New Thinking

Canada's Roadmap to Smart Prosperity

Executive Summary • February 2016

smart prosperity

ABOUT SMART PROSPERITY

Founded by respected Canadian leaders from business, think tanks, labour, Indigenous Peoples, youth, and NGO communities, Smart Prosperity will harness new thinking to map out and accelerate Canada's transition to a stronger, cleaner economy in the next decade.

ABOUT THE AUTHOR, THE SMART PROSPERITY SECRETARIAT

This document is authored by Sustainable Prosperity, a national economic think tank /do tank that harnesses leading-edge thinking to advance innovation in policy and markets in pursuit of a greener, more competitive Canadian economy. Sustainable Prosperity brokers real-world solutions by bringing public and private sector decision-makers to the table with expert researchers to both design and apply innovative policies and programs.

What Is Smart Prosperity?

smart prosperity (noun):

A thriving economy, healthy environment, and high quality of life, achieved through decoupling environmental harm from economic success.

Smart Prosperity (proper noun):

A new initiative launched by respected leaders to harness new thinking for Canada's environment and the economy.

SMART PROSPERITY ROADMAP EXECUTIVE SUMMARY

New Thinking

The Smart Prosperity initiative was founded by respected Canadian leaders from business, think tanks, labour, Indigenous Peoples, youth, and NGO communities. Our purpose: To harness new thinking to map out and accelerate Canada's transition to a stronger, cleaner economy.

This document offers a clear vision and roadmap for that transition, outlining the goals and rewards Canadians can achieve by moving in this direction and what it will take to make necessary progress. There is evidence all around us that Canada has the know-how to marry our economic and environmental values. The research and examples below demonstrate that seizing the best opportunity for Canada's future means drawing on our time-tested strengths and historical experience. A clean, strong economy is the natural extension of our Canadian values and culture. But accelerating that transition at the pace required demands innovative thinking and a clear, unified national direction across all levels of government, all sectors of our economy, and civil society.

"We have two critical innovation opportunities in Canada right now. One is to enable our traditional industries to reinvent themselves in order to compete in a low-carbon economy. The second is to build capacity for the emerging clean-tech entrepreneurs, who are going to be the economic engines of this country."

—Annette Verschuren, Smart Prosperity Co-Chair; CEO, NRStor; former President, Home Depot Canada

WHY CANADA NEEDS SMART PROSPERITY

The world is changing and the most advanced economic players are forging cleaner, more innovative economies. An emerging consensus of the world's most trusted economic and business authorities is that the global economy is moving toward a new, low-pollution model built on clean innovation. This transformation is inevitable, and Canada must act fast to secure a prosperous future as the world's leading economies reinvent themselves.

The old idea that we must choose between a strong economy and a healthy environment has been proven false. Around the world, nations are demonstrating that doing the right thing for the environment can also do right by the bottom line. This includes China's and the U.S.'s massive clean energy investments, Finland's bet on energy-efficiency technology, and Sweden's pacesetting pursuit of a low-pollution economy.

Since 1990, Sweden's GDP has grown by 58% —while greenhouse gas emissions have plummeted by 23%.[1]

This changing global economy offers opportunity for Canada, across all sectors. The rapid growth of emerging markets is putting greater pressures on already stressed resources and ecosystems. This reality, combined with the imperative to address climate change, is creating a lucrative market

for low-pollution innovation across every field. The global clean-technology market is expected to exceed $2 trillion in size by 2020.[II] Over the next 15 years, $90 trillion in new infrastructure investments will be required around the world to achieve a global low-carbon transition.[III] Countries that mobilize investment in clean innovation now will be best positioned to capture a share of these massive economic opportunities.

From advanced energy storage technology to sustainable urban design, and from carbon pricing to lightweight auto manufacturing, Canada has already begun to build the foundation for a next-generation economy. Our clean-tech sector now employs more than 50,000 people, and our stock exchanges host more clean-tech companies than any other country in the world.[V,VI] We have the tools and the wherewithal to succeed in this new economic environment, and every sector—from resource development, manufacturing, and agriculture to clean technology—stands to gain.

Stronger economic and environmental performance is the key to success. Securing our competitiveness, however, means accelerating the pace of change. In part due to our cold climate, enormous landmass, and resource-intensive economy, Canada begins from a lagging position by many measures of energy and resource productivity. But Canadians are eager to do better. The overwhelming majority of us—more than 85%—strongly support enhancing Canada's reputation for clean manufacturing and major changes in our energy use and waste.[VII]

If our ambition is to remain economically competitive with leading nations, meet our global climate commitments, and leave future generations of Canadians with a healthy planet, then we need to make some significant strides in the next five to 10 years. That includes, for example, improving our energy, material, and water consumption productivity; better protecting our natural assets (healthy rivers, forests, and oceans); and increasing innovation and "ecopreneurship" across all sectors. Canada's success can draw on our long-standing strengths and values, but we need the right incentives to accelerate and scale up our efforts.

Smart policies can create win-win outcomes. Smart policies provide us with the tools to improve environmental protection and catalyze a stronger, cleaner economy that builds on our existing strengths. Already there is a shift across Canada toward cleaner power, smarter transportation, more conservation, and more energy-efficient buildings. And there is mounting evidence that effective policies can achieve better economic and environmental results.

In British Columbia, a pioneering carbon tax inspired a 16% decline in fuel use, while the province's GDP growth kept pace with the rest of Canada.[IX] Ontario's coal phase-out is not only North America's largest single carbon pollution measure, but also the catalyst for a burgeoning clean-tech industry. Outside the country, Israel and Australia have used stringent water-use

Ontario's coal phase-out helped reduce GHG emissions by 19%, while the province's GDP grew by 11% from 2005 to 2013.[IV]

Southern Australia dropped agricultural water use by 65% without affecting revenues through smart policies and innovative practices.[VIII]

policies to spur innovation. Flexible pricing policies (e.g., carbon pricing, user fees) and adaptive regulations can harness the power of the market to drive necessary shifts at the lowest cost. In sum, the right policy context will set the stage for us to establish "Made in Canada" as a globally respected brand of environmental productivity and innovation.

Canadians can rise to this challenge. We have been here before. Canada has a history of taking far-sighted policy actions to prepare for global economic changes. In the 1980s, we responded to the rise of globalization and the emergence of planetary-scale environmental problems such as acid rain and ozone layer depletion with new free trade agreements, aggressive debt reduction, and lead roles in international environmental actions such as the Montreal Protocol.

At the same time, partnerships like the Canadian Oil Sands Innovation Alliance and the Boreal Forest Agreement demonstrate our ability to collaborate across sectors to find solutions to our most pressing environmental challenges. With leadership that looks beyond the status quo to recognize what is actually possible, this kind of collaboration has enabled us to, among other transformations, turn away from coal-fired electricity generation in Ontario and elsewhere, all but eliminate acid rain, and stop deterioration of the Earth's ozone layer. And we have achieved this all while improving our social and economic well-being. That same kind of leadership can now build a stronger, cleaner economy that will generate the next generation of jobs and secure a better future for Canadians.

"The future will be about, how do you develop resources and grow the economy in a world where we need to have a smaller environmental footprint? I think Canadians are ready to take on this challenge and become leaders in this space."

—Lorraine Mitchelmore, Smart Prosperity Co-Chair; former President and Canada Country Chair, Shell Canada

SMART PROSPERITY GOALS

Canada's smart prosperity track record to date is mixed, boasting real success in some areas but lagging behind in others. We have demonstrated our capacity to lead through advances in water resource management, carbon-capture technology, carbon-pricing policies, and municipal recycling programs. Canada's resource wealth and highly skilled workforce offer significant potential for major strides in clean innovation. But achieving that potential requires a unifying vision and clear goals that guide meaningful, economy-wide progress.

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Over 85% of Canadians strongly support enhancing Canada's clean manufacturing reputation.[x]

Vision: A stronger, cleaner economy that builds a better future for all Canadians.

Result: Canada boosts its competitiveness, innovation, and environmental performance on pace with leading nations over the next decade, and will become a global leader within a generation.

GOAL Healthy, vibrant, and green communities

Success means making the most global progress in building livable, sustainable, modern communities over the next decade.

What we build in our cities, how we move around in them, and how they use resources will play major roles in defining smart prosperity for Canada. It will also require expert stewardship and innovative solutions to emerging environmental problems in our rural communities. Canadian cities already rank among the world's elite by many livability and sustainability measures, and Canadians have a long tradition of expert stewardship of our land and waters. That said, our cities and communities are not immune from mounting 21st-century pressures: growing populations, infrastructure deficits, transit deserts, and sprawl. We have homegrown examples of how to tackle some of these evolving challenges. Ontario, for example, has become a global leader in clean-tech development for water management, and Canadian municipalities, from Edmonton to Victoriaville, Quebec, to Halifax, are among the world's waste management elite. We need to scale up and accelerate this progress.

By the 2020s, Canada's cities and rural communities will rank among the world's most improved on metrics of sustainability and livability.

Our aim: By the 2020s, Canada's cities and rural communities will rank among the world's most improved on metrics of sustainability and livability, and achieve recognized global leadership in their areas of particular strength. We will get there by using smart, compact urban design; improved green services such as mass transit and bike lanes; higher building efficiency standards; more green spaces; and incentives for rural land stewardship. This will enable our cities to attract top global talent, move people and goods more efficiently, and improve resiliency.

GOAL Innovative, clean businesses generating jobs of the future

Success means each sector's environmental performance is among the global best-in-class, while growing competitiveness and good jobs over the next decade.

Smarter, cleaner, more competitive businesses in every sector will drive the creation of the high-performance Canadian economy of the 2020s. We have a solid start. Canada scores well against peer countries on a number of measures of competitiveness, and many have made important investments in clean innovation, from the emerging smart grid technology cluster in Sault Ste. Marie to a General Motors assembly plant in Ingersoll, Ontario, that produces no waste to southern Alberta's Green Arrow Renewable Energy Corp., a solar power developer entirely owned by the Montana First Nation. The future of Canadian economic competitiveness rests on accelerating investment in innovations like these and keeping pace with leading economic players around the world.

By the 2020s, every Canadian business sector will rank among the worldwide best-in-class in environmental performance and efficiency.

Our aim: By the 2020s, every Canadian business sector will rank among the worldwide best-in-class in terms of environmental performance and efficiency, accompanied by improved rates of competitiveness and high-quality job creation. We will get there using research investments and demonstration projects; technological innovations to boost energy efficiency and resource productivity, and reduce waste; sustainability initiatives with public and non-governmental sector partners; and smart investment and purchasing strategies to embed better environmental performance in daily operations.

GOAL Smart government policies catalyze economic and environmental performance

Success means world-class policies that unleash private initiative and capital to boost eco-efficiency and innovation.

Private initiative and investment will drive Canada's economy in the 2020s, but a primary catalyst for this transition is better policy at every level of government. Existing policies need strengthening, and new smart policies are vital to establish marketplace incentives that make the clean choices the most affordable ones and push investment toward profitable green opportunities. These will build on the success of trail-blazing policy initiatives such as water pricing in Toronto and Sustainable Development Technology Canada, as well as carbon-pricing initiatives, from carbon taxes in Alberta and British Columbia to Quebec's (and soon Ontario's) cap-and-trade system.

By the 2020s, Canadian governance will be a global model for aligning environmental stewardship with economic success.

Our aim: By the 2020s, Canadian governance will be a global model for aligning environmental stewardship with economic success, driven by a new generation of smart policies that promote clean performance. We will get there using pollution pricing; better energy-efficiency incentives; waste reduction programs; strategic investments; and enhanced engagement with First Nations on capacity building and sustainable development.

GOAL Better, affordable choices for people to live sustainably

Success means improving Canadians' quality of life while being world leaders in conserving nature and reducing our environmental footprint.

The average Canadian's environmental footprint ranks among the world's largest, inflated by the high energy demands of our cold climate and dispersed population, and amplified by decades of car-centred urban design. But Canadians want to do the right thing, both as conscientious stewards of our nation's natural bounty and in our daily lives. And we have demonstrated that we are ready to make better choices when presented with practical, affordable solutions. Nova Scotians, for example, pushed for more ambitious

Measuring for Impact

Measuring progress toward Smart Prosperity's goals will require a variety of metrics, from water, CO_2, and energy-use productivity to environmentally adjusted competitiveness rankings. Over the next 10 years, our goal is for Canada to raise its performance for these and other key metrics, on par or exceeding that of 14 peer nations.

recycling goals when the options were clearly presented, and commuters in Calgary and Montreal alike readily hopped on bicycles once safe, high-quality cycle tracks were installed. Now, as electric vehicles are becoming increasingly more affordable, we have the opportunity to proliferate low-carbon transportation options with accessible charging infrastructure within and between our communities.

Our aim: By the 2020s, Canadians will enjoy a rising quality of life supported by a wide array of affordable options to reduce waste, energy, and water use, and their overall environmental impact. We will get there by making it easier to buy power from a clean provider, install eco-efficient and low-flow appliances, live in environmentally healthy homes, choose low-pollution transport, and purchase competitively priced sustainable products and services.

By the 2020s, Canadians will enjoy a rising quality of life supported by a wide array of affordable options to reduce our collective environmental footprint.

FIVE BIG IDEAS TO ACHIEVE SMART PROSPERITY

Achieving the goals outlined above will require efforts on many fronts and input from the range of actors involved. There is abundant evidence—from a global range of studies and from real-world experience—that five key actions offer the best opportunities to harness Canadian strengths toward the task of decoupling environmental damage from economic success.

ACTION NO. 1 Accelerate clean innovation across the economy

Clean innovation and clean technology together form the industrial core of smart prosperity. And both can be harnessed by empowering ecopreneurship across Canada's economy through policies, procurement standards, and practices that drive cleaner investment, research, and development.

Governments at every level can help Canada gain a greater share of this new marketplace by serving as catalysts. Through targeted funding of education and early-stage R&D, serving as a test bed, and nurturing emerging industrial niches, governments can work with private sector partners and markets to both push funding and research toward economically promising areas of innovation and to pull market demand in those same directions. Investments from both federal and Alberta government agencies, for example, assisted Montreal energy pioneer Enerkem in setting up its first commercial biorefinery at Edmonton's Waste Management Centre. Breakthroughs like this will be key in the resource and manufacturing sectors, as well as in clean-tech, to enable Canadian companies to capture emerging domestic and global opportunities.

All major global clean-tech leaders today, including the U.S., China, the UK, France, Germany, and South Korea, have channelled significant public investment into this sector.

ACTION NO. 2 Boost energy and resource efficiency

The concept is simple: Do more with less. But transitioning the whole nation to a high-performance, low-impact economy remains a massive, generational-scale project. Achieving this will require strong standards and systems that promote high-efficiency vehicles, buildings, and equipment; greater recycling; and less waste. Governments at every level can lead by crafting policy to accelerate improvements and help private sector firms overcome initial cost barriers. With the proper incentives in place, businesses can develop efficiency strategies to reduce operational costs, hedge against risks, and improve environmental performance.

While Canada ranks near the bottom of our peers in energy productivity, experience proves that we are capable of significant strides. We improved energy productivity by 23% from 2000 to 2011 (the fourth-fastest rate among our peers), while efficiency improvements have generated energy savings of more than $27 billion nationwide since 1990.[XII,XIII] The opportunity represented by ramping up is enormous—improvements in resource efficiency measures alone could generate up to US$2.9 trillion in savings globally by 2030.[XIV]

$310 billion: estimated size of the worldwide market for energy-efficiency technologies, products, and services in 2012.[XI]

ACTION NO. 3 Price pollution and waste

As economic research has long shown, putting a price on pollution works. Charging the real cost for harm to air, water, land, and climate creates market rewards for better choices. Pricing-policy revenues can be used to cut taxes on jobs and profits, and to support clean solutions. Instruments such as carbon pricing, traffic congestion charging, and user fees for water can harness the market to encourage sustainable actions and push investment into clean innovation across Canada.

