Inclusive and sustainable British Columbia

A mission-oriented approach to a renewed economy

By Mariana Mazzucato

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UCL IIPP
Institute for Innovation and Public Purpose

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About the Institute for Innovation and Public Purpose

The UCL Institute for Innovation and Public Purpose (IIPP) aims to develop a new framework for creating, nurturing and evaluating public value in order to achieve economic growth that is more innovation-led, inclusive and sustainable.

We intend this framework to inform the debate about the direction of economic growth and the use of mission-oriented policies to confront social and technological problems. Our work will feed into innovation and industrial policy, financial reform, institutional change and sustainable development.

A key pillar of IIPP's research is its understanding of markets as outcomes of the interactions between different actors. In this context, public policy should not be seen as simply fixing market failures, but also as actively shaping and co-creating markets. Re-focusing and designing public organisations around mission-led, public purpose aims will help tackle the grand challenges facing the 21st century.

IIPP is housed in The Bartlett, a leading global Faculty of the Built Environment at University College London (UCL), with its radical thinking about space, design and sustainability.

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Foreword by Professor Mariana Mazzucato

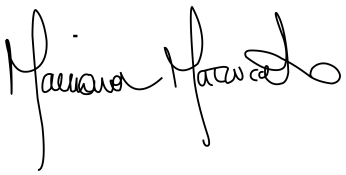
British Columbia (B.C.) is in a crucial time of transition. The COVID-19 pandemic has exposed vulnerabilities in B.C.'s economy, and exacerbated already widening economic and social inequalities. Meanwhile, the heatwaves, fires and floods experienced in 2021, and the immense suffering and disruption they have caused, underscore the need to tackle the climate emergency without delay. These crises are compounded by a series of longstanding economic challenges, including lagging productivity.

Importantly, however, building a stronger and more productive economy while tackling social inequalities and the climate emergency are not mutually exclusive — instead, they must go hand in hand. It is a question of talking not only about the rate of growth, but crucially also about its direction. A directed growth path for B.C. is what this report is about. And B.C. has taken the important first step of embracing a mission-oriented approach to its new economic plan, framed around meeting two broad challenges: inequality and climate change. Missions are not simply 'old wine in new bottles': they require a reorientation from sector- or technology-focused economic policy to an inter-sectoral- and inter-actor-driven economic policy with the design of instruments to catalyse investments towards solving problems that matter to people. This is not top down, but policy with a strong direction, catalysing bottom-up solutions. It requires structuring partnerships, investments, contracts — from procurement to grants and loans — to maximise public benefit. Above all, it requires the understanding that economic, social and environmental policy do not occupy distinct spheres. An inclusive and sustainable economy is only achievable if economic policy is deliberately designed with these goals front and centre. Structured and governed effectively, a mission-oriented approach fuels innovation across multiple sectors, crowding in investment and catalysing economic activity in areas where it has the potential to both tackle public policy challenges, and capitalise on domestic and global market opportunities. In doing so, it can help to tackle major social and environmental challenges, while also achieving higher productivity, investment and equitable growth.

Whether or not missions are successful is intimately tied to the way that government uses the tools at its disposal. Achieving the goals in B.C.'s economic plan will require utilising the full power of government policy to create an investment and innovation ecosystem that drives growth and productivity while solving key problems in society in a people-centred way. This will also require changes to the way that government operates, engages with citizens and stakeholders, and allocates its resources. Most importantly, it will require a drive and determination to succeed, a willingness to take risks and experiment, and a joined-up, coordinated approach across different government departments. That is why I am delighted to submit our independent report, Inclusive and sustainable British Columbia: A mission-oriented approach to a renewed economy, to the government of British Columbia.

The report was written over a year, through an intense collaboration between the B.C. Government and my team at the UCL Institute for Innovation and Public Purpose. In the report we highlight how three areas — public procurement, Treasury assessment methods and public finance — can be most effectively used to support the delivery of B.C.'s mission-led economic plan. We also consider issues that will be key to the implementation and governance of B.C.'s economic plan, such as citizen engagement, breaking down government silos and strengthening public sector capabilities. We draw on extensive research, as well as our experience working with governments and organisations around the world, developing and implementing mission-oriented strategies. The aim of this report is not to set out a definitive pathway for B.C. to follow, but to provide guideposts to help the B.C. Government move forward with implementing a mission-oriented economic plan.

Successfully implementing mission-oriented policy is not easy. But the goal of building a fairer, more sustainable and more resilient economy is now firmly within B.C.'s grasp.



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Executive summary and recommendations

British Columbia (B.C.) is facing a set of enormous challenges: the need to recover from a health pandemic and an active climate crisis, while also achieving higher productivity, investment and equitable growth. This report argues that these goals are not trade-offs. B.C. can achieve economic targets while also tackling social inequalities and creating a sustainable economy — but this requires a massive redirection of the economy and a new approach to economic policy.

B.C. has taken the important first step of setting out an ambitious mission-oriented economic plan for transitioning to a more sustainable, inclusive and innovative economy. By embracing a problem-oriented, cross-sectoral economic strategy, the province has an opportunity to fuel innovation, raise productivity and transform production, distribution and consumption across the entire economy. However, achieving this requires a bold new approach to economic policymaking that rethinks the role of the state in shaping economic, social and environmental outcomes. It will also require a drive and determination to succeed, a willingness to take risks and experiment, and a joined-up, coordinated approach across different government departments.

Setting out a plan is just the first step: whether or not it succeeds will depend on how missions are designed, implemented and evaluated. In this paper we explore how each of three of the most important policy tools — public procurement, Treasury assessment methods and public finance — can be most effectively used to support the delivery of B.C.'s mission-led economic plan, and consider how potential implementation barriers can be overcome. Used strategically, these tools can help B.C. achieve higher productivity, investment and growth and tackle the major social and environmental challenges it faces.

Recommendations

In relation to public procurement, we recommend that:

- B.C. should introduce additional environmental responsibility and social impact criteria that align with the key performance metrics associated with each mission area under the clean and sustainable growth challenges. These criteria should be clear and well defined, with robust guidelines on how to appraise different options. Undertaking these appraisals should be made mandatory for all procurement decisions across government.
- B.C. should gradually move towards embracing a functional rather than a product approach to procurement. Instead of outlining the precise products the Government intends to purchase, the Government should instead describe the function, objective or, even better, mission that it wants to achieve.
- In relation to Procurement Concierge, the Government should play a more proactive role as 'challenge setter', setting out what the key problems are (aligned to the missions in the economic plan) and then inviting business to submit ideas to stimulate bottom-up innovation. By providing a clear direction on the problems B.C. is seeking solutions for, and proactively engaging with innovative businesses, a revised Procurement Concierge initiative could create a strong 'pick the willing' rather than 'pick the winner' dynamic.
- B.C. should seek to forge a new social contract between government and business that better aligns risks and rewards, creates more symbiotic and mutualistic partnerships, and delivers sustainable and inclusive outcomes by design. This should involve attaching conditions to procurement contracts to incentivise desirable corporate behaviour, including in areas such as investment in R&D, employment practice and the price or design of products that emanate from procurement contracts.

In relation to Treasury assessment methods, we recommend that:

- Mission-oriented policies should not be merely assessed using static, allocative efficiency measures, such as cost-benefit analysis. In practice, these tools often prevent bold and ambitious public policies being developed. Instead, a mission-oriented approach requires a different kind of analytical framework for policy appraisal and evaluation that is able to capture the dynamic aspects of market-shaping policies, such as spillover effects, uncertainty, innovation and structural changes to the economy.
- Going forward, B.C. should seek to develop a new suite of Treasury assessment methods focused on systemic change to achieve missions which aim to capture the creation of public value, dynamic efficiency and 'additionality', learning from best practice around the world. This approach helps capture the potential for policy to create spillover effects across many sectors of the economy, and alter the level of investment and broader trajectory of economic growth.

In relation to new financial institution InBC, we recommend that:

- InBC's mandate and investment strategy should be aligned with the challenges and mission areas in B.C.'s new economic plan. This would provide enhanced directionality to what InBC does and why it does it, and act as a powerful catalyst for accelerating the delivery of clean and inclusive growth.
- InBC should take a strategic approach to risk and reward, including ensuring it is able to capture rewards associated with the successes that have occurred as a result of InBC investments. InBC should also seek to partner with other public organisations to provide finance to under-served communities that may not fit the risk/reward profiles of conventional impact investors and financial institutions, including small- and medium-sized enterprises (SMEs), cooperatives, Indigenous-led businesses and women-led businesses.
- While InBC has been launched with a governing board that reflects a wealth of knowledge and expertise, there are opportunities to enhance its governance model to make it more democratic and representative. This could involve reviewing the size and composition of the board, learning from international best practice. The role of the advisory forum could also be strengthened to provide a platform for meaningful stakeholder engagement over how InBC's missions are best achieved.

- InBC should establish new monitoring and evaluation frameworks that go beyond the narrow market failure framework, and which should include an array of indicators aimed at assessing the extent to which it has been successful at creating public value and 'additionality' in line with its strategic missions.
- InBC should seek to overcome historic barriers surrounding access to capital for Indigenous communities, for example by developing specialised processes and programmes designed to address the unique circumstances faced by Indigenous communities.

In relation to implementation, we recommend that:

- Instead of viewing citizen engagement as a one-off event that only takes place when missions are being designed, ongoing engagement is vital to maintain legitimacy and public trust throughout the process of implementing and assessing missions. Interacting with bottom-up citizen initiatives, working with citizen scientists and social innovators, and utilising digital technologies can all help to ensure that multiple voices are heard, avoid capture by any one group and build 'collective intelligence'. Bringing diverse and underrepresented voices, including Indigenous communities, into the process of implementing and evaluating missions will be crucially important.
- In order to ensure that B.C.'s mission-oriented economic plan is operationalised across all government departments, new governance structures may be needed to assume responsibility for driving the missions agenda across government. Any new governance model must be able to catalyse cross-sectoral and cross-institutional coordination, drawing on the expertise of all government departments and agencies.
- Going forward, steps should be taken to build capacities and capabilities for adaptive governance. This means investing to attract top talent, encouraging a risk-taking culture and creating an environment that is conducive to continuous, radical experimentation. Civil servants may also need new skills to successfully manage this transition, which can be enhanced by promoting staff exchanges between the different policy departments, agencies and implementing bodies involved in missions.

1 Introduction: a new approach to economic policy

British Columbia (B.C.) is facing an enormous challenge: the need to recover from a health pandemic and an active climate crisis, while also achieving higher productivity, investment and equitable growth. This report argues that these goals are not trade-offs. B.C. can build a stronger and more productive economy while also battling social inequalities and creating a sustainable economy — but this requires a massive redirection of the economy and a new approach to economic policy.

Economic growth has not just a rate but a direction. To make sure that direction produces an economy that is good for all people — a more inclusive and sustainable economy — we cannot sit back. We must use the full power of government policy, from the use of procurement to grants and loans, to create an investment- and innovation-driven platform where public, private and non-profit organisations collaborate in new ways, stimulating a process of collective intelligence that drives growth while solving key problems in society, from climate change to the digital divide. This report is about just that: how to steer economic growth and raise productivity, using all the tools at our disposal, in a people-centred way.

The 21st century is becoming increasingly defined by the need to respond to major social, environmental, public health and economic challenges. Sometimes referred to as 'grand challenges', these include environmental threats like climate change and demographic challenges such as ageing societies, as well as the difficulties of recovering from the COVID-19 pandemic. Overcoming these challenges will require a new joined-up approach to building an economy that delivers sustainable and inclusive outcomes by design; that prioritises problem-solving over siloed thinking. Critically, it requires a market-shaping approach to policy, not a market-fixing one.

At the international level, the UN's 17 Sustainable Development Goals (SDGs) act as globally agreed grand challenges that have already been chosen through broad and comprehensive consultation (United Nations 2015). But across the world governments at the national, provincial and city level are also beginning to orient economic strategies towards tackling challenges that are specific to local circumstances and needs.

B.C. is the third largest Canadian province by population and fourth largest provincial economy. Although B.C. has many economic strengths, many challenges remain. The COVID-19 pandemic has exposed a range of deep vulnerabilities in the B.C. economy, including challenges related to economic inequality, supply chain resilience and food security. At the same time, the recent climate-related extreme weather events underscore the urgency of acting on the climate emergency.

These social and environmental crises are compounded by a series of longstanding economic challenges. Productivity in B.C. remains lower than across Canada as a whole, which in turn is lower than in other G7 countries, such as the UK, Germany, France and the US (OECD 2022). Within Canada, the provinces of Saskatchewan, Alberta, and Newfoundland and Labrador all have significantly higher levels of productivity than B.C. (Statistics Canada 2021). This in turn has impacted living standards. In 1950 B.C. had the second highest standard of living among Canadian provinces (as measured by GDP per capita). Over the following six decades B.C. experienced the second lowest per capita growth rate of any province, meaning that relative living standards declined to fifth place (Statistics Canada 2019).

As we explore in this paper, one potential reason for B.C.'s productivity challenges relates to investment patterns: while overall levels of investment are relatively high compared to other advanced economies, investment is disproportionately directed towards real estate, whereas investment in other areas crucial to productivity growth, competitiveness and innovation is relatively low. Delivering greater prosperity for all therefore requires a commitment to redirecting investment in order to drive innovation and increase productivity across many different sectors. Crucially, however, achieving these economic goals need not come at the expense of overcoming social and environmental challenges. Building a stronger and more productive economy while battling social inequalities and tackling the climate emergency are not mutually exclusive — instead they must go hand in hand.

In response to these challenges, the B.C. Government has set out an ambitious economic plan for transitioning to a more sustainable, inclusive and innovative economy (Government of British Columbia 2022). The plan, *StrongerBC*, is framed around meeting two key challenges: delivering economic growth that is both inclusive, addressing inequality so everyone can have a better life, and clean, ensuring that business can thrive in a sustainable economy. In doing so, B.C. intends to cultivate new industrial opportunities and redesign foundational industries for success in future global markets.

Figure 1: B.C.'s new economic plan

Source: Government of British Columbia (2022)

To develop the plan, the government has sought inputs from B.C. business groups, labour organisations, Indigenous communities, not-for-profit organisations, local governments and the general public. This wide engagement is vitally important, but equally as critical is new economic thinking. Tackling these challenges cannot be achieved with the same economic thinking and tools that have been used in the past. In common with governments across the world, policy in B.C. has historically been developed in a siloed approach that considers challenges like climate change and social inclusion separately from economic policy, with growth and innovation policies focused on sectoral strategies. While this has delivered some successes, notably in areas such as CleanTech and life sciences, a siloed approach to policymaking continues to stifle cross-sectoral innovation and limit progress towards tackling grand challenges. In the absence of a framework for steering growth and innovation in a sustainable and inclusive direction, there has been an over-reliance on inherently limited ex-post fixes to address harmful social and environmental consequences when they materialise.

Going forward, the government's ambition to deliver economic growth that is both inclusive and clean creates an opportunity to overcome B.C.'s challenges while raising productivity and delivering greater prosperity for all. By embracing a problem-oriented, cross-sectoral economic plan, the province has an opportunity to fuel innovation and transform production, distribution and consumption across the entire economy. However, achieving this requires a bold new approach to economic policymaking that rethinks the role of the state in shaping economic, social and environmental outcomes, and places grand challenges at the heart of a new strategy for directed growth. Doing so will require breaking out of traditional siloes and embracing a new joined-up approach to building an economy that works for everyone. This will not be easy and there will be many pitfalls along the way, but developing a strategy for directed growth will be vital if B.C. is to flourish in the 21st century.

In light of this, the B.C. Government has commenced a partnership with UCL Institute for Innovation and Public Purpose (IIPP) to help structure the transition required to effectively pursue a new economic model, and learn from the efforts of other governments and organisations in terms of how they have successfully organised and coordinated similar efforts to realign their economies and investment approaches.

IIPP is a world-leading academic institute that combines path-breaking research with practice-based theorising to change how public value is imagined, practised and evaluated, and achieve sustainable, inclusive and innovation-led growth. IIPP has provided thought-leadership to governments around the world to help policymakers discover better solutions to complex problems by embracing a mission-oriented approach to policy.

1.1 From market fixing to market shaping: a new economic framework

To direct growth, we must change the language and storytelling of what government is for. This is not about micromanaging, but about setting a bold direction that catalyses cross-sector investment.

Yet the dominant economic paradigm of the past five decades has justified government 'intervention' only in very limited circumstances — to fix market failures while avoiding government failures. Under this framework, goods and services are most efficiently produced by private firms operating in a competitive market, and the state should only 'intervene' in markets to correct certain identifiable market failures and only in cases where the 'intervention' does not cause a government failure.

The idea that the state is at best a fixer of markets has its roots in neoclassical economic theory, which states that competitive markets will bring about optimal outcomes if left to their own devices. This theory justifies government intervention in the economy only if there are explicit market failures, which might arise from the presence of positive externalities (e.g. public goods like basic research, which requires public sector spending on science), negative externalities (e.g. pollution, which requires public sector taxation) and incomplete information (e.g. between banks and SMEs, where the public sector may provide loan guarantees). Under this framework, complex environmental and social factors, such as climate change, are viewed as 'external' to the economy. Policy is focused on maximising the overall rate of economic growth while making marginal fixes to address these market failures, rather than developing a directed growth strategy that delivers inclusive and sustainable outcomes by design.

In policy practice, the market failure approach prescribes specific solutions when it comes to designing macroeconomic, innovation and industrial policy. At the macroeconomic level, the market failure approach argues for limiting the role of the state to mitigating the impact of the natural business cycle generated by free market economies, so fiscal and monetary policy should be limited to countercyclical interventions via adjustments to public spending, taxation and interest rates. As a result, fiscal policy is constrained by the 'discipline' of budget deficit targets, and central banks are limited by tight mandates oriented towards price stability above and beyond other goals. The composition of public spending and investment, and the crucial role this plays in driving innovation and growth, is too often overlooked.

When it comes to innovation and industrial policy, although policy intervention in some areas, such as early-stage R&D, can be justified under the market failure framework, in the main it is assumed that the private sector is the more efficient innovator, possessing greater entrepreneurial capacity and better able to take risks. In contrast, the state is viewed as risk-averse and in danger of creating 'government failure' if it becomes too involved in industrial policy by 'picking winners'. Instead, its role is to 'level the playing field' for commercial actors, for example through supply-side inputs such as better skills and education or the removal of market frictions, and then get out of the way (Kattel et al 2018).

However, the recent history of capitalism depicts a different story — one in which different types of public actors have been responsible for actively shaping and creating markets, not just fixing them; and for creating new wealth, not just redistributing it. From advances such as the internet and microchips to biotechnology and nanotechnology, many major technological breakthroughs — in both basic research and downstream commercialisation — were only made possible by direct, problem-oriented state investment (Mazzucato 2013). In each of these areas the private sector only entered much later, piggybacking on the technological advances made possible by public funds. Here the story is not one of the state getting out of the way, but of an 'entrepreneurial state' that is a lead investor and risk-taker in the economy, co-creating and shaping new markets, not simply 'fixing' them.

Seen through this lens, markets are not self-regulating forces, but rather outcomes of the symbiotic interactions between public, private and third sector actors. As a result, markets can be co-created and co-shaped to serve different ends while delivering greater prosperity for all.

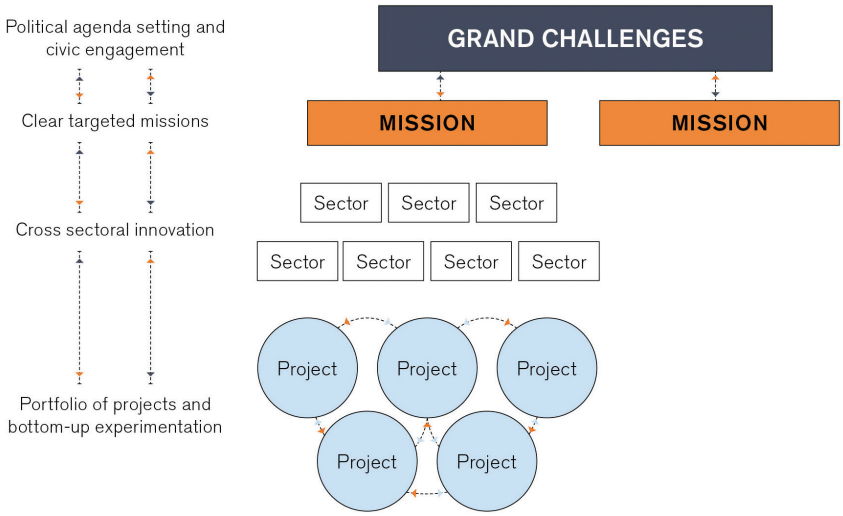
1.2 A mission-oriented approach to industrial strategy

Industrial strategy has been key to countries developing a competitive edge in particular sectors, but it has sometimes led to problems 'picking winners', with some sectors receiving support simply due to the flow of handouts and subsidies to sectors with a louder voice. Missions change that. They require sectoral support, not due to the problems being faced by sectors, but due to the ambitions being set around key challenges, with all sectors being part of the solution, and sectoral transformation and investment being critical to achieving the missions.

Grand challenges are coming to define policymaking in the 21st century. They are a broad area which a government may identify as a priority (whether through political leadership or the outcome of a movement in civil society). For example, how do economies deal with problems with no simple solution, that require transformation and innovation to solve, like an ageing society or climate change? Such challenges should, of course, begin with the 17 Sustainable Development Goals, that all countries, including Canada, have signed up to (UN 2015). Turning the challenge of climate change (SDG 13), for example, into a concrete goal like a carbon-neutral city, will require investments in areas as different as construction materials, transportation, digital services, nutrition and so on. And to foster those investments, tools like procurement can be used to stimulate bottom-up investment towards that goal.

Mission-oriented thinking requires understanding the differences between broad challenges, missions, sectors and specific solutions. Figure 2 shows how this works and in Section 3 we apply this thinking to concrete missions in B.C.

Figure 2. Grand challenges and missions



Source: Mazzucato (2018b)

The US moon landing mission, for example, had a clear goal and needed many bottom-up solutions to respond to hundreds of big and small problems. It is this dynamic directed process that led to the many spillovers resulting from this mission. Similarly, in today's societal challenges around achieving more inclusive and sustainable growth, missions can be targeted while stimulating bottom-up solutions. This can be done through the use of outcomes-based budgeting, innovation-based procurement, and conditionalities attached to procurement contracts, grants and loans. For example, in Germany, the Energiewende ('energy transition') mission has created conditionalities attached to financial support: the steel sector received support conditional on it committing to reducing its carbon content (Mazzucato et al 2020). It did so through repurpose-reuse-recycle technology across its whole value chain. This is an important lens on industrial strategy. Rather than picking sectors, a mission-oriented approach picks problems that all sectors can contribute to — but only if they transform. This process of transformation requires the willingness to experiment and adopt a portfolio approach. Crucially, the projects supporting missions should be designed to deliver 'additionality', catalysing activity that otherwise would not have happened.

