



Annual Report 2008-09

Climate Change **ACTION PLAN**

Protecting our environment.



Ontario



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Front cover main photo: Ontario Tourism
Front cover inset photo: GO Transit

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Message from the Minister of the Environment

John Gerretsen, M.P.P.



Climate change presents a real threat to our quality of life and future generations. It is because of the magnitude and seriousness of this problem that Ontario is committed to doing all we can to cut our greenhouse gas emissions.

15%

Greenhouse gas emissions are targeted to be 15% below 1990 levels by 2020.

We need to take strong, decisive measures during this critical time to ensure our children and grandchildren do not inherit the consequences of inaction. Ontario is rising to this challenge, and as a result of the initial steps we have taken Ontario is well-positioned to build on the progress we have made in the past two years.

In 2007 our government set tough greenhouse gas reduction targets. We are committed to meeting them. By 2020 our greenhouse gas emissions will be 15 per cent below 1990 levels. Reaching our targets will drive per capita emissions to just over 10 tonnes per person: less than half of today's national average. The investments we are making today – which are reflected in this report – are helping us not only reduce the threat of climate change but also better protect our environment and create Ontario's new green economy.

Over the past year, Ontario has introduced crucial new climate change initiatives – among the most ambitious and forward-looking of any jurisdiction in North America. These include the Green Energy Act, passed by the Ontario legislature in May 2009,

its regulations in September 2009, and the introduction of Bill 185, proposed enabling legislation to allow for the development of a cap-and-trade system. If passed, Bill 185 will enable Ontario to link to North American trading systems in the future and assist our province's largest industrial emitters reduce their greenhouse gas emissions.

Last year, in reviewing the first Climate Change Action Plan Annual Report, the Environmental Commissioner of Ontario stated: "It is recognized that virtually all government ministries, agencies and related stakeholders will have a role to play in delivering on the plan's initiatives."

Our government is in complete agreement. Ours is a collective effort and we are taking a comprehensive approach to climate change initiatives involving every community, every sector and every level of government. It is a priority that also involves all ministries across our government, and is coordinated by the Climate Change Secretariat. This includes: an aggressive innovation agenda to support research and development in

Message from the Minister of the Environment

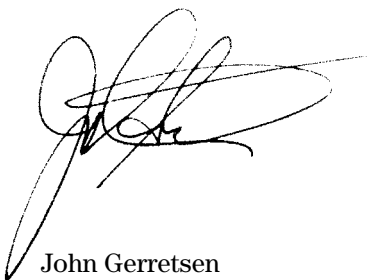
climate change adaptation and green technologies, historic investments in public transit projects and infrastructure that are creating thousands of new jobs and opportunities for Ontarians.

And, while we *are* making progress, Ontario still has much more work to do and a lot more ground to cover if we are to meet our aggressive greenhouse gas reduction targets. The challenges created by climate change demand our full attention, and the sense of urgency requires decisive and timely action on the part of all of us.

The time to act is now! The Ontario government takes this call for responsible action seriously, and we will continue to work in partnership with all Ontarians as we attempt to achieve our climate change reduction goals.

That is why I will be there when the world gathers in Copenhagen, Denmark in December 2009 to negotiate a new global agreement on climate change. Ontario will continue to do all it can to encourage all governments to rise to this challenge, and demonstrate the kind of leadership and meaningful actions which our citizens deserve.


In this report, and in future annual reports, we will show Ontarians the steps we are taking, the success of our efforts, and the lessons we are learning as we work towards meeting our commitments to Ontarians on this most important issue.



John Gerretsen
Minister of the Environment



“...Ontario has introduced crucial new climate change initiatives – among the most ambitious and forward-looking of any jurisdiction in North America.”

A photograph of a woman and two young girls sitting together, looking out a window. The woman is in the center, wearing a white top. The two girls are on either side of her, both wearing blue hoodies. They are all looking out a window at a snowy, mountainous landscape. The image has a soft, slightly blurred quality.

Introduction: Reducing Emissions, Greening the Economy

In 2007, Ontario introduced its [Climate Change Action Plan](#) as the framework for action to reduce total GHG emissions. This action plan established the following GHG reduction targets:

6%

below 1990 levels
by 2014

15%

below 1990 levels
by 2020

80%

below 1990 levels
by 2050

Photo: Ontario Tourism

Introduction:

Reducing Emissions, Greening the Economy

Today we are faced with the urgent need to reduce the greenhouse gas (GHG) emissions that cause climate change, while also addressing the economic challenges of the recent global financial crisis. Confronting these challenges means a commitment to investment, innovation and planning to prepare Ontario to prosper in a low-carbon society. We need to make better choices when it comes to our environment and give Ontario businesses the tools they need to go green and thrive. Ontario's Climate Change Action Plan and our strategies for creating a culture of innovation and conservation are designed to do just that. Our collective goal is for all Ontarians to enjoy a high quality of life sustained by a healthy environment and a clean, green and innovative economy for generations to come.

The need for action

Climate change is not a future threat. It is changing our weather today, threatening our communities and quality of life. What we are only starting to witness is going to get worse if government, industry and citizens fail to act. Even under the most optimistic scenarios for tackling greenhouse gas (GHG) emissions, the effects are expected to persist beyond the end of this century affecting generations long into the future. These effects will increasingly create a strain on our economy, be a hazard to our health and a threat to our quality of life.

In 2007, a major study by Natural Resources Canada, *From Impacts to Adaptation: Canada in a Changing Climate 2007*, predicts that intense rainfall events, heat waves and smog episodes are likely to become more frequent, and points out that physical infrastructure, water quality and supply, human health and well-being, remote and resource-based communities and ecosystems are highly sensitive to climate.

Between 1948 and 2006, Ontario's annual average temperature increased as much as

1.3°C

The Natural Resources Canada report summarizes some of the major impacts of climate change in Ontario:

- *Disruptions to critical infrastructure*, including water treatment and distribution systems, energy generation and transmission and transportation
- *Lower Great Lakes water levels*, which could compromise shipping and reduce hydroelectric output
- *More frequent water shortages*, as summer temperatures and evaporation rates increase
- *Greater risks to public health from injury, illness and premature death* from climate-related events such as extreme weather, heat waves, smog and ecological changes that support the spread of diseases
- *Increased risk for remote and resource-based communities*, which are already severely affected by drought, ice-dam flooding, forest fires and warmer winter temperatures
- *Damage to Ontario's ecosystems*, through the combined influence of changing climate, human activities and such natural disturbances as fire, outbreaks of insects and disease. The report also highlights the sensitivity of Ontario's agricultural production to climate change.

¹ Intergovernmental Panel on Climate Change (2007). Fourth Assessment Report. Climate Change 2007 Synthesis Report: Summary for Policymakers. pp. 20

Since 1948, average annual temperatures in Ontario have increased by as much as 1.3°C in the west of the province, but very little in the east. This trend is projected to continue, with the most pronounced temperature increases occurring in winter, especially at night-time. Since 1900, annual precipitation in southern Canada, including Ontario, has increased by between five and 35 per cent, depending on the region. Precipitation in some parts of Ontario has also changed, with high-intensity storms becoming much more common over the last 50 years.

In its 2007 report, the Intergovernmental Panel on Climate Change (IPCC), the pre-eminent world body responsible for reporting on the scientific consensus behind climate change, warned that global emissions will need to peak by 2015 and decline to less than half of today's levels by mid-century if the world is to reduce the risk of abrupt and irreversible effects of climate change.¹ Climate change is a global problem requiring global coordinated solutions. Ontario is doing its part by setting short, medium and long-term targets.

Ontario's response: Reducing emissions and building a clean, green economy

In 2007, Ontario introduced its [Climate Change Action Plan](#) as the framework for action to reduce total GHG emissions. This action plan established the following GHG reduction targets:

- six per cent below 1990 levels by 2014 (Ontario uses a [1990 base year in line with the UN Framework Convention on Climate Change](#))
- 15 per cent below 1990 levels by 2020
- 80 per cent below 1990 levels by 2050

These targets signal Ontario's strong commitment to taking real, measurable action to reduce GHG emissions in all sectors of the economy. Combined with a range of other strategic government initiatives, the government's action plan continues to evolve.



What is climate change?

According to Environment Canada, climate change is a long-term shift or alteration in the climate of a specific location, region or the entire planet. The shift is measured by changes in some or all of the features associated with the average weather, such as temperature, wind patterns and precipitation. It can involve both changes in average weather conditions and changes in how much the weather varies around these averages. "Climate change" is different than "climate variability" (changes in the weather); it is persistent and measurable over a longer time.

In addition to reducing emissions, the Ontario government believes that building a greener, more sustainable economy is necessary for a safe, healthy and prosperous future. Economic well-being and environmental health go hand in hand. Greening the economy and fostering the transition to a low-carbon future lie at the heart of the province's economic strategy.

The successful development and adoption of green technologies depends on the creation of a green economy infrastructure and finding alternatives to our traditional energy supply – such as increased conservation and renewable energy, which are being driven by the Green Energy Act.

In 2009, the provincial [Budget](#) announced major investments to support new and expanded public infrastructure, energy efficiency and conservation, innovative research and new green-

collar jobs. Over the next two years, Ontario has committed to invest \$32.5 billion to renew, expand and enhance the public infrastructure that underpins the provincial economy – which is expected to create and sustain over 300,000 jobs. The total planned two-year infrastructure investment is approximately double recent levels. These investments complement Ontario's Innovation Agenda's contribution of close to \$3.2 billion in funding, demonstrating the government's commitment to an innovative and green 21st century economy.

Together with investment in green energy, energy efficiency and other areas detailed in this report, these investments are expected to bring us 71 per cent of the way toward our 2014 GHG reduction targets and 56 per cent toward our 2020 targets.



The Numbers – Measuring Ontario's Progress

Together with investment in green energy, energy efficiency and other areas detailed in this report, these investments will bring us

71% 56%

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The Numbers – Measuring Ontario's Progress

This section of the report looks at trends in Ontario's GHG emissions for the period of 1990-2007. This overview includes a look at how Ontario measures its GHG emissions, where those emissions come from and how it compares with those of other provinces. This section also focuses on Ontario's GHG reduction efforts and whether we are on track to meet the targets in the Climate Change Action Plan.

A technical discussion of Ontario's approach to measuring, modeling and forecasting GHG emissions is in Appendix B. The appendix includes detailed information on the province's approach to tracking progress on GHG reductions, as well as information on the government's approach to assessing, managing and mitigating risk to ensure reduction targets are met.

Ontario's Climate Change Secretariat

To coordinate its efforts on climate change mitigation, and achieve the objectives of the Climate Change Action Plan, the government created the Climate Change Secretariat within the Cabinet Office in February 2008. The secretariat's mandate is to provide comprehensive corporate leadership and support for government-wide efforts on all aspects of climate change.

One of the secretariat's primary roles is to track and monitor progress on climate change by the province's ministries and agencies and to report annually. To do this, the secretariat developed a reporting template (see Appendix B) that ministries use to report results of individual initiatives. The secretariat then rolls up these individual initiatives into an overall analysis of progress toward provincial targets.

The secretariat is also responsible for preparing this annual report, and for liaising with the Environmental Commissioner's Office on its review of the report.

How Ontario measures its GHG emissions

Ontario's definition of GHG emissions aligns with the definitions used to prepare Environment Canada's 2009 [National Inventory Report on Greenhouse Gases and Sinks in Canada](#). Statistics on GHG emissions in this annual report are taken from the latest national inventory report which covers the period from 1990 to 2007. Using this approach, Ontario's GHG emissions capture all

of the GHGs resulting from economic activities and personal consumption choices that take place in Ontario.²

The national inventory report statistics are reliable and consistent with international standards for annual submissions to the [United Nations Framework Convention on Climate Change](#).

Where Ontario's GHG emissions come from

Ontario's GHG emissions can be analyzed in a number of ways. Two of the most common approaches include:

- Measuring GHG emissions from different fuel sources
- Measuring the emissions produced by different sectors of the economy

Using either approach, Ontario's 2007 emissions total 197 Mt CO₂ equivalent (eq).

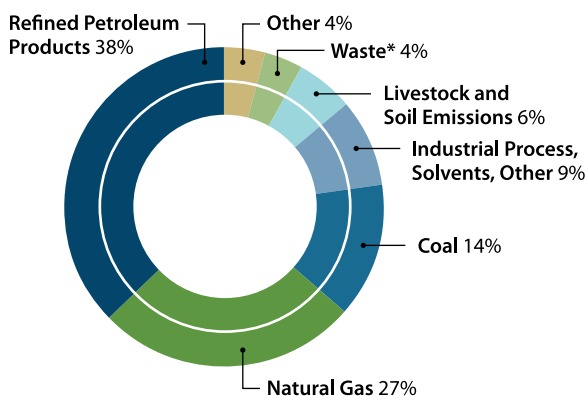
Fuel source analysis focuses on the use of various types of fossil fuels that emit GHGs when burned, in addition to non-fuel GHG emissions from agriculture, waste and industrial processes/solvents. In 2007 three fossil fuels – coal, natural gas and refined petroleum products – were responsible for emitting more than 75 per cent of Ontario's GHGs.

Analyzing the GHG emissions that come from different sectors of the economy focuses on the contribution made by a broad range of activities. The government uses six key economic sectors to evaluate source-related GHG emissions, as shown in the table below, including: electricity, transportation, industry, buildings, agriculture and waste.

FIGURE 1: Ontario's 2007 Emissions by Source and Sector

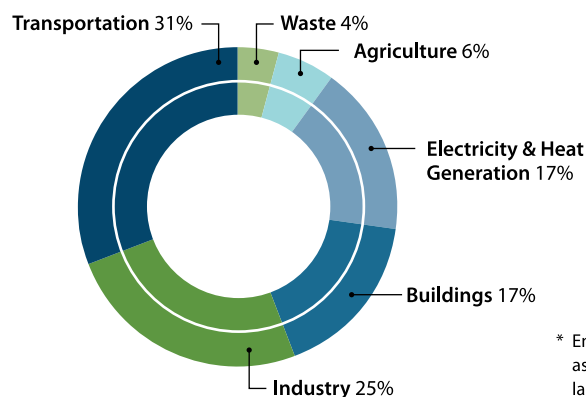
Ontario's 2007 Emissions by Source

(Source: 2009 National Inventory Report; 2007 Report on Energy Supply and Demand in Canada)



Ontario's 2007 Emissions by Sector

(Source: 2009 National Inventory Report)



* Emissions from waste include emissions associated with solid waste disposal on land, wastewater handling and waste incineration.

² GHG emissions from goods and services that are imported into Ontario, including electricity, are not counted towards Ontario's emission totals. That is because those emissions are accounted for in the official reports of the jurisdictions where the goods and services originate. In the same way, Ontario counts the GHG emissions from goods and services that are produced within the province for export – such as automobiles – as part of its GHG totals, even though the goods and services are consumed elsewhere.

| Economic Sector | Description |
|-----------------------|---|
| <i>Transportation</i> | Emissions from the consumption of fossil fuels such as diesel, gasoline and propane consumed by passenger and commercial vehicles including road, rail, marine and air travel |
| <i>Industry</i> | Emissions from the use of fossil fuels such as coke, natural gas and coal are produced from a range of industries including mining, oil and gas extraction, manufacturing, mineral and chemical production, metal production, construction and paper and wood products production |
| <i>Buildings</i> | Emissions from the use of fossil fuels such as natural gas in residential, commercial and institutional buildings for heating and water |
| <i>Electricity</i> | Emissions from electricity and heat generation produced from the combustion of fossil fuels such as coal and natural gas |
| <i>Agriculture</i> | Emissions generated by enteric fermentation, manure management and fertilizer application |
| <i>Waste</i> | Emissions generated by solid waste disposal on land, wastewater handling and waste incineration |

Recent trends in Ontario's emissions (1990-2007)

Between 1990 and 2007, Ontario's total annual GHG emissions rose by 13 per cent, from 175 Mt of CO₂ eq to 197 Mt of CO₂ eq.³ Figure 2 shows the trend line for Ontario's emissions between 1990 and 2007. The figure shows that while total emissions increased steadily over this period, annual emission levels fluctuated from year to year in response to changes in the economy, the weather, energy demand and technological changes to industrial processes, transportation and consumer products.

In 2007, Canada's GHG emissions totalled 747 Mt CO₂ eq. That figure represents an increase of 26 per cent since 1990 – exactly twice the

FIGURE 2: Ontario's GHG Emissions 1990 - 2007

National Inventory Report, 2009

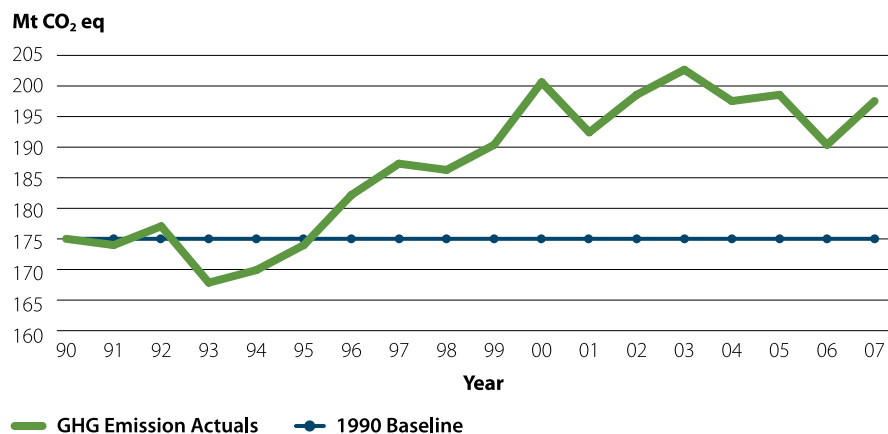
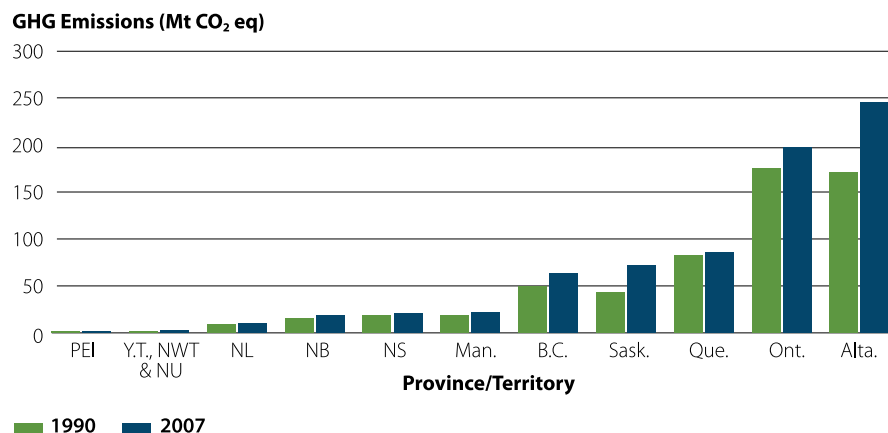


FIGURE 3: Total Territorial and Provincial GHG Emissions, 1990 and 2007

National Inventory Report, 2009



³ GHGs have different global warming potential. To allow GHGs to be compared, the Intergovernmental Panel on Climate Change (IPCC) compares all GHGs to the main gas CO₂. This gives a total as CO₂ equivalent.

rate of increase in Ontario. However, GHG emissions increases since 1990 have also varied across Canada – with the smallest increase (3.7 per cent) seen in Quebec, and the highest increase (66 per cent) seen in Saskatchewan (see Figure 3). In 2007, Ontario was Canada's second-largest producer of GHG emissions after Alberta.