Price signals have already amassed an impressive track record worldwide. The U.S. used a cap-and-trade system to cut the pollution causing acid rain at about half the cost of conventional regulations. Congestion pricing reduced traffic jams and boosted transit use in cities such as London, Stockholm, and Singapore. In Toronto, putting a price on water reduced consumption by 14% in less than a decade.[XVI]

Forty nations and more than 20 subnational governments, representing almost one-quarter of global emissions, are implementing carbon-pricing policies.[XV]

ACTION NO. 4 Invest in advanced infrastructure and skills

The infrastructure that we invest in today will determine Canada's future prosperity. By making the right decisions now, we can build a lasting foundation for leading-edge energy, transportation and water systems, as well as next-generation training and jobs. With around $6 trillion in new infrastructure investments to be made globally each year, this is also a major opportunity to create new avenues for the export of new technology and expertise.[XVII]

Approximately $6 trillion per year in new infrastructure investments forecasted to be made globally over the next decade.[XVIII]

Because infrastructure investments on this scale are often too large for a single government or business to take on alone, innovative public–private partnerships will be essential to success on this front. Ontario's green bond program, for example, has attracted more than $2 billion from a range of institutional investors worldwide to finance clean infrastructure projects, such as light-rail transit in Toronto.[XIX]

Strategic investments in training will also be critical to prepare Canada's highly skilled workforce for this shift. By targeting future-oriented fields, we can create meaningful work and secure lasting prosperity for the next generation.

Ontario's Greenbelt produces an estimated $2.6 billion annually in critical ecosystem services such as water filtration and pollination.[XX]

ACTION NO. 5 Conserve and value nature

Conservation today involves protecting the natural spaces and species that sustain Canada's economy, health, and quality of life. This means not just preserving pristine landscapes, but implementing new strategies, such as incorporating Aboriginal rights and traditions into land and water management, and fostering partnerships between rural communities, NGOs, scientists, governments, and industries.

As stewards of such a significant proportion of the world's natural capital, Canada needs the right policies, and joint efforts of civil society and the private sector to ensure resource-dependent sectors are sustainable for generations to come. Canada already employs one of the world's most advanced accounting systems for natural capital, which estimated the value of our marketable natural resource assets alone at $750 billion.[XXI] Canada's commitment to expanding marine conservation five-fold by 2020 and balanced resource development efforts, such as the burgeoning revival of Newfoundland's cod fishery, point in the right direction.

JUST THE BEGINNING

This roadmap aims to set Canada on the right path, but it is just the beginning of a larger effort to demonstrate—credibly and thoughtfully—what is possible for Canada and Canadians. Making headway will draw on the core Canadian values we share: inclusivity, innovation, collaboration, evidence-based pragmatism, and future-oriented solutions. To succeed, all key players—federal and provincial governments, cities, Indigenous Peoples, businesses, and community groups—must pull in the same direction toward a common goal.

"This country has an opportunity to be a world leader in developing technologies that can help companies address global resource productivity and efficiency challenges."

—Tony Van Bommel, managing partner, BDC Venture Capital [XXII]

We are committed to leading by example and working together to promote the policies and practices that accelerate Canada's motion toward a cleaner, stronger economy. We will bring together the best ideas and examples of our generation to offer practical and actionable guidance and support to all levels of government, industry, and civil society organizations. Our ambition is to spark a new conversation and spur far-sighted action to build a better future for all Canadians.

The road ahead will not be easy or linear, but it is filled with opportunity. The only way to seize it is together as a nation.

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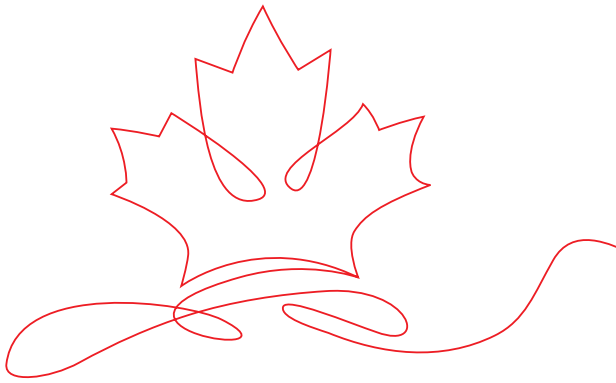
A Pledge From Smart Prosperity's Leaders



Leadership often means challenging people to embrace change in order to build a better future. As the world grapples with climate change and other mounting environmental challenges, the global economy is changing. Before long, the world's strongest economies will be those that find new ways to generate wealth and jobs with less environmental impact.

Choosing between a strong economy and a healthy planet is a false choice. Evidence is all around us that we have the know-how to marry our environmental and economic values.

We are a diverse group of leaders from business, labour, Indigenous, youth, and environmental backgrounds. We have come together to inspire Canadians to be masters of our destiny and take the steps needed to build an economy that grows stronger, even as we lighten our environmental footprint.

Together, we share a vision for a stronger, cleaner economy that builds a better future for all Canadians.

The Canada we aspire to will be defined by

- **healthy, vibrant, and green communities;**
- **innovative, clean businesses that generate the jobs of the future;**
- **smart public policies that catalyze economic and environmental performance; and**
- **better, affordable choices for people to live sustainably.**

We can build this Canada. Together, we can seize this opportunity by accelerating clean innovation across the economy, boosting energy and resource efficiency, pricing pollution and waste, investing in advanced infrastructure and skills, and conserving and valuing nature.

These changes will enable Canada to raise its environmental and economic performance on pace with the world's leading nations over the next decade.

We believe Canadians are ready for a transition from polarization to collaboration, from risk to opportunity, from division to inclusion, and from impossibility to possibility. If we embrace this new reality, we can grow the next generation of good jobs, attract new investment, increase our exports of cleaner resources and technologies, meet our climate commitments, and position Canada to succeed in a changing global economy.

We pledge to move this Smart Prosperity initiative from concept to action by

- **committing to lead by example, and put the principles of Smart Prosperity to work in our own actions and those of our organizations;**
- **convening leaders from business and civil society to collaborate in seeking innovative solutions for cleaner growth;**
- **providing strategic advice and expertise to the Smart Prosperity action plan based on proven best practices and analysis; and**
- **advocating for Smart Prosperity actions with leaders in government, business, and civil society, and engaging all of Canada to assist in accelerating this transition to greater prosperity.**

We pledge to harness new thinking to accelerate Canada's transition to a stronger, cleaner, more innovative economy in the decade ahead. Our goal for Smart Prosperity is to spark a new conversation and spur far-sighted action to build a better future for all Canadians.

We can't do it alone. Please join us.

Kathy Bardswick
President & CEO, The Co-operators

Dominic Barton
Global Managing Director, McKinsey & Company

Ross Beaty
Executive Chairman, Alterra Power Corp Chairman,
Pan American Silver Corp.

Michael Crothers
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President, Executive Chairman, Loblaw Companies Limited

Ed Whittingham
Executive Director, Pembina Institute

Accelerating Clean Innovation Across Canada's Economy

Canada's clean-tech sector now employs more than 50,000 people and our stock exchange hosts more clean-tech companies than any other country in the world. Opportunities span the spectrum of Canadian sectors, from wastewater treatment to smart-grid development to technologies that reduce energy and water use in natural resource production.

A Postcard From Canada in 2030

Canada in 2030 is a nation profoundly transformed and yet instantly recognizable. A familiarity lingers on the streets of Canadian cities and towns, but they are certainly not the same as they were more than a decade before.

Some changes are highly visible. Solar panels adorn thousands of roofs, sidewalks on busy city thoroughfares make room for electric vehicle charging outlets. The streets are still bustling, but pedestrians, bicycles, and light-rail trains share the roadway in harmony with a mix of next-generation cars—some ultra-fuel efficient, others powered by electricity or hydrogen fuel—with a growing number of them autonomous multi-occupant vehicles that were hailed by smartphone.

Sturdy, old single-family homes still line many side streets, but inside they boast state-of-the-art appliances and insulation that save energy and add convenience. And there are more residential options on display among them—rows of townhouses and mid-rise apartment blocks, live/work and aging-in-place facilities, all built to the hyper-efficient building codes of the 2020s. Public parks abound, with kids playing while parents tend community gardens or return a shared weed whacker to the local tool library. Perhaps the biggest change, all but invisible, is the way parked electric cars and energy-hungry appliances communicate with the grid and each other throughout the neighbourhood, checking prices minute by minute, brokering deals between power stored overnight in car batteries and washers full of clothes waiting for an inexpensive moment to start their cycles.

Rural and Indigenous communities also benefit from this wave of innovation, allowing them to keep pace with the transformations underway while maintaining rural lifestyles and Indigenous values, traditions, and rights.

Across the country, people still go to work at manufacturing plants, mining operations, construction firms, retail stores, and family farms—most of which are now among the leaders in finding ways to minimize environmental impacts through human ingenuity and the latest technologies and practices. And more and more people are employed in the booming clean-tech economy, working in high-demand areas like water technology, advanced vehicle components, and smart-grid design.

They live and work in cities, towns, and communities across the country that rank among the world's elite in sustainability and livability. Over the course of the 2020s, Canada became a leading player in the global shift to smart prosperity—a set of policies and principles that have come to form the core of the stronger, cleaner economies that thrive in the new global marketplace. But this new foundation rests on the same sound values, vibrant communities, and economic pragmatism that made Canada a thriving industrial economy in the first place.

Looking back from Canada in 2030, it can be difficult to recall where the divisions once lay. From Parliament Hill to Main Street and from Bay Street to the oil patch, no one talks anymore about a healthy environment and a prosperous economy as divergent goals to be traded against each other. In meeting the fundamental challenge of the 21st century—forging a new economic path that yields greater dividends while reducing environmental costs—Canadians have built on our strengths to find a better way of meeting our needs.

The transformation began with policy innovations more than a decade earlier, measures like British Columbia's pioneering carbon tax, Ontario's coal phase-out and catalytic green bond program, Nova Scotia's waste management regime, carbon pricing in Quebec and Alberta, and the clean-tech incubator Sustainable Development Technology Canada. These and other initiatives like them inspired a wave of policies and innovations, producing a robust, fast-growing clean-technology sector nationwide. Canadian companies such as the waste-to-energy pioneer Enerkem, the photovoltaic innovator Morgan Solar, and the smart home pacesetter Ecobee established early benchmarks in their sectors. Canada was soon punching above its weight in a growing global clean-tech market now worth more than $5 trillion annually.

It's no longer a surprise to see major energy, manufacturing, and resource companies routinely working side by side with Indigenous Peoples, government, and environmental groups. Model initiatives like the Canadian Boreal Forest Agreement and the Canadian Oil Sands Innovation Alliance demonstrated how such alliances can create opportunities to expand market share and export cleaner products worldwide. Canadian cities are global beacons for innovations ranging from green urban design (Vancouver) to advanced waste management (Edmonton) to urban green space (Ottawa). And Canadians in communities coast to coast now find they no longer need to compromise between the right choice and the affordable one in their everyday lives.

The smart prosperity transformation began in that pivotal year: 2016. The world's most advanced economic players had already begun forging cleaner, more innovative economies. The historic Paris Climate Agreement, mounting environmental pressures, and economic downturn wrought by volatile resource prices made it clear that the status quo was no longer sustainable, and Canada was at risk of falling behind. Canadians from every business sector, every level of government, and all walks of life came together to meet this challenge, spurred by five key actions:

- **empowering ecopreneurship through public and private initiatives that accelerate clean innovation and technology across all sectors**
- **creating a high-performance, low-impact economy through a big boost in energy and resource efficiency**
- **creating market rewards for making the right choices by pricing pollution and waste**

- **building the backbone of the new clean economy by making smart long-term investments in advanced infrastructure and skills**
- **safeguarding our abundant natural capital for future generations by renewing our commitment to conserve and value nature**

It once seemed to some that Canada's starting position was a handicap in this race—its small population scattered across a vast landmass with a cold climate and a resource-intensive economy. But this turned out to provide a powerfully innovative laboratory for solutions. Not only did Canadian companies and communities find their own way to smart prosperity, they helped invent practical approaches for jurisdictions far beyond their borders. Canadian businesses uncovered new global opportunities; Canadian workers found rewarding jobs that harnessed their skills to solve environmental problems, while Indigenous Peoples combined traditional knowledge with new technologies and approaches to address their unique needs and help to build a stronger, sustainable economy.

In Calgary, a long-standing municipal commitment to renewable energy combined with ambitious provincial climate policy to create a vibrant hub for clean-tech companies engaged in everything from geothermal power to carbon capture. Sault Ste. Marie emerged from Ontario's coal phase-out as a global laboratory for cutting-edge smart-grid technology. The visionary oil and gas developer Imaginea Energy, meanwhile, was one of the first companies anywhere to eliminate the carbon footprint from conventional oil production and became a model for the global industry. And long-established companies like grocery giant Loblaw found that being an early adopter in reducing waste and promoting sustainable products was a boost to their bottom lines and drove new business growth.

Across the board, Canadian governments, businesses, and communities have used smart policies and incentives, built on our traditional economic strengths, to establish "Made in Canada" as a globally trusted brand for clean innovation and performance.

This is what smart prosperity's destination looks like. It's not a utopia, it is a nation firmly and irreversibly committed to decoupling environmental harm from economic growth and thriving in a hyper-efficient, low-pollution age. This is the Canada we all need, and this report lays out a practical roadmap for the journey that leads there. Using smarter policies, processes, advanced infrastructure, and technology; wasting less; and boosting our resource and energy efficiency, we can get there.

This transformation is already underway. In the following pages, there are many examples of Canadian innovations already in use, building smart prosperity's foundations. We are making real progress, but it needs to be scaled up and accelerated. It's only possible to secure our place in this new economy if we begin now.

Canada can do this. Let's get started.

Boosting Energy and Resource Efficiency[1]

By 2030, 83 billion tonnes of materials, metals, and biomass will be extracted from the earth. Resource scarcity and commodity price volatility are growing considerations for businesses. High-performance, low-impact economies will turn today's scrap metal into tomorrow's infrastructure, and reap tremendous savings.

SECTION 1:
Why Canada Needs Smart Prosperity

BECAUSE THE WORLD IS CHANGING AND SO IS CANADA

Say farewell to last century's status quo: The global economy is now in rapid and significant flux. And an emerging consensus of the world's most trusted economic and business authorities is that the global economy is moving toward a new low-pollution model built on clean innovation. This transformation is inevitable, and Canada must act fast to secure a prosperous future as the world's leading economies reinvent themselves.

Digital-speed technological change and the explosive growth of emerging markets are combining with mounting resource scarcity and environmental challenges to create new opportunities and new risks. The costs incurred from environmental degradation are skyrocketing, and widespread public demand for action to reduce pollution has already begun to reshape many traditional resource sectors. Meanwhile, demand for cleaner, low-carbon production is on the rise, and the global clean-technology market, expected to exceed $2 trillion by 2020, saw investments grow by 17% in 2015 alone.[2,3] The old idea that we must choose between a strong economy and a healthy environment has been proven false. In fact, most of the world's highly competitive economies also rank among the top environmental performers (Table 1), including countries with strong oil, resource, and industrial sectors like Canada.

"We have two critical innovation opportunities in Canada right now. One is to enable our traditional industries to reinvent themselves in order to compete in a low-carbon economy. The second is to build capacity for the emerging clean-tech entrepreneurs, who are going to be the economic engines of this country."

—Annette Verschuren, Smart Prosperity Co-Chair; CEO, NRStor; former President, Home Depot Canada

Box 1 **Top economic experts agree the world is shifting to clean growth**

"The world is on the cusp of a resource revolution … that will enable strong economic growth, at a much lower environmental cost than in the past, thanks to the broad deployment of better, cleaner technologies and the development of more appropriate business models."

—McKinsey & Company

"'Green' and 'growth' must go hand in hand … Governments should depart from business-as-usual policies that do not account for environmental costs and implement green growth policies … Economic and environmental performance are inseparable in the long run."

