234,811.00
Hydro	1	1%	\$44,000	\$44,000.00
Clean Energy Vehicle	2	3%	\$8,500,000	\$4,250,000.00
Charging Station Infrastructure	4	6%	\$1,756,000	\$439,000.00
General	1	1%	\$500,000	\$500,000.00
Energy efficiency retrofit	7	10%	\$384,780	\$54,968.57
Biomass	1	1%	\$47,000	\$47,000.00
Community electrification	1	1%	\$36,000	\$36,000.00
Vacuum Insulation Panels	1	1%	\$49,967	\$49,967.00
Wave Energy Converter	1	1%	\$96,000	\$96,000.00
Smart Grid	1	1%	\$100,000	\$100,000.00
Electronic Data Exchange (EDX)	1	1%	\$100,000	\$100,000.00
Home Energy Performance (HEP) accreditation and training	1	1%	\$200,000	\$200,000.00
Cold climate heat pump water heaters (HPWHs)	1	1%	\$30,000	\$30,000.00
Windows	1	1%	\$25,000	\$25,000.00
All Electric Air Source Heat Pump	1	1%	\$1,200,000	\$1,200,000.00
Passive House	1	1%	\$100,000	\$100,000.00
Regulation	1	1%	\$300,000	\$300,000.00
Geothermal	1	1%	\$100,000	\$100,000.00
Total:	71	100%	\$62,395,861	\$16,218,240.59

TABLE 16. ICE INVESTMENTS BY TECHNOLOGY.

For almost all the projects, the ICE Fund was not the sole funder. For example, the ICE Fund provides at most one-third of total costs in the Post-Secondary Clean Energy Partnership Program, while NSERC and an external industry partner provides the other two-thirds of costs. In fact, the average ICE contribution was \$878,815 while the average ICE-funded project size was \$3.7 million.

Investment Amount	\$CAD	Project Size	\$CAD
Average investment amount	\$878,815	Average project size	\$3,692,846
Highest investment amount	\$7,500,000	Highest project size	\$50,000,000
Lowest investment amount	\$20,000	Lowest project size	\$45,000

TABLE 17. ICE FUNDING DISTRIBUTIONS.

Performance

It is difficult to measure all ICE projects on the same metrics. Some projects are technology-based, while others are focused on driving sales in clean energy products. Thus, the ICE Fund primarily measures its performance based on how many funded projects are complete, or are making progress.

We measure performance based on two metrics: leverage ratio and project status. The leverage ratio measures the additional amount of investment dollars raised for every \$1 invested by ICE. The project status is reported in ICE’s project database. Pilot/ demonstration projects, by definition, are risky, and thus there will be a substantial amount of failed projects.

The leverage ratio is calculated with the following formula:

$$\frac{\text{Total Project Value} - \text{SDTC Funding}}{\text{Total Project Value}} = \text{Leverage Ratio}$$

We found that on average, for every \$1 invested by the ICE Fund, projects were able to raise an additional \$2.48. The following table and graph provide a distribution of the leverage ratios for the 71 projects analyzed.

Leverage Ratio	Projects (#)	Distribution (%)
0 - 1	8	11%
1 - 2	10	14%
2 - 3	27	39%
3 - 4	12	17%
4 - 5	0	0%
5 - 6	5	7%
6 - 7	2	3%
7 - 8	0	0%
8 - 9	0	0%
9 - 10	0	0%
10 +	6	9%
Total	70	100%

TABLE 18. LEVERAGE RATIO SUMMARY FOR ICE.