Mission-oriented policy is not about 'top-down' planning, it is about providing a direction for growth, increasing business expectations about future growth areas and stimulating bottom-up solutions that address the major challenges of the 21st century. Whereas the market failure approach to policy is about 'de-risking' and 'levelling the playing field', mission-oriented policy is about encouraging risk-taking, sharing risks and rewards, and tilting the playing field in the direction of desired goals. It is not about the government 'picking winners', but about 'picking the willing' — those organisations across the economy (in different sectors, including both the public and private sphere) that are willing to engage with societally relevant missions. Using missions to drive industrial strategy means focusing less on individual sectors and more on problems that matter to people. Structured and governed effectively, a mission-oriented approach to policy should fuel innovation and productivity growth across different sectors, crowding in investment across different actors and catalysing activity that otherwise would not have happened.

Missions are not new: they have been used to inspire and direct action throughout history. A generation of missions in the 1960s were technological, such as NASA's Apollo mission to put a man on the moon by the end of the decade. The moonshot required innovation in many sectors, including nutrition, textiles and aeronautics, and hundreds of projects, many of which failed. Much of the technology in our smartphones and laptops today were outcomes of those projects, both successful and unsuccessful (Mazzucato 2021).

But today's missions are not just technological, they are deeply social in nature. They are 'wicked' in the sense that they need technological change, social change, behavioural change and, of course, regulatory change. Wicked challenges are complex, systemic, interconnected and urgent, requiring insights from many perspectives. In *The Moon and the Ghetto* (1977), Richard Nelson asks how we got a man to the moon, but have not been able to solve key issues around inequality? Missions are also context-dependent: there is no 'one size fits all' definition of what a mission should be and how it should be structured. To be successful, missions need to engage with the challenges and complexities faced in any given location.

Crucially, missions must be widely perceived to be legitimate and of high societal importance. This will ensure their durability and survival across political cycles. In order to achieve this, meaningful public participation in the selection process of missions is essential, even if missions are ultimately selected at the political level. Without civic engagement, the risk of alienation from the broader public and a purely technocratic approach is too high. A mission will not inspire people unless they feel they are part of it. And missions will, of course, be more innovative and more interesting the more they are a result of diverse voices at the table.

1.3 Challenges and opportunities in British Columbia

Today B.C. has many economic strengths, including a highly skilled workforce, abundant natural and renewable resources, and a world leading technology sector, but like many places around the world, the province is confronting a wide range of 'wicked' problems. These include high levels of economic inequality, especially impacting women, black, Indigenous and other people of colour (BIPOC) communities, and young people; adapting to an ageing population; ensuring supply chain resilience and food security; and tackling the climate emergency. The COVID-19 pandemic has acted to reinforce these challenges by exacerbating economic and social inequalities. Meanwhile, the heatwaves, fires and floods experienced in 2021, and the immense suffering and disruption they have caused, underscore the need to tackle the climate emergency without delay. This has been reinforced by the latest IPCC report, released in February 2022, which concluded that, 'Human-induced climate change is causing dangerous and widespread disruption in nature and affecting the lives of billions of people around the world, despite efforts to reduce the risks' (IPCC 2022).

Compared with purely technological challenges, these wicked social problems require more attention to the ways in which social issues interact with political and technological issues, behavioural changes and feedback loops. They also require much stronger civic engagement to provide democratic legitimacy, particularly among marginalised groups.

The B.C. Government's economic plan sets out six specific mission areas aimed at meeting two grand challenges — inclusive growth and clean growth — that aim to reorient future growth to achieve a high-care, low-carbon economy that works for everyone. The plan is grounded in the reality that B.C. is at its best when the benefits of a strong economy and resilient communities are shared by all.

The economic plan's six mission areas provide a strong starting point for connecting challenges to concrete goals. An important next step for B.C. will be to turn the new mission areas into concrete missions with well-defined targets that are measurable and time-bound to ensure that progress can be monitored effectively. Crucially, missions must be designed so that it is possible to say definitively whether the goal has been achieved or not. Technological missions such as putting a man on the moon had obvious end points which made evaluation easier. However, modern grand challenges are more long term with less easy to define end points. Under such conditions, establishing intermediate milestones is critical, as they provide the means to keep track of progress towards the mission objective, and allow for informed and flexible decisions to intervene.

B.C.'s economic plan is supported by CleanBC, which is intended to be the most far-reaching climate plan in North America (Government of British Columbia 2021b). Successfully achieving CleanBC is one of B.C.'s mission areas. First launched in 2018 and then revised in late 2021, CleanBC includes a wide range of actions to reduce emissions, build a cleaner economy and prepare for the impacts of climate change. The plan is helping improve how British Columbians get around, heat their homes and power their industries, setting the province on the path to a cleaner, stronger future.

By embracing a market-shaping, mission-oriented approach to its economic plan, B.C. now has the opportunity to replace an outmoded economic model that aims to patch up problems after they arise with a new model of directed growth that delivers inclusive and sustainable outcomes by design. The setting of well-defined, problem-oriented, cross-sectoral missions provides an opportunity to fuel innovation and transform production, distribution and consumption across the entire economy. In doing so, the plan can help British Columbians overcome the grand challenges of the 21st century, while delivering greater prosperity for all. However, setting missions is just the first step. Whether or not the plan succeeds will depend on how missions are designed, implemented and evaluated.

A new policy toolkit

The effectiveness of mission-oriented policy is intimately tied to specific tools that are crucial for implementing and achieving the desired outcomes. These tools cut across all areas of public policy, and require a joined-up, coordinated approach across different government departments. Used effectively, these tools can help B.C. achieve higher productivity, investment and growth and tackle the major social and environmental challenges it faces. While there are many policy tools that will need to be utilised in B.C., in this paper we focus on three of the most important tools for implementing missions:

- **New design of policy (public procurement):** Public procurement represents a significant component of public spending for all governments, including in B.C. A dynamic use of government purchasing can therefore play an important role in directing demand and supply in the economy, and driving innovation. In order to support missions, public procurement must focus on targets and respond to criteria based on more than just the lowest bidder, based on cost. This might include the growth of domestic companies, the development of new technologies, environmental sustainability or health protection. Structured effectively, procurement policy can be a powerful tool for directing demand towards precise and pre-identified missions while crowding in private sector innovation and investment. Adding conditionalities to procurement contracts can also play an important role in creating a new social contract that builds a more symbiotic and mutualistic relationship between the public and private sectors.
- **New design of evaluation (Treasury assessment methods):** One of the key challenges in applying a mission-oriented framework in policymaking is how to relate it to budgetary processes. Influenced by the market-failure framework, modern appraisal and evaluation approaches are often based on a simplistic, static form of cost-benefit analysis (and net present value calculations) that weighs the pros and cons of a policy by using existing market prices. In practice, these tools often prevent bold and ambitious public policies being developed. Instead, a mission-oriented approach requires a different kind of analytical framework for policy appraisal and evaluation that is able to capture the dynamic aspects of market-shaping policies, such as spillover effects, innovation and structural changes to the economy.

- **New financial institution (InBC):** The structure of the financial system is key to the successful implementation of mission-oriented policy. This is because finance is not neutral; the type of finance available can affect both the investments made and the type of activity that occurs. The B.C. Government's new strategic investment fund, InBC Investment Corp (InBC), has the potential to be a powerful tool for fuelling missions by providing patient, long-term, strategic finance guided by public purpose. However, InBC's success will depend on how the fund is structured and governed, as well as its ability to learn from the successes and failures of other public financing entities around the world. The advantage of a mission-oriented public fund is that it provides patient, long-term finance to those organisations that are willing to work with the public sector to tackle public policy challenges. This is not about handouts, but about co-investment.

In this report we explore how each of the above tools can be most effectively used to support the delivery of BC's mission-led economic plan and consider how potential implementation barriers can be overcome. We draw on IIPP's own path-breaking research, as well as our experience working with governments and organisations around the world, developing and implementing mission-oriented strategies. The work also draws on numerous interviews, workshops and meetings that have taken place with B.C. government officials. The aim of this report is not to set out a definitive pathway for B.C. to follow, but to provide guideposts to help the B.C. Government move forward with implementing a mission-oriented economic plan.

The remaining part of the paper proceeds as follows:

Section 2 briefly outlines B.C.'s current challenges and strategies to tackle them, including the CleanBC initiative and its new economic plan.

Section 3 elaborates on the mission-oriented framework, and how missions can most effectively be structured and governed to tackle grand challenges.

Section 4 explores how three policy tools — public procurement, Treasury assessment and InBC — can be repurposed to support the delivery of B.C.'s mission-led economic plan.

Section 5 sets out recommendations, identifies potential implementation barriers to those recommendations and explores possible ways to address them, including citizen engagement, breaking down government silos and building public sector capabilities for adaptive governance.

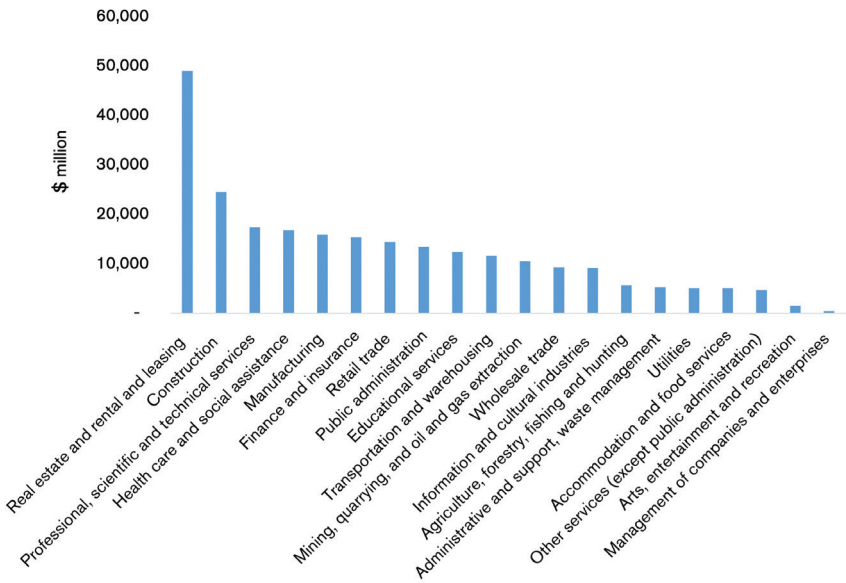
The final section presents the conclusion and recommendations.

2 British Columbia today — and tomorrow

British Columbia (B.C.) is a province of Canada with a population of just over 5 million people. This includes around 200,000 Indigenous First Nations, Inuit and Métis people. B.C. is the third largest Canadian province by population and fourth largest provincial economy.

Historically, the B.C. economy relied on export-oriented resource development, especially in forestry and mining. The last decades of the 20th century saw this dependence decline, even though the province is still blessed with abundant natural resources. Today, real estate, construction and professional services are the largest sectors of the economy as measured by GDP (see Figure 3). Compared to other provinces, B.C. has more small businesses per capita, which employ a larger share of the workforce. Self-employment is also more common than in any other province. The vast majority of businesses — 98% — are small businesses (Government of British Columbia 2021).

Figure 3. B.C. GDP at basic prices 2021, by industry



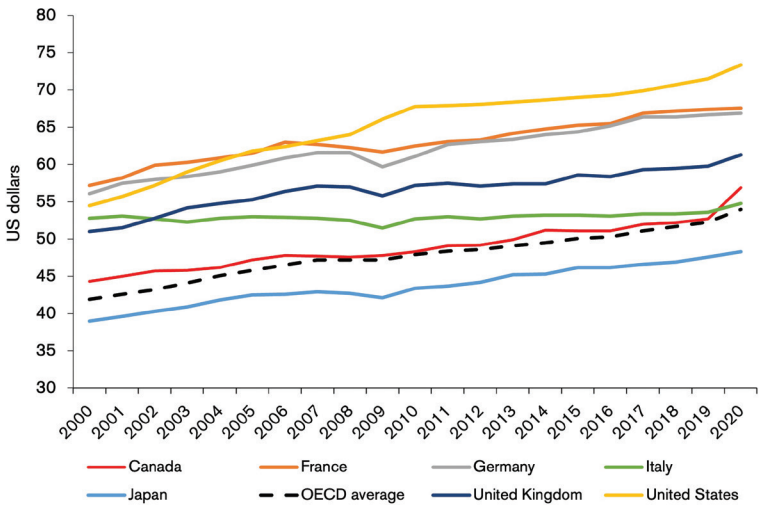
Note: Chained (2012) dollars
Source: Statistics Canada (2022)

B.C. has many economic strengths: it is an advanced, open economy that acts as a gateway to Asia and a major port to North America.
The province has an abundance of natural and renewable resources, and is rich in multicultural diversity. In 2020, the province saw 96.5% of its energy generated by renewable resources (Government of British Columbia 2020). B.C. is home to a diverse, highly educated and skilled workforce, and it has long had among the lowest rates of unemployment of any Canadian province. This includes a thriving technology sector, which employs more than 114,000 British Columbians (Government of British Columbia 2019). Despite these economic strengths, many challenges remain.

2.1 B.C.'s productivity challenge

GDP per hour worked is a measure of labour productivity. It measures how efficiently labour input is combined with other factors of production and used in the production process. Despite increasing in recent years, productivity in Canada remains lower than in other leading advanced economies, including France, Germany, the UK and the US (OECD 2022). Canadian workers remain 7% less productive than workers in the UK, 16% less than in France and 22% less than in the US. A recent study found that the period since 2000 has seen Canada's weakest productivity growth since records began in 1961, and that if Canada's productivity growth since 2000 had matched its own performance from 1961 to 2000 (and those productivity gains were passed through to wages), the average Canadian's pay would have been around $13,550 per annum higher in 2019 (Williams 2021).

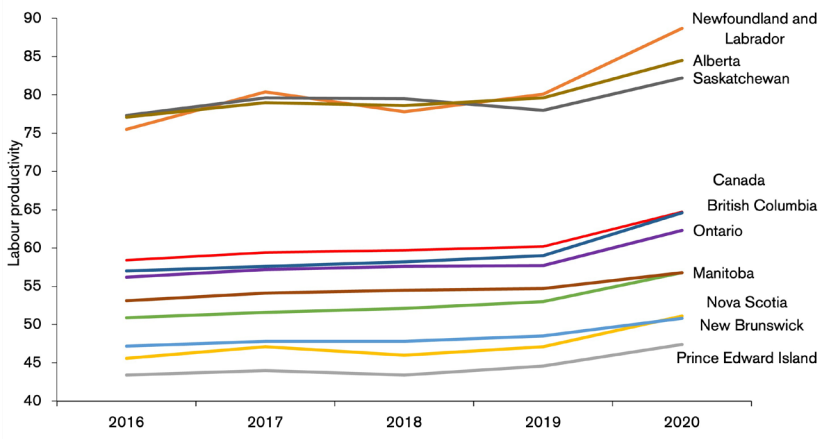
Figure 4. Labour productivity in advanced economies 2000–2020



Note: Total, US dollars 2000-2020, productivity is defined as GDP per hour worked
Source: OECD (2022)

These aggregate figures mask wide disparities across Canadian provinces. As shown in Figure 5, productivity in B.C. is lower than Canada as a whole, with three provinces — Saskatchewan, Alberta, and Newfoundland and Labrador — all have significantly higher levels of productivity (Statistics Canada 2021). However, unlike B.C. these provinces all have significant oil and gas activities and a lower population.

Figure 5. Labour productivity in B.C. and other Canadian provinces



Note: 2012 chained dollars per hour
Source: Statistics Canada (2022)

As a result, there remains a significant gap in productivity between B.C. and other leading advanced economies. While B.C. has a strong foundation of skills and entrepreneurialism to support innovation and drive productivity growth, evidence suggests that firms are often slow to develop and adopt new technologies and innovations (Inclusive Innovation Monitor 2021). Recent studies have found that since 2000 Canada's most productive businesses have lost ground to leading global firms on measures of productivity (Gu 2019).

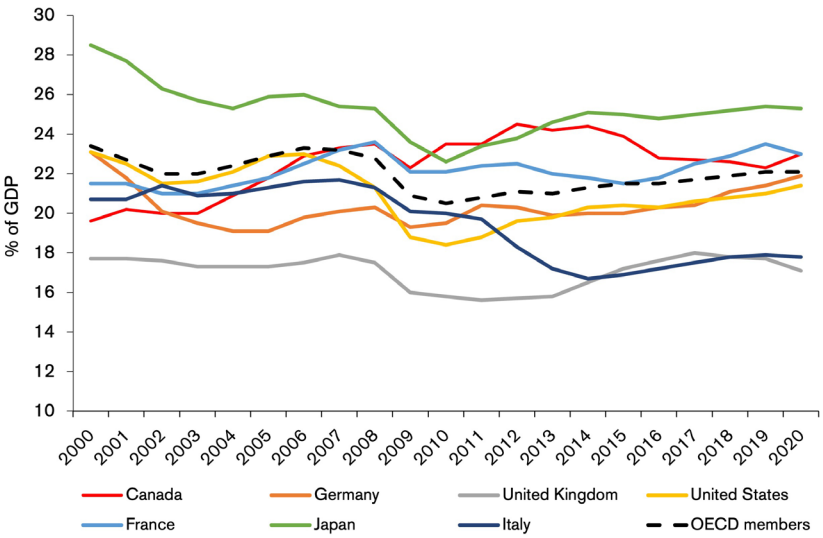
Given the importance of productivity growth for raising long-term living standards, achieving the economic plan's goal of delivering greater prosperity for all will require concerted efforts to raise the level of productivity in B.C. Crucially, however, raising productivity and overcoming social and environmental challenges are not trade-offs: both can be achieved at the same time. To deliver this, the B.C. economy will have to become more innovative — and this will require a willingness to invest by both public and private organisations.

2.2 Redirecting investment

Investment is crucial for the long-term health of any economy, for two main reasons. First, investment in physical and human capital increases the quantity and quality of a nation's means of production, driving productivity growth and living standards. Second, investment is critical to the process of creating new technologies and new ways of doing things (innovation), which is increasingly becoming key to long-run growth (Mazzucato and Wray 2015).

As shown in Figure 6, investment in Canada is currently above the OECD average, with only Japan having a higher level of investment as a proportion of GDP among G7 economies (World Bank 2022). In B.C., investment as a proportion of GDP is 27% — higher than across Canada as a whole and any other province (Statistics Canada 2022).

Figure 6. Investment as a % of GDP among advanced economies

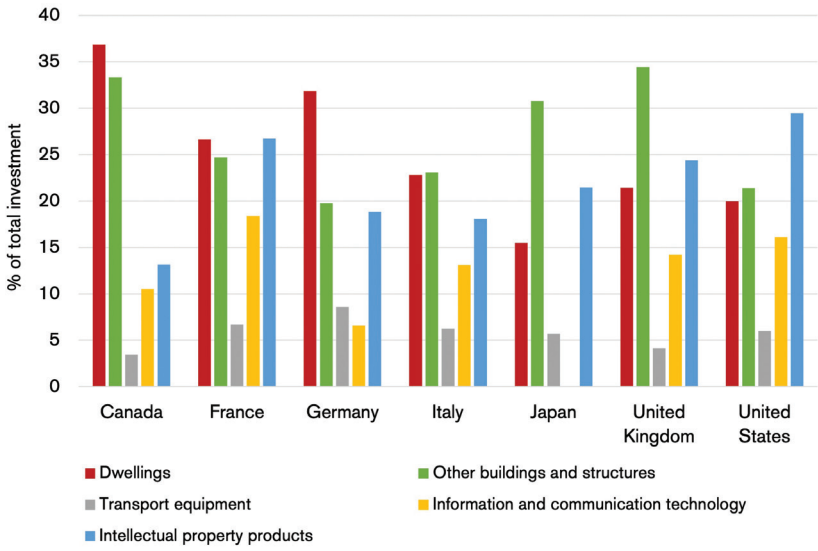


Note: Investment defined as gross fixed capital formation
Source: World Bank (2022)

However, it is not just the quantity of investment that matters — the composition and quality of investment is crucially important. As shown in Figure 7, today Canada's comparably high level of overall investment is largely accounted for by high investment in real estate. The proportion of investment allocated towards constructing new dwellings in Canada (shown in red in the chart) is 37% — the highest among G7 economies (OECD 2022). This is mirrored in B.C., where the same proportion (37%) of total investment was allocated towards new dwellings in 2020 (Statistics Canada 2022). Given the acute housing affordability crisis in many parts of B.C., investment in new housebuilding can play an important role in meeting B.C.'s goals of delivering clean and inclusive growth, particularly if it is focused on building energy-efficient and affordable homes, as the economic plan proposes to do through B.C.'s Housing Hub.

At the same time, however, the proportion of investment allocated towards transport (shown in grey) and intellectual property (shown in blue) in Canada is the lowest among G7 economies, while the proportion allocated to information and communication technology (shown in yellow) is the second lowest. As a result, while overall levels of investment in Canada are relatively high by international standards, investment in areas that are key to productivity growth, competitiveness and innovation is comparably low.

Figure 7. Investment by asset type (% of total investment 2020)



Note: Investment defined as gross fixed capital formation, data for ICT not available for Japan
Source: OECD (2022)

Business expenditures on research and development (BERD) is often considered an indicator of businesses' commitment to innovation, and therefore provides a useful, albeit indirect, gauge of innovation commitment and activity in an economy. According to the OECD, three activities are considered R&D: basic research, applied research and experimental development.

In 2019, BERD in Canada was 0.8% as a share of national GDP — well below the average level of BERD intensity in the OECD overall at 1.7% (Inclusive Innovation Monitor 2021). Canada also ranks last among G7 nations. BERD intensity in Canada has been trending downward since 2001, while in the OECD overall it has been rising. Canada's lower BERD intensity is explained in part by the industrial structure of the economy, with greater shares of the economy made up of historically less R&D-intensive sectors like resource extraction. At the same time, many of Canada's more R&D-intensive sectors tend to spend less on R&D (adjusted for size) than the same sectors in the G7 more broadly (Expert Panel on the State of Science and Technology and Industrial Research and Development in Canada 2018). At the provincial level, BERD intensity in B.C. as a share of provincial GDP is 1% — a figure that is higher than Canada as a whole, but lower than Quebec (1.37%), Ontario (1.17%) and all G7 countries aside from Italy.

