TABLED DOCUMENT 272-18(2) TABLED ON FEBRUARY 8, 2017

THE PATH TO PROSPERITY

EXECUTIVE SUMMARY

ADVISORY COUNCIL ON ECONOMIC GROWTH
February 6, 2017

The Council's second wave of recommendations

The Advisory Council on Economic Growth has been operational for ten months, with a mandate to recommend bold ideas that will significantly improve Canada's economic growth trajectory. The Council is focused on actionable ideas that will drive inclusive growth for all Canadians, with the goal of generating an additional C $15,000 in real, pretax median household income over the current baseline trajectory by the year 2030.

The Council released its initial wave of three specific recommendations in October 2016. As described in more detail in the introductory paper that accompanied those recommendations, Canada faces significant economic headwinds, including a rapidly aging population and a stubbornly low level of productivity. In the years ahead, unprecedented technological change, which presents a large set of opportunities but also the potential for significant workforce dislocation, combined with an uncertain global political, economic, and trade environment, will make the task of meeting the inclusive growth target that we have set out even more urgent and complex.

With this context in mind, the Council decided to focus on bringing forward fewer than a dozen recommendations, which together have the potential to jolt the Canadian economy onto a higher and more inclusive growth path. These recommendations came out of working groups organized around the core foundations of our national economy—skills and workforce participation, innovation, infrastructure and capital investment, and the competitive market environment. In making our selection for recommendations, the Council took into account the Government's own assessment of its existing capabilities and where it felt it could use additional support. Our strong bias was to advance ideas that could be readily implemented, versus delivering a lengthy review of every possibility.

Taken as a whole, our recommendations share common properties: they re-imagine the role of government (specifically, as a convener/catalyst and as an investor), and they push for the flexibility needed to keep pace with a fast-changing world. While some of our initiatives may be more controversial than others, we believe the sum of our recommendations is greater than each of the parts taken alone, as they are mutually reinforcing. Much like "tools in a toolkit," these recommendations can be used in concert and with strategic intent to dramatically accelerate growth, as we have illustrated in a case example of Canada's agriculture and food sector.

In addition, rather than issue a single large report, we have chosen to release a set of short memos each focused on a recommendation. We wanted to get our proposals out when ready, being practical, rather than looking for a "big bang." Our first wave of recommendations from October 2016 included: a proposal for laying the foundations for inclusive growth and improved productivity through a national infrastructure bank and strategy, another on significantly boosting global direct and indirect investment in Canada through a foreign direct investment agency, and a third on immigration—increasing immigration, especially economic immigrants and streamlining immigration to ease entry for top talent.

Today, the Council is releasing its second wave of recommendations, which build upon our first wave and help move us closer to the inclusive growth objective we established. Together, these recommendations have the potential to significantly accelerate the pace and scalability of our innovation ecosystem, to re-engage

more Canadians into the labour force and better prepare them for the jobs of tomorrow, to enhance our ability to compete and win in a few global economic sectors where Canada is naturally advantaged, and to strengthen and diversify our trading partnerships.

More specifically, today's release includes three detailed recommendations . . .

- Unlocking innovation to drive productivity and help new companies scale up more rapidly, including five sub-recommendations to improve the innovation ecosystem
- Accelerating the building of a highly skilled and resilient Canadian workforce by establishing a "FutureSkills Lab"
- Unleashing the growth potential of key sectors such as the agfood sector

. . . and two broader recommendations where the Council has identified specific opportunities, but felt the Government was better positioned to develop the detailed implementation plan:

- Positioning Canada more effectively as a central global trading hub
- Tapping into our economic potential through broader workforce participation

The Council will continue to provide advice to the Government on these and other issues in 2017.

Driving towards inclusive growth

The Council's mandate and objective is to develop a suite of policy recommendations that will drive inclusive growth in ways that benefit all Canadians. We evaluated our portfolio of ideas on three dimensions:

- Will it "move the needle" on income growth as well as increase overall output, and bring us toward our objective of an additional $15,000 in real, pretax median annual household income above the baseline currently expected by 2030?
- Will it drive economic growth consistently and over time—in the short, medium and long term?
- Will it drive inclusive growth (i.e., not just for the most advantaged)?

The third criterion is especially important. The Council believes that delivering more inclusive growth is not just in line with Canadian values; it is imperative for any strategy to prove sustainable. Only through shared prosperity can we increase our economy's capacity to consume, ensure greater social and political stability, and lessen the need for government intervention.

To test for inclusiveness, we asked whether our portfolio met two objectives. In the short term, ideas should improve financial well-being and upward mobility for low-income Canadians, help vulnerable Canadians to participate more fully in the economy, build greater resilience among Canadian workers, maintain or expand

public infrastructure, and create the conditions needed for entrepreneurship to take root. In the long term, ideas should create a more productive, job-creating environment that unlocks economic opportunities for all Canadians.

Engaging with canadians

Throughout this process, the Council made it a priority to consult with a wide range of stakeholders, and received input from the public, private, and academic sectors and many industries. The Council held meetings and interviews with stakeholders from more than 130 organizations, including educational institutions, large corporations, small and medium-sized businesses, government agencies, think tanks, and international policy and research centers. The Council also held nine roundtables across Canada, on topics including First Nations economic development, skills training, innovation, and sector growth. This engagement process has continued since the first wave of recommendations.

OUR SECOND WAVE OF RECOMMENDATIONS

Detailed recommendations

1. Unlocking innovation to drive scale and growth

Canada needs to significantly strengthen its innovative capacity, specifically by providing stronger support for the commercialization of new ideas and facilitating the "scale-up" required to fully capitalize on them. In today's and tomorrow's knowledge-driven economy it is not enough to have a great idea; that idea must also be brought quickly to the broader global marketplace. While entrepreneurs and globally competitive companies are the best sources of these job-generating innovations, their prospects can be enhanced by a stronger, more supportive innovation "ecosystem." To achieve this we make five specific sub-recommendations:

- Streamline immigration to ease entry for top talent.
- Catalyze the formation of business-led "innovation marketplaces" where researchers and start-ups work with corporate and government customers to solve growth challenges.
- Increase the pool of growth capital to ensure promising companies have sufficient capital to scale up, and access to investors who can provide advice and other value-added services.
- Modify our government procurement policy, to shift from a requirements focus to a value-based strategic procurement system, where the government and other public-sector players become important first customers, to test and validate Canadian innovative solutions.
- Review and rationalize today's existing business-facing innovation programs, scaling up those with proven impact and ensuring that the overall suite of programs effectively supports a modern innovation strategy.

2. Building a skilled and resilient workforce with a FutureSkills Lab

An essential part of our inclusive growth objective is to prepare workers for major structural changes on the horizon, such as the automation of jobs and the growth of the "gig" economy. Canada needs new methods to prepare workers. We recommend the formation of a FutureSkills Lab—a non-profit, non-political body designed to promote and enable next-generation skills development. The FutureSkills Lab would support and co-fund innovative approaches to skill development; identify and disseminate new sources of information about required sector and industry skills, as well as the broader labour market; help define clear national objectives for skill-building; and promote the exchange of knowledge with government agencies and private-sector institutions active in this field. The goal of this new entity would not be to replace existing institutions but to better enable them to perform by bridging information gaps in the marketplace and providing a neutral clearing house for critical insights and best practices.

3. Unleashing the growth potential of key sectors

Canada has core strengths in critical sectors, such as agriculture and food, energy and renewables, mining and metals, health care and life sciences, advanced manufacturing, financial services, tourism, and education. But much of our potential is untapped, held back due to policies (e.g., excessive regulations) and other barriers to growth (e.g., shortages in skilled labour, inadequate physical infrastructure). The Council recommends the government, in concert with the private sector, take a targeted approach to removing growth obstacles – thereby unleashing the significant potential of key sectors. This would include setting bold and ambitious sector aspirations, and tapping into the new toolkit of policy vehicles the Council has recommended (e.g., the Infrastructure Bank and innovation marketplaces).

We have highlighted the agriculture and food sector as one example where Canada has the potential for substantial growth and export improvement and the opportunity to become the trusted global leader in safe, nutritious, and sustainable food for the 21st century. The Council recommends piloting this new approach to sectoral development in agfood, and then replicating it in five to seven other high-potential sectors.

Broader recommendations

In addition, as noted, the Advisory Council has identified two broader recommendations where the government is better positioned to specify policy interventions and next steps. Both of these recommendations have the potential for significant impact on inclusive growth.

- Positioning Canada as a preferred global trading partner by nurturing and improving our North American trading relationships; strengthening links with three key large and/or fast-growing economies (China, Japan, and India); investing more heavily to upgrade our trade infrastructure (e.g., ports, airports, and highways); and positioning Canada to maximize benefits from multilateral trade flows and to manage potential disruptions to trade.

- Tapping economic potential through broader workforce participation through initiatives tailored to underrepresented groups. We focused on four of a number of such groups: women with children under 16; older Canadians; lower-income and lower-skilled Canadians; and Indigenous Canadians. Potential ideas include "reskilling" programs and a legal framework that is responsive to the "gig" economy. We also see an opportunity to unlock talent by increasing the number of women in leadership positions, such as through a corporate gender diversity challenge.

In conclusion

This Council took as its key metric for success the goal of delivering an additional $15,000 in median household income above current projections by 2030. Realizing such an ambitious aspiration, amid rapid economic and societal change, will require focused, persistent, and concerted action. It will also require continued progress monitoring so that ineffective programs can be stopped. This Council believes that bold and mutually reinforcing initiatives like the ones released today and last October can help reset our country's economic trajectory and help us achieve the inclusive growth that will provide the strongest foundation for our nation's future prosperity. ■

UNLOCKING INNOVATION TO DRIVE SCALE AND GROWTH

ADVISORY COUNCIL ON ECONOMIC GROWTH
February 6, 2017

Introduction

In an era of uncertainty, change, and unprecedented technological shifts, the imperative for innovation will rise. Innovation is crucial to addressing the core challenge of maintaining living standards and growing our economic output as the population ages and labour-force growth slows. Through innovation, Canadian firms can improve their productivity—such as by finding smarter, better ways to use capital and labour so that they can produce more output for the same level of input. Moreover, innovation can broaden the benefits of growth to more Canadians in the middle class, even as automation fundamentally changes today's jobs, by making Canadian firms global leaders in the jobs of tomorrow.

Fortunately, as a leading open economy with a world-class yet affordable education system, a diverse workforce, and assets ranging from natural resources to the country's reputation for tolerance and fairness, Canada has the tools to ride this next wave of global change, and to help lead it. Canadian students' science, math, and reading scores consistently rank in the top five among OECD nations. Our strong safety net ensures that Canadians are able to share in the country's good fortune, while making Canada a highly attractive choice for top students and talent from around the world. These attributes will help us excel in the sectors and technologies that promise to drive inclusive growth—if our execution matches our ambition. Now is the time to think strategically about our assets, our gaps and how our country can think creatively to further catalyze, and sustain, a nationwide ecosystem that fosters and supports innovation—and creates wealth for all Canadians.

The traditional engines of Canadian economic growth are slowing. As the past few years have shown, Canada cannot rely exclusively on commodities. Nor can it rely on a steadily increasing workforce: employment growth is expected to fall to an annual rate of 0.3 percent from 2014 to 2064, compared with 2 percent increase per year from 1964 to 2014. Meanwhile, the boost that Canada derived from trade liberalization in the past three decades has effectively flat lined since 2000, although there is still great opportunity to improve trade.

Innovation can play a major role in delivering the GDP growth needed to meet Canada's ambitious objectives of increasing productivity, driving inclusive growth, and helping to create conditions for entrepreneurial companies to scale up and become global champions. As the world moves briskly towards digitization and automation, Canada must adapt. We must exploit our advantages to drive the innovative thinking that creates high-value, specialized jobs that are more resilient to technological change and that allow middle-class families to enjoy prosperous livelihoods. At the same time, we must ensure Canadians have the skills and training to seize these new opportunities. For this reason, the Council believes the following innovation-specific recommendations must be complemented by initiatives to improve skills training and workforce participation, as discussed in our other recommendations.[1]

A Mutually Reinforcing Suite of Initiatives

We believe that the following five interventions can help boost Canada's innovation agenda:

1. Catalyze the formation of business-led "innovation marketplaces" in sectors and technologies where Canada has momentum and where market participants need new solutions.

2. Create additional pools of growth capital to ensure promising companies have sufficient capital to scale up and access to investors who can provide advice and other value-added support.

3. Modify our government procurement policy to incorporate strategic procurement and innovation as a key objective. A shift from a requirements-focused to a value-based procurement system will facilitate the government and other public-sector players becoming important first customers, to test and validate Canadian innovative solutions.

4. Review and rationalize government innovation programs, then scale up those that have proven impact. Review regulatory barriers and remove or re-tool those that would impede development of priority sectors and innovation marketplaces.

5. Expedite entry for top talent through immigration policy that helps reduce a talent shortfall for high-growth companies, and invigorate the talent pool through a focused innovation talent strategy and the FutureSkills Canada program.[2]

The Case for Change: Canada's Innovation Opportunity

Why innovation?

"Innovation" is a broad term that includes categories like product, process, marketing, and organization.[3] It has a clear and positive impact on the productivity of firms.[4] Innovative economies are "more productive, more resilient, more adaptable to change, and better able to support higher living standards".[5] Innovation is the "secret sauce" driving productivity across the economy, and is often the foundation of job-creating clusters and Canadian champions.

Commercial innovation creates value and high-quality jobs across the economy. Innovation-focused jobs tend to be high paying and drive job growth for the middle class. These jobs have a very high "multiplier effect"—meaning they create more indirect jobs across all income groups, such as lawyers, doctors, retail workers, etc.[6] High-skilled, higher-wage jobs are also at a lower risk of being negatively affected by automation.[7] "Moving up the value chain" through innovation has the potential to create more specialized jobs in areas facing automation, thereby creating opportunities for displaced workers.[8] Innovation, however, is by no means a guarantee of inclusive growth. Technological disruption can lead to job displacement and short- and medium-term gains tend to favour those with higher skills. Nevertheless, the Council strongly believes that Canada should aim to make a step change improvement in its innovation performance, in order to drive more resilience and productivity growth within its economy. In addition, Canada should seek to equip workers with the skills they will need to thrive in this innovative economy and encourage labour force participation among underrepresented groups in the population. The Council has developed specific recommendations to this effect.[9]

Canada's opportunity

The time is now for Canada to raise its innovation capacity if it is to become more globally competitive and drive economic growth.

Canada has many ingredients of a successful innovation ecosystem. This includes good universities and recognized research strengths, a history of entrepreneurship, significant support and infrastructure for start-ups, and some emerging clusters that could become globally competitive. These are important ingredients for fostering successful innovation.

However, the "recipe" for innovation is elusive. The innovation ecosystem is complex and this Council has not identified any silver-bullet solution. That said, three specific bottlenecks in the ecosystem do appear to be contributing to the country's underperformance in this area:

- a gap between invention and revenue-generating commercialization
- a struggle to scale up successful start-ups and small and medium-sized enterprises (SMEs)
- no burning platform for corporate adoption of innovation

A gap between invention and revenue-generating commercialization

The country does not benefit as much as it should from the intellectual property that it generates. Neither government, business, nor academia has completely solved this conundrum and none will be able to solve it on its own. Several indicators suggest that these groups are not interacting as much as they could. For example, in 2012, Canadian higher-education institutions created approximately 16 licences per institution compared with about 35 in the United States. Furthermore, Canada's ranking on business-university R&D collaboration declined to 19th place in 2015.[10] The reasons for this are complex and interrelated, including a lack of local R&D-intensive corporations to develop and adopt inventions, a lack of qualified staff within universities and companies to build relationships and broker collaboration, and insufficient funding to support early and risky commercialization activities.

Several programs have attempted to bridge this innovation gap. However, our persistent lack of improvement on this dimension calls for a new approach.

Canada is good at starting companies but struggles to scale them up

One of the fundamental problems with Canadian innovation is that even though our entrepreneurs are good at launching companies, very few companies achieve significant scale. Starting a business in Canada is relatively easy: in fact, according to rankings by the World Economic Forum, Canada ranks second in ease of establishing a new firm. The problem is that many companies do not grow after a certain point. The reasons are complex and include a small and fragmented local market, shortages of experienced business talent, a lack of at-scale sources of growth capital, and an aversion to risk on the part of some of Canada's established companies.

As a result, company growth is often stunted. Small firms account for about half of business sector employment in Canada versus just over one-third in the United States.[11] This lack of scale accounts for

20 percent of the labour productivity gap between Canada's business sector and that of the United States.[12] Canada's start-ups also have smaller exits and face a longer path to exit than their American counterparts. For example, a survey of exit events in Canada and the United States since 2000 found that only 1 percent of Canadian exits occurred with a valuation of more than $500 million, compared with 10 percent of exits in the United States.[13] This lack of scaling has started to take a toll on Canadian competitiveness: the nation had 18 global industry leaders in 1990, while in 2015 it had just five.[14]

No burning platform for corporate adoption of innovation

Canada's corporations, on average, do not innovate nor adopt innovation as quickly as those in other developed economies. Canadian business R&D spending is persistently half the US rate, with a large variance among sectors and geographies.[15] Furthermore, Canada's ranking in the OECD Business Expenditure on Research and Development index fell from 12th place in 2001 to 22nd in 2015.[16] R&D investment varies by sector and size of company: sectors that are most exposed to competition through international trade tend to invest more in R&D than those that are not.[17] Though R&D expenditure metrics are admittedly imperfect, they do represent an indicative proxy of the level of corporate adoption of innovation. A recent survey found that only 30 percent of Canadian firms consider any form of innovation to be extremely or very important, and just 15 per cent would assume significant financial risks in the pursuit of innovation.[18]

Part of the reason business R&D investment has not been a priority is that many Canadian firms have been able to prosper in their chosen niches and have settled into a low-innovation equilibrium.[19] Several factors could explain such complacency, including regulatory protections, the depreciation of the Canadian dollar, trade with the United States, strong demand for Canada's natural resources, and low competitive intensity in some sectors.

Multinationals active in Canada could also contribute further to increasing Canada's R&D intensity, which is necessary to counter current trends.

Canada needs to fortify its innovation ecosystem

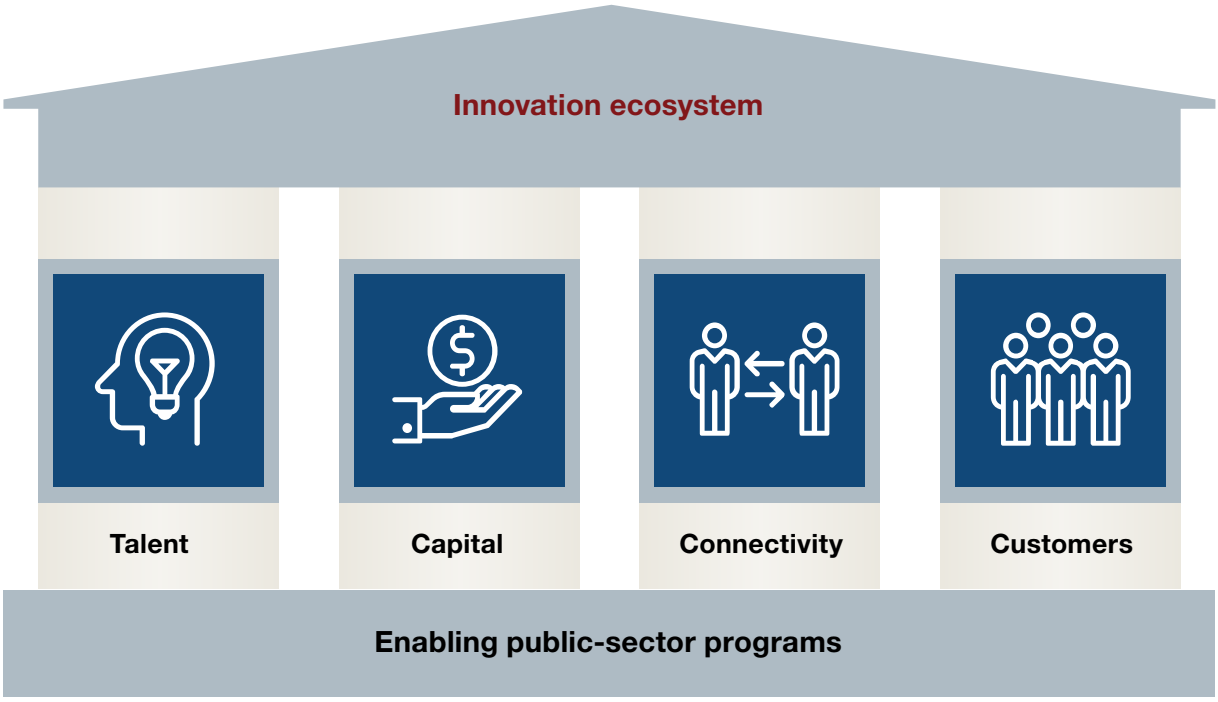
None of these bottlenecks has an obvious solution. In fact, the Council believes that an ecosystem lens is required to improve the country's innovation outcomes.

Furthermore, as Exhibit 1 illustrates, we believe that there are five critical elements in the innovation ecosystem that enable companies to grow into industry leaders: access to talent, capital, connectivity, customers, and enabling public-sector programs.

The Council has identified opportunities for improvement in each of these areas in Canada:

- Finding *experienced* talent: More than half of technology company founders (53 percent) say the biggest obstacle to growth is finding and hiring experienced business talent. They are particularly hard pressed to find senior managers in areas such as business development, sales, and marketing, particularly those with global experience.[20] This is another result of the scale problem: Canada has relatively few companies

Exhibit 1 **Framework for a functioning innovation ecosystem**



that have scaled through all stages of growth nor large companies to train this type of talent. At the same time, immigration processes make it difficult for companies to quickly hire managerial talent from abroad, although this has begun to change.[21]

- Limited access to value-added capital: There is evidence that young Canadian firms would benefit from bigger injections of expansion capital. In a survey, more than twice as many fast-growing companies in Canada cited insufficient access to risk capital as their greatest concern in comparison with high-growth firms in the United States.[22] The average later-stage venture deal (B or C rounds) is 41 percent smaller than such deals south of the border.[23] Moreover, only a few Canadian venture funds specialize in capital-intensive sectors such as healthcare and clean technology ("cleantech"), where funding gaps persist across the lifecycle. Even more important than capital is the value-added support that world-class venture investors can bring. Although strong value-adding investors exist in Canada, this network is also subscale and fragmented. In addition to funding, top-tier professional investors bring relevant experience and connections, including badly needed operational expertise and relationships with customers and top industry talent—all of which can be critical to accelerating growth.

- Low connectivity: Fast-growing companies, particularly tech companies, thrive in an atmosphere where there is a critical mass of talent and knowledge—where companies can connect with customers, partners, start-ups, investors, universities, and vice versa. The few anchor companies that we do have are not

well connected to these clusters or to the broader innovation ecosystem and could benefit from these productivity-enhancing relationships. Universities benefit from connectivity through commercializing their inventions and in finding jobs for their graduates.

- Lack of local customers: Young companies need access to customers—commercial and government—to grow quickly. In general, Canadian corporations are relatively slow to adopt new technology and seem reluctant to buy from young or smaller firms. Large corporations can accelerate small-company growth not only by acting as first customers, but also by referring small companies to other potential customers in their supply chains. Currently, the average large Canadian company purchases around C $728 million in goods and services from SMEs, compared with C $2.7 billion for similar-size US companies.[24] Government can also support fast-growing businesses by using strategic procurement policies to be a first customer, particularly in regulated sectors such as healthcare and energy.

- Poorly coordinated public-sector programs and regulations: There are dozens of different programs relating to innovation in Canada, but the overall effort is diffused, which limits effectiveness. There is an opportunity to use evidence-based evaluation and a rigorous metrics-driven approach to better allocate resources. At present we offer a range of programs created by various governments at different times with limited data on effectiveness. As the nation's performance on innovation continues to lag, it appears these programs are not making the difference they intended.

In addition, the Council received considerable input on promoting and encouraging more of an "innovation culture" in Canada, including greater ambition and higher tolerance for risk and failure. We believe a mindset shift could be promoted through initiatives that celebrate innovation, such as the Governor General's Innovation Awards and events like National Innovation Week.

Recommendations

In this paper, the Council presents a series of five interlocking recommendations to address the issues outlined above, accelerate innovation, and help more Canadian start-ups and SMEs achieve scale. These recommendations have been crafted with five principles in mind: place more emphasis on demand pull over supply-push programs; scale up what is working; focus programs and resources where Canada can win; be bold yet ready to fail and use metrics to turn around quickly; and act with a sense of urgency. Together, these initiatives would help Canada raise its global competitiveness, achieve inclusive growth goals, and create a more resilient economy and labour force.

- Recommendation 1: Create innovation marketplaces to foster commercialization and technology adoption.

- Recommendation 2: Build a value added growth capital strategy focused on Canada's fastest-growing firms.

- Recommendation 3: Implement a strategic public procurement program allowing the government to act as a first customer for innovative Canadian companies.

- Recommendation 4: Review and rationalize government business innovation programming.

- A fifth recommendation, on simplifying the attraction and retention process for top global talent, was published in October 2016.[25]

Recommendation 1: Innovation marketplaces

The opportunity

Canada has developed key aspects of a successful innovation ecosystem, but its efforts are subscale and uncoordinated. Specifically, while Canada has a strong base of talent, large firms, high-growth SMEs, and research infrastructure, these stakeholders are not collaborating sufficiently. The Council believes that three problems must be tackled: insufficient corporate and government adoption of innovation from start-ups, SMEs, universities, and government research; a lack of translation of inventions into commercial innovation; and a lack of local customers for start-ups and SMEs, which hinders their ability to reach scale.

Rapid change and wholesale disruption are markers of the world we live in. Canada has the opportunity to evolve its innovation programs to keep up with this change. Current systems do not allow for the speed required to compete nor the connectivity among universities, SMEs and start-ups, corporates, and government required to reach our full potential. We need a more dynamic system of continual iteration and adjustment, to amplify innovations that are working and squelch those that are not. We also do not have the size and scale to simply let “1,000 flowers bloom”. The time has come for new ways of working, to set a new course for Canada’s innovation economy, create innovation at scale and set a course for becoming an innovation powerhouse.

Catalyzing “innovation marketplaces” and helping them reach scale

More selection, focus, coordination, curation, and scale are required in our innovation ecosystem. The Council recommends the government focus on catalyzing “innovation marketplaces” with the goal of achieving national and globally significant scale in key sectors and technologies. Marketplaces are centers of technology and industry activity that are developed and driven by the private sector.

An innovation marketplace brings together researchers and entrepreneurs with public and private customers around a common business challenge. These marketplaces match innovation demand from corporations and governments with innovation supply from researchers and entrepreneurs. This matchmaking strengthens supply-chain relationships and the flow of information, thereby fueling further innovation.

In our view, innovation marketplaces would benefit all concerned. Companies that come up with world-class ideas could find new customers on their doorstep, develop their talent, and connect with new sources of capital. Established companies could enjoy faster growth, better access to new products and markets, and, perhaps, global competitive advantage. Both kinds of companies, incumbents and new entrants, could come together to identify the business problems that need solving. And Canada’s workers and communities could flourish as new jobs open up and local economies are revitalized. Moreover, an increased emphasis on innovation and creativity could lead to a more diversified and inclusive economy, as more members of

underrepresented groups such as women, youth, older Canadians, Aboriginal Canadians and other minorities are encouraged to bring their creativity and crucial perspectives to the table—and are supported once they do.

More specifically, the Council believes that marketplaces could spur corporations to adopt innovation and buy from young innovative firms by improving connectivity and sharing investment risk. By connecting firms, start-ups, SMEs, and research institutes (including university and government labs), well-functioning marketplaces could set in motion network effects and eventually reach national and then global scale. By spreading risks, marketplace participants would be better placed to invest in game-changing technologies.

At the same time, the government should not take undue risk when selecting marketplaces to scale up. We recommend a "test and validate" approach to catalyzing marketplaces, which would begin by funding a larger number of proposals (e.g., 10–15), and scaling up those that demonstrate success (resulting in 3–5 larger marketplaces).

Box 1

Why innovation marketplaces?

The Council applauds the Ministry of Innovation, Science and Economic Development's ambition to revitalize Canada's innovation landscape, including his proposal to form a series of "Superclusters", funded at scale, in areas where Canada has already developed a competitive edge.

As we are facing an era of rapid and unprecedented technological change, the Council has been considering new approaches to mobilize our full innovation capacity (from research to early scaling firms to our high-performing corporations) on market-relevant growth challenges and opportunities. We have taken learnings from leading models around the world, and adapted those to our geographic and business context. We believe a new approach is required, including:

- Significant private-sector leadership, investment, and involvement
- A data-driven and results-oriented selection and monitoring process
- Lean, agile, and accountable governance
- Capacity to support new technologies and market opportunities as they emerge
- Stage-gated funding approach
- Scaling what works—backing our winners

The Council's recommendation for "innovation marketplaces" attempts to provide guideposts to gaining advantage through such a new approach. This proposal was designed to complement our suite of innovation recommendations, as well as the Council's broader portfolio of ideas, especially our Driving Growth Through Sectoral Strategies proposal. We believe marketplaces would provide the foundation for a dynamic and ambitious innovation economy.

