

Finding a Vision for Change



Annual Greenhouse Gas Progress Report 2008/2009



Environmental
Commissioner
of Ontario

Environmental
Commissioner
of Ontario



Commissaire à
l'environnement
de l'Ontario

Gord Miller, B.Sc., M.Sc.
Commissioner

Gord Miller, B.Sc., M.Sc.
Commissaire

December 2009

The Honourable Steve Peters
Speaker of the Legislative Assembly of Ontario
Room 180, Legislative Building
Legislative Assembly
Province of Ontario
Queen's Park

Dear Speaker:

In accordance with Section 58.2 of the *Environmental Bill of Rights, 1993*, I am pleased to present the Annual Greenhouse Gas Progress Report 2008/2009 of the Environmental Commissioner of Ontario for your submission to the Legislative Assembly of Ontario. This Annual Report is my independent review of the Ontario Government's progress in reducing greenhouse gas emissions for 2008-09, as outlined in the report titled "Annual Report 2008-09 Climate Change Action Plan" that was tabled by the Honourable Minister of the Environment in the Legislative Assembly on December 2nd, 2009.

Sincerely

A handwritten signature in black ink, appearing to read "G Miller", with a long horizontal flourish extending to the right.

Gord Miller
Environmental Commissioner of Ontario

1075 Bay Street, Suite 605
Toronto, Ontario M5S 2B1
Tel: (416) 325-3377
Fax: (416) 325-3370
1-800-701-6456



1075, rue Bay, bureau 605
Toronto (Ontario) M5S 2B1
Tél: (416) 325-3377
Télééc: (416) 325-3370
1-800-701-6456

Table of Contents

1	Executive Summary	3
2	Overview	6
2.1	What the <i>Environmental Bill of Rights, 1993</i> Requires	6
2.2	How the ECO has Interpreted our <i>EBR</i> Mandate	7
2.3	About this Review	7
3	The Context for Action	9
3.1	Climate and Environment	9
3.2	Electricity Planning	10
4	The Targets	13
4.1	Overview	13
4.2	Discussion	14
5	The Sectors	16
5.1	Transportation	17
5.2	Industry	18
5.3	Electricity	19
5.4	Buildings	20
5.5	Waste	20
5.6	Greening the Public Service	21
5.7	Other Concerns	21
6	Assessing the Transparency of the Process	22
6.1	Making the Numbers More Transparent	22
6.2	Clarifying the Optics and Metrics	23
6.3	Need for Other Metrics	24
6.4	Assurance Regarding the Numbers	25
6.5	Governance Issues	25
6.6	Climate Adaptation Issues	27
7	A Broader Mandate	29
8	Conclusions	30
	Appendix	36



1 Executive Summary

In 2007, the Ontario government released Go Green: Ontario's Action Plan on Climate Change ("Action Plan"), which established three targets for greenhouse gas (GHG) emission reductions. The government's GHG reduction targets are as follows:

- 6 per cent below 1990 levels of GHG emissions by 2014;
- 15 per cent below 1990 levels by 2020; and
- 80 per cent below 1990 levels by 2050.

The government publishes annual reports outlining efforts it is taking to achieve these targets. These reports are published under the auspices of the Ministry of the Environment and are prepared by the Climate Change Secretariat. On December 2, 2009, the government released its Climate Change Action Plan Annual Report 2008-09 ("CCAP Annual Report"). The Environmental Commissioner of Ontario (ECO) is responsible for reviewing the government's progress in achieving these targets and independently reporting our findings to the legislature. This document is a response to the CCAP Annual Report and represents the ECO's second annual review of the progress made by the Ontario government in achieving its GHG emission reduction targets.

The CCAP Annual Report indicates that the government will not meet either its 2014 or its 2020 reduction targets. In 1990, Ontario's GHG emissions were 175 megatonnes (Mt) as measured on a CO₂ equivalent (CO₂ eq) basis.¹ By 2007, the latest year for which actual (historic) GHG emissions data is available, Ontario's GHG emissions had increased to 197 Mt – an increase of 22 Mt or 13 per cent.² To achieve the 6 per cent reduction target, Ontario must reduce its GHG emissions to 165 Mt by 2014.³ The CCAP Annual Report indicates that the "impact of current [plan] initiatives" is forecasted to reduce Ontario's 2014 GHG emissions to 180 Mt or 15 Mt short of the 2014 reduction target of 165 Mt.⁴

To achieve the 15 per cent reduction target, Ontario must reduce its GHG emissions to 149 Mt by 2020. The CCAP Annual Report indicates that despite current and planned initiatives, Ontario's GHG emissions could *increase* to about 184 Mt between 2014 and 2020; nearly 10 Mt above the 1990 baseline and 35 Mt short of the 2020 reduction target of 149 Mt. The fact that GHG emissions are projected to *rise* between 2014 and 2020 (even with the stated assumption that the 14 key GHG emission reduction initiatives will be delivered 100 per cent successfully) points to a serious deficiency in the government's planning. There are problems with the CCAP Annual Report's nominated suite of initiatives and with the long-term vision the Action Plan presents.

The CCAP Annual Report indicates that the government will not meet either its 2014 or its 2020 reduction target...

The Action Plan attributes over three-quarters of the forecasted emission reductions delivered by 2014 to one initiative: the phase-out of coal as a fuel at the four remaining coal-fired thermal power plants in the province. The ECO has a major concern with the CCAP Annual Report's method of forecasting the timing of final coal phase-out and its contribution to the achievement of the government's short-term target. The ECO also believes that there is considerable short-term risk in a plan that relies overwhelmingly on the phase-out of coal to deliver the 2014 reductions. The CCAP Annual Report refers to this risk in Appendix B in the context of "[e]xternal [f]actors...beyond the control of the government"⁵ such as demand for peak electricity either from within or outside Ontario's jurisdiction.

The government's focus on electricity conservation with an apparent blind spot for natural gas, the source of 26 per cent of the province's GHG emissions, is also an area of risk the ECO has noted. This is particularly concerning in light of the CCAP Annual Report's own information which places natural gas at the top of the list of 'remaining emissions' sources for three key sectors – industry, electricity and buildings. Since the mid-1990s, the province's two major natural gas distribution utilities have reduced their customers' use of natural gas through comprehensive conservation and demand management (CDM) programs. The contribution of these CDM programs to the government's broader Climate Change Action Plan targets needs to be more clearly articulated in government planning and in future annual reports.

The ECO had expected to see a greater focus on initiatives to reduce GHG emissions associated with transportation

The ECO had expected to see a greater focus on initiatives to reduce GHG emissions associated with transportation, especially modes such as heavy vehicles and freight. All modes of transportation were responsible for 64 Mt, or 31 per cent of Ontario's GHG emissions in 2007. Road

transportation represented just over 48 Mt of these GHG emissions, and within this category, passenger vehicles were responsible for just under 35 Mt. The ECO commends the government's focus on initiatives that are designed to reduce commuting and personal automobile use as this category represents a significant volume of GHG emissions. However, the ECO believes that any serious attempt to reduce tailpipe emissions must consider the potentially significant role of road pricing⁶ in this effort.

There is significant medium-term risk in the government's heavy reliance on a proposed North American cap-and-trade regime to close the gap in projected 2020 GHG emissions. While it is encouraging that the government is engaged in discussions concerning the design of several proposed tradable permit systems in both Canada and the United States, the ECO remains concerned about the risks inherent in a process where key decisions about a future trading regime are largely in the hands of other jurisdictions.

The ECO notes that the government is identifying and assessing options to deliver GHG reductions “that are additional to cap-and-trade.”⁷ However, the ECO still sees considerable risk in a plan that has an over-reliance on a cap-and-trade system to the apparent exclusion of other initiatives that are likely to be needed to close the 35 Mt gap by 2020.

The ECO and the public need to understand the roles and responsibilities of the key ministries and government agencies, and – equally important – where accountability lies...

There is also a concern with the transparency of the governance process that exists to ensure the Action Plan achieves its objectives. In our 2007-2008 Special Report we asked that a ‘process map’ be provided in this year’s CCAP Annual Report clearly indicating the roles and responsibilities of key

ministries and agencies participating in the design and implementation of the Action Plan. Unfortunately, this was not provided in this year’s CCAP Annual Report. The ECO and the public need to understand the roles and responsibilities of the key ministries and government agencies, and – equally important – where accountability lies for meeting the government’s GHG emission reduction targets. This is important because, despite the good intentions displayed in the CCAP Annual Report, neither the ECO nor the broader public has any clear understanding about the government’s management and control procedures, who is accountable, when (or if) due diligence is confirmed and how performance is recognized.

As this report was being finalized, the government released *Adapting to Climate Change in Ontario: Report of the Expert Panel on Climate Change Adaptation*. The ECO is encouraged to note that the Panel’s report has recommended that the Minister of the Environment launch, “by the Spring 2010, a province-wide climate change adaptation plan” and strategy. The ECO made a similar recommendation in last year’s Special Report.

The lack of such a strategy is of some concern in light of the fact that a significant amount of money will be allocated towards critical infrastructure projects over the next two years. The government has committed \$32.5 billion towards renewing, expanding and enhancing public infrastructure.⁸ In the absence of a provincial adaptation strategy, the ECO is concerned that much physical infrastructure renewal (which includes projects that may have up to 50-to-100-year expected lifespans) could proceed without a solid integration of adaptation considerations.

On a more positive note, the ECO applauds the government’s implementation of the Ontario Public Service Green Transformation Strategy; the government is serious about getting its own house in order by setting a good example. The government recognizes that the process of setting and meeting GHG emission reduction targets is an iterative process; learning by doing. It has made the commitment to work with other stakeholders and the Premier’s Climate Change Advisory Panel to search out new initiatives to deliver GHG emission reductions. Recognizing the importance of being able to defend its results going forward, the government is committed to retaining third-party verification expertise. This is all to the good as the learning process continues.



2 Overview

2.1 What the *Environmental Bill of Rights, 1993* requires

On May 14, 2009, the *Green Energy and Green Economy Act, 2009 (GEGEA)* came into force.⁹ Broad in scope, the *GEGEA* made significant legislative amendments in an effort to shift the province towards a 'greener' energy path. Included among the amendments, and of central relevance for this report, was the expanded mandate given to the Environmental Commissioner of Ontario (ECO) under the *Environmental Bill of Rights, 1993 (EBR)*. In particular, a new section 58.2 of the *EBR* requires that the ECO report annually to the Speaker of the Assembly on the progress of activities in Ontario to reduce emissions of greenhouse gases (GHGs). Pursuant to section 58.2 (2), the report by the ECO "shall include a review of any annual report on greenhouse gas reductions or climate change published by the Government of Ontario" in the year covered by the ECO report.

This report represents the first review by the ECO of the government's progress in addressing climate change pursuant to the requirement created by the *GEGEA*. This is not, however the first time that the ECO has reported on the government's GHG mitigation efforts. In December 2008, the ECO released a Special Report to the Legislative Assembly¹⁰ reviewing the government's progress in reducing GHG emissions. The Special Report was not required by legislation, but was called for by Go Green: Ontario's Action Plan on Climate Change ("Action Plan") which was announced in August 2007.