The table below lists Ontario's emissions by sector, and describes some of the factors that influenced changes in emission levels between 1990 and 2007.

| Sector | 1990 GHG Emissions (Mt CO ₂ eq) | 2007 GHG Emissions (Mt CO ₂ eq) | Variation (1990-2007) | Explanation for Variation in Emissions, 1990-2007 (Source: National Inventory Report, 2009) |
|-----------------------------|--|--|-----------------------|--|
| <i>Transportation</i> | 47.3 | 63.5 | 34.4% | Road transportation in Ontario was responsible for the greatest increase in emissions of all Ontario sectors between 1990 and 2007. This growth was directly related to population growth, urban sprawl and consumer preferences for SUVs, vans and pickups. Increased emissions from transportation can also be attributed to the manufacturing sub-sector, which uses transport trucks for just-in-time delivery of goods. |
| <i>Industrial Emissions</i> | 58.2 | 49.9 | -14.3% | Ontario experienced a decrease in emissions from the chemical industry sub-sector. This is largely due to the installation of a catalytic emission abatement system in 1997 at Ontario's only adipic acid production plant. Without the reduction in emissions from this subsector, Ontario's industrial emissions would have increased between 1990 and 2007. |
| <i>Buildings</i> | 26.1 | 33.4 | 28% | Emissions from buildings have increased due to economic changes and population growth. Emissions from commercial and institutional sectors increased by 47 per cent due to a shift from a mainly manufacturing-based economy to a more diversified, service-based economy. Residential emissions increased by 17 per cent, while total population increased by 25 per cent. |
| <i>Electricity</i> | 26.6 | 33.2 | 24.8% | Emissions from Ontario's electricity and heat generation sector grew 25 per cent due to an increase in fossil fuel-based generation (primarily coal and natural gas) to meet demand. However, emissions from this sector decreased by one third between 2003 and 2007 due to changes in the supply mix. |
| <i>Agriculture</i> | 11.0 | 11.0 | 0.0% | Ontario's emissions from agriculture remained constant at 11 Mt CO ₂ eq, with slight fluctuations. This can be explained by relatively constant livestock levels and application of synthetic nitrogen fertilizer. |
| <i>Waste</i> | 5.8 | 7.4 | 27.6% | Emissions from waste increased by 27 per cent primarily due to increased solid waste disposal on land and a provincial waste diversion rate that is below the Canadian average. Ontario has made a concerted effort to increase waste diversion with the implementation of the blue box program, this has been further enhanced by new diversion programs implemented in 2007, 2008, 2009. |

It is important to note that while Ontario's total emissions increased between 1990 and 2007, the intensity of GHG emissions per capita, as well as the quantity of GHG emissions for each dollar of real Gross Domestic Product (GDP), went down over the same period. See Figure 4.

In 1990, for example, Ontario emitted an average of 17.2 tonnes of CO₂ eq per capita. By 2007, this had decreased by 10 per cent, to an average of 15.4 tonnes. As well, in 1990 the province emitted an average of 520 tonnes for every million dollars in real GDP. By 2007, this had decreased by 29 per cent, to an average of 370 tonnes.

In 1990, for example, Ontario emitted an average of 17.2 tonnes of CO₂ eq per capita. By 2007, this had decreased by 10 per cent, to an average of 15.4 tonnes.

Figure 5 shows Ontario's 2007 GHG emissions per capita and per dollar of real GDP, compared to other provinces in Canada.

FIGURE 4: GHG Indicators 1990 - 2007 Trends

(Source: National Inventory Report, 2009, Statistics Canada and Ontario's Economic Accounts, July 2009)

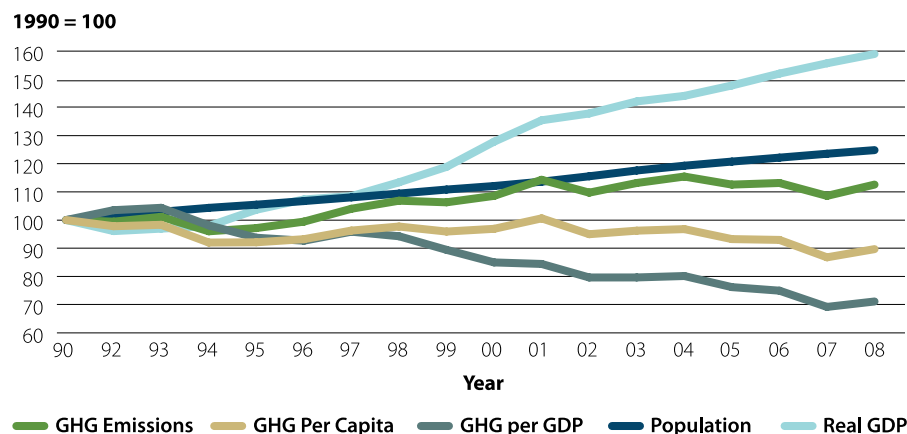
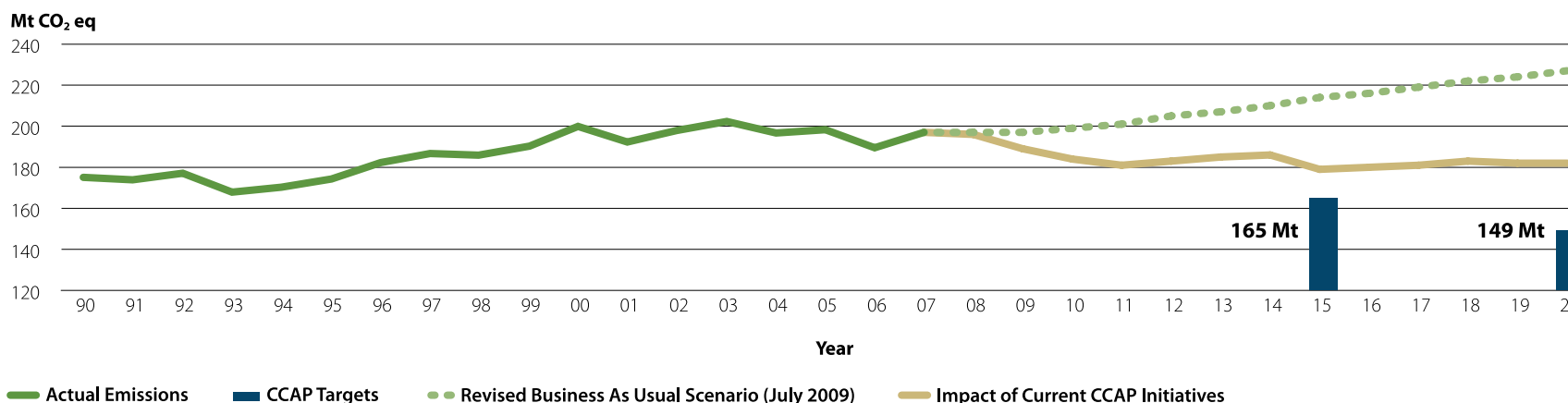


FIGURE 5: Ontario's 2007 Emissions in a Canadian Context

(Source: Environment Canada National Inventory Report, 2009)

| Province / Territory | GHG Intensity | | GHG per Capita | |
|----------------------|------------------|------------|-----------------|------------|
| | Tonnes / \$M GDP | Rank | Tonnes / Capita | Rank |
| QC | 320 | 1 | 11.1 | 1 |
| BC | 380 | 4 | 14.4 | 2 |
| PE | 500 | 5 | 15.1 | 3 |
| ON | 370 | 3 | 15.4 | 4 |
| MB | 510 | 6 | 18 | 5 |
| NL | 530 | 7 | 20.8 | 6 |
| YT, NWT & NU | 330 | 2 | 21.4 | 7 |
| NS | 720 | 8 | 22.1 | 8 |
| NB | 790 | 9 | 24.9 | 9 |
| AB | 1310 | 10 | 70.7 | 10 |
| SK | 1810 | 11 | 72.2 | 11 |
| National AVG | 570 | N/A | 22.7 | N/A |

FIGURE 6: Impact of CCAP 2007 Initiatives vs. CCAP Target

Measuring Ontario's progress

The 2007 Climate Change Action Plan (CCAP) contained more than 70 government initiatives. Some were designed to reduce GHG emissions, while others were designed to enable the transition to a lower-carbon, green economy.

Assuming that the Climate Change Action Plan emission reduction initiatives launched to date (see Appendices B and C) deliver their forecasted emission reductions, Ontario will make substantial progress towards achieving its CCAP targets (See Figure 6).

The government anticipates that initiatives launched to date will deliver 71 per cent of the reductions needed to reach the 2014 target and 56 per cent of the reductions required to reach the 2020 target (see Figure 6).

While our analysis shows significant progress, much more must be done to ensure Ontario meets its 2014 and 2020 targets. Currently, government projections put the shortfalls in a range from 15 Mt in 2015 (after the full phase-out of coal-fired electricity generation by December 31, 2014) to 35 Mt in 2020.

Additional GHG reduction measures will be needed. In particular, the introduction of a cap-and-trade system could be a significant factor in helping to close or eliminate the shortfall.

Pursuing further emission reductions

Figure 7 shows that even after measures announced so far, substantial potential exists to reduce emissions further in most sectors of the Ontario economy. These are sectors that could be covered by a future cap-and-trade system, and that would also benefit from measures that would complement cap-and-trade and add to its overall effectiveness.⁴

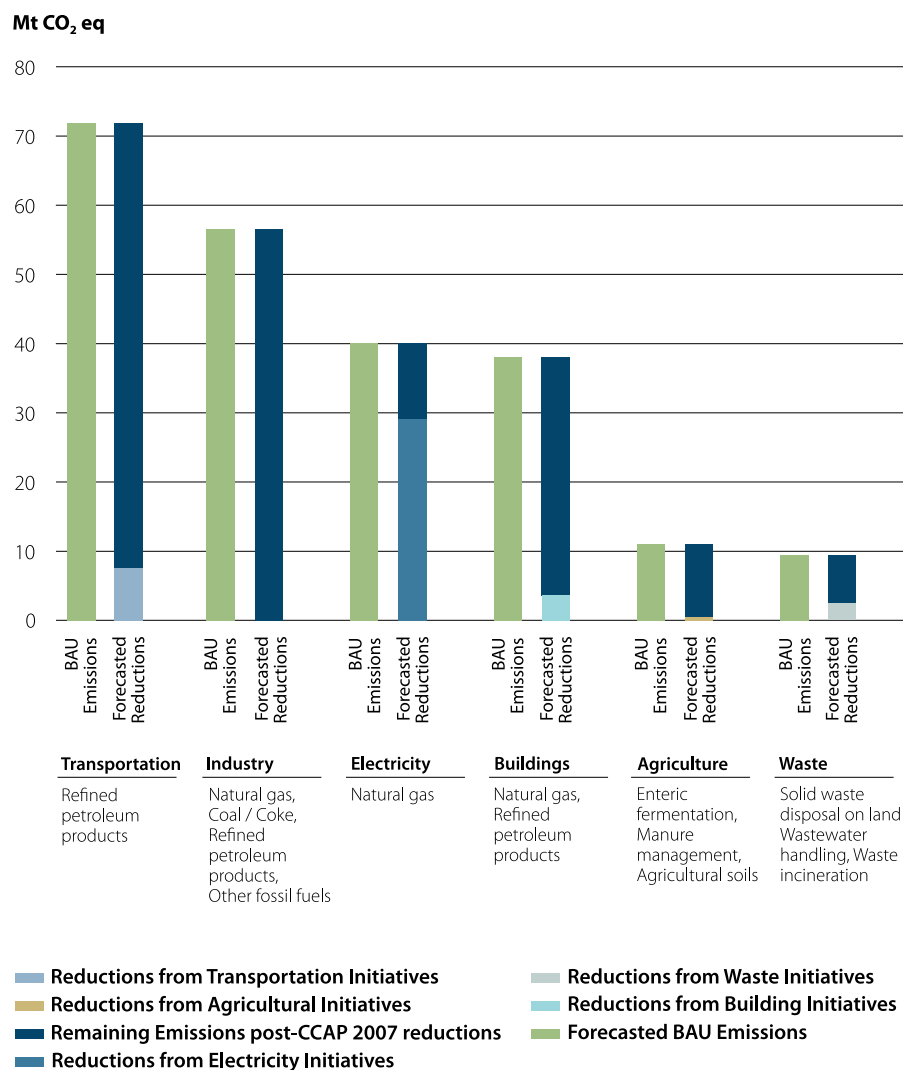
In addition, government initiatives announced after the release of the original action plan – a combination of regulatory changes, market incentives and government investments – will also make an important contribution to reaching the targets. The table on page 15 lists the additional emission reduction initiatives that have been introduced since 2007. These new initiatives have the potential to deliver significant emission reductions by 2020 as new provincial policies are implemented and their impacts increase over time. Ontario is currently assessing their GHG reduction potential, including the low-carbon fuel standard.

The 2007 action plan committed to implementing a low-carbon fuel standard. Ontario continues to assess options for moving forward on this in light of recent cap-and-trade proposals and regulations in California and the US federally. Ontario is committed to aligning with US carbon cap-and-trade proposals to support cross-border trading. The 2010 Climate Change Annual Report will provide additional detail on the proposed treatment of upstream fuels. Options could include relying on bringing transportation fuels fully under a cap-and-trade system or a combination of cap-and-trade and a low-carbon fuel standard that complements a cap-and-trade system.

Reducing Ontario's emission levels is a long-term commitment and the government will continue to implement GHG reduction measures to meet its reduction targets at the lowest cost.

FIGURE 7: CCAP 2007 Initiative Impacts in 2020 and Remaining Emissions

(Note: excludes the potential impact of cap-and-trade)



⁴ Ontario has one dual-fired oil and natural gas generation station, Lennox, which may be operational in 2020. If operational, Lennox will produce less than 5% of the total electricity sector GHG emissions

| Initiative Name/Description | Lead Ministry | Partners |
|---|----------------------|-------------------------|
| <p><i>2011 and 2016 Building Code Changes</i></p> <p>The Ontario Building Code is updated every five years. The last update was in 2006 and the next updates are scheduled to occur in 2011 and 2016. Each update typically increases the energy efficiency standards for new buildings and buildings undergoing renovation. The adoption of more stringent standards into the code in 2011 and 2016 will lower GHG emissions through an overall reduction in the use of energy, including both electricity and natural gas. Work has begun on the 2011 Building Code. Energy conservation has been identified as a top priority in the code development process.</p> | MMAH | |
| <p><i>Vehicle Fleet Efficiency Standards (post 2016)</i></p> <p>The Canadian federal government has indicated that it will introduce new fuel efficiency regulations for the automotive sector beginning in 2011 aligned with the dominant US fuel economy regulations. In September 2009 the US proposed standards that would improve fuel efficiency significantly and decrease GHG emissions. It is anticipated that further improvements to fuel efficiency will be required for the 2017-2020 model year vehicles.</p> | (Federal Government) | MOE (Observer) |
| <p><i>Low-Carbon Fuel Standard (LCFS)</i></p> <p>The 2007 Climate Change Action Plan committed to implementing a low-carbon fuel standard. Ontario continues to assess options for moving forward on regulating low-carbon fuels in light of recent cap-and-trade proposals and regulations in the US federally and in California.</p> | MEI | |
| <p><i>GEA: Potential Bioenergy from Agri-Food Sector</i></p> <p>Anaerobic digestion in the Agri-Food Sector may be used to derive biogas from farm by-products, agri-food sector by-products and food waste, helping to avoid or reduce methane release in the process. Collected biogas could then be used to create electricity, in concert with Green Energy Act (GEA) incentives, or used in industrial processes. Alternatively, biogas could be further upgraded to create pipeline-ready natural gas in the presence of adequate incentives.</p> | MEI | OMAFRA, OPA, MOE |
| <p><i>Biomass Conversion of Coal Plants</i></p> <p>The conversion of some of Ontario Power Generation's coal-fired facilities to burn biomass will enable energy generation from biological materials, thereby making use of existing facilities as coal-fired generation is reduced and ultimately phased-out at the end of 2014.</p> | MEI | MNR, MNDMF, OMAFRA, OPA |

| Initiative Name/Description | Lead Ministry | Partners |
|--|---------------|----------------------|
| <p><i>Greening the Ontario Public Service</i></p> <p>Based on the recommendations made by David Ramsay, Parliamentary Assistant to the Premier, for reducing the carbon footprint of the Ontario government and the OPS, the OPS Green Office (Ministry of Government Services) will coordinate the greening of government operations by undertaking actions to reduce corporate GHG emissions related to fleet, facilities and air travel. Corporate GHG emissions are to be reduced by 19% by 2014 and 27% by 2020.</p> | MGS | all other ministries |
| <p><i>GEA: Appliance Efficiency Standards</i></p> <p>Future increases in appliance energy efficiency standards required under the regulations of the GEA or the Ontario Building Code will result in reduced energy and natural gas consumption and decreased overall emissions.</p> | MEI | |
| <p><i>\$32.5 Billion Investment in Infrastructure</i></p> <p>The 2009 Ontario Budget included a \$32.5 billion investment in infrastructure over the next two years to help stimulate economic growth. A portion of the funding has been directed towards energy efficiency and retrofit projects and expanding transit. These projects will reduce GHG emissions and energy use (electricity and natural gas), lower building operating costs and create jobs.</p> | MEI | EDU, MMAH |
| <p><i>Waste Diversion Strategy and Programs</i></p> <p>Diverting waste from landfills reduces GHG emissions by avoiding the emissions associated with creating new products from virgin materials, and also avoids methane generated in landfills. The Minister of the Environment has directed Waste Diversion Ontario to increase the diversion of Blue Box waste from landfill to 70% by 2011. In addition, the Minister of the Environment approved the following recycling programs to further increase waste diversion and reduce resource use: the Municipal Hazardous and Special Waste Program, the Waste Electrical and Electronic Equipment Program and the Used Tires Program.</p> | MOE | |



Government Leadership

30,000 tonnes

of GHG emissions are planned to be reduced from provincial government offices in Toronto, which will make an important contribution to the government's 2020 GHG reduction targets for government operations.

Government Leadership

The greening of Ontario

By going green, Ontario is opening up new horizons and opportunities. For example, new markets are emerging for lower-carbon energy technologies, eco-friendly products and other sustainable goods and services.

The Ontario government is determined to take advantage of these opportunities to build a more prosperous and sustainable future. By greening its own operations, the government is demonstrating how greening strategies within organizations can contribute to creating a green economy. As part of this commitment, the government is expecting to purchase some \$30 million in new products from Ontario-based emerging green technology companies.



Leadership by example – Ontario Public Service Green Transformation Strategy

The Ontario government is one of the largest employers in the province with some 68,000 staff in ministries, agencies, boards and commissions. Addressing climate change requires major changes in the way all of us work and live, and the government is showing leadership by reducing its own environmental footprint.

In September 2008 the OPS Green Office was created within the Ministry of Government Services (MGS) to drive the greening of government operations. The Green Office's mandate is to ensure that actions are in place to reduce emissions in buildings, vehicles and air travel, paper and print services, electronic devices and e-waste; to help create government-wide business practices that are more sustainable; and to develop a green organizational culture.

The OPS Green Transformation Strategy includes GHG reduction targets of 19 per cent below 2006 levels for the public service by 2014 and 27 per cent below by 2020. This strategy supports recommendations made by David Ramsay, the Premier's Parliamentary Assistant, for reducing the government's carbon footprint, as announced by the Minister of Finance in Budget 2009 which stated that "the public sector – both the government and the broader public sector – will show leadership by conserving energy and using it more efficiently. This strategy will help lower GHG emissions. It will be informed by the work of David Ramsay, Parliamentary Assistant to the Premier of Ontario".