The concept builds on global best practices from Germany, the United Kingdom, and the United States, among others. The US manufacturing sector has formed (with catalytic government support) nine regional hubs to solve advanced manufacturing challenges under the rubric "Manufacturing USA." Another American marketplace focused on energy, ARPA-E, is a particularly relevant model with several aspects worth considering for the creation of future Canadian innovation programs. (See the Appendix for this and other case studies.)

We have adapted these global examples to Canada's unique geography and diverse regional economies in an effort to build on our national strengths. Marketplaces are already forming in Canada—for example, the oil and gas sector has formed a network (Canada's Oil Sands Innovation Alliance, or COSIA) to solve the water, air, and greenhouse gas-emission challenges it faces. This consortium was formed so that oil sands companies could share intellectual property (IP) related to environmental issues. Although the industry did not have a culture of cooperation, COSIA now allows companies to access and share billions of dollars-worth of intellectual property. It has also expanded to a much broader range of collaborative activities, including developing its own IP and a competition for technologies that transform carbon into marketable end products.

In this recommendation, we outline our vision for innovation marketplaces: their guiding principles; the "how-to" of making them work, including sharply defined roles for private sector and government; their selection approach; and their governance.

Core principles

Innovation marketplaces should reflect certain core principles and characteristics as follows:

- Originate through market pull—To qualify for investment, marketplaces must address real business needs articulated by private-sector stakeholders who demonstrate leadership and commitment by putting financial "skin in the game," as well as committing people and other resources.

- Include a risk-sharing objective—Marketplaces would co-fund projects for which the risk and cost of innovation would be difficult for a single actor to bear. The private sector would provide 50 percent of the capital required at a minimum.

- Demonstrate the potential for national then global scale—Marketplaces should have a bold vision, show the potential for significant impact on both the domestic economy and exports, in target sectors or technologies where Canada already has strong momentum and some form of competitive advantage.

- Include multiple partners—Marketplaces would involve a partnership among several companies, technology-driven start-ups and SMEs, university researchers, and, in their role as buyers of goods and services, public-sector agencies—such as governments, hospitals, the National Research Council (NRC), and so on. Marketplaces would engage all relevant players in a single ecosystem, and connect with programs sponsored by provinces, municipalities, and research institutions to maximize the "spillover" of innovation in the community.

Box 2

What could an innovation marketplace look like?

Innovation marketplaces could emerge around a number of different technologies or sectors. For example, Canada has built momentum in "platform technologies" like artificial intelligence, genomics, and energy storage, as well as in core sectors like energy and renewables, agriculture, and financial services. Innovation marketplaces could also be leveraged to tackle a number of inclusive growth challenges, such as social innovation and public service delivery.

Clean technology

Canada has invested steadily in clean technology ("cleantech") for the past decade. Combined with a strong entrepreneurial ecosystem, we have a maturing cleantech sector with a healthy number of market-ready companies poised to compete globally and deliver strong export revenues in large overseas markets. However, the industry has unique barriers to scale: it is capital intensive and includes systemic adoption constraints.

A cleantech related marketplace could drive innovation and growth in two ways:

- Bring forward customers: Have private-sector firms commit to acting as first customers and public entities commit to buying through strategic procurement in a specific clean technology, e.g. in green buildings/infrastructure or energy storage. By taking a focused approach to leveraging our cleantech assets, Canada could spark collaboration between industry and government, reward early adopters and outcomes, and attract the private capital necessary to implement projects at scale.

- Accelerate adoption by modernizing regulation: A responsive and enabling regulatory framework would help propel cleantech innovation while attracting and retaining global-leading companies. Specific modernizations could include ideas like expedited permitting timelines for cleantech companies.

Artificial intelligence

Canada has a strong history of innovation in artificial intelligence (AI). Some of the earliest AI developments came from Canadian researchers, and major Canadian research institutions have moved to entrench their early advantage. This will have far-reaching impact on almost all sectors of our economy. However, the commercialization of AI research has been slowed by a few factors, including a lack of coordination between research institutes and slow adoption by corporate and government customers.

An AI marketplace could strengthen Canada's AI advantage in two ways:

- Bring together research capacity: Facilitate coordination between research and innovators at Canadian institutes in Toronto-Waterloo, Montreal, and Vancouver, while providing a common "brand" to attract innovators from abroad.

- Foster connections and promote early adoption: Bring AI innovators together with corporate and government customers to identify and solve real commercial challenges. This would provide a "springboard" for AI technology to export globally, while enabling Canadian companies in a range of sectors to stay ahead of the technology curve.

- Focus on leading-edge innovation—The purpose of innovation marketplaces would be to drive competitiveness and exports through commercialization and adoption of leading-edge innovation (technologies and processes), not to support product or process improvements that should be the normal course of business.

- Include success metrics—The performance of the marketplace program would be relentlessly assessed with data and against target outcomes. The program would be benchmarked against international peers at the outset and at regular intervals thereafter, to track performance and incorporate global best practices.

- Play matchmaker for talent—Innovation is fuelled by talented people. Marketplace management teams would actively connect the brightest and best people in their domains, forging links between critical experts in established and emerging firms, young talent and relevant stakeholders in the ecosystem, local and international supply chain partners, regulators, and so on. The marketplace for talent would serve as a resource for participants beyond the boundaries of a given project, and thus spawn further collaboration and new avenues for growth.

Forming innovation marketplaces

Both the private and public sectors have a role to play in the formation of marketplaces. The Council envisions marketplace formation being led by the private sector with support from government agencies and departments, in particular the Department of Innovation, Science and Economic Development (ISED). We expect that marketplaces will be an important component of sector strategies, as recommended by the Council.

Role of the private sector

- Assemble consortia of like-minded companies interested in investing in a technology platform, collaborating to solve a shared problem, or strengthening sector capacity in a manner that could significantly increase productivity and global competitiveness in their industries.

- Develop bold plans outlining their ambition and commitment to the marketplace. The plans would outline proposed collaboration models and priorities, commitments for direct funding, in-kind support including personnel, and key performance indicators (KPIs) that measure impact and scale on a national and global basis. The plan would likely call for phased development, with key milestones to demonstrate progress against larger goals as prerequisites for further investment. The program would recognize that plans may change as the marketplaces learn and optimize.

- Establish a leadership and operating model, as well as a governance structure for each marketplace, reflecting the roles and contributions of the partners. Marketplaces should build on available capacity and use relevant expertise to keep momentum.

Role of the government

The government could provide substantial convening and informational support to marketplace formation. As we've seen, Canadian researchers and companies do not interact as closely as they could.
The government could also provide financial and operational support to mitigate risk and stimulate private-sector investment.

The government's initial role would include soliciting bids, such as by:

- Promoting the innovation marketplace program to companies and stakeholders that could be interested by the idea

- Encouraging private-sector-led consortia to come together. An open call would be necessary and would need to be on-going so as to promote the best marketplaces as they emerge. Some preliminary work may be required to cultivate the formation of ambitious consortia.

Once launched, the government should support marketplaces that are making appropriate progress, by:

- Co-funding part of each marketplace's overhead and projects that benefit multiple industry players and where corporate sponsors commit to providing at least 50 percent of the capital needed to de-risk the project. This capital could be allocated in stages based on project milestones.

- Providing regulatory support including a fast-track process for high-priority marketplaces to help them navigate their regulatory environment and modernize regulations where warranted.

- Acting as a "first customer," where appropriate, through targeted strategic procurement programs. For instance, procurement programs can create competitive marketplaces when used within the supply chain of major prime contractors to the government.

- Connecting marketplaces to government programs and resources where needed. For example, the NRC or other institutes could become important sources of people and equipment for marketplace-sponsored projects.

- Featuring marketplaces in international marketing of Canada's innovation assets and efforts to attract greater trade, foreign direct investment, risk capital and talent, as well as infrastructure investments, to generate a "flywheel" effect.

Marketplace selection and management

The Council wishes to emphasize the importance of a shift to an agile, expert, and metrics-driven selection approach. The Council feels strongly that rapid advances in technology and shifting market dynamics will demand a disciplined selection approach coupled with ongoing results-focused program management. The Minister of Innovation, Science and Economic Development should appoint an independent oversight organization to select the marketplaces, continually monitor their performance, and make regular recommendations for future support. The Minister should ensure that the group has the independence, expertise, flexibility, and authority required to carry out this new agile oversight model, such as:

- Deep technology and sectoral expertise with the ability to marshal critical external resources when required. Marketplace proposals are expected in a broad range of technologies and sectors. It would be impractical for a committee to possess every necessary expertise. However, committee members should find the right expertise to support their work.

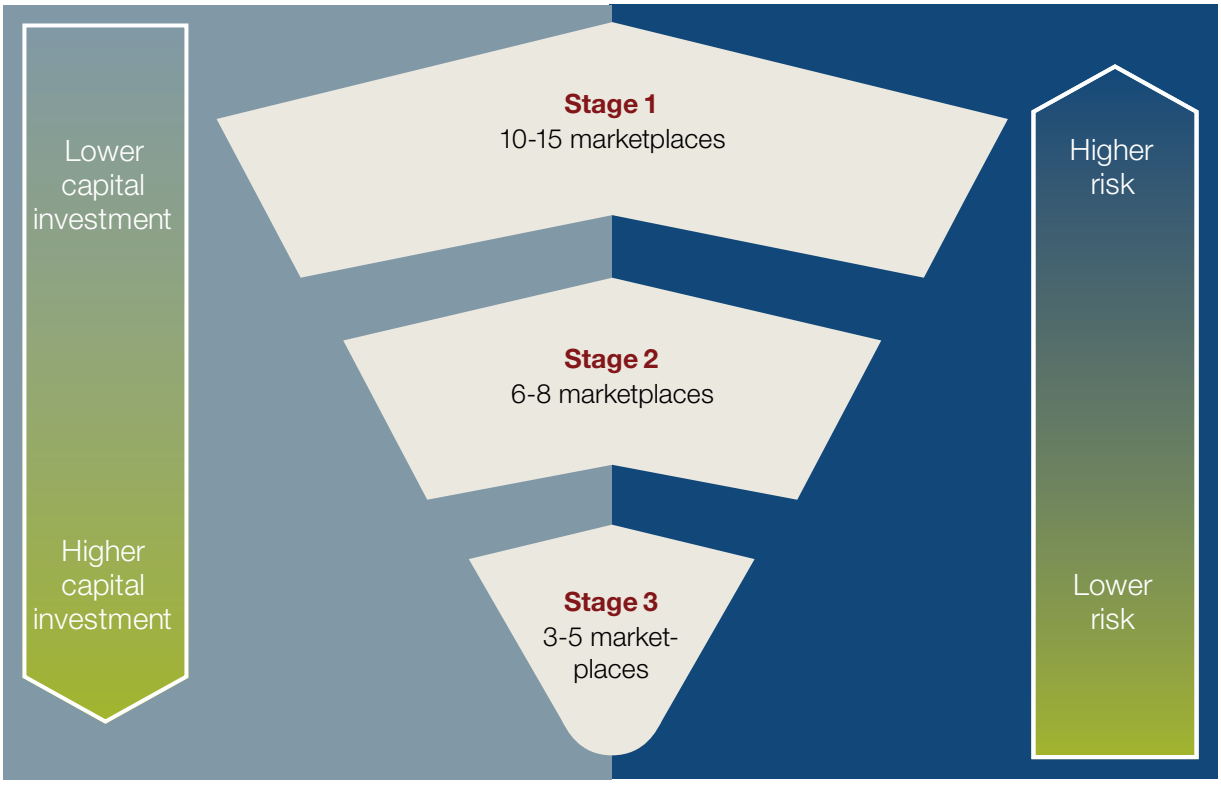
- Milestone approach based on progress and results. Initial selection and the level of follow-on investment decisions should be based on the merits of the marketplace, as evidenced in adherence to core principles and progress on KPIs.

- Ability to execute in an iterative and agile manner. We live in a world of rapid change, and while many of the proposed elements of government's role may seem familiar, the pace of change demands a more agile and iterative way of working with partners to drive outcomes. The Council wishes to emphasize the importance of an agile model where marketplaces are continually validated and funding is channelled to those demonstrating success.

The oversight organization should follow a three-stage approach (Exhibit 2).

Stage 1: Proposed marketplaces are evaluated on core principles outlined above in an ongoing, open-door evaluative process. All selected marketplaces should have potential to reach scale, but risk at these early stages is high. We expect that up to 10 or 15 marketplaces would be eligible for stage 1 funding, and each should be given enough support to reach critical milestones for stage 2.

Exhibit 2 **Process of selecting innovation marketplaces**



Stage 2: Periodic check-ins (e.g. quarterly) are held with marketplace leaders (akin to meetings of a board of directors). The oversight body could assist the marketplace in achieving its goals. It would evaluate funding needs after an appropriate timeframe depending on the sector. Those marketplaces that reach their key performance indicators (KPIs) could receive more funding.

Stage 3: Remaining marketplaces are evaluated after a further period appropriate for the sector. Those marketplaces that reach their KPIs would receive more funding.

The marketplace selection and funding process should be ongoing such that new marketplaces could be funded at any time. The selection process should be agile, dynamic and evergreen.

Governance model

The Council believes that marketplace selection, governance, and progress-tracking would benefit from an entirely new governance model. To support the iterative approach outlined above, the Council suggests creating an oversight organization where these principles are embedded. While the organization could take a few forms (for example, a new body or a division within ISED), it should be as independent as possible, given the difficulty in implementing this type of approach within government.

Once validated, this new iterative approach could be applied to other programs as applicable following the completion of an Innovation Program Review.[26] Over time, the government could shape a fast-moving, metrics-driven, agile agency, with multiple programs at scale, fit for purpose in the fast-moving 21st century.

Connecting to sectors, and getting to scale

The Council recommends that the government map the sectors and opportunities in Canada's key economic sectors. If such a map were developed for Canada's largest economic sectors, it would illuminate the global growth opportunity over the next decade—starting with our strengths, what is working, what is emerging internationally, and identifying clearly where Canada can win and what needs to be done to win. As outlined in the Council's Sector recommendation, these strategies should be led by the private sector in collaboration with relevant public and academic bodies. New collaborations might emerge, as well as a robust, data-driven, and ambitious national strategy. Likewise, new marketplace partnerships could take shape. Beyond that direct impact, these plans could serve to benchmark the impact of selected marketplaces on moving the economic needle to reach our full innovation potential.

APPENDIX: CASE STUDIES

ARPA-E

The American ARPA-E program is noteworthy for its cutting-edge research and iterative governance model. The Council believes that this rigorous but competitive approach could provide a useful template for the innovation marketplace governance model.

ARPA-E was designed in 2005 to help the United States tackle pressing energy challenges. On the selection front, ARPA-E mixes calls for proposals on specific technical barriers alongside open calls for proposals for any energy-related technology. This combination approach draws on the ARPA-E leaders' expertise while

still letting the market bring forward interesting ideas. ARPA-E projects typically require some level of cost sharing with the recipient, although the exact amount depends on the technology.

The program resides in the Department of Energy but employs an independent and highly skilled team to handle project selection and management. The management team decides if projects have the technical merit to be considered an innovative platform technology as well as the potential to make an impact on the market. ARPA-E is explicitly designed to start projects quickly, monitor their success, and quickly terminate projects that do not reach their milestones. ARPA-E professionals have a limited five-year mandate within the organization, after which they return to their home organization, bringing with them their ARPA-E experience.

The program had a budget of US $280 million in 2015.

Manufacturing USA

Manufacturing USA is a US federal government initiative designed to foster innovation and excellence in the manufacturing sector. It consists of a network of 15 public-private regional institutes designed to serve as hubs of manufacturing excellence, in which federal funding (up to US $70 million) is matched or exceeded by private industry and other non-government sources. Over time, the institutes are expected to become financially independent, either through separate project funding or corporate memberships for shared IP schemes.

The program is overseen by an interagency office housed in the Department of Commerce and includes a team of public servants and manufacturing fellows dedicated to managing the program.

Fraunhofer-Gesellschaft

The Fraunhofer-Gesellschaft is a German applied research organization operating through 67 institutes and research units spread throughout Germany. Only 30 percent of the core funding comes from governments. Corporations or groups of corporations typically approach specialized institutes with a specific challenge and galvanize research programs with major investments. The institutes also contract with a wide range of other private and public-sector customers in their zones of applied research expertise. Total Fraunhofer-Gesellschaft staff is 24,000, with an annual research budget exceeding €2.1 billion; €1.8 billion of this comes from contract research, the majority of which is from private-sector customers.

Recommendation 2: Scaling our high-potential businesses through growth capital

The opportunity: accelerate growth with value-add support and investment

From start-ups to third-generation family enterprises, there are 1.2 million small and medium- sized enterprises in Canada. These businesses drive more than half of Canada's GDP and account for 63 percent of private-sector employment.[27] Canada has an SME and start-up ecosystem that is healthy in many respects: we rank second globally in ease of starting a business and we have strong universities that generate significant knowledge and skills which can be commercialized.

Where Canada falls short, however, is in scaling its high potential businesses. Larger businesses are a key driver of productivity and employment needed for inclusive growth. Small firms account for about half of business sector employment in Canada versus just over one-third in the United States.[28]

Two groups of businesses warrant particular attention, and are collectively referred to herein as "high-potential SMEs":

- Early- and expansion-stage SMEs are high-growth firms that develop and commercialize new technologies, some of them game-changers. These firms typically grow at over 40 percent a year in revenues and some have the potential to become anchor companies.

- Established high-impact SMEs are found across all sectors and all regions of the economy, and are responsible for a disproportionate amount of Canada's economic and job growth. These firms are defined as growing at over 20 percent per year in revenues, have at least C $10 million in revenue, have the potential to export, and are led by dynamic and risk-tolerant entrepreneurs.[29]

It is worth noting that the majority of these firms are not backed by venture capital. While venture capital-backed firms are important, focusing solely on these firms would likely exclude many high potential firms that are not within VC focus sectors, as well as more established firms that have a lower risk-return profile.

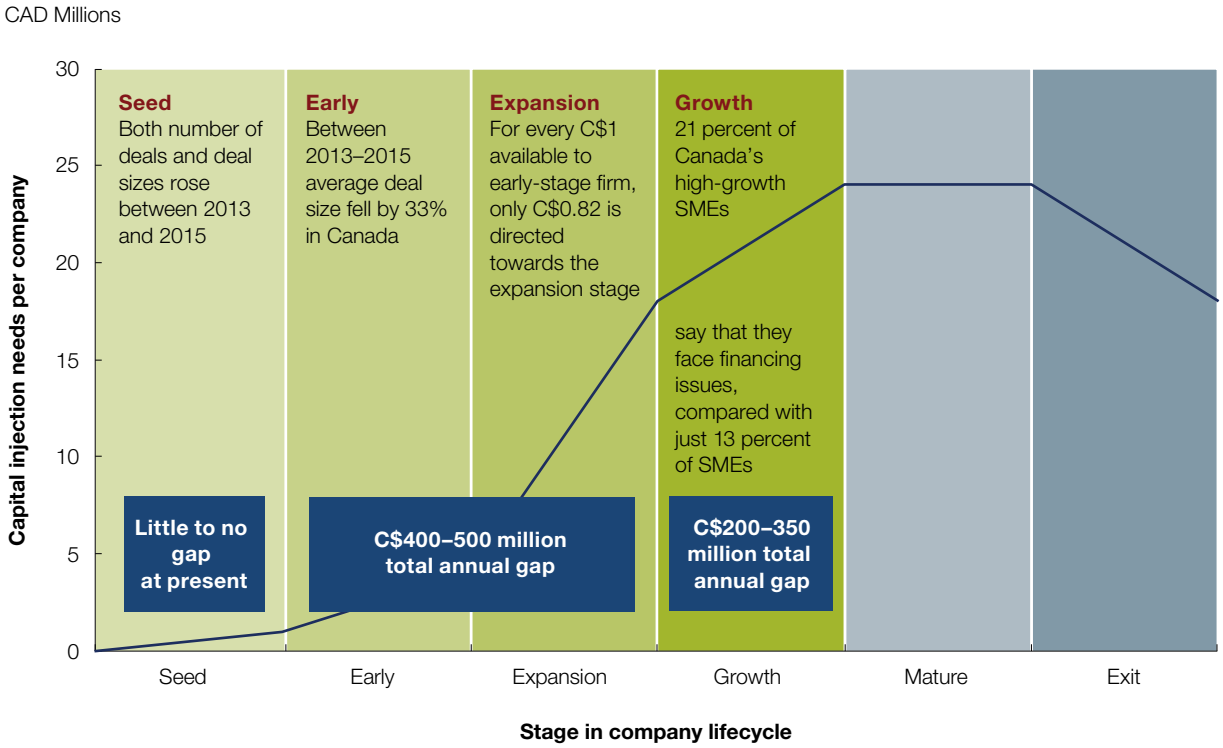
High-potential SMEs face important barriers to scaling and reaching their full potential:

- A lack of business talent and value-added support for high-impact entrepreneurs. In a survey of high-impact SMEs, seven of the top ten barriers to growth related to a scarcity of experienced management talent and advice.[30]

- Shortfalls in deal sizes for Canadian early-, expansion-, and growth-stage SMEs. Exhibit 3 lays out the challenges.

Exhibit 3 **Capital injection needs by stage in company lifecycle**

ILLUSTRATIVE



A healthy innovation ecosystem supports firm development at each stage of the company life cycle. Canadian firms appear to have sufficient access to capital at the seed stage but face increasing unmet capital needs as they scale up.

- For seed financing, i.e. the initial capital needed to start a business, typically up to C $0.5 or $1.0 million depending on the sector, there appears to be adequate financing in Canada at present. The number of deals went from 107 in 2013 to 178 in 2015, and deals sizes rose by 10 percent.[31] The government should continue to monitor this space and consider incentives to investors if this becomes necessary.

- For early-stage companies, the total amount of capital has increased in recent years. But Canadian investors have provided smaller amounts of equity to more companies—in other words, we are spreading this capital too thinly. In 2013, the average early-stage deal in the United States and Canada was the same size. By 2015, the average early-stage deal in the United States was 53 percent larger than in Canada.[32]

- The expansion capital supply in particular is more restricted: for every $1 available to Canadian early-stage firms, only $0.82 is directed towards expansion-stage firms, compared with $1.92 in the United States.[33] Furthermore, the size of expansion-stage deals appears to be too small. Whereas early-stage deals have

increased in size (though still lower than the United States), later-stage deals have fallen 35 percent in size from their 2013 levels. Moreover, later-stage deals in the United States are 71 percent larger than comparable deals in Canada, an indication that Canadian firms may be underfunded in later stages.[34] Though difficult to define precisely, we estimate that the gap for these early- and expansion-stage firms (here defined as firms that have received at least series A venture funding) is between C $300 and C $400 million annually.

- In terms of growth capital for established high-impact SMEs, there is evidence of a lack of risk capital and of a lack of more diverse set of financial products to sustain their growth (see Exhibit 3 on page 18):
  - 21 percent of Canada's high-growth SMEs say that they face financing issues, compared with just 13 percent of SMEs.[35]
  - Established high-growth SMEs need more innovative financing options for growth projects: 29 percent of "high-impact firms" would find financial guarantees to help bid on large contracts very valuable, and 25 percent would like access to loans for risk-sharing agreements.[36]
  - Despite efforts by the Business Development Bank of Canada (BDC) to address this issue, Canada still has room to develop its growth capital market (i.e. growth equity and mezzanine/subordinate debt). Between 2013 and 2015, the US growth capital market grew by 3 percent, whereas Canada's fell by 40 percent.[37]
  - The funding gap for these high-impact SMEs is estimated to be between C $200 million and C $350 million annually.

Stimulating large private-sector investments and value-added support

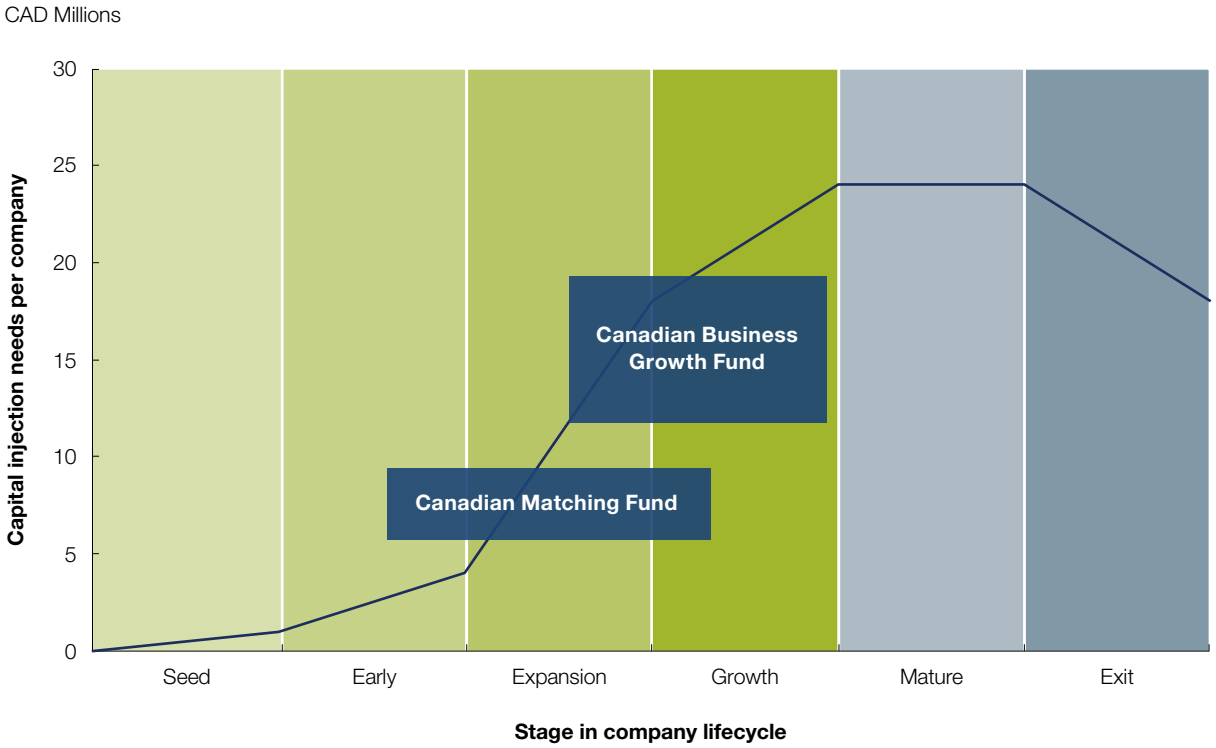
We believe that the government can play a role in scaling Canada's high-performing SMEs by better targeting its support programs and using its spending and regulatory powers to nudge private players to support the scaling of SMEs along their entire lifecycle (Exhibit 4).

Specifically, the government could:

- Create a Canadian Matching Fund to stimulate larger capital raising—both early- and expansion-stage companies need to raise larger sums in a single round, in a way that minimizes investment management fees and the time required to deploy the capital, while also giving high-value-adding investors an incentive to invest. This solution would serve higher-risk companies looking for a cash injection of C $5 million to C $15 million, with a "sweet spot" of C $7 million to C $10 million.

- Support the creation of a private sector led growth fund for minority equity stakes to address the gap in growth financing for established high-impact firms, through the purchase of minority stakes or unsecured debt for growth and expansion projects. This business growth fund should serve companies looking for between C $7.5 million and C $25 million in capital, with a sweet spot between C $10 million and C $20 million or above. **The Council is particularly enthusiastic by this idea, which it views as a high-impact program that could be led and financed by the private sector.**

Exhibit 4 **Capital injection needs by stage in company lifecycle** ILLUSTRATIVE



Initiative 1—A canadian matching fund for high-potential firms

Overview

The Council recommends creating a government-financed Canadian Matching Fund, which would provide high potential SMEs that raise private capital from an arm's length source with matching government funds in the form of unsecured debt or minority equity, at a rate of $1 of matching fund money for each $2 of qualified private capital.

Rationale for creating a Matching Fund

A Matching Fund:

- Leverages private capital to stretch the return on taxpayer dollars
- Puts power in the hands of the entrepreneur rather than the fund/investor because funding would go directly into companies
- Is a source of "patient" capital, with a long-term repayment expectation (ten years or more)

- Ensures "smart capital" by including a minimum private-capital injection of C $3 million and up to C $10 million from an investor selected by the entrepreneur for their ability to add value. The total capital injection in a company would therefore be between C $4.5 million and $15 million at $1 of public capital for every $2 of private capital. This ticket size could grow larger depending on the market reaction to the concept.