—OECD

"Greening growth is necessary, efficient, and affordable. It is critical to achieving sustainable development and mostly amounts to good growth policies."

—World Bank

"We believe Canada can be an energy and resource powerhouse while also developing the technologies and systems that lead to successful businesses and higher paying jobs in this country, as well as contributing to environmental improvement around the globe."

—Canadian Council of Chief Executives

"The transformation ahead represents vast opportunities in a broad range of business segments as the global challenges of growth, urbanization, scarcity, and environmental change become the key strategic drivers for business in the coming decade."

—World Business Council on Sustainable Development

Canada is ready to join the leading pack in this shift, with a unique opportunity to launch a new phase of better economic growth while solving its own environmental challenges. Those resource and manufacturing firms that meet growing worldwide demand for cleaner, low-carbon production will gain market advantage. And Canadian technological breakthroughs and policy innovations have already begun to drive this transformation—Canadian businesses working on a range of clean innovations have earned us 7th place on the 2014 Global Cleantech Innovation Index, and pioneering emissions-cutting efforts like Ontario's phase-out of coal power plants and carbon-pricing schemes in British Columbia, Alberta, and Quebec are among the most ambitious in North America.[4]

We have deep experience with managing dramatic change successfully. Think back to the economic and environmental turmoil of the 1980s, when the rise of globalization and the emergence of planetary-scale problems such as ozone layer depletion and acid rain forced us to act. By the early 1990s, through free trade, aggressive debt reduction, and lead roles in such international environmental actions as the Montreal Protocol and the Canada–U.S. acid rain treaty, Canada repositioned itself quickly to prosper in a new economic era. Along the way, Canada has been second to none in managing social innovation, welcoming people, and absorbing traditions from around the world in this diverse, multicultural age.

The time has come again to accelerate the pace of change. Enormous opportunities await and Canada has already shown we have the tools, but the pace is being set beyond our borders and we can't let ourselves fall behind.

Table 1 **Competitiveness and environmental performance can go hand in hand**

Country	World Economic Forum Global Competitiveness Index Ranking 2014-15*	Environmental Performance Ranking 2014-15**
Switzerland	1	1
Finland	3	9
Germany	4	8
Netherlands	6	11
Sweden	8	7
Norway	9	3
Denmark	11	12
Canada	**12**	**19**

*Based on countries included in the Environmentally Adjusted Global Competitiveness Index (GCI).
**Calculated based on the difference between the GCI and the Environmentally Adjusted GCI.

Box 2

Environmental needs and clean-tech opportunities by the numbers

40-70%
below 2010 levels: estimated reduction in greenhouse gases needed by 2050 to avoid dangerous climate change (IPCC, 2014)

25-40%:
projected global shortages in water, energy, and food by 2030 (Barton, 2014)

45%:
proportion of the world's people who already live in regions undergoing high water stress (World Bank, 2012)

50%:
portion of global fish stocks that are being harvested at or beyond maximum capacity (Roland, 2012)

$2 trillion:
estimated annual cost of global forest loss (OECD, 2012)

$90 trillion:
estimated global infrastructure investments from 2015 to 2030 (GCEC, 2014)

30%:
estimated growth in the global market for smart homes and buildings by 2020 (AMR, 2013)

76%:
estimated growth in the global market for electric and automated vehicles from 2012 to 2014 (Ayre, 2015)

2016:
year by which global investments in solar and wind projects will exceed investments in all other electricity generation projects (Liebreich, 2015)

The world's most advanced economic players are mobilizing investment and expertise to compete in a changing global marketplace that rewards countries generating new wealth and jobs while reducing environmental impacts.

In Sweden, carbon pricing and other policy initiatives have inspired a 23% reduction in greenhouse gases since 1990, while the Swedish economy grew by 58%.[5] In drought-prone Southern Australia, agricultural water use plummeted by 65%, with no decrease in revenues from its irrigated farmland.[6] China and the United States—the two titans of the global economy—have become giants in the clean-tech game as well. China accounted for more than 30% of new investments in renewable energy, while the U.S. leads all OECD* countries in pumping out green innovations.[7,8] Major global corporations such as Royal Dutch Shell have become leading voices in favour of carbon pricing to address climate change. Smart prosperity is already reaping dividends around the world.

Canadians are eager to accelerate our own shift toward stronger environmental performance and are ready to capture the opportunities in this new marketplace. In a 2014 Abacus Data survey, the overwhelming majority of us—more than 85%—say we want to build our reputation for clean manufacturing and want to see major changes in our energy use and waste.[9] It won't be hard to build public support for smart prosperity.

Box 3

Smart Prosperity's vanguard by the numbers

36%:
amount by which Sweden increased carbon productivity (the amount of GDP generated per tonne of CO_2 emitted) from 2000 to 2010 (OECD, 2014)

32%:
portion of German electricity supplied by wind, biomass, and solar sources (Meyers, 2016)

40%:
portion of Finland's R&D budget allocated to clean-tech sectors (WWF/CTG, 2014)

35 gigawatts:
generating capacity of new renewable energy plants installed in China in 2014 (more than the European Union and North America combined) (BNEF, 2015)

86%:
portion of wastewater recycled in Israel (ICV, 2015)

100%:
portion of Canada's major forestry companies that have achieved sustainability certification (FPAC, 2015)

19%:
amount by which Ontario has reduced greenhouse gas emissions from 2005 to 2013, while GDP grew by 11% (GoC, 2015; StatCan, 2015)

* Organisation for Economic Co-Operation and Development.

BECAUSE CANADA'S ECONOMIC AND ENVIRONMENTAL SUCCESS DEPENDS ON IT

From advanced energy storage technology to smart urban design, and from carbon pricing to sustainable forestry, Canada has already begun to adopt the principles of a next-generation economy. Canada's wind, solar, biomass, and small-hydro generating capacity grew by 93% in the last five years.[10] And when large-scale hydro is included, we rank fourth among our peers in electricity generated from emissions-free sources.[11] Our clean-tech sector now employs more than 50,000 people, and our stock exchanges host more clean-tech companies than any other country in the world.[12,13] Companies active in Canada's oil sands have made major investments in carbon sequestration and other technologies aimed at shrinking their footprint, and Canadian forestry companies routinely achieve the highest sustainability certification the global industry bestows.[14,15] Canadian cities like Vancouver, Toronto, and Montreal routinely rank among the world's most livable. Edmonton, Calgary, and Ottawa, meanwhile, are all building out their mass transit systems as fast as budgets will allow.

This is a solid start, but Canada needs to accelerate the pace of this shift to stay with the leading pack and secure our competitiveness in a fast-changing world. Looking at a selection of 14 "peer countries" most similar to us in terms of GDP per capita, population density, economic structure, and economic growth,* the scope of our challenge is clear. Canada's starting point is close to the bottom

Box 4 **Canadian environmental performance by the numbers**

Comparing Canada's environmental performance on key environment–economy metrics to 14 peer countries that are most similar in terms of income, population density, economic structure, and economic growth shows that Canada is lagging behind:

- **14th out of 15:** Canada's rank on CO_2 productivity (GDP per unit of CO_2 emitted)
- **15th out of 15:** Canada's rank on energy productivity (GDP per unit of energy used)
- **9th out of 11:** Canada's rank on water withdrawal productivity (GDP per unit of water used)
- **11th out of 15:** Canada's rank on material consumption productivity (GDP per unit of material consumed)

Canada's recent **rate of progress**, however, has been much better:

- **7th out of 15:** Canada's rank on *improving* CO_2 productivity (2000 to 2010)
- **4th out of 15:** Canada's rank on *improving* energy productivity (2000 to 2011)
- **4th out of 11:** Canada's rank on *improving* water withdrawal productivity (2005 to 2011)
- **8th out of 15:** Canada's rank on *improving* material consumption productivity (2000 to 2011)

Note: Data on water withdrawal is limited for a number of peer countries, with comparable 2005 and 2011 data only available for six of the 15 countries.
Source: OECD Green Growth Indicators (2014).

* The peer countries are Australia, Austria, Denmark, Finland, France, Germany, Ireland, New Zealand, Norway, Spain, Sweden, Switzerland, the UK, and the United States.

among these peers in areas such as CO_2 productivity, energy productivity, material consumption productivity, and water-use productivity—all measures of how efficiently we use our natural resources.[16] In part, this is due to our cold climate, enormous landmass, and resource-intensive economy. But we can and must do better, and we are already making significant strides on some of these metrics: Canada boasted the fourth-best improvement ranking in recent years on both energy and water productivity, and by following top cities' and provinces' examples, we could move closer to number one.[17]

The Smart Prosperity roadmap is a response to global challenges, and Canada's role will be defined by our priorities and driven by our long-standing strengths. Canadians are well educated, with abundant expertise in energy production, resource management, advanced manufacturing, and information technology. We are also collaborative by nature, at ease working across sectors and jurisdictions to develop the creative solutions needed to capture both environmental and economic success. Canada already has thousands of companies developing cleaner technologies and products and dedicates nearly 12% of its R&D budget to energy and the environment, among the highest levels of any peer country.[18] Organizations like Sustainable Development Technology Canada and the Canadian Oil Sands Innovation Alliance are already investing and collaborating across sectors to find solutions to our most pressing environmental challenges.

Those solutions are needed now more than ever. Canadians are responsible for a disproportionate share of the world's natural assets, and we have a duty to do our part to conserve and manage them responsibly for future generations. But in recent years, Canada has been seen as a laggard on environmental stewardship, which has hurt some of our resource industries and Canada's prosperity as a whole. For instance, Canada's inability to build new pipelines to bring oil to tidewater is costing Alberta's energy sector $10 billion per year, and opposition to those pipelines is driven in large part by the concerns about our stewardship record and climate policy.[19] We're better than that reputation, but our progress has been uneven. We have the potential to achieve much more, as we have in the past—we just need to accelerate progress, and expand efforts across the economy.

This is the right thing to do, not only for our economic success, but to live up to our own expectations and embody our most deeply held values as well. A fair and inclusive Canada is one in which keeping our economy healthy also enhances environmental and human health for all Canadians.

Box 5

Canadian natural capital by the numbers

1st:
Canada's rank among all nations in terms of length of coastline (MoW, 2012)

2nd:
Canada's rank among all nations in terms of total landmass (CIA, 2015)

3rd:
Canada's rank among all nations in terms of supply of fresh water (TPI, 2010)

3rd:
Canada's rank among all nations in terms of proven oil reserves (EIA, 2013)

4th:
Canada's rank among all nations in terms of uranium reserves (WNA, 2014)

24%:
Canada's share of the world's remaining intact forest area (Chung, 2014)

"We've got the capacity, we've got the resources, and we've got the will of Canadians to create something far more compelling in terms of being a global player when it comes to a healthier planet, a healthier economy, and ultimately a higher quality of life for all."

—Kathy Bardswick, Smart Prosperity leader; CEO, the Co-Operators

BECAUSE SMART POLICIES WORK

Smart policies* provide us with the tools to improve environmental protection and catalyze a stronger, cleaner economy, building on current economic strengths. Across Canada and around the world, evidence is mounting of the positive benefits for both the environment and the bottom line by shifting toward greener power, smarter transportation, cleaner production, less wasteful buildings, and more conservation.

Consider British Columbia's trail-blazing carbon tax, which has inspired a sharp decrease in fuel use without harming the economy.[20] Canada's forestry industry has reduced both water pollution and air pollution by more than 70% in just 10 years, building a strong environmental brand that has helped it weather challenging market conditions while opening up new opportunities in areas such as wood pellet manufacturing for bioenergy.[21] Ontario's recent coal phase-out (Box 7)—the biggest single climate change action of any jurisdiction in North America to date—was a similarly powerful catalyst for clean innovation, inspiring significant investments in renewable energy.[22]

Doing the right thing can also do right by the bottom line. But we need to do more of it—and we can. Our piecemeal successes to date point the way forward, but Canada must take a broader, more comprehensive approach to secure our place in the new economy as the global pacesetters surge ahead. Germany, despite having far less open space, strong wind, and sunshine than Canada, has become a global leader in virtually every aspect of the renewable energy business, capturing 14% of the global clean-tech market as of 2013, as part of its effort to phase out nuclear and coal power.[23] Sweden intends to eliminate fossil fuels entirely from its transportation system by 2030.[24] China and the United States, meanwhile, rank first and second in new clean energy investment.[25] And Israel has embedded entrepreneurial spirit into its education system and incentivized companies to innovate to overcome local water constraints, with per capita water use of 176 million m^3 (compared with 1,025 million m^3 in Canada).[26]

Smart policies can help to boost innovation and productivity—both key to Canadian competitiveness—while reducing waste and cutting costs.[27] Reducing energy use has enormous potential to lower greenhouse gas and air pollutant emissions, while providing cost savings for businesses and consumers and creating jobs. In Ontario, for example, every dollar spent on energy efficiency in recent years has saved two dollars in electricity costs.[28] Investing in resource productivity reduces costs and guards against resource scarcity risks, while opening up new markets. What's more, smart policies can boost productivity, improving workforce health and job satisfaction. Companies with higher workplace environmental standards enjoy an average of 16% higher labour productivity than their competitors.[29] The inefficiencies in the status quo, meanwhile, can ring up huge costs. Traffic congestion in the Greater Toronto

Box 6

British Columbia's carbon tax leads the pack

The Secretary General of the OECD stated, "British Columbia's carbon tax is as near as we have to a textbook case" of effective carbon pricing. In the five years after it was introduced in 2008, the province's per capita fuel use dropped 16%, while GDP growth kept pace with the rest of Canada. The tax started at $10/tonne and has since risen to $30/tonne. It is revenue neutral, with all the money generated used to reduce other taxes, including corporate and personal income taxes, along with targeted reductions for vulnerable households and communities.

Sources: Gurria (2013); Elgie and Lipsey (2015).

* See page 35 for a description of "smart policies."

Box 7

Ontario coal phase-out

In 2014, Ontario successfully phased out the use of coal-fired electricity, resulting in the single-largest carbon and air pollution reduction in North America.

- In 2007, coal accounted for one-quarter of Ontario's electricity generation, and was a major contributor to air pollution that caused 5,800 deaths and more than $7.8 billion in total costs to the provincial economy each year.
- By phasing out coal power over the next eight years, the province reduced its total greenhouse gas emissions by 19%, while continuing to grow provincial GDP by 11% (from 2005–2013).
- At the same time, the number of "smog days" in Ontario dropped from 50 in 2005 to zero in 2014 and 2015.
- Building on this success, Ontario has announced it will soon implement a cap-and-trade program linked with Quebec and California (and in the future, Manitoba) to support its ambitious 2030 target of reducing emissions by 37% below 1990 levels.
- In 2015, Alberta announced its own coal fired electricity phase-out.

Sources: MOECC (2015a, 2015b); OPA (2013); and OMA (2005).

Box 8

The Porter Hypothesis: How smart environmental policies can help innovation and competitiveness

In 1991, Harvard Business School professor Michael Porter, a world-respected competitiveness guru, challenged the conventional wisdom that environmental regulation always reduces business profitability. He suggested that well-designed regulation need not hurt competitiveness and may even help it, particularly if it helped firms identify eco-inefficiencies, trigger innovation, or overcome organizational inertia. The idea, now known as the Porter Hypothesis, has spawned hundreds of studies in the past 25 years.

Research shows that the economic impact on firms depends largely on the types of environmental policies used. Flexible, market-based regulations—such as emissions taxes and tradable allowances—produce better outcomes than rigid, command-and-control approaches. Policies that create maximum opportunities for industry-led ingenuity, foster continuous improvement, and avoid locking in particular technologies are also most likely to spur greater innovation, reduce compliance costs, and potentially boost overall productivity in some cases.

