

The \$2 Billion Question

How can Ontario reinvest Cap-and-Trade Proceeds to meet its Climate Challenge and Grow the Economy?

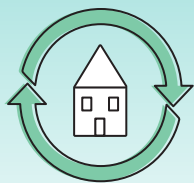


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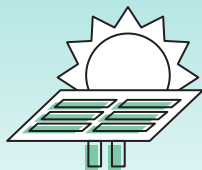
INTRODUCTION

In April, Ontario announced it will put a price on carbon pollution by implementing a cap-and-trade system.¹ The system, which is part of Ontario's climate strategy, requires polluters to purchase permits to emit carbon pollution. The auction of those permits is expected to raise about \$2 billion annually by 2020.² Ontario has committed to reinvest the proceeds from the cap-and-trade system into other initiatives that will reduce carbon pollution.³

This report answers the question, what can that \$2 billion do? And the short answer is, a lot. For example, \$2 billion dollars could:



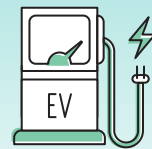
Pay for **rooftop solar systems** on 80,000 Ontario homes



Incentivize **energy retrofits** on nearly 1/3 of all of the homes in the province



Pay for **new transit projects**, like LRT lines in Mississauga, Ottawa, or Waterloo



Build **25,000 public electric vehicle fast charging stations** across the province

The examples offered in this report are not meant to be prescriptions for how Ontario should spend the proceeds. Rather, they are meant to illustrate the scale of the impact the cap-and-trade revenues could have when reinvested in initiatives that can reduce emissions. And given that the system is expected to generate **\$2 billion each year**, it's clear that the impact would be quite significant.

In determining how to actually allocate the proceeds from cap-and-trade, Ontario needs to develop clear criteria to guide decision-making and establish a clear and transparent mechanism that delivers the best value to Ontarians.

Experience from other jurisdictions shows us that when carbon pricing revenue is reinvested into cost-effective emissions reductions, pollution reduction costs remain low. Moreover, **other jurisdictions that have reinvested cap-and-trade proceeds in carbon reduction strategies, such as renewable**

energy, public transit, energy efficiency and conservation, and low-carbon vehicles, have seen positive economic impacts, including above-average economic growth and job creation. They have also seen GHG emissions growth decoupled from economic growth – their economies have grown while emissions have shrunk.

The cap-and-trade system will be an important part of Ontario's climate strategy. However, it alone will not be enough for Ontario to meet its carbon reduction target. Other complementary policies will also be needed.⁴

Thankfully, from installing solar power on people's houses, to driving efficiency through the building sector, to spurring electric vehicle sales and paying for much needed public transit, \$2 billion can go a long way toward solving Ontario's climate challenge while generating jobs and business opportunities.

CAP-AND-TRADE 101

Through the cap-and-trade system, Ontario will set limits on the amount of global warming emissions that industries are allowed to emit (the "cap"). Businesses in Ontario will be required to obtain permits for each megatonne (MT) of emissions they will release and will face penalties for emissions above this level. Companies that have reduced their emissions will need to buy fewer pollution permits, saving money. They may also choose to sell their permits to polluting companies that need them (the "trade"). Each year, the cap comes down, making fewer permits available in the system, increasing the price of pollution and meaning less carbon pollution is allowed in the province. In Ontario, most of the emission permits are expected to be auctioned as they have been in Quebec and California (Ontario's climate partners). The auctions will generate proceeds estimated at \$2 billion per year. A well designed cap-and-trade system⁵ will help Ontario reach its carbon reduction targets and send a clear price signal that rewards innovation, provides certainty for industry, and creates employment and business opportunities in the clean economy.

ONTARIO'S CLIMATE CHALLENGE AND STRATEGY

Ontario has pledged to reduce GHGs by 15 per cent below 1990 levels by 2020 and by 37 per cent below 1990 levels by 2030. **To meet these targets, Ontario will need to take a comprehensive approach. Cap-and-trade will be a key policy, but it alone won't put Ontario on track to meet its targets. Cap-and-trade can double its impact when the proceeds from the system are reinvested in initiatives that further reduce emissions.**

In California, just 16 per cent of emissions reductions are projected to come from cap-and-trade directly.⁶

The rest will come from a combination of public transportation growth, electric vehicle uptake, low-carbon fuel standards, energy efficiency upgrades, and expansion of renewable energy.⁷