- Minimizes fees and administrative oversight required

Qualifying criteria

Companies that qualify for the matching funds should to meet the following conditions:

Criterion	Description	Rationale
Have raised "arm's-length" equity from private sources	Must have previously raised a minimum of C $3 million in private capital that does not come from related parties or affiliates.	The Matching Fund should only put taxpayer dollars at risk when following arm's length private investors.
Demonstrate high growth	Growing by at least 20 percent or more annually for three years and outperforming their sector.	ISED found that high-growth firms are responsible for 1 million of the 1.8 million net job creations over a 15-year period.[38]
Exhibit high ambition	High level of ambition (and risk appetite) determined by the company's business plan and growth objectives.	A comprehensive survey found that highly ambitious entrepreneurs have 10 percent greater revenue growth, 9 percent more international sales, and invested 5 percent more in innovation than moderately ambitious entrepreneurs.[39]
Show the potential to export	Operating in an export sector, or one with potential to export.	Companies that export have higher sales, pre-tax profit margins, and returns on assets, on average, than companies that do not export. They also spend more on R&D, increasing the innovation spillovers for the Canadian economy.
Have a source of value-added support	This could include funding from an engaged investor, having an advisory board or being supported by other external advisors.	A lack of value added support, experience and capabilities are the most important barriers to scale for high potential SMEs – more important than capital alone.

Co-funding

The Matching Fund should offer co-funding through a wide range of potential instruments including common equity, preferred equity, or unsecured debt, based on the entrepreneur's needs:

- Equity can be offered on a pari passu basis, with a call option for other equity investors to be able to buy out the matching fund's stake at some required multiple of capital. This would provide both upside on government funds, as well as an attractive structure for the entrepreneur. The government should purchase its equity position at the same initial valuation as the private investor. If the company moves its headquarters outside of Canada, the government should also consider including a put option to sell its shares based upon some pre-determined valuation formula.[40]

- Alternatively, debt could be offered where appropriate at an attractive yield with a ten-year term to be repaid at maturity, at exit, or upon headquarters leaving the country. However, it is important to note that future rounds of financing should be considered when debt is used as this could discourage follow-on equity funding.

In both cases, the Matching Fund should match private investments on a 1:2 basis (1 part matching funding, 2 parts private-sector funding) for total funding of between C $4.5 million and C $15 million. The public contribution would therefore be between C $1.5 million and C $5 million per deal.

Value-added support

The fund would provide value-added support in four ways:

- Attract leading investment firms (either venture capital or growth equity firms) that can offer their Canadian portfolio companies access to their talent and networks

- Include a commitment to advising as a criterion for selecting investors to ensure that entrepreneurs are receiving the managerial support they need

- Build a virtual network of "operator mentors"— former executives who volunteer to work with firms that have been selected into the fund

- Allow the government to identify clients for the BDC Growth Driver Program and the Accelerated Growth Service (AGS) that coordinate different agencies to help Canada's high-impact firms

Fund size

To bridge the gap of C $300 million to C $400 million faced by early- and expansion-stage companies, a matching fund could invest C $100 million to C $130 million per year which would match C $200 million to C $270 million of private investment.

Benefit for Canadians

Even with low returns and the risk of losses, tax payers will have a better return from the Matching Fund than from a pure subsidy. Furthermore, its economic benefit would also be felt through the revenue, salaries, and tax contributions that recipient firms would generate. While an average small firm (0–99 employees) generates roughly C $500,000 in GDP contribution annually, an average medium-size firm (100–499 employees) generates roughly C $15 million.[41] Scaling just 30 of the 75 to 100 firms that the matching fund invests in every year from small to medium size would therefore generate about C $435 million in additional annual GDP.

Risks to mitigate

The program should mitigate three risks:

- Crowding out private capital. The intention of the matching fund is fundamentally to increase deal sizes and "dry powder" available to our high-performing entrepreneurs. If the Matching Fund replaces either debt or equity capital that would otherwise have invested in these same businesses, that is a negative outcome. In the specific design of the program, the government would need to create an attractive structure for other investors, which does not create a disincentive for the entrepreneur to seek other sources of financing when needed.

- "Gaming" the structure. The administrators for this fund would need to monitor the transactions it supports to identify those cases where investors may be looking to unduly profit from this funding structure without the overarching goal of growing the underlying businesses.

- Failing to attract "smart" capital. The requirement for value-added support for companies to qualify for matching is a qualitative criterion, yet it needs to be applied rigorously for this fund to have the desired impact.

Governance

The Matching Fund should be governed by an existing public agency with deep networks of entrepreneurs and mentors, such as the Business Development Bank of Canada. An independent funding committee within the agency should be established and charged with providing funding quickly and with the least administrative burden. The funding committee should be staffed by experienced investors and focus on an objective evaluation of the business plans of companies that meet the qualifying criteria.

Funding

Rather than devote new funding to these initiatives, the Council recommends re-allocating funding from existing programs where possible. The Innovation Program Review proposed in Recommendation 4 provides a process for identifying potential funding sources.

Initiative 2—A canadian business growth fund

The idea

The government should encourage the private sector to establish one or more Business Growth Funds to provide patient capital for high-growth businesses in the form of minority equity or loans for SMEs. The fund or funds (hereafter the "fund") should consist of pre-committed capital from Canada's leading banks and financial institutions, which would benefit from appropriate capital treatment under the current Office of the Superintendent of Financial Institutions (OSFI) regulations. The Council is particularly enthusiastic about the potential of this idea, given that it is private sector-led and would not place any additional burden on Canadian taxpayers. Though this fund could theoretically be formed without any intervention, we believe that government can play an important role in (a) highlighting the potential capital need; (b) convening and coordinating the different sources of capital, and (c) clarifying the capital treatment for investments in this fund.

Rationale for creating a growth fund

The government should encourage the formation of a business growth fund as it fills a clear capital need, provides a fully private-sector solution and diversifies funding options for SMEs.

- Capital need: The Business Growth Fund could serve firms looking for deals between C $7.5 million and $25 million in capital, with a "sweet spot" between C $10 million and $20 million. It could focus on established, revenue-generating firms looking to finance their next phase of growth.

- Private-sector solution: The cardinal advantage of Business Growth Fund is that it reduces the need for public-sector funding and promotes rational capital allocation. The United Kingdom's Business Growth Fund only required regulators to lighten capital requirements on the committed funds. OSFI capital rules are not a barrier to creating the type of investments proposed in the Business Growth Fund as they provide for similar capital treatment to those in the United Kingdom.[42]

- Diversifying funding options: Observers have expressed concern that the gradual disappearance of small securities firms—over one quarter of independent broker-dealers have disappeared in the past two years—has reduced the options for SMEs seeking financing on public markets.[43] This is a separate issue that the government may want to address, but in the meantime, the Business Growth Fund could provide a solution for companies looking for funding opportunities without having to subject themselves to public-reporting requirements before they are ready.

The Business Growth Fund would allow financial institutions to invest together because of favourable capital treatment for this type of growth capital.

- The key ingredient is a critical mass of private-sector investors that jointly agree to launch this fund—they could include banks, pension funds, insurance companies, and other institutional investors that believe the risk-return profile of these investments is attractive.

- For banks, OSFI rules assign a lower risk weight to equity investments that are deemed to be non-substantial in the Bank Act.[44]

- There are a number of proposals in circulation on how to create a growth fund in Canada. The Council fully supports the creation of such a fund given the market need. It is not contemplated that the fund would require any government financing.

- More than one Business Growth Fund may be needed. However, funds should have sufficient scale to attract the investing talent required to manage the fund and enough Limited Partners (LPs) so that no single LP exceeds the ownership threshold put forward in the current OSFI rules.[45]

Fund size

For established high-impact SMEs, our estimates indicate that there is a C $200 million to C $350 million total annual gap in financing for high-growth firms with at least C $10 million in revenue.[46] The Council believes that it is critical not to create an oversupply of capital in the market. To avoid this, we suggest launching a business growth fund with a total size of approximately C $1 billion, which would address the conservative C $200 million estimate of the expansion-stage capital gap over five years. We believe this could make a significant improvement in the identified gap while mitigating any risk of crowding out other sources of capital.

In addition, the fund could be built using a milestone-based approach, whereby only a fraction of the capital is disbursed initially. Follow-on disbursements would only be made if the fund successfully deploys capital into targeted companies.

Recommendation 3: Supporting innovation through strategic procurement

Governments across Canada spend approximately C $100 billion per year to procure equipment and supplies to provide public services—everything from asphalt to patch roads to hi-tech intelligence equipment—at the municipal, provincial and federal levels. Today, most procurement in Canada is requirements based, meaning that a federal agency, province, or local government issues a request for proposal (RFP) for goods or services and selects a vendor based predominantly on price and quality. In strategic procurement, the government uses its leverage in the purchase of goods and services to pursue indirect benefits such as promoting growth, encouraging employment for certain groups of workers, helping commercialize new products, or scaling up companies. In Canada, we recommend adopting a clear policy to incorporate strategic procurement as a way to support technology adoption and accelerate growth of innovative companies.

The opportunity

The Council believes that strategic procurement could be used in Canada to support innovation and help small companies scale up and gain the credibility to become integrated in global supply chains. With government acting as a first customer, companies can test and validate products and services before introducing them into commercial markets. This is particularly beneficial to mid-sized and smaller companies, which may have more challenges accessing new customers and linking into global supply chains. Strategic procurement would also help deliver inclusive growth by creating opportunities to build on existing success stories linked to businesses owned by underrepresented groups, such as Aboriginal-identified

small businesses. Done well, strategic procurement also offers the opportunity of better servicing all Canadians, and of improving the efficiency of government by applying new technology and approaches to longstanding problems.

The Council recommends that Canada redesign the procurement process to support innovation and manage this effort using clearly defined internal metrics and benchmarking against other countries. Several reports have outlined this problem: the critical challenge will be implementing this approach across governments to achieve results at a meaningful level.[47] The Council strongly recommends that the Government of Canada takes this step now, and actively builds partnerships with other governments and public sector partners to expand the opportunities for Canadian innovators.

Federal procurement in Canada is approximately C $18 billion per year, including goods, services, and construction. This includes roughly $6 billion for defence procurement. Provincial/territorial governments procure approximately C $20 billion per year.[48] However, only a small portion of government spending has been used strategically, even though the federal contracting policy calls for government to take into account "overall benefits to the Crown and the Canadian people" when making purchases. The federal government currently does procurement on behalf of indigenous communities and northern territories but this procurement is currently not strategic and could be better used to promote economic development in these communities. Current procurement practices are designed to avoid risks, contain costs, and focus narrowly on selecting goods and services, rather than achieving social or economic goals such as accelerating innovation or promoting inclusive growth. Overall, the process lacks transparency and does not foster communication between innovators and purchasing agencies, limiting the possibilities for what can be purchased and depriving small companies of an opportunity to validate their products.

Adopting strategic procurement to drive innovation and growth

There are four basic approaches to strategic procurement that are used by other countries, which could guide the formulation of a strategic procurement plan in Canada.

- Solution-based procurement specifies outcomes desired, rather than specifying equipment or service to be purchased.
- Supply-push procurement opens the procurement process to unsolicited offers, exposing the government to innovative ideas and options that officials may not know exist.
- Set-asides reserve a share of government spending for certain types of suppliers, such as small businesses.
- Demand-pull programs where agencies intentionally create demand for nascent technologies.

The solution-based and supply-push procurement approaches have both led to improved outcomes for local companies and industrial growth. Other countries have used innovation set-asides, which allocate a share of procurement to small businesses, and have used demand-pull programs, in which the government defines needs and incents departments to use procurement to stimulate innovation. The US Small Business Innovation Research (SBIR) program is considered a global model for best practice in demand-pull programs.

The program offers research grants for innovative start-ups to develop products and services that are then purchased by the government (for more on global best practices see Box 3, “How other countries do it” on page 29).

Canada should also explore domestic programs at the provincial and municipal levels, which could be emulated and scaled up. Some provinces are considering solution-based procurement programs in healthcare. Such programs would challenge suppliers to come up with solutions to healthcare needs rather than submitting existing technology in response to detailed equipment specifications. Solution-based contracting would encourage innovation and provide an opening for small players.

The Building in Canada Innovation Program (BCIP) is a small supply-push program, under which the government has set aside C $40 million a year to test unsolicited new products. The program is managed by Public Service Procurement Canada (PSPC), which screens suppliers and helps to match them with federal departments, which participate voluntarily. The program is focused on pre-commercial innovation. Informal feedback on the program suggests the program is on the right track, though it was undersubscribed in its early years. It was also suggested that the program should be simplified, and that start-ups should be given more assistance to find internal customers. We support the intent of this program, and see potential to use feedback to improve awareness, effectiveness and scale.

Another strategic procurement program in Canada is the Industrial and Technological Benefits (ITB) program, which requires defence contractors to undertake business activities in Canada that are equal to the value of the contract. Formerly known as the Industrial Regional Benefits program, ITB has recently been revamped to include a “value proposition” to Canada equal to 10 per cent of the overall bid score. As a result, a robust offset plan that supports innovation now can make the difference between winning and losing a contract. The government has flexibility in determining the best value to Canada and can steer investment to priorities such as Canadian firm participation, encouraging Canadian R&D and intellectual property development, SME growth, and increasing export potential. Similar principles can be applied to non-military procurement.

Five actions to drive strategic procurement

We recommend the government specify that support for innovation is an objective of government procurement policy, and commit to being a first customer of new technology, services, and products. As the government develops its approaches to strategic procurement, it is critical to share best practices and collect data across all parts of government on the potential for strategic purchasing and its results. Strategic procurement can be used to stimulate innovation in priority areas and could be aligned with innovation marketplaces, infrastructure programs, and sector strategies, which the Council also recommends. Strategic procurement also provides opportunities for cooperation between the federal government, provincial, and municipal governments.

We recommend that the federal government implement the following five actions to drive adoption of strategic procurement.

1. Use solution-oriented calls for proposals instead of specifying preselected technology. This would help innovative companies (both small and large) compete, and would align different actors in the innovation ecosystem, incent collaboration, and expand supply chains. The process could allow for investment in

early-stage technologies, de-risk purchases of emerging technologies, and help accelerate the commercial readiness of new technologies. Bidding could also favour indirect benefits to Canada such as job creation and firm growth. We also recommend that government agencies conduct more pilot programs to test solutions, such as by sponsoring "grand challenges".

2. Expand the Build in Canada Innovation Program (BCIP). BCIP stands as an important early step in expanding innovation-focused procurement in Canada and we support efforts to market and support more businesses applying to participate and to pitch their innovative solutions to potential government customers.

3. Leverage set-asides. We recommend set-asides for procurement of innovative products and services by the PSPC and other government departments. The set-aside would start at 1 per cent of federal procurement spend and rise to 5 percent by 2025. This program would be mandatory across all federal departments and include purchasing commitments for technologies developed through the program.

Box 3

Case studies from other countries

United States

The United States promotes commercial innovation and small business scale-up through four procurement-related programs:

The Small Business Innovation and Research program (SBIR), requires federal agencies that spend more than US $100 million annually in external R&D to allocate 2.8 percent of these funds to validate the commercialization potential of domestic small business innovation through a highly competitive selection process.

The Small Business Technology Transfer (STTR) program requires agencies that have research budgets of more than US $1 billion to set aside 0.3 percent to fund small business R&D partnerships with academic institutions.

Military spending is earmarked for innovation under a number of programs, the largest of which is the Defense Advanced Research Projects Agency (DARPA) with a US $3 billion annual budget. DARPA invests in new defence technologies and is the center of a robust innovation ecosystem that includes academic, corporate, and government players.

The Advanced Research Projects Agency-Energy (ARPA-E) is an agency within the Department of Energy, which now sponsors research to enhance energy security and advance US energy technology. ARPA-E had a 2015 budget of US $280 million and provides grants to companies to perform R&D-related activities.

Australia

The Australian Defence Force revamped its procurement strategy to bring SMEs into its global supply chains. Outside of defence, the Priority Industry Capabilities (PIC) program funds research for innovations that promote Australian industry. The research is usually a partnership with an academic institution.

United Kingdom

In Britain, the government established an SBIR-like program called the Small Business Research Initiative (SBRI) and made departmental participation mandatory. The program supports both innovative SMEs and large firms based in the United Kingdom and more than 70 government organizations have awarded 2,200 SBRI contracts valued at more than £270 million (C $450 million) since April 2009.

4. Implement a Canadian SBIR-type program. We recommend designing a "demand pull" procurement program modeled after SBIR in the United States. The program should require specific government agencies to earmark part of their budgets (e.g., 3–5 percent over the short to medium term) to fund early-stage R&D by Canadian SMEs. Participating agencies would identify problems they'd like to solve and challenge SMEs to come forward with innovative solutions.

5. Maintain the Industrial and Technological Benefits (ITB) policy. On the defence side, we recommend maintaining the ITB Policy and aligning the value component with priority areas for growth and innovation. Also, the impact on R&D and innovation from recent changes in the program should be monitored.

It should be recognized that implementing these new procurement approaches successfully will require a cultural shift led by leaders in government. This shift will require a risk tolerance that is uncharacteristic of past approaches to government procurement, and an acknowledgement that some ideas will succeed and some will fail.

■ ■ ■

Recommendation 4. Review and rationalize government business innovation programs

Canada needs a focused and effective innovation system that can deliver tangible results against clear economic growth objectives. Therefore, the Council strongly recommends reviewing and retooling Canada's innovation programs to support Canada's 21st century inclusive growth ambitions. This would involve examining current programs, eliminating ones that are not effective, redirecting resources, and adopting the analytical frameworks to create effective innovation programs and manage them using data. To help Canada compete globally, Canada must fund innovation programs that are relevant in a changing context and that support a coherent, agile, and data-driven innovation system.

The purpose of this initiative is to improve the outcomes of innovation programs, not reduce the size of innovation funding. The Council recognizes the challenge of overhauling such a broad suite of important programs while the economy is in transition. We also acknowledge the difficulty of closing programs that have been in existence for decades. However, the world is changing rapidly and Canada's innovation performance is lagging. Doing more of the same is not going to create a successful Canadian innovation ecosystem.

The opportunity

To meet its goals of inclusive growth and increased global competiveness, Canada needs a well-functioning innovation engine. The federal government currently provides critical funding support for accelerating innovation, enabling commercialization, scaling firms, and strengthening exports. In total, these innovation programs cost more than C$5 billion per year across federal departments (see Exhibit 5).

Given the pace of change, we must ensure that these programs are optimized. Over decades, new innovation programs have been added across federal departments, without comprehensive and consistent evaluation and without a unifying vision or objective to guide program design. The federal suite of programs serving businesses needs to be reviewed and retooled to respond to global pressures and to better promote economic growth.

Exhibit 5 Federal programs and agencies across the innovation continuum[49]

NON EXHAUSTIVE

Pipeline for business support: Federal agencies and programs

	1 Start-up	2 Traction	3 Growth	4 Maturity
Access to capital	▪ BDC; FCC Ventures; AAFC financing; VCAP; Futurepreneur Canada; CIC Start-up Visa Program	▪ BDC; FCC; AAFC financing; CSBFP; VCAP; RDAs	▪ EDC; BDC; FCC; AAFC financing; CSBFP; VCAP; RDAs	▪ EDC; BDC; FCC; AAFC financing; CSBFP; RDAs
Product/ service develop-ment	▪ BDC; CICP; Granting council collaborative programs; SD Tech Fund; VCAP; NRC-IRAP; EIP; SR&ED	▪ BDC; Granting council collaborative programs; NRC; NRC-IRAP; SADI; TDP; AIF; ASIP; VCAP; AAFC (AgriInnovation); RDAs; EIP; SD Tech Fund; GGI; IFIT; EMOP; SR&ED	▪ BDC; Granting council collaborative programs; NRC; NRC-IRAP; SADI; TDP; AIF; ASIP; AAFC (AgriInnovation); VCAP; RDAs; EIP; SD Tech Fund; IFIT; EMOP; SR&ED	▪ BDC; Granting council collaborative programs, NRC; NRC-IRAP; SADI; TDP; AIF; ASIP; AIP; AAFC (AgriInnovation); RDAs; EIP; SD Tech Fund; IFIT; EMOP; SR&ED
Business support services	▪ BDC; Futurepreneur Canada; CBN; VCAP; NRC- IRAP	▪ BDC; CBN; NRC-IRAP; TCS; VCAP; RDAs; CanExport; CTAI	▪ EDC; BDC; CBN; NCR-IRAP; TCS; VCAP; RDAs; GOA	▪ EDC; BDC; CBN; NRC-IRAP; TCS; RDAs

The current portfolio of programs delivers funding through a wide range of activities, from support for academic and industrial research to demonstration projects that lead to commercialization and from local sales to export assistance. These programs fall into five main categories (See Box 4 “The five main types of federal innovation support” on page 31).

Despite the range of innovation support programs and size of government investment, Canada continues to lag on key innovation measures, including business investment in R&D and productivity.[50] Programs are sometimes duplicative, and can be challenging for businesses to navigate. Moreover, it is unclear whether the program portfolio delivers the right balance between “supply push” versus “demand pull” or between direct versus indirect R&D support to foster commercialization and productivity enhancement. Canada relies far more heavily on indirect methods to fund industrial R&D and innovation than peer nations.[51] It is also important to explore whether current programs are aligned with priority sectors and regions. Finally, Canada lacks the data about program effectiveness to make evidence-based policy choices about how to allocate funding.

Box 4

The five main types of federal support

Financing for growth and expansion. Innovative companies can receive financial support from the Business Development Bank of Canada and regional development agencies. The Canada Small Business Financing Program offers loan guarantees to private-sector financial institutions. The small business tax rate provides indirect support through lower marginal tax rates.

Innovation support. Funding for innovation is available through the Industrial Research Assistance Program and the Venture Capital Action Plan that invests in young innovative firms. In addition, there are various sector-specific funding programs in such industries as automotive, aerospace, forestry, agriculture, and fisheries. There are testing support programs from the NRC and Transport Canada in the aerospace sector. The Build in Canada Innovation Program uses strategic procurement to support innovation through government purchasing. The Scientific Research and Experimental Development (SR&ED) tax incentive program provides indirect support to commercial research and development efforts for both large and small firms and is the single largest spending category at over C $3 billion per year. There are various programs to encourage the commercialization of university R&D.

Improving access to foreign markets. Export Development Canada provides financing and bonding for exporters. The CanExport Program is designed to help SMEs explore new export opportunities. The Trade Commissioner Service operates offices in 161 cities to encourage exports.

Building entrepreneurial and management capacity. The Business Development Bank of Canada provides (partially subsidized) consulting services. The Canada Accelerator and Incubator Program offers management advisory services including intensive mentoring.

Increasing access to skilled labour. Canadian universities generate a skilled workforce. The Canada Job Grant Program and the Youth Employment Strategy both provide worker training.

Reviewing and rationalizing innovation programs

We propose a structured approach to create a well-defined, relevant suite of federal innovation programs and assets. The goal is to bring efficiency, coherence, and data-driven decision making to the management of Canada's government-sponsored innovation-support programs.

In rationalizing innovation programs, we would aim to make clear connections between innovation goals and innovation programs. The review would identify programs that are no longer a priority, or have not demonstrated effectiveness, and develop a strategy to reallocate resources to higher priorities, identified gaps, or more effective programs. Additionally, the effort would connect to innovation activity across the federal government in programs for skills and talent, immigration, growth capital, trade, and social inclusion. Finally, we would explore opportunities for the federal government to partner with provinces to create a more cohesive and effective national innovation system—one that not only elevates the Canadian business community, but through its effectiveness also encourages greater participation in the economy by women and other underrepresented groups.

There have been a number of previous efforts to review programs, including the 2011 Jenkins Panel. The Council advises the government to draw from this and other research on program rationalization in Canada.

The program suite. A suite of innovation programs that would help Canada compete globally and reach its growth goals would:

- Allocate an appropriate level of resources to address key needs and potential market failures at each stage of the innovation continuum
  - Provide support appropriate to the level of technology and development stage of firms
  - Be responsive to the priorities and unique needs of different sectors (accounting for variation in development timelines, capital needs, and geographic distribution of businesses)
- Focus resources on driving firm growth and scaling up firms
  - Enable firms of all sizes to pull and commercialize research from relevant university and government research labs
  - Use proven approaches to accelerate growth of high-performing firms
  - Focus on building linkages for SMEs to multinational supply chains and commercialization efforts
  - Be accessible for business, with simple interfaces and processes
- Reflect new realities and use new approaches to:
  - Take into account the growing complexity of the intellectual property landscape, the convergence of technologies and sectors (such as digital health), and the opportunities and threats posed by exponential technologies
  - Use challenge-based or outcomes-based funding models to foster cross-sector collaboration and reward results
  - Use more agile regulatory and procurement processes to help local innovators and position Canada as an attractive destination for global innovators

Performance management tools. To understand how innovation programs are performing and to keep them relevant and effective over the long term, Canada needs to have powerful measurement tools and capabilities that are still business friendly, i.e. simple, focused and not too onerous. Canada can:

- Aim to become the leading global user of data to make evidence-based innovation policy decisions and engage with top international practitioners and implement best practices

- Establish consistent and advanced evaluation metrics
- Use data-collection and evaluation methods to assess program effectiveness that are adapted to different program contexts
- Use data to allocate funding to high-performing programs and retool programs as required
- Work with provinces to develop data collection and data-sharing frameworks and standards across all innovation programs with the goal of sharing best practices and improve performance everywhere
- Build a robust database of fast-growing firms across all sectors

Structuring the review process

We propose a four-step program to design and implement the new suite of innovation programs and create an ongoing program-management capability:

- Appoint a review board chaired by an external expert, consisting of external advisors charged with developing recommendations to government, who would be responsible for implementation.
- Define the scope of the review and create a program and evaluation framework for long-term success, to be used in the review as well as ongoing evaluations to ensure continued results.
- Complete a systematic review of all business-facing innovation programs to establish relevance, and measure outcomes and alignment with national priorities to ensure impact on Canada's innovation performance.
- Establish a mechanism to connect the science and innovation activities of government, building on the Fundamental Science Review and the program review proposed here, and govern them in an integrated manner. This would help government set priorities and monitor performance of both science and innovation programs, and ensure alignment between them.

An external expert would be selected to head a review board, which would be responsible for the recommendations to government, and may have an ongoing role in monitoring the impact of the review. The government, in turn, would be accountable for the implementation and impact of the program review. The review board would consist of experienced arms-length experts from business, academia, and other relevant stakeholder groups, and would ideally include international members, to provide independent perspectives and knowledge of best practices.

Reviews would include explicit considerations of future oversight options to streamline program monitoring and develop a framework for ongoing program review. Future oversight of research and innovation and the coordination of these investments could be facilitated by a single advisory body with external representatives covering the domains of both research and innovation. The Council's proposal in this regard is aligned with recommendations in the report forthcoming from the Fundamental Science Review panel, which will provide more detail.

Meeting the needs of cleantech and life sciences

Though this Council has not made a recommendation specific to the funding gaps faced by Canada's cleantech and life sciences companies, we recognize the need for further examination of these issues and the development of sector-specific solutions to solve them.

Indeed, cleantech and life sciences companies are often passed over for Information and Communications Technology (ICT) companies, which receive a disproportionate share of venture capital flows. Between 2009 and 2015, venture capital investments grew by 180 percent in Canada, from just under C $1 billion to C $2.7 billion, but nearly three-quarters of the increase went to ICT firms, compared with 16 percent for life sciences and 10 percent for cleantech.[1]

Cleantech is much more capital intensive than the traditional information technology sector and companies in this emerging industry require more patient capital, especially in energy and manufacturing. Many leading cleantech firms in Canada face severe constraints in constructing their first commercial-scale projects due to perceived financial risks, even when they have customers in hand. Private markets do not typically provide debt financing for newer technologies, preferring the lower risk profile of incumbent (tried-and-true) technologies. Life sciences companies may be less capital intensive, but face steeper regulatory and compliance barriers. Drug makers, for example, must fund lengthy clinical trials before bringing a product to market, which means investors wait longer for returns than they do for investments in IT firms.

The Council would recommend further exploring the specific capital needs of these sectors.