The level of BERD in any economy is significantly influenced by the policy landscape. Public funding of innovation can either be 'direct' in the form of direct investment or indirect in the form of tax incentives to encourage private sector investment. In Canada, policy support for business R&D is heavily skewed towards indirect support mechanisms. In 2019, R&D tax incentives (including subnational tax support) accounted for 77% of total government support for BERD in Canada (OECD 2021). While tax incentives may work to increase investment in some cases, in contexts where technological opportunities are lacking in the first place, for instance due to the lack of industrial and innovation policies, those incentives may well be used to increase profits, without additional investment in R&D. It is well-documented — for instance in Canadian and Dutch studies — that such indirect measures of support often do not create additionality and instead subsidise activity that would have happened anyway (Dagenais et al 1997, Lokshin et al 2013). In contrast, direct investments that help to create new technological and industrial landscapes can be more effective at crowding in private investment than indirect tax incentives (i.e. at providing additionality).

Delivering on the goals in B.C.'s economic plan therefore requires a commitment to directing investment in order to drive innovation and increase productivity across many sectors. Crucially, however, achieving these economic goals need not come at the expense of overcoming social and environmental challenges. Building a stronger and more productive economy while battling social inequalities and tackling the climate emergency are not mutually exclusive — instead they must go hand in hand.

2.3 Social and environmental challenges

In recent years the B.C. Government has introduced a range of policies to make life better for people while at the same time strengthening the economy. These include new investments in child care, housing, schools, strategic infrastructure and other public services. However, the COVID-19 pandemic revealed that, as much as B.C. enjoys a strong economy, the rewards and benefits of it are not being shared equally. Informal and temporary workers, predominantly women and BIPOC communities, were disproportionately impacted. At the same time, the pandemic exposed a range of deep vulnerabilities in the B.C. economy, including:

- **Inequality:** Income inequality in B.C., as measured by the Gini coefficient of after-tax income, is the second highest in Canada, after Ontario (Statistics Canada 2021a). Rising house prices have also driven a widening gap between those who own property and those who do not (Hemingway 2018). These economic inequalities are compounded by stark gender and racial inequalities. In 2018, B.C. had a gender wage gap of 18.6% (Pelletier et al 2019), the highest of all Canadian provinces, while the median total income for Indigenous People is only 72% of the non-Indigenous population (Indigenous Services Canada 2020). The COVID-19 pandemic has served to deepen B.C.'s economic, gender and racial inequalities (Ivanova 2021). Going forward, tackling inequality should not only be about ex-post redistribution, but also about 'predistribution' — creating a more symbiotic public-private partnership that delivers inclusive and sustainable outcomes by design.

- **The climate emergency:** In summer 2021 B.C. experienced a 'heat dome'. Temperatures reached 50 degrees Celsius in one part of B.C., the highest temperature ever recorded in Canada. The heat dome caused nearly 600 heat-related deaths in the province. Higher temperatures, combined with dry conditions, have led to an increased number of forest fires in B.C., which are burning longer and more intensely. In 2021, 1,600 fires burnt nearly 8,700 square kilometres of land in B.C., making it the third worst wildfire season on record. One recent study predicts that by 2080 western Canada will see a 50% increase in the number of dry, windy days that let fires start and spread (Wang et al 2017). Following intense rains and heavy winds, 2021 also saw major flooding and landslides in B.C. The floods forced over 17,000 people to be evacuated from their homes, and multiple people and more than 640,000 farm animals are known to have died. In response, B.C. declared a weather emergency, just six months after an emergency was declared following the summer forest fires. Indigenous People in B.C. and beyond have been disproportionately impacted by climate change, as they are witnessing the immediate impacts on their territories, traditional foods and ways of living (Gauer, Schaepe and Welch 2021).
- **Supply chain resilience:** Recent events, including flooding and the COVID-19 pandemic, have exposed supply chain vulnerabilities in B.C. In 2021 the floods severely compromised the flow of goods on both rail and roads, and cut access to the port of Vancouver, Canada's largest port. This has affected exports out of B.C., imports to other provinces via B.C. and consumption in B.C. itself. Flooding has generated food access issues, including shortages of certain products like milk, eggs and poultry. Small manufacturers and retailers in B.C., as well as in adjacent provinces such as Alberta, also struggled to secure supplies. Both the COVID-19 pandemic and recent flooding have led to episodes of 'panic buying', including of perishable goods and gasoline, which contributed significantly to supply chain delays. In response, B.C. has recently launched the Supply Chain Resiliency Grant Program, designed to strengthen manufacturing supply chains in B.C. This $6 million fund is available to industry and trade associations, and groups of organisations collaborating on a manufacturing project.

- **Food insecurity:** B.C. faced a number of food insecurity challenges even before the COVID-19 pandemic hit. According to the 2019 Hunger Count Report, B.C. food banks reported 124,713 visits in 2019, of which 38,000 were from children (Food Banks Canada 2019). More than half had social assistance or disability assistance as their main source of income. The pandemic has further exacerbated food insecurity in B.C., as low-income households have been left increasingly vulnerable to price spikes and food shortages. In January 2020, the B.C. Government's Food Security Task Force produced a report on food security in B.C. (B.C. Food Security Task Force 2020). The task force was appointed to provide recommendations for the development and use of technology to support food security, and the economic growth of B.C.'s agricultural sector.

2.4 B.C.'s response to date

In response to these challenges, the B.C. Government has launched a range of new initiatives to build on the province's already strong economic foundation. The rest of this section provides a brief overview of the major policy initiatives that the B.C. Government has launched to date, as well as the challenges and opportunities arising from B.C.'s new mission-oriented economic plan.

2.4.1 CleanBC

CleanBC is B.C.'s climate action plan. First launched in 2018, the CleanBC plan outlined B.C.'s response to the climate challenge and included province-wide emissions reductions targets of 40% by 2030, 60% by 2040 and 80% by 2050, against a 2007 baseline (Government of British Columbia 2018). Importantly, the plan also included measures for ensuring a just transition, including skills development and targeted funding for decarbonisation in remote and Indigenous communities.

In October 2021, the government published an updated plan, the CleanBC Roadmap to 2030 (Government of British Columbia 2021b). The new roadmap lays out the additional actions and programmes needed to reach the 2030 target, including a commitment to reach net zero by 2050. The plan was influenced by the severe weather events that have taken place in Canada throughout 2021, including heat waves, severe droughts, wildfires and flooding, as well as the IPCC's latest report, highlighting the need for more urgent climate action.

The roadmap positions B.C. as entering a new global context wherein 'International markets are shifting, and demand is growing quickly for new climate-friendly technologies and services, renewable energy and low-carbon products' (Government of British Columbia 2021b:11). The roadmap includes new measures to accelerate progress on actions outlined in the initial plan, including a faster shift to zero-emissions vehicles (ZEVs); tighter methane regulations; a new emissions cap for natural gas utilities; accelerated net-zero mandates for new buildings; a gradual increase in the carbon tax; and strengthening the low-carbon fuel standard.

The roadmap also introduces a range of accelerated and expanded actions across eight future-looking 'pathways', including low-carbon energy, buildings, industry, agriculture, communities, forestry and negative emissions technology. Notably, the pathway for transportation outlines new approaches to lowering transport emissions, targeting a 25% reduction in vehicle distance travelled by 2030.

2.4.2 Technology and Innovation Policy Framework

In 2019 the B.C. Government developed the Technology and Innovation Policy Framework, which serves as a roadmap to identify innovation priorities and investments in the province. The framework aims to achieve four goals (Government of British Columbia 2019a):

- Grow globally competitive industry clusters across the province that support British Columbians;
- Increase diversity and participation in the innovation economy, including Indigenous Peoples and those living in rural areas;
- Help B.C. companies scale up, anchor and create well-paying jobs for British Columbians;
- Develop the talent pool to help grow the innovation economy and help attract the right types of investment to B.C.

The framework aims to help B.C. businesses become greener and more competitive, and grow partnerships between communities, Indigenous Peoples, post-secondary institutions, research organisations and industry to help solve some of the most critical challenges B.C. faces.

2.4.3 StrongerBC

Launched in 2020, StrongerBC is the B.C. Government's plan for economic recovery after the COVID-19 pandemic. StrongerBC builds on the B.C. Economic Framework that was launched just prior to the COVID-19 pandemic and outlines how the Government intends to help people, businesses and communities recover and emerge from COVID-19 stronger and better prepared for the next stage of recovery (Government of British Columbia 2020d: 14). The plan has four key strategic goals:

- Make health care better by hiring 7,000 new front-line health-care workers, increasing support for mental health care in the workplace and launching a new Hospital at Home initiative that will allow patients to receive medical services in their own home from a team of health professionals;
- Create jobs and opportunities by investing in targeted and short-term skills training in high-demand fields, expanding Indigenous skills training and creating more affordable childcare spaces so that more parents, particularly women, can return to work;
- Help businesses grow and rehire with a range of programmes, including a 15% refundable tax credit based on eligible new payroll, a small- and medium-sized business recovery grant to support hard-hit businesses and protect jobs, and a temporary 100% PST rebate on select machinery and equipment to make it easier for eligible businesses to invest in growth;
- Support strong communities by investing over $400 million to revitalise community infrastructure and support local governments to provide the valuable services people depend on.

2.4.4 The Declaration on the Rights of Indigenous Peoples Act and Reconciliation

The 2019 Declaration on the Rights of Indigenous Peoples Act (DRIPA) is B.C.'s landmark legislative framework on Indigenous rights and reconciliation (Government of British Columbia 2019b). The DRIPA provides a framework for implementing the standards of the UN Declaration on the Rights of Indigenous Peoples (UNDRIP), an international instrument adopted by the United Nations in 2007 to enshrine the rights that 'constitute the minimum standards for the survival, dignity and well-being of the indigenous peoples of the world' (United Nations 2007: 14).

B.C. is the first jurisdiction in Canada to adopt a legislative framework for the implementation of the UNDRIP. The task of adhering to the principles of UNDRIP presents a unique case in B.C., where the vast majority of the province is unceded Indigenous territory, meaning that treaties have not been signed. The purposes of DRIPA are to:

- affirm the application of the declaration to the laws of British Columbia;
- contribute to the implementation of the declaration;
- support the affirmation of, and develop relationships with, Indigenous governing bodies.

As will be discussed further in section 6, deep engagement with citizens, and in particular under-represented groups such as Indigenous communities, will be vital to ensure the success of B.C.'s economic plan going forward.

2.5 B.C.'s new economic plan: StrongerBC

B.C.'s new economic plan, *StrongerBC*, was launched in 2022, and is intended to mark a turning point in the shift towards a more sustainable, inclusive and innovative economy. The plan is intended not as a short-term fix, but as a long-term plan for establishing new directions for growth going forward.

In common with governments across the world, policy in B.C. has historically been developed in a siloed approach that considers challenges like climate change and social inclusion separately from economic policy, while growth and innovation strategies have focused on sectoral strategies. This has delivered some successes: thanks in part to supportive government policy, B.C.'s clean tech sector has grown substantially and now employs 16,300 people with annual revenues of $2.4 billion (KPMG 2020). Similarly, B.C.'s life sciences sector is the fastest growing across Canada, employing more than 17,000 people with annual revenues of $5.4 billion (Government of British Columbia 2020a).

However, a siloed approach to policymaking continues to stifle cross-sectoral innovation and limit progress towards tackling grand challenges. In the absence of a clear framework for steering growth and innovation in a sustainable and inclusive direction, there has been an over-reliance on inherently limited ex-post fixes to address harmful social and environmental consequences when they materialise.

The new economic plan presents an opportunity to chart a new course. By setting a clear direction for innovation and growth, and bringing together all B.C.'s policy priorities into a coherent economic strategy, B.C. now has the opportunity to replace an outmoded economic model that aims to patch up problems after they arise with a new model of directed growth that delivers inclusive and sustainable outcomes by design. Structured and governed effectively, a new growth model that prioritises problem-solving over siloed thinking can help overcome the grand challenges of the 21st century while reducing the need for ex-post policy fixes.

B.C.'s new economic plan is framed around meeting two key challenges (Government of British Columbia 2022):

- **Inclusive growth**, defined as the opportunity for everyone to have a better life: The government plans to achieve this goal by pursuing steady job growth with the goal of full employment, and ensuring workers receive fair pay for their work and that supports are there for people when they need them. It is also a vision for an economy where Indigenous Peoples govern themselves, control their own lands and resources, maintain and protect their culture and heritage, and live free from racism.
- **Clean growth**, defined as ensuring businesses thrive in a sustainable economy: This is linked to an economic vision that leverages B.C.'s natural assets and innovation potential to build clean technology ecosystems. The Government intends to achieve this goal by meeting its climate goals and making B.C. a world leader in the production of low-carbon, ethical and sustainable products and services.

The economic plan embraces a mission-oriented approach to meeting these two challenges and sets out six specific mission areas that will reorient future growth to achieve a high-care, low-carbon economy that works for everyone. The three mission areas underpinning the inclusive challenge are:

- **Supporting people and families:** Take action to reward hard work; make life more affordable; help parents balance the needs of work and home; expand opportunities for education and training; and support the most vulnerable.
- **Building resilient communities:** Invest in more affordable and social housing; build infrastructure like schools and hospitals; invest more in fire, flood and climate mitigation; ensure access to local food; and support people and businesses to transition to a carbon neutral economy.
- **Advancing true, lasting and meaningful reconciliation with Indigenous Peoples:** Make sure Indigenous Peoples are full partners in all aspects of B.C.'s economy; support Indigenous control over their own land and resources; acknowledge, respect and uphold Indigenous rights and First Nations title; and build forums for Indigenous Peoples to develop economic initiatives.

The three mission areas underpinning the clean growth strategy are:

- **Meeting B.C.'s climate commitments:** Making climate pollution more expensive while supporting people; accelerating CleanBC measures to help reach net-zero emissions by 2050; requiring all new buildings to be zero-carbon by 2030; and accelerating B.C.'s move to electric vehicles.
- **Leading on environmental and social responsibility:** Establishing a world-leading standard for environmental, social and governance (ESG) criteria; supporting the promotion of high-quality B.C. goods; investing in clean energy and clean technology; and strengthening B.C.'s mining sector to ensure environmental and regulatory excellence in mining.
- **Fostering innovation across the economy:** Helping local businesses find new markets; supporting talent development in public post-secondary institutions; investing in clean jobs and low-carbon tech innovation; ensuring continued growth and jobs through new a shipbuilding strategy.

In turn, the plan is supported by a number of 'new actions' that will help deliver on the new mission areas.

Figure 8. The economic plan's inclusive growth mission areas and new actions

Source: Government of British Columbia (2022)

Figure 9. The economic plan's clean growth mission areas and new actions

Source: Government of British Columbia (2022)

By embracing a market-shaping, mission-oriented approach to its economic plan and embedding this across government, B.C. has the opportunity to overcome key challenges while delivering greater prosperity for all. The setting of problem-oriented, cross-sectoral missions provides an opportunity to fuel innovation and transform production, distribution and consumption across the entire economy.

However, setting missions is just the first step: achieving success will require a new joined-up approach to building an economy that works for everyone, which prioritises problem-solving over siloed thinking. Whether or not the plan succeeds will depend on how missions are designed, implemented and evaluated, as well as the ability to learn from the successes and failures of other initiatives from around the world.

3 An introduction to successful mission-oriented policy

Mission-oriented thinking requires understanding the difference between broad challenges, missions, sectors and specific solutions[1]. As described above, grand challenges are coming to define policymaking in the 21st century. They are a broadly defined area which a government may identify as a priority (whether through political leadership or the outcome of a movement in civil society). For example: how do economies deal with problems with no simple solution, that require transformation and innovation to solve, like an ageing society or climate change?

While challenges are useful to direct focus and priorities, for the most part they remain too broad to be actionable. Missions, on the other hand, are concrete problems that different sectors can address to tackle a challenge, such as reducing carbon emissions by a given percentage over a specific year period. Selecting missions that matter to society and stimulate innovation across multiple sectors is a highly complex task. Missions come in different shapes and sizes, but should fulfil the following key criteria (Mazzucato 2018):

- **Bold, inspirational, with wide societal relevance:** Missions should engage the public. They should make clear that through ambitious, bold action at the B.C. level, solutions will be developed that will have an impact on people's daily lives. To do this, missions must outline exciting opportunities for bold innovation, while being connected to debates in society about what the key challenges are, like sustainability, inequality, health, climate change and increasing the quality of the welfare state.

1 This report uses the terminology of grand challenges, missions, sectors and solutions as set out in the framework developed by UCL Institute for Innovation and Public Purpose. The specific terminology may vary across different jurisdictions, but the key priority is to ensure that missions are structured and governed effectively.

- **A clear direction: targeted, measurable and time-bound:** Missions need to be very clearly framed. While enabling long-term investments, they need a specific target that can either be formulated in binary ways (as clearly as whether man has reached the moon and returned safely) or quantified (as clearly as whether a certain percentage reduction in carbon emissions against a baseline has been reached across manufacturing). In addition, they need a clear timeframe within which actions should take place. This needs to be long enough to allow the process to grow, for actors to build relationships and interact, while at the same time being time-limited. Without specific targets and timing, it will not be possible to determine success (or failure) or measure progress towards success.
- **Ambitious but realistic research and innovation actions:** Mission objectives should be set in an ambitious manner (taking risks), centred on research and innovation activities across the entire innovation chain, including the feedback effects between basic and applied research. Ambitious objectives ensure that researchers and innovators are challenged to deliver what would otherwise not be attempted ('additionality' in research). Furthermore, the required technological development should attract research and innovation activities that otherwise would likely not be undertaken by private actors, providing the justification and legitimacy for public intervention.
- **Cross-disciplinary, cross-sectoral and cross-actor innovation:** Missions should be framed in such a way as to spark activity across, and among, multiple scientific disciplines across different industrial sectors (e.g. transport, agriculture, health, services) and different types of actors (public, private, third sector, civil society organisations). Missions need to be chosen to address clear challenges that stimulate the private sector to invest where it would not have otherwise invested ('additionality' in business). Missions connect all relevant actors through new forms of partnerships for co-design and co-creation by focusing on targets that require multiple sectors and actors to solve.
- **Multiple bottom-up solutions:** Missions should not be achievable by a single development path or by a single technology. They must be open to being addressed by different types of solutions. A mission-based approach is clear on the expected outcome. However, the trajectory to reach the outcome must be based on a bottom-up approach of multiple solutions, some of which will fail or have to be adjusted along the way.

In the context of B.C., the economic plan's six mission areas provide a strong starting point for connecting challenges to concrete goals.

Crucially however, it is important that each mission area has concrete targets and objectives. In other words, it must be possible to say definitively whether the policy has been achieved or not. Technological missions such as 'putting a man on the moon' had obvious end points which made evaluation easier. However, modern grand challenges are more long term with less easy to define end points. Under such conditions, establishing intermediate milestones is critical, as they provide the means to keep track of progress towards the mission objective and allow for informed and flexible adaptive decisions to intervene. Real-time open data, publicly available, on progress on the milestones will also keep a sense of urgency, achievement and motivation among involved actors. While missions are long term and should have a stable goal, these intermediate signposts should be used to decide whether changes in direction are required and, in some cases, whether the mission itself needs redefining.

In addition to the milestones, broader measures of the cross-sectoral and cross-science impact are needed, so that even if a milestone or the overall mission objective is not reached, the mission might still be considered successful (at least to an extent) if the process produces positive, economy-wide spillovers. An important next step for B.C. will therefore be to turn the existing mission areas into concrete missions with well-defined targets to ensure that progress can be monitored effectively. Metrics should be selected carefully, avoiding the temptation to default to traditional economic indicators associated with jobs and growth to measure success. Relying on these metrics alone risks diverting the missions away from problem-solving, rather than treating these benefits as important but incidental spillovers of problem-oriented investment.

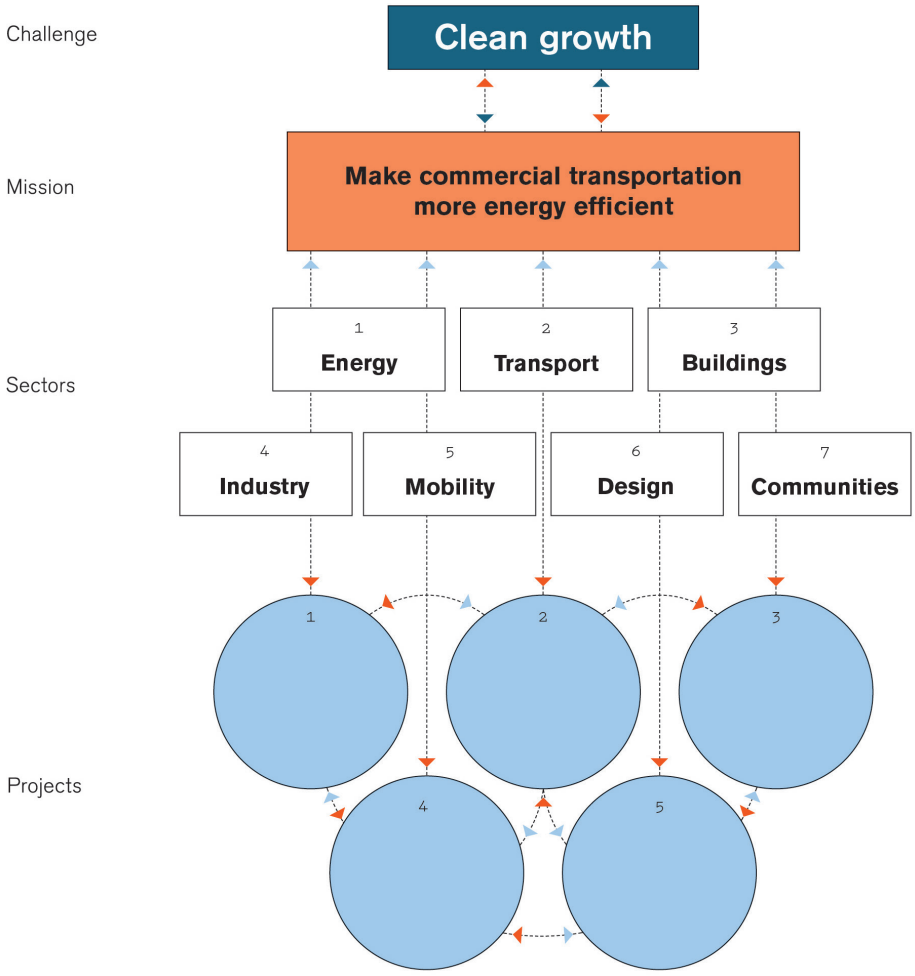
Finally, solutions are specific projects undertaken by businesses, governments, universities or the third sector that can help support a mission. Solutions have clear objectives, should involve many different sectors, and can be supported through the use of supportive policy interventions and financial instruments. The 'granularity' of missions therefore sits between broad challenges and concrete solutions. By setting the direction for a solution, missions do not specify how to achieve success. Rather, they stimulate the development of a range of different solutions to achieve the objective. For example, reducing the vehicle distance travelled in B.C. cannot be achieved by the car sector alone. It will also require solutions in other sectors, such as infrastructure and manufacturing, as well as many other areas.

