RESEARCH BRIEF

Bridging the Finance Gap

The Role of Blended Finance in Building a Climate-resilient Economy

SEPTMEBER 2025

Smart Prosperity Institute

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The Smart Prosperity Institute is a policy think tank and global research network focused on the environment and the economy. We conduct leading-edge research to craft innovative policies and market tools that foster a greener, more competitive Canadian economy. Based at the University of Ottawa, we collaborate with partners across all levels of government, industry and civil society to put knowledge into action and shape effective policies and practices. Our work bridges environmental, social and economic goals — advancing prosperity, well-being and sustainability for all Canadians.

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Acknowledgements

This report was written by Anik Islam. The author would like to thank Marena Winstanley, Dr. Colleen (Ollie) Kaiser, Dr. Vasundhara Saravade, Dr. Geoff McCarney and Caelan Welch for their helpful feedback on initial drafts. The author would also like to thank Sarah Gordon, Hao Tian, Dr. Sebastien Betermier, Andrew Posluns and Steven Robins for their comments and insights on this work.

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Suggested Citation

Islam, A. (2025). *Bridging the Finance Gap: The Role of Blended Finance in Building a Climate-resilient Economy*. Smart Prosperity Institute.

September 2025

With support from

This project was undertaken with the financial support of:
Ce projet a été réalisé avec l'appui financier de :

Environment and Climate Change Canada
Environnement et Changement climatique Canada

This report does not necessarily reflect the views of the funder, nor any of the reviewers. Any errors remain the sole responsibility of the authors.

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Table of Contents

Key messages 1

1 Introduction 2

2 Overview of blended finance 5

2.1 Catalytic instruments and policy tools 6

2.2 Blended-finance structures 8

3 Climate-investment challenges 10

3.1 Project and sector-level challenges 10

3.2 Investor-specific challenges 11

4 How blended finance supports climate investment 12

5 Challenges associated with implementing blended finance 14

6 Conclusion and future research direction 15

Endnotes 16

List of Figures

Figure 1: Canada's annual climate-investment gap 2

Figure 2: Key elements of blended finance 5

List of Tables

Table 1: Catalytic instruments and policy tools used in blended-finance structures 6

Table 2: Examples of blended-finance structures 8

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Key messages

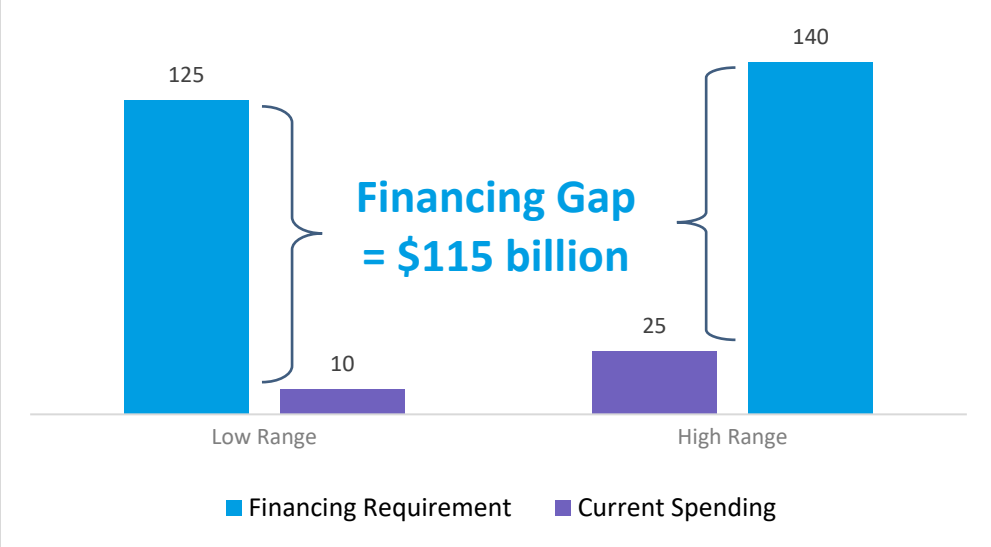
- **Canada faces a significant challenge to finance the transition to a low-carbon, climate-resilient economy.** The country's estimated annual climate investment gap is $115 billion. With limited public-sector financing, domestic and international private financiers will need to help close this gap by increasing their investments in businesses and projects that deliver clean technologies, support the transition to lower carbon emissions and build climate resilience. Closing the financing gap will improve Canada's competitiveness while decoupling our economic prosperity from environmental harm.
- **There are several market failures and investor-related challenges that deter private investments in the low-carbon economy**. These failures and challenges play out across different stages of project and company development, varying by sector. They are further compounded by the disadvantage of having higher costs than technologies and processes that use fossil fuels. Climate-policy frameworks and climate information architecture help, but complementary tools are needed to tackle investment challenges.
- **Blended finance is a solution to help scale climate investment in Canada.** It bundles catalytic financing instruments and policy tools, like risk guarantees, subordinated debt and contracts for differences, into structures that unlock private capital for climate-aligned projects and entities. Through these structures, the private sector can achieve its desired risk-adjusted returns while the public and philanthropic sectors can achieve their environmental and socioeconomic objectives.
- **The goal of this brief is to showcase the role that blended finance can play in Canada's climate-investment landscape.** Our aim is to ensure that policymakers, regulators, financial institutions, industry groups and other related stakeholders understand its potential to help close the climate-investment gap.
- **While there are different types of blending, in this brief, we will focus on innovative, public financial institutions.** These institutions have expertise in high-risk investments where there is a lack of clarity on returns and a limited track record. Public financing institutions share information with different stakeholders, bundle funding and financing instruments, then collaborate with stakeholders to improve risk-return dynamics, bridge market gaps and build capacity.
- **Blended finance is not a panacea for the climate-investment gap.** It does not replace the need for macroeconomic and sector-specific reforms. Blended-finance structures face different project-level challenges and knowledge gaps. Careful design and governance of these structures are critical to ensure they deliver financing outcomes efficiently.
- **Stronger evidence and learning are essential to inform the development of a robust blended-finance ecosystem.** We need to examine the roles that public financial institutions can play, learning from early experiences of Canadian initiatives and international best practices. Targeted research in these areas can clarify where blended finance can add the most value and how to design it effectively to support Canada's climate and economic goals.