[i] BDC Venture Capital Overview, 2016

Expected impact

The effort to rationalize government innovation support programs is expected to yield results in five areas:

- Tangible improvements in program alignment, impact, and value delivered
- Significant reduction of the number of programs and increased program efficiency
- Improved access for business and efficient uptake by business clients
- Reduction of policy gaps as the innovation landscape changes
- A transparent structure and tools that allow for data-driven decisions to adjust programs

We believe that a multipronged effort to fuel innovation could significantly increase Canadian productivity, improve competitiveness, and drive inclusive growth for all Canadians. The Council's five interlocking recommendations provide a suite of initiatives to attract talent, provide value added capital, catalyze adoption, and better use government programs and resources. Taken together, these recommendations will help Canada build more global-leading companies and ultimately create high-quality jobs and opportunities for all Canadians. ■

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[1] See the Council's recommendations on *Building a skilled and resilient workforce with a "FutureSkills" Lab and Tapping economic potential through broader workforce participation*, released today.
[2] See "Attracting the Talent Canada Needs Through Immigration," Advisory Council on Economic Growth, October 2016, and "FutureSkills Canada," Advisory Council on Economic Growth, January 2017.
[3] *The Innovation Imperative: Contributing to Productivity, Growth and Well-Being*, OECD, 2015.
[4] Bronwyn H. Hall, "Innovation and productivity," *Nordic Economic Policy Review*, Number 2, 2011.
[5] *The Innovation Imperative: Contributing to Productivity, Growth and Well-Being*, OECD, 2015.
[6] *Technology Works: High-Tech Employment and Wages in the United States*, Bay Area Council Economic Institute Report, December 2012.
[7] Carl Benedikt Frey and Michael A. Osborne, *The future of employment: how susceptible are jobs to computerisation?*, Oxford University Programme on the Impacts of Future Technology, September 2013.
[8] Philippe Aghion et al, *Innovation and Top Income Inequality*, June, 2015.
[9] See "Attracting the Talent Canada Needs Through Immigration," Advisory Council on Economic Growth, October 2016, and "FutureSkills Canada," Advisory Council on Economic Growth, January 2017.
[10] World Economic Forum, *Global Competitiveness Report 2014–15*, p. 147.
[11] John R. Baldwin, Danny Leung, and Luke Rispoli, *Canada-United States Labour Productivity Gap Across Firm Size Classes*, Statistics Canada, January 2014.
[12] Ibid.
[13] *Canada's Technology Investment Gap: Unlocking the sector's key growth opportunity*, Yaletown Partners, 2016.
[14] Capital IQ, WMM.
[15] Variance between sectors shows that Canadian ICT and financial services firms spend about the same on R&D (as a percentage of total revenue) as their American peers, but Canadian automotive and pharmaceutical companies spend significantly less than US firms (Capital IQ, Press Search, Council of Canadian Academies "Why Canada Falls Short" study).
[16] OECD Science, Technology and Industry Scoreboard 2015.
[17] Council of Canadian Academies, "Innovation and business strategy: Why Canada falls short," 2009, p. 109.
[18] Statistics Canada, "Survey of Innovation and Business Strategy." Survey limited to companies with over 20 people and over $250 million in revenue across 14 sectors.
[19] Council of Canadian Academies, "Paradox Lost: Explaining Canada's Research Strengths and Innovation Weaknesses", 2013, p.7.
[20] *Scaling Success: Tackling the Management Gap in Canada's Technology Sector*, Lazaridis Institute for the Management of Technology Enterprises, Wilfred Laurier University, 2016.
[21] See recent announcements on immigration reform in relation to a Global Skills strategy with a fast-track visa process for top talent (October 2016).
[22] *High-impact Firms: Accelerating Canadian Competitiveness*, Business Development Bank of Canada, 2015.
[23] "The Venture Capital Funnel: Your Chances Of Raising Follow-Ons, Exiting, And Becoming A Unicorn," BDC Venture Capital Overview, 2016, CBInsights, "The Venture Capital Funnel," 2015.
[24] Adjusted for differences in company size: in 2010 the average US large business was 1.6x bigger than the average Canadian large business as measured by average GDP contribution (using 2010 USD-CAD exchange rates). Sources: Statistics Canada, US Small Business Administration, and Statistics of US Businesses, Centre for Digital Entrepreneurship and Economic Performance (DEEP Centre).
[25] See "Attracting the Talent Canada Needs Through Immigration," Advisory Council on Economic Growth, October 2016, and "FutureSkills Canada," Advisory Council on Economic Growth, January 2017.
[26] Detailed in Recommendation 4.
[27] Statistics Canada, share of business sector employment by firm size, 2014 (CANSIM 527-0006).
[28] John R. Baldwin, Danny Leung, and Luke Rispoli, *Canada-United States Labour Productivity Gap Across Firm Size Classes*, Statistics Canada, January 2014.

[29] Adapted from BDC definition of "high-impact firm."
[30] BDC Competitiveness Survey, 2014.
[31] *Canada's Technology Investment Gap: Unlocking the sector's key growth opportunity*, Yaletown Partners, 2016.
[32] BDC, Venture Capital Overview, 2015.
[33] BDC Overview of Venture Capital, 2016.
[34] BDC Overview of Venture Capital, 2016 and CBInsights, "The Venture Capital Funnel," December 2015.
[35] BDC Overview of Growth Capital, 2016.
[36] BDC Competitiveness Survey, 2014.
[37] "Growth & Expansion," total capital invested by country, 2016, accessed through Pitchbook.
[38] Industry Canada, *Profile of Growth Firms: A Summary of Industry Canada Research*, 2008.
[39] BDC High Impact Firm report, 2015.
[40] The exact structure of this would require further consultation and analysis.
[41] Based on 2008 GDP shares by firm size. Calculations assume that the total loss and gain to GDP from firms changing size is equal to the average firm output multiplied by the number of firms either leaving or entering the firm class size. GDP is real business sector GDP (2007 chained C $) and omits utilities, educational services, and public administration. Enterprise data is obtained from CANSIM Table 527-0002.
[42] Expert interviews.
[43] Toronto Stock Exchange.
[44] Investments that are deemed non-substantial in the Bank Act are those that represent less than 10 percent ownership on a look-through basis.
[45] This threshold would be 10 percent per limited partner in a single company assuming that the fund invests no more than 49 percent in any given company.
[46] For the purposes of this calculation, qualifying firms are defined as firms looking for a cash injection of $10 million or more.
[47] *Innovation Canada: A Call to Action – Special Report on Procurement*, Jenkins Expert Panel, 2011; Don Drummond, Evan Capeluck, and Matthew Calver, *The Key Challenge for Canadian Public Policy: Generating Inclusive and Sustainable Economic Growth*, 2015.
[48] Department of Public Services and Procurement Canada, "Overview of the Department," https://www.tpsgc-pwgsc.gc.ca/apropos-about/cdi-mbb/1/survol-overview-eng.html
[49] Accronyms in alphabetical order — AAFC: Agriculture and Agrifood; AIF: Atlantic Innovation Fund; ASIP: Automotive Supplier Innovation Program; BDC: Business Development Canada; CBN: Canada Business Network; CIC: Citizenship and Immigration Canada; CICP: Canadian Innovation Commercialization Program; CSBFP: Canadian Small Business Financing Program; CTA: Canadian Technology Accelerators; EDC: Export Development Canada; EIP: Energy Innovation Program; EMOP: Expanding Market Opportunities Canada; FCC: Farm Credit Canada; GGI: Going Global Innovation; GOA: Global Opportunities for Associations; IFIT: Investment in Forest Industry Transformation; IRAP: Industrial Research Assistance Program; NRC: National Research Council; RDA: Regional Development Agency; SADI: Strategic Aerospace and Defence Initiative; SD: Sustainable Development; SR&ED: Scientific Research and Experimental Development tax incentive; TCS: Trade Commissioner Service; TDP: Technology Demonstration Program; VCAP: Venture Capital Action Plan.
[50] Finance Canada (2009); OECD (2011) for the rankings for BERD intensity (BERD as a percentage of GDP) in 2008; OECD Science, Technology and Industry Scoreboard 2015 for the rankings for BERD intensity (BERD as a percentage of GDP) in 2013.
[51] Conference Board of Canada: Business Enterprise R&D, 2015, www.conferenceboard.ca.

BUILDING A HIGHLY SKILLED AND RESILIENT CANADIAN WORKFORCE THROUGH THE FUTURESKILLS LAB

ADVISORY COUNCIL ON ECONOMIC GROWTH
February 6, 2017

Introduction

Canadian workers face a rapidly changing economy which will have a profound impact on the nature of work and jobs of the future. To be equipped for this change, there is a critical need for Canada to rethink our approach to learning, work, and training. Nearly half of Canadian jobs are at high risk of being affected by automation over the coming ten to twenty years.[1] The rise of the "gig economy" means that an increasing number of Canadians will find employment through independent contract work, and therefore not be afforded access to traditional employer-led training and development. While automation and technological change promises to be economically productive, and will likely result in the creation of new jobs, these changes mean that Canadian workers will have to adapt to employers' and consumers' rapidly evolving requirements.[2]

Canada currently lacks an overarching strategy to deal with the increased probability and scale of job dislocation, and must help prepare Canadian workers for the skill demands of the future economy. The United States recently released a report assessing the impact of AI-driven automation on the economy, proposing a skills strategy to prepare the American workforce for the future of jobs.[3] A report from the Foundation for Young Australians recently made the case for a new mindset towards jobs, careers, and work in response to rapid changes from automation (see Box 1 on page 5). Canada needs a similar forward-looking approach.[4]

Providing Canadian workers with the tools to adapt to a changing labour market would establish the conditions for inclusive economic growth, and create the opportunity for widespread increases in household incomes. As noted in a recent report from the Business Council of Canada, "skills make workers more resilient [and] able to adapt to inevitable change in a world where people have multiple jobs during their working lives."[5] Further, greater support for skills development among disadvantaged groups, and for workers in the low-skill jobs most likely to be affected by automation, will be critical to developing an economy that works for all. Canada must respond to the monumental shifts occurring throughout the global labour market – agile and forward-looking national action today will help prepare future generations of Canadians for work success and boost Canada's competitiveness on the global stage.

Recommendation: The FutureSkills Lab

In this paper, the Council proposes the formation of a national non-governmental organization to operate as a laboratory for skills development and measurement in Canada. Led by an executive team drawn from the private, non-profit, and education sectors, the FutureSkills Lab would invite all levels of government, private sector organizations, labour unions, not-for-profits, and other interested parties to partner on an opt-in basis. Through project partnerships and co-financing opportunities, new and innovative approaches to skills development and outcome measurement will be explored. Drawing from these experiences, the FutureSkills Lab would amass learnings and best practices. By sharing these learnings, the Lab could help inform skills and training program funding decisions of multiple players, including government ministries, researchers, employers, and organizations dealing with labour market information. The Council believes that the FutureSkills Lab could catalyze and enable much more forward-looking approaches to preparing Canadians for the workforce.

Operational independence and freedom from political influence are critical to the FutureSkills Lab's success. It must be nimble and entrepreneurial in order to respond to a rapidly changing work landscape. Much as the Canadian Institute for Health Information (CIHI) is accountable to Health Canada and the provincial and

territorial Ministries of Health which fund it, the FutureSkills Lab would be fiscally accountable to a government department – perhaps in this case Employment and Social Development Canada (ESDC) – as well as to the Canadian public. The specifics of the accountability and reporting structure will need to be considered in the design and implementation of the FutureSkills Lab.

To accomplish such an ambitious mission, the FutureSkills Lab will have three core functions.

1. Support innovative approaches to skills development: Solicit, select, and co-finance innovative pilot programs in skills and competency development that address identified gaps among workers, post-secondary students, and youth

2. Identify and suggest new sources of skills information: Gather labour market signals of skill needs by amassing a portfolio of pilot proposals, support innovative labour market information initiatives focused on employer expectations, use web-based sources to extract and synthesize emerging labour market trends, and draw links between credentials and skills

3. Define skills objectives and inform governments on skills programming: Rigorously measure outcomes of forward-looking and targeted training programs and skills information initiatives, identify and disseminate best practices broadly to education and training stakeholders across Canada, and determine a set of skills objectives for the future. Should stakeholders choose to opt in, these objectives can then help inform the more than $17 billion in annual public spending on skills and training programs, the work of organizations that generate and analyze Canadian labour market information, and researchers and practitioners directly involved with training and education programs

Skills development is important throughout a worker's lifetime. Foundational skills – including literacy and numeracy – are developed early in life, long before students choose to pursue higher education or enter the workforce. Establishing an education system where students can "learn to learn" will be critical to building a skilled and resilient labour force. There is a role for the FutureSkills Lab to play in identifying new innovations in youth training and disseminating best practices.

While the FutureSkills Lab would be an arm's length entity, its collaboration with existing organizations will be crucial to ensuring that efforts are well-coordinated and non-duplicative. In the setup of the organization, early engagement with provincial and territorial ministries of education and labour can build the connectivity required to identify priorities and translate successful pilot outcomes into mainstream policy.

The FutureSkills Lab would need to work closely with Statistics Canada and the Forum of Labour Market Ministers' forthcoming Labour Market Information Council (LMI Council) to exchange information and prioritize areas for collection and analysis of labour market information. Open communication with the Council of Ministers of Education Canada will be critical to ensure that training pilots supported by the FutureSkills Lab are aligned with provincial and territorial goals and objectives in education policy. Regular sharing of information, results, and best practices with Employment and Social Development Canada and the Forum of Labour Market Ministers would help build the FutureSkills Lab into a trusted advisor on skills development

throughout the workers' life cycle. Further, collaboration and information sharing with other pan-Canadian organizations in this space – the Business / Higher Education Roundtable (BHER), Universities Canada, Polytechnics Canada to name just a few – will ensure complementarity in efforts.

In this paper, we first explore the challenges in the Canadian labour market. We then discuss in detail the proposal for the FutureSkills Lab: its three core functions, priorities, governance, interactions with other agencies, and metrics by which its performance should be judged.

Challenges in the Canadian labour market

Canada starts from a position of strength. We rank second among OECD countries in the share of workers that are well-matched to their jobs given their level of education,[6] and we lead our peers in the share of the population aged 25-to-64 with tertiary education.[7] Yet the challenges we and other nations face are severe. Technological developments and automation require skills and behaviours that many Canadian employers believe graduates do not have. At the same time, employer investments in learning and development have declined considerably in recent decades. Finally, Canada lacks forward-looking and reliable information about its labour market to inform policy makers, educators, employers, and workers.

Rapid technological change. Even before automation takes off, it is estimated that two-thirds of current economic activity could be automated with existing technologies.[8] This will only accelerate: advances in automation and "smart" technologies could affect nearly half of current jobs in Canada, according to a study by the Brookfield Institute.[9] Lower-skill, lower-income workers will experience a disproportionate share of the impact. Occupations that mostly require predictable physical work, or rote and repetitive knowledge are most likely to be automated. Artificial intelligence (AI) could also automate significant chunks of repetitive higher-skill jobs like accounting.[10] These trends create an imperative for aligned and efficient efforts to mitigate and minimize job displacement for Canadians in rapidly transforming industries, as well as setting up future generations for work success.

The increasing pace of technological change calls for a greater focus on digital literacy as a cornerstone of inclusive growth.[11] The internet economy in Canada contributed roughly 3 per cent of GDP in 2010, and job growth in this sector is estimated to outpace that in the rest of the economy.[12] While Canada ranks relatively well compared to OECD peers in levels of computer skills and digital literacy, some segments of the population fare less well, namely Aboriginal Canadians, older Canadians, those with disabilities, and certain segments of the population whose manual jobs have been reduced or taken away altogether due to automation and other market trends. Equipping workers with the skills required to thrive in an increasingly digital world will be critical to laying the groundwork for an inclusive economy.

Changing needs in the workplace. While the majority of Canadian employers agree that most post- secondary graduates are prepared for entry-level jobs, their expectations of worker competencies are changing.[13] This suggests that training and education systems need to be updated to meet these changing needs, especially those driven by technological change and automation. With job and career transitions becoming more frequent, workers will also need to build skills throughout their working lives. And other skills will be needed, such as the entrepreneurial flair to not only start but successfully scale innovative companies in Canada.

Box 1

The New Work Mindset: How Australia is shifting the way we think about jobs, careers, and skills

By analyzing millions of job advertisements between 2012 and 2015, the Foundation for Young Australians (FYA) found that demand for certain skills is growing rapidly – digital skills and critical thinking, in particular – revealing seven new "job clusters" where requisite skills are portable between jobs within the cluster. In fact, the FYA estimates that when a person trains for one job, they gain skills in an average of 13 other jobs. In the Australian case, the clusters identified are the Generators, the Artisans, the Designers, the Technologists, the Carers, the Coordinators, and the Informers, each with a common set of skills. The Technologists cluster, for example, includes jobs requiring "skilled understanding and manipulation of digital technology", while the Artisans cluster comprises jobs requiring skill in "manual tasks related to construction, production, maintenance, or technical customer service".

The report, *The New Work Mindset*, urges a shift in focus from jobs to skills to "prepare young people for the future of work". The use of job advertisements to create clusters of overlapping skillsets is an innovative and evidence-based approach. It presents an interesting example for the FutureSkills Lab to consider in the Canadian context. A shift to a skills-based work mindset would not only lead to smoother job transitions for workers throughout their careers, but would be a promising starting point to better link credentials and degrees to skills and competencies.

■ ■ ■

"By understanding the skills and capabilities that will be most portable and in demand in the new economy, young people can work to equip themselves for the future of work more effectively. Our mindset needs to shift to reflect a more dynamic future of work where linear careers will be far less common and young people will need a portfolio of skills and capabilities, including career management skills to navigate the more complex world of work." – The New Work Mindset

Further, the rise of the "gig economy" creates a need for new ways to deliver training to independent workers, many of whom combine multiple streams of income to earn a living. As more Canadians choose independent work over becoming employees, the need for entrepreneurial skills that drive success in self-employment and mitigate risk of job dislocation will be critical. Delivering relevant training in "bite-sized" courses for independent workers could help, much as Australia has done in their own skills program (see Box 3 on page 14).

Starting early in their careers, young workers are increasingly expected to take on more than a rigidly functional role. In a 2016 survey, large Canadian companies reported they are looking for "soft skills" like teamwork, problem solving, and communication in addition to—and sometimes in preference to—functional knowledge and industry-specific experience.[14] Further, in the 2016 Global University Employability Survey, nearly 90 per cent of employers define employability as "a set of job-related aptitudes, attitudes and behaviours," naming adaptability, teamwork, and communication as some of these traits.[15]

Workers need to learn the right skills, but also need help signaling them to employers. Recent research by the Conference Board of Canada notes that credentialing in Canada is centered on education and work experience, neglecting softer skills.[16,17] As a result, it is difficult for job applicants to signal their qualifications clearly beyond technical skills and industry exposure. Credentialing methods could be improved to reflect both technical and soft skills, allowing employers to better communicate their needs, and workers to better communicate their qualifying strengths. Finally, an increase in study-related internships, co-op placements and apprenticeships would help students learn soft skills and enable employers to learn firsthand about the soft skills of potential full-time employees.

Declining training by employers. Annual expenditures by Canadian employers on learning and development have declined by over 40 percent in the past twenty years, from $1249 per employee in the early 1990s to $800 in 2015.[18] Declines may be explained by increasing rates of employee turnover, and growing market competition and margin pressure. These outlays are lower than expenditures by American companies, which invested an average of $976 per employee in 2015. Canada also lags behind OECD peers in job-related informal education. In 2009, the last time this metric was measured, only 30 percent of Canadian workers participated in some form of informal job-related training, compared with 61 percent in Sweden and 47 percent in Norway.[19]

A shift towards part-time and contract work is likely to exacerbate the challenge, as employers will find it increasingly difficult to justify training investments for workers who have multiple employers at any given time. Part-time employment as a share of total employment in Canada increased from roughly 18 per cent in 2000 to 20 per cent by the end of 2016.[20]

Building off the important work of BHER, the private sector could partner in more varied and creative ways with educational institutions to improve workforce preparedness among recent graduates, especially as new skills are required – and new roles appear – in the workplace of the future. About half of large companies sampled by the Business Council of Canada had provided advice to post-secondary institutions on curriculum and program development, and a third had contributed to classroom instruction.[21] For some disciplines, rules from accreditation organizations limit participation by employers in curriculum development. Greater cooperation and flexibility from these organizations could help students be better prepared for the workplace.

Disorganized labour market information. Governments, academics, and others have long recognized the need for more timely and reliable labour market information. Provincial and territorial governments collect data for their regions, but its sensitivity and a lack of standardization in sampling and terminology has made it difficult to use this wealth of information for national policy making. The forthcoming launch of the LMI Council from the Forum of Labour Market Ministers should begin to resolve this – this Council is working to improve local data, standardize methods and standards in terminology, and disseminate labour market information.

Even then, there will still be gaps in information about employer skills and competency demands. While many large employers used to conduct their own occupational forecasting and produce their own data, the increasing pace of change in occupational requirements and definitions has made these exercises largely futile. There is a need for increased collaboration with employers to determine what competencies, as opposed to specific occupations, will be required in the Canadian economy.

Currently, little is done to gather information on labour demand from digital sources, in part because of a lack of mandate in this domain at Statistics Canada (or at the LMI Council). Other jurisdictions have successfully gathered such data, among them the New York City Tech Pipeline, which partnered with LinkedIn to map supply of and demand for tech labour in the region, as well as job vacancies posted by employers. There is scope to augment the work of Statistics Canada and the LMI Council in this area.

Taken together, these four trends present real challenges for Canadian workers, employers, policy-makers, and educational institutions. Canada needs a solution that will help fill the gaps outlined above and provide an overarching skills strategy to prepare the Canadian workforce for future technological change and evolving skills needs.

The FutureSkills Lab

Our proposal calls for an arm's length pan-Canadian organization with three core functions, clear priorities for investment, a strong governance model, open channels of communication with other stakeholders, and a clear way to define success.

Three core functions

1. Support innovative approaches to skills development. The FutureSkills Lab would solicit, select, and co-finance innovative training pilots that address key skills gaps. Pilot proposals would be solicited from the private sector, educational institutions, governments, and not-for-profit entities, with a requirement that submitters contribute a share of the financing required. The FutureSkills Lab's share of pilot financing could vary from a minimum of 30 percent to as much as 90 percent for those programs targeted specifically at skills development among disadvantaged groups (e.g., Indigenous Canadians, those displaced economically by industry or market downturns, Canadians with disabilities).[i]

Submitting organizations would share responsibility with the FutureSkills Lab for the design, implementation, and outcome measurement of the pilot, and would share ownership of the results. The FutureSkills Lab would offer advice and guidance on implementation. As a pre-condition for co-financing support, organizations would partner with the FutureSkills Lab to develop principles and metrics for pilot success, and would agree to share all results with the FutureSkills Lab to allow for rigorous measurement of outcomes.

Providing incentives for private sector participation. While firms are often willing to invest in the development of specific skills for their business, they generally underinvest in general skills such as problem-solving, critical thinking, and persistence. Underinvestment will only get worse as the pace of worker turnover accelerates, lowering the return on investment of general skill training. And as mentioned, research, innovation and company-scaling skills are also needed. To partner effectively with employers and other organizations, the FutureSkills Lab would remove some of the financial risk in building the skills the nation needs.

[i] Please refer to the Advisory Council's memo on Workforce Participation for a more detailed review of opportunities for Canada to expand the labour force among certain disadvantaged groups and increase standards of living and overall economic productivity.

Determining the level of co-financing. The share of the pilot program cost covered by the FutureSkills Lab would be determined by the nature of the training. If the skills involved would close a future gap, are broadly applicable and transferable, and are necessary to make the national workforce more resilient, the FutureSkills Lab should be willing to invest in the pilot. The same is true of pilots targeted at developing skills among disadvantaged groups.

Consider three hypothetical examples:

- A local technology hub develops a 6-month program in functional skills that its members have identified as under-developed: sales, digital marketing, and product management. At the end of the pilot, the technology hub and the FutureSkills Lab measure results against specific metrics, and share them along with best practices with governments, companies and other organizations. At the member companies, newly skilled employees go on to optimize their companies' performance and train other workers. Because this pilot aims to develop skills for which a real gap has been observed, are transferable across many industries, and are needed for effectively starting and scaling companies, the FutureSkills Lab might choose to finance 60 to 70 per cent of total costs.

Exhibit 1 **An example pilot proposal for The FutureSkills Lab**

- A group of manufacturing companies determines that their employees need stronger soft skills such as communication, teamwork, management, and problem solving. They submit a proposal for a program of coaching for managers and directors, in which coaches provide regular virtual help over 12 months. The program calls for specific key performance indicators (KPIs) for each participating manager and director. At the end of the pilot, results are measured against the KPIs and shared, along with best practices, with governments, companies and other organizations. Because the soft skills being developed are highly transferable to other employers, and important for building a resilient and successful future workforce, the FutureSkills Lab would commit to co-financing of perhaps 70 to 80 per cent.

- A large energy company observes a shortage of Canadian graduates with knowledge of robotics and machine learning – "hard skills." The costs of developing specialized training in these fields are substantial, and the training methodology new and relatively untested. The energy company approaches a few of its peers across Canada and finds that they have observed the same gap. Together, the companies submit a proposal to develop a training program for early-tenure workers to build capabilities in robotics and machine learning, drawing from courses taught at a college in Ontario (see Exhibit 1, on page 8). As one outcome, the engaged employers enjoy an expansion of the Canadian talent pool. The FutureSkills Lab is able to extract information about skills gaps in the Canadian labour market and best practices from the pilot, with which it can advise governments on their skills-related spending, including the broader scale-up of successful programs or ongoing support for high-impact programs. Because the skills involved are somewhat company-specific, the FutureSkills Lab would commit to a lower level of co-financing, perhaps 30 to 40 percent. If the pilot were specifically targeted at building skills in Indigenous communities, co-financing would increase to perhaps 90 percent.

Selecting pilots to co-finance. The FutureSkills Lab would support skills development across every industry, region, and stage in the learning lifecycle. See Box 2 for examples of real-world, high-impact programs that the FutureSkills Lab might support in a pilot stage.

2. Identify and develop new sources of skills information. In its second function, the FutureSkills Lab would identify gaps in the measurement, data collection, and analysis of skills and competencies in Canada. Improved information would help all concerned— workers, employers, students, parents, policy makers, and training and education providers—make better informed decisions.[22] If it is to be valuable in this regard, the FutureSkills Lab must make all its knowledge, data, and outcomes widely accessible and visually comprehensible to Canadian workers, job seekers and employers.

In areas where organizations such as Statistics Canada or the LMI Council have a clear mandate for data collection and analysis, the FutureSkills Lab would assume an advisory role by proposing areas for data analysis. In other areas where information exists but is not used, the FutureSkills Lab would support innovative approaches to data collection and analysis, for example by leveraging data from its portfolio of pilot proposals. This includes areas like employer expectations of future skills and competency needs, digital signals from job posting websites and other online sources, and links between credentials and skills.

Box 2

Some existing training programs are examples of the types of pilots the FutureSkills Lab might support through co-financing

For post-secondary and lifelong learners, George Brown College invests in the development and delivery of e-learning courses using labs and robotic simulation software, reaching a wide and diverse audience of students and minimizing per-student training costs

For young girls, the Actua National Girls Program and Technovation Challenge offer boot camps to develop technical, business-plan, and presentation skills

For women wanting to reenter the workforce, Après provides coaching and training, a support network, and direct access to job opportunities

For lifelong learners, Canada Learning Code aims to bring digital education to 10 million Canadians over the next 10 years through private-public partnerships, educator training, and research and advocacy

For female entrepreneurs, Fierce Founders Bootcamp at Communitech offers founders an opportunity to learn from experienced entrepreneurs about how to refine their business model and pitch

For Indigenous workers, BladeRunners helps 15-to-30 year-olds gain skills related to local industry. Seventy per cent of program participants are Indigenous

For youth, The Brightworks School uses project-based learning to build soft skills like teamwork, communications, and problem solving

For high school students, SHAD is a one-month program to learn about leadership in STEAM (science, technology, engineering, arts, and math)

For disadvantaged youth, the forthcoming 40KEY Coalition is a commitment among employers to link training programs to job opportunities to ensure job seekers invest in skills demanded in the labour market

Portfolio of pilots. The portfolio of pilots gathered from private-sector employers, educational institutions, and not-for-profits would inform policy-makers and educational providers about where they should focus their investments and efforts. Currently, governments receive a considerable number of unsolicited proposals for funding of training programs each year, but they are not aggregated and analyzed for trends. The FutureSkills Lab would manage the solicitation, review, aggregation, and analysis of such proposals, and would share widely the trends it observes in competency requirements.

Employer data. Corporations have a significant role in the generation and collection of labour market information; such employer data is a critical resource for forecasting needed competencies. An employer may not know exactly how many engineers it will need in five to ten years, but can more likely articulate the types of foundational competencies (e.g., technical literacy) it will need. Some employers keep high-quality data, though less than before as occupational forecasting has become more difficult. The FutureSkills Lab would consider ways to unlock this valuable proprietary data, perhaps by engaging employers on an annual skills and competency survey and offering a report of trends and findings in exchange.

Digital signals. While the forthcoming LMI Council has signaled intent to explore digital signals, development of the required expertise is likely beyond the LMI Council's immediate scope. The FutureSkills Lab would fill this gap by employing specialized data scientists to forecast market competency requirements from job listing sites (e.g., LinkedIn, Crunchbase, AngelList, and Talent Egg), and cull useful insights from other sources (e.g., conference topics from groups like NextGen, and research priorities of academic institutions). More broadly, the FutureSkills Lab should regularly scan the global landscape for innovative, forward-thinking and comprehensive approaches to competencies development.

Credentials and skills. Finally, the FutureSkills Lab could use the information collected to identify innovative ways of linking degrees and credentials to skills and competencies. This is a complex challenge and one that will need to be addressed with a coherent national approach. As one potential tactic, the FutureSkills Lab might map the skills demanded by employers, as expressed through pilot proposals, with information about the credentials of the employees who have been most successful in the past. Progress on this front would provide greater transparency to employees looking to hire workers with competencies not reflected by traditional credentials, and to students looking to obtain the qualifications they need to succeed in their desired field of work. Working towards national accreditation standards would also create a more mobile Canadian workforce, to the benefit of employers who hire nationally, and workers who would qualify for a larger pool of jobs.