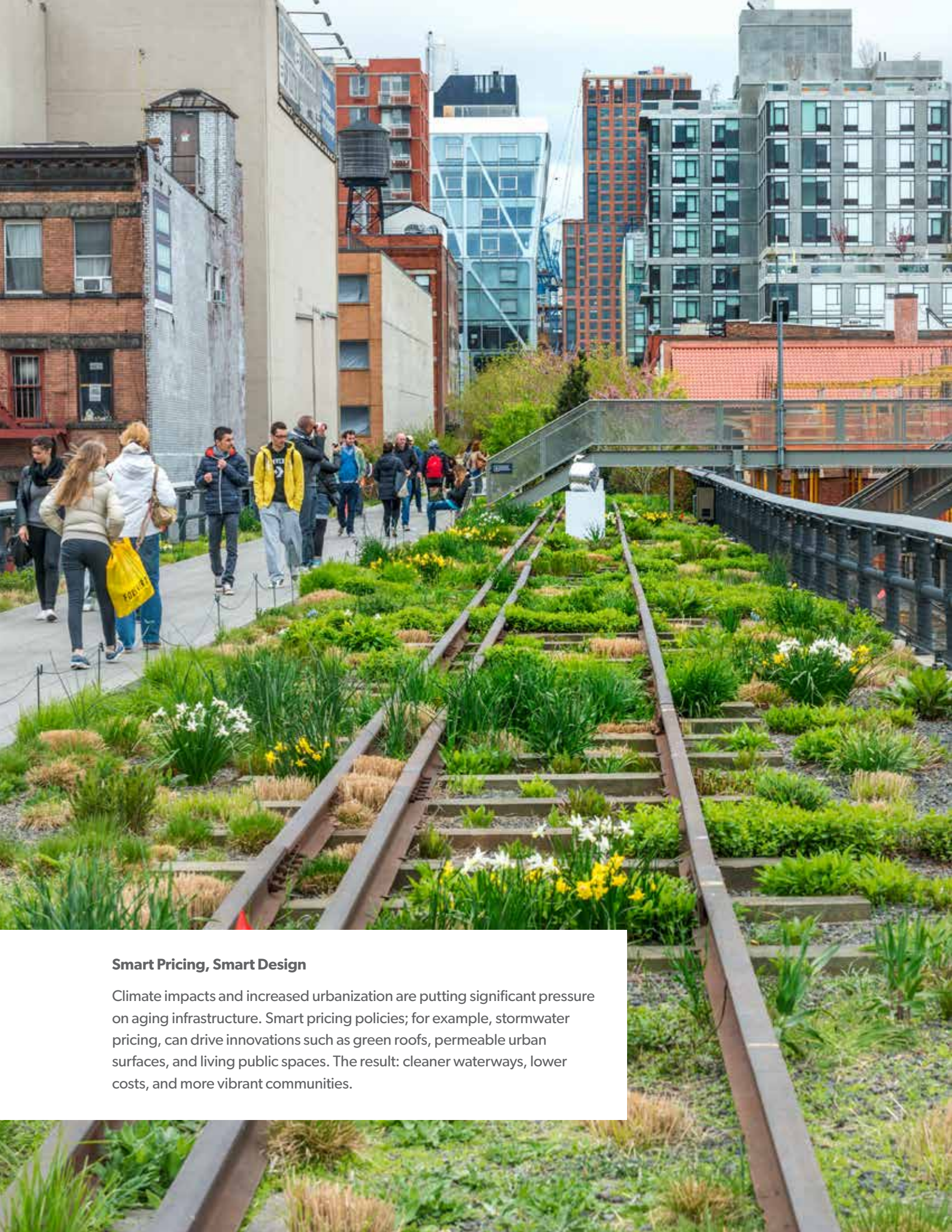
Business strategy and positioning also matter. Firms that are more technologically advanced and globally integrated are more likely to see productivity gains from smart environmental policies.

Sources: Ambec et al. (2013); Albrizio et al. (2014).

Area alone, for example, costs businesses as much as $11 billion every year owing to workers and goods moving at stop-and-go rates.[30]

Done right, smart policies can accelerate Canada's economic transition and spur the clean innovations that companies in both traditional and emerging sectors need to create new sources of growth, attract capital, and expand market and job opportunities. Research shows that flexible, market-based solutions such as emissions pricing and performance standards can drive this kind of innovation.

Canada's smart prosperity transition is already underway, but without a much stronger commitment, we can easily fall behind. Now is the time to speed it up and bring it to every corner of Canadian society.



Smart Pricing, Smart Design

Climate impacts and increased urbanization are putting significant pressure on aging infrastructure. Smart pricing policies; for example, stormwater pricing, can drive innovations such as green roofs, permeable urban surfaces, and living public spaces. The result: cleaner waterways, lower costs, and more vibrant communities.

SECTION 2:
Goals: What Smart Prosperity Will Do for Canada

WHERE CANADA STANDS TODAY

Canada's smart prosperity track record to date is mixed, boasting real success in some areas but lagging behind in others, with too little effort overall. Still, few places on Earth can rival Canada's natural capital—small wonder that such a bounty has produced one of the world's foremost and most diverse resource economies, as well as an impressive, long-standing tradition of environmental stewardship and conservation.

With its abundant water, wind, and solar resources, Canada ranks near the top in generating electricity from emissions-free renewable sources—fourth overall among our peers, with 62% of our power drawn from renewables.[31] Our cities habitually score near the top on livability surveys, and we have saved billions in recent years through efficiency improvements in our homes and businesses.[32,33] From water resource management technology to carbon capture, and from advanced municipal recycling to carbon pricing, Canada's resource wealth and highly skilled workforce have already enabled admirable leadership in clean innovation. But we still lag behind global leaders in many areas crucial to overall competitiveness in the new global economy, so we must act now to redouble our efforts and expand them across every sector and region of Canada.

With our cold climate and vast spaces, Canada may never have the bullet train network Japan does, and our city streets might not soon become as dense with cyclists as Copenhagen's. But we can learn from best practices around the world and build on our own strengths to join the world's front ranks in pursuit of smart prosperity. We have the technological expertise, the people, and the resources. We can do this.

Achieving Smart Prosperity's vision means that, by the 2020s, Made in Canada will be a recognized global brand for environmental performance and clean innovation. This requires accelerating our progress on industrial eco-competitiveness, smart governance, and urban sustainability, enabling a better quality of life while shrinking our environmental footprint across the board.

The next section provides more detail on our goals and how we intend to gauge our progress in reaching them.

Vision: A stronger cleaner, economy that builds a better future for all Canadians.

Result: Canada boosts its competitiveness, innovation, and environmental performance on pace with leading nations over the next decade, and will become a global leader within a generation.

Table 2 **Measuring Progress Toward the Goal**

Measuring progress toward the overarching goal—improving Canada's competitiveness and environmental performance on pace with the world's leading nations—will require a variety of metrics. While relatively good internationally comparable data are available at the national level, meaningful and up-to-date data are more limited at the business, community, and individual levels. As a starting point, Canada's progress will be measured at the national level using a selection of existing international environment–economy metrics. Over the coming years, further work will be undertaken in partnership with other Canadian and international organizations to develop additional and improved metrics of progress. Canada's performance will be compared with a selection of 14 peer countries that are most similar to Canada in terms of GDP per capita, population density, economic structure, and economic growth. The table above highlights some of the initial metrics that will be used, and Canada's current ranking compared with the peer countries. **Over the next 10 years, our goal is for Canada to raise its performance for these and other metrics, making as much progress as any peer nation.**

Metric	Data Source	Canada's Rank
Competitiveness—environmentally adjusted	World Economic Forum Global Competitiveness Index, 2015	12
Clean-tech innovation	WWF/Cleantech Group Cleantech Innovation Index, 2014	6
Environmental inventions	OECD Statistics: Environment/Patents, 2012a	5
CO_2 productivity	OECD Green Growth Indicators, 2014	14
Population exposure PM10	World Bank World Development Indicators, 2013b	7
Energy-use productivity	International Energy Agency Energy Statistics/Balances, 2013	15
Renewable electricity	OECD Green Growth Indicators, 2014	4
Water productivity	World Bank Water Productivity, 2013a	13
Material consumption productivity	OECD Green Growth Indicators, 2014	11
Recycling and composting	OECD Statistics: Environment/Waste, 2012b	11
% threatened species (birds and plants)	OECD Statistics: Environment/Biodiversity, 2013	1
% threatened species (mammals)	OECD Statistics: Environment/Biodiversity, 2013	9
Protected areas (km^2)	IUCN Protected Planet Database, 2014-15	4
Ocean Health Index	Ocean Health Index 2015	7

Note: The 14 peer countries selected are Australia, Austria, Denmark, Finland, France, Germany, Ireland, New Zealand, Norway, Spain, Sweden, Switzerland, the UK, and the United States.

GOAL NO. 1 Healthy, vibrant, and green communities

Success means making the most global progress in building livable, sustainable, modern communities over the next decade.

Canada is one of the world's most urbanized countries—more than 80% of us live in cities—and our future success will be driven primarily by innovations born in our cities.[34] Canada's six largest metropolitan areas (Toronto, Montreal, Vancouver, Calgary, Ottawa, and Edmonton) generate almost half our GDP.[35] What we build in our cities, how we move around in and between them, the water we use, and the waste we generate will play major roles in defining smart prosperity for Canada.

At the same time, the one in five Canadians living in rural communities will play a crucial role. They are the nation's producers of food, managers of natural resources, and caretakers of our abundant wildlife, wetlands, fields, and forests. Achieving Smart Prosperity's goals depends to a significant measure on their expert stewardship and innovative solutions to emerging environmental problems.

By the 2020s, Canada's cities and rural communities will be among the world's most improved on metrics of sustainability and livability, building on their current strengths.

How We Get There:

- **Smart urban design, with more-compact neighbourhoods and improved eco-services such as mass transit and bike lanes.**
- **Higher efficiency standards for new buildings, and incentives for retrofits.**
- **More green spaces, and incentives for rural land stewardship.**
- **More aggressive waste reuse and recycling programs.**

Canada's largest cities already place among North America's elite in key areas: Vancouver in green building and overall livability; Calgary in water use; Edmonton and Toronto in diverting waste from landfill; Ottawa in green spaces; and Montreal in cycling infrastructure.[36] Building collaboratively on these successes and sharing best practices will enable our cities to attract and retain top talent from around the world, move people and goods more efficiently, improve resiliency to global change, and drive innovation in the emerging clean economy and beyond.

Box 9

Canadian urban livability and sustainability by the numbers

4:
number of Canadian cities ranked in the world's top 25 (out of 221) on the Mercer Quality of Living Index (Vancouver, Toronto, Ottawa, Montreal)

25%:
amount by which Toronto reduced greenhouse gas emissions from 1990 to 2012

1:
rank of Vancouver in per capita CO_2 emissions among major North American cities

2:
rank of Montreal among North American cities on the Copenhagenize Index of Bicycle-Friendly Cities

19%:
portion of Canadian bicycle commuters who describe their commute as "the most pleasant activity of the day"

2%:
portion of Canadian motor vehicle commuters who describe their commute as "the most pleasant activity of the day"

3:
rank of Ottawa in lowest per capita water use among major North American cities

1/2/3:
rank of Edmonton, Winnipeg, and Ottawa-Gatineau, respectively, in green space among North American cities

Sources: Mercer (2015); TAF (2013); EIU (2015); Copenhagenize (2015); and StatCan (2011).

GOAL NO. 2 Competitive, clean businesses generating jobs of the future

Success means each sector's environmental performance is among the global best-in-class, while growing competitiveness and good jobs over the next decade.

Smarter, cleaner, more-competitive businesses in every sector—from clean technology to resource industries, from agriculture to advanced manufacturing—will drive the creation of the high-performance Canadian economy of the 2020s. We already have a solid start on this goal: Canadian businesses coast to coast score well against peers on a number of measures of competitiveness, and many of them have already made important investments in clean innovation.

By the 2020s, every Canadian business sector will rank among the worldwide best-in-class in terms of environmental performance and efficiency, accompanied by improved rates of competitiveness and high-quality job creation.

How We Get There:

- **Investing in technological innovations to boost energy efficiency and resource productivity, and reduce waste.**
- **Driving sustainability along the supply chain using purchasing power.**
- **Pursuing sustainability initiatives with public and non-governmental partners.**
- **Embed environmental performance in financial plans, business strategies, and the like.**

Collectively, Canadian businesses will establish Made in Canada as a leading global brand for environmental performance and clean innovation.

Many businesses across Canada have already joined the ranks of smart prosperity's pioneers. Some examples:

- Halifax-based CarbonCure Technologies reduces overall emissions from concrete production by up to 15% among companies using its new method for reinjecting carbon dioxide emissions from concrete production back into concrete during the manufacturing process.[37]
- At the General Motors Canada assembly plant in Ingersoll, Ontario, waste is a thing of the past. Since 2014, operations at the plant, which employs 3,000 workers, have sent zero waste to landfill.[38]
- The Calgary-based industrial design firm DIRTT installs its high-efficiency, readily reusable modular office furniture worldwide, while raking in international innovation awards.[39]
- On the Montana First Nation in central Alberta, Green Arrow Renewable Energy Corp., the first wholly Aboriginal-owned renewable energy developer in the country, recently completed its first commercial-scale project: a rooftop solar array for the band's administration office.[40]

The future of Canadian economic competitiveness rests on accelerating investment in innovations like these and keeping pace with leading economic players around the world.

Box 10

Ontario's clean water technology cluster

A smart combination of progressive water protection legislation, top-notch R&D support, and skilled entrepreneurship has turned Ontario into a global leader in clean-tech development for water management. About 900 established and 300 early-stage water technology companies operate in the province, many doing business worldwide. UV disinfection technology developed by Trojan Technologies (now owned by Danaher) has been installed at 7,800 municipal facilities in more than 80 countries. The provincial water industry employs approximately 22,000 and counting. The Walkerton Clean Water Centre—established following the E. coli drinking water contamination disaster there in 2000—has played a key role in water-related training, applied research, and technology demonstration.

Sources: WaterTap (2015); CBC News (2010).

Box 11

Growing green opens export markets

Thomas Canning—a family-owned canned-tomato producer near Windsor—has tapped into the Chinese market by leveraging "Made in Canada." To the Chinese buyer, the Canadian symbol represents clean air and water, high quality, and food safety. And customers are willing to pay a premium for the environmental and health benefits of the company's sustainably harvested organic products. Canning is now expanding to Nigeria, where tomato processing capacity is scarce, supported by an investment from the Ontario government.

Source: Trillium Network for Advanced Manufacturing (2015).

Box 12

North America's alternative energy capital? Head to the Soo

Since Ontario began its phase-out of coal power in 2006, renewable energy has become a growing piece of the province's new electricity regime. And nowhere has the shift been embraced more fully than the emerging clean-tech hub of Sault Ste. Marie. After years of industrial decline in conventional industries like steel, and pulp and paper, the Soo has embraced clean energy development as a dynamic new business opportunity. Through a mix of wind and solar farms, co-generation from waste heat, and next-generation waste-to-energy plants, the city has emerged as a net energy exporter and a test bed for next-generation smart-grid technology. The region's most recent green power development is a 58-megawatt wind farm being built as a joint venture between Calgary's BluEarth Renewables and the Batchewana First Nation.

Sources: SSM EDC (2015); BER (2014).

GOAL NO. 3 Smart government policies catalyze economic and environmental performance

Success means world-class policies that unleash private initiative and capital to boost eco-efficiency and innovation.

Private initiative and investment will be the engine of Canada's high-performance, low-pollution economy in the 2020s, but a primary catalyst for this transition is better policy at every level of government. Interventions are needed to strengthen existing policies in key areas—in particular, conserving Canada's natural bounty and safeguarding the high quality of our air, water, and land. But new policies are also vital to establish marketplace incentives that make the clean choices the most affordable ones and push investment toward the many profitable green opportunities throughout the economy.

By the 2020s, Canadian policies will be a global model for aligning environmental stewardship with economic growth, driven by a new generation of smart standards and incentives that promote clean performance.