1 Introduction

The climate-change challenge has become a financing challenge. Policymaking has moved on from understanding the scientific challenges (e.g., a need to reduce GHG emissions) to implementing market-based policies that address the economic ones, like a carbon-pricing system to incentivize GHG emissions reductions. [1] Now, it is critical to address the financing challenges of clean innovation and the energy transition to decouple economic prosperity from environmental impact. Clean innovation includes mature technologies such as solar and wind, energy-efficient building retrofits and emerging innovations like grid-scale energy storage and sustainable aviation fuels.[2]

Closing the financing gap to support clean innovation will help build a low-carbon, globally competitive Canadian economy.[3] However, the challenge of filling this gap is significant. According to Canada's 2022 federal budget, the annual investment gap to achieve a low-carbon, climate-resilient economy by 2050 is $115 billion (Figure 1).[4]

Figure 1: Canada's annual climate investment gap



Source: Government of Canada, Budget 2022

Research from the Canadian Climate Institute and the Royal Bank of Canada shows that, since 2016, the federal government has provided around 80% of the financing for the climate transition.[5] The research also points out that the federal government will not have the fiscal space—the budgetary resources to meet policy objectives without jeopardizing long-term financial stability—to fulfill most of these financing requirements alone. To bridge the investment gap in Canada, domestic and international private investors will need to increase their investments in clean innovation, accelerating the energy transition and building climate resilience.

To attract private investments, Canada, led by the federal government, has developed a climate-policy framework that includes a range of market-based mechanisms, regulations and strategic and targeted

funds.[6] The policy framework is supported by a climate information architecture—disclosures, taxonomies, transition plans, scenario analysis and data and analytics—to support credible policy and financing decisions.[7]

While the combination of these policies and information tools helps create the conditions to leverage private capital, market failures persist, and proponents of climate-resilient projects and entities may not be able to get financing from private investors.[8] These market failures play out across different stages of project and company development, vary by sector, and are compounded by cost disadvantages relative to fossil-fuel incumbents.[9] In some cases, the market for climate solutions, such as green hydrogen, is too risky for private investors because of its newness and complexity. In other cases, government policy goals may not match private-sector goals, such as a lack of policy frameworks to support the development of offshore wind projects, resulting in delayed market development and private investment.

These market failures create investment-related risks, such as insufficient revenue streams, large upfront capital costs, uncertainty of technological development, and inadequate supply chains. These risks can be perceived (subjective assessment of risk) or real (actual, quantifiable risks associated with a project or investment).[10] There is also often a mismatch between the priorities and outcomes sought by different types of investors and the investment needs of climate-aligned projects and entities.[11] Banks may not be able to extend loans due to their limited risk appetites and capital treatment pressures from regulators. Venture capital and private-equity investors have a high-risk appetite but focus on small-dollar investments, whereas climate and clean technology projects or companies typically need large upfront capital expenditure. On the other hand, institutional investors such as pension funds can provide large investments but have a lower risk appetite and may choose not to invest in these assets unless they align with meeting their fiduciary obligations.