3. Define skills objectives and advise governments on skills programming. The FutureSkills Lab would measure outcomes of its skills initiatives and pilots and offer that data to inform the tens of billions of dollars in program-funding decisions made by federal, provincial and territorial governments. In addition, it would aggregate information about best practices and lessons learned. These would have many uses; for example, they might be used to review the effectiveness of existing investments in Canada Job Grants and other federal transfers in the training realm. Funding from underperforming programming can be diverted to more successful methods as identified by the FutureSkills Lab, in close collaboration with provincial and territorial governments.

Based on its experience in identifying, supporting and measuring outcomes of training pilots and data initiatives, the FutureSkills Lab would define a set of forward-looking, employer-backed Canadian skills objectives—and would continually update them, as needs evolve. These objectives would be shared with the public and other organizations through regular publications and data releases.

The FutureSkills Lab would also track the effectiveness of specific education and training resources and methods used for the various pilot programs, and share a list of the most effective with relevant and interested parties across Canada.

Priorities for co-financing

The FutureSkills Lab would have three broad priorities when choosing programs to co-fund: support for *lifelong learning to increase resiliency* among workers throughout the totality of their career lifecycle; exploring *innovations in post-secondary education*; and through *youth training*, setting the proper foundation for future career resiliency and greater national economic productivity. While education policy sits outside of federal jurisdiction, there is an opportunity for Canada in wider information sharing on labour market trends and innovative education practices to ensure inclusive and best-in-class education for the future

success of all Canadians. There is broad opportunity in the training and education space in Canada. To ensure success, the organization must focus on the top priorities within each of the three demographic groups outlined below.

Lifelong learning and workforce resiliency. The FutureSkills Lab would identify innovative skills development interventions for workers of all ages and in all industries. With the strategic objective of tempering longer-term job disruption from automation, technological change and other market forces, the FutureSkills Lab would prioritize programs that allow workers to gain the skills required by employers, either by building skills in their respective industries, or acquiring new skills needed to enter other sectors or types of work. Interventions might include innovative approaches to on-the-job retraining, retraining for workers who dropped out of the labour force to care for family members, and for unemployed workers in disrupted sectors.

The FutureSkills Lab should work to develop an ROI-based business case for needed but overlooked skills development training by Canadian employers of all sizes. If targeted outreach and co-financing does not persuade more Canadian employers to participate in targeted skills training, the FutureSkills Lab should work to renew employer engagement in training and learning, especially among smaller companies with smaller budgets.

Post-secondary education. The FutureSkills Lab would support programs that can equip students and new graduates with the skills employers need, or skills associated with successful and scalable entrepreneurship. This support might include increasing opportunities for work-integrated learning, or delivering training tied directly to market-identified skills needs. Increased collaboration between employers and educational institutions is the first step in bridging the gap between employer expectations and graduate competencies. While many employers collaborate with post-secondary institutions, these arrangements mostly involve Canada's largest employers. Approximately 70 percent of large Canadian businesses partner with post-secondary institutions to support internships or cooperative learning programs.[23] This proportion is considerably smaller among small and medium-sized companies. The FutureSkills Lab should work with organizations such as BHER, Universities Canada, and Polytechnics Canada to increase collaboration, communication and experiential learning opportunities between employers and post-secondary institutions. The Lab could act as a conduit by, for example, co-financing innovative co-op programs or experimenting with cross-disciplinary programs.

The FutureSkills Lab would focus on identifying innovative approaches to skills development within both trade industries and knowledge-related disciplines, so collaboration with both colleges and universities will be important. Priority for co-financing support would go to those pilots that build skills important for future work success and are not being made redundant in the near term via automation or other forms of innovation.

Youth learning. The increasingly fast pace of labour market change makes the continued evolution of holistic education and solid foundational training important for young students. The FutureSkills Lab would explore innovative approaches to youth training and competency development, enlisting support from employers and industry groups to help young Canadians learn about future job opportunities. Curriculum creation and delivery of youth education sits within provincial and territorial jurisdiction, and willing and interested provincial and territorial governments would have the opportunity to collaborate with the FutureSkills Lab at their

discretion. Outside of the formal learning environment, there is scope for the FutureSkills Lab to support innovations in extra-curricular training programs, such as the Actua National Girls Program or Technovation Challenge (see Box 2 on page 10).

According to the OECD Survey of Adult Skills, rates of literacy and numeracy among Canadian youth have declined in recent years.[24] While basic numeracy and literacy skills are not in the FutureSkills Lab's purview, it is hoped that the education system will continue to build and refine the conditions necessary for the development of these foundational skills during all Canadians' early education.

Crucial Design Considerations

Governance

To determine the optimal governance and operating model for the FutureSkills Lab, we looked at several international examples of countries that have undertaken efforts of similar scope (see Box 3 on page 14). We found a highly useful example right here in Canada with the Canadian Institute for Health Information (CIHI).

CIHI is an independent, publicly funded, and not-for-profit organization that brings focus and guidance to health information and policy advice in Canada. Using the CIHI model (see Box 4 on page 15), we recommend that the FutureSkills Lab be established as an arms-length organization, led and staffed by an inter-disciplinary team nominated by both governments (federal, provincial and territorial) and non-governmental organizations. While CIHI is a sizeable organization at nearly 750 employees, this Council recommends that the FutureSkills Lab be established initially at a considerably smaller size and funding level for the first five years of operation, after which proven success and efficacy in the skills space may justify gradual growth and expansion of responsibilities (see the discussions on executive and staff, and scale, below).

Independence for the FutureSkills Lab is essential to bring all stakeholders to the table on equal footing, to align well with intergovernmental organizations while avoiding the perception of undue federal government influence, and to remain nimble and thoroughly informed. Unlike education, which is under provincial and territorial jurisdiction, skills must involve all levels of government as well as the private sector, labour unions, industry associations, and other stakeholders to ensure Canada has a robust and forward-looking strategy. Achieving what needs to be done in the skills space would be challenging to do within the current framework of support and institutions. An independent pan-Canadian center of excellence like the one we propose is a vital cog in the machinery of skill analysis and development.

Accountability. While non-governmental and politically neutral in strategic direction, the optimal accountability and reporting structure will need to be considered for the FutureSkills Lab. Taking CIHI as an example, the organization is fiscally accountable to its funding agencies, Health Canada and the provincial and territorial Ministries of Health. The FutureSkills Lab would develop a similar structure to maintain transparency in funding, activities, and outcomes. The federal government should work with relevant ministries and departments to develop the appropriate configuration.

Executive and staff. An interdisciplinary executive team would ensure that the organization serves a broad audience. Members would be drawn from the private, non-profit, and education sectors (both practitioners and education researchers) representing all stages of lifelong learning. The executive team would be

Box 3

International examples of innovative skills development programs

Few countries have undertaken large-scale and forward-looking policy action in this realm, but there are partial examples from Singapore, Denmark, the United Kingdom, Australia, and the U.S. from which Canada can draw lessons and best practices. In the set-up of the FutureSkills Lab, we recommend that the government conduct their own consultations with the ministries of our peer countries who have executed similar programs. We think that the SkillsFuture Singapore example is a particularly interesting one for the FutureSkills Lab to consider for application in Canada.

SkillsFuture, Singapore. Launched in 2016, SkillsFuture aims to invest in human capital through education and training. The SkillsFuture credit provides every Singaporean over the age of 25 with a $500 credit to use towards a range of government-supported training and education courses. The credit never expires and is topped up periodically over the individual's career. The program's intent is to make every student and worker the leader of their own learning path, where they are free to choose the type of training they need to reach their own career goals, whether that means pivoting to a new industry or gaining specific hard or soft skills. SkillsFuture leverages a Skills Framework to enable informed decision-making by students, employees, employers, and training providers. The framework provides information such as workforce profiles, career pathways and wage trends, and desired skill sets of particular roles. A list of training programs that address skills gaps in each sector and role are included in the Framework. Launched only in 2016, Singapore is gradually rolling out this framework sector-by-sector. More information is available here: www.skillsfuture.sg

Adult vocational training, Denmark. Unemployed workers in Denmark are granted the right to an "activation offer", which can be used towards private job training, public job training, classroom training, or residual programs like job search assistance or counseling. Private and public job training occur at the workplace as a form of work integrated learning; private organizations receive a 50 per cent wage subsidy for a low salary for up to 12 months to incent participation in the program, while jobs in public institutions pay a fixed wage. Programs offered aim to build skills in 120 competencies, each applicable to more than a single job area. Types of training include development of job-specific skills, general skills, and labour management skills. More information is available here: eng.uvm.dk

UKCES Futures Programme, United Kingdom. Starting in 2014, the UK Futures Programme trialed innovative approaches to workforce development through co-investments with employers and industry. The UKCES engaged in real-time outcome measurement of all initiatives supported, and identified what worked well for policy-makers and businesses to adopt in their own training and learning practices. More information is available here: www.gov.uk/government/publications/ukces-futures-programme-an-introduction

Jobs NSW, Australia. In 2016, the Australian state of New South Wales committed to working towards a "stackable" vocational education and training system, where workers' existing skills could be measured and efficiently built upon with new training modules. Offering "bite-sized" courses that each add different soft and technical job-readiness skills– interactive communication skills or specialized robotics skills, for example – allow mid-career employees to add skills for little time investment. The program relies on competency-based qualifications to assess the current skill level of an employee seeking additional training. More information is available here: www.jobsfornsw.com.au

New York City Tech Talent Pipeline, United States. In 2014, New York's mayor announced the launch of a tech talent pipeline to support the growth of the tech sector and expand the pool of qualified homegrown tech talent. Part of this program included leveraging online labour market data to better understand the current state of the tech ecosystem. The initiative analyzed aggregated LinkedIn data to identify "in-demand" tech skills in real-time. The NYC Tech Talent Pipeline leveraged this new source of labour market information to mobilize industry partners to create and deliver tech skills programs to help close these gaps (e.g., tech skills training programs, scholarships, critical research, and funding support). More information is available here: www.techtalentpipeline.nyc

responsible for the operation and strategic direction of the FutureSkills Lab, including the approval of pilots and information initiatives to be co-financed, and the determination of Canadian skills objectives. The size of the executive team should be large enough to effectively represent multiple perspectives, but small enough that the group can function nimbly and effectively – a team of between eight and ten could strike this desired balance. Importantly, the FutureSkills Lab's executive team should formally seek insight and advice from provincial and territorial ministries of labour and education to ensure policy makers are engaged in the process. Further, the team would regularly seek expertise from relevant labour unions, industry associations, accreditation bodies, and Statistics Canada.

We recommend that the CEO of the FutureSkills Lab be unaffiliated with the federal government to ensure the organization is perceived – and acts – as neutral and objective. Further, it is critical to the success of the FutureSkills Lab as a nimble, innovative and forward-looking organization that the CEO be entrepreneurial in mindset and experience, and a collaborative leader who can effectively convene stakeholders.

The full-time staff would include researchers, analysts, data scientists, technologists, and marketers. They would be responsible for attracting and screening pilot proposals and submitting a shortlist of proposals to the executive team, collecting a library of Canadian skills opportunities and information gaps, and collaborating with leaders of co-financed pilot projects to set project metrics, measure outcomes, and establish and share best practices. The strategic direction of the FutureSkills Lab, as set by the executive team, would determine the number of full-time staff to be appropriate for the first five years of operation.

Scale. To accomplish its mandate of investing in innovative approaches to skills development and labour market information collection, the FutureSkills Lab should target funding of $100 million per year for its first five years – though it may reasonably begin with less than the full $100 million as it works to build a pipeline of pilot proposals. This level of funding was determined by looking to the initial annual budgets of comparable organizations, including CIHI. In its fifth year of operation, the FutureSkills Lab should be

Box 4

Principles to learn from CIHI

Independent and not-for-profit to ensure impartiality

Funded through bilateral agreements between the federal government and provincial and territorial ministries

Fiscally accountable to Health Canada, provincial and territorial governments, and the Canadian public

Governed by an interdisciplinary team, nominated by both governmental and non-governmental organizations

Provides open access to information for governments, providers, and Canadians

Advises policy-makers through evidence-based recommendations

assessed on its relative success in identifying new best practices in training and skills development as well as data collection. If proven successful, the government may choose to expand the FutureSkills Lab's funding and scope of activities.

Annual funding of $100 million would allow the FutureSkills Lab to directly reach more than 20,000 workers and students per year, assuming a per-intervention cost of $7,700 per person and an average co-financing rate of 50 per cent.[25] Costs could be less for some pilots such as those using digitally delivered instruction. This is a modest estimate, and represents the potential reach and impact of the FutureSkills Lab's initiatives in only the most direct sense. In addition, the FutureSkills Lab would provide significant indirect benefits by validating innovative pilot programs (which can then be expanded by governments and organizations), and by aggregating and disseminating information.

Decisions to expand successful pilots would be made by individual governments for their respective jurisdictions, or by employers and non-profits for their own training and skills development agendas. As the FutureSkills Lab matures and initial pilots prove successful, we recommend that a more detailed process for the roll-out or scale up of successful pilots be determined by these stakeholders.

Interaction with other relevant government organizations

To avoid redundancy and aim for complementary value creation, the FutureSkills Lab would need to collaborate with existing organizations, in particular the Forum of Labour Market Ministers (FLMM) and its LMI Council, the Council of Ministers of Education Canada (CMEC), Statistics Canada, the Business / Higher Education Roundtable (BHER), Universities Canada, and Polytechnics Canada (see Exhibit 2, on page 17). The FutureSkills Lab would play a complementary role to the important work of these entities, and should be considered as an additional resource for stakeholders to experiment with innovative approaches to skill development and information generation. Specifically, the FutureSkills Lab's engagement with government agencies and provincial and territorial partnerships could involve the following:

FLMM and CMEC: The FutureSkills Lab would provide advice and recommendations to the FLMM and CMEC on skills objectives, skills development, and measurement priorities, including reporting on outcomes. The FutureSkills Lab's recommendations could be used by the FLMM to help guide roughly $4 billion in annual training investments, and over $13 billion investments in post-secondary education. The CMEC could work with the FutureSkills Lab to ensure that co-financed pilot programs are aligned with overarching goals and objectives for educations systems in the provinces and territories.

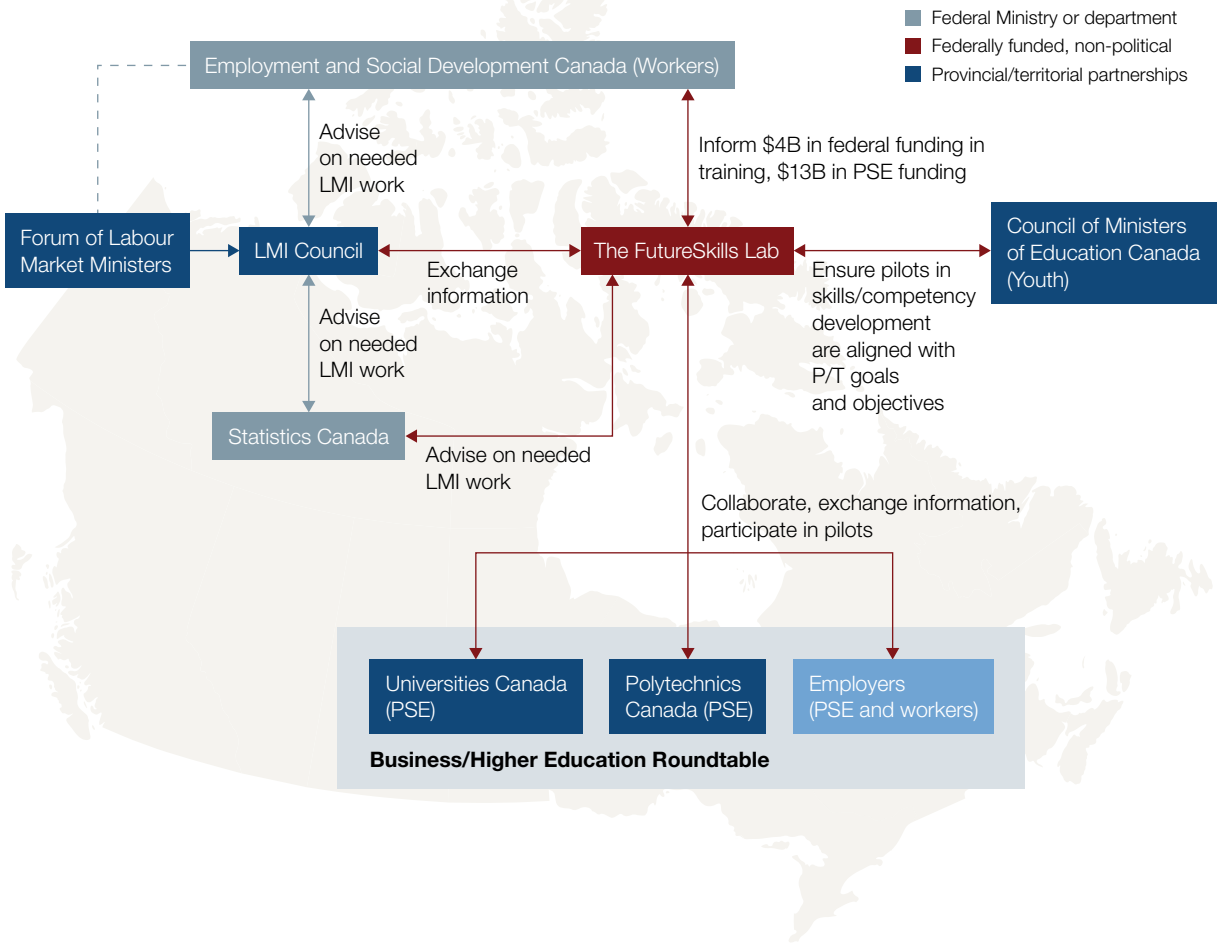
LMI Council and Statistics Canada: The FutureSkills Lab would identify gaps in skills measurement and data, and recommend areas for information collection, analysis, and dissemination to both the Labour Market Information Council and Statistics Canada. While not yet fully operational, the LMI Council is expected to focus on the standardization of large provincial labour datasets, a critical undertaking to improve the quality and timeliness of labour market information in Canada. The FutureSkills Lab can complement this work by functioning as a test space for the identification of new sources of forward-looking labour and skills data, digital or otherwise. To ensure alignment and consistency in national LMI efforts, the Chief Statistician of Statistics Canada could be represented on the FutureSkills Lab, just like the LMI Council.

The establishment of the FutureSkills Lab must be accompanied by a strengthening of other organizations involved in skills measurement, most notably Statistics Canada and the forthcoming LMI Council. Without coordinated action, the value of an independent advisory body such as the FutureSkills Lab would be limited. First and foremost, Statistics Canada should be given increased funding to expand its labour market surveys, engage in greater analysis of the results, and be encouraged to make results widely available and comprehensible at no cost to the public.

Measuring success

The FutureSkills Lab would be responsible for measuring both the results of the pilots it co-funds and the effectiveness of its own processes, which should include a transparent mechanism for employers, governments, educational institutions, and not-for-profits to propose, lead, and co-finance necessary training. The FutureSkills Lab would also be measured on how well it functions as a source of new, meaningful and

Exhibit 2 **Where FutureSkills Canada fits into the existing system**



forward-looking information and as an advisory body for information dissemination. Success of its processes would be measured by the increase in useful innovation in learning and training programs, more efficient matching of employee skill sets and competencies to evolving employer needs, and greater use of skills measurement among employers, policy makers, and educational and training institutions.

In a more macro sense, the FutureSkills Lab would strive to achieve specific labour market outcomes for the Canadian economy. These outcomes include putting Canada on par with OECD leaders in level and breadth of employer-supported training, improving employer perceptions of the job-readiness of fresh graduates, a reduction in the duration of average unemployment periods, higher educational attainment and employment for vulnerable populations, and smoother re-entry into the labour force for those who take time away from the workforce.

Conclusion

The economy is changing rapidly. Advances in automation and digitization, combined with continued forces of globalization, are leading to fluid and mobile labour markets where employers' skills requirements evolve quickly and workers transition between jobs and industries more often than they did in the past. To prepare Canadian students and workers for the future of jobs, there is an urgent need for Canada to develop new approaches to training and skill development. The FutureSkills Lab would provide a forum for all levels of government, employers, educators, and other stakeholders invested in the building of a highly skilled and resilient workforce to come together to test new methods for training delivery and share best practices across jurisdictions and industries. ■

Acknowledgements

The Advisory Council on Economic Growth would like to thank the many industry experts, research organizations, academics, not-for-profits, government agencies, and other stakeholders who took the time to offer their expertise and guidance during this process.

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UNLEASHING THE GROWTH POTENTIAL OF KEY SECTORS

ADVISORY COUNCIL ON ECONOMIC GROWTH
February 6, 2017

Introduction

In the first wave of proposals submitted to the Canadian government in October 2016, the Advisory Council on Economic Growth recommended several actions to benefit the Canadian economy as a whole: developing a national infrastructure strategy, attracting more foreign direct investment, and increasing and improving our immigration flows. In January 2017, we make additional economy-wide recommendations, including policies aimed at driving more innovation, improving skills for Canadian workers, removing barriers to greater workforce participation, and positioning Canada as a global trading hub.

The Council believes the first step to prosperity is ensuring the right conditions are in place to promote growth in all areas in the Canadian economy. However, we also believe that certain sectors of the economy have significant untapped potential that will require focus and attention to unlock. To realize this potential, the Council suggests an approach that uses carefully selected policy actions to remove obstacles (for example, policy barriers such as excessive regulations, interprovincial trade barriers, and inefficient forms of subsidies; or market challenges such high cost of information acquisition, inadequate physical infrastructure, and shortages in skilled labour), and seize opportunities (for example, by convening private and public actors and setting a sector-wide aspiration). We recommend identifying a few sectors (e.g., 6-8) where Canada has a strong endowment, untapped potential, and significant global growth prospects. We then recommend Canada take a focused approach that removes barriers and galvanizes the sector around a bold growth agenda. Peer jurisdictions like the U.S., the U.K., New Zealand and Australia have begun to move toward this approach, and Canada should do the same.

While this memo does not prescribe sectors, eight stand out as potential candidates: agriculture and food; energy and renewables; mining and metals; healthcare and life sciences, advanced manufacturing; financial services; tourism and education. In this memo, the Council uses the agriculture and food ("agfood")[i] sector to illustrate how the government, in concert with the private sector, can take a targeted approach that would unleash the sector's full potential.

The Canadian agfood sector has great potential, given the large natural endowment of water and arable land, distinctive record of accomplishments in research, and exceptional base of companies and entrepreneurs. This sector also has exposure to favourable global market trends including demand from fast-growing Asian economies where protein consumption is on the rise. These assets, coupled with the scale of the existing obstacles, provide the potential for material economic gains for Canadians while also providing a blueprint for how the government and private sector may work together to unleash Canada's potential in other sectors.

[i] The term "agfood" represents the widest sector definition, colloquially referred to as "field to fork." Agriculture and Agri-Food Canada refers to the agfood sector as "Agriculture and the Agri-Food System." We have used Farm Credit Canada's split of Harmonized System (HS) chapters, whereby *agriculture* encompasses Harmonized System (HS) chapters 01 (live animals), 03 (aquaculture), 06 (live plants, and so on), 07 (edible vegetables), 08 (edible fruit), 10 (cereals), 12 (oilseeds), and 14 (vegetable-plaiting materials); and *agri-food* encompasses HS chapters 02 (meat), 04 (dairy), 09 (coffee), 11 (milled products), 13 (lac, gums, and resins), 15 (fats), 16 (preparations of meat), 17 (sugars), 18 (cocoa), 19 (preparations of cereals), 20 (preparations of vegetables), 21 (miscellaneous edible products), and 22 (beverages).

While the actions we propose will need to be refined with the help of the sector, the potential benefit is substantial. The sector already employs 2.1 million Canadians and accounts for 6.7 percent of GDP, with lots of potential for growth; Canada ranks 5th in agriculture exports and 11th in agfood exports—behind smaller countries like Holland and behind less economically advanced countries like Brazil in both categories.[1] Enabling the sector to move up to *2nd* place in agriculture and to *5th* place in agfood would imply an additional US $30 billion in exports in today's distribution of global export shares, equivalent to nearly 2 percent of current GDP.

In this memo, the Council makes several recommendations that would unleash growth potential:

- Adopt a new and focused approach to sector development, based on removing obstacles and setting bold ambitions in collaboration with the private sector

- Identify a small number of high-potential sectors that would benefit from this approach, based on inclusive growth criteria

- Launch an agfood pilot by convening private and public sector stakeholders, identifying major obstacles to growth, setting an aspiration (a vision and quantified goals), and recommending concrete actions. The Council's recommendations provide a "toolkit" that should be leveraged to support growth – e.g., a federal infrastructure bank, a foreign direct investment agency, and a method for catalyzing "innovation marketplaces"

- Refine and apply this approach to five to seven other sectors

The case for a sector approach

The need for a focused, sector approach to economic development is particularly acute for Canada. Although our economy is advanced, it is small in absolute terms, and particularly small relative to the United States. Achieving global scale and competitiveness requires "clearing the path" to growth in our most promising sectors.

To be sure, the government should first and foremost adopt policies that enable the economy as a whole to succeed, as has been the impetus for all of the Council's recommendations. In practice, however, these policies will meet and take effect *within* sectors—some of which, like agfood, will benefit from additional policy focus and tailoring aimed at removing specific obstacles.

The Council believes that the government and private sector can collaborate effectively to identify within specific economic sectors which obstacles *can* and which barriers *should* be overcome through well-designed policy actions. The private sector's involvement is necessary because it is best placed to identify the genuine obstacles to growth within any specific sector. The government's involvement is equally necessary as it is best placed to determine that removing a particular barrier is genuinely in the public interest.

Note that the Council is not suggesting that growth be pursued at all costs. Some well-designed environmental or labour regulations, for example, may achieve their intended objectives and also reduce growth. In many cases, such regulations are appropriate; in other cases, the regulations are excessive or suboptimal in their design, creating unnecessary barriers to growth. Details within each sector need to be carefully examined.

Elsewhere in the world, we are now seeing more countries pursue a focused, enabling approach to their high-potential sectors with significant signs of success. Some of the "tiger" economies in Asia have been doing so for years. The United Kingdom is now pursuing this approach, too, as are other European countries. Open and relatively small economies such as Australia, New Zealand, Israel, and Holland have demonstrated success through close collaboration between the public and private sectors in a number of areas, some of which we note in summary case studies below.

Our view is that government and business should work together to identify and remove the unnecessary obstacles to economic growth. Such a partnership would help raise our collective ambition and unleash Canada's real and inclusive growth potential.

Box 1

Australia launches the "Industry Growth Centers Initiative"[2]

In 2015, Australia launched a Aus $250 million initiative to fund "an industry-led approach driving innovation, productivity, and competitiveness by focusing on areas of competitive strength and strategic priority." The expressed intent is to help Australia transition into "smart, high value and export-focused industries."

The federal government has established Growth Centers in the following six economic sectors:

- advanced manufacturing
- cybersecurity
- food and agribusiness
- medical technologies
- mining equipment, technology, and services
- oil, gas, and energy resources

Growth centers are led by a strategic board of industry experts, tasked with setting the long-term strategy for their respective sectors; looking at four broad themes in doing so:

1. Identifying regulations that are unnecessary, or over-burdensome, and suggesting possible reforms
2. Improving engagement between research and industry to achieve stronger commercialisation outcomes
3. Improving the capability to engage with international markets and access global supply chains
4. Improving the management and workforce skills

Box 1

Israel paves the way for global leadership in the medical devices sub-sector

Today, the medical device subsector accounts for more than half of the broader life sciences sector in Israel, demonstrating the country's continued focus on an area of comparative strength over the past two decades. The country of eight million has become a leader in the sector despite the fact that its domestic market for medical devices is relatively immaterial, representing well less than 1 per cent of the US $350 billion global market. Nearly 700 medical device companies operate in Israel today, collectively exporting more than a billion dollars' worth of products every year, and attracting hundreds of millions of foreign direct investment every year. Israel has the highest number of patents granted per capita in the sector, and ranks fourth in absolute terms.

The government has enabled the sector through:

- accelerator funding, international matchmaking[i] and government procurement[ii] for SMEs to address obstacles to scaling inherent in a small domestic market
- effective commercialization of university patents via mechanisms like Hebrew University's technology transfer company (Yissum) that adopt sophisticated licensing to address obstacles in commercializing new technologies
- capitalizing on the immigration of highly educated citizens from Soviet countries in the 1990s and from other European countries in recent years to address the "talent gap"
- a favourable regulatory regime whereby the Ministry of Health approves products that have received foreign approvals

Holland globally ranks third-largest agfood exporter

The Netherlands enjoys numerous advantages as an agricultural producer despite its relatively small size and resource base (compared with Canada): an innovative population with a long tradition of exporting; tracts of flat, arable land; and proximity to major markets and infrastructure nodes. But these advantages alone would not have launched the Dutch agricultural sector into the ranks of the world's best. The government worked with companies in the sector on a range of initiatives to increase its productivity and remove obstacles to growth:

- developing intensive agriculture facilities, such as greenhouses
- organizing well-integrated supply chains and transportation infrastructure
- ensuring a high level of investment in agricultural research and development
- educating the agricultural workforce
- accelerating innovation by fostering connections among businesses, universities, research institutions, and government agencies through agfood hubs such as FoodValley

An emphasis on raising agricultural productivity helped the Netherlands to achieve the highest growth rate in both exports and total factor productivity over the past 50 years, surpassing Canada and Australia. Today, the country is the world's third-largest exporter of agricultural products and agfood in absolute terms and the largest per-capita exporter in both categories. Its sales of poultry, red meat, bakery goods, and cheese products total €2.3 billion, 80 percent of which is exported. The Netherlands has also become a global market leader in equipment for processing agfood.