One good example of a transformative, challenge-oriented mission is the CleanBC Roadmap's pathway for transportation (Government of British Columbia 2021b). The roadmap has a number of different goals, including:

- Reducing vehicle distance travelled in light-duty vehicles by 25% by 2030;
- Increasing the share of trips (e.g., commuting for work and personal activities) made by walking, cycling and transit to 30% by 2030, 40% by 2040 and 50% by 2050;
- Increasing the share of new light-duty sales made up of zero-emission vehicles to 26% by 2026, 90% by 2030 and 100% by 2035;
- Achieving an overall target of B.C. having 10,000 public EV charging stations by 2030; and
- Making commercial transportation more energy-efficient by reducing the energy intensity of goods movements by 10% in 2030, 30% by 2040 and 50% by 2050, relative to 2020.

All these targets are bold, have clear measurable direction and are ambitious but realistic. Some also encourage cross-sectoral and all-of-government innovation, and involve multiple bottom-up solutions. They identify an acute need to expand clean transportation and send a clear signal that B.C. intends to move away from personal vehicles and gas-powered commercial trucks. Figure 10 shows an illustrative mission roadmap for the commercial transport mission, which will require many different sectors to collaborate and innovate together, and government instruments to fuel bottom-up experimentation on a vast scale.

Figure 10. CleanBC mission roadmap



Note: This diagram is for illustrative purposes only

When it comes to implementing and governing missions, UCL Institute for Innovation and Public Purpose has developed a new theoretical and practical framework to guide policymaking called ROAR. This involves strategic thinking about the desired direction of travel (routes), the structure and capacity of the public sector (organisations), the way in which policy is assessed (assessment) and the incentive structure for both private and public sectors (risks and rewards). A strategy for implementing a mission-oriented economic plan should offer answers to the following questions (for a detailed discussion of ROAR see Mazzucato 2016, Mazzucato et al 2019 and Mazzucato 2021):

- **Routes:** How can public policy be understood in terms of setting the direction and route of change; that is, shaping and creating markets rather than just fixing them?
- **Organisations:** How should public organisations be structured so they accommodate the risk-taking, explorative capacity and capabilities needed to envision and manage contemporary challenges?
- **Assessment:** How can this alternative conceptualisation be translated into new dynamic indicators and evaluation tools for public policies, beyond the static micro-economic cost/benefit analysis and macroeconomic appraisal of crowding in/crowding out that stem directly from the market failure perspective?
- **Risks and rewards:** How can public investments along the innovation chain result not only in the socialisation of risks, but also of rewards, enabling smart growth to also be inclusive growth?

In order to achieve its vision of transitioning to a more sustainable, inclusive and innovative economy, B.C. needs to consider these questions in the context of where the province stands today versus the direction it wants to travel. Table 1 considers questions arising from the ROAR policy framework in the context of B.C.'s clean growth challenge.

Table 1: ROAR framework and B.C.'s clean growth challenge

	B.C.'s clean growth challenge
R is for routes: the directionality of policy that tilts the economy in particular ways	▪ What new markets, technologies and industrial landscapes are needed to deliver clean growth? ▪ Who are the key public, private and third sector actors that are willing to engage with a clean growth mission? ▪ What market-shaping policies are required to tilt the economy in an inclusive and clean direction?
O is for organisations: the organisational competencies needed for exploration and experimentation	▪ What new capacities and capabilities are required for the public sector to act as a lead investor and risk-taker in the economy? ▪ Are new policy delivery vehicles needed to support the implementation of a clean growth strategy? ▪ Are new organisations needed to oversee specific clean growth solutions, for example housing retrofit?
A is for assessment: the new forms of dynamic assessments for capturing market making and shaping that are needed	▪ Are existing appraisal and evaluation approaches, such as static forms of cost-benefit analysis, preventing ambitious policies from being developed? ▪ What new tools of appraisal and evaluation are required to capture the dynamic spillovers of green innovation?
R is for risk and rewards: the concrete instruments to guide how growth can be better shared between all actors in an economy	▪ Who is currently reaping the rewards in B.C.'s economy today in different sectors and who is taking the risks? ▪ What mechanisms and conditionalities are needed to ensure that the benefits of public investment in clean growth are shared more evenly?

4. A new policy toolkit

Successfully using the ROAR framework to implement mission-oriented policy is intimately tied to specific tools that are crucial for tilting the economy in the desired direction. These tools cut across all areas of public policy and require a joined-up, coordinated approach across different government departments. While there are many policy tools that will need to be utilised in B.C., in this section we focus on three of the most important tools for implementing missions: public procurement, treasury assessment methods, and public finance.

4.1 New design of policy (public procurement)

As a major component of public spending, public procurement is a fundamental tool for directing demand and supply. It can also play a powerful market-shaping role by mobilising public purchasing power to tilt economic activity in a desired direction. Every year the B.C. Government spends nearly $7 billion on a variety of goods and services, amounting to around 10% of total public spending (Government of British Columbia 2020b). As a result, public procurement is one of the most powerful policy tools B.C. has at its disposal. The COVID-19 pandemic and the recent flooding events have exposed the vulnerabilities of relying on international supply chains for essential goods, while the climate emergency demands that all public budgets are used strategically to support net zero goals. Reforming procurement policy is therefore a key pillar of building a stronger, more sustainable and more resilient economy.

Historically, procurement has often been used to simply award contracts to the lowest bidder. It may also contend with potentially contradictory policy goals such as cost-savings, value for money, transparency and siloed policy objectives, for example related to the environment, health or employment. However, procurement can also be used as a strategic tool to foster bottom-up innovation and the creation of new markets to help achieve well-defined missions. The Internet, GPS, and the aerospace and semiconductor industries are among the best-known examples of products and technologies that resulted from public procurement strategies aimed at promoting stable demand and triggering technological innovation on the supply side (Mazzucato 2020). More recently, countries such as Sweden have demonstrated how procurement policies can also reshape existing sectors — from construction and transport to food and clothing (Mazzucato 2020).

Case study 1
Green procurement in Sweden

Sweden is an innovative country with a strong drive for ecological transition. The country has long incorporated procurement as a tool for achieving its climate goals.

In 2003, the Swedish Government decided to establish the Swedish Environmental Management Council (SEMCo) in order to formalise the attempt to use green procurement as an environmental policy tool. The action plan contained the following objectives:

- Increasing the share of overall procurement which includes environmental and sustainability elements;
- Establishing a greener contract framework; and
- Expanding the number of central and local public authorities adopting environmental criteria for procurement.

An example of green procurement developed in the following years is represented by the public catering services of the city of Malmö, which envisaged the introduction of 100% organic food by 2020. A pilot contract used for the Djupadal School provided for the introduction of a series of requirements, including the inclusion of organic products in the menu, but also the provision that deliveries would be made once a week, with vehicles complying with the municipal directives on the sustainability of city transport. By the end of the pilot project, 97% of the food served by the canteen was organic, with the economic impact minimised by switching from meat to seasonal vegetables.

Another project, launched in 2011, concerned a joint procurement by 296 organisations, led by the city of Stockholm, for the purchase of electric vehicles. This project aimed to reduce administrative costs for participating organisations, reduce prices, send a strong demand signal to the market and guarantee access to electric vehicles for smaller municipalities. The partners contributed jointly to the definition of the vehicles' characteristics, including the criteria for CO2 emissions and the calculation of life cycle costs. Following the first purchase made in 2012, it was possible to save 34 tons of CO2, a reduction of 95% compared to equivalent petrol vehicles. These and other pilot projects are proof that a different procurement system can be implemented to achieve certain results. Aware of this, in 2016 the Swedish government launched the National Strategy for Public Procurement to promote procurement for innovation.

4.1.1 Public procurement in B.C. today

B.C.'s procurement system is broad and complex. The Ministry of Citizens' Services provides overarching government procurement advisory services, the Ministry of Finance oversees government procurement policy and the Ministry of Attorney General provides legal advice. The B.C. Public Service Agency also plays a crucial role by building capacity through training and other career-development activities.

In 2018, the province launched a new British Columbia Procurement Strategy, which committed to 'Making it easier for companies to do business with government and creating more opportunities for organizations of all sizes' (Government of British Columbia 2018a). The strategy aimed to take full advantage of its buying power to drive economic growth in communities and take advantage of made-in-B.C. innovation. During development of the B.C. Procurement Strategy, the Ministry of Citizens' Services engaged extensively with stakeholders, including business owners, government representatives, community leaders, vendors, Crown corporations and municipalities to explore and understand the challenges and opportunities that existed regarding procurement processes. Based on this extensive stakeholder feedback, the strategy established four goals to guide the modernisation of B.C.'s procurement system:

1. **Realise best value and increased benefit to British Columbians by using procurement strategically:** While keeping costs down remains central to procurement, the new strategy committed the government to increasing its focus on the social and environmental impacts of the goods and services it purchases, ensuring benefits are returned to all British Columbians.

2. **Make it easier to do business with government with simpler, more intuitive processes:** Historically, purchasing processes in B.C. have been complex, time-consuming, restrictive and, in many cases, opaque. The new strategy committed the Ministry of Citizens' Services to working with stakeholders to design transparent, simple-to-use processes proportionate to the size of the procurement.

3. **Create more opportunity for businesses of all sizes, adapting practices towards supporting, growing and sustaining a community of suppliers:** While recognising that the benefits of large-scale contracting can be significant, the new strategy committed the government to ensuring that purchasing processes also create sufficient opportunity for small- and medium-sized businesses, ensuring a resilient range of suppliers going forward.

4. **Build greater capacity for procurement in the B.C. public service through enhanced training and support:** In order to develop and maintain well-supported, well-trained and often fully dedicated staff, the strategy committed to introducing a new procurement career stream, and enhanced support and training for all staff.

Since the strategy's launch, the B.C. Government has made progress in transforming its procurement processes. In 2020, the government published a *Procurement Strategy Update*, which provided an overview of accomplishments to date (Government of British Columbia 2020). Notable among these has been the establishment of new *Environmentally Responsible Procurement Guidelines*. The guidelines state that, where feasible and cost-effective, the Government of British Columbia should acquire products and services that are environmentally responsible. Environmentally responsible products are defined as those that 'reduce waste, improve energy efficiency, limit toxic by-products, contain recycled content or are reusable', while environmentally responsible services are those that 'employ environmental responsibility in their deliver.'

Similarly, new *Social Impact Procurement Guidelines* have been introduced. Social impact purchasing is defined as the use of purchasing power to create 'social value and support social policy objectives'. Elements that may be considered as 'social value' include:

- **Supplier diversity:** Creating opportunities for diverse suppliers such as Indigenous Peoples and employment equity-seeking groups, which could include people with disabilities and other traditionally underrepresented groups.
- **Workforce development:** Offering apprenticeships, skills training and other developmental support to employees, contractors or volunteers, including diverse supplier groups.

Both the *Environmentally Responsible Procurement Guidelines* and the *Social Impact Procurement Guidelines* have been added to *B.C.'s Core Policy and Procedures Manual*, which outlines the B.C. Governments objectives, standards and directives for promoting consistent, prudent financial practices. However, applying social impact and environmentally responsible criteria remains optional, meaning that in practice they are not applied consistently and cost-minimisation often takes precedence.

A final notable development has been the launch of Procurement Concierge — a new and innovative way for the B.C. Government to embrace market-driven innovation and make it easier for companies of all sizes to work with it. Procurement Concierge allows the Government to take advantage of emerging technologies and cutting-edge solutions by allowing industry experts to propose potential solutions to government business challenges prior to starting the formal bidding process. It enables vendors with creative innovations to get their ideas in front of government staff who may benefit from them as quickly as possible. A web app has been developed that gives vendors the opportunity to submit ideas about innovative goods or services that can solve government problems.

4.1.2 Different types of public procurement

As noted above, as a major component of public spending, public procurement is a fundamental tool for directing demand and supply, and driving innovation. In order to examine how procurement budgets could be used more strategically in B.C., it is first important to make a distinction between different types of public procurement.

Pre-commercial procurement

When evaluating the potential impact of a new procurement system in terms of innovation and the mission-oriented approach, the role of the so-called pre-commercial procurement is essential. Pre-commercial procurement involves buyers and sellers of products and services collaborating at an early stage, before products are priced or for sale, to define the scope and criteria for development. This approach mainly concerns R&D for public clients and aims to develop new solutions for challenges facing the public sector.

Such a mechanism can stimulate the process on the demand side; this requires innovative solutions for the public sector and contextually provides preliminary feedback to the company, leading to improvements and potentially giving it a competitive advantage over product or service supply. Private companies commonly use public procurement aimed at R&D to achieve an initial advantage. Expanding this approach could ensure better efficiency and product quality. Akin to the mission-oriented approach, which tends to reflect on societal challenges, pre-commercial procurement aims to respond to the public administration's specific needs or challenges by fostering innovation of new solutions in a heuristic way.

Product procurement and functional procurement

Conceptually, when discussing public procurement, it is important to distinguish between product procurement and functional procurement. In the former, the public servant describes the product it intends to purchase, which must be something that already exists in its complete form. In contrast, the latter relates to those contracts in which the administration describes the function, the objective or, even better, its mission, rather than the product itself. Hence, this is a tender for a product with a certain function. In this case, innovation can be part of the process or at least this option is left open. If functional elements are indicated in the tender, the documents generally contain both a description of the product and the function it should perform. A progressive shift from product procurement to functional procurement is emerging as a general trend around the world (Mazzucato 2020).

Theme classification for procurement

From a policy perspective, several classifications can be used for public procurement. In some cases, different sectors are used to classify procurement (for instance, in public health or IT sector public procurement), with reference to specific products or services. However, there are also horizontal elements with respect to the various categories, such as innovation public procurement or green public procurement. In this case, the focus is on the directionality imparted to the demand, with the aim of stimulating growth in a certain direction, thus leading to innovations and/or green solutions. The different sectoral classifications are summarised briefly below:

- **IT public procurement:** Concerns the procurement of IT services, such as software or application development and implementation, by the public administration.
- **Military public procurement:** Historically plays a strategic role, given the nature of this sector, which usually involves high-end technology in compliance with national security demands.

Classifications according to horizontal elements imparting directionality to public procurement:

- **Green public procurement** relates to the procurement of goods and services (of any sectoral area) that align with environmental criteria, for example are related to the demand for more environmentally friendly products or greater attention being given to the sustainability of the production chain or the life cycle of the good or service.
- **Innovation public procurement** relates to the use of public purchasing centres to stimulate the adoption of innovative solutions that are not yet commercially available.

Several countries have combined these types of procurement, to different extents. In the US, for instance, military procurement is extremely relevant to the national innovation landscape. Generally, the share allocated to green public procurement is still relatively low in nearly all countries. As reported recently in academic studies working on international examples of public procurement, even advanced countries (such as OECD countries) have not yet developed a toolbox to reorganise public procurement (Lember at al 2015). Hence, there is ample room to introduce procurement as a green mission tool.

4.1.3 A mission-oriented approach to public procurement

In recent years B.C. has made significant progress towards using public procurement more strategically to support public policy objectives. The new Procurement Strategy represents a strong starting point, but there is scope for further improvement to ensure procurement is being used as a powerful market-shaping tool to support B.C.'s mission areas and achieve its sustainability, social justice and innovation goals. In a context where B.C. is seeking to market its ESG credentials internationally in export markets, it is crucial that it is seen to be implementing a world-leading approach to procurement domestically. In this section we identify three areas where B.C.'s Procurement Strategy could be further enhanced.

Aligning public procurement with the missions in the economic plan

In order for procurement to work as a tool of economic transformation, it is essential that it is aligned with the government's wider economic strategy. However, given that the present Procurement Strategy predates B.C.'s new economic plan, at present it is not fully aligned with the new plan's aims of delivering clean and inclusive growth.

In order to support missions, it is important that public procurement is used strategically to respond to criteria that are based on more than just the lowest bidder. While B.C. has taken steps to establish new green and social impact guidelines for procurement, as outlined above, these criteria are not mandatory and are currently not applied on a consistent basis across government. This creates a risk that such criteria are applied sparingly and do not end up driving a change in behaviour. Given the powerful role that procurement can play in directing demand and supply, and driving innovation, ensuring alignment with B.C.'s economic plan and ESG ambitions should be a key priority going forward.

In practice, this means strengthening the environmental responsibility and social impact criteria to ensure they align with the mission areas in the economic plan. For example, this could include:

- Introducing additional environmental responsibility procurement criteria that align with the key performance metrics associated with each mission area under the clean growth challenge (i.e. achieve CleanBC, lead in ESG-centred industries, and strengthen value-added manufacturing and export innovation).
- Introducing additional social impact procurement criteria that align with the key performance metrics associated with each mission area under the clean growth challenge (i.e. improve quality of life, Indigenous reconciliation and build resilient communities).
- Ensuring that all environmental and social impact criteria are clear and well defined, with robust guidelines on how to appraise different options — and making undertaking these appraisals mandatory for all procurement decisions across government (i.e. including them as a mandatory step in the *Core Policy and Procedures Manual*). Public servants should be empowered to weigh these criteria over and above cost assessments, with the aim of maximising public benefit associated with all procurement decisions.
- Embracing a functional approach to procurement rather than a product-oriented approach. Instead of outlining the precise products the government intends to purchase, the government could instead describe the function, the objective or, even better, the mission that it wants to achieve. As noted above, by setting the direction for a solution, missions do not specify how to achieve success, because the right answers are not always known in advance. Instead, missions are intended to stimulate the development of a range of bottom-up solutions and reward those actors willing to take risks and experiment. By setting out the mission or problem the government is seeking to overcome, rather than a specific product, innovation solutions can be incentivised and supported. B.C. could begin this transition by stipulating that a certain proportion of the total procurement budget (10%, for example) should take the form of functional procurement and this could be increased over time, allowing for learning, experimentation and adapting as necessary.

These changes will not only help B.C. deliver on its ESG ambitions, they will also ensure that procurement is acting as a powerful tool to tilt the direction of the economy in the clean and inclusive direction envisaged by the new economic plan. As noted in Section 3, one good example of a transformative, challenge-oriented mission is CleanBC Roadmap's pathway for transportation. As the Swedish case study above illustrates, mobilising procurement purchasing power can play a powerful role in achieving these goals. Assessing all transport-related procurement options against these goals will mean that procurement budgets become a strategic source of funding to support B.C.'s mission areas. By acting as a lead investor in green transport, the Government can help to shape new markets and technologies, which can then be rolled out across the economy on a larger scale.

Leveraging pre-commercial procurement to drive innovation

As noted above, pre-commercial procurement can play a powerful role in driving mission-oriented innovation. While the new Procurement Strategy makes it easier for suppliers to engage with the procurement process, there is less emphasis placed on the power of procurement to drive innovation. There is therefore scope for the strategy to be developed further so that procurement can more effectively foster bottom-up innovation and the creation of new markets to help achieve B.C.'s missions.

Again, as noted above, one innovative aspect of B.C.'s new Procurement Strategy is the Procurement Concierge. The Procurement Concierge allows the B.C. Government to take advantage of emerging technologies and cutting-edge solutions by allowing industry experts to propose potential solutions to government business challenges prior to starting the formal bidding process. As such, the scheme has the potential to play a powerful pre-commercial procurement role, collaborating with buyers and sellers at an early stage, before products are priced or for sale, to define the scope and criteria for development. In doing so, it could play an important role driving innovation to support the mission areas in B.C.'s economic plan.

At present, however, the Government plays a largely passive role in defining the challenges Procurement Concierge is supposed to help address. There is therefore scope for the Government to play a more proactive role as 'challenge setter', setting out what the key problems are (aligned to the missions in the economic plan) and then inviting business to submit ideas to stimulate bottom-up innovation. In doing so, B.C. can learn from successful examples such as the US' Small Business Innovation Research (SBIR) programme. Innovative Solutions Canada (ISC), Canada's federal innovation agency, has taken inspiration from the US SBIR and there may be benefits for B.C. in embracing a similar approach at the provincial level (Innovation, Science and Economic Development Canada 2019).

Case study 2
The US' Small Business Innovation Research programme

The Small Business Innovation Research (SBIR) programme is a public procurement programme that was established in 1982, but significantly expanded between 1988 and 1992. Its main objectives are to stimulate technological innovation and to use SMEs to meet the R&D needs of federal agencies and departments. In doing so, SBIR encourages the participation of socially and economically disadvantaged companies that would otherwise not be able to introduce technological innovations.

The SBIR programme is also concerned with increasing the commercialisation of innovations resulting from federal R&D funding. SBIR requires that all federal agencies with R&D expenditures in excess of US $100 million commission a defined portion of their total external R&D spending through a set of procurement procedures established by the programme. This portion is now around 3.2% of the annual budget. SBIR implies an explicit risk-taking attitude by federal agencies, as well as a desire to encourage the development of specific technologies through SMEs. This implies the existence of technical expertise within the agencies in terms of being able to recognise the technological characteristics of the services acquired, the developments in the sectors in which the companies operate and so on.

The way in which the SBIR programme is structured and managed is crucial for its success. Federal agencies signal the new 'themes' every two years. Typically, a theme refers to the technology needs of the agency, for its own aims or for more general objectives. The allocation of procurement funds happens in three distinct phases:

- Phase I, up to US $150,000 for a feasibility study that can last for a period of up to six months;
- Phase II, up to US $1 million for two years, to be used to develop the project; and
- Phase III, during which federal funds can be received on a non-competitive basis, including to cover the commercialisation of the project.

SBIR prizes cover 100% of the project's costs and include a profit margin. At the same time, the partnership with other organisations is not compulsory. At the end of the process, the company owns the intellectual property rights of the project.