2.2 How the ECO has Interpreted our *EBR* Mandate

By amending the *EBR*, the *GEGEA* gave the ECO a very broad mandate with regard to reporting on Ontario's annual progress towards GHG emission reductions. While the ECO is required to review any annual reports produced by the government, we also interpret our mandate to include obtaining information from other sources in order to develop a holistic overview of provincial progress in this area. Fundamentally, the mandate of the ECO is to monitor the government's progress on efforts to both mitigate – and adapt to – climate change. Reviewing and providing an assessment as to how well the government is conducting its reporting will be a part, but not the exclusive focus, of our annual reviews.

Each year a significant portion of our attention will focus on the government's overall performance. In particular, the ECO will focus on the short and medium-term targets that were established by the government in its 2007 Action Plan and assess annual progress made towards each of these. In assessing performance, the ECO will examine cross-cutting issues such as the modelling and accounting practices underlying the province's claimed and forecasted GHG emissions.

As well, the ECO will also analyze and report on the performance of key individual initiatives that are outlined in the Action Plan and are reported on in future annual reports.

2.3 About this Review

Objectives

Our overall objective within this report is to review the progress made by the Ontario government in fiscal year 2008 - 2009 towards ensuring the province can achieve its GHG emission reduction targets. In particular, the ECO's objective is to determine whether the initiatives that the government has established to date put it on track to achieve its short- and medium-term emission reduction targets. The government's targets are to reduce GHG emissions by 6 per cent from 1990 levels by 2014 and 15 per cent by 2020. In 1990, Ontario's greenhouse gas emissions were 175 Mt,¹¹ which means that Ontario's target for 2014 is to reduce GHG emissions to 165 Mt and the 2020 target is to reduce GHG emissions to 149 Mt.

A further ECO objective is to review the governance processes that have been established to track GHG emission reductions, as well as to understand how roles, responsibilities, and accountabilities have been established to ensure the government can achieve its climate change objectives.

Review criteria

The ECO expected that the Ontario government would show real and forecasted GHG reductions for each of the key GHG emission reduction initiatives it is pursuing for the years 2008 to 2014. This is fundamental in order to assess whether Ontario is on track to meet its 2014 and 2020 targets.

We expected that the government would be transparent in describing the modelling assumptions used in

its forecasts of GHG reductions while providing third-party assurance as to the veracity of the modelling.

We expected that the government would demonstrate that it has the management systems and the capacity to monitor and report on the performance of the key measures contained within its Action Plan with regard to forecasted emission reductions.

We expected that the Ontario government would establish clear roles, responsibilities and accountabilities for: 1) implementing each of the identified measures; and 2) achieving the forecasted reductions.



3 The Context for Action

3.1 Climate and Environment

Since the Intergovernmental Panel on Climate Change (IPCC)¹² released its Fourth Assessment Report in 2007, a significant body of new peer-reviewed scientific research has been published that suggests that the IPCC may have underestimated the potential severity of future climate change impacts. In particular, recent data indicates that global ice cover is melting more quickly than predicted, which will contribute to acceleration in rising sea levels.¹³ Northern permafrost, which contains vast quantities of carbon dioxide and methane (a potent GHG), is thawing more quickly than previously projected and releasing these gases into the atmosphere.¹⁴ Finally, carbon dioxide is absorbed by oceans. As the gas dissolves, it forms carbonic acid which increases the acidity of ocean waters. Ocean acidification poses a significant threat to the world's coral reefs, shellfish and marine ecosystems.¹⁵ With increasing amounts of carbon being released, each of these processes will occur at a more rapid rate.

As acknowledged within the CCAP Annual Report, recent findings are now leading towards a global scientific consensus that more than 2°C of average global warming above pre-industrial levels would constitute a dangerous level of climate change. In order to have a chance of remaining below this threshold, the IPCC has indicated that industrialized countries need to reduce their combined emissions of GHGs to 25-40 per cent below 1990 levels by 2020 and by 80-95 per cent by 2050.¹⁶ While the Action Plan target for 2050 is in line with that of the IPCC, the ECO believes that a target more than 40 years into the future cannot to really serve as a catalyst for transformational change.

The transformational change must begin now and, within a decade or so, we must be much further along the path towards dramatic reductions. As indicated by the IPCC, this means that by 2020 the minimum reductions required would need to be 25 per cent, with more aggressive targets in the range of 40 per cent. Accordingly, the ECO questions the government's use of the term 'aggressive' to describe Ontario's current short- and medium-term targets (6 per cent below 1990 by 2014 and 15 per cent below 1990 by 2020) and is concerned that the targets set by the government might become viewed as maximums that need to be achieved, rather than what they should actually be considered – bare minimums. The ECO expects the government to carefully assess its targets in light of current scientific evidence.

The ECO questions the government's use of the term 'aggressive' to describe Ontario's current short- and medium-term targets...

Along with substantially reducing GHG emissions, there is an urgent need to focus on adaptation measures. Even if we were able to stop all emissions tomorrow, some climate change impacts will still occur. It is important, therefore, to adapt now to limit both future damage, as well as the long-term costs of responding to climate-related impacts that are predicted to grow in number and intensity in the years to come.

3.2 Electricity Planning

There is considerable uncertainty surrounding electricity policy planning in Ontario. In June 2006, the then Minister of Energy directed the Ontario Power Authority (OPA) to prepare an Integrated Power System Plan (IPSP).¹⁷ This Directive contained various goals that would have a direct bearing on GHG emissions in the province, depending upon future projections regarding the fuel mix. In particular, the goal for peak demand reduction from conservation measures was 6,300 megawatts (MW) by 2025.¹⁸ Interim measures were to reduce projected peak demand by 1,350 MW by 2010, with an additional 3,600 MW by 2025.¹⁹

The Directive also called for the expanded use of renewable energies and for an increase in the total capacity of renewable energy sources to 15,700 MW by 2025. In the interim, the IPSP was to result in an increase in the installed capacity of new renewable energy sources by 2,700 MW by 2010, compared with a 2003 baseline. Unlike the Directive regarding conservation targets, the IPSP did not strive to exceed the targets for renewable resources on the grounds that incremental renewable resources would "be large wind projects...[that] would not be cost effective when compared to the supply resources included in the Plan that would be displaced..."²⁰

A continuation of nuclear generation was also anticipated, as the Directive called upon the OPA to plan for nuclear capacity to meet base-load requirements but to limit the installed in-service capacity of nuclear to 14,000 MW. The plan was to "maintain the ability to use natural gas capacity at peak times and pursue applications that allow high efficiency and high value use of the fuel."²¹

In response, in August 2007 the OPA filed an application for approval for its proposed 20-year electricity plan, for the period 2008 to 2027, with the Ontario Energy Board (OEB).²² Within the IPSP, two options were presented, each of which assumed nuclear power, and an increased reliance on natural gas, would be part of the future electricity mix.

In September 2008, the Minister of Energy and Infrastructure directed the OPA to “revisit” its plan in light of changed circumstances.²³ In particular, this September Directive requested that OPA enhance the contributions to be made by renewable energy, conservation and distributed energy. The OPA was directed to provide an amended and revised IPSP which, it was expected, would be submitted to the OEB by March 2009. On March 12, 2009, the OPA indicated to the OEB that, in part because of the introduction of the *GEGEA*, it would require more time to respond to the September Directive.

In a further development, in June 2009 the government suspended a nuclear procurement process for two replacement reactors at the Darlington Nuclear Generating Station.²⁴ While indicating a continuing commitment to modernize Ontario’s nuclear fleet and, therefore, retain nuclear as a key component of its generation mix, the government determined that only one of the three bids, from Atomic Energy of Canada Limited (AECL), met the terms and objectives outlined by the government. Concerns regarding the quoted price, combined with uncertainty surrounding the future of AECL, led to the suspension.

A recent market assessment report has forecasted the OPA’s IPSP near-term capacity expansion requirements at just over 10,000 MW between 2008 and 2016.²⁵ The government originally assumed that just over one-quarter of this new capacity would come from natural gas; the emissions of which the ECO is assuming have been factored into its GHG forecasting. However, based on the nuclear cost issues noted above, there is a distinct possibility that only a portion of new nuclear capacity planned will ever be built. The report cautioned that two-thirds of this capacity expansion will likely need to be met by natural gas. The Ontario government should confirm, therefore, that this much higher natural gas contribution scenario has been factored into Ontario’s future GHG emissions forecasting.

To date, no further clarity has been provided either by the government, or the OPA, as to what the actual path forward now is with regard to electricity planning in the province.

Along with these developments, the government is proceeding with its planned phase-out of coal-fired electricity generation by 2014. Pursuant to Ontario Regulation 496/07 – Cessation of

Coal Use, made under the *Environmental Protection Act*, none of the four remaining coal-fired generating stations (Atikokan, Lambton, Nanticoke and Thunder Bay) are permitted to burn coal after December 31, 2014.²⁶ In September 2009, the government announced that two of eight units at Nanticoke and two of four units at Lambton would be closed by October 2010.²⁷ In phasing out the use of coal, Ontario Power Generation (OPG) is now testing the use of biomass (such as wood pellets and agricultural by-products) as a new renewable energy source and is targeting 2012 as the year it will begin using biomass as a replacement fuel in its former coal facilities.²⁸

Given each of these major changes in the Ontario electricity system, including the introduction of the game-changing *GEGEA*, it appears that the IPSP that was submitted in August 2007 is no longer current as a key document guiding electricity policy planning in Ontario. With the uncertain future that now surrounds new nuclear procurement, and the phase-out of coal, a stronger emphasis on conservation and demand management, along with renewables, will likely be necessary than was contained in the original IPSP. The *GEGEA* creates the necessary conditions to increase conservation measures and expand renewable energy in the province, and it is likely that the current targets contained within the IPSP are significant underestimates. A recent survey by the OPA, for example, indicated a near-term potential of 15,128 MW of renewable energy potential, including 13,382 MW of wind and 1,213 MW of solar photovoltaic.²⁹

To date, no further clarity has been provided by the government or the OPA as to what the actual path forward will be with regard to electricity planning in the province.³⁰ Given that much of the government's climate change plans are premised upon activities in the electricity sector and, in particular, coal phase-out, the ECO is concerned about the uncertainty and risk factors that currently exist in this area.



4 The Targets

4.1 Overview

As pointed out in the ECO's Special Report last year, in order to measure progress towards the government's target of a 6 per cent reduction in emissions below 1990 levels by 2014, it is imperative that the government provide numbers relating to both real and projected emission reductions associated with specific initiatives. In order to adequately track the government's progress on GHG reductions towards the 2014 target, the ECO recommended that forecasts (at least by sector if not by initiative) be provided for the years 2008 to 2014.