[i] Provided by the Office of the Chief Scientist (Israel Innovation Authority).
[ii] Particularly through defense and security agencies.

Recommendation: Adopting a new sector approach to growth

The Council recommends a four-step approach to defining and implementing a sector approach to promoting economic growth:

1. Identify high-potential sectors that offer the best prospects for catalyzing inclusive economic growth, by using factors such as the following (See Exhibit 1 for illustrative examples):

- potential to contribute to GDP growth (for example, attracting investment and growing exports)
- potential to create resilient jobs, leveraging of Canada's strengths in human capital and natural resources
- favourable global demand trends
- policy levers—presence of addressable obstacles to growth

2. Identify the most important obstacles to growth in these sectors, and verify that these do not stem from other essential policy objectives.

3. Take clear policy actions to overcome these obstacles, thus improving the sector's competitive position and prospects for growth, taking advantage where appropriate of the new toolkit of policy instruments recommended by the Council (for example, the infrastructure development bank and innovation marketplaces).

4. Galvanize the sector around a growth agenda, and monitor the sector's progress over time to ensure the policy actions have supported economic activity within the sector.

Undertaking these tasks well requires a deeper level of collaboration between business and government than has historically been the case. The private sector must play a central role in defining what obstacles to remove to help the sector grow and to compete globally. The government's role, which is to protect the public interest and to promote national welfare, can be further defined through four main responsibilities:

- convening private and public organizations to diagnose obstacles and set priorities
- setting bold aspirations for the sector at a national level
- enacting coherent, consistent policies and regulations to clear the path to the sector's growth
- gathering and sharing information about the sector's performance and the effectiveness of policies

The next section illustrates the Council's approach to developing a strategy to unlock the growth potential of the agfood sector as an example that could be piloted this year. The Council recommends that the approach be replicated in at least three other sectors over the next three years, and then up to five to seven sectors over time.

Exhibit 1 **High-potential sectors should be identified in terms of their economic prospects and their strengths relative to global opportunities.**

Priority sectors	Employment contribution Jobs, Direct and indirect	GDP contribution % of Canadian GDP	Growth CAGR, 2010–2015
Agfood	2.1 million	6.7	2.7%
Advanced manufacturing	1.7 million	10.5	3.7%
Energy and renewables	0.9 million	13.7	2.6%
Healthcare and life-sciences	1.8 million	6.8	1.7%

Initial focus areas	Canada's strengths	Global opportunities
Agfood	• Trusted **food safety** • **Resource availability** (e.g., water) and **productivity** (e.g., crop yield) • Arable land position • Strong **clusters** (e.g., U of Guelph)	• Exploding **emerging market demand** for higher-value food (e.g. proteins, functional foods) • Growing **global supply constraints** in land, water, energy, and carbon emissions
Advanced manufacturing	• Robust automotive, aerospace and defense **manufacturing base to build from** • **Strong engineering clusters** (e.g. Waterloo) • Responsible for **nearly half of** all BERD1	• **"4th industrial revolution" in the making** (cyber-physical convergence) • **Cost of labor is a declining factor** in manufacturing global value chains
Energy and renewables	• **Top-4 globally** for hydro-electricity production, LNG, and oil reserves • 430 public companies with **combined assets over $495 billion** • Strong **innovation capacity** (e.g., CAPIA)	• Global energy consumption will grow by **30% between now and 2040** • **Cleantech** to meet climate challenge • Proximity to USA — **North American energy security** and integration
Healthcare and life sciences	• **Domestic demand** via national healthcare system • **10 largest pharma companies have R&D presence,** 1500 medical device firms • World-class **regenerative medicine and stem cell therapy** development	• **Aging population** in most advanced economies • **Productivity imperative to favor innovation and sector growth** (e.g. new healthcare delivery models)

Source: Economist Intelligence Unit; IHS Global Insight; McKinsey Global Institute analysis; Bank of Canada; NRCan; IEA

Piloting the new approach in the agfood sector

The Council recommends that the government begin developing strategies to clear a path for growth of high-potential sectors by studying the endowment, or starting position, of each sector and comparing our strengths and weaknesses with other countries and with significant trends in the market for the sector's products and services. Next, the government can work with its private sector partners to develop possible aspirations for the sector and to identify bold moves for helping it advance toward them quickly.

Canadian endowment and global trends

Endowment. Canada's agfood sector is among the world's largest: the US $26.1 billion of agricultural products Canada exported in 2015 amounted to 5.7 percent of all global agricultural exports and qualified our country as the 5th-largest agricultural exporter in the world. Canada is the single largest exporter of some major commodities, including wheat, canola, and lentils. We are also the 11th-largest exporter of agfood, with US $19.1 billion of these exports in 2015—2.8 percent of the global total, leading the way in niche products like maple-syrup.[3]

The agfood sector, defined broadly, is one of Canada's largest employers and economic engines, contributing 2.1 million jobs and 6.7 percent of our GDP.[4] Widely dispersed across rural and urban areas, these jobs are a force for economic inclusion. Some are increasingly sophisticated as a result of technological progress in the sector, requiring skilled workers with a high degree of digital literacy. The sector has also proven to be a strong employer of New Canadians across the value chain.[5]

Our agfood exports have averaged annual growth of 9.5 percent during the past five years, and the sector enjoys advantages that can sustain or even increase that figure for the foreseeable future.[6] One of these advantages is our stock of basic natural resources: freshwater, long coastlines suited to aquaculture, and much arable land. In fact, Canada's arable land is the least densely occupied, by both livestock and people, of any country in the world. Our per-hectare use of pesticides is among the world's lowest, which should appeal to discriminating consumers.[7]

Canada's agfood companies also operate in favourable business and economic conditions. Our institutions provide a degree of political stability and international goodwill that encourage foreign investment and cross-border trade, notably with the major market of the United States. Companies in the sector have affordable, reliable access to capital and inputs (for example, fertilizers, feed, and seeds)[ii] and a healthy network of R&D facilities at universities across the country. Over the past few decades, the Canadian agfood sector has pioneered and introduced significant and valuable innovations—for example in, canola, pulses, and chilled pork. A sophisticated, ethnically diverse consumer base stimulates processed product development that can find appeal around the world.

Global outlook. Booming demand for food and an expanding global middle class should benefit Canada's agfood sector significantly. By 2050, global demand is expected to rise by 70 percent.[8] The world will need to produce as much food in the next 45 years as in the previous 10,000.[9] A good deal of this demand

[ii] Agricultural and food-processing equipment, on the other hand, is largely imported.

will come from emerging markets, where some three billion people are expected to enter the middle class from 2010 to 2030—particularly in Asia—and to consume considerably more protein than their less wealthy counterparts do today.[10]

Many middle-class consumers also want proof that their food has been produced in a safe and environmentally sustainable way. Land degradation, water scarcity, urban sprawl, climate change,[iii] and political and social instability could make it harder for many countries to produce the food they need and are likely to place a premium on agricultural products from regions where environmental and labour conditions are considered good.

On all these counts, Canada has a strong position. Our potential agricultural output greatly exceeds the requirements of the population, so this country could become an increasingly significant source of high-quality food to feed the world's growing middle class, while ensuring accessibility to affordable, nutritious, and healthy food at home.

Yet, our future as an agfood leader is far from assured. Countries across Africa, Asia, Eastern Europe, and South America could emerge as new sources of agricultural exports subject to sector reforms that include new technology adoption. Meanwhile, established agfood centers, such as the Netherlands, will continue to reap the productivity benefits of advances in data analytics, automation, and genomics to name only a few.

Canada's agfood century will have to be earned.

Obstacles to growth in the sector

While the strengths and trends described in the previous section are considerable, so are the obstacles that stand in the way of growth for Canada's agfood sector. The Council sees obstacles that can be addressed inherent in three major sets of opportunities:

Moving up the agfood value chain. Canada processes only 50 percent of its own agricultural output.[11] Moreover, the country has a US $3.2 billion trade deficit for agfood products, partly because our food-processing sector is underdeveloped. This stems from a historical lack of investment in processing infrastructure paired and often correlated to a challenging regulatory environment (lengthy permitting processes, supply-management boards, etc). Similarly, underinvestment in our transportation infrastructure means that the difficulty to aggregate food-processing supply chains across our vast land mass is compounded (resulting in a greater reliance on commodity trade, which is also hampered or "taxed" by transportation bottlenecks).[12]

Increasing productivity. Several basic factors constrain the productivity of Canada's agfood sector. In some subsectors (dairy, for example), the average size of our farms is relatively small, so few achieve the

[iii] While Canada's prospects for arable land growth through climate change are favourable compared with the rest of the world, higher investment payoffs will be found in (1) improving productivity, and (2) moving up the added-value chain. The notable exception may be in aquaculture, where Canada's untapped coastline endowment is significant.

economies of scale realized in some other exporting countries. Moreover, while new digital technologies like machine learning have the potential to cause step changes in productivity, the lack of a common analytics platform and rural broadband stand in the way of realizing the full potential of these advances in Canada. At a more basic level, too, we could do more to encourage productivity gains: for example, government spending on agriculture, equalling 26 percent of its economic output,[13] flows largely to farmers to smooth volatility and manage risk; it is not contingent on meeting productivity-related requirements, such as adopting new technologies. In the food-processing sector in particular, companies, on average, report that they realize fewer innovations than the manufacturing sector as a whole.[14]

Expanding trade. Canada lacks preferential trade agreements with three of its five highest-potential markets for agfood exports: China, India, and Japan. This stands in contrast with Australia, for example, whose agfood sector benefits from a preferential trade agreement with China implemented in 2015. Furthermore, the Comprehensive Economic and Trade Agreement (CETA) between Canada and the European Union, which would eliminate nearly all tariffs on trade between the two regions, has yet to be implemented. *Meanwhile*, subsidies for agricultural products around the world distort prices, create difficult competitive conditions, and encourage the use of unsustainable modes of production. Countries across Africa, Asia, Eastern Europe, and South America could emerge as new sources of agricultural exports subject to aggressive sector reforms and subsidies.

Aspiration: Global leadership in agfood

Setting a bold, overarching aspiration to develop the agfood sector would help the government engage the private sector and other stakeholders to define and carry out a strategy to clear the path for growth. A vision statement—such as "Canada will become the trusted global leader in safe, nutritious, and sustainable food for the 21st century"—would reflect the strength of our starting position, as well as the global trends we can exploit.

That goal may sound very ambitious, but Canada's experience with canola production shows how our agfood sector can attain world-leading performance through concerted effort and collaboration among the private sector, research institutions, and government. Canadian researchers bred canola from rapeseed, another oilseed plant, in the early 1970s. They wanted to develop a crop that could serve new markets at a time when Canada's agricultural output suffered from declining prices for wheat. Canola yields increased by more than 150 percent from their introduction to 2015, and Canada's exports of canola oil rose by almost 200 percent from 2003 to 2015, largely because of high demand in China. Today, canola is our second-largest crop by volume.[15]

What would Canadian leadership in global food production look like? Growth objectives can be set in two complementary ways: through a national top-down view of the entire sector, and through bottom-up objectives for individual subsectors (land crops being one example).

Top-down, sector-wide goals. Since Canada has room to increase most categories of agricultural and (especially) agfood exports, the Council recommends that the federal government set national, sector-wide goals for growth. These goals should be quantified, and shaped by analysis that estimates global demand for broad categories of products and tested against Canada's potential to increase agricultural output and agfood processing.

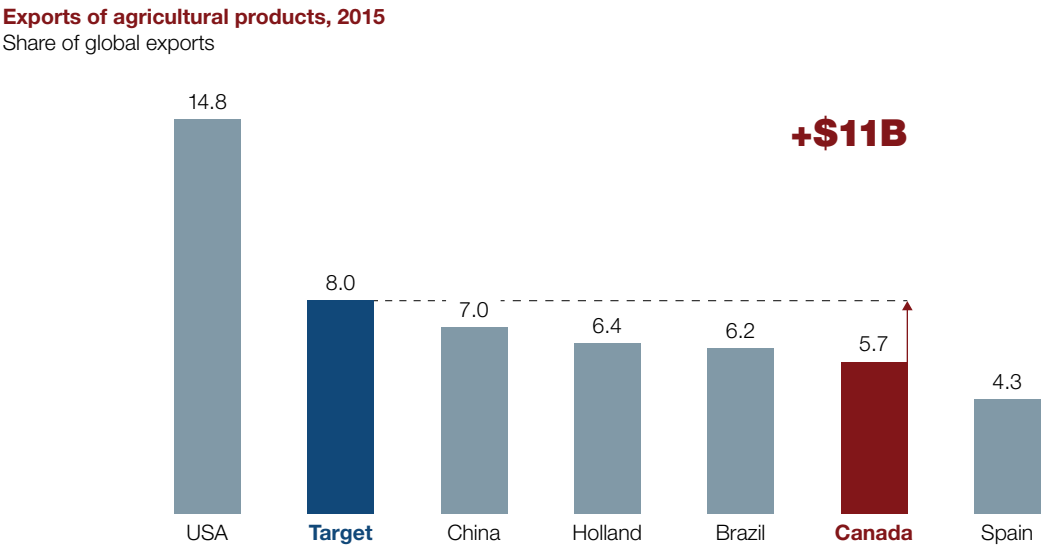
To illustrate the concept, the government may set an ambition to increase Canada's annual agfood exports by US $30 billion over the next five to ten years—equivalent to nearly 2 percent of today's GDP. About one-third of the gains could come from agriculture exports, with the balance from moving up the value chain and expanding our agfood exports:

- **Agriculture:** Increase Canada's share of global agricultural exports to 8 percent, from 5.7 percent (Exhibit 2),[16] so that we would become the world's second-largest agricultural exporter, after the United States, which accounts for 14.8 percent of the total.

- **Agfood:** Double our share of world exports, to 5.6 percent, from 2.8 percent (Exhibit 3).[17]

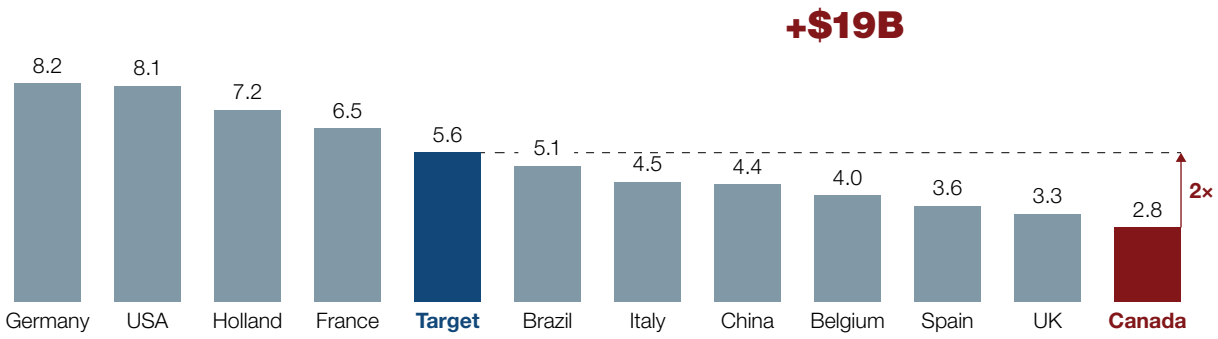
Bottom-up category targets. The Council recommends that the government reconfigure the Value Chain Roundtables established by Agriculture and Agri-Food Canada[18] into new sub-sector action teams focused on major agfood subsectors and oriented for high-impact. Representatives from other sectors (for example health, environment, and technology), bringing new perspectives, should be brought in to support transformational change. Each of these teams comprising the senior-most representatives of relevant companies, government organizations, and academic institutions would set growth targets for their subsector.

Exhibit 2 **Canada could target an 8 percent global market share in agricultural products by 2027.**



Source: World Trade Organization

Exhibit 3 **Canada could aim to double its global market share in agfood products by 2027.**



Source: World Trade Organization

Targets would be bold and take into account not only the subsector's economic potential but also its environmental and social impact. Collectively, the subsector targets should match or exceed the national goals of the entire agfood sector. Illustrative examples of export-growth targets the industry's subsectors might aim for over a five- to ten-year horizon include:

- **Oilseed and pulse crops:** Boost oilseed sales by 20 percent (or US $2 billion) and increase our global market share of pulses to 50 percent (from 38 percent). Do so by removing obstacles to growth in key exports markets (for example, through preferential trade agreements and through investments in physical trade infrastructure focused on the Asia-Pacific), while addressing obstacles standing in the way of capital investment needed to move up the value chain higher-value products (for example, pulse flours and premium organic products).

- **Aquaculture:** Increase global market share to 0.6 percent (from 0.2 percent) and exports by almost US $2.6 billion. Do so by adopting a new, forward-looking Canadian Aquaculture Act combined with an economic-development strategy that reforms ill-adapted traditional fisheries regulations for this emerging subsector to create opportunities for provincial, regional, and aboriginal stakeholders to pursue if they choose.

- **Dairy:** Produce up to six billion more marketable litres of milk annually by progressively reducing obstacles such as rigid provincial quotas that curtail investments in productivity.[19] (Today, in contrast to Canada, New Zealand exports around 97 percent of its milk production and accounts for close to 30 percent of dairy products traded globally.)[20]

- **Technology:** Increase exports of equipment (now US $2 billion) and digital and scientific services (for example, genomics) by US $3 billion to US $5 billion over ten years. We would achieve these goals by tapping into the advanced manufacturing expertise of other Canadian economic sectors and by adopting strategies like those of successful technology exporters, such as Israel and the Netherlands.

Bold moves: Rallying the private sector and government to work together towards bold growth objectives

Conventional strategies for sector-specific economic development often fall into several traps, including placing the government at the center of the strategy with insufficient private sector input, failing to set an ambitious growth aspiration, and lacking a thorough understanding of market conditions and obstacles therein. Failing to coordinate among the government ministries and departments responsible for different aspects of these sector strategies—particularly departments with different priorities—may also limit their effectiveness.

The Council recommends a more integrated, collaborative approach to sector development and one where the private sector is engaged to lead strategy development by identifying those obstacles that hinder growth.

Convening the private sector. In addition to creating the action teams discussed above to set targets and identify obstacles to growth within each agfood subsector, the Council recommends that the federal government stand up a private sector body to nationally represent and champion the Canadian agfood sector as a whole. This would go a long way in positioning the private sector centrally within the design and implementation of a federal sector strategy.

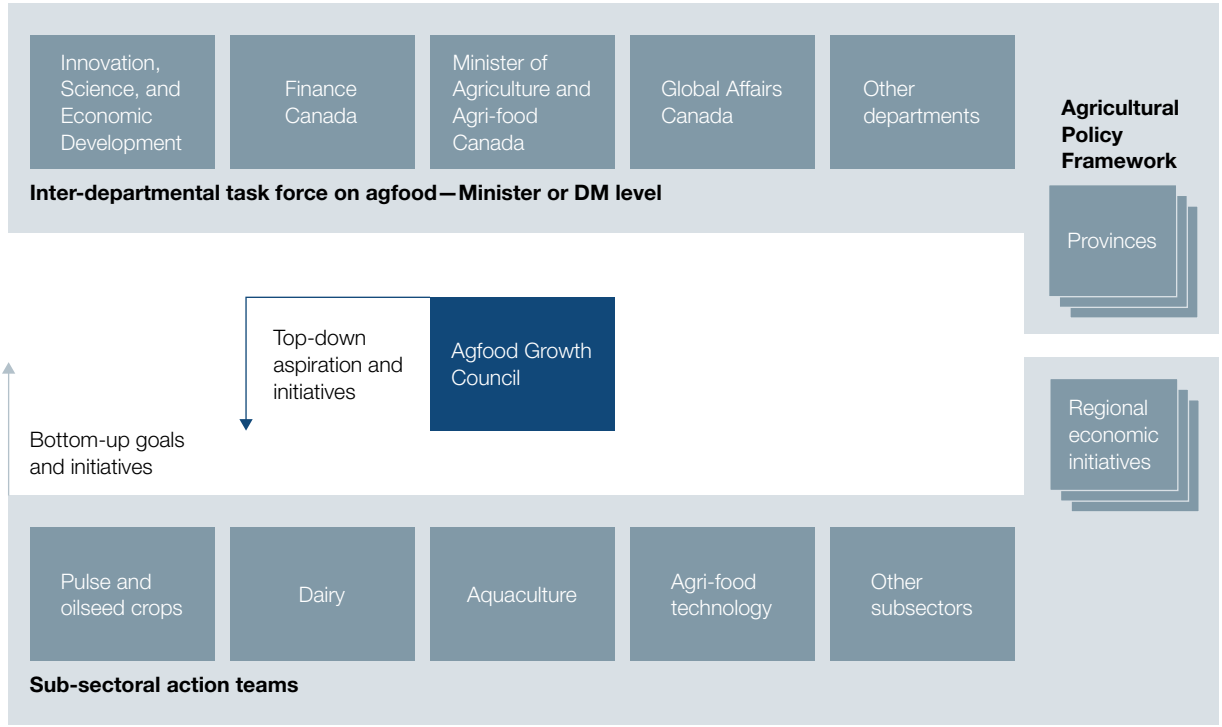
A body such as an Agfood Growth Council would be comprised of 10–15 visionary, high-profile and respected leaders from the private sector. Members would be champions, passionate about unleashing their sector's growth potential. Collectively, members would represent the broad value chain (growing, processing, logistics, wholesale, and retail). Such a council would report directly to the Minister of Agriculture and Agri-Food Canada, and be supported by a small secretariat.

In terms of responsibilities, an Agfood Council would be responsible for identifying obstacles to growth at a national level, generally affecting multiple provinces and subsectors at once (for example, international market access through preferential trade agreements). Such a council would also contribute to setting top-down targets, such as those presented earlier. Moreover, that Council would play an important role in encouraging sub-sector action teams to set ambitious, bottom-up targets of their own—ensuring reconciliation with the top-down target—and tracking progress over the course of the Council's mandate. The Agfood Council would also look to enable, synchronize, and link the major proposals to reduce obstacles put forward by sub-sector action teams. The Council would also serve to champion the implementation of its own recommendations adopted by government, helping to rally the private sector, academic institutions, and other organizations around bold initiatives that could dramatically increase economic growth for the sector.

Collaboration across federal ministries and departments. For the purposes of removing obstacles, the government should also consider an interdepartmental task force on agfood, chaired by the minister of Agriculture and Agri-Food Canada and supported by the Prime Minister's Office, to share implementation

Exhibit 4 **The federal government should adopt a new, bold approach in developing and implementing a sector growth strategy**

ILLUSTRATIVE



responsibilities and accountability across departments (for example, Health Canada, Infrastructure Canada, and Innovation, Science and Economic Development Canada) for meeting sector growth aspirations.

Working with the provinces. Provinces play a critical role in the agfood sector as in others.[iv] The Council recommends that the federal government continues to pursue collaboration with the provinces through the Agricultural Policy Framework to coordinate the delivery of business risk, research, and other programming. However, in the future, the scope of the Framework could be expanded to include growth-oriented objectives and initiatives stemming from future outputs of an Agfood Growth Council and sub-sector action teams. Interprovincial barriers to trade in the sector, as an example, should thus be further addressed. Provincial representation may also help in some of the subsector actions teams.

Growth through pilot projects. In implementing bold moves, both the government and the Agfood Council should consider innovative pilot projects to deliver economic impact that could be rapidly scaled. One such type of pilot project could be the creation of four to six world-class agfood processing hubs across the country to ease entry and scaling hurdles faced by small and medium-sized enterprises. Food hubs are

[iv] The Council is encouraged by recent policy developments as in the case of Saskatchewan's agfood strategy orientation.

both physical and virtual: physically, a hub provides a zone with shared state-of-the-art infrastructure that provides better quality at a lower cost than individual processing investors could afford (road/rail/port connections, crop aggregation and marketing facilities, high speed Internet, low-cost and alternative energy, "one-stop registration centers" etc); virtually, the hub provides an organizing body to collectively market (including identifying international outlets and building a strong brand), encourage innovation (providing immediate opportunities to pilot and scale new technologies), providing financial services, and by promoting growth-oriented policies (such as tax incentives, streamlined regulations, and rapid technology registration). The hubs are often anchored by one or several large players, which help to attract and grow other potential players in the sector.

Similar hubs have proved successful in Brazil, Denmark, South Korea, Sweden, and other countries. As a practical matter, agfood hubs could be established and administered in conjunction with the private sector, provinces, and host municipalities. These hubs would soon become centers for excellence and innovation in agfood, much as Silicon Valley is for high technology.

Capturing broader opportunities. In addition to pilot projects such as the agfood processing hubs, a government taskforce on agfood could launch the following series of bold initiatives to remove obstacles based on the Advisory Council's other recommendations to government:

Competitive markets and trade

- **Trade agreements:** Seek preferential trade agreements with key agfood export markets, prioritizing China, India (currently in negotiations), and Japan; further harmonize agfood regulations (such as those related to DNA barcoding and genetically modified organisms) with the United States and the European Union.[v]

- **Branding:** Enhance Canada's reputation as a source of "trusted food" through international marketing in collaboration with the private sector, under a future National Food Strategy emphasizing the safety, accessibility, affordability, sustainability, nutritional quality, and health attributes of our agfood products.

- **Foreign investment**[vi]**:** Make the agfood sector a priority of the new federal agency the Council proposed for attracting foreign direct investment, with coordinated messages from senior government leaders, including the Prime Minister; provide foreign agfood companies with incentives to source and process Canadian agricultural products and to conduct their research and development in Canada.[vii]

- **Regulatory levers:** Coordinate and combine special economic and export-zone incentives from federal, provincial, and municipal authorities; for example, eliminate import tariffs on agfood's manufacturing ingredients[21] and offer tax incentives for capital investments by food processors.

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[v] See the Council's "Positioning Canada as a global trading hub" recommendation.

[vi] See the Council's "Bringing foreign investment to Canada" recommendation.

[vii] The Netherlands provides an example of what is possible: 12 of the world's 40 largest food-and-beverage companies have a major production site or R&D facility there.

Infrastructure and capital investment

- **Infrastructure**[viii]**:** Use the newly proposed infrastructure-development bank for "hub and spoke" infrastructure projects connecting agfood hubs with one another, with food-producing regions, and with domestic and international markets; offer incentives to private investors for projects to help decongest our rail networks, for advanced logistics solutions, and for first- and last-mile infrastructure (for example, elevators and storage).[ix]

- **Digital connectivity:** Launch a national plan to provide high-speed Internet access (for example, 5G standard) for Canadian farms and agfood companies, so they can share and use big data more easily (as described below).

- **Capital investment**[x]**:** Reform regulations that stifle or deter investments in agfood assets, such as greenhouses and aquaculture systems; streamline complex permitting processes (for example, by offering preapprovals for common areas of investment within agfood hubs).

Talent and labour markets

- **FutureSkills Lab**[xi]**:** Encourage pilots for "future of agfood" training and reskilling programs (including apprenticeships) to meet the current and future labour requirements of agfood companies (and aging farmers), and to mitigate the problems caused by increasing automation—for example, by offering voluntary training on digitization for dairy farmers or on aquaculture for wild-catch fishermen and coastal aboriginal communities. New Zealand's business led, government-partnered Te Hono Movement provides an innovative example of how inspirational training can be provided at the leadership level of a sector, too. The program convenes agfood business leaders for a week of training every year at Stanford University on themes aimed at boosting the competitiveness of New Zealand's agfood sector.[22]

- **International talent**[xii]**:** Attract and retain top international talent in agfood R&D by expediting visa applications for skilled workers and investing in fellowships and exchange programs for university and graduate students in top agricultural technology and science programs abroad.

- **Cross-sector talent:** Attract talent from adjacent fields and sectors (for example, health and life sciences, technology, analytics, and advanced manufacturing) to accelerate the development and commercialization of innovative, superior technologies for farming and food processing.

Innovation

Innovation Marketplace[xiii]**:** Encourage the development of a private-sector led Innovation Marketplace centered on raising agfood productivity by connecting start-ups with established companies across the country, drawing commercial concepts out of university research centers, and providing initial funding to

[viii] See the Council's "Unleashing productivity through infrastructure" recommendation.
[ix] Canada's ranking in the World Bank Group's Logistics Performance Index slipped from 9th in 2007 to 12th in 2014.
[x] See the Council's "Boosting growth with productivity-enhancing business investment" recommendation.
[xi] See the Council's "Building a highly skilled and resilient Canadian workforce through the FutureSkills Lab" recommendation.
[xii] See the Council's "Attracting the talent that Canada needs through immigration" recommendation.
[xiii] See the Council's "Innovation—Chapter 1: Build innovation marketplaces" recommendation.

help offset the risk of pilot projects. “Grand Challenges” could be launched as public–private partnership competitions to develop breakthrough solutions to major issues (for example, improving nutrition to lower the incidence of chronic diseases, thus improving quality of life and reducing healthcare costs, or producing food while coping with climate change and actually enhancing eco-systems).