How We Get There:

- **Pollution-pricing mechanisms.**
- **Clean procurement strategies.**
- **Stronger standards and incentives for energy efficiency.**
- **Waste reduction policies to extend producers' responsibility for their products.**
- **Strategic investments in R&D and demonstration projects that mobilize private capital toward clean technologies.**
- **Enhanced engagement with First Nations to build capacity for the new economy and support sustainable development.**

These innovative new policies at every level will expand nature conservation and protect the health of Canadians. They will also mobilize private capital toward innovation, eco-efficiency, and the advanced infrastructure needed to build this new economy, encouraging growth in both the emerging clean-tech and established resource and manufacturing sectors.

Canada has already made significant progress on some fronts, with smart policies like British Columbia's carbon tax, which rewards energy-efficiency innovation; Ontario's stringent water protection laws, which have encouraged the growth of a vibrant water technology sector, now more than 1,000 companies strong; Vancouver's Greenest City Action Plan, which is pushing

clean investment and reducing pollution throughout the city; and the federal government's 2012 early-stage, clean-tech venture capital fund (BDC), which has kick-started innovative companies such as the Toronto-based energy-efficiency firm EnCycle.[41,42] Now we need more far-sighted policy initiatives like these, on a larger scale, from every level of government to unleash eco-efficiency and innovation across the Canadian economy.

Box 13 **Canadian smart policy milestones**

- Quebec cap-and-trade initiative: Co-founded with California the largest carbon market in North America (Ontario and Manitoba now joining). *(MDDELCC, 2014)*
- Alberta Climate Change policy, establishing an initial carbon price of $30/tonne and a cap on Oil Sands greenhouse gas emissions *(Government of Alberta, 2015)*
- Canada–United States Air Quality Agreement: Spawned federal and provincial regulations that reduced SOx and NOx (the main pollutants causing acid rain) by over 60% from 1990 to 2013, accompanied by robust GDP growth. *(IJC, 2014)*
- Nova Scotia energy-efficiency regulations: Resulted in 165 gigawatt hours of electricity saved per year. *(Efficiency One, 2015)*
- Federal passenger vehicle regulations: Will result in 174 million tonnes in greenhouse gas reductions and $50 billion in fuel savings. *(Environment Canada, 2014)*

Box 14 **Finland: Clean-tech R&D pacesetter**

Finland spends about 40% of its national research and development budget on clean-tech-related sectors—the largest proportion of any country on the planet. With little in the way of conventional energy resources, Finland has a history of having to do more with less, a knowledge base it leveraged to grow its clean-tech sector. More than 50% of Finnish clean-tech companies are focused on energy-efficiency solutions. Finland now punches well above its weight—in 2014, its share of the global clean-tech market was double its share of global GDP.

Sources: Tweed (2014); WWF/CTG (2014).

GOAL NO. 4 Better, more affordable choices for people to live sustainably

Success means improving Canadians' quality of life while being world leaders in conserving nature and reducing our environmental footprint over the next decade.

Canadians see themselves as conscientious stewards of a nation blessed with unparalleled natural gifts. We want to do the right thing. Canada boasts one of the world's highest proportions of "aspirational consumers"—40% of us define ourselves by a strong desire to have a positive impact by demanding products that enhance well-being and sustainability.[43] But the average Canadian's environmental footprint also ranks among the world's largest, inflated by the high energy demands of our cold climate and dispersed population, and amplified by decades of car-centred urban design.[44]

By the 2020s, Canadians will enjoy a rising quality of life supported by a wide array of affordable options to reduce their waste, energy and water use, and overall environmental impact.

Box 15 **What are smart policies?**

Smart policies are ones designed to support both economic and environmental objectives.

They are environmental, economic, or other polices that

- **minimize costs**, limiting both economic and environmental impacts;
- **maximize opportunities**, promoting innovation, investment, and co-benefits; and
- **encourage creative solutions**, finding better ways to meet social and environmental goals.

Examples of smart policies:

- **Ecofiscal policies**, such as pollution taxes, road congestion pricing, and cap-and-trade systems, give an economic reward for lowering environmental harm; they encourage cost-effective pollution reduction, mobilize private investment toward cleaner technologies and products, and generate revenue that can be used to further support economic and environmental objectives.
- **Energy-efficiency policies**, such as vehicle fuel-efficiency standards, reduce carbon emissions and air pollution while generating cost-savings that support competitiveness and resilience to energy price fluctuations.
- **Sustainable procurement policies**, that enable governments (which are among Canada's biggest buyers) to lead by example while showcasing clean technologies and products.
- **Clean innovation policies**, such as arm's length public investment funds, leverage private capital that helps Canadian ecopreneurs generate new clean technologies and processes that improve environmental outcomes, reduce costs, and create market opportunities that generate job growth.

How We Get There:

This is where the four Smart Prosperity goals come together. Smarter policies, cleaner business performance, and greener urban development will make it possible for more Canadians to:

- **Buy their power from an affordable clean provider.**
- **Install eco-efficient and low-flow appliances to save energy, water, and money.**
- **Live in environmentally healthy homes.**
- **Choose low-pollution transport such as walking, cycling, transit, or car-sharing.**
- **Purchase more, competitively priced sustainable products and services.**

Canadians have demonstrated they are ready to make better choices when they are presented with practical, affordable solutions rather than unwieldy, expensive alternatives. Montreal quickly became one of North America's premier cycling cities once safe, high-quality cycle tracks and an expansive bike-sharing system were installed.[45] Nova Scotians pushed their provincial government to aim for more ambitious recycling goals than originally planned when the options were clearly presented.[46] And across the country, nearly 60% of Canadians now regularly buy organic food, with lower prices, wider availability, and a uniform standard inspiring a tripling of organic sales from 2006 to 2012.[47]

Box 16

Calgary's biking boom

In the spring of 2015, the City of Calgary unveiled one of Canada's most extensive urban cycle track programs: a six-kilometre, $5.8-million downtown network of safe, physically separated bike lanes. In just six months, the pilot project increased bike trips along the routes by 95%.

Source: City of Calgary (2015).

THE SMART PROSPERITY INITIATIVE: OUR ROLE

These are visionary goals. No single group could accomplish them alone. But working together, we can make tremendous progress. To do so, however, will require a clear and unified understanding of what progress looks like and how to measure it. The Smart Prosperity initiative will work with cities, businesses, and governments across Canada to help catalyze a coherent vision of success and develop robust progress metrics for each of these goals. We will draw on expert research and globally recognized benchmarks to help guide progress along the most effective and credible paths. And we will regularly track and report on Canada's headway to encourage greater momentum.

These goals define the destination—what smart prosperity will look like—and critical milestones along the way. To achieve them, Canadians must unleash our creativity in every sector and community, and harness our individual strengths to meet the economic and environmental challenges of a changing world. The next part of this report focuses on how to do that with tangible actions that we can start taking today.

Box 17 **The world's top 10 urban innovations**

In 2015, the Global Agenda Council on the Future of Cities developed a list of the 10 best examples from around the world of cities creating innovative solutions to a variety of problems.

1. **Digitally Reprogrammable Space** As urban populations grow in limited spaces, the focus in many cities is shifting to better, multi-functional uses of infrastructure to get more from less.
2. **Waternet: An Internet of Pipes** With costly water losses from leaking pipes of 25% to 30%, some municipalities have turned to cloud-based solutions to connect pipes to the Internet of Things.
3. **Adopt a Tree Through Your Social Network** Trees are a great way to engage citizens in environmental efforts, and offer climate, air quality, and stormwater management benefits.
4. **Augmented Humans: The Next Generation of Mobility** Cities are increasingly recognizing that making pedestrian and bicycle commuting easier can lead to reduced congestion and pollution.
5. **Co-Co-Co: Co-generating, Co-heating, Co-cooling** Co-generation (power + heat) is shifting to tri-generation and quad-generation systems that also take on cooling and use captured CO_2.
6. **The Sharing City: Unleashing Spare Capacity** Sharing homes (e.g., Airbnb), cars (e.g., Zipcar), and other products (e.g., Streetbank) is becoming increasingly popular, and cities are moving toward shared facilities and clustered services to get more from less.
7. **Mobility-on-Demand** Digital information and communication technologies, combined with self-driving vehicles, can manage traffic more efficiently and reduce congestion and pollution.
8. **Medellin Revisited: Infrastructure for Social Integration** Medellin, Colombia, shows the potential for infrastructure and urbanism to be used as a tool for social development.
9. **Smart Array: Intelligent Street Poles As a Platform for Urban Sensing** The anticipated conversion of four billion street lights to more energy-efficient LED lights offers the opportunity to add sensing technologies that collect data on weather, pollution, traffic, and parking.
10. **Urban Farming: Vertical Vegetables** One way to reduce food waste is to grow food on consumers' doorsteps, with roofs, walls, and parking lots filled with stackable, soilless hydroponic systems.

Source: Global Agenda Council on the Future of Cities (2015).

Valuing Nature[48]

The final Great Bear Rainforest agreement, signed in February 2016, is a world-leading model of building a conservation-based economy with collaboration between governments, First Nations, industry, and ENGOs. The accord permanently protects 85% of B.C.'s northern forested wilderness, while underpinning a sustainable forestry sector in the region.

SECTION 3:
Actions: How Canada Achieves Smart Prosperity

ACTIONS: HOW CANADA ACHIEVES SMART PROSPERITY

We're already on our way. Canada is making real progress toward smart prosperity. But this shift needs to be accelerated, scaled up, and expanded to every part of the economy. In the coming years, we need to be ready to capture new economic and environmental opportunities, attract investment, and respond nimbly to rapid technological and ecological changes.

Achieving these goals will require efforts on many fronts and input from the range of actors involved. Still, there are five key priority areas where action is particularly needed to put Canada on a path to smart prosperity:

1. **Accelerate clean innovation across the economy**
2. **Boost energy and resource efficiency**
3. **Price pollution and waste**
4. **Invest in advanced infrastructure and skills**
5. **Conserve and value nature**

There is abundant evidence—from a global range of studies and from real-world experience—that these five action areas offer the best opportunities to harness Canadian strengths toward the task of decoupling environmental damage from economic success.

Let's look at each action in more detail.

ACTION NO. 1 Accelerate clean innovation across the economy

Clean innovation and clean technology together form the industrial core of smart prosperity. Harnessing both is how we build smart prosperity's engine. The widespread deployment of innovative clean technologies is the key to improving economic and environmental performance across all sectors. Smart policies, practices, and business strategies can inspire ecopreneurship throughout the Canadian economy, capturing new export opportunities, and attracting new investment to Canadian businesses.

As shown by examples throughout this report, clean innovation is happening already throughout our economy—Canada ranks 7th worldwide on the Global Cleantech Innovation Index.[49] But our global market share has slipped 41% since 2008 as the clean-tech market has boomed and other leading jurisdictions have raced ahead.[50]

Our pace needs to accelerate to capture our full share of emerging global opportunities and thoroughly address domestic environmental challenges.

Box 18

Two varieties of clean

Clean innovations

are new technologies, products, and business practices that improve environmental performance in any sector of the economy.

Clean technology

—clean-tech—is the sector of the economy focused exclusively on developing next-generation green innovations such as energy production and storage, biochemicals, and electric vehicle batteries.

Box 19 U.S. government's landmark clean energy investment

The Advanced Research Projects Agency—Energy (ARPA-E) was launched in 2009 under the U.S. Department of Energy. Its mission is to improve U.S. competitiveness, energy security, and greenhouse gas reduction by funding high-potential, high-impact energy technologies that are too early for private sector investment.

The agency is designed to be smart and nimble, with a small staff, flexibility to work outside regular government procedures, and directors empowered to use discretion in project selection and termination. ARPA-E's culture encourages risk and allows for failure, and its team of tech-to-market advisers helps connect technology developers with private sector funders and business partners. ARPA-E is based on the "island–bridge" model that allows it to operate independently and experiment while remaining linked to government and its technology diffusion programs through the Department of Energy.

Since 2009, the agency has funded more than 400 potentially transformational energy technology projects, many of which have spurred millions of dollars in private sector financing. Many ARPA-E awardees have also formed start-up companies, or partnered with government or industry to advance their technologies.

Source: ARPA-E (2016).

Box 20 CycleCapital Management: A driver of Canada's clean-tech ecosystem

Montreal-based CycleCapital Management was ranked as Canada's most active private clean-tech venture capital firm in 2015. Since 2009, with industrial partners, it has invested $95 million and leveraged $1 billion in investment to support clean technology start-ups across Canada in agriculture, green mining, energy efficiency, biofuels, and green chemistry.

CycleCapital also pioneered Quebec's clean-tech ecosystem by putting in place Ecotech, the Cleantech Cluster, creating EcoFuel (which gives seed financing of early-stage companies), and co-founding the green economy think tank SWITCH, which brings together business, environmental, municipal, and technological leaders. A real catalyst, SWITCH's aim is to help make Quebec a more innovative, competitive, and resilient society. Several of its recommendations on environmental taxation, public procurement, employment in the green economy, energy transition, and carbon markets have been integrated into the Quebec government's priorities.

Source: CycleCapital Management (2016); Simard (2016); Switch (2016).

Canada has the knowledge, skills, and economic fundamentals to be among the leaders. What is required now is greater scale, focus, and coordination to fully realize our potential.

Governments at every level can help Canada gain a greater share of this new marketplace by serving as catalysts. They can play a vital role in driving investment into early-stage innovations—an area that private investors tend to underfund. Indeed, almost every major technological innovation of the past century, from unlocking the oil sands to creating the Internet, has required a significant public investment somewhere along the way. And this is especially critical where an innovation is aimed at a public good, such as reducing pollution, which is itself a by-product of a market failure.

Box 21 Growth of global clean-tech sector creating opportunities for Canadian mining

Hybrid vehicles, rechargeable batteries, wind turbines, energy-efficient lighting, and other technologies depend on rare earth elements—a group of 17 metals that have similar properties and occur in many of the same mineral deposits. While these elements are relatively abundant, they rarely occur in concentrations that make mining projects financially viable.

Over the last 10 to 15 years, global consumption of rare earth elements has increased at 8% to 12% per year, and this growth is expected to continue. Without better recycling efforts, it is estimated that industrial demand for some rare earth metals may increase by as much as 2,600% by 2025.

Canada is estimated to have 40% to 50% of the world's known reserves of rare earth elements outside of China (which accounts for 95% of global production). However, Canada is in a race with Australia, the U.S., and others to capture economic opportunities. Leading on environmental performance is one way that Canadian companies could gain a competitive edge; for example, by developing best practices in the management of radioactive concentrations within the mineral deposits, drawing on Canada's uranium mining experience. Indigenous peoples will also play an important role in the development of rare earth elements in Canada, as many of the deposits are located on their traditional lands.

Sources: Standing Committee on Natural Resources (2014); Coulomb et al. (2015).

Box 22 Shell Quest Oil Sands Carbon Capture and Storage Project breaking new ground

Carbon Capture and Storage (CCS) is listed by the International Energy Agency as one of the key technologies the world needs for a low-carbon future, but more projects are needed to make CCS more accessible and affordable globally. The Shell Quest Carbon Capture and Storage Project—supported by significant investments from the federal and Alberta governments—is Canada's first CCS project for oil sands operations. Quest is designed to capture more than one million tonnes of CO_2 a year—equal to the emissions from about 250,000 vehicles.

Source: Shell Canada (2015).

No surprise, then, that the global clean-tech leadership consists primarily of nations like the United States and several European countries with major public investment programs in this sector. Canada can follow their lead and build on the country's existing strengths to drive this new wave of innovation in both existing and emerging sectors of the economy.

The primary role for government is to provide strategic support in those areas where Canada has a comparative advantage, where the potential exists to be among the global leaders, or where environmental performance improvements are critical to competitiveness. Achieving breakthroughs will require a new openness to risk in both programs and procurement, combined with strong environmental policies that generate greater demand for clean innovation. It will also take targeted investments to accelerate progress and scale up small companies along with greater emphasis on commercialization, and connecting Canadian businesses to global clean market opportunities.