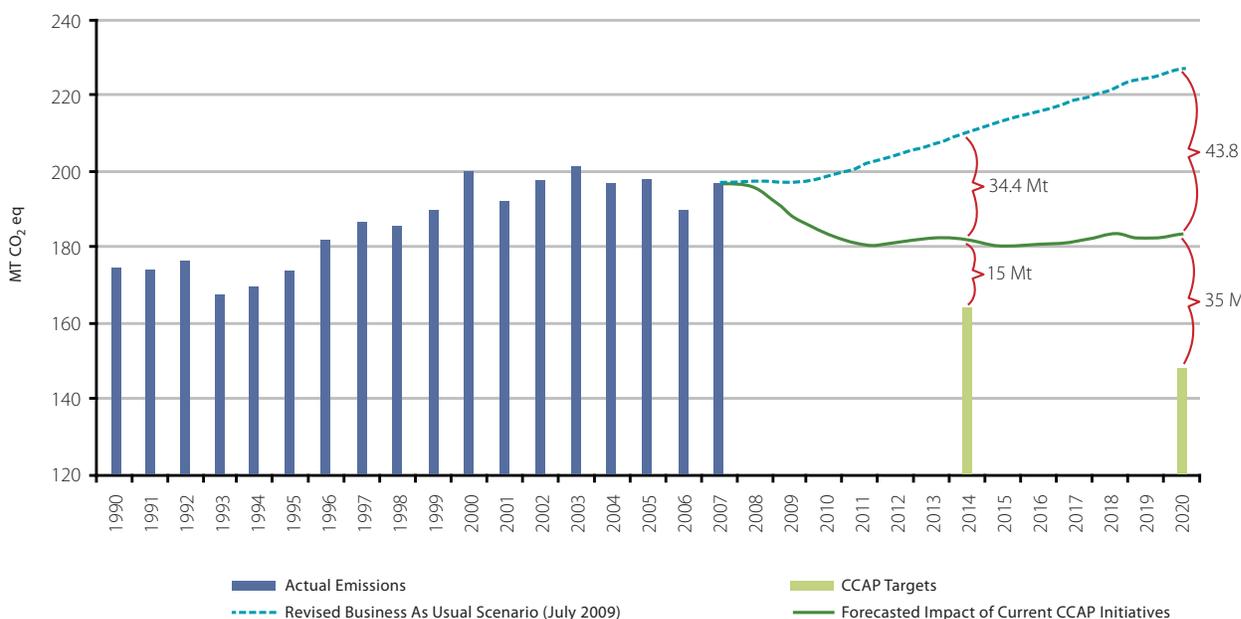
The ECO recognizes that the impacts of many of the Action Plan initiatives, along with the tracking and reporting processes, are still in the initial stages. However, the provision of such information going forward will be a fundamental component of any credible reduction plan. The ECO is pleased that the government plans to employ a third-party verification process next year and sees this as critical to the success of the Action Plan as it will confirm data quality and transparency.³¹ This is especially important given that federal National Inventory Report (NIR)³² emission figures typically suffer an 18-month time lag. In other words, the final figures for 2014 will likely not be available until April 2016 – this delay speaks to the importance of having a verification process in place that will instil public confidence in the reductions claimed. According to both Figure 6 and Figure B2 of the CCAP Annual Report,³³ initiatives undertaken to date should already have begun to 'bend the curve' downwards toward the 2014 target. In the future, therefore, CCAP Annual Reports should include quantitative information with regard to both the initiatives responsible for such reductions and the actual reductions achieved.

Finally, the government will need to provide clarity as to the start date, or time-frame over which any actual reductions have occurred. In other words, a clear baseline must be provided against which each initiative can be measured. Ideally, this information should be represented in a clear chart format so that it is unambiguous to the public when each initiative began, what the projections were for each initiative and the results achieved.

4.2 Discussion

Figure 6 in the CCAP Annual Report, entitled ‘Impact of CCAP 2007 Initiatives vs. CCAP Target’, projects future emissions from the most recent data year (2007) to 2014 and on out to 2020. A slightly modified version of this figure has been reproduced below as our Figure 1. The green bars indicate the 2014 target of 165 Mt and the 2020 target of 149 Mt. The figure indicates that the impact of current Action Plan initiatives nominated in 2007 will *not* get the government to its 2014 target of 165 Mt (6 per cent below the 1990 level), but projects a shortfall in the order of 15 Mt at 2014. Equally significant, the figure shows that the Action Plan will not achieve its 2020 target of 149 Mt (15 per cent below 1990 levels) and is projecting a shortfall of 35 Mt at 2020. It should also be noted that after the phase-out of coal and beginning in 2015, the GHG emissions forecast trends slightly *upward*.

Figure 1 – Impact of CCAP 2007 Initiatives vs. CCAP Target



In total, the impact of the suite of Action Plan initiatives is projected to deliver 34.4 Mt of GHG reductions at 2014 and 43.8 Mt at 2020. What is revealing is that about three-quarters of the 2014 GHG reductions are attributed primarily to OPG’s commitment to phase-out coal use at its four remaining thermal power facilities. The other 13 initiatives in the suite of key GHG reduction initiatives are projected to deliver about 8 Mt by 2014 and about 15 Mt by 2020. As well, a significant portion of each of these totals is attributed

The Targets

to a federal initiative,³⁴ the Fuel Efficiency Standard, rather than a provincial one. Of the remaining 8 Mt reduction projected for 2014, the CCAP Annual Report attributes approximately 2.24 Mt to this federal initiative. Similarly, of the 15 Mt reduction projected for 2020, 5.45 Mt is projected to come from the Fuel Efficiency Standard.³⁵

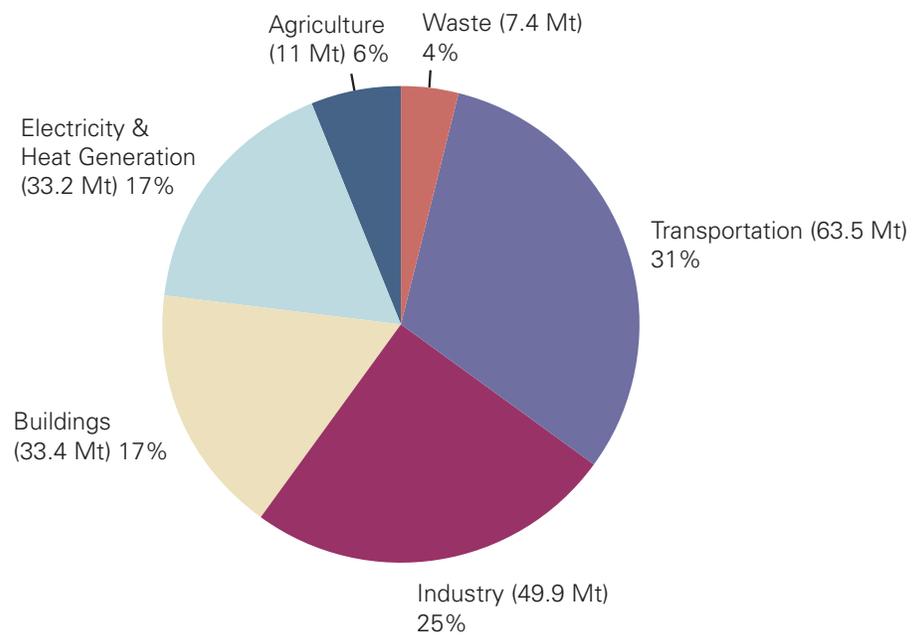
The CCAP Annual Report's Figure B1 also shows that the government's revised Business-As-Usual (BAU)³⁶ scenario at 2014 and 2020 reflects more recent modelling of the impact on GHGs associated with the recession. This figure indicates BAU GHGs are now forecasted to be 17 Mt lower in 2014 and 22 Mt lower in 2020 compared to BAU values published in last year's Annual Report.



5 The Sectors

The CCAP Annual Report's Figure 1 provides a chart depicting Ontario's 2007 GHG emissions by sector. This is adapted as our Figure 2, below.

Figure 2 - Ontario's 2007 GHG Emissions by Sector



Sector discussions follow below with a review of the Action Plan's suite of GHG reduction initiatives, a critique of the government's approach and suggested areas where the government needs to focus more effort.

5.1 Transportation

As depicted in Figure 2 above, the transportation sector was responsible for 63.5 Mt, or 31 per cent, of Ontario's emissions in 2007. Since 1990, this sector has experienced the largest percentage increase in GHG emissions when compared to all other sectors.

Road transportation (gasoline and diesel) represents the largest portion of transportation's overall emissions with 48.2 Mt (three-quarters). Aviation, railways, navigation and off-road transportation constitute the remaining 25 per cent.³⁷ Of the 48.2 Mt attributed to road transportation in 2007, passenger vehicles were responsible for 34.8 Mt, whereas freight transportation³⁸ was responsible for 13.4 Mt. The large growth of GHG emissions for passenger transportation is directly related to urban sprawl, with over 5.6 million commuters in Ontario in 2006 and 71 per cent of them using a personal vehicle to travel to work.³⁹ The growth can also be attributed to consumer preferences for light-duty gasoline trucks such as SUVs, vans and pickups, which has resulted in a 123 per cent increase in emissions from these vehicles since 1990.⁴⁰ The ECO recognizes the importance of reducing GHG emissions associated with commuting

The government must seriously consider road pricing as a candidate initiative to reduce transportation GHG emissions.

and personal automobile use and believes that the Action Plan's reduction initiatives focus correctly on this area. The public transit and transportation demand management (TDM) initiatives identified in the Action Plan are fundamental to reducing emissions in this sector.

Similar to the proposals in the CCAP Annual Report to establish a price on carbon through a cap-and-trade regime as one means to reduce GHG emissions from the power sector and large industry, the ECO believes that the government must seriously consider road pricing as a candidate initiative to reduce transportation GHG emissions. A recent Organization for Economic Co-operation and Development (OECD) report has noted the key challenges of traffic congestion, poorly integrated regional transit services and relatively underdeveloped public transport infrastructure in the Greater Toronto Area. The lost productivity costs to Canada due to this congestion in the Toronto region are estimated at \$3.3 billion annually.⁴¹ The OECD recommends such initiatives as toll lanes on 400-series highways that would reduce congestion and tailpipe emissions while providing much needed funding for investment in rapid transit.

In the area of freight transportation, beyond the use of speed limiters, there is a disappointing lack of candidate measures to reduce GHG emissions associated with the transportation of freight and goods, either by road or rail. GHG emissions from road-based freight transportation have increased by 63 per cent since 1990, rising from 8.2 Mt to 13.3 Mt in 2007.⁴² Emissions from heavy-duty diesel vehicles have almost doubled, increasing from 6.6 Mt in 1990 to 12 Mt in 2007.⁴³ This increase can be attributed to the manufacturing subsector, which relies on just-in-time manufacturing, resulting in an increase in the use of transport trucks to move raw materials and finished goods.⁴⁴

Further, while the federal government has jurisdiction over the national railways, the province should be focusing on those rail assets over which it does have control, including GO Transit and the Ontario Northland Railway. The electrification of GO Transit alone over the next ten to fifteen years would significantly reduce transportation GHG and related particulate emissions from diesel locomotives.

5.2 Industry

As noted in Figure 2 above, the next largest segment of the GHG emissions pie is attributed to industry. In 2007, the industrial sector was responsible for 50 Mt or 25 per cent of Ontario's emissions. As depicted in Figure 7 of the CCAP Annual Report, the forecasted amount of GHG reductions projected for industry under the current suite of initiatives at year 2020 is zero. The CCAP Annual Report notes that "the introduction of a cap-and-trade system could be a significant factor in helping to close or eliminate the shortfall"⁴⁵ not only in the industrial sector but in other sectors of the Ontario economy.

The forecasted amount of GHG reductions projected for industry under the current suite of initiatives at year 2020 is zero.

The government has indicated its intention to develop a cap-and-trade system to control and reduce GHG emissions beyond the electricity sector, and has introduced enabling legislation for this purpose. The government's approach initially assumed Canadian federal action in this area, and more recently has been premised on harmonizing with U.S. initiatives, particularly through the Western Climate Initiative (WCI).