- **Commercialization:** Implement a patent-box regime (taxing patent revenues at a preferential rate) to accelerate the commercialization of Canadian intellectual property; use federal procurement to support technologies that would have significant benefits if implemented on a national scale.

- **Approvals:** Modernizing regulations to streamline approvals and remove barriers to bringing new solutions to market by involving organizations like the Canadian Food Inspection Agency within the sector action teams.

- **Growth capital**[xiv]**:** Encourage Canada’s leading banks and institutional investors to establish funds providing fast-growing small and midsize enterprises with patient capital in the form of minority equity stakes or equity-like loans. Complement these efforts by enabling agfood hubs to access the financial expertise of institutions such as Farm Credit Canada (sector knowledge), the Business Development Bank of Canada (venture capital), and Export Development Canada (export intermediation).

- **Big data:** Develop a data strategy for the agfood sector in Canada to securely collect agronomic and economic data from farmers and food processors, provide them with enhanced decision-making tools to enhance yield, crop quality, and competitiveness, foster system-wide transparency and traceability, and furnish researchers with data for their work–all through partnerships with analytical platform providers and scientists.

A proposed road map for sector impact

With this memo, the Council has proposed a framework the Government of Canada can use to accelerate the growth of high-potential sectors by removing unnecessary obstacles that stand in their way. Developing and successfully implementing these strategies requires a new approach to sector development, particularly as it relates to the collaboration between the government and the private sector. This approach would allow stakeholders in a target sector to jointly define aspirations and quantifiable targets, to identify potentially beneficial initiatives, to make policy recommendations, and then to spearhead implementation. Here is an outline of how this approach might unfold:

Phase 1 – Convening

- Establish a national sector working group, for example an Agfood Growth Council, led by the private sector, with a two-year mandate to overcome existing obstacles. For the agfood sector, this Council would include leading growers and processors, agricultural innovators, multinational corporations, supply-chain operators, and representatives from adjacent sectors (such as life sciences, environment, and technology).

[xiv] See the Council’s “Innovation—Chapter 2: Scaling our high-potential businesses” recommendation.

- Pilot the transformation of two to three reconfigured value chain roundtables representing major subsectors (for example, agfood processing) into sub-sector action teams with clear growth targets.

Phase 2 – Setting the ambition

- Develop the national-level vision for the sector in tandem with the Agfood Growth Council.
- Encourage a call to action from the Prime Minister and other senior levels of government to rally the private sector and government to work together, while encouraging capital investment (domestic and foreign).
- Quantify a bold aspiration for growth over a defined period of time top down—through the Agfood Growth Council—and from the bottom-up, through sub-sector action teams.

Phase 3 – Paving the way for growth

- Enable the sector action teams to identify and assess the most significant obstacles and challenges limiting growth within their subsectors.
- Advise the government on continuing, modifying, or terminating existing policies, regulations and programs (for example, streamlining cumbersome approval processes for new products).
- Design and launch pilot projects through public-private partnership (for example, the agfood hubs).
- Focus R&D efforts on areas with promising commercial applications by sharing business problems in the agfood innovation marketplace.
- Draw on new economy-enabling entities like the foreign direct investment attraction agency and the infrastructure-development bank to focus and synchronize efforts.

The agfood sector represents a distinctive opportunity for Canada to boost inclusive economic growth based on a rich natural endowment that should be combined with an integrated approach to innovation, competitive markets and trade, talent and labour, and infrastructure and capital investment. From a national economy-wide perspective, the Advisory Council believes that sector strategies can help Canada's businesses and households realize the potential of our country's natural endowments and latent strengths as sources of inclusive growth and prosperity. ■

[1] "Canadian agriculture's productivity and trade," Farm Credit Canada, November 29, 2016, fcc-fac.ca.
[2] "Industry Growth Centers," Australian Government—Department of Industry, Innovation and Science, consulted January 2016, https://www.industry.gov.au/industry/Industry-Growth-Centres/.
[3] "Statistics and market information," Agriculture Canada and Agri-Food Canada, September 29, 2016, agr.gc.ca, and "Canadian agriculture's productivity."
[4] "An Overview of the Canadian Agriculture and Agri-Food System 2016," Agriculture Canada and Agri-Food Canada, http://www.agr.gc.ca/.
[5] Interviews with industry experts—examples provided range from farm workers producing okra around the GTA, to processors producing Caribbean-style hot sauces.
[6] Interview with Agriculture Canada and Agri-Food Canada.
[7] Interviews with industry experts.
[8] Over 2009 levels, according to *Global agriculture towards 2050*, UN Food and Agriculture Organization, October 2009, fao.org.
[9] National Press Club—presentation by Dr Megan Clark (September 2009).
[10] Homi Kharas, *The emerging middle class in developing countries*, Brookings Institution, June 2011.
[11] "An Overview of the Canadian Agriculture and Agri-Food System 2016," Agriculture Canada and Agri-Food Canada, http://www.agr.gc.ca/.
[12] Interviews with industry experts.
[13] "An Overview of the Canadian Agriculture and Agri-Food System 2016," Agriculture Canada and Agri-Food Canada, http://www.agr.gc.ca/.
[14] Ibid
[15] "Canada at a glance," Agriculture Canada and Agri-Food Canada, http://www.agr.gc.ca/.
[16] 2015 market share figures drawn from *Canadian agriculture's productivity and trade*, Farm Credit Canada, November 29, 2016, fcc-fac.ca.
[17] Ibid.
[18] See "Value chain roundtables," Agriculture and Agri-Food Canada, November 15, 2016, agr.gc.ca.
[19] According to a 2014 Conference Board Report on supply management reform in the dairy sector, "The moderate growth scenario would see Canada add around six billion more litres of milk annually by 2022 to meet international demand, whereas the aggressive growth scenario sees Canada produce about 12 billion more litres annually." Grant et al, *Reforming Dairy Supply Management: The Case for Growth*, The Conference Board of Canada, 2014.
[20] Ibid.
[21] As announced in Budget 2016, see "Government of Canada consults on eliminating tariffs in vital agri-food processing sector," Department of Finance Canada, http://www.fin.gc.ca/n16/16-056-eng.asp.
[22] "Stanford Bootcamp", Te Hono Movement, http://www.tehono.co.nz/stanford-bootcamp, consulted January 2017.

POSITIONING CANADA AS A GLOBAL TRADING HUB

ADVISORY COUNCIL ON ECONOMIC GROWTH
February 6, 2017

Introduction

International trade in goods and services has long been an important driver of world economic growth. Canada continues to be committed to international trade, but faces a world in which other countries appear to be turning towards protectionism. The risk is that Canada's access to world markets will decline as other countries become increasingly inward looking. For a small economy such as Canada, the costs associated with such an outcome cannot be overstated.

The recent increase in anti-trade sentiment around the world should be acknowledged. At home, the dislocations created by greater trade should be proactively addressed. But neither global sentiment nor addressable costs should dissuade Canada from seeking its place as a major trading hub within the global economy. Far from it: in fact, we have an economic imperative to do so. The relatively small size of our economy requires us to trade for continued growth and prosperity. Larger and more diversified developed economies have other sources of growth For example, international trade accounts for 65 percent of GDP in Canada but only 30 percent in the United States.[1]

Beyond the imperative to continue trading, Canada has the right ingredients to become a global trading hub and a nexus for global supply chains. This is an enviable position, and one that Canada is well-equipped to capture. We are located next to the world's largest economy, and our various Atlantic and Pacific ports provide valuable access to international markets. Canada's highly educated and multicultural population connects us economically and culturally to the world. We have rich endowments of natural resources and robust agricultural and advanced manufacturing industries. We should build on these advantages.

To become a global trading hub, the Council recommends four specific policy directions:

1. Nurture and improve our trading relationships within North America. Canada should deepen and modernize its current trading relationships through a "Team Canada" approach that includes both private sector and government networks and efforts.

2. Develop significantly better and deeper trading links with large and fast-growing economies, particularly in Asia. Canada should seek new, preferential trade arrangements with large and fast-growing nations, especially in Asia, and more specifically with China, Japan and India. In addition, Canada should provide "aftercare" for its trade agreements—strategies aimed at championing our country abroad and offering Canadian companies easy, understandable access to trade information and support.

3. Invest in trade infrastructure to improve our physical access to global markets. Over the next decade, Canada should make trade infrastructure a priority through the newly proposed Canadian Infrastructure Development Bank. One example is the expansion of the Asia Pacific gateway.

4. Address disruptions from future trade flows. Canada should improve the resilience of its workforce to changes brought about by both international trade and technological change. The Council has proposed a mechanism – the FutureSkills Lab – to help upskill and "reskill" workers to participate in the new economy. This should be complemented by ongoing efforts to improve basic education and increase workforce participation.

The benefits of trade

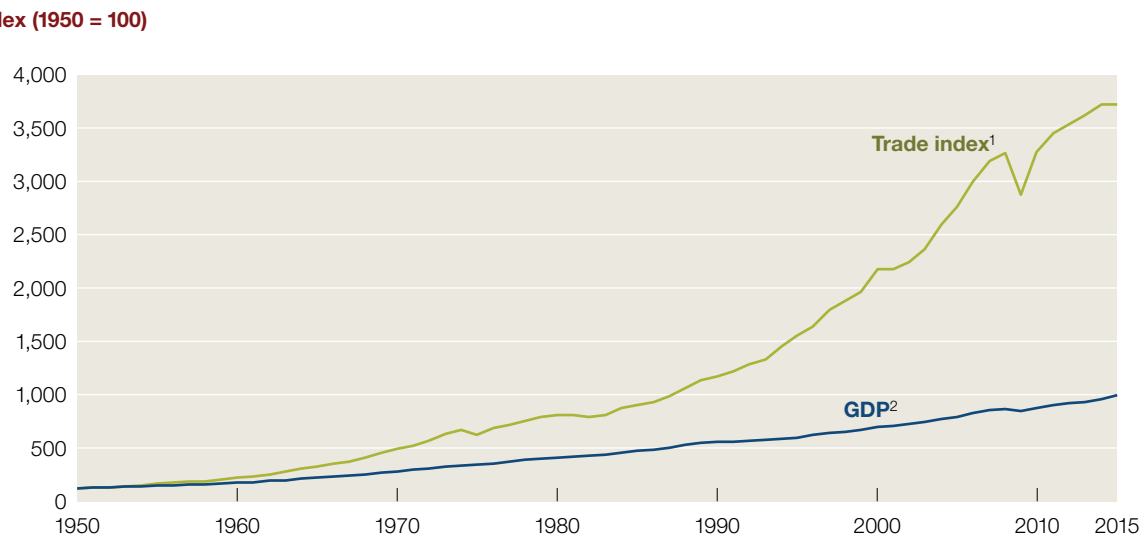
The relationship between trade and growth is clear. Total world income, as measured by real gross domestic product (GDP), grew by about nine times from 1950 to 2015; over the same period, the volume of global merchandise exports grew by more than 35 times (Exhibit 1).[2] International trade accelerated in the 1990s and declined sharply during the global financial crisis. While the decline has since reversed, observers do not expect a return to the rapid growth experienced in the years before the Great Recession. This "new normal" will have a direct impact on future GDP growth.[3]

Despite the role of trade in spurring global growth and lifting entire segments of the population out of poverty, the future of large multilateral trade agreements, such as the Trans-Pacific Partnership (TPP), is clearly at risk. Similarly, growing anti-globalization sentiment in some European countries may obstruct the full and timely implementation of the Canada–EU Comprehensive Economic and Trade Agreement (CETA). Finally, the future of trade relationships between the US, Canada and Mexico is increasingly uncertain as well.

Globalization creates valid concerns

While open economies have broadly benefited from globalization, the middle classes within these countries haven't always participated equally in its rewards. As has long been known, greater trade flows between countries often lead to the disruption of traditional economic patterns, creating costly transitions for the affected workers and firms, particularly those displaced when economic activity flows to other

Exhibit 1 **Growth in world trade and income, 1950–2015**



[1] As measured by global merchandise export volumes.
[2] GDP index is for world GDP.

Source: World Trade Organization

countries and foreign imports replace domestically produced goods. These costs were especially acute in the years that witnessed the entry of large, low-wage countries such as China into global trade and investment flows. Policy makers have not always recognized these watershed moments, or addressed them effectively.

At the heart of today's anti-trade sentiment is an understandable anxiety about job losses, economic dislocation, and an increasingly unequal distribution of income and wealth. While the concerns are real, the great majority of job losses these days tend to be linked to automation rather than jobs being exported abroad. Canada must be highly responsive to these changes and adopt forward-looking policies to help manage dislocation. The Council's FutureSkills Lab recommendation is one way to enable workers to participate in the future economy.

Canada benefits in many ways from international trade

Trade benefits our economy and society in many ways. Our imports of goods and services, together with foreign competition from global firms, give our consumers a greater choice of products and help domestic firms to increase their productivity by lowering their business costs. Access to foreign markets also raises productivity by exposing our economy to innovation and providing an opportunity for our domestic companies to achieve larger scale. Firms competing across borders are more productive and resilient to downturns, grow faster, and pay higher wages than firms competing only domestically.[4] What's more, the most connected countries enjoy GDP growth rates that, on average, are 40 percent higher those of other OECD countries.[5] Economies active in international trade also benefit from bigger inflows of foreign direct investment (FDI) in production facilities, research labs, distribution centers, office buildings, and the like. These inward FDI flows often embody the latest and best technologies and therefore enhance Canada's productive potential. (See the Council's *Bringing Foreign Investment to Canada* recommendation.)

Why Canada can become a global trading hub

With an enviable geographic position, rich natural resources, skilled labour force, strong political traditions, and diverse population, Canada already has many of the elements required to vault into the top tier of global trading nations.

Multicultural human capital. Canada's labour force is not only among the best educated of the member nations of the Organization for Economic Co-operation and Development (OECD) but also incredibly diverse.[6] Our pool of labour and management talent is multicultural, multilingual, and, in many cases, globally connected. These advantages can be leveraged by our businesses to project themselves overseas and for foreign companies operating in Canada to manage their operations here effectively.

Natural resources. Canada has a rich endowment of natural resources that will continue to be in demand for many years to come. Our petroleum deposits alone make us a global energy superpower: on a worldwide ranking of exports, we are third in crude oil, fourth in natural gas, fifth in agricultural products, and eighth in coal.[7] We also excel in the expertise and innovation required to develop these resources—from hydroelectric engineering and pipeline control to mining safety and the design of complex water systems. Canada gains by selling this expertise to the world.

Geography. Our country is well situated to serve as a central hub for global trade.[8] On its densely populated southern border lies the United States, the world's largest single-country consumer market with 320 million people. Our coastal ports provide unbounded and direct maritime access to Europe, Asia, and South America; our inland ports on the Great Lakes provide easy access to several US states.

Preferential market access. Canada has long been active in bilateral and multilateral treaties to liberalize trade. In 1994, for example, we joined the United States and Mexico in the North American Free Trade Agreement (NAFTA). When the Canada–EU CETA goes into effect, our exporters will gain improved access to the European Union's vast and relatively affluent consumer market, containing over half a billion people.

Recommendations

To build on Canada's strengths and transform it into a central global trading hub, we recommend four major initiatives. If implemented, these initiatives would enhance trade within North America, expand trade with other large and fast-growing economies, bolster Canada's trade infrastructure, and deliver more inclusive benefits for Canadians. All four would support inclusive economic growth for Canada.

Recommendation 1: Nurture and improve our North American trade relationships

The North American Free Trade Agreement has clearly enhanced the trading relationship between the United States, Canada, and Mexico, but even greater benefits would follow from further market integration. To deepen our economic ties with the United States, Canada should look to strengthen linkages with the American business community, and counter the current protectionist sentiment. Both the government and the private sector should push for better integration of Canadian and American businesses and should promote the benefits of engaging with Canadian businesses through cross-border trade and investments. Such an approach would recognize the fact that one of Canada's greatest economic assets is our proximity to and long history of trade with the United States, which receives nearly three-quarters of Canada's exports and provides half of our imports.

There is also an opportunity to improve trade linkages between Canada and Mexico. About 95 percent of the North American trade of both Canada and Mexico, in goods and services alike, is with the United States. Canada and Mexico hardly trade at all, and flows of FDI and immigration are negligible. Despite sharing the same continent with Mexico, Canada actually gets more FDI from Israel, South Africa, and Norway. In fact, in each year between 2000 and 2011 we received more immigrants from Colombia than from Mexico.[9] Canada should create specific strategies to increase trade with Mexico.

To deepen our trading relationships with the United States and Mexico, Canada should adopt the following key initiatives:

Remove regulatory barriers. Harmonize standards and regulations to encourage value-chain integration. The Regulatory Cooperation Council (RCC) has taken steps to improve regulatory cooperation between Canada and the United States. But barriers persist. For example, the required re-inspections of meat imports from Canada increase driving time by two to four hours and raise prices for consumers.[10]

Promote sector-specific "super-integration" strategies. Canada can play to its strengths by targeting important sectors to increase trading activity within North America. In energy and agriculture, for example, the federal government can work with value-chain councils (such as the one proposed in the *Council's Unleashing the Growth Potential of Key Sectors* recommendation) to boost productivity and capture market share within North America. Canada's energy and agri-food potential has yet to be unlocked. We should also develop sector-specific strategies for infrastructure—including, as a key component, investments to better integrate North American economies. Infrastructure projects such as the recently approved Enbridge Line 3, for example, will facilitate higher oil exports to the United States.

Improve infrastructure and enabling technology. To move people, natural resources, and goods more efficiently across the 49th parallel, Canada can improve the physical infrastructure and border-crossing process. In the manufacture of cars, for example, delays at the U.S. border can add hundreds of dollars to a vehicle's cost because components often cross the border several times before completion.[11] To reduce congestion at key crossings, we could pursue investments in joint border-monitoring stations or in terminals at remote locations.

Enable people flows. Customs processes—with proper security precautions—can expedite the flow of immigrants and visitors for tourism, employment, training, or education.

Recommendation 2: Strengthen our ties with large and fast-growing economies

Canada stands to benefit by continuing its long-standing engagement with the World Trade Organization in its efforts to promote multilateral trade liberalization. It can also gain significantly by creating preferential trade agreements with certain large or fast-growing markets. Given the inherent limitations of time and resources, however, the Canadian government needs to set some priorities.

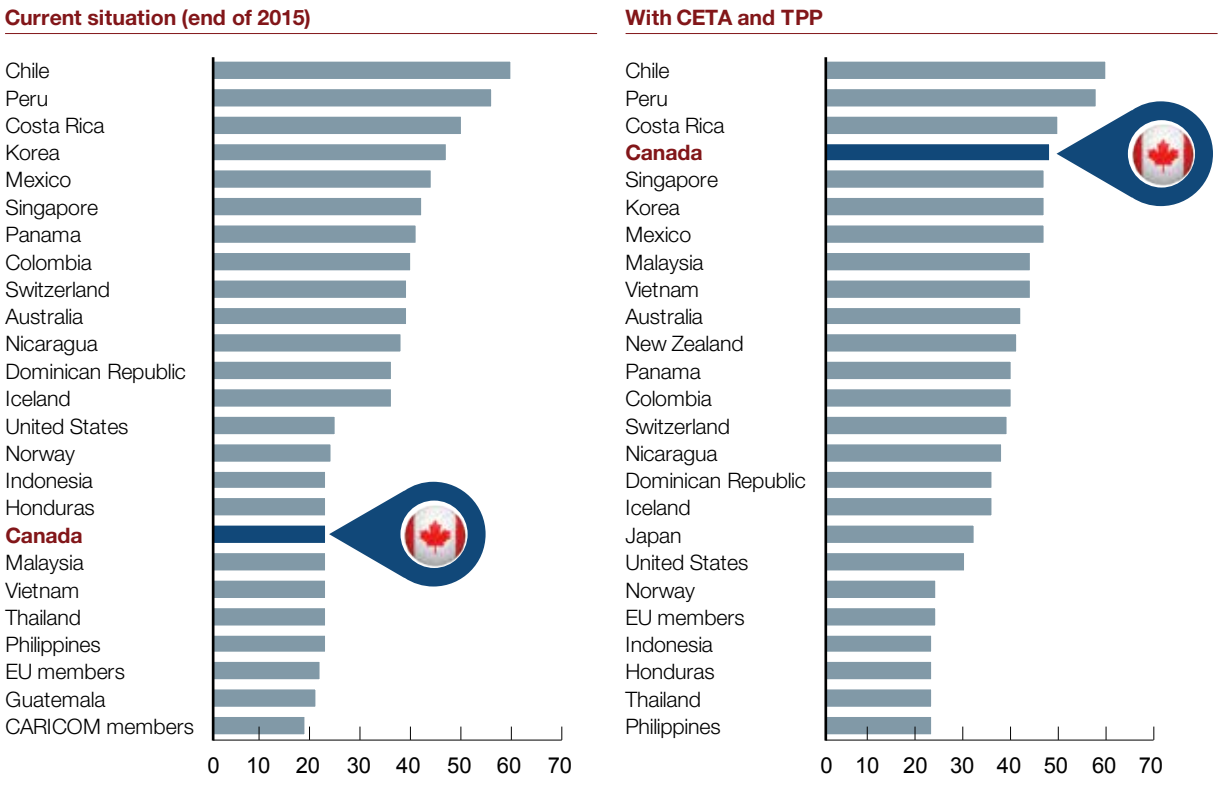
Given the size of the potential benefits to Canadians, as well as the current socio-political dynamics, the Council recommends prioritizing efforts for preferential trade with China, Japan and India. Such trade pacts would open up new markets for our companies, help them to achieve economies of scale, raise their productivity, give our consumers greater product choice and lower prices, and accelerate overall GDP growth.

No less important than signing such trade agreements is ensuring that Canada's businesses of all sizes understand how to benefit from them. Many small and medium-sized companies simply don't know what they must do to take their business overseas. Coaching them and providing "accompagnement" through organizations like Export Development Canada and private sector peer associations will be critical.

The TPP and CETA. Canada should not abandon the possibility of a successful Trans-Pacific Partnership (TPP). If the United States pulls out of the TPP, it cannot go ahead in its current form. That opens up the possibility that the more limited Regional Comprehensive Economic Partnership (RCEP), led by China, will eventually be implemented. In this context, Canada will need to develop an alternative approach to increase its trade relationship with Asia, including the possible development of a new agreement.

Exhibit 2 Preferential trade access to global GDP

US $ trillion



Source: C.D. Howe Institute

Meanwhile, Canada should actively devote the resources necessary to ensure the full passage of the Canada–EU CETA. As Exhibit 2 shows, implementing the TPP and CETA agreements would substantially increase market access for Canada and thus the potential for enhanced growth.

The China opportunity. Canada has yet to benefit from trade with China as much as some other economies have. Although China's share of world trade has nearly quadrupled since 1995, Canada's share of that trade has fallen by about 25 percent as China expanded its links with other trading partners.[12] Canada should attempt to reverse this trend by continuing bilateral trade discussions based on clear mutual objectives. We are currently at a competitive disadvantage to nations that have trade agreements with China; for example, Australia, which has exports similar to Canada's, established the China–Australia Free Trade Agreement (ChAFTA) in December 2015. As China transitions to a more consumption-based economy, Canada will have opportunities to increase its exports. Our agricultural products, for example, are obvious candidates for export growth to China.

The Japan opportunity. Japan has indicated continued commitment to TPP. Given the risks associated with the proposed agreement, however, Canada should hedge its future trade relation with Japan by pursuing the negotiations that began in March 2012 towards a Canada–Japan Economic Partnership Agreement (EPA). This agreement was projected to generate annual GDP gains of up to $4 billion for both countries.[13] Japan is now our second-largest trading partner in Asia, but our trade volumes have generally fallen short of what they could be given that market's size and wealth. (In 2013, Canada did about $25 billion in total trade with Japan – a figure matched only by Canada's agfood exports to the USA that year.[14])

The India opportunity. India, with a US $2 trillion-plus GDP that is among the fastest growing in the world, has become a coveted trading partner. Initial negotiations for a Canada–India EPA began in November 2010. While the Council recognizes some of the difficulties associated with current negotiations, a productive agreement should be completed as soon as practical. India has the potential to be a cornerstone growth market for a future Canadian agfood strategy. (For illustrative purposes, we note how in 2015, India imported nearly one billion dollars' worth of lentils from Canada, up from $400 million the year prior.)[15]

Recommendation 3: Invest in trade-enhancing infrastructure

Canada can become the preferred location for trade among Europe, Asia, and North America. But that will happen only if we have the proper trade infrastructure, including modern transportation systems to support modern supply chains, as well as the digital infrastructure for information flows. (See Box 1 on page 11).

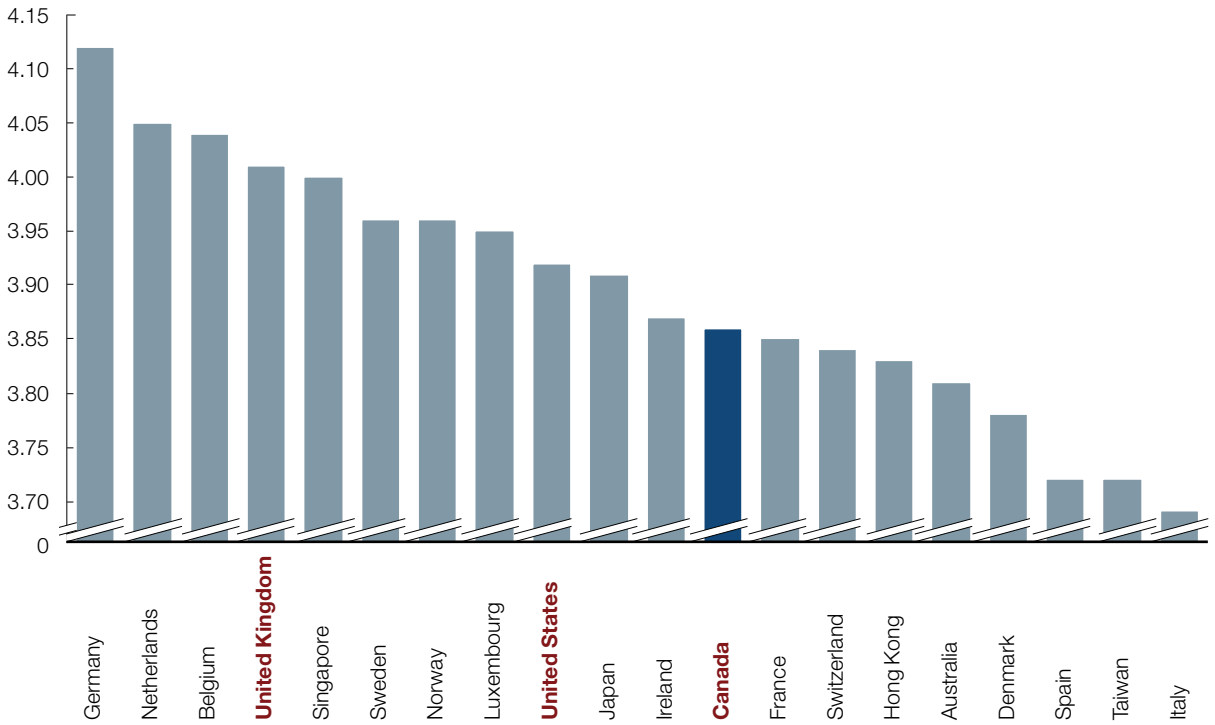
Today, Canada's transportation infrastructure ranks 12th among the nations on the World Bank's Logistics Performance Index (Exhibit 3). Transportation delays create heavy costs across global value chains. For example, the added expense of each extra day an unfinished product remains in transit has been compared to a tariff of 0.2 to 2.1 percent. Vehicle parts are most sensitive to these costly transportation delays,[16] and this is a large part of Canada's manufacturing sector. But such costly time delays make Canadian companies in many sectors less competitive.

To promote Canada as the preferred trading hub in North America, Canada should aim to score ahead of the United States (number nine) on the World Bank Logistics Performance Index. Although Canadian ports and airports have become bigger and more efficient conduits for international trade, domestic road congestion remains an important bottleneck. Improving our trade infrastructure can also help Canada attract more FDI, including infrastructure investments that bolster trade.

Pipelines, another type of trade infrastructure, offer the safest, least expensive way of getting our growing output of petroleum products to world markets. Until recently, the obstacles to building the capacity required to do so was a significant barrier to growth. The recent approval of Kinder Morgan's Trans Mountain Pipeline will notably improve Canada's access to large and fast-growing Asian markets.