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million

in new products from Ontario-based emerging green technology companies.

The OPS emission reduction targets demonstrate that large organizations can achieve more sustainable operations while reducing overall costs. The greening strategy is expected to lead to many new partnerships with other organizations, as we share strategies to lower costs while reducing GHG emissions. The experience gained and lessons learned will also be useful in promoting emission reduction efforts in Ontario schools, colleges, universities, long-term care homes, hospitals and justice facilities.

Greening Ontario's government buildings (the key source of the government's GHG emissions) is a central component of the

strategy to meet the GHG reduction targets. A signature initiative is the government's plan to reduce emissions from provincial government offices in Toronto by 30,000 tonnes, which will make an important contribution to the government's 2020 GHG reduction targets for government operations. A flagship component of this strategy is one of the largest-ever office building retrofits in North America, which will bring about a green transformation at the former head office of Sears Canada, located at 222 Jarvis Street in Toronto. The project is expected to stimulate 1,000 new jobs and create about 455,000 square feet of state-of-the-art, green office space.



The 222 Jarvis Street project will aim to achieve the Leadership in Energy and Environmental Design, or LEED®, Gold standard. The opportunities for energy-efficient building improvements include:

- A green roof
- Solar energy
- Daylight and occupancy sensors for optimal lighting control
- State-of-the-art Information Technology infrastructure
- Wireless communications infrastructure to reduce the need to travel to meetings
- Fewer parking spots and more bicycle storage.

The government is also reducing printing and now requires a minimum amount of recycled content and certification for all paper purchased – a policy that was announced by the Premier. Since using less paper often means relying more on computers, the government has also taken steps to reduce the energy consumed through its Power Management Strategy and IT and Data Centres.

Staff in ministries and agencies in smaller communities across the province are also being highly innovative in their efforts to mitigate climate change and build a high quality of life in their communities. From community gardens in Thunder Bay to tree planting in Ottawa and Timmins to bringing in renewable energy for facilities in our provincial parks and recycling programs in Toronto, public servants have shown a commitment to grassroots efforts to reduce the government's carbon footprint.

...the Environmental Commissioner of Ontario recognized the Project Green initiative with the 2008-2009 ECO Recognition Award.

The Ministry of the Environment's Project Green initiative has been at the forefront of staff-led greening efforts in the Ontario Public Service. Recognizing their hard work and notable successes, the Environmental Commissioner of Ontario recognized the Project Green initiative with the 2008-2009 ECO Recognition Award. In presenting this award, the ECO honoured the commitment of Project Green staff and grassroots efforts throughout the ministry and across government towards measurable improvements in environmental performance.

Environmental education in Ontario

In February 2009, at a provincial Environmental Education Symposium, the Ministry of Education released *Acting Today, Shaping Tomorrow: A Policy Framework for Environmental Education in Ontario Schools*. This policy framework guides schools and boards in teaching and learning about the environment, student engagement and community engagement and environmental leadership.

The ministry has also partnered with principal and teacher organizations and environmental stakeholders to develop and deliver resources that will support teachers, schools and boards in implementing this policy framework through revised curriculum. Web-based materials for teachers are nearing completion. The ministry has also established Regional Environmental Education Lead positions in each of the six English-language and three French-language regions across the province to support boards and build networks to move environmental education forward.

Ontario's universities and colleges have also joined the movement to green their operations and bring environmental sustainability into their teaching and research. Ontario's universities offer opportunities for students to study the environment at an undergraduate, graduate and post-graduate level, and more than two-thirds have a research institute on climate change or sustainability issues. Many colleges offer programs in energy systems technology, environmental impact assessment, environmental protection technology, green building certification, construction and environment, ecosystem restoration and sustainable development – providing skills that will prepare graduates for success in the green economy. These programs are critical to training the clean energy workforce of the future.

In their physical infrastructure, a majority of campuses have embraced LEED® certification for some of their new buildings and retrofits. Green roofs also are an increasingly common feature on university campuses, such as the one recently installed at Lambton College's Suncor Sustainability Centre. Ontario colleges as a group are also implementing Real Time Operating Systems (RTOS) to manage their energy use, allowing for up-to-date information to drive energy conservation and efficiency.



Getting the best advice: Premier's Climate Change Advisory Panel

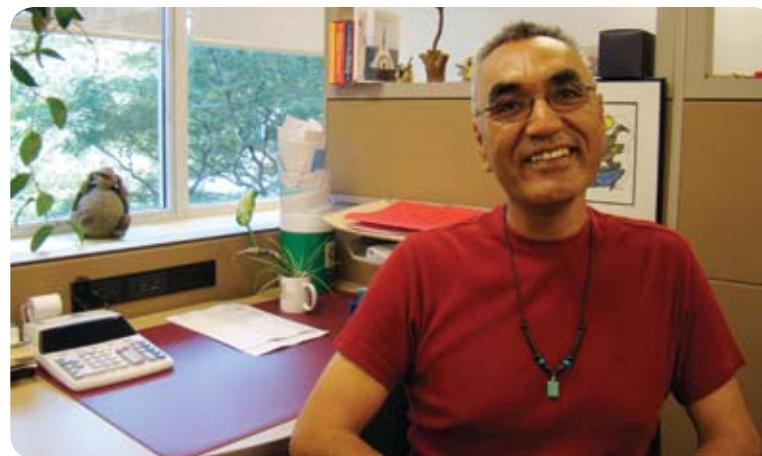
Climate change will have far-reaching effects on the public, business and the economy, and for global, national, sub-national and local governments. To help Ontario prepare for these effects, the government called on an independent group of experts for advice on a broad range of climate change related issues facing all sectors of our society.

The Premier's Climate Change Advisory Panel was created in the fall of 2008, and brings together leaders in areas that are important to implementing the Climate Change Action Plan. The panel's [11 members](#) are distinguished climate change scientists, business leaders and representatives of key stakeholder groups throughout the province. The panel is chaired by Andrew Heintzman, president of Investeco Capital Corp.

The advisory panel's mandate is to support better policy development and decision-making processes. The panel's advice helps Ontario identify green economic opportunities and technologies so the province makes the shift to a lower-carbon economy.

Since its creation, the advisory panel has advised the government on a number of complex climate change related policy issues, including cap-and-trade, carbon offsets, green-tech venture capital, building retrofits, the Green Energy Act and electric vehicles.

The panel is currently developing proposals for the Premier's consideration, expanding on four current strategies: a smart mobility strategy; green jobs; alignment of price signals, regulations and conduct; and consumerism. The 2010 Climate Change Action Plan report will describe the outcomes of the panel's work.



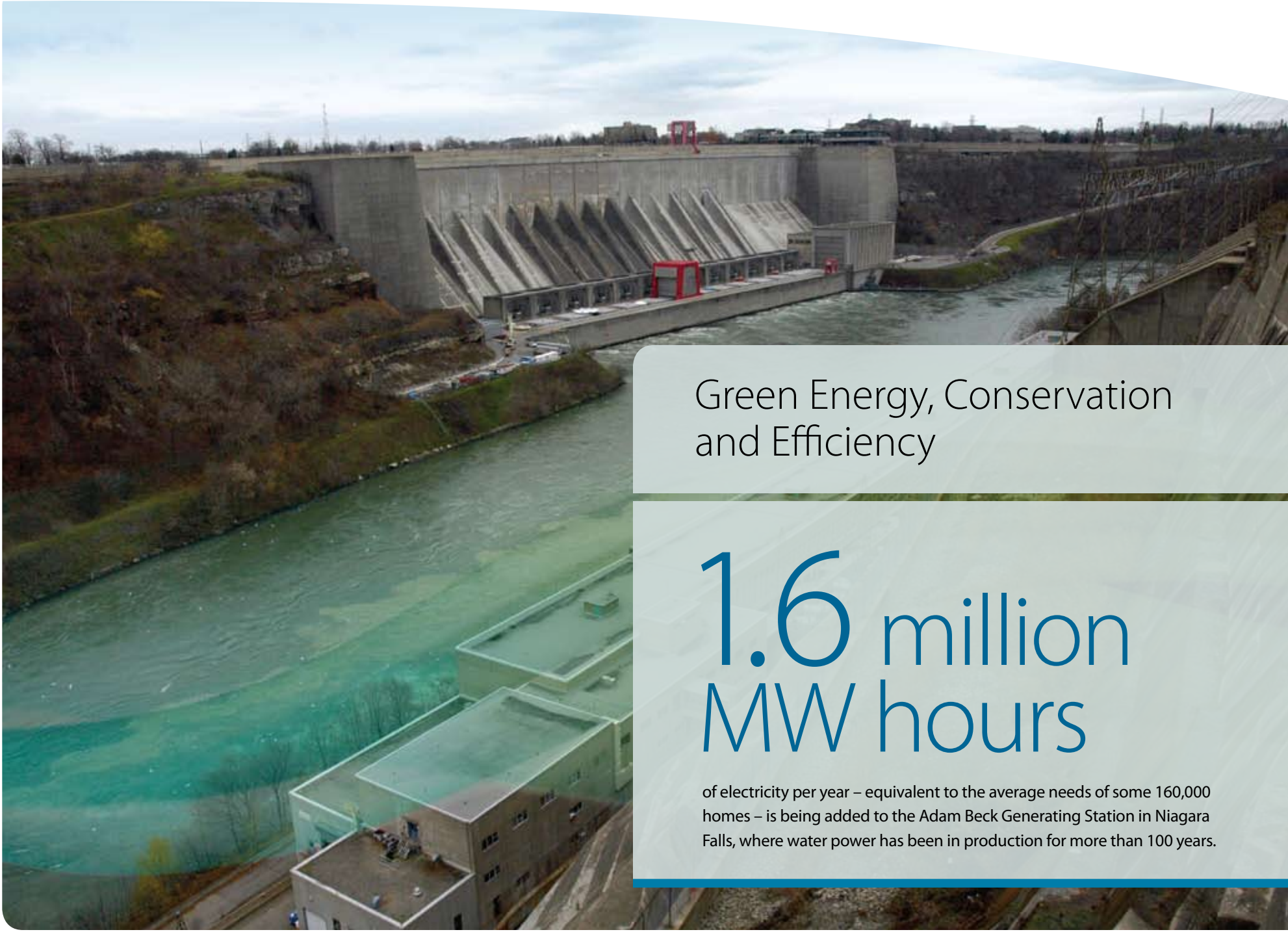
Stakeholder engagement

Reporting annually on progress to the legislature and to the public at large is one part of a broader government commitment to involving stakeholders in the development and implementation of Ontario's Climate Change Action Plan. In addition to publishing this annual report, the government has taken a number of steps over the past year to inform the public of proposed climate change actions and progress, and to seek their input.

Those efforts included posting discussion documents on the development of a proposed cap-and-trade system for Ontario on the Environmental Registry.⁵

The government was also actively engaged with stakeholders throughout the development of the Green Energy Act by seeking feedback on the proposed legislation's provisions. In addition, a multi-stakeholder group from industry and the environmental community was brought together to discuss the impacts of a proposed GHG cap-and-trade system for Ontario. In addition, the government convened an Offsets Experts Working Group to gather advice on the development of a GHG offsets system.

⁵ The discussion paper: A Greenhouse Gas Cap-and-Trade system for Ontario was posted in December 2008, and Moving Forward: A Greenhouse Gas Cap-and-Trade System for Ontario was posted in May 2009.



Green Energy, Conservation and Efficiency

1.6 million MW hours

of electricity per year – equivalent to the average needs of some 160,000 homes – is being added to the Adam Beck Generating Station in Niagara Falls, where water power has been in production for more than 100 years.

Green Energy, Conservation and Efficiency

Phasing out coal-fired electricity

Nearly six years ago Ontario made a bold decision to replace its coal-fired electricity generation capacity with a cleaner, greener energy supply. Today, Ontario remains the only jurisdiction in North America to have passed a regulation requiring a complete phase-out of coal-fired electricity. Phasing-out coal by the end of 2014 represents the largest single GHG reduction measure in North America in this time frame.

Emissions from coal-fired electricity generation have already fallen by one-third – from 34.5 Mt in 2003, to 23.0 Mt in 2008. The province is working to cut another one-third of the total emissions from coal-fired generators by 2011, with a complete phase-out scheduled by the end of 2014. As a midway point,

Ontario plans to reduce CO₂ emissions from coal-fired power stations to 19.6 Mt in 2009 and 15.6 Mt in 2010, with emissions dropping to 11.5 Mt between 2011 and 2014. By the end of 2014, the carbon footprint from electricity generation in Ontario will have been reduced by approximately 75 per cent as a result of this phase-out.

The province is on track to meet its 2009 target. In September 2009, the Minister of Energy and Infrastructure announced that Ontario Power Generation (OPG) will close four coal-fuelled power units in 2010 – four years ahead of the 2014 target. OPG will close two of the eight coal-fired units at its Nanticoke station near Simcoe and two of four units at its Lambton plant near Sarnia by October 2010. Together, these plants represent nearly 2,000 megawatts (MW) of generation capacity. Along with the shutdown of the Lakeview Generating Station in 2005, the early phase-out of these coal-fired generating units reduces in-service coal capacity by 40 per cent since 2003.

In September 2009, the Minister of Energy and Infrastructure announced that Ontario Power Generation (OPG) will close four coal-fuelled power units in 2010 – four years ahead of the 2014 target.

Recent government decisions respecting procurement of new nuclear capacity are not expected to affect Ontario's GHG projections. The province continues to evaluate its options respecting nuclear new capacity and nuclear refurbishment as part of the long-term supply plan process.

The Green Energy Act

Building on Ontario's significant progress towards phasing-out coal-fired electricity and bringing more wind and other renewable energy supplies online, the government introduced the landmark Green Energy Act. This new legislation was passed in May 2009. Regulations and other tools needed to fully implement the legislation were introduced in September 2009 as part of a 10-step plan to bring the act to life.

The act is forward-looking legislation that, combined with other initiatives, will help spur Ontario's progress towards a low-carbon future by promoting energy conservation, green power and green jobs.

The act will make it easier for developers to get renewable projects up and running and on the grid – such as new wind turbines, solar panels and bio-energy plants. New regulations will eliminate many of the barriers faced by proponents of renewable energy while ensuring human health and the environment are protected. Streamlined regulations for energy approvals will provide a consistent approach to renewable energy projects right across the province. The regulations will also make it easier for green power producers to navigate the provincial approvals process. To guide project developers, communities and municipalities through these regulations, the government has established the [Renewable Energy Facilitation Office](#) as a one-window access point to assist with renewable energy projects.

Other regulations under the act will foster a culture of conservation by helping homeowners, government, schools and



industry increase energy efficiency in their buildings and reduce energy use, operating costs and GHG emissions.

Greening Ontario's energy supply

Since 2003 Ontario has added more than 7,000 megawatts (MW) of new, lower-emission electricity to the provincial grid. These new energy projects have been a mix of cleaner gas-fired generation and 1,223 MW of green, renewable power, including growing Ontario's installed wind power capacity to 1,162 MW.

A new renewable energy electricity pricing system, which expands upon the earlier success of the Renewable Energy Standard Offer Program and encourages development of a range of clean, renewable energy projects from a diverse group of producers – including homeowners, farmers, community-based groups and larger-scale commercial developers – was introduced in September. The new system, called a feed-in tariff program (FIT), is North America's most comprehensive, offering stable,

competitive prices that vary based on the project's size and the renewable energy technology utilized. FIT provides long-term procurement contracts – 40 years for hydroelectric projects and 20 years for all other technologies. A number of other countries, such as Germany, Spain and Denmark, have successfully used FIT programs to encourage the development of renewable energy projects. The program opened for applications on October 1, 2009.

Ontario's FIT program focuses on facilities that have energy generated from renewable sources, including on-shore and off-shore wind developments, water power, solar, biogas, biomass and landfill gas plants.

The FIT prices, which were based on experiences both from Ontario and from other jurisdictions, are designed to cover the capital, operating and maintenance costs of the facilities while also allowing the developer a reasonable rate of return on investment over the term of the contract. FIT prices also provide additional incentives for community-based and Aboriginal projects.

A series of 10 transmission projects in the northern distribution network are expected to create more than 6,000 jobs in the region and an upgraded northern transmission and distribution grid will support over 3,000 megawatts of renewable resources.

Investing in transmission capacity is another important way to help green Ontario's energy supply. In September 2009 the government directed Hydro One to immediately proceed with planning and implementing major transmission and distribution projects across the province, with nearly half of the \$2.3 billion investment to be spent on projects in northern Ontario over the

next three years. A series of 10 transmission projects in the northern distribution network are expected to create more than 6,000 jobs in the region and an upgraded northern transmission and distribution grid will support over 3,000 megawatts of renewable resources, such as wind, hydroelectric and solar power, by 2020. The investments are also expected to grow industry in the area and open up the potential for future green energy initiatives in First Nation communities.



The Ontario government is also providing assistance to community groups looking to build new green generation. Through the Community Energy Partnerships Program, community groups, including co-ops, non-profit groups and local partnerships, would be eligible for one-time financial assistance of up to \$200,000 for project costs. These projects would also receive a premium incentive of an additional one cent/kilowatt hour when selling energy into the grid. Through the Municipal Renewable Energy Partnership Program, municipalities will be reimbursed for some costs related to hosting renewable energy projects, which could include costs for roads, traffic management or surface drainage. A special program – the Aboriginal Energy Partnerships Program – will work with Aboriginal communities to develop community energy plans, build capability and share best practices, and develop renewable energy projects with premium incentives and a \$250 million loan guarantee program.

The Green Energy Act will deliver new green opportunities for municipalities – enabling municipalities to develop/own/operate generation directly, helping to “green” their own operations, and enabling local distribution companies (LDCs – many of them municipal) to engage in building and running conservation programs for their own communities. These opportunities,

combined with a record investment in infrastructure funding have replaced the Municipal Eco-Challenge program. The government will continue to explore new ideas to help municipalities participate in growing Ontario's green economy and greening their own infrastructure.

Moving toward a smart electricity grid

The development of a smart grid will help build a greener electricity system by making it easier to integrate increasing amounts of renewable energy into the electricity distribution system, enabling new conservation technologies and supporting future advancements such as electric vehicles. A smart electricity grid will also help local utilities identify problems faster, bringing together advances in information and communication technology with electricity generation to allow supply, demand and transmission to respond to each other in real time to increase reliability and performance.

The Green Energy Act establishes a regulatory framework that will support and enable the development of a smart grid over time. As well, the 2009 Ontario Budget announced that the government will invest \$50 million over five years to enable the research, capital and demonstration projects necessary for the development of a smart grid.



Ontario is already a leading jurisdiction in North America in this area, having installed more than 2.4 million smart meters, and is on its way to installing a total of 4.5 million. Together with time-of-use electricity rates, smart meters will result in more engaged consumers and contribute to the development of a culture of conservation.

Together with time-of-use electricity rates, smart meters will result in more engaged consumers and contribute to the development of a culture of conservation.

In the coming months, the government will continue working with its energy agencies, local distribution companies, transmitters and the private sector to develop a strategic implementation of a smart grid to support Ontario's energy objectives.

Smarter electricity pricing comes to Ontario

June 2009 marked an important milestone for 10,000 Toronto homeowners, as Ontario began the province wide rollout of time-of-use electricity rates. These Toronto residents joined 40,000 others in Milton, Newmarket and Chatham-Kent who are already on time-of-use rates. By the summer of 2010, a million Ontario households are expected to be on the new rates.

