

# FACING CLIMATE CHANGE

## EXECUTIVE SUMMARY



Download the full report at: [eco.on.ca/reports/2016-facing-climate-change](http://eco.on.ca/reports/2016-facing-climate-change)

**Greenhouse Gas Progress Report 2016**



Environmental  
Commissioner  
of Ontario

# Executive Summary

Greenhouse gas (GHG) emissions by humans are changing the climate.

In Ontario, climate change is already contributing to many impacts. Coldwater fish are losing habitat. Heat is stressing moose populations, which are already in decline. Invasive species are flourishing. Wildfire risk is increasing. Disease-carrying pests are spreading. Northern communities’ ice roads are becoming less reliable. The season for ice fishing and snow sports is shrinking. Heat waves are posing health risks for vulnerable populations. Cities like Toronto, Burlington, Windsor, Thunder Bay and Sault Ste. Marie have suffered extreme storms and devastating floods. Severe heat and drought have crimped water supplies and damaged crops.

## Why we must dramatically reduce our GHG emissions.

The Environmental Commissioner of Ontario (ECO) reports annually to the Legislature, and the public, on Ontario’s progress reducing GHG emissions. In the first chapter of this year’s report, the ECO reviews the science of climate change, its impacts on our planet and why Ontario must dramatically reduce its GHG emissions. The following chapters report on what Ontario’s emissions are now, and what the government is doing to reduce them. **The government has taken great steps towards GHG reductions this year; the ECO’s recommendations should help it avoid some major pitfalls.**

The focus of this report is on climate change mitigation, i.e., reducing GHG emissions. Ontario must also get ready to adapt to the impacts of climate change. The ECO will examine climate change adaptation in a future report.

Is it as bad as we thought?

It's worse

## Why Act Now? (Chapter 1)

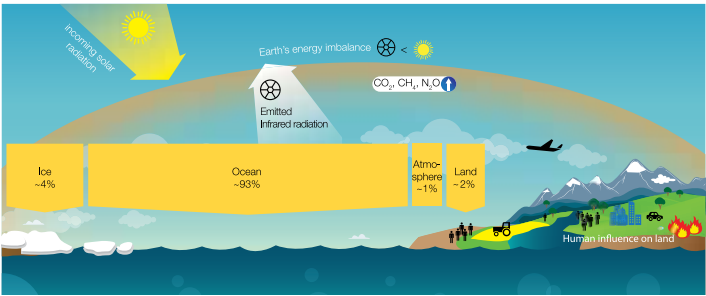
Climate change is one of the greatest threats of our generation.

Ontario’s climate is changing because Earth’s climate is changing. The **weather** has always fluctuated, and it will continue to do so. But the long-term average, the **climate**, is getting warmer and the weather is getting wilder. Effects on the natural environment, human health and the economy are accelerating.

Human activity is causing climate change (sometimes called *global warming*) by putting more GHGs into the atmosphere. As these gases accumulate, **GHGs form a powerful, invisible blanket around Earth**, trapping additional heat from the sun. This blanket is already dangerously thick and growing faster than ever. Past emissions will continue to trap heat for many years.

The most common GHG is carbon dioxide. In 2015, carbon dioxide levels in the atmosphere were the highest they have been for at least 800,000 years. Carbon dioxide also makes the oceans more acidic.

Where does the trapped heat go? Most of it (~93%) warms the oceans. Warmer water expands, raising sea levels, and fuels wilder storms. Some heat is melting ice and permafrost and warming land. About 1% of the extra heat has pushed up the world’s average air temperature.