In Quebec, the emission cap is set to decline by nearly four per cent annually, but much of the emissions reductions are expected to come from expanding public transit, supporting energy efficiency and conservation upgrades for Quebec

businesses, buildings and residents, investments in renewable energy, and municipal and community initiatives to reduce GHG emissions.⁸ And Alberta, in addition to its consideration of adopting a price on carbon, is studying a comprehensive suite of options that looks at phasing out coal-fired electricity and supporting energy efficiency and public transit.⁹

To maximize the impact of their cap-and-trade systems, both California and Quebec have committed to allocate cap-and-trade revenue to projects that reduce emissions. California requires proceeds from allowance auctions to be deposited into the Greenhouse Gas Reduction Fund and reinvested to reduce climate pollution and benefit the economies, health and environment of the state's communities.¹⁰ In Quebec, pursuant to the province's *Environmental Quality Act*, cap-and-trade proceeds are transferred to the Green Fund and are used to fund the province's Climate Change Action Plan, which include the mitigation, adaptation and sustainable development measures described above.

CARBON PRICING AND COMPLEMENTARY POLICIES

There's been a lot of talk about carbon pricing, but how high would that price need to be to meet necessary climate targets? Economists estimate that a carbon price would need to be over \$100 per tonne, or perhaps in excess of \$200 per tonne, to meet realistic climate targets in Canada.¹¹ That high a price on carbon just isn't being considered in Canada right now. In the last Quebec-California cap-and-trade auction, the price of carbon rose to just CA\$16.10 per tonne.¹² In the American northeast's Regional Greenhouse Gas Initiative (RGGI), the price is US\$6.02 per ton.¹³ At CA\$30 per tonne, British Columbia has the highest carbon price in North America.¹⁴ When the price on carbon is too low on its own to drive sufficient emissions reductions, using its proceeds to support complementary policies is necessary. The higher the price, the stronger the impact, but the question is: how high a price is realistic in Ontario in the short term? Given that it's unlikely Ontario will have a carbon price high enough to put us on track to meet the province's carbon reduction targets, complementary actions are critical.

Like Quebec and California, the province of Ontario has promised to reinvest cap-and-trade proceeds into projects that reduce emissions.¹⁵ Ontario's legislation, the 2009 Environmental Protection Amendment Act (Greenhouse Gas Emissions Trading), outlines the types of projects eligible to be funded by the cap-and-trade proceeds.¹⁶ If dedicated

to new, unfunded emissions reduction projects and managed well, these investments can also deliver strong co-benefits and create jobs and business opportunities. Reinvesting the proceeds into projects that deliver a direct benefit to Ontarians also helps generate and sustain public support for cap-and-trade programs.

HOW MUCH MONEY WILL BE RAISED BY CAP-AND-TRADE IN ONTARIO?

THE MATH



Ontario's emissions (2014)	171 MT
Estimated coverage of the cap-and-trade system (at 85 %)	145 MT
Most recent permit price at auction	\$16/tonne
Total proceeds (if all permits auctioned)	\$2.3 Billion

Ontario's cap-and-trade system is expected to cover similar economic sectors and emissions as those in Quebec and California, each of which cover about 85 per cent of emissions in their jurisdictions.¹⁷ In 2014, Ontario's emissions were 171 megatonnes (MT) per year.¹⁸ At the most recent auction, permits in the linked California-Quebec Western Climate Initiative carbon market fetched just over CA\$16 per tonne,¹⁹ meaning that if Ontario auctioned all the permits in its cap-and-trade program at today's price, it would raise approximately \$2.3 billion each

year. If a portion of those permits are given away freely to address concerns around competitiveness and leakage, the system will raise slightly less than that. But given that any relief given to companies to address competitiveness concerns is expected to be temporary, and that permit prices will rise in the years to come, for the purposes of this report we estimated the program will raise about \$2 billion each year by 2020, consistent with the findings of a recent EnviroEconomics study.²⁰

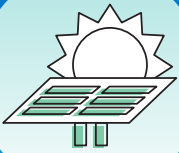
FOR THIS REPORT WE CRUNCHED THE NUMBERS TO ANSWER THE QUESTION, WHAT CAN \$2 BILLION DO WHEN REINVESTED IN EFFORTS TO REDUCE CARBON POLLUTION?