Time-of-use rates work in combination with smart electricity meters to give consumers more information on their power consumption, allowing them to make smarter decisions about how and when to use electricity and help the province better manage its peak demand. The varying rates reflect the fact that electricity costs more to produce when the demand for it is highest.

Switching their use of energy-consuming appliances such as washing machines or dishwashers from peak demand periods to evenings or weekends can help consumers better manage

1,162_{MW}

of installed wind capacity
reached in Ontario as of
August 2009.

their energy consumption and costs. Managing the use of other appliances like air conditioners can also help reduce electricity demand and cost.

Harnessing the power of conservation

Conservation is cheaper and cleaner than providing new energy supply. During 2008-09, efforts to improve efficiency and reduce energy use across the province continued – with emphasis on reducing electricity demand during peak demand periods.

Conservation efforts – especially those targeted at peak demand – can reduce the amount of electricity infrastructure we need. This in turn reduces the cost of the electricity system for all users, while also providing benefits to the environment.

By 2025 the province is targeting savings of more than 20 per cent of the forecasted peak demand. By the end of 2007 Ontario had already reached its first interim target – 1,350 MW. These efforts are contributing towards the province's additional target of 1,350 MW in conservation savings by the end of 2010, with a 450 MW demand reduction achieved in 2008.

A key focus of energy conservation is to target the energy efficiency of buildings. As part of a joint Federal/Provincial/Territorial process, Ontario's building code is being revised. Work is currently under way to update the model National Energy Code for Buildings, and to incorporate energy efficiency for houses into the next model. Ontario's building code has contained energy conservation provisions since it was first published in 1975, and includes resource conservation as a core purpose and objective.

One of the other ways the province is working to achieve its conservation goals is to make energy efficiency improvements "one house at a time." In May 2009 the government announced plans to more than double its investment in the Ministry of Energy and Infrastructure's popular Home Energy Savings Program.

The increased rebates provide extra help for homeowners who undertake energy efficiency upgrades and other GHG-saving home improvements. Assistance is available for a range of improvements, such as fixing the insulation in attics, foundations, basements and crawl spaces, and upgrading leaky windows and doors.

The program enhancements include numerous additions designed to increase uptake of conservation measures. For instance, provincial funding for solar domestic hot water systems increased 150 per cent to \$1,250 from \$500.

To take advantage of the rebates available under the program, homeowners must first conduct a home energy audit – which is a vital step in understanding a home's energy consumption. The audits provide information on where the energy is spent, and also indicate which improvements can save homeowners the most on their energy bills.

The Ontario Power Authority and the province's local distribution companies are also leading a number of other conservation initiatives targeting residential, commercial and industrial sectors. For example, the consumer program offers Ontario's residential customers a broad range of opportunities to participate in energy conservation, including coupons for rebates on energy-efficient equipment, an appliance retirement initiative and incentives for devices that manage energy demand. The business program offers energy-efficiency opportunities for new construction and existing buildings in commercial and institutional sectors, as well as various energy demand management options. The industrial energy efficiency program provides financial incentives to support green operations and practices of industrial consumers that are directly connected to Ontario's transmission system.

Harnessing water power

At the Adam Beck Generating Station in Niagara Falls, where water power has been in constant production for more than 100 years, the plant's output is being increased by the addition of a new tunnel that will provide 1.6 million MW hours of electricity per year –

which is equivalent to the average needs of some 160,000 homes. Four other water power projects are currently under construction across Ontario, which will add another 80 MW of clean, renewable hydroelectric capacity to the provincial grid.

Some of the water power projects currently underway highlight the value of the province's enhanced engagement process with First Nations and Métis communities. The Lac Seul project, near Ear Falls, came online in early 2009, and represents an excellent example of collaboration. The project is a joint venture involving the Lac Seul First Nation. The project provides an additional 13 MW of hydroelectricity to Ontario's electricity grid, along with significant economic benefits to the First Nation community.

Another example of successful partnership is the 25 MW Umbata Falls development on the White River near Marathon. This project, a partnership between the Ojibways of the Pic River First Nation and a private developer, came into service in November 2008.

The Ontario Power Authority is also working with several existing small hydroelectric plants across the province to negotiate new long-term contracts and ensure their renewable energy continues to be available for the benefit of Ontarians. New hydroelectric facilities are expected to come online over the coming years as a result of the feed-in tariff program.



Harnessing the power of the wind

Since 2003 Ontario has made rapid progress in building new, green energy supply, including a nearly 80-fold increase in wind power capacity. During the past year, several major Ontario-based wind projects went online – doubling the province's wind energy capacity in a single 12-month period. At the beginning of September 2008, Ontario had 521 MW of wind power capacity – and in August 2009 a total of 1,162 MW of wind capacity was online with 670 turbines across the province, compared to 532 MW in Quebec and 524 MW in Alberta.

Wind energy represents an ultra-clean source of power, since it emits no GHGs while in operation. Canada's four largest wind farms are all in Ontario. Three of these projects came online during the past year—including the second phase of the 199.5 MW Melancthon EcoPower Centre near Shelburne, the 181.5 MW Enbridge Ontario wind farm near Kincardine, and the 197.8 MW Wolfe Island wind farm near Kingston. In June 2009, Ontario reached 1,000 MW of installed wind capacity when the Wolfe Island wind farm came online. The Melancthon EcoPower Centre is currently Canada's largest operational wind farm. This 133-turbine facility can produce enough emissions-free electricity each year to meet the needs of some 54,000 homes.

In January 2009 the Ontario Power Authority announced 20-year contracts for six large wind energy projects. These projects will create about 2,100 direct and indirect jobs, and provide nearly 500 MW of clean, green power by 2012. Three of the new projects are located in the Chatham-Kent area, while the other three are located in Essex, Prince Edward County and Thunder Bay. The economic benefits of wind power will benefit a number of Ontarians. These projects will pay about \$3 million in annual lease payments to landowners who host the wind turbines and an estimated \$1 million in municipal taxes each year. The \$1.32-billion capital costs of the projects are being financed privately.



50 million tonnes

of biomass produced each year in Ontario, with enough energy potential to meet the needs of seven million homes.

To help make green job opportunities become a reality in Ontario, the government has announced plans to help St. Lawrence College of Applied Arts and Technology in Kingston offer specialized training. Starting in the 2009-10 academic year, St. Lawrence will offer Ontario's first Wind Turbine Technician program to train skilled workers for the growing wind energy sector.

The government is also partnering with the private sector to invest in local manufacturing. In September the government announced an investment with Windtronics in Windsor to establish local operations to assemble residential and small commercial wind turbines.

Harnessing solar power

A key part of Ontario's green energy plan is to harness the power of the sun by encouraging investments in solar power projects through the FIT program. Solar power investments can range from a few panels on a home or business to large dedicated projects. Solar power has enormous potential to provide reliable, clean energy for Ontarians and to become a key sector in the emerging green economy.

In Sarnia-Lambton, the centrepiece of the region's burgeoning green energy sector – which includes wind and bio-energy – is a major solar installation being developed by First Solar. When completed (expected in 2010), the facility will produce as much as 80 MW of clean energy, and will be one of the largest solar installations in North America.

In Arnprior, a major solar installation is being developed by EDF EN Canada that will produce as much as 20 MW of clean energy. This \$100-million



project, consisting of 300,000 solar panels, will generate enough clean electricity for nearly 7,000 homes during peak times when the province's power demand is highest.

It is anticipated that the Green Energy Act and other provincial policies will continue to attract new solar projects to the province.

Harnessing bio-energy

By 2010 the global renewable and bio-products industry is expected to generate more than \$125 billion a year in revenue. Ontario produces close to 50 million tonnes of biomass each year, with enough energy potential to meet the needs of seven million homes. The FIT program is expected to encourage the development of bio-energy projects across the province in the years to come.



New partnership opportunities that cross traditional sector boundaries are a key part of building the foundations of a strong bio-economy. In November 2008 the government announced an investment of \$50,000 from the Rural Economic Development Program that will help AGRIS Co-operative and Suncor Energy explore new opportunities for alternative fuel sources. This could strengthen southwestern Ontario's bio-economy with the potential for building a unique multi-oilseed plant which could be powered by material produced by local farms. Shifting to the use of innovative alternative fuel sources will help build stronger, healthier and cleaner communities, while creating new economic opportunities and jobs in rural areas.

The government is looking for innovative ways to turn materials from underutilized forest materials into new investment opportunities and jobs. In January 2009 Ontario announced a Request for Expressions of Interest (RFEI) to companies for

innovative ideas on how to better use forest bio-fibre. The goal is to support new investment and create new green jobs in Ontario's bio-economy and value-added manufacturing sectors while maintaining ecological integrity. The Environmental Commissioner of Ontario noted in his 2008-2009 report the need to carefully assess the implications of increased use of bio-fibre on resilience of forest ecosystems. Assessing new policies and program initiatives on a lifecycle basis is an important advance that will inform Climate Change Action Plan measures. Based on the responses to the RFEI, the Ministry of Northern Development, Mines and Forestry (MNDMF) will be in a better position to determine how much of the unused wood and bio-fibre can be used in the future.

New opportunities are also emerging to develop an agricultural biomass industry in Ontario. Agricultural biomass includes agricultural by-products and food/bio-energy processing residues (e.g. dried distillers grains), as well as energy crops like switch grass. Agricultural biomass is being considered as a fuel replacement by the Ontario Power Generation at its Atikokan, Nanticoke and Thunder Bay generating stations, which are currently fired with coal, and at cement plants – which are primarily powered by fossil fuels. Also under investigation is the potential use of agricultural biomass to fuel heating systems at greenhouses, livestock barns, industries, institutions and residences.

In April 2009, the governments of Canada and Ontario announced a five-year investment of up to \$300 million to make Ontario's agri-food sector more innovative, responsive and profitable. The new Growing Forward programs will focus on two areas – best practices and innovation and science. The Best Practices programs will help agri-businesses reduce their emissions by helping to improve their performance in four key areas –

environment and climate change, food safety and traceability, business development and bio-security. The Innovation and Science programs will encourage and support ongoing research and the commercialization of research.

The past year has also seen significant steps forward in bringing to life the government's investment in the Center for Research and Innovation in the Bio-Economy (CRIBE). In December 2008 a taskforce presented recommendations to the Minister of Research and Innovation on the future operation of the centre, located at Lakehead University in Thunder Bay. Part of CRIBE's initial focus will be developing a pilot bio-refinery initiative in Thunder Bay that will provide a "test bed" for new products and processes that use wood fibre as a raw material and lead to next generation forestry products.

ONTARIO FIRM PARTNERS WITH CHINESE COMPANY ON NEW RENEWABLE TECHNOLOGY

In October 2008, Canadian Windfields Solar and Renewable Energy Corporation announced plans to build a demonstration plant near Shanghai with Chinese company Wuhan Liren. At the same time, the Chinese firm is investing in a new Ontario plant that will build and support the company's biomass electricity generation systems. The new plant will be the first of its kind in North America. Instead of using traditional renewable energy sources, such as solar and wind, the plant will run on agricultural and unused forest bio-fibre.



Transportation

\$11.5 billion

will be invested by Ontario in public transit projects in the Greater Toronto and Hamilton area (GTHA) over the next several years.

Photo: GO Transit

Transportation

Moving Ontario in greener directions

GHGs from transportation accounted for 31 per cent of Ontario's 2007 total emissions. One of the best ways to reduce transportation-related GHG emissions is to get more people out of their cars and on to public transit. Providing Ontarians with greener transportation alternatives is a cornerstone of the action plan.



Under the province's MoveOntario 2020 initiative, launched in June 2007, the government is making the largest transit investment initiative in Canadian history. This historic commitment forms the foundation for the priority projects in Metrolinx's Regional Transportation Plan. Over the next several years, Ontario will invest \$11.5 billion in public transit projects in the Greater Toronto and Hamilton area (GTHA).

In 2008 the government also announced a new, streamlined regulation for assessments of public transit projects to bring new transit services online more quickly. Between September 2008 and October 2009, the province has also invested more than \$300 million in local public transit projects in communities throughout Ontario through the sharing of provincial gas-tax revenues.

The province's massive transit expansion and improvement investment provides a solid foundation for the long-term transit plans identified in *The Big Move*, the Regional Transportation Plan released in 2008 by Metrolinx, the province's regional transportation planning agency for the GTHA. One of the plan's goals is to create a transportation system with a smaller carbon footprint and lower GHG emissions. In fact, Metrolinx estimates that the projects, policies, and programs outlined in the plan, in conjunction with the beneficial effects of the Growth Plan for the Greater Golden Horseshoe, can be expected to reduce GHG in Ontario by between 3.3 and 3.7 Mt of CO₂ eq per year by 2031 – equivalent to about 0.7 tonnes of CO₂ eq for every person who lives in the GTHA.



THE BENEFITS OF PUBLIC TRANSIT

Since 1996 travel volumes in the GTHA have increased by more than 20 per cent, to the point where some eight million automobile trips are made on an average workday on the area's roads and highways. Traffic studies have shown that during a normal rush hour, the average vehicle in the GTHA is carrying an average of just 1.15 people – which means that the vast majority of the cars on the road have a single occupant.

By contrast, a single GO Transit bus replaces about 50 cars. A 12-car GO Train can carry about the same number of people as 1,670 cars. On a typical weekday morning, about 45,000 GO Train passengers arrive at Toronto's Union Station every hour. If all those people drove cars to work instead of taking public transit the city would need to build four more Gardiner Expressways and four new Don Valley Parkways to handle the additional traffic.

The Regional Transportation Plan embraces the principles of the Growth Plan for the Greater Golden Horseshoe. By directing urban growth to existing built-up areas and limiting the size of the urban area, automobile trips will be shorter than would otherwise be the case. The increases of density within urban growth centres across the GTHA will make transit, cycling and walking viable alternatives to travel by private automobile.

This section outlines the government's actions to build a more seamless, better integrated and coordinated transportation network – a system that helps reduce traffic congestion and GHG emissions, while giving people greener, more efficient transportation alternatives and a better quality of life.

GO Transit merges with Metrolinx

In May 2009 the [Greater Toronto and Hamilton Area Transit Implementation Act](#) was passed. This legislation provides for a merger between GO Transit and Metrolinx, under the Metrolinx banner. This merger will pave the way for faster implementation of public transit projects in Ontario's most populated urban area, and better coordination between the many transit companies that serve customers in the GTHA.

Creating the new Metrolinx and retaining GO Transit as an operating brand within the new agency will help to improve and expand public transit, ease traffic congestion and create thousands of jobs. The government has directed Metrolinx to implement approved projects as quickly as possible, and has appointed a new board for the agency, filled with experts in local government, planning, finance and development.

Greening Ontario's public transit fleet

In February 2009, the federal and provincial governments announced a joint investment of up to \$500 million to support major improvements to the GO Transit system. The federal-provincial funding will provide GO Transit riders in the GTHA and surrounding communities with better access to the GO network, while creating jobs for local construction workers in communities throughout southern Ontario. The investment will help to reduce congestion on roads and highways in major urban areas by adding parking capacity at 12 GO stations and upgrading rail lines to improve the system's reliability. More efficient, reliable and sustainable transit for commuters will also help Ontario's urban centres attract and keep jobs, making our economy more competitive.

GO has also forged ahead with a full range of initiatives to green its operations with the purchase of new locomotives and buses that move more people, use less energy and emit fewer GHGs. For example, GO's new MP40 locomotives are more powerful and fuel efficient than previous engines – allowing for two more passenger coaches per train and up to 300 more passengers on every trip. The new locomotives use the cleanest diesel technology available. GO Transit now has 27 MP40 locomotives in its fleet, and is planning to add another 30 of the engines by the fall of 2010.

In April 2009 GO Transit powered up a new EW50 wind turbine at the Lisgar GO Station in Mississauga. This investment in energy-generating technology is a first. The turbine is expected to generate as much as 80 per cent of the station's power needs.

In April 2009 GO Transit adopted a Station Access Strategy, with the goal of encouraging customers to get to and from the local GO station either on foot, by bicycle or on local transit.

The idea is to reduce the need to keep expanding GO's parking lots by reducing the number of cars parked at GO stations from the current level of 67 cars for every 100 passengers, to 50 cars for every 100 passengers by 2020.

To support the strategy, all GO buses were retrofitted with bike racks as of April 2009. Many GO stations already offer bicycle storage areas or lockers, and in 2009-10, GO is building 56 more bicycle shelters across the system. These investments support an increase in active transportation, which not only means reduced GHG emissions and infrastructure needs; it also improves health outcomes and reduces congestion.

GO's station access strategy aligns very well with the BikeLinX program – one of Metrolinx's signature green initiatives – designed to encourage and accommodate commuters to combine cycling and public transit. Under the BikeLinX program, Metrolinx has funded municipalities in the GTHA to equip their buses with bicycle carrying racks and to purchase and install permanent, secure bicycle storage facilities in strategic locations throughout the region. Municipalities have already begun to plan and install more than 2,300 new bike racks, along with numerous secure bike parking facilities.

Looking to the future, GO Transit is undertaking a study for the electrification of the entire GO Transit rail system. The recommendations of a Community Advisory Committee were approved unanimously by the Metrolinx board in October 2009. The study will be the first ever comprehensive examination of the possible electrification of the entire GO system. The study is also unique in that it involved stakeholder engagement in the development of the scope of work.



Photo: GO Transit

5,450
tonnes

of GHG emissions were prevented by the Smart Commute program in 2008-09.

Smart Commute program's popularity rising

Another important green initiative is the Smart Commute program, a joint venture of Metrolinx, area municipalities and employers. Under the program, participating employees can obtain services and assistance to explore a range of commuting options, including carpooling, cycling, walking, teleworking and switching to a more flexible work schedule.

The Smart Commute program is delivered through a network of local transportation management associations (TMAs) in the GTHA. It now has 10 TMAs, and more than 100 employers and 275,000 commuters. In 2008-09 Smart Commute helped commuters save more than \$3.9 million and prevent more than 5,450 tonnes of GHG emissions.

Ontario Transportation Demand Management Municipal Grant Program

The Ministry of Transportation initiated the Ontario Transportation Demand Management (TDM) Municipal Grant Program in 2008 as a way of responding to the call for more provincial support for sustainable transportation initiatives and as a way of demonstrating the ministry's commitment to reducing the impact of our transportation system on the environment. Eligible TDM initiatives involved education, promotion, outreach, or various incentives and disincentives to help travelers choose alternatives that have less impact on the environment.

In 2008-09, the pilot year for the grant program, a total of \$250,000 was awarded to 13 municipalities to assist them in developing and implementing TDM initiatives. The projects selected involve a wide range of initiatives, some of which are quite innovative for Ontario. They included community-wide bicycle safety and commuter challenge promotions, transit promotion campaigns targeted to school children and disabled

riders, walk-to-school programs, new bicycle parking and bike path signage, and comprehensive TDM and cycling plans for neighbourhoods and entire regions. The selection process for a second round of funding in 2009-10 is underway.

Fast-tracking approvals for public transit

The environmental assessment (EA) process for transit projects has typically taken between two and three years to complete. Because public transit is a high priority, the government announced a new, six-month limit on the assessment process for all public transit projects. This means more transit projects will be completed sooner.

Under the Transit Project Assessment Process, Metrolinx, municipalities and municipal transit authorities will engage in 120 days of formal consultation on a proposed project description and prepare an Environmental Project Report (EPR). The EPR will include environmental conditions, impacts of the project and proposed mitigation. The public will have a further 30 days to review the EPR followed by a 35-day review period by the Minister of the Environment. The minister will then decide whether the project can proceed as described or be subject to conditions or additional work.