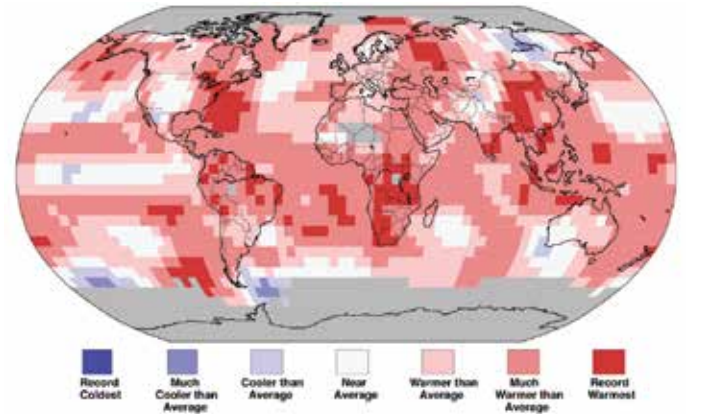


**The flow and storage of energy in Earth’s climate system.** The global ocean is absorbing ~93 per cent of the additional heat.

Source: International Union for Conservation of Nature, *Explaining Ocean Warming: Causes, scale, effects and consequences*, 2016. From Laffoley and Baxter 2016, as redrawn and modified after Schuckmann et al. (2016).

## What used to be “normal” weather is gone.

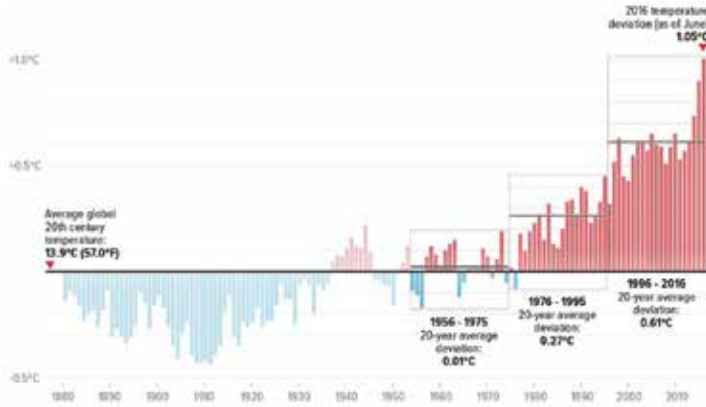
As a result, 2016 has continued to break all temperature records. January to August had the highest land and ocean temperatures ever recorded.



**Blended Land and Sea Surface Ocean Temperature Percentiles January to August 2016.** Note that blue (cool) areas near Greenland and Antarctica may represent meltwater and may indicate a slowing of ocean circulation currents.

Source: National Aeronautics and Space Administration, *State of the Climate Global Analysis*, 2016.

Climate change does not mean that everywhere will be warmer all the time. Natural cycles, and disruption of those cycles, will sometimes make some places colder. But what used to be *normal* weather is gone, and not likely to return.



**Annual temperature deviations.** This chart indicates how average annual temperatures since 1880 compare to the average global temperature of the 20th century.

Source: Mashable (using data from the NOAA National Climatic Data Center), *Leaving the 20th century climate behind*, 2016.

While not all impacts are harmful, on balance, climate change will bring more extreme weather, ecological damage, financial loss and human misery.

Ontario will not suffer as much from climate change as many other places. We are a relatively cold province, blessed with fresh water, and most of us live well above sea level. Still, warmer and wilder weather is already affecting the province, and much more lies ahead. Ontario is warming faster than the world average, especially in the north.

It is too late to avoid *some* disruptive and expensive changes to our environment and economy. But we still can influence how destructive those changes will be. **By working together, we can still protect much of what we love**, by reducing the GHGs that we emit, and by preparing for the changes ahead.

Executive Summary

Ontario’s Carbon Footprint – Where Are We Now? (Chapter 2)

Ontario’s targets are to reduce provincial GHG emissions (carbon footprint) by:

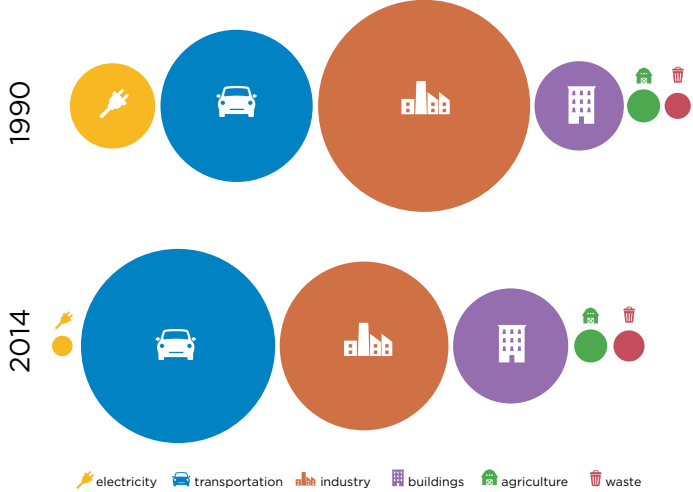
- 6% below 1990 levels by 2014;
- 15% below 1990 levels by 2020;
- 37% below 1990 levels by 2030; and,
- 80% below 1990 levels by 2050.

These targets, while ambitious, are consistent with those of other countries and are amply justified by climate science.

According to the official international method of calculation, Ontario met its 2014 target, mostly by closing coal-fired power generating stations. Meeting future targets will be harder. In four years, by 2020, Ontario has to reduce emissions a further 15 megatonne (Mt) (18.5 Mt compared to business as usual), a bigger and faster reduction than the 12 Mt reduced from 1990 to 2014.

Ontario still depends on fossil fuels for 80% of its energy. **Transportation is our biggest challenge:** Ontario’s largest and fastest growing share of GHG emissions. Industry, homes and commercial buildings are other major emitters.

How are our emissions?  
Closing the coal plants was a big win, but we have a long way to go

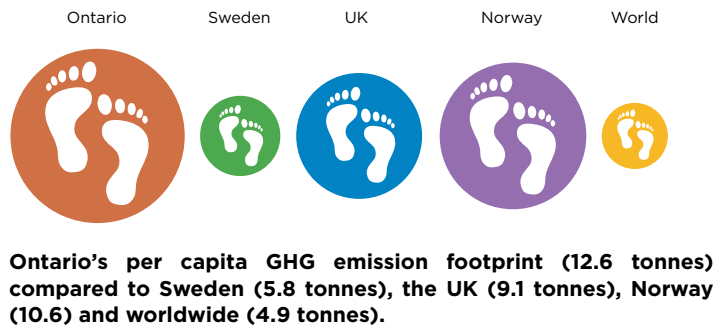


Ontario’s Greenhouse Gas Emissions by Sector  
Source: Environment and Climate Change Canada, National Inventory Report 1990-2014: GHG Sources and Sinks in Canada, Part 3, Table A11-12, (2016), p.55.

Are we being honest with ourselves?  
If we count everything, our emissions are really high

Ontario’s Carbon Footprint – Beyond the Reported Numbers (Chapter 3)

Ontarians have high emissions per person, compared to most people around the world, even those in other rich northern countries.



Source: Figure created by the ECO using information from the Conference Board of Canada and the World Bank.

Ontarians have high emissions per person.

And these emission numbers underestimate our true carbon footprint, because they leave out:

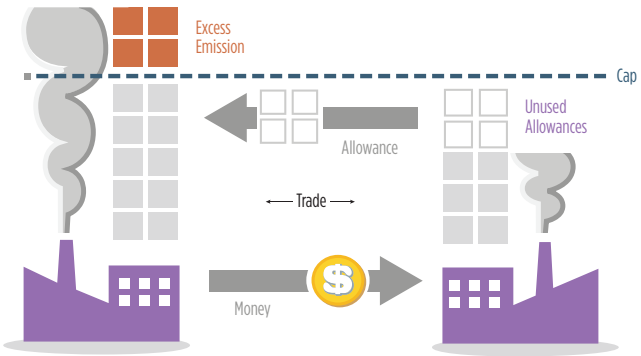
- the full impact of some emissions, such as methane and black carbon (soot);
- the emissions we cause by consuming things grown or made outside the province; and
- the emissions we cause through international aviation and shipping.

If these additional emissions were reflected in Ontario’s annual GHG totals, our reported emissions would be much higher. We have lots of room to improve, and many opportunities to do so.

How good is our cap and trade program?  
Looks pretty good so far, but there's a problem in California.