Just as federal agencies in the US signal the new 'themes' for SBIR every two years, the Procurement Concierge programme could identify a series of challenges that are aligned with the mission areas in the economic plan. By providing a clear direction on the problems B.C. is seeking solutions for, and proactively engaging with innovative businesses, a revised Procurement Concierge initiative could create a strong 'pick the willing' dynamic.

Where no domestic suppliers are forthcoming with innovative ideas, proactive efforts could be made to establish new local supply chains with financial and technical support from InBC and other government agencies. In doing so, procurement policy can be used to shape new markets and technologies, which can then be rolled out across the economy on a larger scale.

A new social contract: attaching conditionalities

The type of public-private partnerships that exist in any given economy and the outcomes they deliver are not fixed. Instead, they are shaped by the terms attached to any agreement or contract that is signed between public authorities and private businesses. Because procurement represents such a large proportion of overall government budgets, the terms and conditions attached to procurement contracts play a vital role in shaping economic outcomes.

In order to achieve the economic plan's goals of delivering inclusive and clean growth, B.C. has the opportunity to rethink the 'deal' that exists between public and private to reflect the state's role as a lead investor and risk-taker in the economy, co-creating and shaping new markets, not simply 'fixing' them. This involves creating a more symbiotic and mutualistic partnership that better aligns risks and rewards between public and private actors. Achieving this requires rethinking the way that contracts between government and businesses in B.C. are designed and structured.

Lessons on how to achieve a more symbiotic and mutualistic type of public-private partnership can be drawn from other fields. Bell Labs, one of the greatest private research and development (R&D) labs in modern history, owes its origin to the US Government insisting that AT&T, a telecoms monopoly throughout much of the 20th century, reinvested its profits back into production and innovation beyond that needed by the company (Gertner 2013). In doing so, the state received a social return for giving a monopoly right to the company: reinvestment creates greater spillovers.

Going forward, B.C. could attach similar conditions to procurement contracts to incentivise desirable corporate behaviour. In exchange for government procurement commitments, companies could be required to invest profits in R&D, meet certain labour standards, or eliminate carbon emissions over a certain period. This is especially important in avoiding the kind of hoarding of cash and financialisation (using cash for share buybacks to boost stock prices) that afflicts many modern companies (Lazonick 2014). Conditions could also be attached regarding the price or design of products that emanate from procurement contracts — an approach that has been used in some countries during the COVID-19 pandemic.

By attaching binding conditions on procurement contracts between government and businesses, B.C. can start to forge a new social contract between public and private that delivers sustainable and inclusive outcomes by design.

Strengthening procurement capabilities

As with all areas of government policy, ensuring that the public sector has sufficient capabilities to deliver effective procurement policy will be key. Recent studies have analysed a series of barriers to the implementation of public procurement for innovation, such as complexity in the development of new strategies, time spent in the process, and the lack of communication between different administrations and actors involved in the process.

Among these, a special role is played by the capabilities of the team that is in charge of setting the tender and managing the entire process. There is a need for specific technical skills to write a tender and to be able to choose the best offer, especially when the selection includes elements other than cost. A lack of technical capabilities (in the health, scientific or engineering fields, for example) in writing a tender and evaluating the proposed options undermines the ability of the purchasing entity to obtain the desired policy outcome through procurement. Going forward, B.C. should therefore strive to increase capabilities in procurement teams, including by means of learning-by-doing processes.

Importantly, reforming procurement policies should not mean an increased reliance on outsourcing key government functions. Instead, the state must invest in its own resources, developing internal capabilities in strategic areas, including the ability to design contracts aimed at achieving public policy objectives. Without these key competences, the government will not be able to achieve its objectives. Going forward, the B.C. Government should focus less on outsourcing government functions and more on learning from trial and error. Investing in capabilities within government, especially in the procurement area, is a crucial prerequisite for rethinking the relationship that public procurement agencies establish with private suppliers in a more dynamic and symbiotic way.

As will be discussed further below, in order to successfully stimulate innovation, embedding a risk-taking culture and approach will be key. Because innovation is highly uncertain, for every success there will likely be many failures. Acting as a lead investor necessarily means absorbing a high degree of uncertainty and accepting failures when they happen. However, B.C.'s 2018 Procurement Strategy identified that the government is often perceived by suppliers to be 'risk averse', which can end up stifling innovation (Government of British Columbia 2018). To successfully drive innovation, there is therefore a need to embrace a risk-taking culture in B.C.'s procurement teams, particularly in the case of Procurement Concierge, which aims to drive innovation. As noted above, an explicit risk-taking attitude by US federal agencies has been a key part of SBIR's success.

4.2 New design of evaluation (Treasury assessment methods)

While the shift towards a mission-oriented plan in B.C. represents an important step, a key question is whether existing policy tools — from conceptual frameworks to evaluation methodologies and data analytics — enable or in fact constrain such a shift. Indeed, perhaps the main danger is that it will be used as a new label for 'business as usual'.

To avoid this, a fundamental reappraisal of the role of the public sector is required that goes beyond the traditional 'market failure' framework to a 'market-co-creating' and 'market-shaping' role (Mazzucato 2016). This role would enable shifting not only the rate, but also the direction of economic growth; and a shift in focus from marginal improvements in allocative efficiency driven by notions of 'value for money' to a broader notion of public value creation driven by public purpose. Such a change in policy focus requires a different kind of analytical framework for policy appraisal and evaluation that is able to capture the dynamic aspects of market-shaping and 'mission-oriented' policy.

4.2.1 From public goods to public value

As noted above, the dominant economic paradigm of the past five decades has justified government 'intervention' only in very limited circumstances — to fix markets. Under this framework, goods and services are most efficiently produced by private firms operating in a competitive market, and the state should only 'intervene' in markets to correct certain identifiable market failures, which might arise from the presence of positive externalities (e.g. public goods), negative externalities (e.g. pollution) and incomplete information (e.g. between banks and SMEs).

At the same time, it has been assumed that value is a reflection of price — if something has a high price, then it must be valuable. The understanding of value is restricted to a theory of exchange; only that which has a price is valuable. 'Collective' effort is missed since it is only individual decisions that matter. 'Social value' is limited to looking at economic 'welfare' principles; that is, aggregate outcomes from individual behaviours (Mazzucato and Kattel 2019). Meanwhile, at the macroeconomic level, GDP is not able to account for the value of goods and services that do not have prices, such as the essential care we receive inside our homes from family members or the negative effects of pollution on the environment.

While academics have discussed the idea of 'public value' over the past two decades, most notably in the public management and administration field, this has not disrupted the economic understanding of where value is created (Kattel et al 2018). As a result, it has not changed how governments view their role in the economy. In order to make public value a functional and powerful new policy framework, it is necessary to fundamentally rethink the economics that such a framework is based on.

Any theory of value must first identify the collective nature of how value is conceptualised and created. Public value is not just about measuring how the public or society benefits from the value that is created; it is also about how it is created in the first place. Public value has been diminished by not being centred on the state as co-creator and producer. In reality, public value results from the collective imagination and investments of the public, private and non-profit sectors, as well as pressure from social movements. To produce those well, knowledge and capabilities are required in the planning, production, management and interactions among the different interest groups.

While the conventional view is that public goods are required to fill the gap created by a lack of investment by the private sector, public value goes beyond public goods. Rather than asking what gap or failure public goods are filling and fixing, we should ask what are the outcomes that society desires and how can we make these happen. To do this, it is useful to begin with an understanding of markets as outcomes of the interactions between different actors in the economy. The concept of public value enables us to overcome the dubious dichotomy between market and state. In reality, government actions enable markets to function, or create and shape markets, through investment, demand generation through procurement, legal codes, antitrust policies, university scientists and physical infrastructure. In other words, markets are co-created by actors from all sectors. This new role for governments as co-creators of markets would make it possible to shift not only the rate, but also the direction of economic growth through collective action. Thus, the concept of public value is fundamental for guiding public action in shaping markets and co-creating the direction of economic growth.

A more positive theory of public value therefore views value as being collectively generated by a range of stakeholders, including the private sector, the state and civil society (Mazzucato and Ryan-Collins 2019). The market and the economy itself, under this approach, are viewed as an outcome of the interactions between these sectors. If the public part of value creation is guided by different criteria from the private sector, it must also be evaluated differently. Rather than assessing whether a market failure has been corrected, the question is: what form of new market has been created? This requires a fundamentally different approach to the way policies are appraised and evaluated.

4.2.2 The limits of conventional cost-benefit analysis

One of the key challenges in applying a public value-based framework in policymaking is how to relate it to budgetary processes. Conventional approaches to policy appraisal, influenced by the market failure framework, typically involve undertaking a cost-benefit analysis (CBA). Under this approach, costs are usually defined by their opportunity cost, i.e. the value which reflects the best alternative use a good or service could be put to (including a do-nothing/business as usual option) with market prices usually the starting point for the analysis. To enable market-type price comparison of interventions whose return will vary in terms of time, CBAs typically make use of a 'discount rate' that reflects the time preference of users of the service for having money now rather than in the future. After adjusting for inflation and discounting, costs and benefits can be added together to calculate the net present value (NPV) for different policy options.

In B.C., the process for policy appraisal is guided by two main frameworks. The first is the Policy Approaches Playbook, which provides a 'framework to assist policy teams in selecting the most appropriate approach to their particular circumstances' (Government of British Columbia 2020c). The playbook was developed to provide a starting point for new policy analysts to understand the most common policy approaches, as well as a summary overview for experienced policy professionals.

It outlines five principles to guide the development of provincial policy, legislation and regulations in B.C., which are also defined under the Government of British Columbia's Regulatory Reform Policy. The five principles are:

1. **Identify the best option:** To determine the scope of the problem being addressed, policymakers should consider the problem they want to solve, ensuring this is the best approach to achieve the desired outcomes. A full range of options, including non-intervention (i.e. business as usual), should be explored before identifying the best possible option for achieving desired outcomes. This playbook supports the identification of the best option by describing the various approaches and providing examples.

2. **Assess the impact:** When developing new or amending statutes, regulations and associated policies and forms, how to achieve the greatest net benefit and lowest cost to affected groups must be considered. The direct and indirect costs and benefits of the proposed change must be evaluated to minimise compliance burdens on people, business and government. This assessment involves identifying affected groups as well as the nature, magnitude and duration of the impacts.

3. **Consult and communicate:** Early consultation with impacted people, businesses and other relevant groups is a best practice. Parties affected by the change should be consulted and have an opportunity to provide feedback. The ministry making the regulatory change should have a plan to clearly and openly communicate the change, its impact and compliance requirements, in a way that is accessible to all stakeholders. Communication with impacted people, businesses and other relevant groups is essential throughout the regulation development process, particularly if changes are made after the consultation process.

4. **Streamline design:** When developing regulatory changes, options for streamlining must be considered to eliminate duplication, overlap, inconsistencies and contradictions with other regulations, agencies or levels of government. Look for opportunities to minimise the number of steps, improve processing times, improve access or develop user-friendly online services, to reduce the time and costs imposed on businesses and people. Determine how the proposed change streamlines the regulatory process.

5. **Evaluate regulation effectiveness:** Statutes, regulations and associated policies and forms should be reviewed regularly to ensure they are achieving desired outcomes. Quantitative and qualitative measurements should be used to determine how effective the legislation has been in achieving its goal and whether or not it should be amended or repealed.

Notably, the playbook states that, 'In policymaking, the objective is generally to find solutions that require the least amount of regulation and government intervention, while achieving as much or all of government's objectives.' The playbook also stresses the importance of considering the potential benefits of not intervening, stating that this approach 'avoids market distortions from government intervention.'

Further guidance on assessing the costs and benefits of new policy is set out in the Business and Economic Implications Framework (BEIF) (Government of British Columbia 2019c). The BEIF was introduced in January 2019 to provide decision-makers with a 'consistent assessment of the expected implications proposals may have for B.C. businesses and the economy.' The BEIF outlines three steps for assessing a policy proposal's expected costs and benefits for businesses and the economy:

- **Step one:** The BEIF step one form is a simple yes/no questionnaire used to establish whether there are any costs or benefits for businesses, or other impacts on jobs and B.C.'s economy. If all questions are answered 'no' then no further analysis is required. If any questions are answered 'yes', then a step two analysis must be undertaken.
- **Step two:** Step two involves producing an informed assessment of the costs and benefits of a proposal on B.C.'s businesses and the economy. The BEIF guidance includes a BEIF Cost and Benefit Estimator Tool, which follows the standard approach of estimating direct costs and benefits, and then discounting them using a 'discount rate' to calculate the net present value (NPV) for different policy options. The guidance recommends that indirect costs and benefits are better assessed qualitatively as they tend to be more complex to calculate.

- **Step three:** An additional third step is required where a policy proposal is high profile or controversial, or where it has an estimated net cost or benefit of more than $100 million to businesses. While the step two analysis consists of estimates generated by ministry staff using available data, a step three analysis should be conducted by an economic professional using economic modelling approaches to generate more precise estimates and ranges.

As a result, policy appraisal in B.C. typically follows the standard CBA approach that is underpinned by the market failure framework, which uses market prices to estimate direct costs and benefits, and assumes that government intervention in the economy should be minimised. However, this kind of basic CBA is not well suited to mission-oriented policymaking for a number of important reasons (Kattel et al 2018):

- CBA relies on meaningful estimates of costs and benefits. Meaningful estimates can be impossible to make when costs and/or benefits are unquantifiable and subject to fundamental uncertainties (e.g. in relation to the existence of future technologies or the characteristics of future markets).
- CBA considers each potential policy measure on its own merits, but when a system is changing, its behaviour is generally dominated by the collective effect of the interactions between its components, rather than by the behaviour of those components individually (Kunc 2012). Understanding this effect usually requires modelling how the system will evolve over time. CBA cannot achieve this since it assesses all future costs and benefits from the perspective of a single point in time (discounting to give an NPV).
- The market failure framework justifies action only to the extent that it addresses a failure. This falls short of what is needed when the aim is to create a new market or to change the direction of travel of markets' evolution. In mission-oriented policymaking, the aim is not to 'level the playing field', but to 'tilt the playing field' in the desired direction (Mazzucato 2017). CBA and NPV are mostly aimed at preventing costly government failures; by their very nature, they cannot tell us very much at all about proactive market-creating and market-shaping policies.
- By always comparing the policy intervention to the status quo and emphasising short-term risks, CBA approaches encourage decision-makers to prefer small-scale, marginal interventions (Allas 2014: 89). Yet there is considerable evidence that innovation systems exhibit increasing returns or an 'S-curve'-type effect, where shifting incentives across multiple sectors may be more likely to achieve such increasing returns (Mazzucato 2017). The strong emphasis on risk assessment/optimism bias is likely to mitigate against the creation of a mission-oriented approach where failure is viewed as a learning process integral to the achievement of important technological breakthroughs.

More broadly, CBA-type analyses are mainly concerned with static allocative or distributive efficiency, which involves making the best use of resources at a fixed point in time. In contrast, dynamic efficiency involves making the best use of resources to achieve changes over time, and so is concerned with innovation, investment, improvement and growth — including, perhaps most importantly, the creation of new markets and technologies, and shifting technology frontiers (De Soto 2009). Missions are, by definition, concerned with dynamic efficiency rather than allocative efficiency, since they aim to accelerate innovation and transformational change. When allocative efficiency frameworks are applied to dynamic efficiency problems, the analysis presents a very skewed picture that fails to take into account the likelihood of markets shifting over time.

A useful way to illustrate the problem of using market-fixing approaches to policy evaluation, characterised by static allocative efficiency, is to consider how they might constrain market-shaping policy in the context of B.C.'s decarbonisation goals.

B.C.'s decarbonisation goals and dynamic efficiency

The commitment to reaching net-zero emissions by 2050, as outlined in B.C.'s CleanBC Roadmap to 2030, is an example of a dynamic efficiency objective, because it is concerned with making the best use of resources to achieve changes over time. Using standard CBA-type approaches, based on the assumption of allocative efficiency, creates a bias towards certain solutions when it comes to tools such as tax, subsidies and regulation.

Regulation: In allocative efficiency frameworks, regulation is generally seen as a negative to be minimised unless it corrects a market failure. B.C.'s Policy Approaches Playbook emphasises the use of regulation to correct market failures, such as externalities, but warns that regulation 'may translate into a less favourable business environment within economic sectors.' In contrast, from a dynamic efficiency perspective, well-designed regulation can be an important market-shaping tool that can help create new technologies and industrial landscapes that did not exist previously. Tools such as agent-based modelling and evolutionary economics have provided empirical and theoretical explanations for this effect: when placed under constraints, agents devote more of their effort to exploration and less to exploitation (Holland 2000). As a result, using standard CBA approaches to appraise new regulations to support B.C.'s decarbonisation goals may significantly underestimate the benefits of such policies.

Subsidies: In many countries subsidies for the deployment of clean technologies, such as renewable power generation and electric vehicles, have been effective in reducing the costs of these technologies, growing the markets for them and accelerating innovation, strengthening the comparative advantage of countries that have led the way. Allocative efficiency frameworks such as CBA can justify the use of these measures based on the value of avoided carbon emissions, but they typically exclude from consideration any benefits relating to innovation, cost-reduction and future competitiveness. Partly due to the limitations of conventional CBA models, historic attempts to forecast the cost of renewable energy have consistently underestimated how quickly the cost of renewable energy would fall due to technological advances (Zenghelis 2021). As a result, using standard CBA approaches to assess the impact of new clean energy subsidies may significantly underestimate the value of such policies.

Taxation: Introducing a common carbon price across all sectors of the economy has been recommended by a wide range of economists on the basis that this is required for achieving least-cost decarbonisation (LSE 2011, Policy Exchange 2018). In B.C., the Government has already introduced a carbon price of $45 per tonne — the strongest, most comprehensive carbon-pricing policy in Canada — and the Government's CleanBC Roadmap has committed to increasing this further by 2030 (Government of British Columbia 2021).

If the objective were to maximise allocative efficiency, introducing a common carbon price across all sectors of the economy would be the optimal approach. However, because decarbonisation is a dynamic efficiency problem, the level of carbon pricing that significantly influences investment decisions, rates of innovation and the behaviour of market systems varies greatly between sectors: whereas in the power sector a carbon floor price of £18/tonne has been instrumental in accelerating the demise of coal (Howard 2016), in the auto sector an effective carbon price of £300/tonne has had a much more limited effect on the transition away from petrol and diesel vehicles (Watson 2012). As a result, embracing a dynamic efficiency approach to policy appraisal could involve setting different carbon prices in each sector that are somewhere close to a threshold that is likely to act as a tipping point in system behaviour, such as the cost differential between clean and fossil alternatives.

4.2.3 Appraising mission-oriented policies

A market shaping, mission-oriented approach to policy is focussed on creating transformational change to achieve the stated missions — a system-wide dynamic efficiency (including innovation, spillover effects and systemic change). Evaluating these policies must therefore be a dynamic process that requires ongoing and reflexive assessment of whether the system is moving in the right direction via achievement of intermediate milestones and user engagement (Mazzucato et al 2018).

Both the OECD (2015) and the European Commission (2016) have considered dynamics-focused analytical frameworks, noted their distinct differences from more traditional allocative efficiency frameworks and highlighted their applicability to mission-oriented policymaking. While there remains a challenge to provide comprehensive guidance on the application of dynamic efficiency frameworks to economic policy decisions, there are some clear differences from the allocative approach that have been identified in the academic literature. These emerge from the core characteristics of complex systems (Kattel et al 2018):

- **Heterogeneous agents.** In conventional neoclassical models of the economy, a 'representative agent' or firm is generally assumed, with identical preferences to all other agents (or agents who act in such a way that the sum of their choices is mathematically equivalent to the decision of one individual or many identical individuals). Such an approach aids model tractability, but is unrealistic and misleading since economies are inherently heterogeneous, with differences in income, status, wealth, firm size and ownership all influencing 'rational' behaviour. In complex systems, heterogeneity and heterogeneous behaviour are explicitly assumed and modelled.
- **Fundamental uncertainty.** Decisions about the future always involve factors that are to some extent unknowable. Within complex systems, such as areas of the economy that are subject to significant change, these factors are likely to be highly relevant to strategic decisions. This implies that an analytical framework to support mission-oriented policymaking should place a low priority on the ability to confidently quantify precise future outcomes. Instead, they should have explicit and transparent ways of working with irreducible uncertainty, such as including detailed scenario analysis, bringing it to the centre of consideration.

- **Path dependence.** The evolution of complex systems over time is path-dependent. Institutions and agents can become 'locked in' to particular behaviours, norms and cultures (Arthur 1989). This implies that frameworks should place a high priority on the ability to demonstrate that any action (or inaction) is consistent with the desired direction of travel.
- **Disproportionality of cause and effect.** In complex systems, disproportionality or nonlinearity is the norm. A large effort applied to one part of a system may produce no perceptible effect, while a small effort applied to another part may produce a very large effect. This implies that frameworks should place a high priority on identifying the points of greatest leverage, to ensure the cost-effectiveness of interventions.
- **Emergence.** The behaviour of complex systems tends to depend more on the interactions of their components and on the feedback of those interactions on the emergent structure than on the properties of those components individually (e.g. the behaviour of weather systems cannot be understood by extrapolating from the properties of a water molecule). This implies that frameworks should place a low priority on assessing potential actions individually, and a high priority on understanding and assessing their collective effect.
- **Absence of optimality.** While an 'optimal' allocation of existing resources can be defined, there is no meaningful definition of an optimal pathway through time. This is because the range of possible future combinations of technologies, business models and market structures is effectively infinite. Dynamic efficiency cannot be perfected, it can only be made better or worse. This implies that our frameworks can only give comparative rather than definitive answers and that, rather than requiring optimality, they should give a high priority to pathways being adaptive, creating options where there is uncertainty and enabling policy to be revised as uncertainties are resolved.

Table 2 contrasts market-fixing approaches to policy evaluation, characterised by static allocative efficiency, with market-shaping approaches to policy evaluation, characterised by dynamic efficiency.