In response to these market failures and investor challenges, blended finance could be an effective tool to support Canada's climate-investment needs. It is a structuring approach that uses risk-tolerant catalytic capital from public and philanthropic sources to attract capital from private sources seeking market returns on investment.[12]

As the name suggests, blended finance uses a range of catalytic financing tools and policy instruments and combines them into customized financial structures. It can be applied across different projects and entities, starting from early-stage climate solutions to large infrastructure projects. Blending itself can occur at different levels, ranging from directly blending different types of capital in a company or project to establishing funds or public financial institutions to make investments.[13]

Through these structures, the private sector can achieve its desired risk-adjusted returns. At the same time, the public sector and philanthropic organizations can achieve their environmental, economic and social objectives. Blended finance can be cost-effective for the latter stakeholders as it enables the use of non-grant instruments that have some expectation of repayment, such as concessional loans, making it easy to reinvest capital in other areas and/or sectors.[14]

Blended finance has been used extensively in emerging markets and developing countries in pursuit of sustainable development outcomes.[15] While there are numerous examples of its effectiveness, the relevance and applicability of blended finance have been downplayed in developed markets, including in Canada, over the years.[16]

However, this perception is beginning to change quickly. Developed countries are making blended finance an active part of their economic, industrial policy and climate-finance strategies.[17] For example, the United Kingdom (UK) and Australia have developed sustainable finance strategies with the UK 2023 Green Finance Strategy and Australia Sustainable Finance Roadmap, respectively.[18]

Both strategic frameworks intend to use blended finance as a tool to attract private capital for projects and entities aligned with their energy transition and climate-resiliency needs. These countries have also established innovative public financial institutions, the UK National Wealth Fund (NWF) and the Australia Clean Energy Finance Corporation (CEFC).

These public financial institutions obtain, synthesize and disperse information. They bundle different financing and policy instruments to address specific financing challenges while working collaboratively with key stakeholders such as policymakers, regulators, different private investors, academia and civil society. This form of blending has proven to be effective in high-risk financing areas. These include financing new innovative technologies and building climate resilience where there is a lack of clarity on returns and a limited track record for making investments.[19]

Canada's public financial institutions, the Canada Infrastructure Bank (CIB) and Canada Growth Fund (CGF), use blended-finance approaches. Their formation, early engagements and the deals they have structured lay the path forward. However, stakeholders from across Canada's climate and sustainable finance landscape (e.g., policymakers, regulators, financial institutions, industry groups, academia and civil society) can build on the momentum by improving their understanding of blended-finance practices. These measures would help Canada develop a robust blended-finance ecosystem to attract private capital and close the financing gap to build an innovative, competitive and climate-resilient economy.

The objective of this brief is to explore the use of blended finance as a tool in Canada's climate and sustainable finance landscape. It examines some of the widely used tools and financing structures, the challenges blended finance can help address and outlines further research needs to build a conducive ecosystem to finance clean innovation. The brief focuses on innovative public financial institutions because of the role they play in financing climate investments, which are typically high-risk, have a limited track record and lack clarity on returns from investment. These institutions are also part of the larger climate investment policy framework in Canada and in other countries that are building low-carbon, climate-resilient, competitive economies.

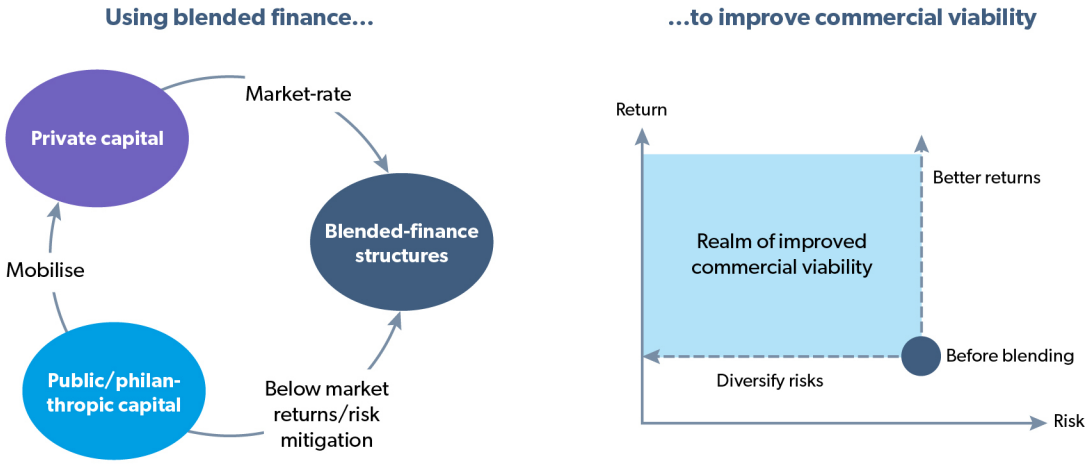
The brief is structured as follows: an overview of blended finance and commonly used blended finance instruments and structures (section 2), key project and investor-related challenges (section 3), what