The examples used in this report are not intended to be taken as recommendations for how the proceeds should be spent. This report is not suggesting that Ontario should invest the entirety of cap-and-trade revenues on a single initiative in just one sector of the economy. Nor is it suggesting that Ontario should directly pay for thousands of solar panels or retrofits. The figures serve to illustrate that investing \$2 billion per year into complementary actions can stimulate significant direct and indirect environmental, economic and social benefits.

Re-investing cap-and-trade proceeds in complementary actions to reduce emissions is a win-win-win for Ontario. And when it comes to making decisions as to how exactly to reinvest the revenues for maximum impact, it's important to ensure that the proceeds are allocated to programs, projects and initiatives that further reduce GHG emissions in a clear, transparent and rigorous manner. Initiatives that receive cap-and-trade proceeds should be new and not yet funded, and demonstrably have a positive environmental, economic and social impact. And Ontario should report, on a regular basis, on the projects and impacts funded thanks to cap-and-trade.

WHAT CAN ONTARIO DO WITH \$2 BILLION IN ANNUAL CAP-AND-TRADE PROCEEDS?

Assuming that the system raises \$2 billion per year, here are some examples of what \$2 billion can do when re-invested in initiatives that further reduce global warming emissions and create economic opportunities.



INSTALL ROOFTOP SOLAR SYSTEMS ON 80,000 ONTARIO HOMES PER YEAR



The price of solar power has fallen dramatically over the past several years. Solar-module prices dropped nearly 75 per cent in the last five years alone.²¹ Solar is already competitive with natural gas and coal in some jurisdictions, and it's just a matter of time before solar reaches parity in Ontario too.²²

The Canadian Solar Industries Association estimates that the cost of an average rooftop solar system in Ontario is now \$25,000 to \$30,000, depending on installation and connection costs and the value of the Canadian dollar.²³

Assuming a cost of \$25,000 per residential solar unit, \$2 billion in cap-and-trade proceeds could install solar systems on 80,000 homes.

Solar power has numerous benefits for individual Ontarians and the provincial economy. A recent analysis shows that, by 2025, Ontario homeowners will be able to generate and store enough solar power to supply their own electricity around the clock, reducing homeowners' electricity bills.²⁴ On the economic side, Ontario's solar industry is already a significant employer and the province is home to the third largest solar manufacturer in the world.²⁵ Globally, solar and wind combined are projected to add more electricity production than either coal or gas in the next 20 years.²⁶ This growth is a huge export opportunity for Ontario's solar manufacturing sector.

Ontario is home to the third largest solar manufacturer in the world.



ENERGY RETROFITS ON NEARLY 1/3 OF ALL ONTARIO HOUSEHOLDS IN A YEAR

Conserving energy is the easiest and most cost-effective way to cut carbon pollution. Not only does energy conservation benefit and protect the environment, it also improves economic productivity by reducing waste, increasing efficiency, and creating jobs. **Economic modelling has shown that cutting electricity and natural gas use through conservation by 25 per cent in Ontario between 2015 and 2025 could create more than 25,000 net new jobs in the province, cut GHG emissions by nine per cent, and increase Ontario's GDP by \$3.7 billion.**²⁷

Buildings are the third largest contributor to Ontario's carbon emissions. One way to reduce those emissions is by retrofitting existing homes. This could include adding better insulation, improving heating and cooling systems, purchasing high-efficiency appliances, installing new windows, plugging air leaks, or

installing low-flow water appliances. Previous federal and provincial grants and programs, such as Natural Resources Canada's ecoENERGY Retrofit program (ended in 2012)²⁸ and Ontario's Home Energy Savings Program (ended in 2011), helped homeowners make their homes more energy-efficient, saving them money. Cap-and-trade proceeds could be used to re-launch these popular energy retrofit programs, creating jobs, saving consumers money on their electricity bills, and reducing GHG emissions.

If one assumes a provincial contribution of roughly \$1,300 – the average amount homeowners accessed under the previous provincial program²⁹—\$2 billion could incentivize energy retrofits in 1,543,210 Ontario homes every year, nearly one-third of all homes in the province.³⁰



PAY FOR ENTIRE LIGHT RAIL TRANSIT PROJECTS IN ONTARIO



Ontario has embarked on a long-term plan to expand public transportation infrastructure, dedicating \$31.5 billion over 10 years for public transit projects across the province.³¹ Investing in public transit reduces congestion, creates thousands of jobs, encourages more compact growth, discourages sprawl, and reduces GHG emissions by taking cars off the road. Cap-and-trade proceeds can help pay for new transit projects that are currently unfunded.