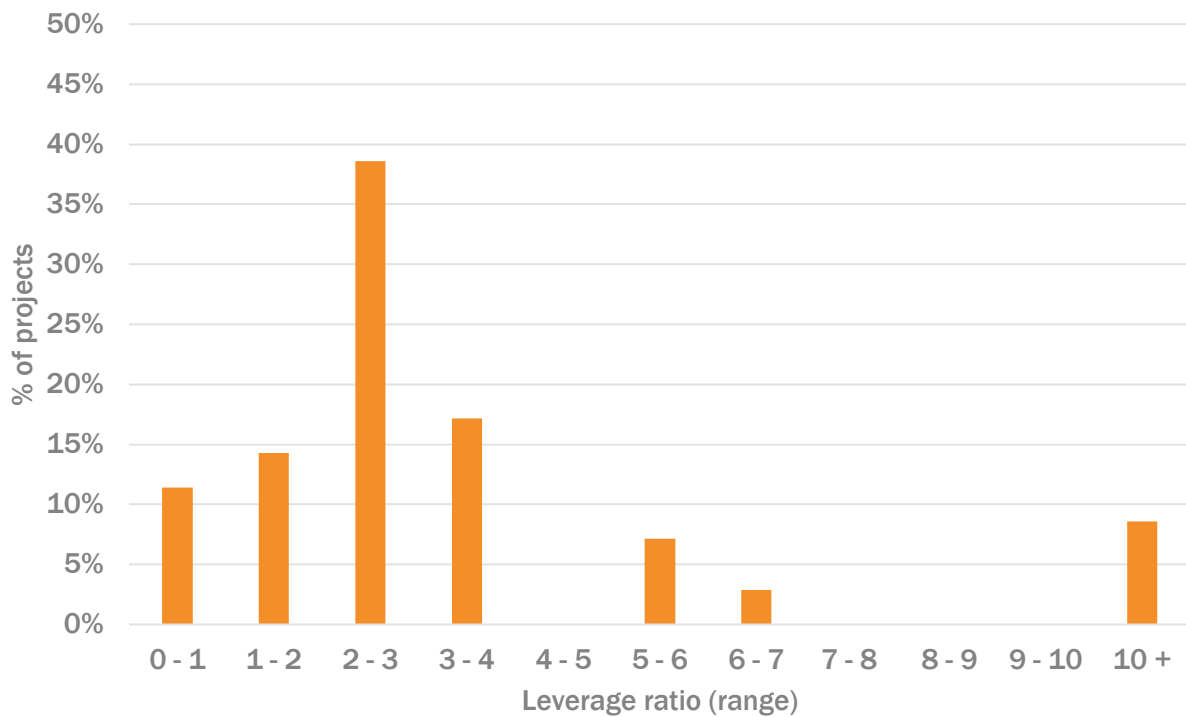


FIGURE 5. LEVERAGE RATIO DISTRIBUTION, % OF PROJECTS (ICE FUND).

SDTC Data and Performance

The energy utilization sector received most funding, possibly due to low capital requirements. Overall, the energy utilization sector received the most funding from SDTC (21% of all funding – \$226,867,310), while forestry-related projects received the least (6% of all funding, \$60,592,826).

Economic Sector	Projects (#)	Projects (%)	SDTC Funding (\$)	Funding (%)
Agriculture	22	6%	\$49,061,829	5%
Energy Exploration & Production	56	16%	\$206,612,860	21%
Energy Utilization	92	27%	\$226,867,310	23%
Forestry	17	5%	\$60,592,826	6%
Power Generation	56	16%	\$167,684,076	17%
Transportation	52	15%	\$133,266,513	13%
Waste Management	45	13%	\$148,893,676	15%
Total	340	100%	\$992,979,089	100%

TABLE 19. SDTC PROJECTS BY ECONOMIC SECTOR.

Ontario received the most funding, while British Columbia and Quebec received the second and third most (respectively). The geographic distribution of funding is not surprising. Projects from Ontario received the most funding⁵², with \$322.4 million (32% of all funding) for 126 projects (37% of total). British Columbia received \$238.7 million (24%) for 77 projects (23%), while Quebec received \$165.3 million (17%) for 69 projects (20%).

Province	Projects (#)	Projects (%)	SDTC Funding (\$)	Funding (%)
British Columbia	77	23%	\$238,677,600	24%
Alberta	41	12%	\$194,298,821	20%
Saskatchewan	7	2%	\$22,634,930	2%
Manitoba	5	1%	\$13,702,910	1%
Quebec	69	20%	\$165,256,583	17%
Ontario	126	37%	\$322,395,743	32%
Newfoundland and Labrador	1	0%	\$102,400	0%
New Brunswick	2	1%	\$2,354,774	0%
Nova Scotia	11	3%	\$31,721,844	3%

⁵² Possibly because most of the applications came from Ontario. We do not, however, have the adequate data to derive insights on this.

Prince Edward Island	1	0%	\$1,833,482	0%
Total	340	100%	\$992,979,089	100%

TABLE 20. SDTC PROJECTS BY PROVINCE.

SDTC was never the sole funder in the projects. The SDTC committed an average investment amount of \$2,937,808, while the average project value was over three times the investment amount, at \$10,802,701.