Transportation

As a result, several municipal and regional transit projects are moving forward under the new, streamlined assessment process, including the Georgetown South Service Expansion and Union Pearson Rail Link, and the Yonge Subway North Extension. The Region of Waterloo's Rapid Transit project and the Downtown Ottawa Transit Tunnel project are also currently conducting the streamlined process.

The regulation provides for the provincial oversight to ensure that the natural environment, cultural heritage values, and constitutionally protected aboriginal or treaty rights are protected.

Toronto's red rockets going green

The government is creating more than 5,000 direct jobs and an estimated 10,300 indirect jobs with improvements to Toronto's public transit system through a \$416-million investment in a new fleet of 204 state-of-the-art energy-efficient streetcars.

Thunder Bay's Bombardier plant will deliver two prototypes of the new cars to the Toronto Transit Commission in 2011. Twenty of the new cars are expected to be in service by 2012. These new cars will replace the city's aging streetcar fleet with fully accessible vehicles that are larger and more energy efficient and comfortable.

Networking HOV Lanes on major provincial highways

The province invested more than \$150 million to build the first provincial high-occupancy vehicle (HOV) lanes on Highway 403 and Highway 404. New HOV lanes are currently being constructed on the QEW in Halton Region and on Highway 417 in Ottawa at a cost of \$497 million. HOV lanes help reduce emissions by encouraging carpooling and the use of public transit. These projects are part of Ontario's 2007 plan to create a network of more than 450 kilometres of HOV lanes on 400-series highways throughout the Greater Golden Horseshoe.



Investing in more efficient highway operations

The Ministry of Transportation is converting all of its traffic signals to high-efficiency LED lamps. This will save enough energy to continuously light almost 12,000 100-watt light bulbs for one year. The ministry has also converted its Fort Erie Truck Inspection Station building to solar power and is making 100 per cent of all reclaimed pavement available to private-sector contractors who repair and build roads across Ontario.

Government helps commercial fleets go green

The government is encouraging Ontario companies to switch to greener commercial vehicles and technologies to reduce GHG emissions. Through the Green Commercial Vehicle Program – a four-year, \$15-million initiative – Ontario provides grants to companies for purchasing alternative fuelled medium-duty vehicles or retrofitting heavy-duty vehicles with anti-idling technology. To date the program has received more than 1,500 applications from about 200 Ontario companies.



Photo: GO Transit

Paving the way for the electric vehicle

In January 2009 the government announced that it is working with a company that creates innovative infrastructure for electric vehicles. This is a necessary step in getting electric cars onto Ontario's roads and highways.

Under the initiative, California-based Better Place will establish a Canadian head office in Ontario and build an electric vehicle demonstration and education centre in Toronto. The centre will promote consumer awareness and acceptance of electric vehicles. Better Place has also agreed to develop a plan for an electric vehicle charging network that includes timelines and costs as a fundamental step towards the widespread adoption of electric vehicles and associated technologies.

In July 2009 the government then unveiled a plan to help consumers switch to greener vehicles. Owners of plug-in hybrid electric and battery electric vehicles will:

- Receive rebates between \$4,000 and \$10,000 based on the vehicle's battery capacity for vehicles purchased after July 1, 2010
- Be rewarded with a green licence plate that will allow single occupant electric vehicles to use HOV lanes for a limited five-year period
- Be able to charge their vehicles at Ontario government and GO Transit parking lots.

Ontario will lead by example and build consumer demand by purchasing electric vehicles for the Ontario Public Service vehicle fleet. Twenty per cent of eligible new Ontario public sector passenger vehicle purchases will be electric – so by 2020 the fleet will have up to 500 electric vehicles.

Expanding the use of electric vehicles by consumers and government will put Ontario at the forefront of the new, green economy in North America. The Ontario government aims to have one out of every 20 vehicles driven in Ontario to be electrically powered by 2020.

Land Use and Stewardship

12.5
million
tonnes

of carbon dioxide are absorbed from the atmosphere every year by the Far North Boreal region's trees, soil and peat resources.



Photo: Ontario Tourism

Land Use and Stewardship

Through such legislation as the Places to Grow Act and the proposed Far North Act, Ontario is setting out frameworks for sustainable growth that protect the province's natural resources and recognize the carbon storage and sequestration capacity of natural areas. In 2009 the government continued to build on the strategy set out in the Places to Grow plan and Lake Simcoe Protection Act, releasing its strategy for the Simcoe area.

42%

of Ontario's land mass
is made up of the
Far North region.

The province's vision document [Simcoe Area: A Strategic Vision for Growth](#) anticipates that the population of the Simcoe area will grow to about 667,000 people by the year 2031 from 437,000 today. This vision document outlines key priorities for ensuring sustainable long-term growth in the Simcoe area, including:

- Curbing urban sprawl by focusing new development into existing cities and towns that already contain a mix of uses and services and can accommodate growth through intensification
- Building on Simcoe's diverse economic base to create new jobs along the Highway 400 and Highway 11 corridors
- Protecting green spaces and agricultural areas, and creating a cleaner Lake Simcoe by minimizing urban expansions and the impacts of urban development
- Outlining a clear future for the City of Barrie as the area's largest urban centre and its role in fulfilling the Simcoe area vision.

To accommodate this future growth, the vision document proposes Barrie as the Simcoe area's urban anchor, with

additional urban growth targeted mainly at centres such as Orillia, Collingwood, Alliston and Bradford.

Stewardship

Ontario's Boreal Region

In July 2008 Ontario made protection of the Far North Boreal region a signature environmental stewardship commitment. The Far North region makes up about 42 per cent of Ontario's land mass. The area's trees, soil and peat resources act as a globally significant carbon sink by absorbing approximately 12.5 million tonnes of carbon dioxide from the atmosphere every year.

In June 2009 Ontario took an important step toward the permanent protection of at least half of the province's Far North region – an area three times the size of Lake Superior – with the introduction of the proposed Far North Act. The Far North spans the whole width of Northern Ontario, from Manitoba in the west, to James Bay and Quebec in the east. It covers more than 40 per cent of the province – some 450,000 square kilometres.

The proposed legislation would protect at least 225,000 square kilometres of Ontario's Far North through a network of conservation areas. The initiative will also introduce a community-based land use planning process that would allow Far North First Nations and the province to decide which areas should be protected and which areas should be used for economic development. The initiative would also conserve essential habitat for species such as woodland caribou and Ontario's only populations of polar bears and snow geese through a network of conservation lands. Finally, the proposed legislation will help slow climate change by ensuring the vast Far North boreal landscape maintains its capacity to act as North America's largest carbon sink.

The proposed Far North Act resulted from more than nine months of cooperation and dialogue among the province, First Nations, resource industries, scientists and environmental groups. To date, the province has successfully negotiated 13 Memoranda of Understanding around land use planning with First Nations in the Far North. Land use planning currently under way supports adaptation efforts to recognize the diversity of Ontario's biological heritage, including species at risk, forests, and the carbon rich wetlands of the Hudson Bay Lowlands.

Tree planting activities

The Ministry of Natural Resources is engaged in two separate tree planting programs: the 50 Million Tree program and the Urban Greening Initiative. The 50 Million Tree program involves large-scale planting efforts on rural lands in southern Ontario in partnership with [Trees Ontario](#). In the first phase of this program the government is committed to investing more than \$3 million per year and partnering with Ontario Stewardship councils, conservation authorities, contractors and community groups. Since 2008, approximately 3.6 million trees have been planted. Over time, the number of trees planted each year will increase.

Ontario recognizes the need to return more natural cover to the landscape to restore critical ecosystem functions such as protecting soil, air and water. Increasing the amount of forest

cover on the landscape will promote healthy natural systems that are more resilient to the changes that are coming.

An additional planting program, the Urban Greening Initiative, aids smaller-scale community planting in publicly accessible green spaces. This program provides funds to public agencies, institutional landowners and community organizations undertaking volunteer-driven tree planting projects. Through an agreement with the Ministry of Natural Resources, the non-profit group Evergreen has been facilitating the planting of 100,000 native trees and shrubs in 2008 and 2009. The Ministry of Natural Resources focuses on planting forests at a larger, landscape scale. It is also engaging citizens in grass-roots efforts to support these campaigns at an individual level. The ministry has created a website (ontario.ca/plantatree) where people can spread the word about how they are fighting climate change by planting trees. Visitors to the site are also encouraged to submit stories and photographs of local tree-planting events and provide information on how many trees they have planted. The site also contains useful information about tree-planting and its benefits.

Community Go Green Fund

In encouraging local stewardship of our environment, the Ontario government also partners with local community groups. In October 2008 and October 2009, the province launched the second and third rounds of funding for the Community Go Green Fund.

The 2008 round is supporting 34 new grassroots, community-based projects to fight climate change and reduce GHG emissions at the local level. To date, 57 community-based projects have received more than \$4 million in funding – the 2010 report will highlight the results of the third and final round of funding.



3.6 million trees

have been planted under the 50 Million Tree program and Urban Greening Initiative since 2008.



Adaptation

The shift in weather patterns and increased frequency and severity of storms can mean a critical strain on infrastructure built for yesterday's risk specifications.

Adaptation

Planning for Ontario's future climate impacts

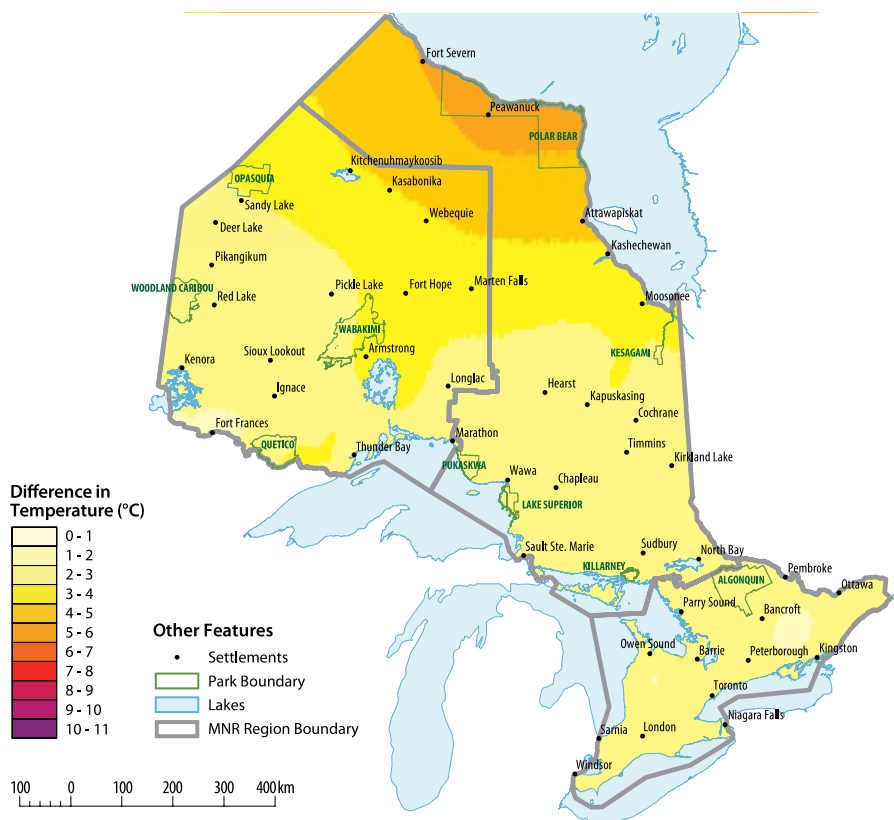
Climate scientists recognize that all climate projections involve making assumptions about the future. However, their assumptions are based on careful studies of historical observations and a thorough analysis of these facts to identify important patterns and trends. Despite this inherent uncertainty, *every climate projection carried out for Ontario indicates an increase in the average annual temperature over the next 20 to 50 years*. Most of the models also project an increase in annual precipitation. From this perspective it is not really a question of *whether* Ontario will be warmer and wetter in the future – but a question of *how much* warmer and wetter it is likely to be, and what actions we need to take to adapt to these changes in our climate.

The seasonal climate projections show a warming trend that will be most pronounced in northern Ontario in the winter. As well, the projections for southern Ontario's weather indicate that the number of summer days over 30°C is expected to more than double by 2050.

The scientific projections for increased precipitation are not as consistent. However, most of the models show that northern Ontario will get more precipitation in the future, with some

estimating the increase at more than 40 per cent. A slight decrease in annual precipitation is predicted for other parts of the province. For southern Ontario, some models show a 10 per cent decrease in summer and autumn rainfall by 2050. The amount of moisture available will also be affected by warmer temperatures and longer growing seasons – which have an impact on evaporation and evapotranspiration rates.

FIGURE 8: B2 Scenario, Average Winter Temperature Difference* Between 1971-2000 and 2041-2070 in Ontario



*Temperature values are calculated for the months of December, January and February.

S.J. Colombo, D.W. McKenney, K.M. Lawrence and P.A. Gray. 2007. Climate Change Projections for Ontario: Practical Information for Policymakers and Planners. Ontario Ministry of Natural Resources, Applied Research and Development Branch. Climate Change Research Report CCRR-05. Sault Ste. Marie, ON.

Climate information derived from spatial climate data provided by Natural Resources Canada/Canadian Forestry Service Sault Ste. Marie.

Published February, 2007, © 2007, Queen's Printer for Ontario. This map is a product of the Applied Research and Development Branch of the Ontario Ministry of Natural Resources and the Canadian Forest Service. Produced By: The Provincial Geomatics Service Centre, PGSC Project ID: #5415, Projection: Lambert Conformal Conic, Datum: North American Datum 1983.

This map is intended for the purposes of illustration and discussion only. It shows one of a range of possible future projections of Ontario's climate. Predictions of future climate may vary from those shown here due to uncertainty in the rate of global release of greenhouse gases due to human activity, unknown or inaccurately quantified feedback responses releasing/absorbing greenhouse gases from land and water ecosystems, and shortcomings associated with climate modelling. Do not rely on this map for legal administrative purposes. This map may contain cartographic errors or omissions.

Some of the winter projections show an increase in precipitation that grows from south to north and ranges from 10 per cent to more than 40 per cent. The same projections also indicate that extreme precipitation events will become more intense and more frequent. While lake-effect snow will likely increase in the short to medium-term, as lake temperatures rise and winter air temperatures remain cool enough to produce snow, the projections show that by the end of the 21st century average snowfall amounts may decrease, possibly being replaced by heavy lake-effect rainfall events.

Climate change impacts

Planning to adapt to these changes to our climate is a major challenge, because of the significance of the impacts and the uncertainty they create. As the map at the left shows, these impacts will vary in different regions of the province, requiring different actions. Changes in temperature and precipitation will have interactive and feedback effects that are difficult to predict. Adding additional layers of complexity are the increasing weather variability and extreme weather events predicted as a result of climate change and the difficulty of predicting greenhouse gas levels that result from global-level decision-making.

The shift in weather patterns and increased frequency and severity of storms can mean a critical strain on infrastructure built for yesterday's risk specifications. Increased temperatures can increase the spread of vector-borne diseases and heat-related mortality. Changing precipitation patterns can make it far more difficult for farmers to manage agricultural production. Forest ecosystems are threatened by these interactive effects, along with increased fire risk. Communities in the Far North are some of the most vulnerable to climate change impacts, with extreme shifts combining with unique challenges to threaten quality of life.

Adaptation

These risks are real, and they are the reason why Ontario is taking action to reduce our GHG emissions. However, the global concentration of climate change-causing GHG emissions is not within Ontario's control. While we can and must do our part to mitigate the effects of climate change to have an impact on global GHG concentrations, Ontario must adapt to the changing climate.

Government policy actions on adaptation

Adaptation is about protecting us, our environment and our economy through taking action to reduce the potential risks and exploit opportunities associated with a changing climate.



The Ontario government's measures for addressing climate change adaptation include:

- The Lake Simcoe Protection Plan requires the development of a climate change adaptation strategy for the watershed by 2011
- The Ministry of the Environment is currently consulting on a water conservation and efficiency strategy which will increase the resilience of Ontario's water resources
- The Ministry of the Environment is assessing emerging science needs to consider climate change impacts within the source water protection planning process. Recently, with leadership from the Ministry of Natural Resources and the Credit Valley Conservation Authority, a pilot project was carried out to create a technical guide to aid in water budgets and modelling and in preparing adaptation strategies to protect drinking water sources
- The Ministry of Health and Long Term Care has established minimum health requirements for fundamental public health programs and services that require increased public awareness of the factors associated with the health hazards of extreme weather and climate change
- The Ministry of Natural Resources is conducting leading-edge science and research to allow Ontario to better understand and adapt to impacts of climate change on biodiversity and healthy, sustainable ecosystems
- The Ministry of Northern Development, Mines and Forestry and the Ministry of the Environment are working with the Ontario Centre for Climate Impacts and Adaptation Resources to develop climate change vulnerability, risk and opportunity assessments to inform the Northern Growth Plan

- The Ministry of Energy and Infrastructure modified its Infrastructure Planning Guidelines to require that ministries consider the impacts of climate change on infrastructure
- The Ministry of Natural Resources' Dam Safety Program is working to take into account the potential risks from climate change in new regulatory design and inspection requirements
- The Ministry of Agriculture, Food and Rural Affairs' Animal Health Strategy. Bill 204, the proposed Animal Health Act was introduced to the legislature in October 2009. If passed, the act would increase the resilience of our agriculture and agri-food sectors in the face of climate change risks from animal disease and food borne disease outbreaks
- The Ministries of Environment and Natural Resources have created new rules for green energy projects to support implementation of the Green Energy Act to improve the climate resiliency of the provincial grid

Premier's commitment to adaptation

In spring 2008 the Premier hosted a National Climate Change Adaptation Summit. The summit brought together more than 100 scientists and academics to solicit practical advice for governments across Canada (e.g. model legislation, best practices, etc.) and to promote an ongoing dialogue between scientists and policy makers. The summit focused on adaptation challenges related to water with three key sub-themes; infrastructure, emergency planning and preparedness and water management. One of the strongest themes to emerge from the discussions was the need to "mainstream" adaptation into the government decision-making process.

Expert Panel on Climate Change Adaptation

The Expert Panel on Climate Change Adaptation was appointed in December 2007 to provide the government with advice on how best to plan and prepare for the impacts of climate change. The [11-member panel](#) is co-chaired by Dr. David Pearson, Professor of Earth Sciences at Laurentian University, and Dr. Ian Burton, Emeritus Professor at the University of Toronto. Dr. Ian Burton and two fellow panel members, Dr. Barry Smit and Dr. Gordon McBean recently received a share of the Nobel Peace prize for their international work on climate change.

The panel engaged 15 ministries and government agencies (including the Climate Change Secretariat) in a process of extensive discussion on a broad range of policy and program areas to develop recommendations culminating in a report to the Minister of the Environment.

The report calls for the Government of Ontario to build a climate-resilient province which will be well positioned to adapt to the impacts of climate change. To this end, the panel made five key recommendations:

- Development of a province-wide climate change adaptation strategy and action plan
- Establish a Climate Change Adaptation Directorate with staff dedicated to adaptation
- Ensure on-going access to a broad range of adaptation experts
- Enhance the Ministry of the Environment's climate change science and modelling capacity
- Identify dedicated funding for adaptation initiatives

Adaptation

To inform the development of a climate change adaptation strategy, the Panel identified the following strategic goals:

- *Enhance government leadership:* Enhance provincial government capacity to take leadership in effectively assessing, reducing and managing climate change and related natural disaster risks, as well as taking advantage of beneficial opportunities.
- *Integrate adaptation:* Integrate adaptation to climate change into the policies and programs of government ministries for the purpose of continuously reducing risks as well as taking advantage of beneficial opportunities resulting from climate change.
- *Support communities:* Increase efforts by communities to improve climate change resilience by providing information, training and tools to support an adaptive, risk management-based approach to the impacts of climate change.
- *Develop and disseminate knowledge and tools to manage risk:* Develop and strengthen the continuous creation and communication of knowledge about adapting to climate change, reducing climate risks and taking advantage of beneficial opportunities through programs of research, monitoring, public awareness and education.
- *Collaborate with other governments:* Seek opportunities to influence and collaborate with other governments in Canada and internationally for the purpose of sharing climate change adaptation experience and developing cooperative activities.