Table 2: Market-fixing vs market-shaping policy frameworks

	Market fixing	Market-shaping/ mission-oriented
Justification for the role of government	Market or coordination failures: ▪ Public goods ▪ Negative externalities ▪ Imperfect competition/ information	All markets and institutions are co-created by public, private and third sectors; role of government is to ensure markets support public purpose
Business case appraisal	Ex-ante cost-benefit analysis (CBA) — allocative efficiency assuming static general relationships, prices etc	Focused on systemic change to achieve mission — dynamic efficiency (including innovation, spillover effects and systemic change)
Underlying assumptions	Possible to estimate reliable future value using discounting/monetisation of externalities/risk assessment; system is characterised by equilibrium behaviour	Future is uncertain because of potential for novelty and non-marginal change; system is characterised by complex behaviour
Evaluation	Focus on whether specific policy solves market failure and whether government failure is avoided (Pareto-efficient)	Ongoing and reflexive evaluation of whether system is moving in direction of mission via achievement of intermediate milestones; focus on portfolio of policies and interventions, and their interaction
Approach to risk	Highly risk-averse; optimism bias assumed	Failure is accepted and encouraged as a learning device

Source: Kattel et al (2018)

In summary, given the emphasis on transformational change, mission-oriented policies should not be merely assessed using static, allocative efficiency measures, but in terms of creation of public value, dynamic efficiency and their 'additionality' — the extent to which they have been successful at catalysing activity that otherwise would not have happened. This approach helps capture the potential for policy to create spillover effects across many sectors of the economy, and to alter the level of investment and broader trajectory of economic growth.

This does not mean abandoning conventional cost-benefit analysis altogether — these approaches can still play a useful role appraising incremental policies. Instead, it means developing a new complimentary suite of Treasury assessment methods to appraise policies aimed at catalysing *transformational change* to achieve missions. These approaches should aim to capture dynamic effects over time, identify the points of greatest leverage, acknowledge fundamental uncertainties and focus on collective impact across projects (rather than assessing each project individually). Here lessons can be learned from the UK HM Treasury's recent modifications to *The Green Book*, which is widely recognised as one of the leading appraisal and evaluation guidance manuals in the field.

Case study 3

Appraising transformational change in the UK's *Green Book*

The Green Book, issued by HM Treasury, is guidance on how to appraise policies, programmes and projects. It also provides guidance on the design and use of monitoring and evaluation before, during and after implementation. It sets out how policymakers should undertake cost-benefit analysis (CBA) in order to the impact of different policy options on social welfare. However, it has long recognised that CBA is not appropriate in all situations. It notes that, 'Social CBA and Social CEA are 'marginal analysis' techniques. They are generally most appropriate where the broader environment (e.g. the price of goods and services in the economy) can be assumed to be unchanged by the intervention. These techniques work less well where there are potential non-marginal effects or changes in underlying relationships' (HM Treasury 2018: 21).

This limitation is of crucial importance. Market-shaping policies, such as missions, aim to accelerate innovation, creating new technologies and radically changing the prices, availability and existence of goods and services. Their central purpose is to transform underlying relationships, a wide range of prices and the broader environment (OECD 2015). In 2020 HM Treasury published an updated version of The Green Book, which included a new annex setting out how transformational impacts should be appraised robustly within the Green Book framework (HM Treasury 2020). The revised Green Book defines transformational change as:

- A fundamental structural change in the nature of the subject undergoing transformation. The scale of the change alone is not a defining characteristic; and
- Being in practical terms virtually irreversible, in other words the removal of the intervention will not cause the system to revert to its original state.

The guidance notes that transformational change is characterised by both tipping points (where relatively small interventions can be a catalyst for change) and leverage points (key nodes in the system where interventions are most likely to influence the system behaviour). This means it is inherently uncertain and while appraisal can help identify the key parameters and dependencies, it cannot forecast impacts with a high degree of accuracy. It also notes that the likelihood of successfully achieving transformational change is greatest when delivered through a coherent strategy, which in turn is underpinned by strategic portfolios, programmes and projects. Individual projects and programmes will not typically lead to transformational change on their own. In light of this, it recommends that transformational change should be assessed and reported at the level of strategy, while the appraisal of portfolios, programmes and projects should show how their specific outputs are necessary for delivering the transformational objectives of the strategy.

4.3 New financial institution (InBC)

Access to finance is essential for firms looking to grow and innovate. but simply increasing the availability of finance will not on its own improve economic performance. What matters is not just the quantity of available finance, but the quality of finance. This is because finance is not neutral; the type of finance available can affect both the investments made and the type of activity that occurs (Mazzucato and Semieniuk 2017). Because innovation is highly uncertain, has long lead times, and is collective and cumulative, innovation requires not just any type of finance, but patient, strategic, committed finance (Lazonick and Mazzucato 2013). Short-termism and risk-aversion mean that the private sector will often not invest in higher-risk areas until future returns become more certain. Early-stage provision of finance can help to create and shape new markets, and nurture new landscapes, which the private sector can develop further. In other words, it can — if structured well — lead to a dynamic 'crowding in' effect. Understanding how this is done — what works, what does not — requires learning from international experiences with financial institutions willing to provide strategic, long-term finance.

B.C. has already taken the bold step of creating a new public financial institution as a tool to drive the transformational changes it would like to see. The InBC Investment Corp is a Crown, or public sector, strategic investment fund established on 17 September 2020. InBC has been capitalised with $500 million of public funds and is fully owned by the B.C. Government: half by the Ministry of Jobs, Economic Recovery, and Innovation (JERI) and half by the Ministry of Finance. In the words of Premier John Horgan, InBC funds 'will be used to grow the economy and create jobs that will support British Columbians in all regions of the province' (Office of the Premier 2021).

However, establishing a public financial institution does not in itself guarantee that it will be a successful institution. Instead, a public financial institution is made successful by the policies shaping it, the public purpose it aims to deliver on, the representatives governing it and by its ability to demonstrate results to its affected community, transparently and accountably. Just as some public financial institutions are shining exemplars of effective and representative public purpose, others around the world have been captured by private interests and fail to deliver in the public interest. When designed and operated in the public interest, public financial institutions can demonstrate enormous capacity to positively shape social, economic and environmental change by providing policymakers with the tools, expertise and capacity needed to direct finance with public purpose, and in ways capable of confronting grand challenges like inequality, the climate crisis and democratic representation (Mazzucato 2015, 2021).

Public financial institutions are not new. Governments worldwide have begun to create new institutions, including in Germany, Finland, France, the Netherlands, Portugal, Scotland, the UK, Wales and Canada, with the new Canada Infrastructure Bank. In 2021 there were more than 1,650 public financial institutions worldwide, including public banks, investment funds and multilateral banks (Marois 2021a: 55). While historically many of these institutions focused on traditional developmental needs, in recent years many have increasingly focused on overcoming key social and environmental challenges, such as climate change and social inclusion (Griffith-Jones and Ocampo 2018; Mazzucato and Macfarlane 2018a; Mazzucato and Mikheeva 2020; Marois 2021b; Clifton et al 2021).

InBC was created to provide local capital for high growth firms within B.C. in ways that anchor those firms and flows of capital within the province, and to deliver on B.C.'s priorities of inclusive, clean and innovative growth (InBC 2021a: 6). This section explores the potential pathways through which InBC can emerge as a powerful lever of mission-oriented and public purpose-driven transformation and innovation. It does so by examining six crucial design features: InBC's mandate and purpose; its approach to balancing risks and reward; its governance; its approach to assessment and evaluation; its role promoting Indigenous reconciliation; and its role promoting community value creation.

It is important to note that InBC is not alone as a source of patient finance in B.C. — it exists within an ecosystem of public financing across the province and, more widely, Canada. Going forward, it will be important to identify opportunities to collaborate with other public financial institutions to maximise opportunities for financing around inclusive and clean growth in B.C. A full list other sources of finance within the province of B.C. and across Canada is provided in Appendix A.

4.3.1 InBC's mandate and purpose: a missions approach

The main way that public financial institutions can help to create public value is by providing long-term, patient and supportive finance. According to the B.C. Government, the aim of InBC is to align its operations with government priorities and the public sector to confront societal challenges, like recovery from the COVID-19 pandemic (Kahlon 2021). The InBC Act (2021: 4(1)) specifies further that InBC is 'to make investments that achieve a financial return' and 'that support the social, economic and environmental policy objectives of the government.' This has coalesced around a triple bottom line orientation focused on people, planet and profit:

- **People** (economic and social impact): InBC's investments will contribute to positive economic and social outcomes for people throughout British Columbia; this includes jobs creation, advancing reconciliation with Indigenous Peoples, and promoting diversity and inclusion.
- **Planet** (environmental impact): InBC will contribute to a better future by investing in the low-carbon economy to create new clean energy jobs and opportunities.
- **Profit** (financial return): InBC's investments will seek to provide financial returns.

The triple bottom line approach offers broad guidance to InBC and serves to instill an operational ethos that prioritises social and environmental considerations, as well as profit-making. However, going forward a key challenge will relate to how InBC decides to prioritise its limited resources. While $500 million is a significant amount of capital, in the context of the B.C. economy it remains a relatively small sum. As a result, with such a broad mandate there is a risk that InBC's limited funds are not targeted in a sufficiently strategic way, limiting its ability to catalyse meaningful change.

There is therefore scope to establish a more clearly defined direction for InBC's investments to ensure it plays an effective role in supporting B.C.'s new economic plan. Not only will this help InBC decide how to prioritise its investments most effectively, it will also provide a clear basis upon which to monitor and assess InBC's performance. One way to achieve this is to incorporate a mission-oriented framework to its mandate and investment portfolio. There is growing evidence that public financial institutions that are 'mission driven', with investment activities directed towards predefined challenges, are more effective than those tasked with broad socio-economic objectives. While the former focuses on solving concrete problems, the latter can end up reinforcing business as usual — providing low-cost financing to incumbent industries rather than nurturing new industries and transforming existing landscapes (Mazzucato and Macfarlane 2018).

In light of B.C.'s new mission-oriented economic plan, aligning InBC's investment strategy with B.C.'s challenges and mission areas would ensure that InBC's financing activities are in line with government priorities. This approach would enable the creation of a powerful synergy between finance, procurement, regulation and other policies, which can be simultaneously coordinated to drive structural transformation. This close alignment between the German KfW and government policy has been instrumental to the systemic greening of Germany's economy through the Energiewende policy (Moslener et al 2017). Sharpening InBC's directionality in this way will also enable management to better deploy its resources (both financial and knowledge) to tilt the playing field towards the transformative change in areas the government has identified through its new economic plan. In doing so InBC can learn from other examples of mission-oriented public financial institutions, notably the Scottish National Investment Bank.

Case study 4
The Scottish National Investment Bank

In September 2017 the First Minister of Scotland, Nicola Sturgeon, announced plans to establish a new Scottish National Investment Bank to support the Scottish Government's vision for delivering smart and inclusive growth. The announcement was informed in part by advice from IIPP Director Professor Mariana Mazzucato, who has been part of the Scottish Government's Council of Economic Advisors since 2016. Following the announcement, IIPP was appointed to a small advisory group that was convened to lead the work developing an evidence-based implementation plan. This was published in February 2018 and drew on IIPP's research to outline a roadmap for creating a new mission-oriented Scottish National Investment Bank.

The bank began operations in November 2020 and has been designed to provide long-term, public, patient finance to support Scottish Government policy priorities. Following a process of engagement with stakeholders and shareholders, the Scottish government mandated the SNIB to focus on the three grand challenges: the climate emergency; place-based opportunity; and demographic change. To help confront these challenges, the SNIB adopted three missions:

- Achieving a just transition to net zero by 2045
- Extending equality of opportunity through improving places by 2040
- Harnessing innovation to enable our people to flourish by 2040

The SNIB holds itself accountable to its missions by publishing an annual missions report, wherein it assesses and reports on the 'mission impacts of its investments', thus allowing 'the bank's investments to address persistent grand challenges faced by Scotland' (SNIB 2021: 2).

Aligning a public financial institution with a set of missions aimed at confronting predefined challenges is no straightforward task. It requires strategic alignment across all areas — including investment goals, portfolio-based success metrics and investment conditions. The Finnish Climate Fund, for example, was established in 2020 to support Finland's efforts at tackling climate change[2]. To ensure that the fund stays true to this purpose, it devised a set of clear and binding *pre-conditions* that preclude funding projects that do not help to combat climate change. These conditions signal a clear direction to the fund's investment strategy. Similarly, the Dutch Invest-NL Fund (established in 2019) was created to support sustainable transitions. Invest-NL recognised the risk of investments unintentionally counteracting or working at odds with one another in ways that undermine its core purpose. As a result, Invest-NL was designed to ensure that all investments must contribute to both the climate and energy transition. As well as helping to streamline Invest-NL's directionality, this also forms the basis of its performance assessment.

4.3.2 Risks and rewards

Because investing carries a degree of uncertainty, for every success there may also be some failures. In some cases, returns will arise slowly and may be negative in the beginning, while in other cases returns never materialise. Acting as lead investor necessarily means absorbing a high degree of uncertainty and accepting failures when they happen. This highlights the importance for InBC of finding the right balance between risk and reward.

InBC has been tasked with providing strategic risk capital to help companies scale up and grow in ways that confront the challenges of climate change, reconciliation with Indigenous Peoples, social equity and anti-racism, while fostering an innovative economy and achieving a financial return (InBC 2021a: 6; Office of the Premier 2021). It will aim to achieve this by providing patient capital for periods of up to ten years while generating modest returns based on a portfolio of investments unconstrained by short-term profit horizons (InBC 2021b). The Investment Policy Statement that is currently being designed will provide more details on this approach.

2 For further information, see the Finnish Climate Fund (Ilmastorahasto) Strategy.

Lessons on how to assess risks can be drawn from other public financial institutions. In devising its investment strategy, the Invest-NL Fund identified a five-level scale by which it can identity its appetite for risk/reward, ranging from 'very low', 'low' and 'average' to 'high' and 'very high'. Different risk/return appetites are connected to ten different categories of risk that are aligned with the specific context of the Netherlands and Invest-NL as a public institution. In relation to investment risk (the risk of having to write off an investment), Invest-NL specifies that it has a very high appetite for risk/return profiles, because it was 'incorporated to invest in areas where the market does not invest.' In contrast, Invest-NL's appetite for liquidity risk is very low in recognition of the fact that, as a public institution, it wants 'to be able to meet its financial obligations at all times.' In addition, Invest-NL has adopted an environmental, social and governance (ESG) category, or the risk that its 'position will deteriorate because its activities are exposed to risks associated with the environment, sustainability, social performance and appropriate governance.' Its risk appetite in this area is ranked very low, because it has been established to have a positive social and environmental impact. In turn, the transparency of Invest-NL's risk/reward matrix makes it easier for it to be held accountable for pursuing its public purpose.

Figure 11. Invest-NL categories of risk

Source: Adapted from Invest-NL (2021)

In addition to responsibly managing risks, InBC should also be able to capture some of the rewards that arise from the risk-taking and investment of InBC. Where successes have occurred as a result of InBC investments that have benefitted specific firms, InBC should be able to reap some of the financial rewards over time. This can be done by taking equity stakes in the companies supported, just as private venture capital firms do, or sharing ownership of intellectual property (Mazzucato and Macfarlane 2018). In structuring its investment portfolio InBC can learn from the strategies of venture capitalist firms, structuring investments across a risk-return spectrum so that lower risk investments help to cover higher risk ones.

As part of managing its risks and rewards, InBC can also partner with other public and private sources of investment capital (InBC 2021b: 12). For example, InBC can seek to leverage its public capitalisation of $500 million to crowd in additional private investment and combine its lending with other forms of government support, such as grants and procurement contracts. InBC has the opportunity to work with a portfolio of public organisations to manage the risk/reward considerations of investments that might not otherwise be considered viable, but that could catalyse significant public value creation. This could prove particularly impactful for under-served communities that may not fit the risk/reward profiles of conventional impact investors and financial institutions. These include:

- SMEs;
- cooperatives;
- Indigenous-led businesses; and
- women-led businesses.

Focusing on providing finance to these groups, which have historically faced barriers to accessing capital, could be a powerful way for InBC to catalyse public value and additionality. By leveraging and aligning knowledge, expertise and resources across different sources of public funding, InBC can play a major role in stimulating investment that otherwise may not occur.

4.3.3 Governing InBC in the public interest

Governance is perhaps the most significant feature that will determine whether InBC succeeds as a legacy institution within B.C. How a public financial institution is structured, and who is represented through governance mechanisms, shapes the ability it has to catalyse public value creation over the long term. Without meaningful governance and representation, it is difficult for a public financial institution to function with public purpose and to react dynamically to the needs of the society in which it exists. Democratic voices need to be able to transparently assess and shape what a public entity does and why (Galbraith 1973; Cumbers 2012). At the same time, representative governance structures need to be matched by sufficient in-house administrative and knowledge capabilities (Mazzucato and Mikheeva 2020). Many of the problems that have commonly been associated with public financial institutions, such as capture by interest groups, can be attributed to poor governance.

The InBC Act (2021) specifies that there will be a nine-member board with members recommended by the Minister of Jobs, Economic Recovery and Innovation. Two members will be B.C. public servants — the Deputy Ministers of the Ministry of Jobs, Economic Recovery and Innovation and of the Ministry of Finance. Seven members will be from the private sector. The Minister of Jobs, Economic Recovery and Innovation designates the chair in consultation with the Ministry of Finance, while the vice-chair is elected by the board. The board is responsible for managing and supervising InBC operations, and for selecting the chief executive officer (CEO). On the recommendation of the board, the CEO in turn selects the chief investment officer (CIO), who has sole authority over InBC investments. While the CIO ensures that investments are made 'in accordance with the purposes of the corporation', the CIO functions independently from the CEO, board, government or any other public officer.

The InBC Investment Policy Statement will guide CIO decisions by clarifying 'the parameters for achieving a triple bottom line investing mandate' (InBC 2021: 7). The board will hold the CIO accountable for adhering to and operating with the objectives of the IPS (InBC 2021: 8). The InBC Act empowers the board to set up an advisory forum, with up to 12 members, to provide advice to the board. Advisors may also sit on other board committees. By the end of 2022, InBC is tasked with developing a governance and accountability framework that will detail 'the roles and responsibilities of the board, its committees and InBC's management' and define a structure that aligns InBC with government operations to 'deliver its mandate (InBC 2021a: 10-11).

Although InBC's governance model is still taking shape, there are a number of areas where B.C. could seek to enhance its emerging governance practice. While the existing governance model prioritises the presence of decision-making firewalls to privilege independence, it is important that these firewalls do not stifle dynamic alignment with government policy. At the same time, opportunities for the InBC board, CEO and CIO to hear from, and then act on, feedback from wider stakeholders in B.C. on a dynamic basis could be further enhanced. In addition, B.C.'s commitment to reconciliation with Indigenous Peoples provides an opportunity to pursue an innovative and world-leading approach to incorporating the voice of wider stakeholders into governance models.

Around the world public financial institutions are governed in multitudes of ways with significant variation in who is represented in decision-making and why (Bourgin and Sol 2021; Brennan 2021). The experience of other successful public financial institutions, such as Germany's KfW, indicates that including a wider range of stakeholders on the board, such as industrial trade bodies, trade unions and regional representatives, can be beneficial as long as mechanisms are in place to prevent capture by any single interest group. This more representative governance model has enabled KfW to react to societal demands for a deep and prolonged energy transition (Energiewende) across society.

Another successful example is the Costa Rica Banco Popular's Workers' Assembly, which has 290 representatives from ten social and economic sectors (BPDC 2017: 13). The Workers' Assembly appoints four representatives to the seven-member National Board of Directors, with the government appointing three members. The Workers' Assembly is also charged with integrating material delivered to it by the Banco Popular's Permanent Commission for Women. In 2014 a nationwide consultative process resulted in the bank's 2017–20 strategic plan being shaped around three strategic missions: gender equity, accessibility, and environmental responsibility. The bank's governance structures therefore enable dynamic and meaningful feedback loops to take place between the bank and wider society in ways that can impact its future direction.

Case study 5
Governing the German KfW

The German development bank, KfW, was founded in 1948 in post-World War Two Germany with the support of incoming US Marshall Funds for national reconstruction (Marois 2021b: 195; Macfarlane and Mazzucato 2018; Mazzucato and Penna 2015c). KfW's highest governing body is the Board of Supervisory Directors, which has 37 members comprising:

- the Federal Minister of Finance and the Federal Minister for Economic Affairs and Energy, who act as chairman and deputy chairman, alternating the roles on an annual basis;
- five other specified federal government ministers;
- seven members appointed by the Federal Council (Bundesrat);
- seven members appointed by the Federal Parliament (Bundestag);
- one representative each of the mortgage banks, the savings banks, the cooperative banks, the commercial banks and a credit institution prominent in the field of business credit;
- two representatives of industry and one representative each of the municipalities, agriculture, the crafts, trade and the housing industry; and
- four representatives of the trade unions.

The KfW board therefore draws together political and societal representation, facilitating the broad-based representation in ways that can meaningfully shape KfW's operations and direction of travel (Marois 2021b: 202).

Going forward, there are a number of options that could be considered with regards to enhancing InBC governance. For example, InBC could specify the composition of board members by sector and profession in order to increase representation, diversity and range of expertise. InBC could also review the size of its board and how board members are determined to allow for a wider range of voices, drawing on examples such as the KfW model. Stakeholders that could be given a voice include Indigenous communities, cooperatives, SMEs and women, alongside representatives from the ecosystem of finance in B.C., such as private investors, banks and credit unions. In addition, the role of the advisory forum could be strengthened, drawing on aspects of the Banco Popular's assembly model as an overarching forum for democratic deliberations. This model could be used, for example, to provide a platform for meaningful stakeholder engagement over how InBC's missions are best achieved. InBC could also consider establishing permanent expert commissions to provide recommendations on core B.C. priorities, such as social inclusion, environmental sustainability and Indigenous reconciliation, drawing on the Banco Popular model of the Women's Commission.

4.3.4 Assessing success

InBC is currently in the process of developing its accountability and assessment framework, as well as the type of metrics it will employ to measure performance. If InBC is to maintain public confidence over the long term, it is vital that it is able to capture and communicate the value it is delivering to B.C.

Whereas private financial institutions tend to be evaluated on the basis of their financial performance, public financial institutions are often evaluated on the extent to which they are fixing perceived market failures. Public financial institutions are often criticised on the basis of 'picking winners' or 'crowding out'. While there are instances where criticism is merited, part of the reason often lies in the absence of monitoring and evaluation frameworks which adequately capture the dynamic outcomes of public investments and the additionality they generate. As a result, new monitoring and evaluation frameworks will be required in order to assess the performance of InBC that goes beyond the narrow market failure framework, which should include an array of new indicators aimed at assessing the extent to which it has been successful at creating public value and additionality. Crucially, any performance metrics should be dynamically aligned with the specific missions InBC is tasked with delivering.