blended finance can do in addressing these challenges with selected examples (section 4), challenges associated with implementation (section 5) and areas for future research (section 6).

2 Overview of blended finance

Despite its prominence, blended finance does not have a common definition. For this brief, blended finance is defined as a structuring approach, not a single investment method, financing instrument or end solution. It combines public and/or philanthropic capital, which has more varied objectives and a higher tolerance for risk, with private capital, which wants market-based financial returns on investments.[20] Blended finance achieves this objective by diversifying risks or enhancing returns, thereby increasing their commercial viability (key elements shown below in Figure 2).

Figure 2: Key elements of blended finance



Source: Adapted from Convergence, Sustainable Markets Initiative, Investor Leadership Network

Blended finance can be applied across a range of projects and entities. They can be early-stage climate solutions, such as an innovative geothermal energy company or supporting the introduction of clean technology into value chains, like integrating green hydrogen into industrial processes such as steel or fertilizer production. They can also be large infrastructure projects, such as decarbonizing port infrastructure.[21] This is because blended finance allows financiers (and other stakeholders with varying objectives) to come together to mitigate and share financial, operational and delivery risks over the lifecycle of projects/entities.[22]

Private financiers, such as banks and venture capital firms, and institutional investors, like pension funds, can achieve their risk-adjusted return requirements and access a range of asset classes to take advantage of new investment opportunities and increase their exposure to less familiar business models, technologies and markets.[23]

Governments and philanthropic funders that usually provide the catalytic capital can advance environmental and socioeconomic goals more cost-effectively with blended finance.[24] Traditionally, governments and philanthropic organizations use grants to support clean innovation. However, blended finance enables the use of non-grant instruments, like concessional loans that have some expectation of repayment, reducing the net cost of the investment. Repayments can be reinvested in other areas and/or sectors. The entire process is expected to lead to higher capital appreciation, greater income yield and more investor interest in climate-aligned investments.[25]

2.1 Catalytic instruments and policy tools

Blended-finance transactions draw on a range of catalytic instruments and policy tools to attract private investment. These instruments and policy tools include traditional mechanisms such as grants, loans and equity to more sophisticated ones like risk guarantees, subordinated loans, securitized products and others. Instruments and tools are suited to different project contexts and risk profiles. A non-exhaustive list and related details are provided below in Table 1.

Table 1: Catalytic instruments and policy tools used in blended-finance structures[26]

Categories	Instruments	Details
Grant	• Non-repayable grants • Repayable grants • Convertible grants	Grant instruments are capital that usually does not have to be repaid or compensated. Repayable grants must be repaid under certain conditions, typically if the project reaches a certain level of success. Convertible grants can be converted into equity or another form of investment under certain conditions. Through separate technical assistance facilities or direct funding, grants can provide direct technical support on early-stage research and development, project feasibility and design, and preparatory work. They can also be used to develop skills, processes and resources over the long term to enhance the entity's or project's ability to manage financial and sustainability-related aspects. All these uses help projects and entities become commercially attractive for investors.