The intent is to work with private sector partners and capital markets to both push funding and research toward areas of innovation and to pull market demand in those same directions. Areas of useful government support include targeted education funding aimed at generating new ideas and nurturing entrepreneurs, helping to grow venture capital funding for clean entrepreneurs, innovative procurement initiatives that showcase emerging clean technologies and products, as well as establishing early-stage R&D financing and serving as test bed and early adopter for new technologies. Municipal governments can also help by nurturing emerging industrial niches, leading operational practices, and attracting and retaining the very best human capital through quality-of-life enhancements.

With the right public push-and-pull incentives in place, private enterprise can then step in to expand and accelerate clean innovation based on these foundations. The business sector can also supply the skills, knowledge, and financial capital to commercialize innovations, build demand, and find new markets at home and abroad.

The clean-tech market continues to boom worldwide, presenting a huge enticement for Canadian firms already engaged in everything from wastewater treatment to smart-grid development. But breakthroughs are also needed for resource and manufacturing sectors to compete in a changing marketplace, from technologies to reduce energy and water use in the oil sands to next-generation bio-products to spur growth in the forestry and agriculture sectors. The need for this new wave of innovation—and the opportunity it represents—is found everywhere in Canada's economy. We simply need to unleash it.

"The future will be about, how do you develop resources and grow the economy in a world where we need to have a smaller environmental footprint? I think Canadians are ready to take on this challenge and become leaders in this space."

—Lorraine Mitchelmore, Smart Prosperity Co-Chair; former President and Canada Country Chair, Shell Canada

ACTION NO. 2 Boost energy and resource efficiency

The concept is simple: Do more with less. But transitioning the whole nation to a high-performance, low-impact economy remains a massive generational-scale project. Achieving it will require best-in-class standards, technologies, and processes that promote efficiency, reuse, and recycling.

Using smarter processes and advanced technology to produce more while using less fuel and water, and leaving less waste is the right thing to do, not just for the environment, but for the bottom line as well. It will save money for Canadian businesses and consumers, and with the right supporting policies, it can also enhance business competitiveness and individual quality of life while reducing waste, conserving resources, and slashing pollution.

Box 23 **Building lighter cars**

Martinrea International—a Canadian auto parts maker with more than 40 manufacturing sites in eight countries—has found opportunity in the tightening of vehicle fuel standards. It is helping to show that larger vehicles can be made lighter and more fuel-efficient, without compromising safety, by using innovative manufacturing and design methods. For example, Martinrea developed an aluminum rear subframe for the new lightweight Range Rover.

Source: Boothe et al. (2015).

Energy use—in our homes, vehicles, and businesses—is the largest source of our emissions and pollution. More than a third of Canada's greenhouse gas emissions come from energy use in buildings (not including electricity) and transportation alone.[51] Canada has already made admirable strides, improving energy productivity by 23% from 2000 to 2011, the fourth-fastest rate among 15 peer countries.[52] And efficiency improvements have generated energy savings of more than $27 billion across the country since 1990.[53]

But we have a lot of work to do to catch up: Canada still ranks 15th out of 15 peer countries on energy productivity overall.[54] And there is a massive economic opportunity lurking in all that untapped energy and resource efficiency—an estimated $130 billion per year in potential energy savings in the U.S. alone, with similar savings surely waiting in Canada.[55] Our resource-based economy, cold climate, and vast geography present unique challenges, but our successful efficiency efforts to date demonstrate that these are not insurmountable.

Water use is also a growing issue, particularly in drier regions and cities with mounting water infrastructure deficits. Canada has improved its water productivity over the past decade, but still ranks 13th among 15 peer countries.[56] Agriculture is the largest water user in Canada, followed by power generation, mining, and forestry.[57] In the face of water scarcity, climate change, and rising food prices, global agriculture is shifting to high-tech solutions, such as drip irrigation, GPS-assisted precision agriculture, and new resilient varieties of plants that offer a ray of hope for feeding a growing global population as water resources shrink.[58]

Box 24

The global efficiency market by the numbers

$310 billion:
estimated size of the global market for energy-efficiency technologies, products, and services in 2012.

$80 billion:
estimated size of the energy-efficient vehicle market by 2020.

30%:
estimated growth in the market for smart homes and buildings by 2020.

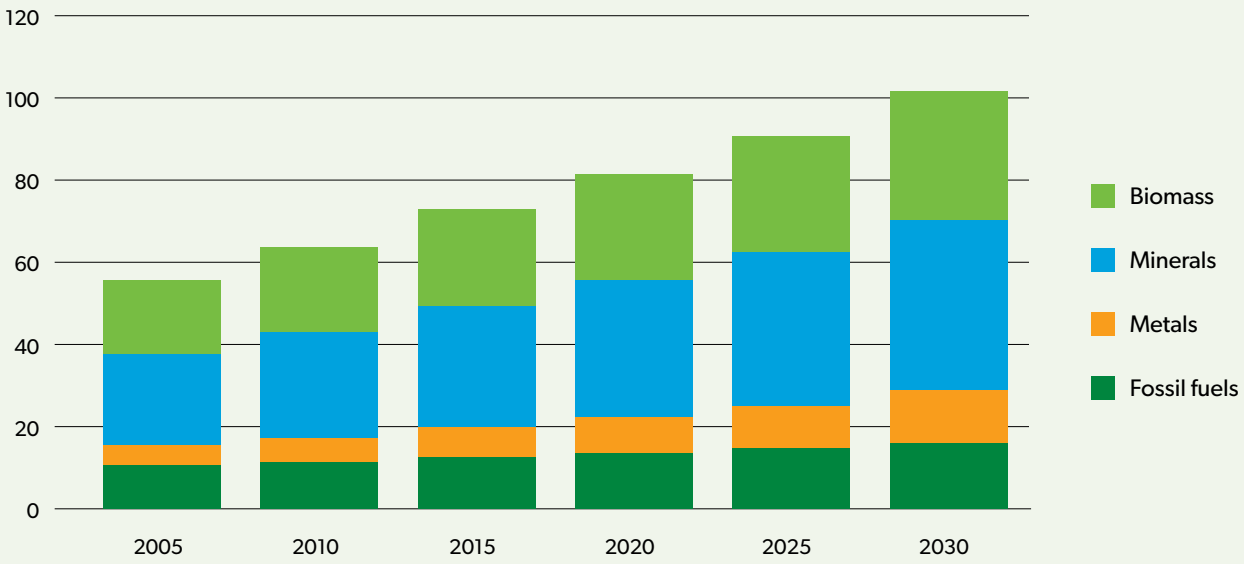
Sources: IEA (2014); Allied Market Research (2014).

Chart 1 **Circular economy: Resource efficiency can lower costs and grow economic opportunity**

By 2030, 83 billion tonnes of materials, metals, and biomass will be extracted from the earth—55% more than in 2010. This offers opportunity for Canada both in sustainable resource production and use. Canada has reduced the amount of materials it uses per unit of GDP, but not as fast as the U.S., and other peer countries in Europe.

Projected Global Resource Extraction to 2030

billion metric tons



Resource scarcity and commodity price volatility are growing considerations for businesses, with more than 10 minerals considered a high supply risk. Countries and companies that develop resource-efficient processes and technologies will be in a position to achieve resource security and input price stability, and tap into the growing global market for resource-efficiency solutions.

The world could realize an estimated US$1 trillion in financial savings annually by 2025 by moving to a "circular economy" that increases the rate of recycling, reuse, and remanufacturing in supply chains. For example, a study of opportunities in Denmark finds that pursuing circular-economy approaches in construction and real estate, machinery, plastic packaging, and hospitals could:

- Increase GDP by 0.8-1.4%
- Decrease resource consumption by up to 50%
- Increase jobs by 7,000-130,000
- Increase net exports by 3-6%
- Decrease the carbon footprint of the sectors by 3-7%

Sources: KPMG (2012); OECD (2014); Ellen MacArthur Foundation (2014); and Coulomb et al. (2015).

Box 25 Enerkem and Edmonton create a clean-tech waste-energy pioneer

The Enerkem biorefinery in Edmonton is the world's first major collaboration between a large city and a waste-to-biofuels producer to address waste disposal challenges and turn municipal solid waste into clean fuels and renewable chemicals. For more than a decade, the City of Edmonton's Waste Management Centre (EWMC) has been a global leader, hosting state-of-the-art recycling and clean-tech innovations. Located at the EWMC, the Enerkem Alberta Biofuels facility is part of a comprehensive municipal waste-to-biofuels initiative in partnership with the City of Edmonton and Alberta Innovates—Energy and Environment Solutions, using technology developed and manufactured primarily in Quebec. It is by far one of the most significant developments the waste and biorefinery sectors have seen yet, and one of the first commercial advanced biorefineries in the world. This game-changing facility will help to increase the City of Edmonton's waste diversion rate from 50% to 90%, and reduce greenhouse gas emissions by 60% when compared with gasoline.

An independent analysis evaluated that the Enerkem facility in Edmonton created more than 610 jobs in Canada during its construction and will generate 150 direct and indirect jobs during operations. Enerkem is developing additional biorefineries in North America and globally, while helping solve some of today's most pressing environmental issues.

Source: Enerkem (2016).

Box 26 Victoriaville: Small city, big thinking on waste management

Victoriaville, Quebec—pop. 42,000—competes with the best-performing cities in North America on diverting waste from landfill. The city's diversion rate is already 64%, with a target of 85% by 2018. Its main material recovery firm, Gaudreau Environnement, employs 250 people in the region and diverts 56,000 tonnes of material each year. Victoriaville has also combined social and environmental objectives through youth training and recovery centres that engage troubled youth in material recovery.

In addition to collecting three streams of waste, Victoriaville has monthly collection of bulky waste items such as carpets and furniture, and an eco-centre collecting used cellphones, small appliances, and other items that would otherwise end up in a landfill.

Source: Ghazal (2010).

The opportunities for resource efficiency are enormous, not just for energy and water, but across a range of resource sectors. A 2011 McKinsey study estimates that improvements in resource efficiency—initiatives such as reducing material and water waste in production processes and transporting goods more efficiently—could generate up to US$2.9 trillion in savings globally by 2030.[59]

Some Canadian companies are already seizing these opportunities. Titanium Corporation in Alberta, for example, has found a way to recuperate and sell bitumen and high-value minerals and solvents in waste tailings that could recover $1 billion per year from oil sands production while at the same time reducing greenhouse gas emissions.[60] In Ontario, British Columbia, and elsewhere, leading-edge Canadian water treatment companies are poised to capture a share of the rapidly growing global market for new water technologies as large regions of the world deal with increasing clean water scarcity.[61] And in Canada's cities and towns, studies show that reducing the municipal solid waste disposal rate by just 30% would inject $10 billion into the economy from increased recovery of paper, metal, and plastics.[62] A 2014 Conference Board of Canada study estimates that Ontario alone could create about 13,000 jobs and increase GDP by $1.5 billion with a waste diversion level of 60%.[63]

When it comes to energy and resource efficiency, governments can lead by crafting policy to accelerate improvements and help private sector firms overcome initial cost barriers. There's a wide array of policy tools to encourage doing more with less, including more stringent building codes, tax breaks for investing in energy-efficiency retrofits, incentives for sewage treatment and water recycling, investments in clean infrastructure, and incentives to recover and reuse resources such as wood and steel.

With the proper incentives in place, businesses can develop efficiency strategies that will reduce operational costs, hedge against risks to key inputs, improve environmental performance, and reduce waste. Businesses clearly could benefit from that policy catalyst. In a study conducted by the Canadian Energy Efficiency Alliance, 73% of businesses rank energy efficiency as a high priority, but only 27% believe they are doing all they can to improve it.[64]

Communities and individuals also have vital roles to play in this efficiency push. As municipalities across Canada have discovered, waste management systems that make recycling and composting effortless can inspire major changes in individual behaviour. More and more cities and towns are moving beyond the basics, aiming to see every product returned to a useful life or safe disposal. The Halifax Regional Municipality, for example, now diverts 68% of its residential waste from landfill, up from 5% in 1995, under Nova Scotia's ambitious province-wide waste diversion plan.[65] The rise of the sharing economy in everything from household tools to cars is introducing enormous opportunities to reduce the need for individual consumption and waste at the community level, while improving quality of life.

"I believe that Canada has a tremendous opportunity to evolve into a different, more competitive country. It's not about taking away part of what we do, it's about integrating and optimizing value, and moving Canada up the value chain."

—Vicky Sharpe, Smart Prosperity leader; founding President and CEO, Sustainable Development Technology Canada

Box 27 "Resource revolution" underway to meet demand for energy, materials, food, and water

The anticipated addition of three billion middle-class consumers over the next 15 to 20 years, and the growing challenges of finding and extracting new supplies of resources are raising the risk of global resource shortages and price volatility. Environmental deterioration—such as soil erosion, declining fish stocks, and depletion of groundwater—combined with climate change, will place even greater pressure on sources of food and water, and the production and extraction of energy and minerals.

In a 2011 report, McKinsey highlights the economic opportunities arising from these changing global conditions. They estimate potential global savings of US$2.9 trillion in 2030 from resource-efficiency actions, 70% of which generate an internal rate of return greater than 10% (even without government policy). They identify 15 areas of opportunity that account for roughly 75% of the total savings:

1. Building energy efficiency
2. Increasing farm yields
3. Reducing food waste
4. Reducing municipal water leakage
5. Urban densification
6. Higher energy efficiency in the iron and steel industry
7. Increasing yields on smallholder farms
8. Increasing transport fuel efficiency
9. Increasing the penetration of electric and hybrid vehicles
10. Reducing land degradation
11. Improving end-use steel efficiency
12. Increasing oil and coal recovery
13. Improving irrigation techniques
14. Shifting road freight to rail and barge
15. Improving power plant efficiency

Source: McKinsey & Company (2011).

ACTION NO. 3 Price pollution and waste

If you want less pollution, make it more expensive to pollute. Though this simple maxim has long been backed by economic research, most governments have instead favoured costly "command and control" regulations for tackling environmental problems. But in recent years, legislators around the world have been developing a powerful suite of pricing tools to discourage waste and pollution and encourage desired outcomes like increased innovation and eco-efficiency—instruments such as carbon pricing, traffic congestion charges, user fees for water, and incentives to landowners for providing ecological services such as carbon sinks. These mechanisms harness the market to encourage sustainable actions and push investment into clean innovation.

There is an emerging global consensus among industry leaders, economists, government officials, and environmental advocates: pricing pollution is the essential policy foundation for a successful transition to a cleaner, more resource-efficient economy.[66] By charging the real costs for damage to air, water, land, and climate, and using the revenues to cut taxes and invest in clean solutions, governments are creating clear market signals that reward smart choices and discourage damaging ones, as well as mobilizing private investment and stimulating market demand for cleaner technologies, products, and services.

Price signals have already amassed an impressive track record worldwide. The U.S. used the world's first large-scale cap-and-trade system to successfully cut pollution-causing acid rain at about half the cost of conventional regulation, saving billions each year.[67] Congestion pricing has shrunk traffic jams and boosted transit use in London, Stockholm, and Singapore.[68] And carbon prices now exist in 40 nations and more than 20 states, provinces, and cities, covering almost one-quarter of global emissions.[69] Similar pricing approaches are increasingly being used around the world to combat other environmental problems, such as water pollution, waste, and toxic chemicals, while boosting eco-efficiency and innovation.

Canada lags behind most developed nations in overall use of environmental pricing—a problem raised by the OECD in its economic reviews of Canada.[70] But this trend has begun to change, as a growing number of provinces and cities have started using pricing instruments to address climate change and other environmental challenges.