The federal government should seriously consider the detailed recommendations of the Canada Transportation Act Review, such as developing a national plan, over 10 to 30 years, to improve both intermodal and sector-specific connectivity. The recommendation to invest in connectivity for northern Canada should also be reviewed for implementation.[17] A national Northern Corridor megaproject bundling roads, rail

Exhibit 3 **Top 20 countries, ranked by the World Bank's Logistics Performance Index, 2014**



Source: Institute for Research on Public Policy

lines, pipelines, and transmission lines in a relatively narrow right-of-way would significantly discount the construction costs. This kind of initiative would improve Canada's access to emerging markets and support the international shipping trend toward larger sea vessels that may make internal ports obsolete.[18]

The following ideas to improve Canada's trade infrastructure are complementary to the Council's *Unleashing Productivity* through Infrastructure recommendation:

- Make trade infrastructure a priority (alongside social, transit, and green initiatives) in the $120 billion Federal Infrastructure Plan.
- Create incentives for investment in intelligent transportation systems that use advanced digital technologies to manage roads, railways, ports, and other transport systems.
- Expand Canada's gateway and trade-corridor initiatives, such as Northern Corridor and Pacific Gateway.
- Improve the collection of data on the performance and state of repair of our trade infrastructure (e.g., ports, airports, rail). A lack of data now limits the ability to make informed decisions.

- Encourage cities and provinces to introduce well-designed road and bridge tolls to reduce the economic costs of traffic congestion.

- Work with our NAFTA partners to reinforce the bloc's competitiveness by adopting North America–wide approaches to planning transportation systems and infrastructure.

Recommendation 4: Address disruptions from future trade flows

Greater flows of international trade raise average living standards, as measured by per capita GDP. But the negative consequences of globalization must be taken seriously to ensure that all Canadians receive their fair share of its benefits. Only when policy makers address these concerns effectively can we expect Canadians to support an agenda that calls for increasing our global trade.

Our economic policies, including trade policies, must therefore promote inclusive growth, explicitly aiming to create opportunities for all members of our society, not just the lucky few.

Explaining the benefits of increased trade. Though international trade generates significant economic benefits for Canadians, many people continue to doubt its importance. Such doubts are only fuelled by the rising anti-trade sentiment seen in other parts of the world. Our government should take the communications challenge seriously by not only showing Canadians the nature and magnitude of the benefits of international trade but also by addressing its disruptive effects.

Employment dislocation. To minimize the downside of increased international trade, we recommend that the government implement programs to ease the process of adjustment. We recognize the difficulty of identifying the precise cause of any specific case of economic dislocation, and for this reason more flexible policies offer greater promise. The Council's FutureSkills Lab proposal—which supports innovative ways to develop skills, to identify and create new sources of information about them—exemplifies what we can do to help workers adapt to both global competition and disruptive technological change.

Commercial upside. The benefits of preferential trade must extend to Canada's small businesses which collectively account for 47 percent of business sector employment.[19] The majority of small businesses in Canada do not export at all, and do not know where to start. A recent survey showed that nearly 65 percent of Canadian companies do not understand how to sell their goods and services overseas.[20] Our country already has organizations like Export Development Canada and the Trade Commissioner Service that support companies engaged in international trade. We should promote these organizations more effectively to ensure that even small Canadian firms and their workers benefit from our expanding trade agreements and relationships.

Canada has a unique opportunity to become a global trading hub by strengthening its current trade relationships, building new ones, enhancing the infrastructure required to deliver goods and services, and preparing Canadians to take full advantage of trade ties. That kind of effort would build a foundation for sustained economic growth to the benefit of all Canadians.

Box 1

Canada's changing trade landscape: More services and digital flows

Four out of five Canadians are employed in producing services, including those that go into the manufacture of traded products. As nearly half of Canada's export value consists of services,[21] we have a keen interest in completing the Trade in Services Agreement (the negotiations were launched in 2013 with 23 World Trade Organization members representing 75 percent of global GDP). Working with other nations, particularly the United States, Canada should push for freer trade in services such as finance, telecommunications, e-commerce, and air and ground transport—not to mention the free, efficient movement of the people who produce and deliver them.

Our future trade efforts and negotiations should also account for emerging digital flows—an enabler of trade in goods as well as in services—which expanded 45 times over from 2005 to 2014.[22] Canada should support this digital commerce by ensuring that all new trade agreements cover it. At home, we can continue to invest in our digital infrastructure to expand broadband access and ensure cybersecurity. The federal government can also invest in technology education and encourage the development of clusters of digital businesses.

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TAPPING ECONOMIC POTENTIAL THROUGH BROADER WORKFORCE PARTICIPATION

ADVISORY COUNCIL ON ECONOMIC GROWTH
February 6, 2017

Introduction

Canada's economic growth over the past 50 years was fuelled largely by growth in labour force participation rates. In 2015, Canada had one of the highest labour force participation rates among OECD countries. While it is true that our population is now aging and that the workforce will no longer grow at the pace we have become accustomed to, Canada still has significant untapped labour force potential given the under-representation of a number of demographic groups. Finding ways to include more of these Canadians in the labour force would improve their quality of life and their chances of success in the economy. This would deliver on the promise of inclusive growth in a way that also improves the wider economy's prospects, and makes it less likely that Canada's social safety net becomes overstretched.

The Council has identified four demographic groups where an increase in participation to "best-in-class" levels could have a significant impact on the economy: Indigenous Peoples, lower-income Canadians, women with young children, and Canadians over the age of 55. We are keen to see action from the federal government to spur inclusive growth by increasing participation rates among these four over the coming years. The four groups addressed here are not meant to be an exhaustive list. Several other groups face barriers to participation, such as people with disabilities, recent immigrants, and youth who are not in education, employment, or training (NEET). Bringing more members of these groups into jobs is also very important, but we have focused attention on the groups for which increased participation in the workforce will have the greatest economic impact, since we believe that the better the economy performs, the greater the opportunity for all Canadians.

This memorandum is not a specific recommendation of one policy approach over another; it is rather a collection of broad recommendations to aid policy makers to explore the existing policy landscape in depth, and to determine ways of removing barriers to employment. In some cases, the appropriate response might be new policy, while in others the government might simply need to "get out of the way", for example by eliminating distortions created by existing policies that discourage employment. The potential approaches we outline here are only examples and do not constitute an exhaustive list of policy options. Further, it is important to note that policy makers are not the only actors in this space—employers, both private and public, have a role to play in establishing the conditions for more inclusive participation in the workforce.

The workforce participation imperative

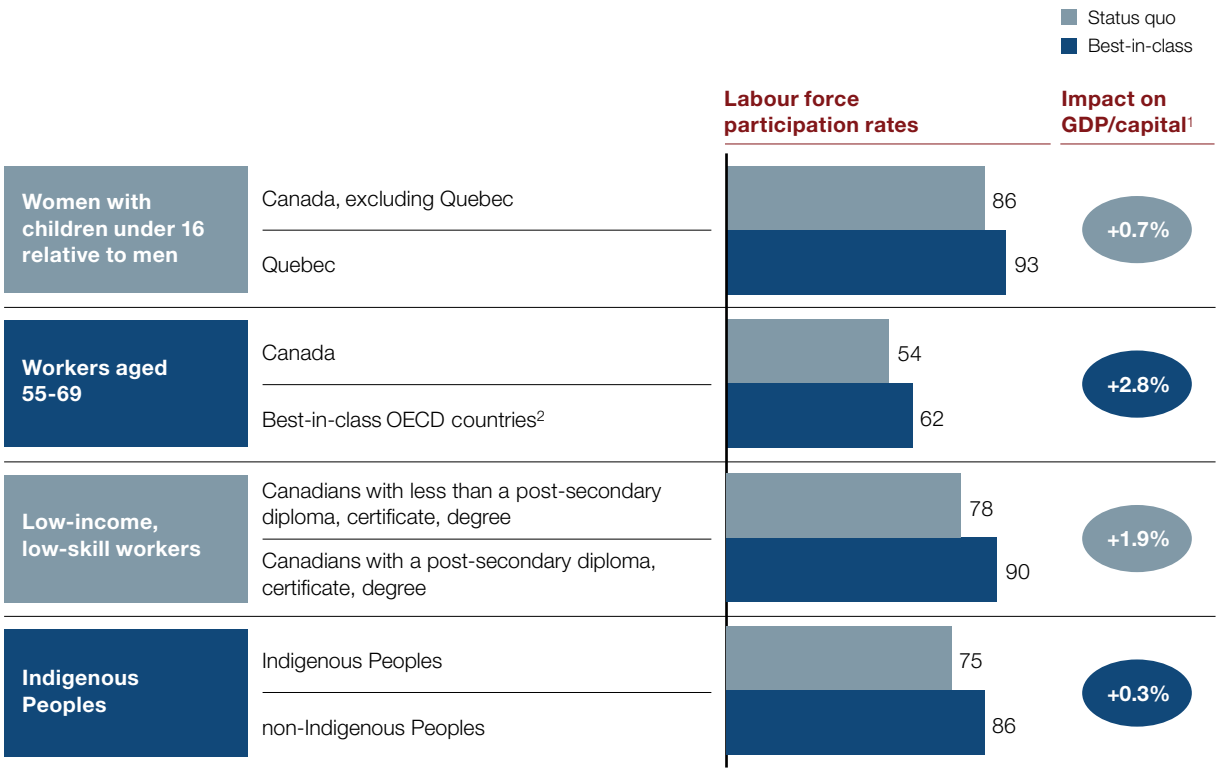
The economic growth potential of closing the gap between current participation rates and a best-in-class alternative for the four demographic groups addressed here is significant (see Exhibit 1 on page 3). Further, the impact of growth would disproportionately benefit Canadians in lower income quintiles.

Indigenous Peoples. Engaging more Indigenous People in the workforce is a fundamental imperative for inclusive growth, and would not only boost economic outcomes for the nearly 1.5 million Canadians with Indigenous identities but also spur economic opportunities and raise living standards for all Canadians.[1] Bringing the participation rates of Indigenous Peoples up to those of other Canadians could add $7 billion to

GDP, or 0.3 percent to GDP per capita.[i] The impact may be larger in jurisdictions where Indigenous Peoples make up a larger share of the population, such as Manitoba, Saskatchewan, and the Territories.

Lower-income Canadians. Nearly a third of Canadians aged 25 to 54 lack education beyond upper-secondary levels. The workforce participation rate for these low-income Canadians was 78 percent in 2015, but among Canadians with post-secondary diplomas, certificates, or degrees, it was 90 percent. Raising the participation rate of this group of Canadians to 90 percent could add $38 billion to GDP, or 1.9 percent to GDP per capita.

Exhibit 1 **Lower participation rates present a huge opportunity for growth in Canada**



[1] Persons may be members of more than one demographic group. To ensure impacts on GDP per capita are additive, the impact for Indigenous Canadians and Lower-income Canadians are computed after excluding persons in other demographic groups. Impact figures point to the scale of the opportunity in each group, and do not imply that policy options referenced here will achieve the magnitude of these impacts.
[2] Best-in-class OECD countries include Sweden, Norway, the United States, Japan, and New Zealand.

[i] The National Indigenous Economic Development Board recently published *Reconciliation: Growing Canada's Economy by $27.7 Billion*, which found that closing the gap in economic outcomes between Indigenous Peoples and the non-Indigenous population could contribute $27.7 billion to the economy—about a 1.5 percent boost in GDP. This differs from our own impact estimates (which are lower) as it measures the gap in economic outcomes between Indigenous and non-Indigenous workers, as opposed to the impact of raising participation rates of Indigenous workers up to those observed among non-Indigenous workers.

Women with young children. In Quebec, women aged 25 to 54 who have children under the age of 16 participate in the workforce at a rate of 93 percent of that of similarly aged men. But in the rest of Canada, the rate is considerably lower, at 86 percent. Raising the national level to match that of Quebec could add $13 billion to GDP, or 0.7 percent to GDP per capita.

Canadians over the age of 55. The workforce-participation rate of older workers is 62 percent in the top-performing OECD countries—Sweden, Norway, the United States, Japan, and New Zealand. But in Canada, it is only 54 percent. Closing the gap could add $56 billion to GDP, or 2.8 percent to GDP per capita.

Principles for policy design

Across all four of these demographic groups, four common principles emerged as consistently important for higher workforce engagement: access to training and reskilling programs; a reasonable process for requesting flexible work arrangements; benefit and tax systems that do not create disincentives to work; and best-in-class delivery of services and regular "stop-do" program reviews.

Access to training and reskilling programs. Timely, forward-looking training and reskilling programs are important to support re-entry into the workforce, the retention of older workers, the vertical mobility of low-skilled workers, and skills development among Indigenous Peoples. In particular, access to digital and computer training will be increasingly important as digitization and automation comes to affect a significant share of Canadian jobs over the coming decades.[2] Indeed, to achieve inclusive growth and build resilience, digital literacy is critical for workers at all income levels. Approaches to training will differ by demographic group. Nearly $3 billion in federal funding already flows annually through the Labour Market Development Agreements, the Canada Job Fund Agreements, and the Labour Market Agreements for Persons with Disabilities. Further, our country could leverage the FutureSkills Lab to explore innovative approaches to developing the skills of specific parts of the population.[ii]

Reasonable process for requesting flexibility in work arrangements. A risk-free process to let workers seek flexible work schedules can keep them in the workforce despite life priorities that may conflict with the traditional nine-to-five work commitment. The availability of flexible work schedules will depend largely on the nature of the job and industry and on the labour needs and attitudes of the employer. New Zealand offers an interesting example of a more legislative approach—the 2015 Employment Relations Act amendment offers all workers the right to request changes in working arrangements, gives employers a month to respond, and provides a review mechanism to ensure that employers act in good faith when they deny such requests.[3] Canada may find such an approach unnecessarily intrusive, but the model is nevertheless one to study.

Further, it would help to establish a legal framework to support the growth of the "gig economy," in which workers are independent contractors. That would increase the number of flexible work options available to people with scheduling constraints.

[ii] See this Advisory Council's recommendation for a FutureSkills Lab to act as a pan-Canadian center of excellence in developing skills.

Finally, employers could consider offering more widespread flex-time, job-sharing, compressed work weeks, phased-retirement plans, part-time options for older workers looking to take on lighter commitments, or other alternatives to the standard work week. In this way, people who want to work could do so, and employers could retain the talent they need.

Benefit and tax systems that do not create disincentives to work. Tax and benefit systems should not create distortions that make workers less likely to participate in the labour force—in other words, new entrants should not face financial penalties for working. The financial barriers that tax and benefit systems can rectify differ by demographic group. We address these barriers in the sections below.

Best-in-class service delivery and regular "stop-do" program reviews. Existing policies should be reviewed and their impact evaluated regularly. The government ought to compile a list of policies to terminate or amend so that they can better address current market challenges and opportunities and do not divert limited resources from higher-impact programs.

Specific policy principles

This memo focuses on four demographic groups. The groups outlined here are not mutually exclusive, and some Canadians will find themselves identifying with all four groups. However, some barriers to working are specific to one group, and potential solutions to these barriers are addressed here.

Indigenous Peoples

Indigenous Peoples face deeply rooted systemic barriers to inclusion in the workforce. These barriers are unlikely to be eliminated by focusing on a single dimension of policy. The Advisory Council on Economic Growth is currently pursuing further study on economic growth and the Indigenous economy. Here, we point to a few areas for exploration that could increase inclusion in the workforce for Indigenous peoples, to be considered not only by the agencies and programs of the federal government but also by the Indigenous community's many economic-development, business, and political organizations focused on building a healthy labour market.

All communities should have access to high-quality primary and secondary education. Twenty-four and 35 percent of Indigenous People aged 15 to 65 have low literacy and low numeracy skills, respectively—a proportion significantly larger than that of the non-Indigenous population.[4] Exacerbating the challenge, per capita federal funding for primary and secondary education on reserves does not cover the standard cost of delivery in many rural and northern communities, and educational resources and services are frequently more costly due to the geographical dispersion of schools. Further, independent management of most on-reserve schools means that they generally lose out on the network benefits and economies of scale of being part of a school board. High-quality primary and secondary education is critical for building the skills required for inclusion and success in the workforce, and every part of Canada should have reasonable access. The federal government could commit itself to that goal and work with Indigenous communities to identify viable paths forward.

Long-term financing should be more accessible to Indigenous communities and businesses. Federal transfer agreements are now the sole or primary source of financing for many Indigenous communities on reserves. Funding arrangements between individual communities and Indigenous and Northern Affairs Canada (INAC)

often last five years and are renewed after every term.[5] A lack of visibility beyond the five-year period makes it harder to seek out beneficial private-sector loans, and can prevent Indigenous contractors from bidding on large contracts due to an inability to secure bonding for businesses based on-reserve. Further, the majority of transfer funding is provided for the support of social programs and services and is therefore not available for business investment or for leveraging private financing. These barriers make long-term economic planning difficult, and hinder job creation and business growth on reserve. Greater access to capital outside of federal transfers could help, either through conventional commercial banks or alternative means. The First Nations Financial Management Board (FNFMB), for example, not only provides certification and monitoring services to help communities access financing from financial institutions but also offers a direct borrowing pool for long-term ventures. These efforts could be scaled to reach more Indigenous businesses.

Rural communities ought to have reliable digital connections. Four in ten Indigenous businesses have no Internet connection or an unreliable one.[6] Digital access is important for creating businesses and jobs, especially in the age of the "gig economy" and of Internet-based businesses. The broader reach of Internet and mobile networks into rural communities would build digital literacy, develop critical tools for creating and enlarging small businesses, and increase connectivity between the rural and urban parts of Canada. The federal government could work with indigenous communities and the private sector to identify options for the development of Northern and rural networks.

Mechanisms for brokering public-private partnerships should be supported. Canada could benefit from more partnerships between businesses and Indigenous communities to promote employment, skills development, and economic development. These public-private partnerships could not only build the financial and management capacity of Indigenous communities but also be of economic benefit to the partnering business. Education and advocacy will be needed to help the parties kick off relationships, establish a mutual commitment, and develop policies and practices. The work of leading Indigenous business and economic development organizations—for instance, Canadian Council for Aboriginal Business's Progressive Aboriginal Relations (PAR) program, or Indigenous Works—could be scaled to facilitate more of such productive relationships.

Partnerships can also help employers to evaluate their current indigenous hiring practices, set up reasonable targets for improvement, and measure their own performance against these targets. Many Canadian employers already use employment equity and reporting practices, either through internal initiatives or with the help of organizations such as the PAR program or Indigenous Works. Existing platforms like these are well poised to assume an expanded role as partners for employers looking to engage with indigenous communities.

Manitoba Hydro, an excellent example, is among the province's largest employers, drawing over 18 percent of its total workforce and 50 percent of its Northern workforce from the Indigenous community. For new Indigenous employees, Manitoba Hydro offers three 7- to 10-month pre-placement programs, including technical-trade orientation and on-the-job training.[7] The program has been lauded as a critical reason for the company's successful effort to increase Indigenous employment.

Lower-income Canadians

The tax and benefit system should not inadvertently discourage workforce participation or efforts to seek higher-paying work. One policy opportunity would be to augment the Working Income Tax Benefit (WITB)—the federal government has already announced an enhancement in 2019 as a means of offsetting the impact of higher pension contributions on eligible low-income workers as a result of the Canada Pension Plan (CPP) enhancement. The WITB is widely regarded as an effective way to reduce the financial penalty for entering the workforce—for example, from income tax payments and the loss of social assistance benefits. But even with the forthcoming enhancement, WITB phases out completely at an annual net income of less than $21,000, which is below the average Canadian full-time minimum-wage income, and well below the estimated living wage, as measured for Toronto in 2015.[8] WITB could be further extended to help make work pay for low-income Canadians working full time.

An alternative approach might involve targeted support to lower-income Canadians for specific financial barriers to working, including high costs of transportation, the loss of medical and pharmaceutical benefits that come from transitioning out of social assistance, child care costs, or the costs of work equipment or clothing. Targeted support is desirable if it reaches the segments of the population for which work-related costs are a significant barrier to working, but it is critical that the delivery of the support, whether through tax credits or other expenditures, minimizes complications and inefficiencies in the current tax system.

Further, the Employment Insurance (EI) system could better encourage people to accept work where it is available. This program is necessary to support Canadians who have gone through job loss. However, some components of the EI program can create barriers to working, making the labour market less efficient and leading to suboptimal outcomes for workers and employers alike. For example, variable entrance requirements provide different access to benefits and related training supports by region, and there is a lack of variation in benefits to recognize different circumstances between long-tenured workers, seasonal workers, contract workers, and the self-employed. The entire EI system could be reviewed and recalibrated to eliminate labour market distortions.

Women with young children

Families with young children, and in particular low-income families, should have reasonable access to a sufficient supply of affordable, high-quality, and convenient childcare. The expansion of the Canada Child Benefit (CCB) is one available policy option. If the maximum benefit were extended to families further up the income scale—beyond the current $30,000 threshold in net family income—the CCB would have a stronger impact among families that now find the cost of childcare a significant barrier to participation in the workforce. Alternatively, increasing the maximum benefit amount per child could have a similar impact.[iii]

A different approach could be the creation of a universal subsidized childcare program, which not only ensures that quality of service is measured but also makes it possible to distribute benefits on a progressive scale. If such a model were to be considered on a national level, the Quebec system is an obvious case study. While the system has been lauded for its apparent ability to increase female workforce participation

[iii] Increased generosity of the Canada Child Benefit could reduce the labour force participation of second earners as household disposable income rises with higher benefits. This is less likely to be a problem among the lowest-income households.

rates,[9] it has been criticized for being insufficiently progressive in delivery. If the aim is to remove the financial barriers faced by low-income parents in particular, the progressiveness of a national childcare program will be a crucial element.

While not an area for federal action, local governments could explore creative ways to moderate high childcare costs, such as reforming zoning laws to encourage childcare facilities in convenient locations. Under the Jobs New South Wales initiative, for example, an Australian state government is changing its regulations so that more childcare services can be provided both in residential neighbourhoods and city centres. That would make drop-offs and pick-ups less time consuming for parents going to work.

Another creative option comes from Norway, where parents are entitled to work part time until the youngest child turns 12, and to flexible work arrangements allowing ten days of paid leave per year so they can care for sick children.[10] The available evidence suggests that parents—predominantly women—are more comfortable accepting full-time work if they know that they can care for their children when necessary.[iv]

Canadians over the age of 55

Pension systems should not discourage working. Older Canadians willing to remain in the workforce beyond the traditional retirement age should not face disincentives. The federal government could explore different incentive structures in OAS and GIS, as well as in the CPP. Under the current system, seniors may take up the OAS pension between the ages of 65 to 70, with payments increasing in line with deferral. Workers may take up CPP between the ages of 60 and 70. Allowing OAS and CPP deferrals beyond age 70 could encourage willing older workers to remain in the labour force longer. The government could also explore ways to make deferrals beyond age 65 more attractive.

The Council understands that the age of working eligibility is one element of a complex system. The government should of course consider the entire system, and all relevant factors, including a) the ability to work for some older workers, particularly those engaged in more physically demanding professions, b) the health transfer system, and c) the overall system of taxation and transfers, which may create disincentives to employment (e.g., in terms of lost GIS for example). Within this system, we believe that the ages of eligibility for the Old Age Security (OAS) program and Canada Pension Plan (CPP) should be recalibrated and increased to meet the Canadian reality of an ageing society and a considerably longer life expectancy than we had just a few decades ago. Increasing the age of eligibility for the OAS—and by association the Guaranteed Income Supplement (GIS), which has the same eligibility age—and the CPP would follow a trend in many other OECD countries, which have extended the age of eligibility in recent years to make their public pension systems more fiscally sustainable.[11]

Older workers face barriers to re-entering the workforce after job dislocation or time away. Employers have an important role to play in identifying and addressing cases of age discrimination when they occur. Governments could provide training to navigate the contemporary job-application process—one of the

[iv] Quebec also grants ten paid days leave to care for sick children, but most other Canadian provinces do not.

primary barriers for older workers who want to re-enter the workforce—perhaps by leveraging the FutureSkills Lab. Finally, the government can promote the broad economic benefits of retaining older workers—in particular, by helping the public to understand that retaining late-career workers does not diminish the number of jobs available for younger Canadians.

Conclusion

The significant underrepresentation of some demographic groups (especially Indigenous Peoples, lower-income Canadians, women with young children, and Canadians aged 55–69) gives our country substantial untapped potential from the workforce. Addressing the barriers to participation is an inclusive economic-growth opportunity that should not be overlooked. This Advisory Council urges the government to take action to improve labour force participation rates in each of these four groups through new policy or simply "getting out of the way" as circumstances require.

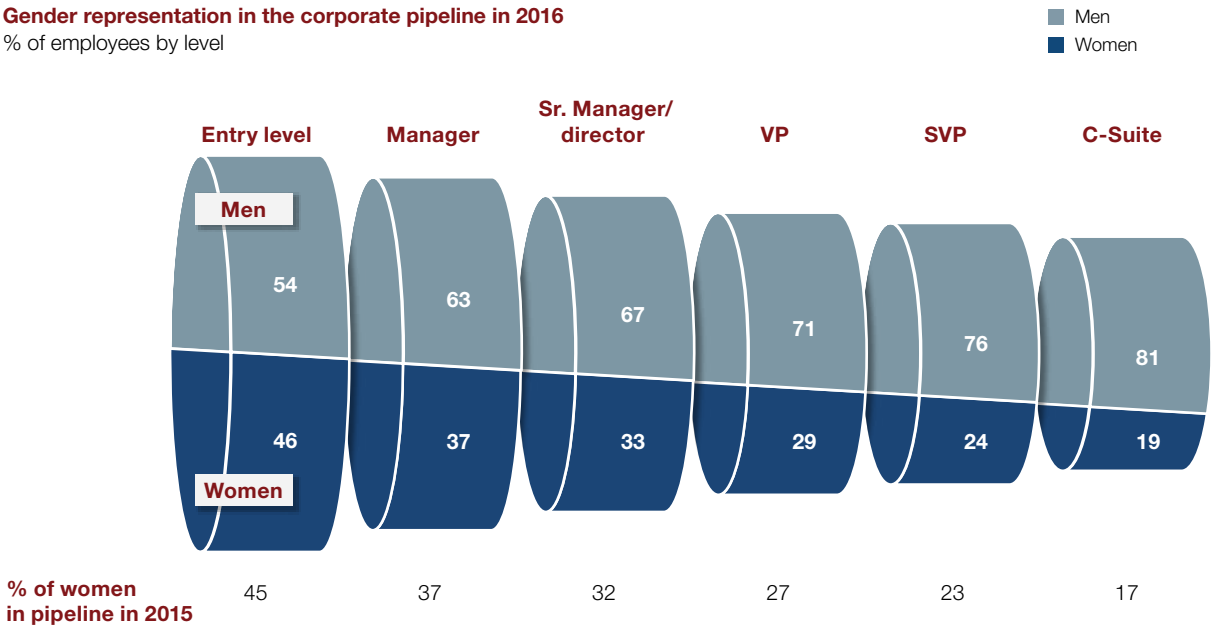
Appendix

Increasing the number of women in leadership positions

This memorandum has focused on strategies to remove the workforce participation barriers that face specific sectors of our population, including women with young children. An added challenge is to ensure that women already in the workforce and their male counterparts have the same opportunity to progress to senior management positions. The dearth of women in leadership positions limits the talent pool from which Canadians firms can draw. A lack of gender diversity on executive teams limits the vision set by leadership and is correlated with weaker financial performance—according to some research, the most gender-diverse companies are 15 percent more likely to outperform their national industry medians in financial results.[12]

The statistics show that Canadian companies are good at hiring women but less effective at advancing them: women make up 46 percent of the country's labour force but hold less than one-third of all senior management positions. Strikingly, the companies in the Canadian TSX 60 have only one woman CEO among them.[13] The share of seats that women hold on the boards of Canadian stock-index companies has received much attention. In 2014, it was just under 21 percent, a smaller proportion than in many other OECD countries.[14]

Exhibit 2 **Female representation declines throughout the talent pipeline**



Having women represented on boards is important, but not sufficient to increase gender diversity in executive teams. For that, a focus on retaining women throughout the "pipeline" will be critical. One problem, research shows, is that women are 46 percent less likely than their male counterparts to have sponsors who champion their careers.[15]

A potential initiative—a gender diversity challenge

As a first step to closing the gender diversity gap in senior-management positions, the federal government could spearhead a Canadian gender diversity challenge to make businesses more aware of the problem and spur a real commitment to advancing talented women. By signing on to the challenge, participating public and private organizations would commit themselves to the following:

- setting the "tone from the top" by publicly promising to make gender diversity in leadership a top priority
- setting and publicizing self-imposed targets for retaining and promoting women throughout the pipeline, with goals determined by the specific industry and sectoral context
- tracking performance against targets and making high-level results public—perhaps in collaboration with impartial third-party organizations; Catalyst Canada, for example, already tracks gender diversity on boards and could be leveraged as a partner

The third party's role could include galvanizing organizations to sign on, connecting companies with qualified women to help meet targets, tracking and publishing results, promoting success stories, implementing a coaching and sponsorship program to develop leadership capabilities and creating a supportive and inclusive environment, and establishing hiring and performance-review guidelines to ensure fair practices. To prevent the initiative from becoming a mere public-relations stunt, the federal government could consider annually convening the leaders of participating organizations to share their best practices, challenges, and opportunities. ■

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