Risk mitigation/sharing	• Guarantees • Insurance	Risk mitigation/sharing instruments protect/compensate commercial investors for risk or loss that the market cannot insure/hedge or that it misprices, including credit, liquidity or project completion risks (e.g., a first-loss guarantee if the project does not earn enough revenue after a certain number of years). These instruments can take many forms to achieve investment objectives.
Anchor investments	• Grant or equity positions in a funding structure	Anchor investments in a project or entity act as a signal of quality to other investors—particularly those who are more risk-averse or less familiar with the opportunity. Anchor investors have the capacity to take on more risks (often motivated by broader socioeconomic objectives), typically have better access to information and can work with lower monitoring costs. They can also help address challenges related to investment coordination (e.g., the need to invest in supply chains before investing in the cleantech project itself).
Subordinate/Junior Financing	• Subordinated debt • Subordinated equity	Subordinated debt and/or equity ranks below other debts/equity in terms of claims on assets or earnings in the event of a borrower's default or bankruptcy. Public capital usually takes on this subordinated debt or junior equity position to achieve public good-related policy objectives, accepting a lower return compared to the risks, while private investors take a senior debt or equity position with higher returns.
Results-based financing	• Utilization-linked loans • Sustainability-linked loans or bonds	Results-based financing offers incentives to invest in projects/entities to achieve specific, pre-determined outcomes. A portion of the returns on investment is tied to the delivery of these outcomes, creating performance-based accountability. The payments can go to investors and lenders if the achievement of targets can be reliably verified.
Securitization	• Asset-backed securities	Securitization is the process of transforming a pool of illiquid assets from financial institutions into tradable financial instruments. For example, the cash flow from assets (e.g., mortgages) can be divided into a range of

		instruments with risk–reward profiles (e.g., high-risk mortgages with a higher rate of default vs. low-risk mortgages with lower rates of default on repayments) to meet the needs of different investors.
Market support	• Offtake agreements • Contracts for differences	These instruments support long-term revenue stability and help reduce market risk. They can take different forms, such as offtake agreements (i.e., purchase agreements at a fixed rate) or contracts for differences (i.e., an agreement made between two parties to exchange payments depending on the difference between market price and a pre-agreed "strike" price).

Source: Compilation of research from Convergence, Grantham Research on Climate Change and the Environment, OECD, and UK Transition Finance Market Review.

2.2 Blended-finance structures

The catalytic instruments and policy support described above can be combined into different financing structures. A non-exhaustive list of financing structure archetypes is outlined below in Table 2.

Table 2: Examples of blended-finance structures[27]

Blended-finance structures	Details
Grant Senior/Subordinated Debt Equity	Public and/or philanthropic investors provide grants and/or take subordinated positions (e.g., with longer and more flexible loan terms) within the capital structure to lower the overall cost of capital and improve the commercial viability of projects or entities.
Guarantee/ Insurance Debt Equity	Public and/or philanthropic investors provide instruments such as guarantees or insurance at below-market terms to offer an additional layer of protection to private investors.
Technical Assistance Facility Debt Equity	Public and/or philanthropic investors support a grant-funded technical assistance facility used in the pre-investment stage to address specific barriers, such as information gaps, which can help attract private debt and/or equity investments.

Offtake support	Debt Equity	Public-sector or philanthropic organizations support private investments via offtake agreements to mitigate market risks and strengthen commercial viability by ensuring revenue certainty or stability.

Source: Compilation of research from Convergence, Climate Policy Initiative, and World Economic Forum.

Notably, there is no single optimal method to structure these instruments. A single structure may include multiple instruments (e.g., grants, guarantees, subordinated debt or offtake support).[28] Different types of structuring approaches can be taken within a particular transaction and adapted over time:[29]

- Public and philanthropic capital can be given to a company or a single project (project level);
- Public, philanthropic and private capital can be pooled together to be invested in multiple projects or companies, often through a special purpose vehicle (fund level);
- Public, philanthropic and private capital can be invested through other funds (fund-of-fund level); and
- Public, philanthropic and private capital can be channeled through a newly set up or adapted permanent institution (institutional level).

The use of these instruments and structures depends on several factors. These include:

- the nature and scale of the risks or market failures that need to be addressed,
- the optimal level of incentive/returns required by investors,
- the concessions or costs that catalytic/non-commercial investors are willing to accept; and,
- the ability of the structure to attract commercial funding on an ongoing basis.[30]

For example, a large utility-scale energy storage project may need grants and subordinated debt to reduce the upfront capital costs and technological risks to make investment attractive for private investors. Green hydrogen production facilities may need publicly backed offtake agreements—contracts in which a buyer commits to purchasing a specified amount of hydrogen at predetermined terms over a period—and the public sector may need to provide these agreements for a defined period to offset hesitancy due to initially high production costs and uncertain demand.

These examples show that blended-finance structures tackle specific risks and challenges associated with climate-aligned projects or entities. Understanding how different financing approaches can unlock investment and contribute to Canada's climate and economic objectives requires deeper analysis of the risks and challenges that need to be addressed. The next section (section 3) outlines some of the broader challenges related to climate investments.