These efforts provide an excellent start, but we need to go much further. The smart prosperity transition will hit full stride once the real cost of every environmental impact is part of the cost of doing business, from air pollution to water use, and from habitat degradation to traffic congestion. The revenue sources created by these approaches can also be used to boost competitiveness, buffer impacts to vulnerable people, smooth Canada's economic transition, and spur further clean innovations.

Box 28

Toronto water prices yield results

Simply put, price signals work. By increasing water prices between 6% and 10% per year from 2005 to 2012, the City of Toronto lowered overall water consumption by 14%, even as the city's population grew by 4.5%. (Water use per capita fell by 24%.) These reductions will ease demand for costly new municipal water infrastructure.

Source: Bennett (2013).

"I believe we have a duty to future Canadians to have an economy that is 100% in sync with the environment, not an economy that is successful at the expense of the environment."

—Greg Kiessling, Smart Prosperity leader; executive chairman, Bullfrog Power; President, UpCapital Ltd.

ACTION NO. 4 Invest in advanced infrastructure and skills

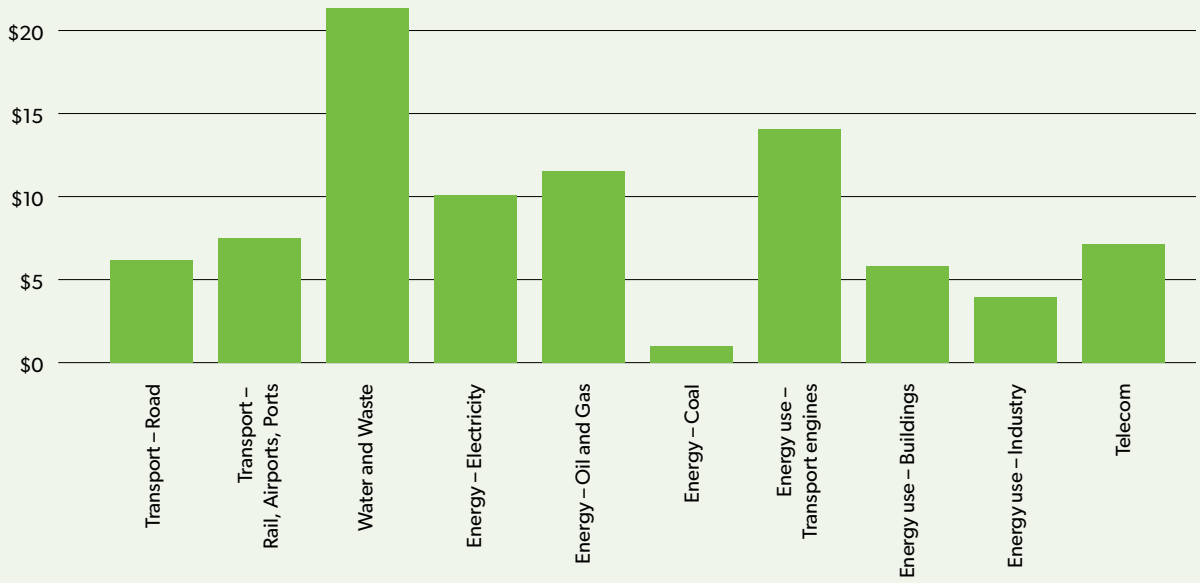
Smart grids and electric vehicle charging stations, efficient mass transit and bike lanes, greener buildings, and new water treatment plants—this next generation of infrastructure will enable us to bring smart prosperity to every Main Street in the country. And the choices we make today are especially crucial, since the infrastructure we build locks us into relying on particular energy, transportation, and water systems for decades to come. Our careful investments in new infrastructure and the training needed to thrive in the new economy will lay the foundation for Canada's future prosperity. With an average of roughly $6 trillion in new infrastructure investments being made worldwide each year out to 2030, this is also a major opportunity to create new avenues for the export of new technology and expertise.[71]

Chart 2 **Massive global opportunities in cleaner infrastructure**

Between 2015 and 2030, approximately US$90 trillion will need to be spent globally to address aging infrastructure in developed countries and rapid expansion in developing countries. Countries and companies making these investments will increasingly be looking to ensure what they build creates the foundation for a low-carbon future, and is resilient to changing climate impacts and resource risks. These investments offer substantial economic opportunities for Canadian companies, many of which are already among the leaders in energy technology, water infrastructure, and transportation innovation.

Infrastructure Investment Estimates, 2015-2030

2010 US$ trillion



Source: GCEC (2014)

Economists and business leaders point to infrastructure as essential to long-term economic and environmental success. The type and quality of our infrastructure is a key determinant of how much energy we use, how much pollution we create, and how much waste we generate, all of which have a mounting influence on our global economic competitiveness. That's why Canadian governments at all levels, along with their private sector partners, have begun making significant investments in renewable power, public transit, and water infrastructure. But much more is needed to meet ambitious climate goals, build cities of the future, move people and products efficiently, and modernize water and waste infrastructure.

"I believe in a different growth, a growth that allows the decarbonization of the economy, a more equitable growth, focused on meeting the current and future needs of people and communities."

—Monique Leroux, Smart Prosperity leader; President and CEO, Desjardins Group

Because infrastructure investments on this scale are often too large for a single government or business to take on alone, innovative public–private partnerships will be essential to success on this front. Once governments provide market signals and innovative investment vehicles, such as green bonds, there will then be significant opportunities to develop partnerships with private investors, energy and transit operators, the construction industry, and many others.

Canadian financial institutions such as insurers, banks, and other investors will play a critical role. They can provide the foundation for risk transfer, developing new products and services (such as the 2015 introduction of flood insurance coverage for Canadian homeowners), and use their considerable assets (exceeding $5 trillion) for "impact investing" to support infrastructure revitalization, high-efficiency transportation options, renewable energy, and other resiliency solutions for Canadians.[72,73]

Municipal governments can accelerate this clean economy transition through permitting and zoning changes to favour smart infrastructure or ecofiscal tools such as congestion fees, water pricing, and full-cost development charges

Box 29 **Ontario's green bonds get smart infrastructure built**

Ontario's green bond program is a trail-blazing infrastructure funding model, attracting investment capital from across Canada and the world to build greenhouse gas-fighting infrastructure. Launched in 2014 with an initial $500-million bond issue, the program offers attractive returns to investors while funding clean development.

The first bond issue was nearly 500% over-subscribed, with orders of $2.4 billion from insurance, pension and corporate investors, banks, and other institutions from Canada, the U.S., Europe, and Asia. The $5.3-billion Eglinton Crosstown LRT, Ontario's first project to be funded by green bonds, promises to move people up to 60% faster than current bus service, while reducing car dependency and expanding Toronto's emissions-free electrified transit system. Other projects eligible for proceeds from green bonds include clean transportation; energy efficiency; clean energy and technology; forestry and agriculture; and climate adaptation and resilience.

Source: Ontario Ministry of Finance (2014).

to both promote sustainability and generate some of the revenue needed for infrastructure investments.

Engaging workers in the right jobs will be critical to establishing our place among the world's leaders in a greening global economy. Canada's highly skilled workforce has long been a powerful asset thanks to a high level of education, and strong manufacturing and service industries. Canada's clean-tech sector already employs more than 50,000 people, and the International Labour Organization estimates that a greener economy could yield a net gain of 60 million jobs worldwide.[74,75] Environment-related skills are also in growing demand in the resource and manufacturing sectors.

To thrive in this new marketplace, further investment in training and skills development will be required to avoid labour bottlenecks from holding back Canada's progress. Developing this suitably skilled workforce will also help attract investment. What's more, smart investments in clean skills training can provide new opportunities for both youth and populations—including Indigenous Peoples—marginalized in the current system. And retraining programs can help ensure that existing workers displaced by the changing economy develop the skills needed to compete for new jobs.

By targeting training in future-oriented fields, we can create meaningful work and secure lasting prosperity for the next generation. In addition to generating new jobs in the production, installation, and maintenance of new technologies, the cleaner economy is expected to require the labour market to restructure as demand moves to new industries and "upskill" to manage technological and efficiency changes.

By investing today in advanced infrastructure and skills, we can build the foundation to succeed in the economy of tomorrow.

Box 30 **Creating sustainable job opportunities for Indigenous Peoples**

Two very different partnerships between governments and Indigenous Peoples illustrate the emerging range of opportunity for Indigenous People in the new clean economy:

- In the Maritimes, the federal Atlantic Commercial Fisheries Diversification Initiative has been working with dozens of First Nations communities to diversify their commercial fishing enterprises—helping a Mi'kmaq First Nation in New Brunswick, for example, to move away from an increasingly unsustainable wild fishery by developing an oyster farm.
- Meanwhile, in Alberta's oil patch, the government organization Alberta Innovates has established the Aboriginal Environmental Services Network to coordinate efforts to recruit skilled workers from First Nations to provide a range of environmental fieldwork, from monitoring and data collection, and water and soil sampling to reclamation and wildlife management.

Sources: Indigenous and Northern Affairs Canada (2015); Alberta Innovates (2015).

ACTION NO. 5 Conserve and value nature

Conservation in the 21st century means more than just preserving pristine landscapes. It also includes new strategies, such as incentive payments to landowners for conserving wetlands or wildlife habitat, incorporating Aboriginal rights and traditions into land and water management, and fostering partnerships between rural communities, Indigenous Peoples, NGOs, scientists, governments, and industries. Canada's expansive, diverse natural bounty is our greatest national asset. Protecting and stewarding the natural spaces and species that sustain our economy, health, and quality of life is an implicit part of every smart prosperity action.

Canadians simply must be second to none in accomplishing this task, because we are responsible for such a significant proportion of the world's natural capital assets—among them the third-largest supply of fresh water, the second-largest landmass, the largest remaining area of intact forest, and the longest coastline.[76,77,78] Conserving and valuing nature is in our DNA.

Around the world, nations are coming to treat measuring and valuing natural capital as a necessary part of current economic decision-making. From leading European jurisdictions like Germany and the UK to China and Australia, natural capital is being added to national economic accounting. Statistics Canada is recognized as among the most advanced, and in 2013, it estimated the value of Canada's marketable natural-resource assets alone—resources like energy, minerals, and timber—at about $750 billion.[79,80]

This asset tally is impressive, but of course it's just one facet of the enormous total value nature provides to Canadians, from ecosystem services like flood mitigation and carbon absorption to biodiversity, recreation, and aesthetics. Calculating the value of a healthy natural environment, and the many ecological goods and services it provides, isn't easy, but we are getting better at it. Ontario's Greenbelt, for example, produces an estimated $2.6 billion annually in critical ecosystem services such as water filtration and pollination, and the natural capital value of the B.C. Lower Mainland, thanks in large part to its Agricultural Land Reserve, is estimated at $5.4 billion per year.[81,82] And roughly 89% of Canadians participate in outdoor activities in nature, spending about $41 billion every year—another measure of natural capital's inherent value.[83]

Further investment and innovation will be critical to conserving and restoring the inherent economic value of nature. Canadian governments, private enterprise, and landowners are working together to add innovative market-oriented approaches to the conservation tool kit. For example, Canada was instrumental in founding the Forest Stewardship Council, an international sustainable forestry organization, and our forestry sector has been a world leader in achieving certification under that banner.[84] In Saskatchewan, Ducks Unlimited has spearheaded an innovative "reverse auction" to pay landowners for restoring wetlands in their fields and pastures, with a goal of restoring 56,000 hectares of wetlands over 20 years.[85]

Under the Ontario endangered species offsets program, private landholders can be paid to conserve habitat for threatened plants and animals.[86] In Manitoba, the provincial government is seeking to prevent soil erosion and improve water quality by offering a riparian tax credit to farmers who agree to improve the management of lakeshores, riverbanks, and stream banks on their properties.[87] By deepening and expanding these policies and joint initiatives, Canada can ensure our natural environment and resource-dependent sectors are sustainable for generations to come, and in doing so, build skills that are of growing global economic value.

These financial tools can be powerful, but conservation remains the foundation of stewardship—and Canadian governments are making significant strides there as well. Parks and protected areas now cover 10% of Canada's land, twice the amount just two decades ago (though we still rank in the middle of the pack globally).[88,89,90] Less than 2% of our country's ocean territory is protected today, but the federal government has committed to ramping this up to 10% by 2020, a target supported by the UN Convention on Biological Diversity, recognizing that marine habitats sustain a globally critical food supply as well as industries from fisheries to tourism.[91,92] Achieving these and other science-driven conservation goals will yield enormous dividends to both our economy and quality of life, today and for generations to come.

Box 31 **A sustainable fishing renaissance in Newfoundland**

From its founding in the early 1600s, Cupids, Newfoundland—the second English settlement in North America—was dependent on the abundant cod caught in nearby waters. The cod fishery's collapse in the early 1990s was devastating for the small village, as the workforce at the local fish-processing plant plummeted from 80 people to just six.

As cod populations begin to recover, the community is determined to do things right this time. They are looking to the new partnership between WWF-Canada and the Fish, Food and Allied Workers Union as a way to build a new model for a sustainable cod fishery. The Fisheries Improvement Projects are multi-step, multi-stakeholder initiatives aiming to improve fishing practices and management to help the northern cod fishery rebuild and meet or exceed the Marine Stewardship Council (MSC) certification for sustainable fisheries. The 3Ps cod fishery off southern Newfoundland—a partnership between Icewater Seafoods and WWF-Canada —is now in the final stages of assessment for MSC certification. Newfoundland and Labrador's Department of Fisheries and Aquaculture, and Fisheries and Oceans Canada are key supporters of the project, and funding was drawn from multiple stakeholders, including Loblaw and High Liner.

Source: WWF-Canada (2015).

Box 32 **Tembec leads the way on sustainable forest management**

In 2001, Tembec became the first large public forest products company in Canada to commit to seek sustainability certification for all its forest management operations under the internationally recognized Forest Stewardship Council (FSC) standards. Tembec was chosen by the FSC as the recipient of the 2007 Winds of Change Award, recognizing its leadership role in safeguarding Canadian forests. By 2008, Tembec certified that 100% of the public forestlands under its control were sustainably managed.

Source: Tembec (2016).

Each of these five actions—innovation, eco-efficiency, infrastructure, incentives, and conservation—is very important in its own right. But these actions will be much more effective if carried out in a coordinated way, as part of an overall strategy, so they can be mutually reinforcing. The whole is greater than the sum of its parts. And given that responsibility for those various parts rests with different actors, it is critically important that a national strategy be done in a way that engages all the key players, so federal and provincial governments, cities, and Indigenous Peoples, businesses, and community groups are all pulling in the same direction toward a common goal.

That isn't easy to do. But it is possible—we've done it before and rallied together when faced with big national challenges. And the current situation calls for nothing less if we want to keep pace with the world's leading nations as they retool to meet the environmental challenges and economic opportunities of a changing world.

"In a decade, we could see Canada among the world leaders in an innovative economy that puts people first and builds inclusive communities that respect nature and live in harmony with nature."

—David Miller, Smart Prosperity leader; President and CEO, WWF-Canada; former Mayor, City of Toronto

THE SMART PROSPERITY INITIATIVE: OUR ROLE

These five actions are the key to unleashing the eco-ingenuity and enterprise needed to build a stronger, cleaner economic future for Canada. The Smart Prosperity initiative and its leaders will work with governments, businesses, and communities to help inform and accelerate efforts to implement these critical actions.

In particular, we will carry out leading-edge research, drawing on the best examples and smartest minds from across Canada and the world. This research will inform a series of reports: some will explore what is needed in each of the five key action areas; others will take a deep dive into clean-growth opportunities in different sectors, provinces, or cities.

We will bring together people from different sectors and regions across the country, along with top experts, to explore options and generate ideas for better approaches. We will help to spark a broader dialogue among Canadians—in person and online—about the opportunities and challenges ahead, and how we can act to build a smarter, more prosperous future.