The government posted a discussion paper on cap-and-trade on the Environmental Registry in May 2009.⁴⁶ The discussion paper suggests that implementation of an Ontario system will await a 'coalescing' of the Canada and U.S. federal initiatives and the WCI.⁴⁷ The ECO believes that an over-reliance in the government's plan on a cap-and-trade system that *might* deliver the tonnes by 2020 is an area of considerable risk. While the ECO supports the government's plans to assess "new options that deliver GHG reductions that are additional to cap-and-trade,"⁴⁸ the clear impression is that the government hopes a cap-and-trade system will "close the gap" by 2020. No thought seems to have been given to contingencies or options if plans to harmonize a North American tradable permit regime are revised, delayed or rejected. In addition, the ECO sees risk associated with a process where the decisions about the scope, coverage, legal implications and timing of a future cap-and-trade system may be largely in the hands of other jurisdictions.

At the time of writing, the administration in Washington was considering all options to bring the U.S. into the climate change mitigation mainstream in advance of United Nations Framework Convention on Climate Change meetings in Copenhagen in December 2009. In addition to various cap-and-trade proposals before the U.S. Congress, the administration is considering directing the U.S. Environmental Protection Agency to impose administrative controls on key large industrial emitters (coal plants and the automobile sector) to mandate GHG reductions.⁴⁹ An *administrative* as opposed to a *legislative* route is a distinct possibility and could jeopardize the introduction of a North American-wide tradable permit system.

A further area of risk relates to the Canadian government's proposed regulatory framework for industrial GHG emissions which is based on an emissions-intensity format (GHG emissions per unit of output).

As things currently stand, the incompatibility between the Canadian federal proposals based on emissions intensity (and the use of a 2006 baseline), and the Ontario approach based on absolute emission reductions – similar to what the U.S. government is proposing – may lead to the forecasted reductions achieved through Ontario’s coal phase-out not receiving adequate compensation and recognition under the Canadian regulatory framework.

Ontario’s coal phase-out may not receive adequate credit and recognition under the currently proposed Canadian regulatory framework.

A related area of risk and uncertainty concerns Ontario’s obligations under the North American Electric Reliability Corporation (NERC) and the WCI regarding the status of power imports and exports, particularly those that are fossil-fuel derived. A 2008 NERC report cautioned that “broad-scale fuel switching from coal to natural gas and increased dependence on natural gas as a fuel for electric generation may impact reliability.”⁵⁰ Under its NERC commitments, Ontario could be obligated to restart coal plants, should the need arise. With regard to WCI obligations, if Ontario were to import coal-fired electricity from New York

(currently a non-WCI jurisdiction), then Ontario could be responsible for including these GHG emissions in its yearly inventory report. In either case, such actions could undermine Ontario’s ability to claim a complete ‘coal phase-out’ by the end of 2014.

There is an incompatibility between the Canadian federal proposals ... and the Ontario approach based on absolute emission reductions.

5.3 Electricity

The electricity sector was responsible for 33.2 Mt or 17 per cent of Ontario’s emissions in 2007. The forecasted GHG reductions in the electricity sector represent the largest single contributor to the government’s 2014 and 2020 GHG reduction targets.

As noted above in Section 3.2, the September 2008 Directive from the Minister of Energy and Infrastructure for the OPA to revamp the IPSP and the June 2009 suspension of a nuclear procurement process present major challenges for electricity planning in Ontario. Given the uncertainty surrounding the status of the IPSP and the uncertain future that now surrounds new nuclear procurement, the ECO believes that a much stronger emphasis on conservation and demand management, along with natural gas-fired generation and renewables, will likely be necessary.

The ECO believes that a key area of risk in the Action Plan continues to be its overwhelming reliance on the phase-out of coal and related activities to deliver the numbers. This is particularly concerning in light of the obscure path forward on electricity planning in Ontario. In addition, the market assessment report⁵¹ identified in Section 3.2 has demonstrated that Ontario’s system peak load is *increasing* while base load is in decline,⁵² thus elevating the importance of peaking capacity to the system. The government originally assumed that just over one-quarter of this new capacity would come from natural gas, the emissions of which the ECO is assuming have been factored into the Action Plan’s 2014 and 2020 GHG forecasts.

The market assessment report has further noted that due to related nuclear cost and deferral issues, as much as *two-thirds* of the OPA's near-term peaking capacity expansion requirements may have to be met by natural gas. If so, then the ECO disputes the CCAP Annual Report's assurances that "[r]ecent government decisions respecting procurement of new nuclear capacity are not expected to affect Ontario's GHG projections."⁵³

5.4 Buildings

In 2007, the building sector was responsible for 33.4 Mt or 17 per cent of Ontario's emissions. Between 1990 and 2007, the building sector in Ontario was responsible for 7 Mt of the 22 Mt increase in GHG emissions over this period.

According to the ECO's calculations, the CCAP Annual Report forecasts a cumulative 4.5 Mt contribution in GHG emission reductions from initiatives targeting the buildings sector by 2020. Reducing electricity demand seems to be the main focus. While the ECO agrees with the importance of electricity demand response, the Action Plan seems to be pursuing this to the apparent exclusion of opportunities – both existing and future potential – involving the use of other forms of energy, particularly natural gas.⁵⁴

The natural gas distribution utilities in Ontario – Union Gas and Enbridge Gas – have implemented industry-leading conservation and demand management (CDM) program offerings across all segments of their customer classes – residential, commercial, institutional and industrial – since the mid-1990s. Enbridge alone has generated cumulative savings from its customer CDM programs of 3.6 billion cubic metres of natural gas from 1995 through 2007. Enbridge has publicly reported that this reduction in natural gas use has translated into avoided CO₂eq emissions of nearly 7 million tonnes.⁵⁵ As these reported emission reductions are evaluated and confirmed by third-party auditors under the auspices of the OEB and are net of free-riders,⁵⁶ it remains unclear to the ECO how, or if, these significant GHG emission reductions are being factored into the government's GHG forecasting.

5.5 Waste

In 2007, the waste sector was responsible for 7.4 Mt or 4 per cent of Ontario's emissions. The only waste initiative that has been identified within the Action Plan relates to the capture of methane gas from landfills. This requirement is pursuant to recent changes to Ontario Regulation 232/98 – Landfilling Sites, made under the *Environmental Protection Act*, which requires landfills with capacities larger than 1.5 million cubic metres to design and install gas collection systems, either to flare methane or burn it to generate electricity (landfill-gas-to-energy). However, there does not appear to have been any critical evaluation in the Action Plan regarding the industry assumptions underlying this change in regulatory requirements.

Recently, it has been suggested that landfill gas collection efficiency, previously assumed to be 75 per cent based on U.S. Environmental Protection Agency data, may, in fact, be as low as 20 per cent.⁵⁷ Of particular concern is the issue of 'containment failure' long after a landfill is closed and post-closure maintenance has terminated. This deterioration may be responsible for uncontrolled releases of methane similar to or greater than what is produced during the limited interval that the gas collection system

is operating. Therefore, the ECO believes that the issue of forecasting fugitive emissions from landfill operations, and the assumptions that underpin this forecasting, need to be critically re-evaluated to ensure that the forecasted GHG emissions reductions from the installation of collection infrastructure are real and verifiable.

5.6 Greening the Public Service

The Ontario Public Service (OPS) Green Office was established and situated within the Ministry of Government Services in September 2008. This office is responsible for working with the Climate Change Secretariat and all ministries to co-ordinate a government-wide approach to greening internal government operations.

The Green Office has developed a multi-year Green Transformation Strategy which focuses on making reductions in areas such as: vehicle use and fuel consumption; business air travel; packaging and waste; electronic waste; and paper, water and energy consumption.⁵⁸ As indicated in the CCAP Annual Report, the 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.

The ECO is encouraged to see the establishment of a centralized government body that has been specifically tasked with the responsibility of co-ordinating green initiatives across the entire government. This is not a small mandate given that there are 29 ministries, some 630 agencies, boards and commissions, and 68,000 OPS employees spread across 1,800 locations. The Green Office has 13 employees and its operating budget for 2009/2010 was \$1,000,000, with \$169,100 available for 'services.'⁵⁹

The ECO understands that the Green Office is developing tools to measure and report on its progress⁶⁰ and it is the ECO's anticipation that such reports would be made available to the public. The ECO is pleased to see that a 30,000 tonne reduction target has been established for provincial government buildings in Toronto.⁶¹ As well, the ECO is encouraged that province-wide reduction targets of 19 and 27 per cent have been established for 2014 and 2020 respectively,⁶² using a 2006 baseline.

5.7 Other Concerns

As noted in our 2008/2009 Annual Report released in October 2009, the Ministry of Natural Resources adopted a forest biofibre policy in August 2008, the purpose of which is to "guide the allocation, pricing and use of forest 'biofibre' for energy production and other value-added end uses."⁶³ We agreed in our Annual Report that, over the longer-term, burning forest biofibre to generate electricity is a better strategy than burning fossil fuels, "as net carbon emissions are nil."⁶⁴ However, over the short-to-medium term, the ECO noted that burning forest biofibre does create a carbon 'debit' by releasing large amounts of CO₂ "that will not be re-sequestered for decades."⁶⁵ As such, the ECO is concerned about the risk to the government's GHG forecasting over the short-to medium-term associated with this use of forest biofibre as well as its risks to forest biodiversity.



6 Assessing the Transparency of the Process

6.1 Making the Numbers More Transparent

The ECO accepts that restating the BAU is necessary, and the CCAP Annual Report is transparent in presenting this in the context of the recent contraction in the economy. However, a plan that attributes achieving one-third of its 2014 GHG reduction target to an economic downturn and about one-half to one initiative (coal phase-out) cannot be considered 'aggressive'. A plan that conservatively focuses on current best practice is no substitute for a plan with a vision of the future. This lack of vision is perhaps best illustrated in the report's Figure 7, adapted and clarified below as our Figure 3.

A plan that conservatively focuses on current best practice is no substitute for a plan with a vision of the future.