Additionally, the panel provided over 50 recommendations to inform the development of a climate change adaptation action plan. These recommendations identify short and long-term actions for the Government of Ontario to prepare and plan for climate change impacts on areas such as public health, environment, infrastructure and economy. The panel also recommends that the Government of Ontario work with other levels of government including municipalities and First Nations, as well as collaborate with other jurisdictions across Canada and abroad.



Adaptation research and resources

Climate change will not only affect people but wild animals as well. Changes in habitat, food sources, temperature and precipitation are just a few of the things that may require animals to adapt in order to survive. This is one of the reasons why the Ministry of Natural Resources (MNR) is researching the effects of climate change on the Southern Hudson Bay polar bear population.

In the fall of 2008 MNR researchers fitted 13 polar bears along the coasts of James Bay and Hudson Bay with Global Positioning System (GPS) satellite radio collars. The collars pick up six GPS locations a day for each bear, enabling researchers to track where the bears are headed with considerable accuracy. This information will help MNR identify bear movement patterns, and also determine how changing polar ice conditions will affect survival rates and population abundance. A tool developed in partnership with the World Wildlife Fund allows Ontarians to [follow the movements of three of these bears](#) from their own homes.

Ontario has also developed a wide range of research, tools and resources for understanding and planning for how best to adapt to climate change. Some highlights of adaptation research include regional projections of climate change effects on Ontario lake trout populations, forecasts of major natural biotic disturbances such as the spruce budworm's response to climate change and the role of urban forests in adaptation. OMAFRA has also been working with partners to improve awareness of the impacts that climate change may have on crops and plants in Ontario.

Ontario has also developed a wide range of research, tools and resources for understanding and planning for how best to adapt to climate change.

The Ministry of the Environment is enhancing its existing modelling capability to allow the province to better predict the impacts of climate change on the natural environment (i.e. temperature, precipitation, winds) and the associated implications, which will benefit various stakeholders (i.e. government agencies, municipalities, insurance managers, forest, fisheries and ecosystem managers, electric utility managers and public health practitioners).

The Ministry is also enhancing its existing monitoring programs by expanding its monitoring activities to the Far North where climate change impacts are predicted to be more severe. In 2009, the Ministry monitored baseline water quality parameters and aquatic life in several Far North lakes near Hawley Lake on the shore of Hudson Bay. The province's first carbon flux monitoring

station was established in the James Bay Lowlands of Ontario in July 2009 in an effort to better understand the carbon sink/carbon source behaviour of peatland ecosystems in this area. These actions will broaden our understanding of climate change and its effects on the natural environment to allow for better decisions to be made regarding climate change related issues such as land use planning, infrastructure spending, transportation routing and emergency management planning.





Working with Other Jurisdictions

80%

The G8 supports a goal of developed countries reducing emissions of greenhouse gases, in aggregate, by 80% or more by 2050 compared to 1990 or more recent years.

Working with Other Jurisdictions

Climate change is a global problem, and Ontario's efforts are not only important for our own future health and prosperity, they also contribute to the drive for global solutions.

Recognizing this need for cooperation, Ontario has worked closely with other jurisdictions that share common goals through avenues such as:

- The Memorandum of Understanding on climate change with Quebec and collaboration with provinces and territories
- Membership in the Western Climate Initiative
- Membership in The Climate Registry
- Membership in the International Carbon Action Partnership
- The Federal/Provincial/Territorial Building Code development process
- Engagement in the Canadian Council of Ministers of the Environment.



Ontario and Quebec have made significant progress under the 2008 Memorandum of Understanding. Both provinces are moving forward with proposed cap-and-trade enabling legislation and are collaborating on the development of a regional cap-and-trade system with other leading states and provinces in the Western Climate Initiative.

In a joint cabinet meeting on September 11, 2009, Ontario and Quebec committed to continue working together on a range of areas, including moving forward with GHG reporting regulations and consultations with stakeholders on key design issues. Ontario and Quebec are committed to implementing a cap-and-trade system in step with other North American partners and compatible with a U.S. national program likely to be ready by 2012.

The Western Climate Initiative, which includes four Canadian provinces and seven US states, continues to be an important venue for influencing US national approaches to cap-and-trade, including offsets (a mechanism companies can use to find low-cost sources of emission reductions) and new reporting rules, which are critical to establishing an effective cap-and-trade system.



The road to Copenhagen

World governments will gather in Copenhagen in December 2009 to negotiate a successor to the Kyoto Protocol. If successful, this global deal could define a long-term framework for how all nations address climate change. Ontario continues to encourage the federal government to contribute constructively to these negotiations. Ontario encourages Canada to commit to emissions reductions in line with leading developed countries, and to contribute the financial, technical and capacity development resources that will be required by developing countries to mitigate and adapt to climate change.

At the July 2009 meeting of the G8 in L'Aquila, Italy, there was agreement that the G8 has recognized “the broad scientific view that the increase in global average temperature above pre-industrial levels ought not to exceed 2°C in order to avoid the risk of serious economic consequences and irreversible damage to the environment and the climatic system... The G8 supports a goal of developed countries reducing emissions of greenhouse gases, in aggregate, by 80% or more by 2050 compared to 1990 or more recent years.”

Ontario's GHG reduction target for 2050 – which involves an 80 per cent reduction in the province's 1990-level emissions – aligns with this international goal and the long-term goals of other leading jurisdictions and key trading partners.



Photo: Ontario Tourism

Looking Ahead

41%
decrease

in Ontario's projected CO₂ emissions per capita by 2020.

60%
decrease

in Ontario's projected CO₂ emissions per million dollars
of real GDP by 2020.

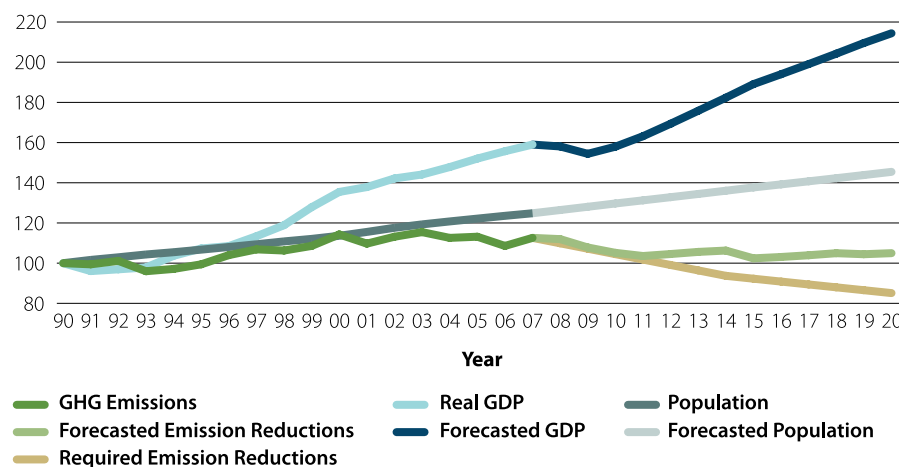
Looking Ahead

Ontario has continued to build on its 2007 Climate Change Action Plan with significant new investments in green energy and conservation, transit, infrastructure, research and innovation. But more needs to be done if Ontario is to meet its 2014 and 2020 targets and to set the stage for the deep reductions needed to meet the 2050 targets.

Ontario has taken the first steps on a long-term journey to a low-carbon future. In 1990 the province's GHG emissions were 17.2 tonnes CO₂ eq per capita and 520 tonnes of CO₂ eq per million dollars of real GDP. By 2020, assuming Ontario's economy, population, and GHG targets evolve as projected, the province's emissions will be 10.1 tonnes of CO₂ eq per capita, a decrease of 41 per cent, and 207 tonnes of CO₂ eq per million dollars of real GDP, a decrease of 60 per cent. These improvements are both realistic and achievable with the technologies available today.

Figure 9: Ontario's Low-Carbon Journey (1990 - 2020)

1990 levels = 100



The year ahead will be critical to Ontario's long-term success and the development of a cap-and-trade system for GHGs will be a key feature. If Bill 185 is passed, cap-and-trade initiatives in 2010 would include:

- New GHG reporting requirements that will ensure the design and implementation of a fair and effective cap-and-trade system
- Developing regulations to ensure that Ontario reaches its GHG reduction targets and that Ontario industry remains competitive through alignment with US and international systems
- Working with other jurisdictions to align where appropriate and avoid duplication
- Measures that can stimulate the development of carbon offsets as a compliance option
- Developing measures that will complement the implementation of cap-and-trade, including transitional support for industry.

Additional climate change activities also planned for 2010 include:

- The province's response to recommendations of the Expert Panel on Climate Change Adaptation
- The government's response to the recommendations of the Premier's Climate Change Advisory Panel
- Assessment of new options that deliver GHG reductions that are additional to cap-and-trade
- New rules for managing waste, including organics
- A provincial water conservation and efficiency strategy based on the outcomes of watershed assessments for 38 regions of Ontario
- A sustainable procurement strategy for government operations.

Over the coming year more work will also be done to strengthen our capacity to report and verify the success or failure of initiatives and to track GHG emissions and sinks, including those from Ontario's forests and agriculture.



Photo: GO Transit

WHAT IS CAP-AND-TRADE?

The Cap

Cap-and-trade is a form of market-based regulation that encourages industry to limit GHG emissions. By passing a regulation, the government establishes a “cap” (or limit) on emissions that will be allowed for Ontario. The total cap is then divided into allowances, which may be distributed to companies that emit GHGs or to others in consideration of GHG reduction initiatives. Emitters must relinquish enough allowances to match their emissions. Over time, as the overall cap is lowered, the total emissions of GHGs go down.

The Trade

Capped facilities must report total GHG emissions following a standardized format. If the facility’s actual emissions are equal to its allowances, the emitter is in compliance, and does not have to do anything once it relinquishes those allowances. If the actual emissions are less than the allocated allowances it holds, the facility has unused allowances (a surplus) that it can sell or save for its own use later on. Creating a surplus of allowances and selling them can help finance the cost of going green.

If a facility’s actual emissions are greater than its allowance holdings, it must purchase allowances from other companies or face penalties imposed by the government.

Allowances are traded and priced based on supply and demand. As the government gradually lowers the total cap on emissions, there are fewer allowances distributed, and this reduced supply will make their

price or value increase. Over time, industries that currently use older, carbon-intensive technology will find it more cost effective to upgrade to new, low-carbon technology to reduce the need to buy allowances.

The European Union is using cap-and-trade, and the US is considering this approach.

Carbon Offsets

Cap-and-trade systems can also create an economic incentive for carbon offsets that can be used to comply with the cap-and-trade regulations. Offsets are projects undertaken by non-regulated industries that reduce or remove GHGs – such as tree-planting (trees naturally capture carbon dioxide) or any other activity that reduces GHGs. Offsets can be purchased like surplus emissions allowances so that emitters can meet their compliance obligations.

Offset projects are usually undertaken by groups, companies, environment associations, etc. To be eligible as an offset, projects have to meet criteria that are laid out by the regulatory authority.

For example, farmers and other rural landowners can develop offset projects by changing some of their practices, such as the way they till their land (tillage/ploughing opens up the topsoil, which releases carbon dioxide) or managing their farm’s manure more effectively. Ontario is also working with its partners in forestry to develop, implement and verify a number of carbon offset measures, including large-scale tree-planting.



Photo: GO Transit

Conclusions

Appendices

Conclusions

This is the second annual report on progress in implementing Ontario's Climate Change Action Plan. There will be at least five more annual reports before we can tell the story of our journey to 2014, the date of our first GHG reduction target. Significant progress has been made toward reaching our targets and in the province's ability to report on progress. But there is much more to do here at home and globally if we are to avoid dangerous climate change.

Climate change is not the kind of environmental problem that can be solved by one jurisdiction. Ontario's actions to reduce GHGs will not slow climate change. Only globally coordinated action that takes meaningful steps to substantially reduce global greenhouse gas emissions in the next decade will protect Ontarians from the worst impacts. Collaboration with governments at all levels and globally through the United Nations, citizens and business is essential to ensure all jurisdictions do their fair share and that we succeed.

To reach our target for 2050 we will need to continue to find ways to cut GHG emissions while transforming our economy and adapting to the climate impacts we are now facing. We will also need to set GHG reduction targets for 2030 and 2040 if we are to remain on track to 2050.

Reaching our 2020 and 2050 targets will break the link between economic growth and growth in GHGs. Completing this journey is a challenge but also an opportunity. Getting it right will be critical to the health of our people and economy. The transformation will take hard work, but the advantages are enormous – an innovative and competitive economy generating the green jobs we need while showing the world that climate protection and a high quality of life go hand in hand.

Appendices

APPENDIX A

ASSURANCE STATEMENT

Based on the methods, data sources, and assumptions used to forecast Provincial GHG emissions for the Ontario Climate Change Action Plan 2009 Annual Report, the forecasted business as usual emissions for Ontario are a fair representation of those expected using current best practices in GHG emissions forecasting. Further, based on the methods, data sources, and assumptions used to model GHG reductions for the 14 initiatives in the 2009 Annual Report, the estimated future annualized GHG emission rates are a fair representation of forecasted annual GHG emission rates that would be expected using current best practices in the evaluation of GHG mitigation programs.

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APPENDIX B: THE NUMBERS

Modeling (also called forecasting) GHG emissions and potential emission reductions is essential to understanding Ontario's progress towards meeting its action plan targets, and to evaluate the likely impact of potential additional actions.

Many variables and assumptions go into creating a forecast, which means that modeling over short to medium-term periods (e.g. between now and 2020) is a highly complex process. Ontario's approach to modeling GHGs from year to year will need to be constantly adjusted to incorporate changing best practices and other refinements based on lessons learned and the latest data available.

Ontario is the first jurisdiction to undertake a validation of its forward looking emission reduction forecasts.

Validating Ontario's results

To provide the public, the Ontario legislature and the Environmental Commissioner of Ontario with confidence in the province's long-term forecasts, the government had its emission reduction modeling methodology and assumptions validated by an independent third party. The process of completing a validation is intended to help provide confidence that the

methodologies and assumptions used to develop the projected GHG emission reductions under the action plan are reasonable and align with best practices where available. Ontario is the first jurisdiction to undertake a validation of its forward looking emission reduction forecasts.

For the 2009 annual report, the Government retained E.H. Pechan & Associates to examine the entirety of the province's emission reduction forecasts, including the business-as-usual forecast and the emission reduction impact of initiatives, to determine alignment with current best practices in GHG emissions forecasting. As seen in Appendix A, they found the province's emission reduction forecasts to be a fair representation using current best practices.

Moving forward, the province will continue to refine and enhance its emission reduction forecasting capacity and incorporate new, emerging best practices as appropriate. Beginning with next year's report, the Ontario government will implement a third party verification process, in addition to continued validation, to verify a sample of the actual results being achieved by individual initiatives.

By verifying actual program results and comparing them with the province's forecasts, the government can ensure that the results published in each year's annual report are not only credible, but also demonstrate the integrity of the province's modeling and risk management process.

Projecting Ontario's future GHG emissions

The approach to GHG modeling used in this year's annual report is based on providing a "snapshot in time." This approach uses the most recent reliable data available at a given time, along with reasonable assumptions about a wide range of macroeconomic, demographic and sector variables to project the likely emission levels between now and 2020.

The analysis contained in this report was developed in July 2009 and represents the best available information at that time. Information that became available after the early summer of 2009 has thus not been factored into the modeling results.

Ontario's approach to forecasting emission levels is based on two key components:

- An analysis of historic linkages between key emission drivers and emission levels
- Projections that evaluate how Ontario's climate-change initiatives will influence future emission levels.

While there are other, more complex methods for forecasting future emission levels, such as energy demand and supply modeling, Ontario decided to adopt a simplified approach after analyzing the historic relationship between key emission drivers, such as Gross Domestic Product (GDP) growth, population growth and energy consumption in the transportation, buildings, electricity, industry, agriculture and waste sectors.

In the case of the industrial and transportation sectors, a strong statistical correlation was found between GDP growth rates and emission levels. In the other sectors, the government was satisfied that a historical trend based approach to forecasting would provide an accurate picture of likely future emission levels.

Source data for the modeling in this year's Climate Change Annual Report is primarily drawn from Natural Resource Canada's [Energy Use Database](#) and Environment Canada's [National Inventory Report](#). In addition, real GDP forecasts from the Ontario Ministry of Finance's [2009 Ontario Budget](#) and the [2005 Long-Term Economic Outlook](#), as well as electricity supply mix information from the Ministry of Energy and Infrastructure and the Ontario Power Authority were used to inform emission forecasts.

This information was used to create:

- A Business as Usual (BAU) forecast – a forecast that assumes that historical emission trends will continue, while accounting for the economic outlook in Ontario and excluding the anticipated effect of the emission reduction initiatives that are both planned and underway.
- An Initiative Impact forecast – a forecast that accounts for the anticipated impact of the emission reduction initiatives that are both planned and underway, while also assuming that these initiatives will be delivered 100 per cent successfully.

Business as usual (BAU) modeling

In the 2007 Climate Change Action Plan, the province published a BAU projection of emissions forecast to 2020 in the absence of government action. The use of a BAU projection is intended to answer the question: What would Ontario's emissions have looked like if no government action had been taken? BAU projections intentionally leave out the impact of current and planned government emission reduction initiatives to provide a baseline for “top down” emissions reduction forecasting.

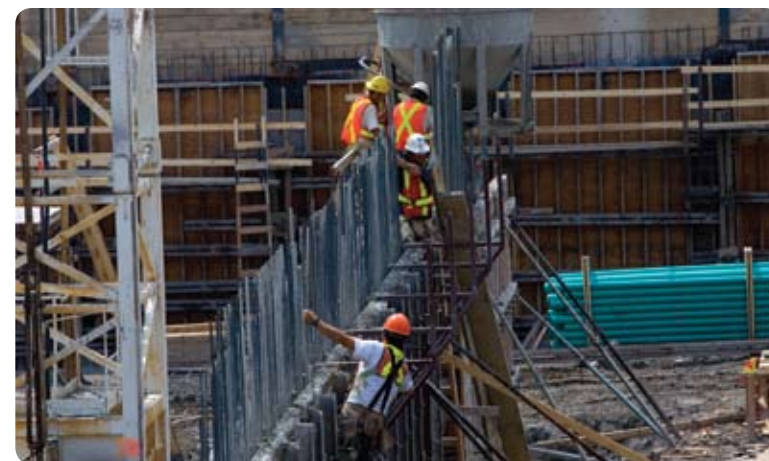
Using a “top down” modeling approach, the impact of both individual GHG reduction initiatives and groups of initiatives is evaluated against a common baseline, and then subtracted from the BAU forecast to develop an emission forecast (i.e. BAU minus Initiative Impacts = Emissions Forecast). This approach can be applied either to individual sectors or to the whole economy.