Smart Prosperity's leaders will play a key role. They will work within their circles and across Canada to promote the need for effective, timely actions—ones that can catalyze clean innovation and bolster better growth, and generate next-generation jobs while conserving our priceless natural heritage. Most of all, they will lead by example, in their own lives and organizations, to show that it is possible to build better businesses and better communities, while at the same time lightening our toll on the planet.

In everything we do, the Smart Prosperity initiative and its leaders will generate new ideas and propose practical solutions for better policies and practices that can drive both environmental and economic progress across all parts of Canada.

We've Already Begun

This is the challenge of our time. Canadians are ready. Now let's get going.

SECTION 4:
How Smart Prosperity Embraces Canadian Values

HOW SMART PROSPERITY EMBRACES CANADIAN VALUES

Technological innovations and policy initiatives are vital to building smart prosperity, but how we work together to get there matters just as much. These are the values that will guide Canada's transition. If they sound familiar, that's because they have always been with us.

SMART PROSPERITY IS INCLUSIVE

Benefit all parts of society, particularly Indigenous Peoples and vulnerable groups.

To be successful and sustainable, smart prosperity must engage and benefit all of Canadian society. It must be fair, open, and egalitarian, which will require targeted efforts to identify and manage potential positive and negative impacts on vulnerable Canadians.

We can create a cleaner environment in ways that help lower-income families. Carbon pricing can be accompanied by investments in better public transit and energy retrofits for affordable housing to put low-carbon options within the reach of all budgets. Targeted tax breaks can ease the burden for those most vulnerable to higher energy costs. Training programs designed to develop the skills needed in the new economy will also enhance inclusiveness—and any workers displaced by this shift must have opportunities to retrain, providing a just transition to new work.

Indigenous Peoples, in particular, must benefit from this changing economy. Realizing this potential will require the active participation of affected communities. This means the 600-plus natural resource projects planned across Canada must follow best practices to collaborate, engage, and consult with potentially affected Indigenous communities, while providing partnerships, jobs, and lasting benefits, and drawing on traditional knowledge to ensure they are done sustainably. Moreover, the unique technologies and innovations needed for northern and Indigenous communities to adapt to climate change can put Canada at the forefront of addressing this need worldwide. For example, the long-standing housing shortfalls in Indigenous communities can best be met through affordable, energy-efficient homes using sustainable new designs that can create export opportunities.

Box 33 Embracing eco-innovation at Canada's largest retailer

Loblaw Companies—Canada's largest retailer and its biggest private employer—has made respecting the environment one of the core principles of its business. The grocery giant now continually invests in and tests new ways to bring sustainability to its operations and products. It has reduced packaging and the use of plastic bags, increased the energy efficiency of its lighting and vehicle fleet, and created the first national recycling program for gardeners, taking back old plastic pots and flats. As part of its growing menu of environmentally friendly products, Loblaw is now a leader in promoting sustainably harvested seafood, with 138 products now on its shelves certified by the Aquatic or Marine Stewardship Councils.

Source: Loblaw (2014).

Box 34 Landmark sustainable forestry agreement

The Canadian Boreal Forest Agreement, signed in 2010, is an unprecedented industrial–environmental collaboration. It brings together 19 forest products companies and seven leading environmental organizations, allowing them to shift their efforts from fighting each other to finding joint solutions.

In the new approach, companies and environmental groups work together to find ways to build both a more competitive forest industry and a better-protected, more sustainably managed boreal forest. The environmental groups committed to stop boycotting the forestry companies. In return, the companies suspended logging operations on almost 29 million hectares of boreal forest. They then worked together on programs such as developing action plans for the recovery of woodland caribou.

Source: Canadian Boreal Forest Agreement (2015).

Box 35 Premiers come together for cleaner energy

In July 2015, Canada's provincial premiers and territorial leaders worked together to forge a national energy strategy, enabling collaboration on common energy-related interests and developing energy in an environmentally and socially responsible manner. The premiers set clear goals and specified actions in everything from conservation to energy delivery. They agreed to work together to promote energy efficiency and conservation; transition to a lower-carbon economy; enhance energy information and awareness; accelerate the development of energy research and technologies; facilitate the deployment of cleaner energy sources; and build and enhance modern, reliable, and environmentally safe and efficient energy transmission networks.

Source: Canada's Premiers (2015).

SMART PROSPERITY IS INNOVATIVE

Embrace new ideas, and try new approaches.

Innovation is at the very core of smart prosperity—a transition necessitated by the end of business as usual will need everything but business-as-usual thinking to guide it. This is not just about technological breakthroughs: The transition will be driven by new ideas, new processes, new connections, and new approaches.

Consider the idea of "intrapreneurship," where employees within an established firm are encouraged to think like entrepreneurs—embracing flexibility, innovation, and risk-taking. Such strategies are critical to developing smart prosperity solutions, and we similarly need to encourage ecopreneurship—finding bold, flexible new approaches to achieving economic successes while reducing environmental impacts.

SMART PROSPERITY IS COLLABORATIVE

Break down silos, seek integrated solutions, share responsibility, and build trust across a wide range of interests.

Given the scale and complexity of the challenges we face and the urgency of solving them, smart prosperity requires different actors from different parts of Canadian society to work together to build integrated solutions. For example, moving to cleaner energy systems will mean changing how we produce power, how we distribute and store it, and how we use and conserve it—meaning companies (both existing and new), all levels of government, workers, and consumers all need to be part of the change. Doing this means breaking down long-standing divisions, and building new bridges of trust and shared responsibility that span across different interests.

The Smart Prosperity roadmap itself—bringing together a diverse group of Canadian leaders from business, environmental, Indigenous, youth, and labour organizations—has been conceived from day one as exactly the type of collaborative effort needed.

But that's just a start. If we want to position Canada to succeed in a changing world, and meet its environmental challenges and economic opportunities, we will need to work together, across different regions, sectors, generations, and levels of government—as Canadians have done before when facing other big changes.

SMART PROSPERITY IS EVIDENCE-BASED

Employ sound research and analysis, learn from real-world examples, share information and evidence transparently and broadly.

Collaboration, innovation, and inclusivity are all built on trust, and that trust will emerge from decisions made using the best available evidence, shared openly and transparently. The most credible and up-to-date science, data, and economic analysis will not only ensure smart decisions, it will enable every contributor to the smart prosperity transition to fully understand how decisions were reached, what they are intended to do, and what they mean for the daily lives of all Canadians. Communicating this information in a readily understandable way will be crucial, so everyone involved in the discussion is working from the same basic facts.

Evidence-based decision-making will involve identifying Canada's strengths and comparative advantages, and properly assessing our performance relative to our peers. Economic and business analyses are important to this process,

Box 36 Innovative collaboration aims to build a cleaner future for Canada's oil sands

Canada's oil sands industry was built on innovation; a public–private research collaboration developed the technologies to unlock the hard-to-access oil over several decades. However, oil sands operations have come under increasing fire, both locally and globally, for having a too-heavy environmental footprint. While producers have made significant strides in reducing water use and greenhouse gas emissions per barrel, the nature and size of the oil deposit create real environmental challenges.

Canada's Oil Sands Innovation Alliance (COSIA) was established in 2012 to try to better meet those challenges. COSIA brings together 13 major oil companies and 30 associate members; it aims to capture, develop, and share the most innovative approaches for improving environmental performance. To date, COSIA member companies have shared 814 technologies and innovations worth nearly $1.3 billion. And COSIA recently partnered with the XPrize Foundation to offer a US$20 million prize to innovation teams that are able to capture and convert CO_2 into products, such as advanced cement or liquid fuels.

COSIA member companies have committed to achieve a level of environmental impact (per barrel) that is better than that of other world sources of oil. Meeting this ambitious goal will not be easy; there is a long way to go. But even some of its harshest critics are giving the industry credit for the expanded effort it is making to improve environmental performance by accelerating clean innovation.

Postscript: On November 22, 2015, the CEOs of four major oil sands companies and the leaders of four of Canada's main environmental groups stood together on the stage with Alberta Premier Rachel Notley as she announced new climate rules that include a globally significant carbon tax and a cap on greenhouse gas emissions from Alberta's oil sands—the only major oil producer in the world to do so.

Source: COSIA (2016); Government of Alberta (2015).

but sound science, informed by the best available evidence, has to be the final arbiter. Smart win-win solutions only emerge from objective analysis of the evidence and its import for alternative policies and business strategies, as well as from careful consideration of the potential impacts on vulnerable businesses and individuals. All this relies on accurate data and transparent communication.

SMART PROSPERITY IS FUTURE-ORIENTED

Start with the future—the Canada we want in 10 to 15 years—as the beacon to guide proposed changes.

Canadians agree in large measure about what they want their future to look like. They want a better future built on a stronger, cleaner economy—a stable and prosperous economic order that provides a better quality of life and growing opportunity for all parts of society, while taking a much less damaging toll on our environment.

Given the need to move quickly in building next-generation Canadian cities, infrastructure, and businesses to keep pace with a changing world, disputes over immediate consequences and short-term impacts can be difficult to resolve. Divisions can deepen and opposing positions become entrenched. These barriers often stem from a mismatch of timing and incentives, a perspective that considers each change as an end in itself rather than a means to propel us toward a shared vision. Individuals and companies, for example, may need to make significant investments now in innovation and efficiency, even though the benefits of fuel savings or new technologies and processes may only be realized years ahead.

This is why Smart Prosperity's future-oriented approach is so crucial. Achieving our goals requires us to take a longer-term societal view, keeping a fixed eye on the Canada we want to build a generation from now, guided by a policy framework that corrects market failures and provides incentives for actions that improve the quality of life of Canadians, both today and for tomorrow. With a vision of Canada worth working together to achieve, we can be clear about where we want to go every step of the way and overcome the divisions that can slow this transition.

These are ambitious goals, driven by bold actions. We need a clear vision of a better future, grounded in solid Canadian values, to achieve them.

THE SMART PROSPERITY PATH: NEXT STEPS

A better Canada is possible. A place where the things that matter most to us have been not just sustained but enhanced, even as we use fewer resources and create less mess. A more prosperous and more competitive Canada, driven by a cleaner and more efficient engine, among the leading pack of the new global economy, boasting a Made in Canada brand renowned for environmental performance and clean innovation.

Smart Prosperity's goals include more vibrant cities and communities, where innovative businesses create forward-looking work, enabled by governance that makes the smart, green choices more affordable for industry and individuals alike, creating a sustainable, enviable quality of life for every Canadian.

The journey that leads us to these goals begins with significantly accelerated clean innovation and technology development in every sector of the Canadian economy, accompanied by a big boost to energy and resource efficiency built on major new investments in advanced infrastructure and skills. It requires pricing pollution and waste to incentivize clean choices, as well as enhancing our efforts to conserve and value nature.

This roadmap sets Canada on the right path, aided by a diverse group of leaders from across Canada who have come together to help make it a reality. But this is only a first step, and the route ahead is far from fixed. The Smart Prosperity team will continue to broaden and deepen our research and analysis, develop better indicators of success, undertake deep dives in specific sectors, explore the five key action areas more completely, convene conversations, gather success stories, and promote specific solutions. And we will lead by example, in our own lives and organizations, by showing practical ways to improve both the environmental and economic bottom line—as more and more Canadians are already doing.

In communities and businesses across the country, this change is already underway. Now we need to ramp it up, building on these existing efforts. We will bring people together to explore new ideas and new solutions, both online and in person—working toward a Smart Prosperity summit next year. We need to hear more success stories, develop better strategies, explore all the options, and harness the many resources available across the country to forge a stronger, cleaner economy that builds a better future for all Canadians.

This is the challenge of our time. Canadians are ready. We've already begun the change. Now let's get going.

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Boxes and Charts

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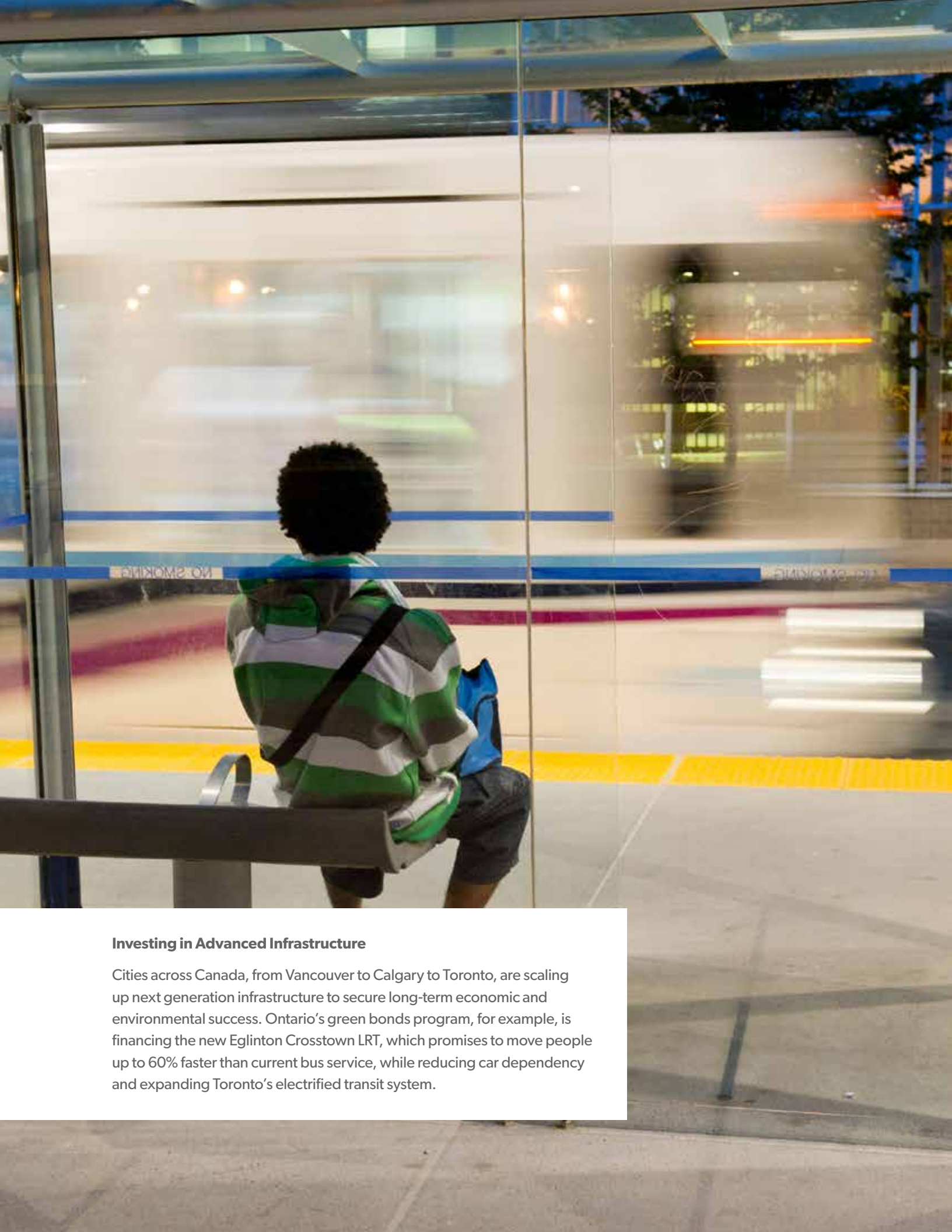
Acknowledgements

We would like to acknowledge the support and contributions of Stewart Elgie, Chris Turner, Bruce Anderson and the Smart Prosperity Secretariat staff: Erika Aruja, Melanie Coulson, Johanna Leffler, Mac Radburn, Rachel Samson, Jessie Sitnick, William Scott, Jenn Wesanko, Mike Wilson, and Tony Young.



Investing in Advanced Infrastructure

Cities across Canada, from Vancouver to Calgary to Toronto, are scaling up next generation infrastructure to secure long-term economic and environmental success. Ontario's green bonds program, for example, is financing the new Eglinton Crosstown LRT, which promises to move people up to 60% faster than current bus service, while reducing car dependency and expanding Toronto's electrified transit system.

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