Figure 3 – Forecasted CCAP BAU Emissions Compared to Remaining Emissions in 2020

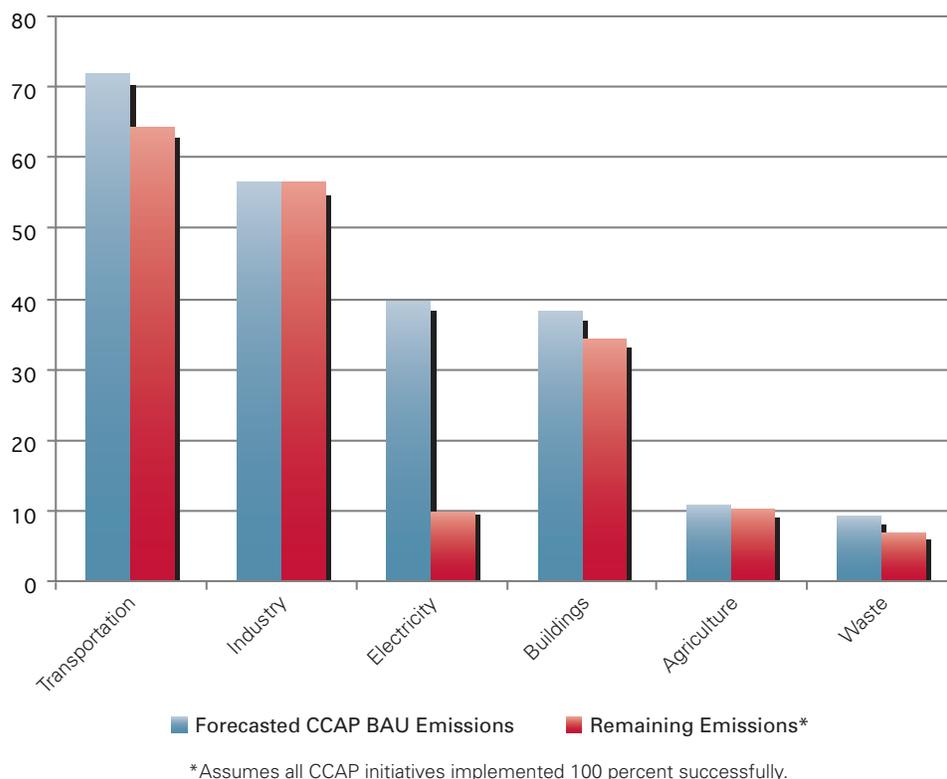


Figure 3 more clearly demonstrates where CCAP Action Plan deficiencies lie. The sector discussions in Section 5 provide the details. Our revised figure makes it much clearer to the reader where the sector reductions are expected and, equally clearly, where they are not expected. Compared to the BAU bars in blue, no GHG emission reductions are forecasted in the industrial sector and, with the exception of the electricity sector, those forecasted in the transportation and building sectors are very modest.

6.2 Clarifying the Optics and Metrics

The CCAP Annual Report notes that while Ontario’s absolute emissions increased by 13 per cent between 1990 and 2007, emissions *intensity* (using either tonnes per capita or tonnes per dollar of real Gross Domestic Product) went down over the same period.⁶⁶ The ECO believes that the introduction of emission intensity metrics, while illustrative of one kind of trend, may introduce unnecessary confusion. While such a trend may be commendable, the only true measure of success will be absolute reductions in GHG emissions and the ability of the government to drive the province’s GHG emissions towards (and ideally to exceed) the targets that have been set.

A second area of confusion is the manner in which the 2014 target is being reported and portrayed in Figure 6 of the CCAP Annual Report. Figure 6 would lead one to believe that the target year is 2015, rather than 2014. Let us be clear – the government’s original target was to reduce Ontario’s GHG emissions to

6 per cent below 1990 levels by 2014 and the government continues to state that 2014 is its target year. Claiming that the government has achieved 71 per cent of its 2014 target in one part of the CCAP Annual Report while showing in a figure elsewhere that this won't be accomplished until 2015 is very misleading.

Common practice in GHG mitigation planning is to report total emissions on a full calendar year basis⁶⁷ and to evaluate forecasted emissions and emission reductions in a similar manner. The ECO believes that this is also consistent with the public's understanding of the issue. For example, emissions for the baseline year of 1990 represent the total amount of GHGs emitted in 1990 and the target for 2014 of 165 Mt represents the total amount which will be emitted in 2014 if the government's target is met. The government is correctly reporting 1990 GHGs on a full calendar year basis as its baseline. It is confusing, therefore, that the government then changes, and uses an annualized emission rate⁶⁸ as the metric for determining success in achieving future forecast targets, rather than a calendar year total. Ultimately, it is only through the future comparison of emissions actually released in 2014 to the amounts actually released in 1990 that the government will be in a position to determine whether the 6 per cent reduction target has been met.

Common practice ... is to report total emissions on a full calendar basis and to evaluate forecasted ... emission reductions in a similar manner.

Ontario Regulation 496/07 requires the phase-out of coal by the end of 2014. OPA's coal plant retirement schedule indicates there will be about 3,290 MW of in-service coal capacity available in 2014 (and assumes an output of 15 terawatt hours (TWh) and a 52 per cent capacity factor)⁶⁹. In the interests of clarity and preventing confusion, it would have been more transparent for the government to report that it will miss its 2014 target by an additional estimated 3 Mt (due to the contributions of coal-fired electricity in 2014), but then to provide a clear explanation of the impact and significance of the coal phase-out on GHG emissions post-2014 and towards the 2020 target.

6.3 Need for Other Metrics

In the CCAP Annual Report, projected reductions are provided for 14 key initiatives and are reported in megatonnes of carbon dioxide equivalent (Mt CO₂eq). Given that the overriding goal of the Action Plan is to reduce GHG emissions, the ECO agrees that this is the most important metric that should be reported in any government progress report on climate change and, where feasible, should be utilized for as many initiatives as possible. Quantifiable emission reductions could be attached to some initiatives that currently are missing such information. For example, through the provision of capital funding to college and universities for energy efficient retrofits, or through the expansion of high occupancy vehicle lanes (two initiatives that are identified within the CCAP Annual Report), the government should be in a position to attach quantifiable emission reductions forecasts, or at least estimates, to such efforts.

The remaining 56 initiatives that are listed do not have any associated GHG tonnage, but according to the government were designed to be "enablers" in the transition to a lower-carbon, green economy. According to the CCAP Annual Report, the performance (or progress) of the 56 "enabling" initiatives

is tracked through proxy measures, rather than through quantifiable emission reductions, and so no emissions reductions have been associated with these efforts. The ECO recognizes that for many initiatives tonnage reduction is not the most appropriate metric to determine progress. For example, the CCAP Annual Report includes several initiatives that are educational in nature and so measuring the GHG emission reductions of such initiatives would clearly not be the most useful metric.

Nevertheless, for initiatives that do not lend themselves to quantifiable GHG emission reductions, the ECO believes that it is fundamental for the purposes of transparency that the government provide progress reports on the development of other such proxy metrics wherever possible. Many of these 'soft' initiatives play a role in raising social and cultural awareness of climate change issues and serve a key role in moving towards a less-GHG intensive society and the "culture of conservation" envisaged by the *GEGEA*. By reporting on the nature of these proxy measures, and the annual progress that is made towards them, the government would demonstrate greater transparency with regard to the efficacy and progress towards its non-quantifiable GHG emission reduction goals. Ideally, this information should be presented in such a manner that the public, at a glance, is able to determine progress.

6.4 Assurance Regarding the Numbers

The ECO is pleased to see that the forecasted reductions from the 14 key initiatives have been validated in a transparent manner with an Assurance Statement by a third-party validation consultant.⁷⁰ With suitable caveats regarding "the methods, data sources, and assumptions used to model GHG reductions for the 14 initiatives,"⁷¹ it was determined that the restated Business-As-Usual⁷² (BAU) forecast and the restated

The ECO is pleased to see that the forecasted reductions from the 14 key initiatives have been validated in a transparent manner...

projections of contributions to GHG reductions from the Action Plan's 14 key initiatives are a "fair representation"⁷³ for forecasting purposes.

The one area the ECO does have a concern is with the CCAP Annual Report's underlying assumption that all initiatives will be fully implemented,

achieving 100 per cent of their potential. This is an inherent area of risk that was not analyzed by the validation consultant. The government should be providing GHG forecast scenarios depicting GHG reductions where adoption rates are less than 100 per cent successful (such as 25, 50 and 75 per cent successful). This would provide the government, the ECO and the public with a clearer assessment of the risk associated with penetration rates that are less than fully successful.

6.5 Governance Issues

In our Special Report last year, we asked for greater transparency in terms of how GHG emissions forecasting is done, what the projections are, when the milestones will be achieved and where progress is being made in achieving them. Implicit in this request is the need for transparency in the *process* which drives and enables these activities. We noted last year that "virtually all government ministries,

agencies and related stakeholders will have a role to play in delivering on the [climate change action] plan's initiatives."⁷⁴ This observation is quoted verbatim in the Minister of the Environment's message in this year's CCAP Annual Report where he indicates that the government is in "complete agreement."

The public and other stakeholders, in addition to the ECO, need to understand the governance process that ensures the government will meet the Action Plan's targets. To hold the government accountable, this process must be articulated in the government's annual reports in a clear and transparent way. The ECO asked in our Special Report that a 'process map' be provided in this year's CCAP Annual Report clearly indicating the roles and responsibilities of key ministries and agencies participating in the design and implementation of the Action Plan. The ECO is disappointed that this schematic was not provided. The ECO and the public need to understand who in the government has the responsibility, authority and – equally important – the accountability for meeting the Action Plan's reduction targets.

The CCAP Annual Report refers to the government's use of a standardized process for collecting, analyzing and reporting information on the performance of individual initiatives. The CCS shared with the ECO an early version of a template "[l]ike the dashboard of a car"⁷⁵ and the ECO strongly supports the use of such a template. We particularly support a template that can incorporate milestone timelines by year (and disaggregated by each quarter) out to 2014 and beyond. The ECO agrees with the CCAP Annual Report that this method of tracking is a key component in the government's management of risk associated with its Action Plan.

The ECO and the public need to understand who in the government has the responsibility, authority and – equally important – the accountability for meeting the Action Plan's reduction targets.

The ECO still has major concerns about the lack of transparency in the Action Plan process. While MOE and the CCS are the designated 'champions' of the Action Plan, they have no real power or ability to nominate key expenditures that will deliver on the plan, or to block those expenditures that may compromise it.⁷⁶ In fact, the CCS has no real regulatory powers of its own. While its budget is housed within the MOE, the Secretariat reports to the Secretary of the Cabinet, who is also the head of the Ontario Public Service.

So, while the *commitment* to the Action Plan may be demonstrated (with the caveats noted earlier), the *capacity* to deliver on the Action Plan's milestone targets in the face of competition within Cabinet for scarce resources (both human and financial) is not clearly demonstrated in the CCAP Annual Report.⁷⁷ The 'co-ordination' role of the CCS is clearly noted. Its role is "to provide comprehensive corporate leadership and support for government-wide efforts on all aspects of climate change"⁷⁸ including the monitoring and tracking of progress.

In terms of monitoring and evaluation, the process does not clearly indicate how results will be used to adjust strategies for the design and implementation of new (and existing) initiatives (policy learning); nor is it clear how results will be used to enhance accountability for performance (performance management). In discussions with CCS staff over the spring and summer of 2009, it was indicated to the ECO that updates on the planning process were being reported through a Climate Change Action Committee (CCAC),

chaired by the Minister of the Environment, and to CCAC Deputies. The roles and responsibilities of the CCAC and its membership are not discussed in the CCAP Annual Report. It is the ECO's understanding that the decisions and recommendations originating with the CCAC are channelled through the Secretary of the Cabinet to the Cabinet and Premier.

The ECO strongly supports the creation of the Premier's Climate Change Advisory Panel in the fall of 2008. The CCAP Annual Report provides a link to this 11-member Panel and summarizes the Panel's mandate, roles and current research priorities. The ECO believes that this Panel should have more visibility in future annual reports and an expanded mandate that clearly articulates how it will advise key ministries and committees going forward. Process transparency would be considerably improved in subsequent annual reports with the inclusion of a process diagram showing how the outputs from this Advisory Panel relate to the work of the CCAC.

The ECO is assuming the new Cabinet Committee on Ontario's Economic Future (CCOEF)⁷⁹ will play a lead role in ensuring that the *GEGEA* and the Action Plan are co-ordinated to transform the provincial economy. The CCOEF's mandate is to "maximize the business opportunities created by the global economy *and climate change* (emphasis added)."⁸⁰ However, beyond listing the members of this cabinet committee, the CCOEF's web site provides little in the way of details as to how it will carry out its mandate. The real climate change policy levers are in the hands of these CCOEF ministries (and at least two others - the Ministry of Transportation and the Ministry of Municipal Affairs and Housing).