Cap and Trade (Chapter 4)

To do our fair share, Ontario is joining a worldwide movement to put a price on GHG pollution. Ontario’s new *Climate Change Mitigation and Low-carbon Economy Act, 2016*, creates a cap and trade program that covers 82 per cent of Ontario’s direct emissions. The first compliance period begins January 1, 2017, and is to be linked with California and Quebec in 2018. For the basics of cap and trade, see Appendix A to this report, online at [eco.on.ca](http://eco.on.ca).



Schematic of how cap and trade works  
Source: Adapted from Ontario’s Climate Change Strategy (2015).

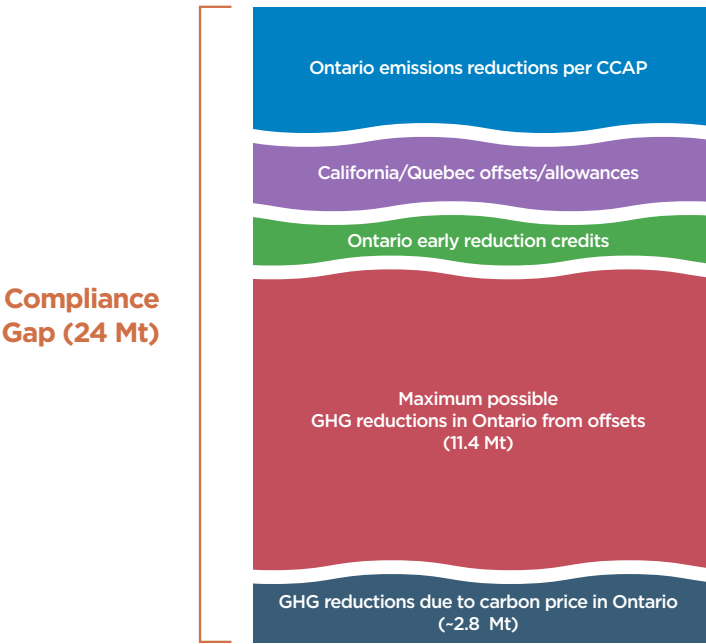
Chapter 4 focuses on the key design choices that Ontario has made, and how these choices may affect the success of the program in reducing emissions. In general, the cap and trade program is reasonable and well-designed, balancing the urgent need for GHG reductions with the cost to Ontario citizens and businesses, and the need to build public and non-partisan support. The types of changes that will reduce GHG emissions can also have many benefits for Ontario’s environment and economy.

The cap and trade program is reasonable and well-designed.

In 2020, Ontario’s capped emitters (i.e., those covered under the cap and trade program) will have a 24 Mt gap between their projected business as usual emissions and the allowances (i.e., permits to pollute) that the government will distribute (for free or by auction). Emitters have several options for filling that gap, such as reducing their emissions further, perhaps as the result of the Climate Change Action Plan (CCAP), or buying allowances from California (see figure below).



Executive Summary

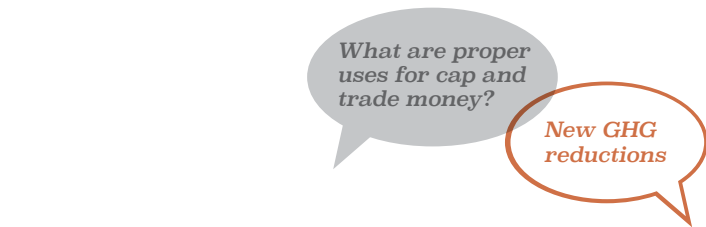


**How emitters can meet the compliance gap (2020).** See Chapter 4.5 for a full explanation of this figure.

Source: Adapted from: Dave Sawyer, Jotham Peters, and Seton Stiebert, EnviroEconomics, summary report, *Impact Modelling and Analysis of Ontario's Proposed Cap and Trade Program*, p.10, May 27, 2016.

Linking Ontario's cap and trade program with California and Quebec will reduce costs for Ontario GHG emitters, and has other important benefits. But if Ontario emitters buy allowances from outside the province, Ontario emissions may not go down much. Also, the California cap and trade program faces legal problems. A timely supply of high-quality Ontario offset credits (i.e., voluntary GHG reductions outside the capped sectors, which can be purchased by emitters) may be key to keeping investment and GHG reductions in Ontario.