An alternative to “top down” modeling is “bottom up” modeling. This approach to modeling uses fuel consumption projections and other sector based data sources to determine emission levels in the absence of a BAU scenario (i.e. coal use plus gasoline use plus other fuel use plus agriculture emissions = Emissions Forecast). In either scenario, the emissions forecasts are similar.

To make comparisons to the original action plan BAU compatible with this year's annual report, the government has continued to use a “top down” approach to modeling. In the future, however, as it becomes more difficult to disentangle the impact of the government's GHG emission reduction initiatives from future emission outlooks, we may adopt a “bottom up” approach.

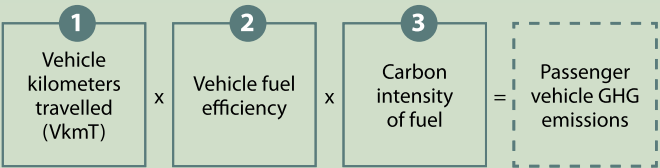
Updating the BAU for the 2009 Annual Report

To support the 2009 annual report, Ontario updated the BAU forecast based on the latest historical emissions data for the province, revised macroeconomic and sector growth assumptions from the Ministry of Finance and enhancements to the underlying sector modeling based on emerging best practices and lessons learned since the release of the 2007 action plan. The original BAU projection from the 2007 action plan and the latest BAU contained in this report are thus not directly comparable. However, it does provide an indication of the extent to which Ontario's emissions trend changed between 2007 and July 2009 in the absence of government action. The key driver of this change was a decline in the province's short to medium-term economic outlook as a result of the global economic downturn.



Example: Passenger Vehicles

The key drivers for emissions from the use of a passenger vehicle are ❶ how many kilometres are driven per year (vehicle kilometres traveled), ❷ the fuel efficiency of the vehicle per 100 km traveled (litres per 100 km) and ❸ the type of fuel used (carbon intensity of fuel per litre). Multiplied together they determine the annual GHG emissions from the use of a passenger vehicle.



BAU Scenario:

An Ontario resident drives 20,000 km per year. The resident’s car has a fuel efficiency of 10L/100 km and uses regular gasoline with a carbon content of 2.4 kg of CO₂ eq/Litre. The emissions from the use of this car are 4.8 tonnes per year.

Taking Action (New Initiative):

The Ontarian decides to help fight climate change by commuting to work using public transit two days a week, lowering overall personal vehicle use by 4,000 km per year (16,000 km per year vs. 20,000 km per year). The revised emissions from operating this car are 3.8 tonnes per year.

Initiative Impact:

A reduction of one tonne of CO₂ eq per year.

Note: This is a simplified example and does not take into account the resident’s contribution to public transit fuel use

Figure B1: Changes in the Business as Usual (BAU) Scenario – Original Climate Change Action Plan BAU vs. July 2009 BAU

(Source: National Inventory Report, 2009)

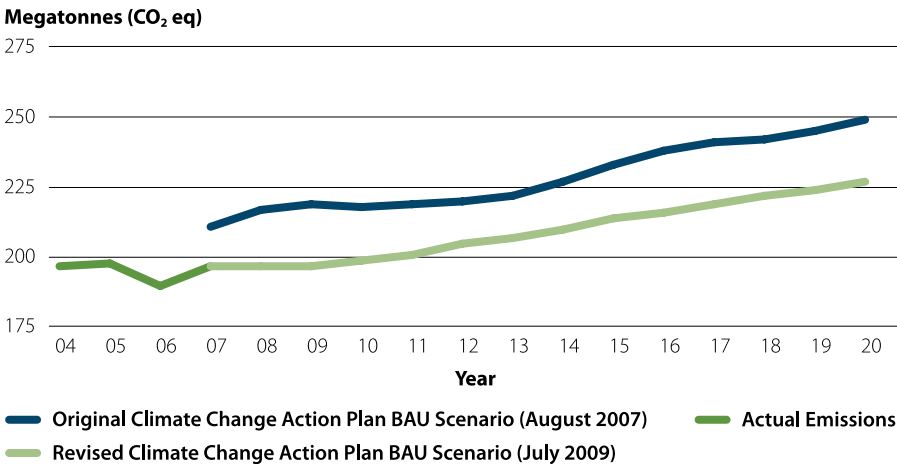


Figure B1 shows that Ontario’s BAU emissions forecast is now projected to be 22 Mt lower in 2009, 17 Mt lower in 2014 and 22 Mt lower in 2020.

Initiative impact modeling

The potential contribution of individual initiatives to reducing emission levels is determined by evaluating the impact of government actions on one or more of the key emission drivers of a particular activity. For example, as illustrated at left, in the case of transportation it is the number of kilometres driven, the fuel efficiency of vehicles and the type of fuel used. The relative complexity of the modeling undertaken to determine the impact of a particular government action depends on the emitting activity that is being targeted, as well as the inter-relationship of that action with other initiatives.

Given the complexity and inter-related nature of Ontario's GHG reduction activities, determining the specific impact of a single initiative can represent a considerable challenge. Many variables – such as economic and population growth and energy consumption trends – are important in evaluating the potential impact of an initiative. The example at right provides a simplified illustration of how initiatives are modeled.

Tracking progress

In his review of the 2008 annual report, the Environmental Commissioner of Ontario noted that “the issue of tracking is fundamental to making course corrections and re-evaluating the design and performance assumptions around the initiatives that are expected to achieve the GHG reductions.” To address the crucial issue of tracking and risk management, Ontario has developed a standardized process to collect, analyze and report information on the performance of individual initiatives that support the overall success of the action plan.

Ministry reporting

Ontario tracks the performance of all action plan initiatives using a common template. Like the dashboard of a car, these templates present important information related to an initiative's progress and status using common, easily understood terms. The purpose of the reporting template is to allow all ministries and agencies responsible for climate change initiatives to provide regular updates on their progress towards achieving action plan commitments.

Using a consistent mechanism for tracking progress and risk enables the Climate Change Secretariat to develop government-wide risk management strategies to keep the plan and its targets on track, to recommend course corrections when needed and to report to the public through the annual report.

Risk management

The potential reductions linked to the government's current GHG reduction measures presented in this report are based on a 100 per cent successful delivery scenario. Achieving the projected emission reductions requires the successful ongoing mitigation of contingencies and risks that are both within and outside the government's control.

Potential contingencies and risks are tracked through regular ministry reporting for each emission reduction initiative. The contingencies and risks fall into several key categories, all of which have a potential impact on emission forecasts:

- A. **Economic:** Changes in the province's economic outlook and changing economic trends at the sector and sub-sector level
- B. **Funding:** Delays/changes in required funding for current or planned initiatives
- C. **Approvals:** Delays in Ontario government approvals/decision-making that result in project delays
- D. **Delivery:** Delays in implementation/completion of projects (e.g. construction delays)
- E. **Market Adoption:** Failure or delay in consumer or business adoption of new technologies or services
- F. **External Decision-Making:** Delays or changes in decisions made by other jurisdictions that result in delays in Ontario policy or program implementation
- G. **External Factors:** Changes beyond the control of the government that have key emissions impacts (e.g. weather changes and demand for peak electricity).

Measuring Ontario’s progress

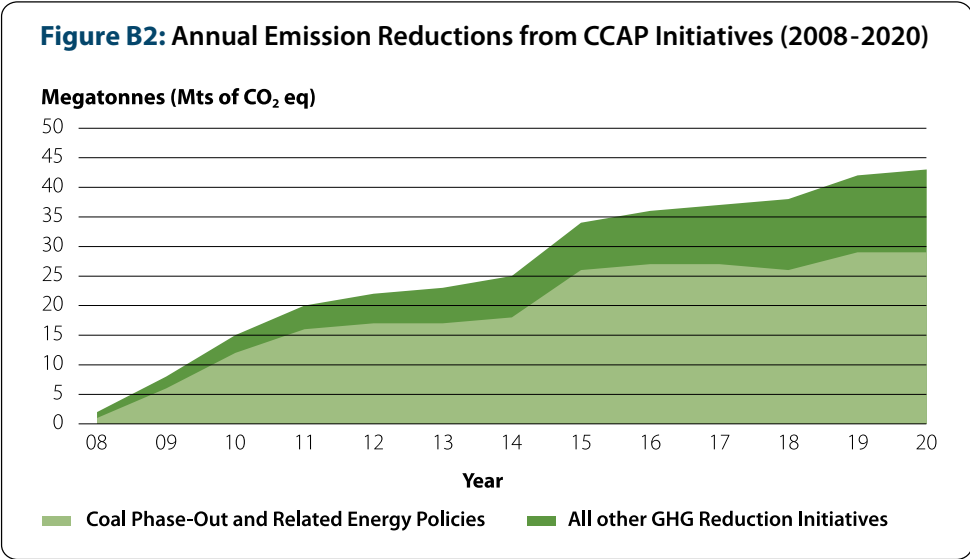
Ontario’s Climate Change Action Plan was released in 2007, and contained more than 70 individual initiatives (see Appendix C). Responsibility for delivering the initiatives is spread across 11 provincial ministries and two agencies. Initiatives fell into two broad categories:

- 1. Those that would lead to measurable GHG reductions
- 2. Those that were more broadly designed to support the transition to a low-carbon economy.

Initiatives that have measurable GHG emissions reductions are tracked using modeling assumptions that demonstrate the linkage between program actions and GHG emission levels. By contrast, the performance of initiatives designed to promote the transition to a low-carbon economy, but do not have quantifiable emission reductions, are tracked through proxy measures. Proxy measures focus on identifying an initiative’s contribution to enhanced public awareness (e.g. Pick Ontario Freshness), support for increased market adoption of green products or services (e.g. Next Generation of Jobs Fund) and/or its support for enhanced government decision-making (e.g. MNR’s Polar Bear Research).

The impact of individual initiatives

Of the more than 70 initiatives in the original action plan, 14 are forecasted to deliver measurable GHG reductions. These initiatives represent a combination of distinct GHG reduction efforts (e.g. provincial regulation requiring methane from landfills to be captured) and clusters of related efforts that are aimed at achieving a common goal (e.g. coal phase-out and related green energy and conservation activities). These initiatives cross all of the emission sources and sectors of the economy, and represent a blend of short, medium and long-term



emission reductions. The initiatives include activities that are both within and outside the direct control of the Ontario government.

As shown in Figure B2, the cumulative impact of the province’s GHG reduction initiatives is forecast to grow over time, from 1.5 Mt of reductions in 2008 to 44 Mt in 2020.

The impact of individual initiatives on overall GHG reductions varies. Coal phase-out, and the associated green energy and conservation policies that support it, for example, will contribute a majority of Ontario’s current forecast emission reductions: 77 per cent in 2014, and 67 per cent in 2020. The GHG reduction impact of the remaining initiatives ranges between 0.0 and 2.2 Mt in 2014 and between 0.02 and 5.5 Mt in 2020.

The following table lists the 14 key GHG reduction initiatives underway in the province and their forecasted impact on Ontario’s total emissions by 2014 and 2020.

Key GHG Reduction Initiatives and their Forecasted Impact on Ontario's Total Emissions

| Initiative Name/Description | Lead Ministry | Partners | GHG Reductions (Mt CO ₂ eq)* | |
|---|---------------|---------------|---|-----------------|
| | | | December 31, 2014 | January 1, 2020 |
| <p><i>Afforestation</i></p> <p>Includes two afforestation programs in southern Ontario: 1) A program with Trees Ontario to plant 50 million trees in southern Ontario by 2020 and 2) A program with Evergreen Foundation to plant 100,000 trees in cities and urban areas by 2010.</p> | MNR | Trees Ontario | 0.00 | 0.5 |
| <p><i>Biogas Financial Assistance Program</i></p> <p>A three-year \$11.2-million investment, launched in September 2007, to help farmers and agri-food businesses develop biogas projects and the further expansion of existing projects in Ontario that produce clean energy, reduce electricity costs and contribute to local economies.</p> | OMAFRA | | 0.03 | 0.03 |
| <p><i>2006 Building Code Changes</i></p> <p>Legislation which mandates increased energy efficiency for new buildings and for buildings undergoing renovation. Code changes are being phased in between 2006 and 2011 to give industry time to prepare. Emission reductions associated with this initiative come from natural gas and other fossil fuel demand reductions – electricity conservation impacts are reflected under Coal Phase-Out and related energy policies.</p> | MMAH | MEI | 0.91 | 1.53 |
| <p><i>Coal Phase-Out and Related Energy Policies</i></p> <p>Phasing out the province's use of coal-fired electricity by December 2014. There are numerous initiatives that are critical for the completion of Coal Phase-Out, including Clean Energy Supply, Renewable Energy Supply, and Conservation Programs.</p> | MEI | OPA, MOE | 26.4 | 29.1 |
| <p><i>Conversion to Electric Buses</i></p> <p>A \$180.1-million funding program to support the replacement of ageing municipal transit buses and provide long-term, sustainable funding.</p> | MTO | MMAH | 0.06 | 0.16 |
| <p><i>Energy Efficiency Act and Other Existing Efficiency Policies</i></p> <p>An act that sets minimum energy-efficiency standards for specified energy-using products and provides descriptions of the responsibilities of dealers with respect to these products. The act also sets out labelling standards for energy-using products, as well as the collection of statistics and information on energy use and alternative energy.</p> | MEI | MMAH | 1.16 | 1.97 |

Key GHG Reduction Initiatives and their Forecasted Impact on Ontario's Total Emissions (continued)

| Initiative Name/Description | Lead Ministry | Partners | GHG Reductions (Mt CO ₂ eq)* | |
|---|---------------|----------|---|-----------------|
| | | | December 31, 2014 | January 1, 2020 |
| <p><i>Fuel Efficiency Standard</i></p> <p>Federal regulations to limit GHG emissions from the automotive sector under the Canadian Environmental Protection Act, 1999.</p> | MOE | | 2.24 | 5.45 |
| <p><i>Green Commercial Vehicle Program/Anti-Idling Retrofits</i></p> <p>A four-year \$15-million program that provides funding in the form of grants for companies to 1) Purchase hybrid and alternative-fuel vehicles; and 2) Retrofit heavy-duty vehicles with anti-idling technologies.</p> | MTO | | 0.02 | 0.02 |
| <p><i>Heavy Truck Speed Limiters</i></p> <p>A \$425K program to develop mandatory speed limiters for all large trucks operating in the province. A speed limiter is an electronic device within a truck engine that caps the truck's top speed at a maximum of 105 km/h. Mandatory speed limiter requirements are now in place.</p> | MTO | | 0.26 | 0.26 |
| <p><i>Home Energy Savings Program</i></p> <p>A \$372-million grant program to assist homeowners with completing an energy audit and associated retrofit work. The program also educates the public about where and how to improve energy efficiency in homes and reduce emissions.</p> | MEI | | 0.16 | 0.16 |
| <p><i>Methane Landfill Capture</i></p> <p>Involves regulations which require landfill methane gas collection for new, expanding or operating landfills larger than 1.5 million cubic metres total waste disposal volume.</p> | MOE | | 2.19 | 2.4 |
| <p><i>Ontario Bus Replacement Program & Public Transit Commitments</i></p> <p>The province is supporting the achievement of GHG reductions through numerous funding programs and projects for transit. Dedicated transit programs such as Gas Tax Funding and the Ontario Bus Replacement Program provide municipalities with transit funding to renew, improve and expand their systems. Significant provincial investment in GO Transit will also help deliver top quality inter-regional transit service, serving millions of riders every year.</p> | MTO | MMAH | 0.7 | 1.1 |

Key GHG Reduction Initiatives and their Forecasted Impact on Ontario's Total Emissions (continued)

| Initiative Name/Description | Lead Ministry | Partners | GHG Reductions (Mt CO ₂ eq)* | |
|--|---------------|----------------|---|-----------------|
| | | | December 31, 2014 | January 1, 2020 |
| <p><i>Places to Grow Act</i></p> <p>An act that provides legal authority for the 2006 Growth Plan for the Greater Golden Horseshoe, a 25-year vision and plan to manage growth and development in ways that support economic prosperity, protect the environment and help communities achieve a high quality of life.</p> | MEI | MMAH | 0.11 | 0.34 |
| <p><i>The Big Move</i></p> <p>A 25-year Regional Transportation Plan to improve regional transportation, bolster global competitiveness, protect the environment and enhance quality of life. The RTP has a number of objectives which include providing transportation choices, promoting active and healthy lifestyles, and increasing interconnectedness in the GTHA.</p> | Metrolinx | MTO, MEI, MMAH | 0.14 | 0.77 |

* NOTE: The impact of the individual transportation initiatives is higher than their combined impact reported in other portions of this report due to the interplay of changes to key emission drivers (e.g. vehicle kilometres travelled, vehicle fuel efficiency and the carbon content of fuel)

APPENDIX C

Climate Change Action Plan Initiatives

| Initiative Name/Description | Lead Ministry | Partners |
|---|---------------|--------------------------|
| <p><i>5% Ethanol in Gasoline</i></p> <p>Regulation which requires that gasoline sold in Ontario contain 5% ethanol, on an annual basis, beginning January 2007.</p> | MOE | OMAFRA, MEI |
| <p><i>Afforestation</i></p> <p>Includes two afforestation programs in southern Ontario: 1) A program with Trees Ontario to plant 50 million trees in southern Ontario by 2020 and 2) A program with Evergreen Foundation to plant 100,000 trees in cities and urban areas by 2010.</p> | MNR | Trees Ontario, Evergreen |
| <p><i>Biogas Financial Assistance Program</i></p> <p>A three-year \$11.2-million investment, launched in September 2007, to help farmers and agri-food businesses develop biogas projects and the further expansion of existing projects in Ontario that produce clean energy, reduce electricity costs and contribute to local economies.</p> | OMAFRA | |
| <p><i>2006 Building Code Changes</i></p> <p>Legislation which mandates increased energy efficiency for new buildings and for buildings undergoing renovation. Code changes are being phased in between 2006 and 2011 to give industry time to prepare. Emission reductions associated with this initiative come from natural gas and other fossil fuel demand reductions – electricity conservation impacts are reflected under Coal Phase-Out and related energy policies.</p> | MMAH | MEI |
| <p><i>Business Demand Program</i></p> <p>A conservation and demand management program that targets the commercial and institutional sector including retail stores, office towers, agricultural operations and municipal government, university, school and hospital (MUSH) facilities. The Business Program focuses on both new construction and existing buildings.</p> | OPA | |
| <p><i>Cap-and-Trade</i></p> <p>The Minister of the Environment has introduced legislation to put in place the enabling authority to develop a cap-and-trade system for GHGs.</p> | MOE | |
| <p><i>Capital Funding to Colleges and Universities</i></p> <p>In 2007-08, government provided an additional \$400 million capital funding to colleges and universities to help rehabilitate and modernize their physical infrastructure, address deferred maintenance issues, and make their campuses more energy efficient. These investments all positively impact environmental outputs, reducing GHG emissions, direct and indirect.</p> | EDU | |