It is also not clear to the ECO how engagement involving CCOEF ministries is being secured to ensure their ownership of (and confidence in the ability to deliver on) the Action Plan's forecasts and reduction targets. Ideally, a governance process would delineate roles, responsibilities, accountabilities and key metrics that will encourage CCOEF members and recognize their contributions to achieving plan results (including recognition for exceptional performance).

6.6 Climate Adaptation Issues

A clear understanding of provincial adaptation needs and priorities and government plans and challenges is essential.

Along with reducing GHG emissions in order to mitigate the impact of climate change, it is critical that appropriate measures to adapt to climate change are taken, given the inevitability of some degree of climate change in the future. Even if all global GHG emissions could be stopped tomorrow, the enormous inertia in

the Earth's climate systems means that changes to our climate over the remainder of this century are unavoidable. The urgent need to begin preparing for such changes is not an alternative to reducing overall GHG emissions, but a parallel and complementary action. In the absence of a federal climate change adaptation strategy, it is fundamental that Ontario move ahead and develop its own comprehensive strategy given that much of the social, economic and cultural health of Ontario is influenced by climate and many provincial ecosystems are potentially vulnerable to the impacts of climate change. In order to properly address the predicted impacts of climate change in Ontario, a clear understanding of provincial adaptation needs and priorities, and government plans, priorities and opportunities is essential.

In July 2007, the Ontario government announced the establishment of an Expert Panel on Climate Change Adaptation and named its two co-chairs.⁸¹ The remaining Panel members were appointed five months later and are comprised of several scientists and environmental experts.⁸² The mandate of the Expert Panel was to “help the Ontario government, municipalities and Ontarians prepare and plan for the impact of climate change in areas such as public health, environment, infrastructure, and economy.”⁸³

In November 2009, the government released *Adapting to Climate Change in Ontario: Report of the Expert Panel on Climate Change Adaptation*. The report contains five key recommendations, including one that calls upon the Minister of the Environment to take “immediate steps to seek Cabinet support for launching, by Spring 2010, a province-wide climate change adaptation action plan...[that is] guided by a strategy”⁸⁴ founded on five goals. The strategic goals are to:

- enhance government leadership;
- integrate adaptation;
- support communities;
- develop and disseminate knowledge and tools to manage risk; and,
- collaborate with other governments.

Also included in the report are 59 recommendations that, according to the Panel, “can be used to make a fast start on building a more climate-resilient province.”⁸⁵

The ECO is pleased that the government’s report on climate change adaptation has been finalized and is publicly available. The ECO is also encouraged to note that the first recommendation made by the Panel – to develop an adaptation strategy and action plan – is consistent with a recommendation made by the ECO last year. Clearly there is a significant amount of work remaining to put an approved strategy in place; and the ECO is encouraged by and supports the Panel’s recommendation that this be done by spring 2010.

The urgent need to develop a strategy is clear in light of the significant amount of money allocated towards critical infrastructure projects over the next two years. As the CCAP Annual Report indicates, the government has committed \$32.5 billion towards renewing, expanding and enhancing public infrastructure. Without a provincial adaptation strategy, the ECO is concerned that much physical infrastructure renewal (which includes projects that may have up to 50 to 100 year expected lifespans) will proceed without a solid integration of adaptation considerations.

Finally, the ECO believes that government reporting regarding adaptation measures should be kept separate from GHG mitigation and emission reductions discussions. While climate change mitigation and adaptation policies and efforts are complementary (in that some mitigation activities also are adaptive in nature – such as the installation of green roofs) the ECO would suggest that future Action Plan reporting focus solely on mitigation activities and that a separate venue be established for government reporting on adaptation. The ECO is not suggesting that an either/or approach be taken towards mitigation and adaptation, but rather that there is a need to undertake both approaches together as two complementary but distinct issues within an overall comprehensive plan on climate change.



7 A Broader Mandate

The *GEGEA* stipulates that the ECO report annually to the Speaker of the Assembly on the progress of activities in Ontario to reduce emissions of GHGs. This mandate includes, but is not limited to, a review of the government's annual reports. As such, the *GEGEA* mandate casts a wide net. This report fulfills the *GEGEA* requirement for the ECO to report to the Legislative Assembly before the end of 2009.

While MOE and the CCS are the lead agencies setting the parameters for government engagement on the issues, their power to deliver on major GHG mitigation and adaptation initiatives is limited.

for government engagement on the issues, their power to deliver on major GHG mitigation and adaptation initiatives is limited. In future reports, the ECO will be assessing the plans and policies of the key ministries and agencies that will have a key influence on the government's success or failure in achieving its climate change objectives.

Recognizing that it has a broader GHG and climate change policy review and reporting mandate, the ECO is also reviewing a broad range of planning and policy initiatives that it believes have a collective impact on the ability of the provincial government to implement GHG mitigation and adaptation initiatives out to 2020 and beyond. While MOE and the CCS are the lead agencies setting the parameters



8 Conclusions

It is the ECO's function to review and evaluate the progress the Ontario government is making in achieving its GHG emission reduction targets. This role includes giving credit where credit is due, but it also involves pointing out areas the ECO believes need to be improved.

The CCS staff are messengers and co-ordinators in this process and are performing their role well. The ECO is impressed with their considerable efforts over the past year to develop realistic and defensible metrics and to provide co-ordination across the various ministries and agencies whose actions, policies and programs will determine the success or failure of the Ontario government in achieving the GHG emission reduction targets set out in the Action Plan.

Of particular note in the CCAP Annual Report are the efforts in the OPS to reduce GHG emissions from operations and activities within OPS' control. The OPS Green Transformation Strategy is pursuing a commendable target to reduce the government's carbon footprint to 27 per cent below 2006 levels by 2020.

The CCAP Annual Report clearly recognizes, and the ECO agrees, that the process of meeting GHG emission reduction targets is a formidable task. The government acknowledges that the current suite of initiatives, even when implemented 100 per cent successfully, will not allow it to meet either its short-term 2014 or its medium-term 2020 GHG emission reduction targets.

The government is also transparent in identifying where and in what sectors it anticipates it will get its short-term GHG emission reductions. The ECO is pleased to see that the government has obtained third-

Conclusions

party assurance regarding the modelling of projected initiative impacts and that subsequent annual reports will include third-party verification of actual measured savings as they become available.

There are, however, many areas in which improvement is needed.

Clearly, in order to find a way to meet its targets, the government needs to identify and develop more tools for its GHG mitigation tool kit. Future annual reports must also explore scenarios wherein the implementation of key initiatives occurs at adoption rates that are less than 100 per cent successful because success cannot depend on the rosiest scenario.

In order to find a way to meet its targets, the government needs to identify and develop more tools for its GHG mitigation tool kit.

The ECO has other major reservations, particularly regarding the efficacy of several of the existing initiatives. For example, we see some short-term risk (to 2014) associated with a GHG mitigation plan that places an inordinate amount of faith in the execution of one key

initiative – the phase-out of coal use at OPG’s four remaining coal-fired plants. The government as much as agrees with this concern as the CCAP Annual Report provides a discussion of risk management and the potential impacts on emission forecasts due to such ‘external factors’ as demand for peak electricity, presumably leading to either delays in the phase-out of coal or some unseen imperative that requires the re-starting of idle units after 2014.

Similarly, we see considerable medium-term risk (to 2020) associated with the government’s positioning on the potential GHG reductions in the economy that may be delivered by a cap-and-trade system. The ECO has noted above its concerns regarding the risks inherent in a process where Ontario becomes a ‘policy taker’ if many of the key cap-and-trade policy decisions are made in other jurisdictions.

The CCAP Annual Report is particularly lacking in clarity relating to the process of Action Plan governance. The process of how decisions are made, and by whom, must be clearly articulated not just to the ECO but to the broader public and other stakeholders who will read the CCAP Annual Report and make decisions based on this reading.

Now that the Premier’s Expert Panel on Climate Change Adaptation has released its report, the ECO will expect to see clarity on how mitigation and adaptation strategies are co-ordinated and reported within the government’s broader climate change planning mandate.

The roles, responsibilities and accountabilities of the various government ministries and agencies as well as private sector stakeholders must be more clearly articulated in future annual reports. While the CCS and MOE may be the co-ordinators of Action Plan information, tracking and reporting, they are not the keepers of the policy levers that can minimize risks of competition for funding or delays in approvals or implementation.

The ECO agrees with the Climate Change Secretariat’s description of the implementation of Ontario’s Climate Change Action Plan as an iterative journey. We remain hopeful that the areas in need of improvement noted in this review will lead to an improved plan and a clearer vision for change going forward.

Abbreviations

- AECL** – Atomic Energy of Canada Limited
- BAU** – Business-As-Usual
- CCAC** – Climate Change Action Committee
- CCAP** – Climate Change Action Plan
- CCOEF** – Cabinet Committee on Ontario’s Economic Future
- CCS** – Climate Change Secretariat
- CDM** – Conservation and Demand Management
- ECO** – Environmental Commissioner of Ontario
- GEGEA** – Green Energy and Green Economy Act, 2009
- GHG** – greenhouse gas
- IPCC** – Intergovernmental Panel on Climate Change
- IPSP** – Integrated Power System Plan
- Mt** – megatonnes
- MW** – megawatts
- NERC** – North American Electric Reliability Corporation
- NIR** – National Inventory Report
- OBC** – Ontario Building Code
- OEB** – Ontario Energy Board
- OECD** – Organization for Economic Co-operation and Development
- OPA** – Ontario Power Authority
- OPG** – Ontario Power Generation
- OPS** – Ontario Public Service
- TDM** – Transportation demand management
- WCI** – Western Climate Initiative

¹ Environment Canada. National Inventory Report - Greenhouse Gas Sources and Sinks in Canada 1990–2007, p.567. GHGs have different global warming potentials and so to allow these gases to be compared, the Intergovernmental Panel on Climate Change compares all GHGs to carbon dioxide, the main gas. This results in a total being stated as CO₂ equivalent (CO₂eq). For brevity in this report, we have chosen to refer to GHG quantities in Mt (megatonnes).

² According to page 524 of the National Inventory Report - Greenhouse Gas Sources and Sinks in Canada 1990–2007, the precise 1990 and 2007 totals were 174.6 Mt and 197.4 Mt respectively.

³ The 165 Mt reduction target is based on a 1990 baseline of 175 Mt as reported in the National Inventory Report 1990-2007. As a result of continual changes and improvements to the inventory, historic estimates have been revised. Accordingly, slightly different totals have been reported for 1990 emissions over the past several years. This has no significant impact for Ontario's overall targets, but may cause some confusion as it leads to a slight restatement of the tonnage target each time the 1990 estimate changes. For example, in the Climate Change Action Plan Annual Report 2007-2008, the government stated that its 1990 emissions were 177 Mt. The ECO assumes that the government derived this information from the National Inventory Report 1990-2004.

⁴ Climate Change Action Plan Annual Report 2008-09, p.13.

⁵ Climate Change Action Plan Annual Report 2008-09, p.61.

⁶ Road pricing refers to any direct charge levied to the user of roads. Charges can take the form of taxes, parking fees, road tolls and/or congestion charges.