If the objective is to reduce emissions from the business as usual case, the cap-and-trade revenues must be invested in new projects, but to get a sense of what \$2 billion can do, the following chart shows examples of what the cap-and-trade proceeds could accomplish if invested in public transit to get more people to their schools, jobs and homes quicker.

LRT PROJECTS THAT \$2 BILLION COULD COVER THE COSTS OF:

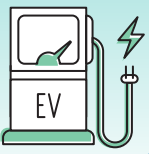
The capital costs of the Mississauga LRT, with \$400 million left to spare.³²

The cost of the Hamilton LRT *and* the provincial share of capital costs for the Waterloo Region LRT, with \$300 million left to spare.^{33, 34}

The cost of the entire contract to design, build, finance, operate and maintain the Waterloo Region LRT for 30 years, with \$100 million left to spare.³⁵

Nearly all of Phase 1 (downtown portion) of Ottawa's new, mostly underground Confederation LRT line.³⁶

The planned expansion of GO Transit's Regional Express Rail within 7 years.³⁷



BUILD 25,000 PUBLIC ELECTRIC VEHICLE FAST CHARGING STATIONS ACROSS THE PROVINCE PER YEAR



The largest source of GHG emissions in Ontario comes from the transportation sector.³⁸ With many Ontarians dependent on trips by car rather than public transit, increased purchase and use of electric vehicles (EVs) can help drive down transportation sector emissions. By one estimate, use of EVs could lead to a 70 per cent reduction in well-to-wheels GHG emissions over the lifecycle of a car relative to conventional gasoline vehicles.³⁹

One of the hurdles that stand in the way of greater EV adoption is a lack of public charging locations.⁴⁰ **With \$2 billion, Ontario could build 25,000 electric vehicle fast-charge stations across the province.⁴¹ If distributed across Ontario, based on population, that would mean 4,880 EV charging stations in Toronto, 1,810 in Ottawa, and 956 in Hamilton.**

In the gridlocked Greater Toronto and Hamilton Area, Ontario could build over 12,000 EV charging stations.⁴²

Building EV charging infrastructure and growing the market share of EVs would bring economic benefits to the province. Increased demand for EVs could also stimulate the EV industry in Ontario and create an opportunity to grow Ontario's manufacturing sector, which still has a sizeable automotive component.

In a scenario where 10 per cent of Ontario vehicles are electric in 2025, the EV industry could create 34,334 additional full-time jobs.

EVs sit at the crossroads of both clean energy and innovative automotive technology, both of which have been identified as crucial to Ontario's

economic future. **In a scenario where 10 per cent of Ontario vehicles are electric in 2025, the EV industry could create 34,334 additional full-time jobs.**⁴³ EVs could also become part of a smart grid, acting as a cost-saving energy solution that stores surplus baseload energy (charging) during times of low demand and sells energy back into the grid during peak periods, thereby helping to optimize

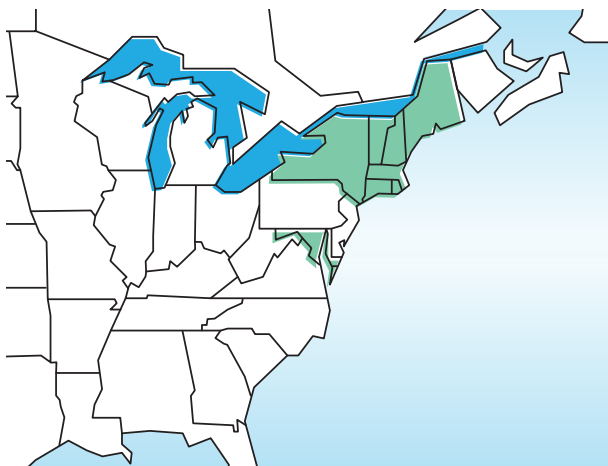
electricity use.⁴⁴ And individually, **by switching from a gasoline vehicle to an EV, the average Ontarian could save approximately \$1,400 per year on fuel costs**—money that can be redirected to other financial needs.⁴⁵ Car owners could also benefit from the significantly lower maintenance costs of EVs, due to their simplicity relative to internal combustion engines.⁴⁶

POSITIVE ECONOMIC IMPACTS OF CAP-AND-TRADE PROCEEDS IN OTHER JURISDICTIONS

Reinvesting revenues into initiatives that reduce pollution won't only reduce emissions more quickly; it will also stimulate the economy.