Climate Change Action Plan Initiatives (continued)

| Initiative Name/Description | Lead Ministry | Partners |
|--|---------------|----------|
| <p><i>Carbon Offset Pilots in Ontario Agriculture</i></p> <p>The results obtained from the Pilot Project to Test Carbon Offset Protocols in Ontario Agriculture will inform the design of the carbon offset trading component of a potential future cap-and-trade system for GHGs. The project tested two draft protocols for feasibility of use on Ontario farms: (1) Tillage System Management (reduced till or no till); (2) Nitrogen Fertilizer Reduction (in corn). The project was a condensed trial to test the data collection and management requirements as well as the verification component of the two draft protocols.</p> | OMAFRA | MOE |
| <p><i>Changing Highway Design Construction and Maintenance Practices to Adapt to Climate Change</i></p> <p>Develop framework to identify opportunities to improve existing practices and to introduce new initiatives that will provide a response to climate change.</p> | MTO | |
| <p><i>Clean Energy Supply (CES)</i></p> <p>An initiative that includes several procurement processes for 20-year capacity contracts for combined cycle or simple cycle natural gas facilities. Procurement activities comprise a) a province-wide RFP for up to 2,500 MW, and b) site-specific procurement in given transmission catchments with system reliability requirements (e.g. Portlands).</p> | MEI | |
| <p><i>Coal Phase-Out and Related Energy Policies</i></p> <p>Phasing out the province's use of coal-fired electricity by December 2014. There are numerous initiatives that are critical for the completion of Coal Phase-Out, including Clean Energy Supply, Renewable Energy Supply, and Conservation Programs.</p> | MEI | OPA, MOE |
| <p><i>Combined Heat and Power Supply (Non-Renewable)</i></p> <p>The OPA has been directed to procure up to 1000 MW of high efficiency Combined Heat and Power (CHP) generation from projects across Ontario. CHP (or 'Cogeneration') is the simultaneous production of electricity and heat using a single fuel such as natural gas, although a variety of fuels can be used.</p> | MEI | |
| <p><i>Commitment to Public Transit</i></p> <p>The province is supporting the achievement of GHG reductions through numerous funding programs and projects for transit. Dedicated transit programs such as Gas Tax Funding and the Ontario Bus Replacement Program provide municipalities with transit funding to renew, improve and expand their systems. Significant provincial investment in GO Transit will also help deliver top quality inter-regional transit service, serving millions of riders every year.</p> | MTO | |

Climate Change Action Plan Initiatives (continued)

| Initiative Name/Description | Lead Ministry | Partners |
|--|---------------|----------|
| <p><i>Community Conservation Initiatives (CCI)</i></p> <p>A program that supports grassroots-based conservation outreach, education and incubation projects. The program targets small scale community organizations who engage audiences in adopting and acting on a culture of conservation in Ontario, and small scale behind-the-meter renewables energy education. Recipients of CCI funding are typically locally-based incorporated not-for-profit organizations, such as NGOs, community groups and school groups.</p> | MEI | |
| <p><i>Community Go Green Fund</i></p> <p>A \$6.6 million, four-year program, starting in 2007 for not-for-profit groups to help Ontario achieve its GHG reduction targets. The ministry is looking for projects that provide outreach and education, promote long-term behaviour change and deliver action to reduce GHG emissions.</p> | MOE | |
| <p><i>Conservation and Technology Development Fund Program</i></p> <p>The Conservation Fund supports electricity conservation pilot projects that build marketplace capacity for conservation programs, test new or unique program elements, and can be scaled-up to achieve significant energy savings. Technology Development Fund assists innovative energy technologies that will improve the supply and conservation of electricity – are in the pre-commercial stage – and require funding for development, demonstration or verification.</p> | MEI | |
| <p><i>Consumer Conservation Program</i></p> <p>A conservation and demand management program that offers Ontario's residential customers a broad range of opportunities to participate in energy conservation, including rebates on energy efficient equipment, appliance retirement and demand response activities.</p> | OPA | |
| <p><i>Conversion to Electric Buses</i></p> <p>A \$180.1-million funding program to support the replacement of ageing municipal transit buses and provide long-term, sustainable funding.</p> | MTO | MMAH |
| <p><i>Credit for Consumers of 100% Renewable Energy Retailers</i></p> <p>Announced in 2007 as a \$1 million four-year program which would allow consumers of 100% renewable energy to receive rebates for a portion of the extra costs that they pay to buy that power.</p> | MEI | |
| <p><i>E85 Fueling Stations</i></p> <p>Construction of two E85 fueling sites for provincial vehicles (85% ethanol and 15% gasoline mix). This initiative begins the process of establishing a network, encourages the adoption of technology, and provides local opportunities for ethanol producers. It also provides an opportunity for government leadership, and raises public awareness of alternative fuels.</p> | MEI | |

Climate Change Action Plan Initiatives (continued)

| Initiative Name/Description | Lead Ministry | Partners |
|--|---------------|----------|
| <p><i>Early Researcher Awards</i></p> <p>The Early Researcher Award program helps promising, recently-appointed Ontario researchers build their research teams. Research supported by this program includes clean technology and the bio-economy.</p> | MRI | |
| <p><i>Electric Vehicles – Consumer Adoption Study</i></p> <p>Produce a public report that details how the province can help encourage uptake of electric vehicles through financial incentives, education, preferred access to transportation network and government fleet purchases.</p> | MTO | |
| <p><i>Energy Conservation Initiative</i></p> <p>A sector-wide initiative to provide direction and assistance to District School Boards on energy management, including the creation of a utility consumption database, average provincial consumption benchmarks for utilities and identification and sharing of best practices.</p> | EDU | |
| <p><i>Energy Efficiency Act and Other Existing Efficiency Policies</i></p> <p>An act (now repealed and incorporated into the Green Energy Act) that sets minimum energy-efficiency standards for specified energy-using products and provides descriptions of the responsibilities of dealers with respect to these products. The act also sets out labeling standards for energy-using products, as well as the collection of statistics and information on energy use and alternative energy.</p> | MEI | MMAH |
| <p><i>Environmental Education Policy Framework</i></p> <p>A framework to guide boards and schools in the implementation of environmental education. A key feature of implementation is the integration of environmental education in all subjects and all grades as part of the ongoing Curriculum Review process. Through the use of the Standards for Environmental Education in the Curriculum, the curriculum writers are incorporating environmental expectations and opportunities in every grade and every subject.</p> | EDU | |
| <p><i>Environmental Farm Plan</i></p> <p>A program to guide farmers in preparation of comprehensive environmental risk assessments for their farms. It develops action plans, subjects the plans to peer review, and provides funding to items identified in the action plan. Many environmental best practices that are funded reduce GHG emissions, such as nutrient management, conservation tillage and creation of vegetated habitat.</p> | OMAFRA | |
| <p><i>Ethanol Growth Fund</i></p> <p>A 12-year, more than \$520-million program designed to encourage the construction and operation of ethanol fuel plants in Ontario to bring new investment, jobs and opportunities to rural communities. It will help meet the Ontario Renewable Fuels Standard (RFS), which requires 5% ethanol in gasoline, with Ontario produced ethanol.</p> | OMAFRA | |

Climate Change Action Plan Initiatives (continued)

| Initiative Name/Description | Lead Ministry | Partners |
|---|---------------|----------|
| <p><i>Expand High Occupancy Vehicle Lanes – 404 Northbound, QEW & 417</i></p> <p>Add High Occupancy Vehicle (HOV) lanes to new and existing provincial highways in the Greater Golden Horseshoe and Ottawa Areas based on 2007 planning for an HOV lane network.</p> | MTO | |
| <p><i>Expert Panel on Climate Change Adaptation</i></p> <p>Appointed in 2007 by the Minister of the Environment as part of Ontario's Climate Change Action Plan to provide advice on measures to help the province understand how to prepare and plan for climate change impacts.</p> | MOE | |
| <p><i>Far North Planning</i></p> <p>The protection of at least 225,000 square kilometres of the Far North Region under Ontario's Far North Planning Initiative. Ontario will work with Far North First Nation communities, non-aboriginal northern communities, environmental groups and resource industries to permanently protect the area, while allowing for areas of environmentally sustainable economic development.</p> | MNR | |
| <p><i>Faster Approvals for Go Green Projects (including six-month Transit assessments)</i></p> <p>Six-month streamlined assessments are in place for public transit and renewable energy projects. MOE will work with MEI to implement the streamlined approval requirements for renewable energy projects EA to fulfill requirements of the Green Energy Act.</p> | MOE | |
| <p><i>Fuel Efficiency Standard</i></p> <p>Federal regulations to limit GHG emissions from the automotive sector under the Canadian Environmental Protection Act, 1999.</p> | MOE | |
| <p><i>"Go Solar Ontario" Public Engagement Campaign</i></p> <p>The establishment of a 'one-stop shop' where the public can get information on solar energy. The program included a 1-800 number, a website, promotions, and community workshops providing technical information on solar, advice on government and LDC incentives, a Q&A service, and sources of additional information.</p> | MEI | |
| <p><i>Greenbelt Act, Greenbelt Plan</i></p> <p>The Greenbelt Plan contains policies for providing permanent agricultural and environmental protection, as well as providing for a wide range of recreation, tourism and cultural opportunities in the area.</p> | MMAH | |
| <p><i>Green Commercial Vehicle Program/Anti-Idling Retrofits</i></p> <p>A four-year \$15-million program that provides funding in the form of grants for companies to 1) Purchase hybrid and alternative-fuel vehicles; and 2) Retrofit heavy-duty vehicles with anti-idling technologies.</p> | MTO | |

Climate Change Action Plan Initiatives (continued)

| Initiative Name/Description | Lead Ministry | Partners |
|---|---------------|----------|
| <p><i>Green Energy Act</i></p> <p>Sweeping new legislation to attract new investment, create new green economy jobs and better protect the climate. The act makes it easier to bring renewable energy projects to life and fosters a culture of conservation by assisting homeowners, government, schools and industrial employers to transition to lower energy use.</p> | MEI | various |
| <p><i>Green Schools</i></p> <p>Funding to support the piloting of green technologies, design, and construction standards to evaluate the cost/benefit, suitability, and feasibility of a wider application of specific green components such as, solar or geothermal energy technologies and innovative mechanical systems or materials which demonstrate the potential for positive returns in terms of reduced energy requirements.</p> | EDU | MRI |
| <p><i>Heavy Truck Speed Limiters</i></p> <p>A \$425,000 program to develop mandatory speed limiters for all large trucks operating in the province. A speed limiter is an electronic device within a truck engine that caps the truck's top speed at a maximum of 105 km/h. Mandatory speed limiter requirements are now in place.</p> | MTO | |
| <p><i>Home Energy Savings Program</i></p> <p>A \$372-million grant program to assist homeowners with completing an energy audit and associated retrofit work. The program also educates the public about where and how to improve energy efficiency in homes and reduce emissions.</p> | MEI | |
| <p><i>Industrial Conservation Program</i></p> <p>The Industrial Conservation Program enables energy efficiency and demand response in diverse industries across the province including construction, manufacturing, automotive production and assembly, resource mining & milling, petroleum & chemical refining, pulp, paper & forestry.</p> | OPA | |
| <p><i>Innovation Demonstration Fund</i></p> <p>The Innovation Demonstration Fund focuses on the commercialization and initial demonstration of globally competitive, innovative technologies, processes and/or products. Preference for funding is given to bio-based, environmental and alternative energy technologies. The 2009 Budget increased funding to this program by \$50 million to a total of \$80 million.</p> | MRI | |
| <p><i>Low-Carbon Fuel Standard</i></p> <p>The 2007 Climate Change Action Plan committed to implementing a low-carbon fuel standard. Ontario continues to assess options for moving forward on regulating low-carbon fuels in light of recent cap and trade proposals and regulations in the US federally and in California.</p> | MEI | |

Climate Change Action Plan Initiatives (continued)

| Initiative Name/Description | Lead Ministry | Partners |
|--|---------------|----------|
| <p><i>Methane Landfill Capture</i></p> <p>Involves regulations which require landfill methane gas collection for new, expanding or operating landfills larger than 1.5 million cubic metres total waste disposal volume.</p> | MOE | |
| <p><i>MNR Climate Change Research Activities</i></p> <p>Wide ranging research and science activities related to climate change, including state of the knowledge papers on climate change impacts on fisheries, parks, forests, outdoor recreation, biodiversity and forest fire management. Work has also been undertaken on climate change projections for Ontario, forest carbon budget modeling and carbon cycling in forests and peatlands.</p> | MNR | |
| <p><i>MOE key Buildings on 100% Renewable Power</i></p> <p>The Ministry of the Environment has contracted for its Head Office (135 St. Clair Ave. W) and its laboratory facility at 125 Resources Road to be powered by 100% green power.</p> | MOE | |
| <p><i>MTO's Contribution to Green the OPS Fleet</i></p> <p>Activities include: hybrid vehicle purchases, legacy fleet replacement, use of E-85 Ethanol and alternative fuels, driver training focusing on improving driving habits to reduce fuel consumption and emissions.</p> | MTO | |
| <p><i>Next Generation Jobs Fund (Jobs Investment Program)</i></p> <p>A program to support business expansion/retention and attract foreign investment. The program will help companies involved in green auto research, parts production and assembly; clean fuels research, development and commercialization; manufacturing and processing environmental technologies; services (ICT and Financial) and anchor investments to support cluster development (including services sector); and strategic investments uniquely advantageous to Ontario.</p> | EDT | |
| <p><i>Ontario Bus Replacement Program</i></p> <p>A multi-year capital funding program that supports the replacement of municipal transit buses and provides long-term sustainable transit funding.</p> | MTO | MMAH |
| <p><i>Ontario Emerging Technologies Fund</i></p> <p>Announced as part of the 2009 Budget, the fund will supply emerging Ontario companies in the clean tech sector with venture capital funding.</p> | MRI | |

Climate Change Action Plan Initiatives (continued)

| Initiative Name/Description | Lead Ministry | Partners |
|---|---------------|----------|
| <p><i>Ontario-Quebec Continental Gateway</i></p> <p>Ontario is working with the federal government and Quebec to develop a Continental Gateway strategy. The Continental Gateway is the multi-modal system in Ontario and Quebec whose roads, rail lines, ports and airports support Canada's two largest economies and over 71% of Canada-United States trade.</p> | MTO | |
| <p><i>Ontario Research Fund</i></p> <p>The Ontario Research Fund supports cutting-edge research that can be developed into innovation goods and services that will boost Ontario's economy.</p> | MRI | |
| <p><i>Ontario Solar Thermal Heating Incentive (Industrial and Commercial Sector)</i></p> <p>A \$14.4 million, four-year program that provides the institutional/commercial/industrial sector with up to \$80,000 towards the installation of a solar thermal heating system (e.g. water or air). Program budget and profile based on NRCan experience.</p> | MEI | |
| <p><i>Ottawa Rapid Transit</i></p> <p>Plan for a rapid transit network to relieve capacity pressures in the downtown core, rejuvenate and encourage residential intensification in the urban area and extend into the suburban communities as population densities increase.</p> | MTO | |
| <p><i>Phase-Out Inefficient Light Bulbs</i></p> <p>A commitment to ban the sale of inefficient light bulbs by 2012. The new allowable minimum efficiency level for lighting will be on average approximately 40% higher than today's standard incandescent light bulb.</p> | MEI | |
| <p><i>Pick Ontario Freshness</i></p> <p>A branding and marketing strategy to promote consumer awareness of Ontario-produced foods and to encourage consumers to purchase Ontario foods in grocery stores, farmers' markets and restaurants across the province. The 2008 Budget provided a \$56 million funding commitment over four years towards this ongoing strategy.</p> | OMAFRA | |
| <p><i>Pilot Carbon Market Development for Afforestation Projects</i></p> <p>Exploring potential carbon marketplace and mechanisms to allow landowners undertaking afforestation projects to pool their stored carbon for entry in the marketplace and test the draft afforestation protocol. MNR will investigate the level of interest and incentive levels required to attract southern Ontario landowners to participate in the carbon credit market through afforestation initiatives. Two workshops (one in eastern Ontario and one in southwestern Ontario) will be conducted to examine landowner attitudes and willingness to participate across the landscape.</p> | MNR | |

Climate Change Action Plan Initiatives (continued)

| Initiative Name/Description | Lead Ministry | Partners |
|--|---------------|----------|
| <p><i>Places to Grow Act</i></p> <p>An act that provides legal authority for the 2006 Growth Plan for the Greater Golden Horseshoe, a 25-year vision and plan to manage growth and development in ways that support economic prosperity, protect the environment and help communities achieve a high quality of life.</p> | MEI | MMAH |
| <p><i>Polar Bear Research</i></p> <p>A \$860,000, three-year program to research the effects of climate change on the health of Ontario's polar bear populations.</p> | MNR | |
| <p><i>PRESTO System Project & Promotion</i></p> <p>A centrally operated e-fare system based on smart-card technology to create "seamless" transit travel.</p> | MTO | |
| <p><i>Quebec Windsor High Speed Rail Corridor</i></p> <p>Study to determine feasibility of High Speed Rail (HSR) in the Quebec City to Windsor Corridor.</p> | MTO | |
| <p><i>Renewable Energy Supply (RES I, II, III, RESOP, CHP III)</i></p> <p>Procurement of renewable energy resources include: RES I (RFP for 300 MW), RES II (RFP for up to 1,000 MW), Renewable Energy Standard Offer Program (for small projects up to 10 MW in size), RES III (RFP for 500 MW), CHP III (RFP for 100 MW of renewable cogeneration), and hydroelectric projects proposed by Ontario Power Generation.</p> | MEI | |
| <p><i>Report in Legislature and ECO to Review Process</i></p> <p>Annual reporting to the legislature on the status of progress in achieving the climate change goals set out in the Go Green Action Plan. The Environmental Commissioner will provide transparency and review the government's progress. The Green Energy Act includes a statutory mandate for the Environmental Commissioner of Ontario to review Ontario's annual progress on GHG emissions.</p> | MOE | |
| <p><i>Smart Meters</i></p> <p>A target to install smart meters in 4.5 million Ontario households and small businesses by the end of 2010 in order to track how much electricity a customer uses, and when that electricity is used.</p> | MEI | |
| <p><i>Support for Ontario Centre for Climate Change Impacts and Adaptation Resources</i></p> <p>A project to build partnerships and knowledge on climate change impacts and adaptation issues across Ontario and deliver information and education.</p> | MOE | |

Climate Change Action Plan Initiatives (continued)

| Initiative Name/Description | Lead Ministry | Partners |
|--|---------------|----------------|
| <p><i>Support Metrolinx: Regional Transportation Plan, MoveOntario 2020</i></p> <p>Work with Metrolinx to complete five and 10-year capital plans and support implementation of transit projects identified in the RTP.</p> | MTO | |
| <p><i>Supporting Economic Growth Through Critical Transportation Infrastructure</i></p> <p>Development of a new business model and procurement strategy for the management and operation of Ontario's 400 Series Highway Service Centres. RFP encourages sustainable transportation initiatives.</p> | MTO | |
| <p><i>Sustainability Strategy for the Ministry of Transportation</i></p> <p>Development of a comprehensive strategy that would commit the ministry to take responsibility for the social, economic and environmental impacts of programs, policies and business practices.</p> | MTO | |
| <p><i>The Big Move</i></p> <p>A 25-year Regional Transportation Plan to improve regional transportation, bolster global competitiveness, protect the environment and enhance quality of life. The RTP has a number of objectives which include providing transportation choices, promoting active and healthy lifestyles, and increasing interconnectedness in the GTHA.</p> | Metrolinx | MTO, MEI, MMAH |
| <p><i>Toronto-York Spadina Subway Extension</i></p> <p>Extension of the Toronto-York Spadina subway from its current terminus at Downsview Station to the Vaughan Corporate Centre at Highway 7 in York Region.</p> | MTO | |
| <p><i>Waterloo Rapid Transit</i></p> <p>An Environmental Assessment for a proposed Rapid Transit line within a 30-km corridor that will link the city centres of Cambridge, Kitchener and Waterloo.</p> | MTO | |

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For more information on climate change,
visit the Ministry of the Environment at:

www.ontario.ca/environment

For more information on what you can do, visit:

www.ontario.ca/additup

Protecting our environment.



Ontario