3 Climate-investment challenges

3.1 Project and sector-level challenges

Assets and entities that help mitigate and adapt to the effects of climate change present significant economic growth opportunities.[31] Yet market failures persist, leaving many proponents of clean-innovation projects unable to secure financing from private investors.[32]

Over the lifecycle of company and project development, there are many deterrents to private investments in clean projects, technologies and entities.[33] At the early exploratory stage, projects have limited certainty about whether approvals, permits or commercial launches will materialize. These uncertainties restrict investor appetite. As businesses move into demonstration and commercialization, they experiment with new products, technologies and business models. These carry elevated risks related to technology performance, construction and delivery. When firms begin to scale, they require capital to expand operations, but insufficient revenues, high operating risks and lack of supporting infrastructure can push expected returns below levels acceptable to commercial investors.

Beyond the lifecycle of individual firms, sector-specific dynamics can worsen these challenges.[34] In some sectors, the revenue streams depend on future cost savings, the scale and timing of which remain uncertain. Others rely on supply chains that are vulnerable to external price shocks (e.g., lithium prices for manufacturing batteries). Misalignment between government policy goals and private-sector incentives can also slow market development and private investment. These challenges are further intensified by near-term cost disadvantages—often referred to as the green premium—relative to necessary fossil fuel-based technologies and processes. This is largely because today's fossil fuel-based infrastructure and equipment have been optimized over decades for cost-efficiency.

The investment-related risks and challenges arising from these market failures can be perceived (subjective assessment of risk) or real (actual, quantifiable risks), including but not limited to: [35]

- **Policy and regulatory uncertainty:** unclear or evolving policy and regulatory measures can delay project timelines, increase compliance costs and erode investor confidence, ultimately deterring private investment participation.
- **Upfront capital requirements:** many climate or clean technologies have mostly upfront capital requirements, making it difficult to access financing.
- **Technology risks:** first-of-a-kind risk associated with the deployment of new and innovative climate and clean technologies that are still unproven at commercial scale leads to funding challenges.
- **Business model/performance risks:** long-term revenue uncertainty stemming from business models, operational performance and market dynamics, which makes it difficult to estimate returns and creates barriers to securing capital.
- **Completion/technical risks:** issues associated with project or business-model design and/or construction of projects that create uncertainty about deliverability. Examples include a lack

of adequate market information, potential planning insufficiencies, deficient technical standards, permitting time delays and cost overruns.

- **Enabling infrastructure/value chain:** interconnections between different parts of the value chain, upstream and downstream, can create challenging business dynamics that affect investment certainty. For example, slow electric vehicle adoption may negatively affect the business model and borrowing capabilities of a company building electric vehicle chargers.

3.2 Investor-specific challenges

Different types of financiers see a mismatch between capital allocation needs for climate solutions and their respective objectives.

- **Venture capital and private-equity investors** face limitations in terms of the size of investment deals they can undertake. Although venture capital's interest in clean, climate-related technology has increased significantly since the early 2000s, these investors tend to focus on smaller dollar investments. In contrast, climate-aligned companies typically have large upfront capital expenditure requirements. Sectors such as information technology or biotechnology provide far more attractive returns for venture capital and private-equity investors compared to clean technologies.[36]
- **Banks** may face a mismatch between the shorter loan terms they can offer borrowers (typically five to seven years), given risk appetites and capital treatment pressures, and the longer-term financing needs of climate-aligned projects and entities (beyond the seven years).[37] This mismatch is due to existing capital treatment requirements and lower risk appetites that slow lending to climate solutions.[38]
- **Long-term institutional investors** such as pension funds, primarily guided by fiduciary responsibility towards their beneficiaries, can provide large investments but have limited risk appetite. Experience demonstrates that they are more inclined to invest in brownfield or existing assets with proven returns rather than in risky or illiquid greenfield assets associated with climate-aligned projects and entities (e.g., new plants producing sustainable aviation fuel).[39] Pension funds and other institutional investors may be inclined to invest if climate solution projects are developed as strategic assets that deliver regular, cost-efficient income for fiduciaries, such as large infrastructure projects like high-speed electric railways and green ports.[40] However, these types of strategic assets remain publicly owned and are not as readily available to institutional investors as in peer countries such as the UK and Australia.[41]

These barriers highlight the need to take innovative steps to unlock private capital. This includes examining the instruments and financing structures that can be deployed and ultimately scaled to support clean and innovative projects. The next section (section 4) describes possible solutions with examples.

4 How blended finance supports climate investment

In response to the investment challenges across project and entity lifecycles, and sectors and investor types (see section 3), blended finance uses different combinations of instruments and structures (see section 2). It does so to improve risk-return dynamics and enhance commercial viability, bridge market gaps to enable proper functioning of markets and support capacity development where required.