⁷ Climate Change Action Plan Annual Report 2008-09, p.53

⁸ Climate Change Action Plan Annual Report 2008-09, p.6.

⁹ Some of the Act's schedules did not come into force until a later date.

¹⁰ Environmental Commissioner of Ontario. Special Report to the Legislative Assembly of Ontario. Progress in a Climate of Change: A Review of Ontario's Climate Change Action Plan Annual Report 2007-2008.

¹¹ Environment Canada. National Inventory Report - Greenhouse Gas Sources and Sinks in Canada 1990–2007, p.567.

¹² The IPCC was established in 1988 by the World Meteorological Organization and the United Nations Environmental Programme to evaluate and document the role of human activity as a risk factor in causing climate change.

¹³ To date most of the climate-related rise in sea level has been caused by thermal expansion as the water warms. In the future, however, the largest potential of sea level rise is from melting ice, which adds water to the oceans. Changes in sea level will create significant adaptation challenges along Ontario's James Bay and Hudson Bay shorelines.

¹⁴ Pew Center on Global Climate Change. Science Brief 2. "Key Scientific Developments Since the IPCC Fourth Assessment Report", June 2009.

¹⁵ Pew Center on Global Climate Change. Science Brief 2. "Key Scientific Developments Since the IPCC Fourth Assessment Report", June 2009.

¹⁶ Intergovernmental Panel on Climate Change. Fourth Assessment Report – Climate Change 2007: Mitigation. Contribution of Working Group III, Chapter 13, Policies, Instruments and Co-operative Arrangements, Box 13.7, page 776.

¹⁷ Directive from Dwight Duncan (Ontario Minister of Energy), "Integrated Power System Plan", June 13, 2006.

¹⁸ Directive from Dwight Duncan (Ontario Minister of Energy), "Integrated Power System Plan", June 13, 2006.

¹⁹ Directive from Dwight Duncan (Ontario Minister of Energy), "Integrated Power System Plan", June 13, 2006.

²⁰ Integrated Power System Plan, Updated August 29, 2008, Exhibit B, Tab 1, Schedule 1, p.10.

²¹ Directive from Dwight Duncan (Ontario Minister of Energy), "Integrated Power System Plan", June 13, 2006.

²² Ontario Power Authority website, accessed October 2, 2009 www.powerauthority.on.ca/Page.asp?PageID=1224&SiteNodeID=126

²³ Directive from George Smitherman (Ontario Minister of Energy and Infrastructure), "Amendments to Supply Mix Directive Issued June 13, 2006", September 17, 2008.

²⁴ Ministry of Energy and Infrastructure, "Ontario suspends nuclear procurement", June 29 2009.

²⁵ Power Advisory LLC, Ontario Market Assessment Report, October 2009.

²⁶ Ontario Regulation 496/07 – Cessation of Coal Use – Atikokan, Lambton, Nanticoke and Thunder Bay Generating Stations.

²⁷ Government of Ontario News Release, September 3, 2009, "Ontario Coal Closure Launches Countdown To Green Energy," accessed October 5, 2009 at www.news.ontario.ca/mei/en/2009/09/ontario-coal-closure-launches-countdown-to-green-energy.html.

²⁸ Ontario Power Generation, "Electricity from...Biomass: Renewable Energy from Fields and Forests", accessed October 5, 2009 at www.ontariopowergeneration.com/pdf/biomassfs2009.pdf

²⁹ Ontario Power Authority. April 22, 2009 – Renewable Energy Supply Survey Results accessed November 19, 2009 at fit.powerauthority.on.ca/Page.asp?PageID=122&ContentID=10539&SiteNodeID=1125.

³⁰ The OPA's 2010-2012 Business Plan, released in September 2009, does provide some short-term clarity in this regard.

³¹ Verification refers to the process whereby a third-party confirms that the emission reductions claimed are real, surplus, measurable and additional to what would otherwise have occurred under a BAU scenario.

-
- ³² Environment Canada. National Inventory Report - Greenhouse Gas Sources and Sinks in Canada.
- ³³ All CCAP Annual Report figures referenced in this report – Figures 1, 6, 7, B1 and B2 – are reproduced in Appendix 1.
- ³⁴ Climate Change Action Plan Annual Report 2008-09, p. 64.
- ³⁵ Climate Change Action Plan Annual Report 2008-09, p. 64.
- ³⁶ As indicated at page 59 of the Annual Report, a Business as Usual forecast assumes that historical emissions 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.
- ³⁷ National Inventory Report – Greenhouse Gas Sources and Sinks in Canada 1990-2007, p. 567.
- ³⁸ Freight transportation is primarily performed by heavy-duty gasoline vehicles and heavy-duty diesel vehicles. National Inventory Report – Greenhouse Gas Sources and Sinks in Canada 1990-2007, p. 45.
- ³⁹ Environment Canada. National Inventory Report – Greenhouse Gas Sources and Sinks in Canada 1990-2007, p. 525.
- ⁴⁰ Environment Canada. National Inventory Report – Greenhouse Gas Sources and Sinks in Canada 1990-2007, p. 525.
- ⁴¹ Brodie Fenlon, “The cost of congestion: Canada loses billions to Toronto’s traffic”, Globe and Mail, November 10, 2009, p.A1.
- ⁴² National Inventory Report – Greenhouse Gas Sources and Sinks in Canada 1990-2007, p. 567. Included in this category are heavy-duty gasoline vehicles and heavy-duty diesel vehicles.
- ⁴³ National Inventory Report – Greenhouse Gas Sources and Sinks in Canada 1990-2007, p. 567.
- ⁴⁴ National Inventory Report – Greenhouse Gas Sources and Sinks in Canada 1990-2007, p. 525-526.
- ⁴⁵ Climate Change Action Plan Annual Report 2008-09, p. 13.
- ⁴⁶ Environmental Registry Number 010-6740. The discussion paper is entitled Moving Forward: A Greenhouse Gas Cap-and-Trade System for Ontario.
- ⁴⁷ Ministry of the Environment. Moving Forward: A Greenhouse Gas Cap-and-Trade System for Ontario, June 2009, p.5.
- ⁴⁸ Climate Change Action Plan Annual Report 2008-09, p. 53.
- ⁴⁹ This is a direct outcome of the 2008 U.S. Supreme Court decision in Massachusetts v. EPA, 549 U.S. 497 (2007) that ruled the EPA can regulate GHG emissions as a pollutant under the U.S. Clean Air Act and impose administrative controls on large emitters. See www.epa.gov/climatechange/emissions/downloads/ANPRPreamble.pdf.
- ⁵⁰ North American Electric Reliability Corporation. Special Report: Electric Industry Concerns on the Reliability Impacts of Climate Change Initiatives, November 2008, p.4.
- ⁵¹ Power Advisory LLC. Ontario Market Assessment Report, October 2009.
- ⁵² Due to the decline in industrial demand associated with pulp and paper, steel production and car manufacturing.
- ⁵³ Climate Change Action Plan Annual Report 2008-09, p.24.
- ⁵⁴ In fact, the source of most the “remaining emissions” noted in the CCAP Annual Report’s Figure 7 for the industrial, electricity and buildings sectors is the combustion of natural gas.
- ⁵⁵ Enbridge. 2008 Corporate Social Responsibility Report, accessed November 19, 2009 at www.enbridge.com/csr2008/environmental/en26.php.
- ⁵⁶ Free riders are defined as those participants in a CDM program who would have undertaken the efficiency or conservation initiative even in the absence of the program.
- ⁵⁷ Intergovernmental Panel on Climate Change. Fourth Assessment Report, Working Group III – Chapter 10 Waste Management, p.600.
- ⁵⁸ “Green Transformation: The Ontario public service plan.” A presentation given by Neil Sentance, Assistant Deputy Minister of the OPS Green Office and posted at www.itincanada.ca/opdfs/a10575.pdf (accessed October 16, 2009).
- ⁵⁹ Ministry of Government Services, The Estimates 2009-2010, p.15 Accessed October 16, 2009 at www.fin.gov.on.ca/en/budget/estimates/2009-10/volume1/MGS.pdf. Figures confirmed with staff from MGS who indicated that the staffing strategy and funding was for this year’s needs and is not a projection for going forward.
- ⁶⁰ “Green Transformation: The Ontario public service plan.” A presentation given by Neil Sentance, Assistant Deputy Minister of the OPS Green Office and posted at www.itincanada.ca/opdfs/a10575.pdf (accessed October 16, 2009).
- ⁶¹ Climate Change Action Plan Annual Report 2008-09, p. 19.
- ⁶² Climate Change Action Plan Annual Report 2008-09, p.18.
- ⁶³ Environmental Commissioner of Ontario. Annual Report 2008/2009, p. 50.
- ⁶⁴ Environmental Commissioner of Ontario. Annual Report 2008/2009, p. 51.
- ⁶⁵ Environmental Commissioner of Ontario. Annual Report 2008/2009, p. 51.
- ⁶⁶ Climate Change Action Plan Annual Report 2008-09, p. 12.
- ⁶⁷ As per Chapter 1, p.1.4 of the 2006 IPCC Guidelines for National Greenhouse Gas Inventories, national inventories “contain estimates for the calendar year during which the emissions to...the atmosphere occur”.
- ⁶⁸ Climate Change Action Plan Annual Report 2008/2009, p.57
- ⁶⁹ Power Advisory LLC. Ontario Market Assessment Report, October 2009, p. 58.
-

⁷⁰ Validation in this context represents a process whereby an independent third-party provided confirmation that the methodologies and assumptions used to develop the projected reductions are reasonable and align with best practices.

⁷¹ Climate Change Action Plan Annual Report 2008-09, p.57.

⁷² As indicated at page 59 of the Annual Report, a Business-as-Usual forecast assumes that historical emissions 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.

⁷³ Climate Change Action Plan Annual Report 2008-09, p.57.

⁷⁴ Environmental Commissioner of Ontario. Special Report to the Legislative Assembly of Ontario. Progress in a Climate of Change: A Review of Ontario's Climate Change Action Plan Annual Report 2007-2008, p.13.

⁷⁵ Climate Change Action Plan Annual Report 2008-09, p.61.

⁷⁶ For MOE, the notable exceptions are regulations relating to the capture of landfill gas and the architecture of a yet to be finalized cap-and-trade regime.

⁷⁷ The competition for scarce resources is an increasingly important issue, in light of recent comments by the provincial Finance Minister regarding the burgeoning provincial deficit. "Fall Economic Statement Updates Ontario's Finances: Global Economic Recession Causes Increase in Deficit," October 22, 2009, Ministry of Finance website.

⁷⁸ Climate Change Action Plan Annual Report 2008-09, p.8.

⁷⁹ Membership on the CCOEF includes the Premier as Chair and the ministers from: 1) Intergovernmental Affairs (the Premier), 2) Energy and Infrastructure, 3) Finance, 4) Management Board of Cabinet (same minister as #3), 5) Environment, 6) Training, Colleges and Universities, 7) Research and Innovation (same minister as #6), 8) Revenue, 9) Northern Development, Mines and Forestry and, 10) Economic Development and Trade. Information from the website of the Office of the Premier. Meet the Committees, accessed on November 20, 2009 at www.premier.gov.on.ca/team/committee.asp?Team=19&Lang=EN

⁸⁰ Website of the Office of the Premier. Meet the Committees, accessed on November 20, 2009 at www.premier.gov.on.ca/team/committee.asp?Team=19&Lang=EN.