As discussed in section 4.2, performance metrics should aim to capture dynamic effects over time and focus on collective impact across projects (rather than assessing each project individually). This approach can help to capture positive, economy-wide spillover effects — and identify when projects may no longer be helping to achieve InBC's strategic goals. Assessment can also be embedded into InBC financing decisions: resources can be released and distributed on a 'stage-gate' principle dependent on the project achieving intermediate milestones (Mazzucato 2018: 18). InBC can also attach standards and conditions to funding to ensure alignment with its missions and the priorities of the B.C. Government. This could include developing market-leading standards for ESG lending and attaching conditions to loans (for example, that customers demonstrate adherence to specific environmental standards). Any standards and conditions should be subject to regular reviews, subject to shareholder and stakeholder feedback.

Importantly, any evaluation and lending frameworks should be applied equally to any funds InBC lends via private sector intermediaries (for example private sector banks or investment funds) to ensure that standards are maintained regardless of whether InBC lends to customers directly or indirectly.

4.3.5 Indigenous reconciliation

As a purpose-oriented public financial institution, InBC has a historical opportunity to commit to reconciliation with Indigenous Peoples in B.C. Indigenous Peoples have constitutionally protected rights that are unique and distinct, which InBC should endeavor to acknowledge, recognise and uphold.

In establishing its governance, investment strategy and institutional expertise, InBC will need to co-create an approach that recognises Indigenous rights, historical structural barriers, and the opportunities for value creation among Indigenous communities and businesses. Co-created pathways must be sensitive to the fact that First Nations, Métis and Inuit are distinct peoples with unique cultures, histories, rights and legal traditions in what is now B.C.

In particular, InBC can play an important role in confronting a widely acknowledged barrier to Indigenous-led businesses and entrepreneurs: access to capital. Access to capital is vital for business growth and innovation. It is also essential for achieving the economies of scale required to partner with large industry actors, successfully bid for procurement contracts and engage internationally. Historically, however, Indigenous communities have faced barriers to accessing capital due to a legacy of regulatory hurdles, Indian Act impositions and the inability of Indigenous communities to leverage reserve land as collateral.

A report to the B.C. Government by Indigenuity Consulting Group (ICG) on CleanBC funding programmes, for example, highlighted that there are multiple application processes, varying rules and volumes of information, yet no support for Indigenous communities to help them navigate through it (ICG 2020: 12). Feedback from the First Nations Financial Management Board (FNFMB) in December 2021 also noted the difficulty in navigating the many different pools of public funds, and that the application processes and reporting requirements are often onerous. While InBC cannot overcome these barriers alone, it could play an important role by developing specialised processes and programmes that confront the 'risks and rewards' creatively and meaningfully, helping to catalyse public value creation among Indigenous communities. As noted above, this will not only require meaningful consultations with Indigenous communities, but for Indigenous Peoples to have voice within InBC governance structures.

5 Implementing mission-oriented policy

This paper has explored how three different tools — Treasury assessment, public procurement and public finance via InBC — can be most effectively used to support the delivery of B.C.'s mission-led economic plan. However, missions are not just a new framework for shaping economic policy, they also require changes to the way that policies are delivered. In other words, successfully implementing and governing a mission-oriented approach to policy means changing the way that government operates, engages with citizens and stakeholders, and allocates its resources. In this section we discuss three cross-cutting issues relating to the way that missions are governed and implemented that will be essential if B.C. is to deliver on the promise of its new economic plan.

5.1 Citizen engagement and collective intelligence

Designing and implementing mission-oriented policy cannot be top down. Instead, it must inspire and harness the creativity of citizens to tackle major problems. In order to inspire society at large, and maintain public trust and confidence, missions need to have widespread legitimacy and acceptance. This means, among other things, that mission-setting must find its way to the centre of the political priority-making process and involve citizens in a serious way. Engaging a wide group of stakeholders, from individuals and civil society organisations to citizen movements or political parties, is critical to forming missions and to ensuring their longevity. Bringing diverse and underrepresented voices, including Indigenous communities, into the process of implementing and evaluating missions will be crucially important.

As IIPP has set out elsewhere, there are three key stages where citizen engagement becomes crucial for missions: how to involve citizens in the definition and selection of concrete missions that matter to society; how citizens participate in the implementation of missions; and how citizens will be involved in the assessment (evaluation, review and monitoring process) of missions (Mazzucato 2019). We discuss each of these in turn in the context of B.C.

Co-creation

Missions offer an opportunity to involve citizens in solving grand societal challenges, to communicate about them, and to create wide civic excitement about research and innovation. In this context, it is critical to develop a sound and transparent process to select missions, frame them and to assess missions along the way, so that they have the right checks and balances. In order to achieve this and to ensure that missions reflect societal expectations, it is essential to allow as many citizens as possible to engage in the mission-definition process at an early stage. Meaningfully engaging and involving people in co-design has become a core principle of public sector innovation, just as it is in innovative private sector practice. Co-design gives societal ownership of the missions' goals and objectives, ensuring that the missions have longevity beyond the period in post of individual ministers or governments.

The B.C. Government has already undertaken extensive consultations with a wide range of stakeholders to inform the design of the mission areas in the economic plan. As discussed in Section 3, however, it is vital that concrete targets and objectives are attached to each mission area to ensure that success or failure can be monitored and assessed. Citizen engagement around these targets can play an important role in ensuring they are institutionalised and embedded over the long-term. This can be done in a number of ways, including the use of novel online citizen consultation tools. This potentially allows the collection of large, broad, citizen-based input and responses, at low cost and in a flexible manner. Various governments around the world have engaged in policy experiments relying on large-scale citizen input next to expert knowledge. In addition to online consultations, policymakers can also rely on the wealth of evidence coming from publicly funded research and innovation projects on co-creation and citizen engagement. Going forward, the B.C. Government should continue to make use of formal consultations, as well as direct interaction with citizen movements, civic society, workers, and under-represented groups, to ensure meaningful citizen engagement in the development of concrete mission proposals.

A significant challenge presented by the active involvement of any type of stakeholder group, including citizens or civil society organisations, is avoiding the capture of missions by well-resourced vested interests, and recognising the differences between long-term civic needs, and passing trends and phases. For this reason, citizens and their associations should work closely alongside policymakers, researchers and businesses/industry. Engaging meaningfully with stakeholders may require public funding to ensure that best practice methods are used, and to pay for peoples' time, particularly in the case of under-represented groups such as Indigenous communities. This will enable multiple perspectives to be focused on the issues at hand, avoid mission capture by any one group and ensure a wider systemic change.

Co-implementation

Citizen engagement should not be a one-off event that only takes place when missions are being designed. Instead, it is vital that ongoing engagement takes place while mission-oriented policies are being implemented. It is highly unlikely that citizens can and should be involved in every research and innovation process, but significant space should be given for citizen science and user-led innovation processes in each and every mission. Citizen scientists and social innovators who tackle scientific and innovation challenges that cut across disciplines are a rising phenomenon, including in Canada (Government of Canada 2022). In some cases, they provide research data and solutions that could not feasibly be created by the closed science and innovation system.

The format within which co-implementation takes place in missions depends on the context of the mission. For instance, there could be dedicated bottom-up citizen initiatives in some mission areas. These could take the form of accelerators, providing support to small-scale initiatives through suitable grants, and stimulated by prizes and other types of rewards and incentives, as has happened in the London Borough of Camden in the UK (see case study). In other missions it is possible that co-implementation takes place within projects gathering established science and innovation actors, thereby bringing citizen scientists and innovators much more closely into contact with the traditional research and innovation system, building mutual knowledge and understanding in the process. Going forward, it is vital that citizen engagement in the implementation of B.C.'s mission areas is actively encouraged.

Case study 6

Camden's citizen-centric approach to missions

Camden is a thriving London hub of business and culture, but also has deep social, economic and health inequalities. However, Camden 2025, the vision for the borough, sets out an ambition and set of priorities for Camden to be a place where everyone has a chance to succeed and no-one is left behind. The Camden Renewal Commission was convened in September 2020 to bring together people from across Camden's community and, through its four missions, the Commission has put building an inclusive, healthy and sustainable vision at the heart of the borough's long-term ambition. The commission, tasked in 2020 with the transformation of the London borough of Camden, is co-chaired by Professor Mariana Mazzucato and is supported by 15 commissioners.

Across the borough's missions, a key area of focus is enabling the community to lead and to seed experimentation across the borough in pursuit of the missions. For example, in February 2021, Small Green Shoots and Fitzrovia Youth in Action organised a summit that brought together young people to talk about what the 'youth mission' means to them. Camden Council has also partnered with a participatory grant-making organisation, Camden Giving, to make available a We Make Camden kit of funding, support and networking to take forward their ideas in relation to the missions. Camden Giving had £145,000 available for such grants in 2021. The decisions about who receives funding are made by a panel of Camden citizens.

The council is also building on the early partnerships developed through the commission to take forward activity to achieve the missions. Ultimately, the aim is that community leaders, private sector organisations, anchor institutions and citizens themselves drive forward and co-own the missions, with the ultimate aim of cultivating deep and sustainable roots within Camden.

Co-assessment

The final stage of involvement is engaging citizens and civil society organisations in the monitoring and assessment of the progress of missions, and ultimately their results. Monitoring should be as open and accessible as possible for people to be engaged. This is one reason why missions should be as clearly stated as possible, so broad sections of the population can be engaged in and excited by a mission, and involved in tracking progress.

Citizen engagement should not be limited to traditional community-participation activities. As enabling technologies develop and become more universally present in society, the participation of individuals can be more widespread. Using technological devices such as smart phones for such monitoring activities can create mass mobilisation and civil engagement, providing further pressure for action at the political level.

Well-placed citizen or civil society organisations should also be represented in evaluating proposals, reviewing the progress of projects, evaluating the progress of portfolios of projects and participating in advisory structures. This ensures that the mission's outcomes are aligned with the needs, values and expectations of society. This, again, should take place alongside established researchers, businesses/ industry and policy experts, with the assurance that all stakeholders uphold impartiality in their proceedings.

5.2 Breaking down silos and coordinating missions

Missions aimed at creating and shaping markets are by definition cross-sectoral and should span multiple public organisations. For example, any mission around clean growth will need to work across the departments of energy, transport and health. They require coordination between various policy fields, synergies and breaking 'silos'. However, a lack of such coordination capabilities has become one of the most difficult issues in modern day innovation policymaking and presents a challenge in B.C. The reasons for this can be found in what is called the 'complexity paradox' of modern public policy: the more complex policy issues are, the more compartmentalised policymaking becomes, increasingly fragmented into different government departments and initiatives. On top of that, complex organisational structures with rigid formal processes can limit the flow of information, reduce openness and constrain creativity.

In order for B.C.'s mission-oriented economic plan to succeed, it is therefore critical that it is operationalised across all government departments. By being cross-sectoral and inter-departmental, it can effectively foster and influence the way in which tools — from grants and loans to procurement policy — can be used to crowd in bottom-up experimentation. However, policy in B.C. has historically been developed in a siloed approach, with 'Mandate Letters' being sent to each department, setting out key ministerial priorities. Going forward, it is vital that B.C.'s mission areas sit at the heart of its approach to developing and implementing policy. This means that the machinery of government must become more agile and work across silos, between departments, to take a new and innovative approach to industrial and innovation policy, spurred by missions and grand challenges. Achieving this will likely require new governance structures within the public sector to assume responsibility for driving the missions agenda across government.

Any new governance model must be able to catalyse cross-sectoral and cross-institutional coordination, with the authority to work across government silos and departments. Successfully breaking down traditional silos means taking innovation outside the ministries of business, finance or innovation and putting it at the centre of economic growth strategies. Crucially, it must have buy-in and support from the highest offices of executive power. This creates a more horizontal relationship between those financing economic growth in the Treasury and those in the departments that reflect the content of that growth. While missions represent a bold departure from status quo policymaking, experience shows that in mature economies such as B.C., they are mostly implemented through incrementally upgrading existing governance systems and institutions. Outlining a specific governance model is beyond the scope of this paper, but lessons can be learned from international experience in places like the UK, where the government has created new senior leadership posts to support its mission-oriented industrial strategy.

Case study 7

The UK Industrial Strategy Challenge Fund's 'challenge directors'

The Industrial Strategy Challenge Fund (ISCF) is the UK's flagship challenge-led innovation programme. It is managed by UK Research and Innovation (UKRI), an arms-length agency of the Department for Business, Energy and Industrial Strategy (BEIS). The ISCF was established to address 'major industrial and societal challenges', and is made up of 23 challenges which were aligned with the four themes of the UK government's mission-oriented industrial strategy:

- clean growth;
- ageing society;
- future of mobility; and
- artificial intelligence and data economy.

UKRI invites academics and businesses to make suggestions on particular challenges that might contribute to these objectives and provide a worthwhile use of financial support. To date, £2.6 billion of public money and £3 billion in matched funding from the private sector have been invested in projects that bring together researchers and businesses to tackle major societal and industrial challenges.

To ensure the ISCF had to capabilities to succeed, UKRI recruited a team of 'challenge directors' — senior civil servants with responsibility for setting the direction for, and then successfully implementing and administering, each challenge. Recruitment for challenge directors focused on identifying senior leaders who had a mix of science and industry experience, and a strong track record of catalysing change (House of Commons Committee of Public Accounts 2021).

Whatever model is chosen, it is vital that it is able to influence policy across government, drawing on the expertise of all government departments and agencies. Any new entity must also be fully resourced, both in terms of financial means, but also in terms of staff and analytical capability, ensuring that it is able to attract top talent.

5.3 Building capacity and capabilities for adaptive governance

Among the most important contributors to the success of missions are the capabilities within public bodies, and their capacity to think and act big (Kattel and Mazzucato 2018). Fundamentally, mission-oriented approaches require the ambition to transform landscapes rather than just fix problems in existing ones. Missions represent an end to 'business as usual' for public-private interactions and will require state agencies to be much more active in their role as co-shapers of markets. Key to this is the development of dynamic public sector capabilities, such as the ability to experiment, explore and learn. Not everything will work, nor should it be expected to.

When assessing the types of state capabilities that are needed, there are lessons to be learned from organisations that have tackled ambitious mission-oriented projects, and have implemented structures which are flexible, adaptable and able to foster bottom-up solutions. This is often successfully achieved by implementation structures that enjoy a high degree of political support and which have operational autonomy in order to make sure that political cycles will not derail missions. The ability to experiment by trial and error is also key. The success of agencies such as DARPA in the US, but also key innovation agencies in Finland, Sweden, Israel, Ireland and Singapore, has been driven by continuous, radical experimentation and by the existence of sufficient managerial capacities (Breznitz et al 2018; Breznitz and Ornston 2013). Creating the conditions for this experimentation to take place in B.C. will be vital to the success of the economic plan.

Implementing mission-oriented policy will require specific types of leadership, which encourages risk-taking and adaptive explorative capacity, and can attract top talent to lead such strategies. In some instances, this might mean hiring visionary people with a business, scientific or other background in an advisory capacity, for a limited time period, to assist the governance structure in the definition and design of the missions. Civil servants will also need new skills to successfully manage this transition, such as complex systems analysis and innovation network management (Kattel and Mazzucato 2018). Missions require public actors to think outside the box, both in helping to frame inspirational missions and in using government levers to crowd in and galvanise new activity. This can be enhanced by promoting staff exchanges between the different policy departments, agencies and implementing bodies involved in missions, encouraging experimentation and risk-taking.

6 Conclusions and recommendations

B.C. is facing a set of enormous challenges. This report has argued that economic goals and social and environmental goals are not trade-offs. B.C. can achieve higher productivity, investment and equitable growth while also tackling social inequalities and creating a sustainable economy — but this requires a massive redirection of the economy and a new approach to economic policy. B.C. has taken the important first step of setting out an ambitious economic plan for transitioning to a more sustainable, inclusive and innovative economy. However, setting out a plan is just the first step: whether or not it succeeds will depend on how missions are designed, implemented and evaluated.

In this paper we have explored how each of three of the most important policy tools — public procurement, Treasury assessment methods and public finance — can be most effectively used to support the delivery of B.C.'s mission-led economic plan and considered how potential implementation barriers can be overcome. In doing so we have drawn on IIPP's own research, as well as on numerous interviews, workshops and meetings that have taken place with B.C. government officials. We have not sought to recommend specific missions or broad policy goals, or set out a definitive pathway for B.C. to follow. Instead, our aim has been to provide guideposts to help the B.C. Government move forward with implementing a mission-oriented economic plan. In this section we provide a summary of our overall recommendations. Used strategically, these tools can help B.C. achieve higher productivity, investment and growth and tackle the major social and environmental challenges it faces.

In relation to public procurement, our concluding recommendations are as follows:

- B.C. should introduce additional environmental responsibility and social impact criteria that align with the key performance metrics associated with each mission area under the clean and sustainable growth challenges. These criteria should be clear and well defined, with robust guidelines on how to appraise different options. Crucially, undertaking these appraisals should be made mandatory for all procurement decisions across government.

- B.C. should move towards embracing a functional approach to procurement rather than a product approach. Instead of outlining the precise products the government intends to purchase, the government should instead describe the function, the objective or, even better, the mission that it wants to achieve. By setting out the mission or problem the government is seeking to overcome, rather than a specific product, bottom-up innovation solutions can be incentivised and supported. B.C. could begin this transition by stipulating that a certain proportion of the total procurement budget (10%, for example) should take the form of functional procurement. This could be increased over time, allowing for learning, experimentation and adapting as necessary.
- In relation to Procurement Concierge, the government should play a more proactive role as 'challenge setter', setting out what the key problems are (aligned to the missions in the economic plan) and then inviting business to submit ideas to stimulate bottom-up innovation. By providing a clear direction on the problems B.C. is seeking solutions for, and proactively engaging with innovative businesses, a revised Procurement Concierge initiative could create a strong 'pick the willing' rather than 'pick the winner' dynamic. B.C. should also should strive to increase capabilities in procurement teams by investing in technical capabilities and embedding a risk-taking culture.
- B.C. should rethink the way that contracts between government and business in B.C. are designed and structured to better align risks and rewards between public and private actors, and create more symbiotic and mutualistic partnerships. This should involve attaching conditions to procurement contracts to incentivise desirable corporate behaviour, including in areas such as investment in R&D, employment practice and the price or design of products that emanate from procurement contracts. By attaching binding conditions to procurement contracts between government and business, B.C. can start to forge a new social contract between public and private that delivers sustainable and inclusive outcomes by design.

In relation to Treasury assessment methods, our concluding recommendations are as follows:

- Mission-oriented policies should not be merely assessed using static, allocative efficiency measures such as cost-benefit analysis. In practice, these tools often prevent bold and ambitious public policies being developed. Instead, a mission-oriented approach requires a different kind of analytical framework for policy appraisal and evaluation that is able to capture the dynamic aspects of market-shaping policies, such as spillover effects, uncertainty, innovation and structural changes to the economy.
- Going forward, B.C. should seek to develop a new suite of Treasury assessment methods focused on systemic change to achieve missions which aim to capture the creation of public value, dynamic efficiency and 'additionality', learning from best practice around the world. This approach helps capture the potential for policy to create spillover effects across many sectors of the economy, altering the level of investment and broader trajectory of economic growth.

In relation to InBC, our concluding recommendations are as follows:

- While a triple bottom line framework offers some guidance to InBC, a mission-oriented approach, whereby InBC co-creates a set of clear, bold, measurable missions, would provide enhanced directionality to what InBC does and why it does it. Aligning InBC's investment strategy with the challenges and mission areas in B.C.'s new economic plan would provide a powerful tool for accelerating the delivery of clean and inclusive growth.
- InBC should take a strategic approach to risk and reward, including ensuring it is able to capture rewards associated with the successes that have occurred as a result of InBC investments. InBC should also seek to partner with other public organisations to provide finance to under-served communities that may not fit the risk/reward profiles of conventional impact investors and financial institutions, including SMEs, cooperatives, Indigenous-led businesses and women-led businesses.
- While InBC has been launched with a governing board that reflects a wealth of knowledge and expertise, there are opportunities to enhance its governance model to make it more democratic and representative. This could involve reviewing the size and composition of its board, learning from international best practice. The role of the advisory forum could also be strengthened to provide a platform for meaningful stakeholder engagement over how InBC's missions are best achieved.

- InBC should establish new monitoring and evaluation frameworks that go beyond the narrow market failure framework. These should include an array of indicators aimed at assessing the extent to which it has been successful at creating public value and 'additionality' in line with its strategic missions.
- InBC should seek to overcome historic barriers surrounding access to capital for Indigenous communities, for example by developing specialised processes and programmes designed to address the unique circumstances faced by Indigenous communities.

In relation to implementation, our concluding recommendations are as follows:

- Instead of viewing citizen engagement as a one-off event that only takes place when missions are being designed, ongoing engagement is vital to maintain legitimacy and public trust throughout the process of implementing and assessing missions. Interacting with bottom-up citizen initiatives, working with citizen scientists and social innovators, and utilising digital technologies can all help to ensure that multiple voices are heard, avoid capture by any one group and build 'collective intelligence'. Bringing diverse and underrepresented voices, including Indigenous communities, into the process of implementing and evaluating missions will be crucially important.
- In order to ensure that B.C.'s mission-oriented economic plan is operationalised across all government departments, new governance structures may be needed to assume responsibility for driving the missions agenda across government. Any new governance model must be able to catalyse cross-sectoral and cross-institutional coordination, drawing on the expertise of all government departments and agencies.
- Going forward, steps should be taken to build capacities and capabilities for adaptive governance. This means investing to attract top talent, encouraging a risk-taking culture and creating an environment that is conducive to continuous, radical experimentation. Civil servants may also need new skills to successfully manage this transition, which can be enhanced by promoting staff exchanges between the different policy departments, agencies and implementing bodies involved in missions.

B.C. has taken the important first step of embracing a mission-oriented approach to its new economic plan. If structured and governed effectively, the plan can help B.C. achieve its economic goals, while also battling social inequalities and creating a sustainable economy. Achieving this will require utilising the full power of government policy to create an investment and innovation ecosystem that drives growth while solving key problems in society. Most importantly, however, it will require a drive and determination to succeed, a willingness to take risks and experiment, and a joined-up, coordinated approach across different government departments. Successfully implementing mission-oriented policy is not easy and mistakes may be made along the way, but the goal of building a fairer, more sustainable and more resilient economy is now achievable if B.C. embraces the opportunity to take an active role in setting the direction of economic growth.