While there are many types of blending approaches, public financing institutions have been used to structure investments in new technologies or projects, which are typically high-risk, have a limited track record and lack clarity in returns on investments.[42] These innovative institutions obtain, synthesize and disperse information and/or financing to address specific financing challenges, working collaboratively with key stakeholders such as policymakers, regulators, different private investors, academia and civil society.[43] These institutions are being used by peer countries such as the United States, UK and Australia.

In Canada, at the federal level, these approaches are adopted by two public financial institutions that support clean innovation and economic development.[44] The CIB, a federal Crown corporation tasked with supporting revenue-generating infrastructure projects, provides a range of concessional loans, equity investments and advisory support across different sectors and technologies.[45] The CGF, an independent public fund operated at arm's length from the federal government by PSP Investments, supports firms with pre-commercial, innovative clean technologies with equity funding and other bespoke instruments like carbon contracts for differences.[46]

The instruments and/or funding structures used by these public financial institutions, which meet the three objectives of changing risk-return dynamics, bridging market gaps and supporting capacity development, are described below.

Changing risk-return dynamics: Blended-finance structures can assign risks to the parties that can mitigate or manage them best. This allows private investors to meet their risk-return criteria and channel investments to various projects/assets.[47] As an example of changing risk-return dynamics, companies building electric vehicle charging stations may struggle to attract private financing because it is difficult to predict future revenue streams. This is because revenue from charging stations depends on the number of electric vehicles that need access to a public charger in an area, which is difficult to estimate.[48] The non-predictability of revenue creates credit risks that project proponents and other private investors may not be able to mitigate.

The CIB tries to fill this market gap by providing utilization-linked financing (ULF), a form of results-based financing, to charging companies.[49] The ULF is structured so that repayment of loans is linked to the usage of the charging infrastructure. Repayment only starts once the charge points reach a certain pre-determined utilization level. The ULF structure allows the CIB to share the market/utilization risk with charging companies, enabling these entities to make equity investments. It can also act as an anchor investor, enabling other private financial institutions to take more senior debt positions (i.e., lenders who are first in line to get repaid). The structure also ensures reliability of service as CIB requires 97%

charger uptime. Failure to meet this standard results in penalties, further reducing market risks for private investors and ensuring value for money from public investment.

Bridging market gaps: Blended-finance instruments and structures can be used to identify and support key performance drivers to scale investments in climate solutions. Bridging market gaps ensures that projects and entities have demand certainty. It also makes sure that they have enough scale or risk-mitigation measures to address technology and supply chain-related risks, making climate solutions bankable for commercial investors.[50]

As an example of market making, carbon capture and storage (CCS) projects face market and revenue risks that can be mitigated by a blended finance approach. One of the ways that CCS projects or entities derive revenue is by selling carbon credits to large emitters under the industrial carbon pricing system.[51] However, to be commercially viable, CCS projects and entities need a stable and predictable rise and stringency in the carbon price over the lifespan of the project. If these prices fluctuate, the projects are likely to face significant pricing and operating risks, thereby deterring private investments. The CGF tries to mitigate this gap by providing direct market support. For example, CGF and the Alberta-based CCS company, Entropy, entered a carbon-credit purchase agreement with other financing commitments. The CGF will purchase a fixed quantity of carbon credits annually at a predetermined price.[52] This arrangement provides price certainty significantly above current market pricing, mitigating revenue uncertainty and enhancing investment attractiveness.

Supporting capacity development: Blended-finance structures typically include funding to build capacity among project developers/entities. Capacity building can take the form of supporting technical work (e.g., feasibility study), training, research and development and other related activities to build a system of continuous learning and problem solving.[53]

For example, large, innovative projects usually need front-end engineering and design (FEED) to support capacity development. The FEED process helps examine technical specifications and evaluate the likelihood of project success from a techno-economic perspective. Conducting FEED studies can lead to large, upfront project costs, create uncertainties and reduce viability for private investors.
In response to the gap, the CIB has a project acceleration/technical assistance funding to support FEED-related expenditures across a range of energy-transition projects, including CCS, hydrogen and clean fuels.[54] The CIB adopts a convertible debt structure to support FEED capital, where a convertible note is modified to long-term debt or equity positions upon a successful final investment decision. This flexible arrangement removes the capital loss uncertainties associated with FEED studies, helping de-risk project development and enabling continued private investment into the entity/project as it develops.