Investment Amount	\$CAD	Project Size	\$CAD
Average investment amount	\$2,937,808	Average project size	\$10,802,701
Highest investment amount	\$63,600,000	Highest project size	\$217,488,811
Lowest investment amount	\$51,937	Lowest project size	\$208,573

TABLE 21. SDTC FUNDING DISTRIBUTIONS.

Performance

We measure performance based on two metrics: leverage ratio and project status. The leverage ratio measures the additional amount of investment dollars raised for every \$1 invested by SDTC. The project status is reported in SDTC's project database. Since these early-stage companies are inherently risky, it is not surprising that some projects have become inactive.

The leverage ratio is calculated with the following formula:

$$\frac{\text{Total Project Value} - \text{SDTC Funding}}{\text{Total Project Value}} = \text{Leverage Ratio}$$

We found that for every \$1 invested by SDTC, projects were able to raise an additional \$2.48. The average ratio does not tell the whole story, as there were some projects that raised over \$5 for every \$1 invested. The following graph provides the distribution of leverage ratios for the SDTC-funded projects.

Leverage Ratio	Projects (#)	Distribution (%)
0 - 1	3	1%
1 - 2	109	32%
2 - 3	166	49%
3 - 4	35	10%
4 - 5	10	3%
5 - 6	5	1%
6 - 7	6	2%

7 - 8	2	1%
8 - 9	0	0%
9 - 10	0	0%
10 +	2	1%
Total	338	100%

TABLE 22. LEVERAGE RATIO SUMMARY FOR SDTC.

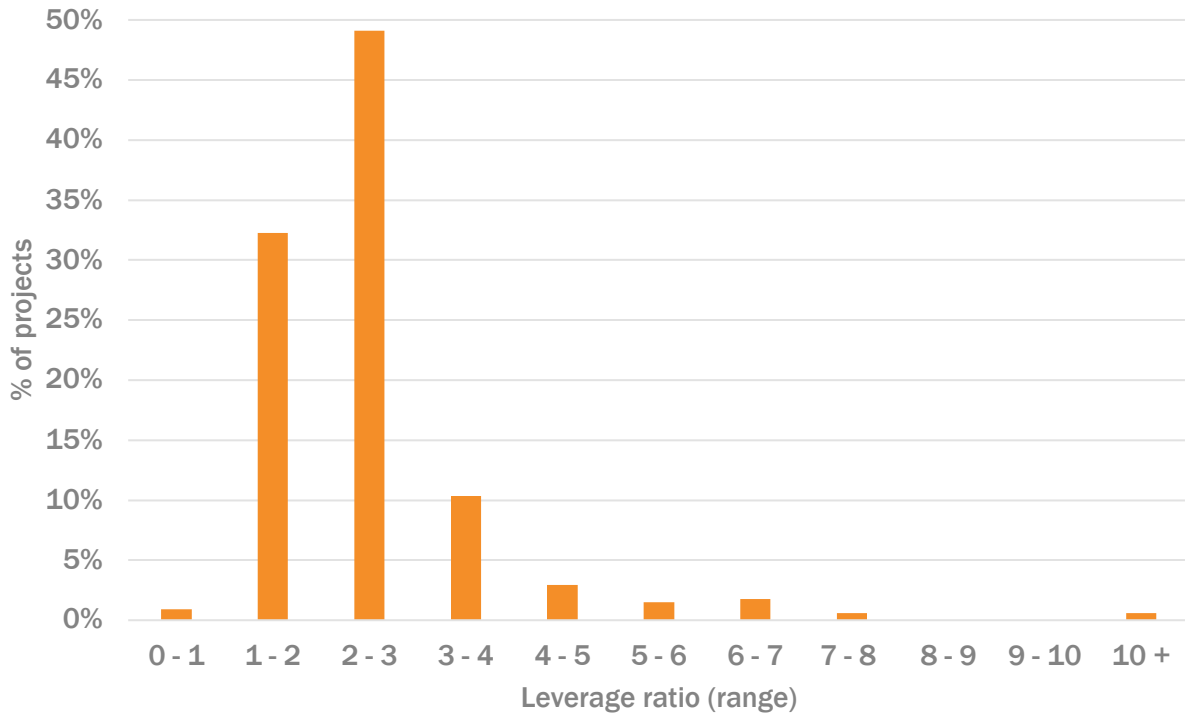


FIGURE 6. LEVERATE RATIO DISTRIBUTION, % OF PROJECTS (SDTC).

With regards to project status, we found that almost half of the 340 funded projects were successfully completed. SDTC did not provide any more details on the reasons behind inactive projects.