Appendix A: The ecosystem of public finance in British Columbia and Canada

Table 3: The ecosystem of patient public finance

Name	Responsible ministry (federal/ provincial)	Target sectors/areas	Nature of funds	Available resources ($)
Innovate BC	B.C. Ministry of Jobs, Economic Recovery and Innovation	Innovation	Grant programmes/ project funding	$25 Mn for 2021–22
Forestry Innovation Investment	B.C. Ministry of Jobs, Economic Recovery and Innovation	Forestry — innovation	Grant programmes/ project funding	$6.58 Mn invested in 2020–21
B.C. Knowledge Development Fund	B.C. Ministry of Jobs, Economic Recovery and Innovation	Post-secondary/ health — research infrastructure	Grant programmes/ project funding	$802 Mn invested since 1998
Innovative Clean Energy Fund	B.C. Ministry of Ministry of Energy, Mines and Low Carbon Innovation	Clean energy	Grant programmes/ project funding	$110 Mn invested since 2008
CleanBC Building Innovation Fund	B.C. Ministry of Ministry of Energy, Mines and Low Carbon Innovation	Buildings — low-carbon innovation	Grant programmes/ project funding	$5 Mn for 2021–2022
CleanBC Industry Fund	B.C. Ministry of Environment and Climate Change Strategy	Clean energy, efficiency and decarbonisation	Grant programmes/ project funding	$33 Mn in carbon tax revenue for 2020
CleanBC Communities Fund	B.C. Ministry of Municipal Affairs and Housing/ B.C. Ministry of Environment and Climate Change Strategy	Clean energy and energy efficiency	Grant programmes/ project funding	$47 Mn for 2021–2022

Name	Responsible ministry (federal/ provincial)	Target sectors/areas	Nature of funds	Available resources ($)
Go Electric Advanced Research and Commercialization Program	B.C. Ministry of Energy, Mines and Low Carbon Innovation*	Transportation — technology	Grant programmes/ project funding	$4.18 Mn in 2020
Renewable Energy for Remote Communities Program	B.C. Ministry of Energy, Mines and Petroleum Resources**	Clean energy	Grant programmes/ project funding	$16.5 Mn for 2020–2023
First Nations Clean Energy Business Fund	B.C. Ministry of Indigenous Relations and Reconciliation	Indigenous clean energy	Grant programmes/ project funding	$6 Mn total
BC Indigenous Clean Energy Initiative	B.C. Ministry of Energy, Mines and Low Carbon Innovation***	Indigenous clean energy	Grant programmes/ project funding	$9.5 Mn total
Jobs and Growth Fund in Western Canada	Western Economic Diversification Canada	Growth and recovery sectors	Grant programmes (non-profits) and loans	$217 Mn total
Regional Economic Growth Through Innovation	Western Economic Diversification Canada	Innovation	Grant programmes and loans	N/A
Strategic Innovation Fund	Innovation, Science and Economic Development Canada	Innovation	Grant programmes and loans	$2.2 Bn for 2021–2028 (in addition to Net Zero Accelerator)

* The Go Electric Program is administered by MNP LLP.
** The Remote Communities Program is administered by Coast Funds and the Fraser Basin Council.
*** The Indigenous Clean Energy Initiative is implemented and administered by New Relationship Trust.

Name	Responsible ministry (federal/ provincial)	Target sectors/areas	Nature of funds	Available resources ($)
Net Zero Accelerator Initiative	Innovation, Science and Economic Development Canada	Clean energy and decarbonisation	Grant programmes and loans	$8 Bn for 2020–2028
Canada's Digital Technology Supercluster	Innovation, Science and Economic Development Canada	Digital technology	Grant programmes/ project funding	$173 Mn total
Industrial Research Assistance Program	National Research Council of Canada	Innovation	Grant programmes/ project funding	$500 Mn for 2021–2026
Community Opportunity Readiness Program	Indigenous Services Canada	Community economic development	Grant programmes/ project funding	$78.9 Mn for 2019–2024
Energy Innovation Program	Natural Resources Canada	Clean energy and energy efficiency	Grant programmes/ project funding	$24 Mn annually
Clean Tech Fund	Sustainable Development Technology Canada	Clean energy, efficiency and decarbonisation	Grant programmes/ project funding	$750 Mn for 2020–2024
Clean Tech Practice Program	Business Development Bank	Clean technology	Loans/ financing	$600 Mn for 2018–2023
Industrial, Clean and Energy Technology Venture Fund	Business Development Bank	Innovation	Loans/ financing	$300 Mn total
Indigenous Growth Fund	Government of Canada	Indigenous innovation	Loans	$150 Mn total

Funds within the Ministry of Jobs, Economic Recovery and Innovation

InBC exists alongside two other B.C. public sector Crown agencies and funding bodies with responsibilities focused on innovation and technology: the B.C. Renaissance Capital Fund/BC Tech Fund (discussed below) and Innovate BC. Other pertinent public innovation agencies linked to JERI include the Forestry Innovation Investment and the B.C. Knowledge Development Fund.

Innovate BC encourages the development and application of innovative technologies to meet the needs of industry in B.C., and accelerates technology commercialisation by supporting start-ups and developing entrepreneurs. Innovate BC is responsible to and supports the broader mandate of JERI. Its current strategic priorities include support for technology start-ups; offering business development and partnership opportunities; support for B.C. entrepreneurs; building the capacity of B.C. companies to access global markets and attract investment; facilitating relationships between B.C. industry and public post-secondary institutions; providing policy and programme advice to government to foster innovation and the commercialisation of B.C. technologies; and working with regional partners to ensure the benefits of technology and innovation are felt around the province. Innovate BC has a budget of around $25 million for 2021 (including a one-time contribution of $15 million for the Innovator Skills Initiative), with funding sources typically split between the provincial and federal governments (Government of British Columbia 2021c). The Innovate BC Ignite Program offers over $1 million annually to B.C. technology companies for innovation projects in the natural resources and applied science space, and its BC Fast Pilot has provided $3.8 million in funding since 2019 to support B.C. SMEs to design, build and operate a pilot or small demonstration. BC Fast funding is provided in partnership with the National Research Council of Canada.

In addition, JERI is responsible for the **Forestry Innovation Investment (FII)** fund and the **B.C. Knowledge Development Fund (BCKDF)**. The FII focuses on supporting innovation and growth in B.C.'s forest sector. In 2020–2021, FII invested $6.58 million, which helped to leverage just under $22 million with federal government and private industry contributions. The FII Wood First Program specifically targets innovative, sustainable and climate-friendly wood use and construction technologies in B.C., committing approximately $2.3 million in 2021–2022. The BCKDF focuses on primary capital investment support for B.C. research infrastructure through public post-secondary institutions, research hospitals and affiliated non-profit agencies. The BCKDF funds up to 40% of project costs, alongside the Canada Foundation for Innovation (CFI), which also funds 40%. The remainder is funded by private partners/research institutions (Government of British Columbia 2021a).

Funds within British Columbia

The province of B.C. has numerous support programmes and funds (possibly as many as 50) that align with the priorities of InBC, such as low-carbon innovation, inclusive economy, reparations, distributed growth, SMEs, technology and maintaining investment in B.C. Across many of these programmes there are clear connections with core components of CleanBC, even if the programme predates CleanBC.

The **Innovative Clean Energy Fund (ICE)** was launched in 2008 and is funded through a levy on certain energy sales. Since 2008, ICE has provided financial support of around $110 million towards pre-commercial clean energy technology projects, clean energy vehicles, research and development and energy efficiency programmes. In 2017, ICE supported the B.C./STDC (Federal) Joint Call Partnership to establish a $40 million fund for clean energy projects. In 2021, the Government announced that ICE will support the province's hydrogen strategy.

There are several CleanBC-related funds too. The **CleanBC Building Innovation Fund** supports low-carbon, energy-efficient building solutions, including innovative design, construction practices, systems, materials, products or technologies. The CBBIF has allocated $5 million for fiscal 2021/2022. The CleanBC Industry Fund invests a portion of B.C. carbon tax revenues into businesses working on GHG emission reduction projects from large industrial operations (including development, trial and deployment). Investments aim to foster a larger market for B.C.'s clean technology companies. In 2020, approximately $33 million in carbon tax revenue was invested in 22 emission-reduction projects.

The **CleanBC Communities Fund (CCF)** invests in small-scale, Indigenous and non-Indigenous community-owned clean energy projects. CCF aims to foster a transition away from fossil fuels, and generate new economic activity and new jobs, while advancing B.C.'s clean energy sector. Funded projects must increase the community's capacity to manage renewable energy, access to clean energy transportation, the energy efficiency of buildings or the generation of clean energy (Government of British Columbia 2021b). The CCF is a federal-provincial partnership, with the federal portion falling under the Investing in Canada Infrastructure Program (ICIP) Green Infrastructure Sub-Stream. The first wave of funding was $63 million in 2018. In 2020, up to $47 million was committed for projects starting in 2021 or 2022.

The **Go Electric Advanced Research and Commercialization Program (ARC)** was created in 2018 and falls within the CleanBC Go Electric Program. ARC funding supports the development of companies operating in the zero-emission vehicle (ZEV) sector and encourages international investment in B.C. The ARC program awarded $1.19 million to five projects in 2019. In 2020, available ARC funding increased to $4.18 million. The ARC Program is administered by a business advisory firm, MNP LLP.

The **Renewable Energy for Remote Communities Program (RERC)**, a CleanBC program, funds the capital costs of renewable electricity projects to reduce reliance on diesel. Funds can cover construction activities, contract labour, equipment for project construction, training costs, technology procurement and associated materials. On behalf of the province, Coast Funds and the Fraser Basin Council (FBC) are responsible for delivering $16.5 million to remote communities to develop renewable electricity projects. Coast Funds, an Indigenous-led conservation finance organisation, is responsible for delivering the RERC Program with First Nations located in the Great Bear Rainforest and Haida Gwaii regions. The Fraser Basin Council (a non-profit comprised of federal, provincial and First Nations government and third sector organisations) is responsible for delivering the RERC Program with all other remote communities in B.C.

The **First Nations Clean Energy Business Fund (FNCEBF)** was created by the Clean Energy Act in 2010 to promote increased Indigenous community participation in the clean energy sector within their traditional territories and treaty areas. The FNCEBF provides agreements between the B.C. Government and successful applicants for 'capacity' (community energy plans, equity project feasibility studies) and 'equity' (investment in clean energy generation projects or assistance in the implementation of energy efficiency/demand-side projects within a community). It also provides revenue-sharing agreements between the B.C. Government and First Nations. The Ministry of Indigenous Relations and Reconciliation is responsible for administering the fund and it uses expertise from across provincial government to assess applications. The FNCEBF has about $6 million in funds and it is expected to receive additional revenue from new power projects (Government of British Columbia 2020).

The **B.C. Indigenous Clean Energy Initiative** (BCICEI) was launched in 2016 with $4.2 million in funding and renewed in 2019 with a further $9.5 million in funds over three years. The BCICEI is a partnership between Western Economic Diversification Canada (federal/regional body), the province of British Columbia and the New Relationship Trust (First Nations, non-profit), which administers the programme based on an Indigenous-led management structure. The funding received is described by the New Relationship Trust as a form of 'economic reconciliation'. The BCICEI supports developing local clean energy and energy efficiency projects in Indigenous communities; building Indigenous capacity; creating benefits, including ownership, revenue sharing, business development and local employment; and identifying pathfinding opportunities for further funding and partnerships on clean energy.

Funds within Canada

At the federal government level, there are important funding and financing programmes whose mandates connect with InBC. As noted above, some B.C. innovation and investment funds have already been leveraged with these federal programmes. There may be further opportunities to leverage these federal finds with InBC.

The regional development agency programme, **Western Economic Diversification Canada (WD)**, is evolving into two separate regional development agencies, one focused on the prairies and a second on the pacific region, named **Pacific Economic Development Canada (PacifiCan)**. Therein, WD is supporting two programmes of relevance to B.C. and PacifiCan.

First, there is the **Jobs and Growth Fund in Western Canada**. This provides funding to businesses and organisations to help create jobs and position local economies for long-term growth. WD provides $700 million nationally over three years, which includes up to $70 million dedicated to businesses created after January 2020. WD will provide up to $217 million to help future-proof businesses, build resiliency, support green transitions, foster inclusive recovery, enhance competitiveness and create jobs. Support for transitions to a green economy, inclusive recoveries, SMEs and digital transformations, and growth sectors are clear foci.

Second, there is the national **Regional Economic Growth through Innovation** programme, which is also delivered through regional development agencies, including PacifiCan. Two core programmes include the Business Scale-up and Productivity Program, which offers interest-free, repayable funding to incorporated businesses, and the Regional Innovation Ecosystems Program, whose funding supports inclusive regional ecosystems conducive to innovation, growth and competitiveness. Economic inclusion is a priority, as is support for growth in clean tech and resources; life sciences; value-added agriculture; advanced manufacturing; and digital technology.

The Federal Ministry of Innovation, Science and Economic Development Canada (ISED) is supporting well-funded programmes of note. First, there is the **Strategic Innovation Fund (SIF)**, which in 2021 was allocated $7.2 billion by the Government of Canada over seven years. The fund supports large-scale, transformative and collaborative projects that promote the long-term competitiveness of industry, clean growth and strategic technological advantage. SIF plays a key role in the continuum of innovation funding: $2.2 billion from SIF covers all sectors of the economy, is available to for-profit and not-for-profit organisations with innovation, and has two broad components, Business Innovation and Growth, and Collaborations and Networks.

Second, and also supported by SIF, is the **Net Zero Accelerator Initiative (NZA)**. It was launched in 2020 with $3 billion and awarded an additional $5 billion, beginning in 2021–2022, making it an $8 billion initiative to support projects that will help to reduce domestic greenhouse gas emissions. It supports Canada's goal of being a net-zero economy by 2050 and will target projects that lead to the decarbonisation of large emitters; support clean technology and industrial transformation; and help the development of a Canadian batteries ecosystem.

ISED is also supporting **Canada's Digital Technology Supercluster (CDTS)**, a B.C.-based consortium of private industry, high-tech start-ups and post-secondary institutions. CDTS aims to advance Canadian digital technologies to address health, sustainability and productivity challenges, and create economic opportunities across Canada. CDTS is funded as part of the Canadian Government's Innovation Superclusters Initiative, which received $173 million from the federal government over five years beginning in 2018, matched by over $200 million pledged by the members of the CDTS.

The **National Research Council of Canada** has an innovation assistance programme for small and medium-sized businesses called the **Industrial Research Assistance Program** (NRC IRAP), which aims to accelerate SME growth by providing innovation services and funding. The NRC IRAP offers non-repayable financial assistance covering 80% of salaries and 50% of contractor costs under various sub-programmes. In 2021, the Government of Canada announced $500 million over five years, starting in 2021–2022, and $100 million per year thereafter. The NRC IRAP has already partnered with Innovate BC on the BC Fast Pilot Program.

Indigenous Services Canada (ISC) has the **Community Opportunity Readiness Program (CORP)**. CORP provides project-based funding to First Nation and Inuit communities for a range of activities to support economic development opportunities in communities. The CORP Annual Regional (B.C.) Budget is approximately $2.1 million. The annual CORP Prioritization Framework Budget 2019 proposes to invest $78.9 million over five years, starting in 2019–2020, with $15.8 million per year ongoing, to support Indigenous entrepreneurs and economic development.

Natural Resource Canada (NRCan) has the **Energy Innovation Program (EIP)**, which targets advancements in clean energy technologies, while supporting the transition to a low-carbon economy. The EIP has an annual grants and contributions budget of $24 million. The EIP funds research, development, demonstration projects and other scientific activities in relation to its four missions:

- Improving efficiency and processes to reduce emissions from energy end-use;
- Accelerating electrification and maximising the benefits of low-emitting heat and power;
- Developing cleaner hydrocarbon and renewable fuels pathways; and
- Maintaining safe and resilient energy systems to protect Canadians in the changing energy landscape.

The **Sustainable Development Technology Canada (SDTC)** is an arm's-length foundation created by the Government of Canada to fund new clean technologies. It is the largest funder of cleantech SMEs in Canada. SDTC's mission is to identify and fund Canadian companies developing and demonstrating new technologies with the potential to transform the environmental and economic prosperity of Canada. Through its Clean Tech Fund, SDTC provides funding to Canadian SMEs advancing innovative technologies that are pre-commercial, and have the potential to demonstrate significant and quantifiable environmental and economic benefits. In 2020, the SDTC was recapitalised with $750 million over five years.

Community and public financial institutions in B.C. and Canada

The mandate and scope of InBC suggests that its investments have the potential to connect with and leverage the financial resources held by community (notably credit unions) and other public financial institutions within B.C. and nationally.

Credit unions are often community-based and community-focused financial institutions that adopt ESG priorities and triple bottom line mandates similar to that of InBC. The province of B.C. has one of the strongest and largest credit union networks in Canada with over 30 institutions, most of which have strong ESG mandates, and support socially responsible and impact investing. The five largest credit unions in B.C. by assets are: **Vancity, Coast Capital Savings, First West Credit Union, Blueshore Financial** and **Westminster Savings Credit Union**. Vancity is the largest credit union not only in B.C., but in Canada, holding some $25 billion in assets in 2020. It has a strong ESG mandate and a triple bottom line approach of 'people, planet, profit'. Every year, Vancity returns 30% of net income back to members and the community through its Shared Success Program, which makes contributions in the form of grants and donations to members and the broader community. For 2021, $6.95 million supported organisations that are doing work to strengthen communities. Funds focus on three areas: cooperative principles and practices; social justice and financial inclusion; and environmental sustainability. The president and chief executive officer of Vancity, Christine Bergeron, is the first board chair of InBC.

The quasi-public **British Columbia Investment Management Corporation (BCI)** is the province's public pension fund manager. It is the fourth largest pension fund in Canada, with $199.6 billion in managed assets accounting for over 500,000 pensions that are included in the College Pension Plan, Public Service Pension Plan, Teachers' Pension Plan, Municipal Pension Plan and WorkSafeBC Pension Plan (among others). BCI incorporates ESG considerations. BCI has come under criticism, however, as only a small portion of the invested funds (as little as 16%) have been found to come under ESG oversight (See Yunker, Dempsey and Rowe 2018: 18–28).

Canada has three national-level public banks of relevance to InBC. **Business Development Bank (BDC)** is a Crown corporation and national development bank, mandated to help create and develop Canadian businesses through financing, growth and transition capital, venture capital and advisory services, with a focus on SMEs. In 2019 it had $30.6 billion in assets. BDC supports clean tech and green innovation as well as key industry areas in agriculture; biorefinery products; energy efficiency; energy infrastructure; extractive processes and products; industrial processes and products; power generation; recycling, recovery and remediation; transportation; water and wastewater. The **Clean Tech Practice Program** is committing $600 million between 2018–2023 in both new equity and commercial loans. Here the BDC commits to taking on more risk to help high-potential cleantech firms scale and expand. The BDC **Industrial, Clean and Energy Technology (ICE) Venture Fund** has $300 million in capital, providing early-stage investment and beyond, with a focus on ESG, energy, mobility, industrial systems and technology, among other areas.

Export Development Canada (EDC) is a federal export credit agency with $60.4 billion in assets (2018). EDC has a Net Zero 2050 plan and is committed to becoming a net-zero institution by 2050 (net zero means emissions generated by clients) (Export Development Canada 2021). This means increasing BDC business with low or no-emission business, and supporting projects and companies that capture, use or store emissions.

Canada Infrastructure Bank (CIB) was founded in 2017 and plans to invest $35 billion in revenue-generating infrastructure. Its priorities include climate actions, indigenous reconciliation, connected communities and economic growth. The CIB sees itself as a catalyst for private investment nationally in green infrastructure, clean power, public transit, trade and transportation, and broadband. This de-risking PPP approach has generated criticism nationally from public sector unions and academics, because it promotes the privatisation of public services (CITES; CUPE; McDonald et al 2020). In October 2020, the Government announced a COVID-19 growth recovery plan to direct $10 billion of the CIB's $35 billion into five major initiatives: $2.5 billion for clean power to support renewable generation, storage and transmission; $2 billion for broadband in under-served communities; $2 billion for large-scale building retrofits; $1.5 billion for agriculture irrigation; and $1.5 billion for zero-emission buses and charging infrastructure.

There are a number of indigenous community funds and financial institutions operating in B.C., often with support from federal public financial institutions. Nationally, **Indigenous Growth Fund (IGF)** is a new $150 million investment fund for Indigenous SMEs. IGF is funded by the Government of Canada and the Business Development Bank of Canada (BDC), as well as by Export Development Canada (EDC) and Farm Credit Canada (FCC).

Indigenous businesses can access IGF resources through business loans available from **Aboriginal Financial Institutions (AFIs)** across Canada. The funding is seen as a commitment to economic reconciliation and a crucial step on the path to prosperity for Indigenous Peoples. Within B.C., there are 11 AFIs: Aboriginal Business and Community Development Centre; All Nations Trust Company (ANTCO); Burns Lake Native Development Corporation (BLNDC); CFDC of Central Interior First Nations; Haida Gwaii Community Futures; Métis Financial Corporation of B.C. (MFCBC); Native Fishing Association (NFA); Nuu-chah-nulth Economic Development Corporation (NEDC); Stó:lō Community Futures Corporation (SCF); Tale'Awtxw Aboriginal Capital Corporation (TACC); and the Tribal Resources Investment Corporation (TRICORP).

Appendix B: Abbreviations and acronyms

B.C.	British Columbia
BEIF	Business and Economic Implications Framework
BEIS	UK Department for Business, Energy and Industrial Strategy
BERD	Business expenditures on research and development
BIPOC	Black, Indigenous, and People of Colour
CBA	Cost-benefit analysis
CEO	Chief executive officer
CIO	Chief investment officer
DARPA	Defence Advanced Research Projects Agency
DRIPA	Declaration on the Rights of Indigenous Peoples Act
ESG	Environmental, Social and Governance
EU	European Union
FNFMB	First Nations Financial Management Board
GDP	GDP Gross Domestic Product
ICG	Indigenuity Consulting Group
IIPP	The UCL Institute for Innovation and Public Purpose
InBC	InBC Investment Corp
ISC	Innovative Solutions Canada, Canada's federal innovation agency
ISCF	The Industrial Strategy Challenge Fund, the UK's flagship challenge-led innovation programme
JERI	B.C. Ministry of Jobs Economic Recovery and Innovation
KfW	Kreditanstalt für Wiederaufbau, a German development bank
NPV	Net present value
OECD	Organisation for Economic Co-operation and Development
R&D	Research and development
ROAR	Routes & directions; Organisations; Assessment; Risk & rewards
SBIR	US' Small Business Innovation Research programme
SDGs	Sustainable Development Goals
SME	Small or medium enterprise
SNIB	Scottish National Investment Bank
UCL	University College London
UKRI	UK Research and Innovation, an arms-length agency of BEIS
UN	United Nations
UNDRIP	UN Declaration on the Rights of Indigenous Peoples

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