While the examples above illustrate the role that blended-finance structures and instruments can play in addressing investment challenges, there are challenges associated with implementation. The next section (section 5) looks at these challenges.

5 Challenges associated with implementing blended finance

Blended finance is not a panacea.[55] On its own, it cannot overcome long-standing macroeconomic or sector-specific barriers that limit commercial investment. At the project level, blended-finance approaches may face several challenges that limit their potential effectiveness. Some of the broader factors include: [56]

- Different actions by stakeholders with varying objectives may result in coordination failure, making it difficult for innovative projects and entities to access funding (e.g., grants from different ministries or public-sector entities competing for the same outcomes);
- Value-for-money of investing public capital in blended finance structures may not be easily quantified ex-ante with certainty, creating challenges in measuring overall outcomes and effectiveness;
- Complex governance structures may deter local stakeholders from participating and hinder the consideration of local context and dynamics;
- The technical skills needed to undertake blended finance structuring (i.e., different processes to structure revenue or cash flows from projects/entities) may not be easily available, which can hinder progress; and
- Blended-finance structures may not be effectively monitored and evaluated, thus breaking important information feedback loops. This can slow the achievement of climate policy and financing objectives.

A related barrier is the knowledge gap around blended finance. Blended-finance structures are complex and bespoke with long design timelines. These structures are difficult to replicate across different sectors due to a lack of granular information (e.g., transparency around project preparation, targeting of metrics) in the project development and financing processes.[57] These asymmetries can be reduced through an iterative process by undertaking more projects, understanding emerging challenges, building expertise and in time developing replicable structures that can mitigate the risks and enhance returns.[58]

It is important to consider these broader structural, project-level complexities and knowledge gaps so that blended finance can be employed as a tool in a larger strategy to achieve investment outcomes. This allows stakeholders to balance market failures and investor specific challenges with effective implementation and find the right level of concessional financing and market support needed to unlock private investment. It also helps develop an exit strategy for concessional financing. As the market reaches maturity, public and philanthropic capital providers can channel funds into areas of clean innovation where concessional support is needed. Careful design and governance of blended-finance structures are critical to ensure that these policy and financing outcomes are achieved effectively and efficiently.[59]

The next section (section 6) outlines concluding thoughts and future research needed to support the development of a robust blended finance ecosystem that advances climate capital allocation in Canada.

6 Conclusion and future research direction

As Canada confronts the twin imperatives of decarbonization and economic competitiveness, blended finance offers a practical, flexible and increasingly necessary tool for scaling the private capital needed to bridge the climate investment gap. By strategically deploying catalytic capital and policy tools to reduce risk, enable innovation and crowd-in private investment, blended finance could accelerate the development of climate-resilient infrastructure, technologies and business models. It could help private investors earn their returns while the public sector and philanthropic organizations achieve their positive environmental and socioeconomic impact goals.

However, to realize its full potential, Canada needs to build a robust blended-finance ecosystem. This requires understanding how blended finance and related public financial institutions fit in the existing climate policy frameworks, governance and accountability mechanisms. It means understanding what roles blended-finance tools, structures and public financial institutions can play in addressing market failures and structural investment challenges. It will also involve evaluating progress to date in Canada and learning from international examples—particularly regarding strategic mandates, internal governance frameworks, stakeholder coordination models and financial structuring approaches used by leading public financial institutions.[60] Effective transfer of knowledge from Global Affairs Canada and global networks such as Convergence on financing sustainable development can be beneficial to develop the blended-finance ecosystem for financing climate-aligned projects and clean innovation.

Based on this context, future research questions of note include the following:

- What roles do blended-finance structures and public financial institutions play to address market failures and investment-related challenges?
- What have been the early lessons from Canada's public financial institutions (e.g., CIB, CGF) in terms of structuring, governance and capital mobilization outcomes?
- What actionable insights can innovative institutions from peer countries (e.g., CEFC in Australia, NWF in the UK) offer to improve Canada's approach?
- What measures can different actors (e.g., federal agencies, Crown corporations, philanthropic organizations, mission-driven intermediaries) take to close policy and climate-related information gaps to scale up blended finance?
- How can blended finance be used effectively to attract other sources of capital, for example, economic participation from Indigenous groups?
- How can Canada effectively transfer knowledge from its various blended-finance initiatives related to sustainable development into financing climate-aligned projects?

Canada is well-positioned to lead in this space by learning from international experience. By focusing on these future research areas, blended-finance practices can be refined to better align capital with national climate and economic priorities, build investor confidence and deliver transformative outcomes that support a climate-resilient, prosperous Canadian economy.

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