Project Status	Projects (#)	Projects (%)
Completed	168	49%
Active	118	35%
Inactive	54	16%
Total	340	100%

TABLE 23. SDTC PROJECT STATUS.

ERA Data and Performance

The leverage ratio is calculated with the following formula:

$$\frac{\text{Total Project Value} - \text{ERA Funding}}{\text{Total Project Value}} = \text{Leverage Ratio}$$

We found that for every \$1 invested by ERA, projects were able to raise an additional \$2.96. The average ratio does not tell the whole story, as there were some projects that raised over \$10 for every \$1 invested. The following graph provides the distribution of leverage ratios for the ERA-funded projects.

Leverage Ratio	Projects (#)	Distribution (%)
0 - 1	44	38%
1 - 2	38	32%
2 - 3	11	9%
3 - 4	4	3%
4 - 5	0	0%
5 - 6	4	3%
6 - 7	2	2%
7 - 8	4	3%
8 - 9	1	1%
9 - 10	2	2%
10 +	7	6%
Total:	117	100%

TABLE 24. ERA LEVERAGE RATIO DISTRIBUTION.

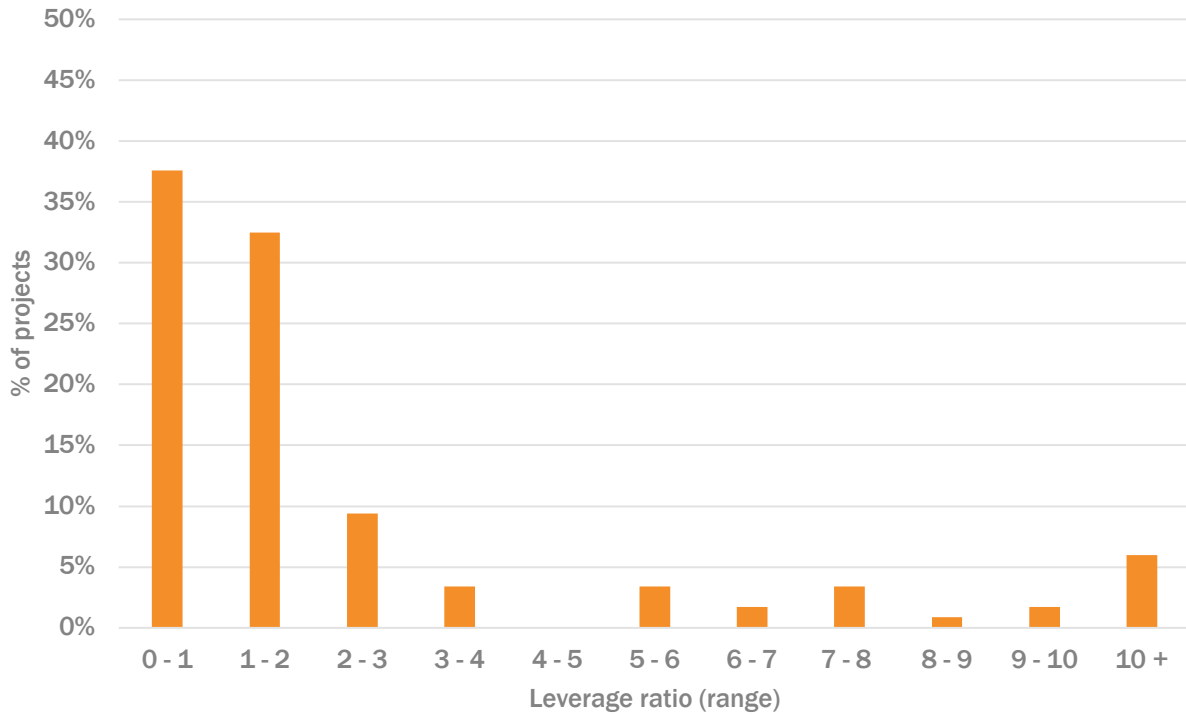


FIGURE 7. LEVERAGE RATIO DISTRIBUTION, % OF PROJECTS (ERA).

With regards to project status, the majority of ERA's projects are either completed or still active. There are seven projects in the pipeline, and only one project was terminated early.

Project Status	Projects (#)	Projects (%)
Complete	60	51%
Active	49	42%
Contribution Agreement	7	6%
Terminated early	1	1%
Total:	117	100%

TABLE 25. ERA PROJECT STATUS.