The Regional Greenhouse Gas Initiative (RGGI) is a cap-and-trade system that regulates fossil fuel-powered electric generating plants with a capacity of 25 megawatts or more in several U.S. states: Connecticut, Delaware, Maine, Maryland, Massachusetts, New Hampshire, New York, Rhode Island, and Vermont.

REGIONAL GREENHOUSE GAS INITIATIVE (RGGI)



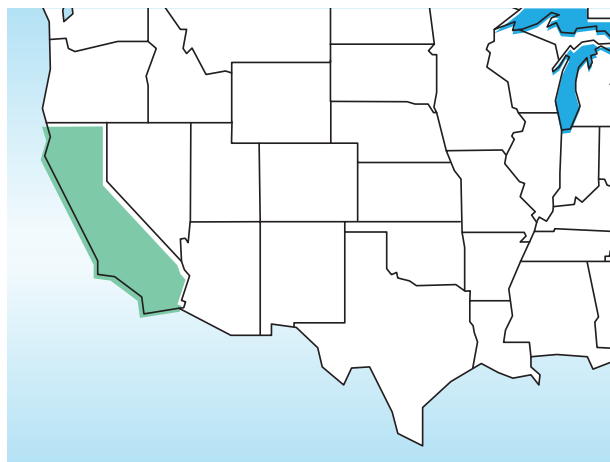
Under the RGGI, regional GHG emissions declined faster than expected—18 per cent between 2009 and 2014.⁴⁷ Emissions reductions were so dramatic that a 2012 review of RGGI reset the cap from 165 million tons to 91 million tons as of 2014. Even after the review, emissions in 2013 were 4.9 per cent lower than the new, more stringent cap.⁴⁸ And 2014 saw even greater emissions reductions, at 5.2 per cent per cent below the cap.⁴⁹ By one estimate, RGGI accounts for about half of the region's emissions reductions since 2009, far greater than those achieved in the rest of the United States.⁵⁰

Under the RGGI cap-and-trade system, 100 per cent of emissions allowances are auctioned. The auctions raised \$1.9 billion between 2009 and 2014. **Proceeds are primarily recycled into energy efficiency, renewable energy, research and development for GHG reduction technologies, and direct consumer energy bill assistance. Investments in energy efficiency from RGGI revenue created over \$2.6 billion in economic gains** and generated 28,500 job-years of direct and indirect employment in the first six years of operation.⁵¹

Emissions in the region dropped 2.7 times faster than the rest of the country since RGGI was established, even as RGGI states' economies grew 2.5 times faster than other states.

Contrary to expectations, electricity prices dropped by an average of 2 per cent across RGGI states between 2008 and 2014, while prices in non-RGGI states increased by 13 per cent during the same period.⁵² **The decline in emissions and other hazardous pollutants from RGGI programs led to nearly \$11 billion in health savings** (avoided illness, hospital visits, lost work days) between 2009 and 2014.⁵³ Perhaps most importantly, RGGI states de-coupled emissions growth from economic growth. **Emissions in the region dropped 2.7 times faster than the rest of the country since RGGI was established, even as RGGI states' economies grew 2.5 times faster than other states.**⁵⁴

CALIFORNIA



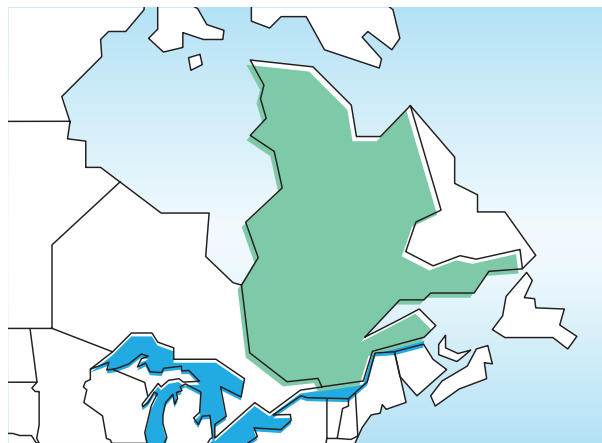
California's cap-and-trade program covers emissions from industry, buildings, electricity and transportation, covering about 85 per cent of the state's emissions. **Companies covered under the program reduced their emissions by 3.8 per cent between 2012 and 2013, while California's economy as a whole produced 6.6 per cent less GHG pollution for every dollar of GDP in 2013 as compared to 2009.**⁵⁵