⁸¹ Ministry of the Environment Backgrounder, "Expert Panel on Climate Change Adaptation: Co-chairs", July 19, 2007.

⁸² Ministry of the Environment Backgrounder, "Expert Panel on Climate Change Adaptation", December 12, 2007.

⁸³ Adapting to Climate Change in Ontario: Report of the Expert Panel on Climate Change Adaptation, November 2009, p.3.

⁸⁴ Adapting to Climate Change in Ontario: Report of the Expert Panel on Climate Change Adaptation, November 2009, p.7.

⁸⁵ Adapting to Climate Change in Ontario: Report of the Expert Panel on Climate Change Adaptation, November 2009, p.1.

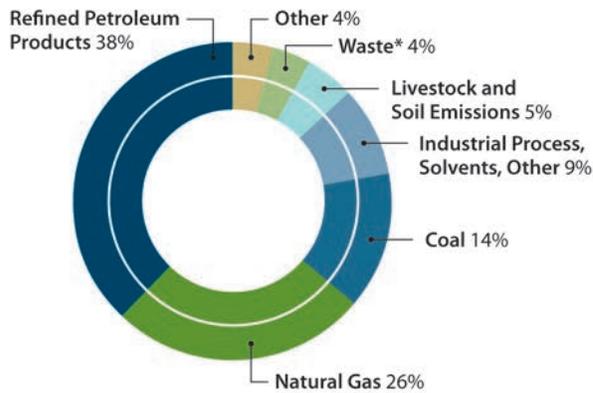
Appendix 1

Figures Referenced in this ECO Report from the Government of Ontario Climate Change Action Plan Annual Report 2008-09

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)

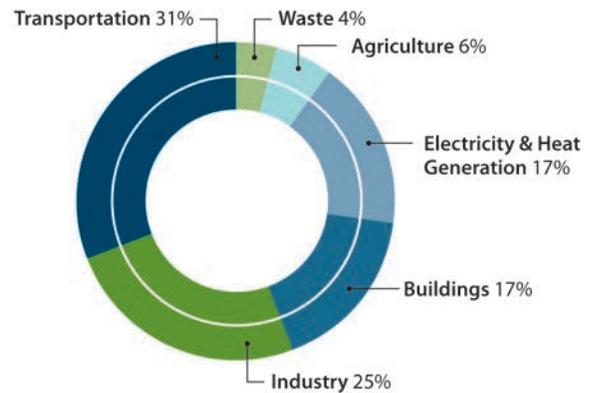


Figure B1: Changes in the Business as Usual (BAU) Scenario – Original Climate Change Action Plan BAU vs. July 2009 BAU

(Source: National Inventory Report, 2009)

Megatonnes (CO₂ eq)

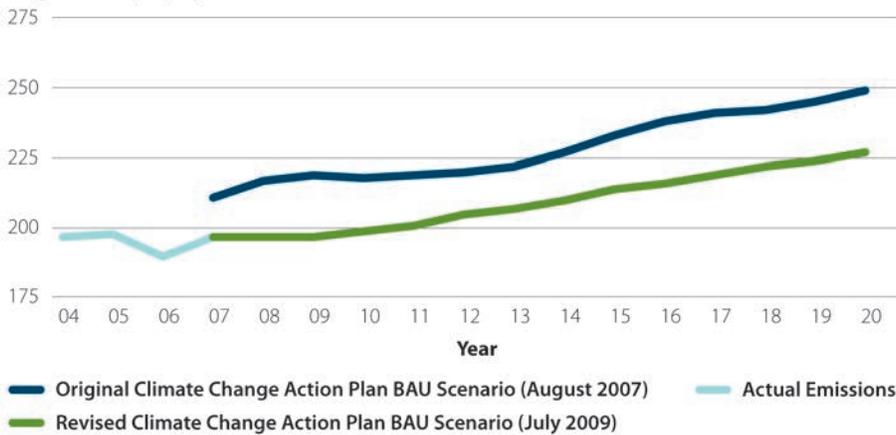


Figure B2: Annual Emission Reductions from CCAP Initiatives (2008-2020)

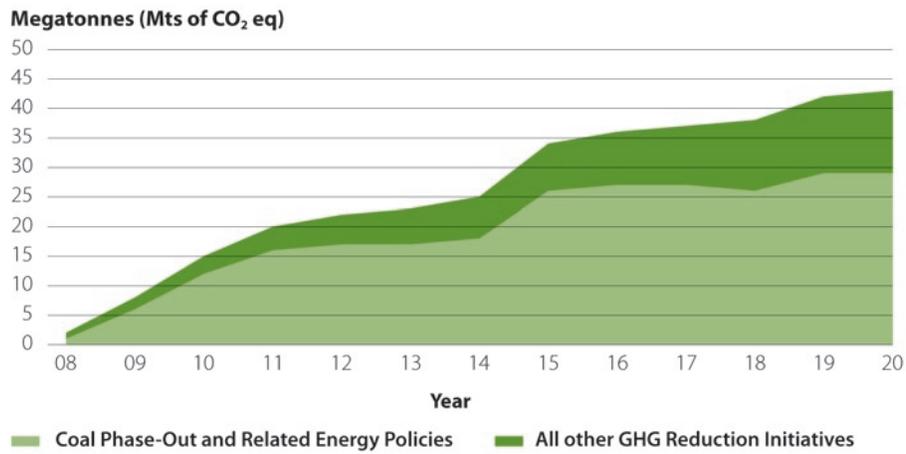


FIGURE 6: Impact of CCAP 2007 Initiatives vs. CCAP Target

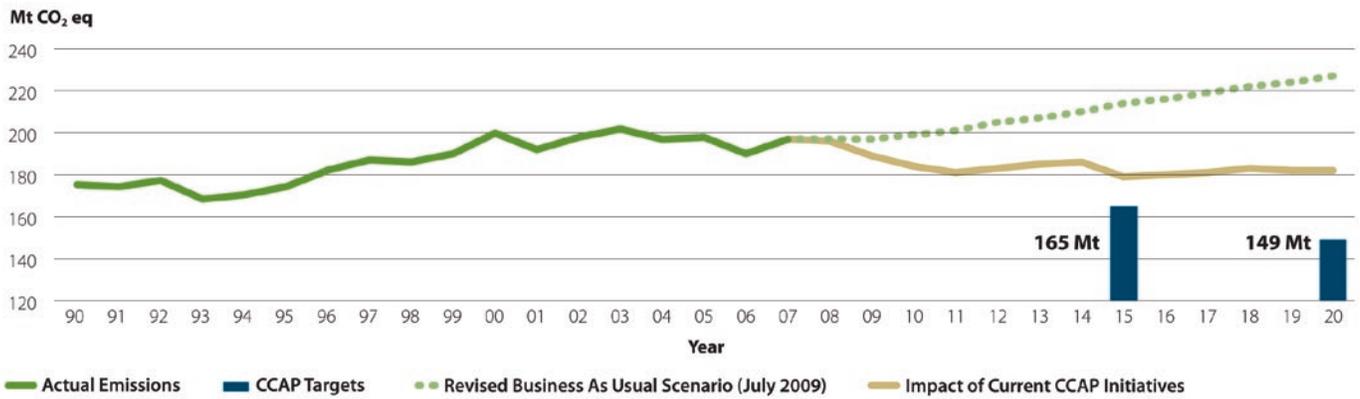
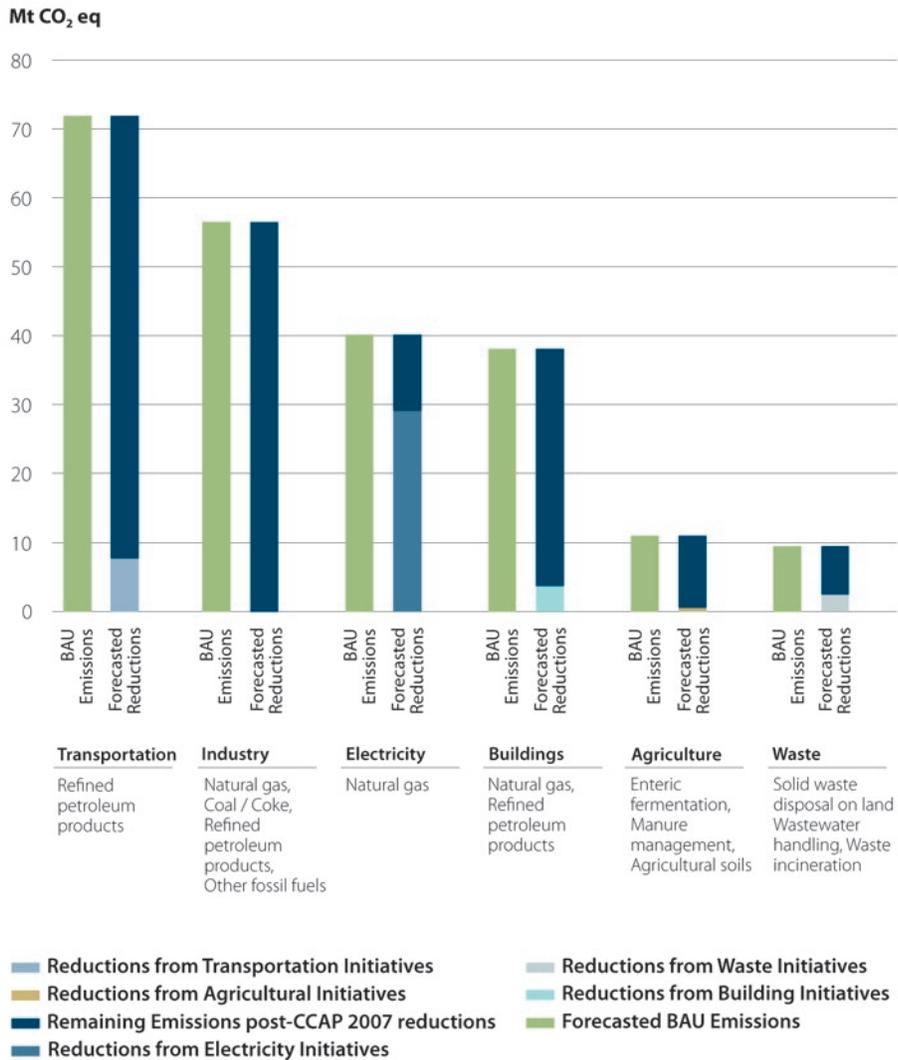


FIGURE 7: CCAP 2007 Initiative Impacts in 2008 and Remaining Emissions

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



This Annual Report is printed on Canadian-made Rolland Enviro 100 paper manufactured from 100% post-consumer waste fibre, is Process Chlorine Free (PCF) and used BioGas in its production (an alternative “green energy” source produced from decomposing waste collected from landfill sites) to reduce greenhouse gas emissions and the depletion of the ozone layer.

Rolland Enviro 100 saves the harvesting of mature trees, reduces solid waste that would have gone into landfill sites, uses 80% less water than conventional paper manufacturing and helps reduce air and water pollution.



Environmental Commissioner of Ontario
1075 Bay Street, Suite 605
Toronto, Ontario, Canada M5S 2B1

Telephone: 416-325-3377
Fax: 416-325-3370
Toll Free: 1-800-701-6454

www.eco.on.ca

Disponible en français
ISSN 1920-776X