Over the first two years of the program, \$2.65 billion was collected through the sale of allowances in quarterly auctions. California's 2014-15 budget allocated the first \$902 million of cap-and-trade proceeds for public transit, sustainable communities, affordable housing, electric vehicle rebates, water efficiency projects, and high-speed rail.⁵⁶

California legislation requires 25 per cent of this funding to be invested in programs that benefit disadvantaged communities. For example, thanks to the cap-and-trade proceeds 1,600 roof-top solar panels will be installed on low-income houses by the end of 2016, saving residents about \$800 in electricity bills the first year and as much as \$32,000 over the panels' lifespan.⁵⁷

California's economy flourished during the first two years of its cap-and-trade program. The state experienced job growth of 3.3 per cent, adding 491,000 jobs. Per capita income increased by 8.5 per cent, and in 2013, GDP grew by 2.2 per cent, in line with the national average. California also broke the link between economic output and job creation, **with economic growth outpacing emissions growth by a factor of almost five.**⁵⁸

QUEBEC



Quebec's cap-and-trade system is linked with California's and was launched in 2013. It now covers 85 per cent of provincial emissions, including transportation fuels. Quebec's emissions are projected to decrease by 20 per cent below 1990 levels by 2020.⁵⁹

Quebec's cap-and-trade auctions have already netted a quarter of a billion dollars for the province's Green Fund, which supports sustainable development and environmental measures, including the administration of the province's cap-and-trade program and Action Plan on Climate Change. The Quebec government expects that four auctions of allowances per year will raise \$425 million in each of 2015-2016 and 2016-2017, for a total of \$2.4 billion for the Action Plan on Climate Change by 2020.⁶⁰ **All proceeds from cap-and-trade are entirely allocated to initiatives described in the Action Plan, particularly public transit, energy efficiency, and further measures to reduce GHG emissions.**⁶¹

Quebec's cap-and-trade system is too new to yield meaningful data about the economic impact of carbon pricing. However, most observers of the Quebec system agree that cap-and-trade has not had a negative impact on the province's economy and will position Quebec to benefit from the growing global clean economy.⁶² The province was one of just two Canadian provinces to deliver a balanced budget this year and is projected to see employment increase by 0.9 per cent.⁶³ At a time when the rest of Canada has fallen into a recession, Quebec's GDP is expected to increase by 1.8 per cent in 2015 and 2 per cent in 2016.⁶⁴ Furthermore, linking emissions trading markets with California is expected to allow Quebec to save between \$387 and \$532 million more than what it would have cost to reduce emissions independently.⁶⁵

CONCLUSION

Ontario has taken an important first step in announcing a cap-and-trade program that puts a price on carbon pollution. But cap-and-trade will only achieve a portion of the GHG emissions reductions needed for the province to meet its 2020 climate targets.

The rest of these reductions need to come from investing the proceeds from the system in new, not yet funded complementary actions that cut carbon pollution across sectors while providing economic, health and social benefits. The proceeds should be dedicated in a clear, transparent and rigorous manner to the Greenhouse Gas Reduction Fund, not the government's general revenues.

Like Quebec, California and RGGI, Ontario has committed to use the money generated from cap-and-trade to further reduce emissions. This is good for the climate, Ontarians and the economy. The estimated \$2 billion per year generated by Ontario's cap-and-trade program can enable residents to produce renewable energy on their rooftops, make

Ontarians' homes more efficient and cheaper to heat and cool, help build much-needed public transit infrastructure, and accelerate the uptake of EVs to make our air cleaner and reduce our dependence on gasoline.

Experience from other jurisdictions with cap-and-trade indicates that these investments have positive environmental and economic impacts, including new jobs, lower electricity bills, and lower health costs. Ontario can do the same. **The answer to the \$2 billion question is easy: use cap-and-trade proceeds to invest in complementary policies and programs that will help the province meet its climate targets and build a thriving clean economy in Ontario.**

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