Buying California allowances could send some emitters' capital to California for several years. However, the cap and trade program plus the Climate Change Action Plan should also reduce Ontario's multi-billion-dollar imports of petroleum and natural gas. The balance could be in Ontario's favour.



Spending the Money Well (Chapter 5)

Ontario has chosen a *cap and invest* approach to carbon pricing. The government will put the proceeds from its quarterly cap and trade allowance auctions into a Greenhouse Gas Reduction Account (GGRA) that it controls. Its justification: it needs the money to drive emissions reductions that would not otherwise occur.

The ECO agrees that putting a price on carbon, by itself, would not be enough to achieve Ontario's reduction targets, unless the price were very high. But will the GGRA fund (up to \$2 billion per year) be genuinely used to reduce Ontario's GHG emissions, or will it leak away into other government priorities? The government should build public confidence by ensuring that the money is being spent only on new GHG reductions, with clear spending rules and transparent, timely reporting.



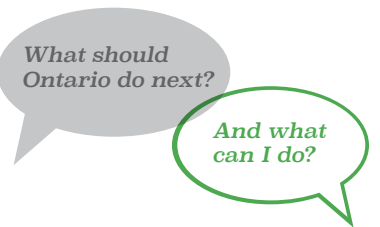
Climate Change Action Plan (Chapter 6)

The cap and trade program alone is predicted to provide only 2.8 Mt of the 18.5 GHG reductions needed to meet Ontario's 2020 GHG target. The government estimates that 9.8 Mt of additional reductions will come from its Climate Change Action Plan, to be funded from the GGRA.

Subsidizing electricity rates is not an acceptable use of GGRA funds.

The Action Plan contains some excellent proposals, which should, over time, reduce Ontario's emissions. For example, the ECO supports the Action Plan's proposed investments in low-carbon transportation and in clean technology innovations. The proposed green bank could improve energy efficiency in buildings, and be a helpful intermediary between building owners/operators and energy efficiency service providers.

However, the Action Plan is not likely to produce 9.8 Mt in new reductions by 2020. The ECO found no evidence to support emission reduction claims for the key proposal to subsidize electricity prices, or the claim that technology adoption by industry can produce 2.5 Mt in additional reductions by 2020. This means that subsidizing electricity rates is not an acceptable use of GGRA funds. It also means that, for the 2017-2020 compliance period, the gap to be filled by offset credits and/or California allowances may be larger than the government predicts.



Knowledge + Action = Hope (Chapter 7)

This has been an important year, with much progress on climate action in Ontario and around the world. Ontario has punched above its weight, and deserves kudos for its active role in national and international co-operation. **Putting a price on GHG pollution is long overdue.**

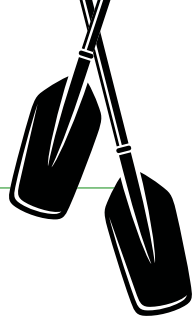
But there remains a chasm between the facts and what the public understands, and between government rhetoric and action. If the government doesn't treat climate change as an emergency, then many people feel that they don't need to either. To earn public support for serious climate action, the whole government must consistently show that it takes climate change seriously.

At the same time, climate change action cannot be left entirely to governments. As proud Ontarians who care about each other and the beautiful province in which we live, there is much we can each do. No one can do everything, but everyone can do something. It's not too late.

No one can do everything, but everyone can do something. It's not too late.

# Recommendations

---



## Summary of recommendations from the ECO's 2016 Greenhouse Gas Progress Report

### Ontario's Greenhouse Gas Emissions (Chapter 3)

---

The government should report regularly on Ontario's entire climate change footprint, not only on Ontario's direct GHG emissions as calculated pursuant to international guidelines.

The government should give a higher priority to reducing Ontario's methane and black carbon emissions.

### Cap and Trade (Chapter 4)

---

The government should be more transparent about who receives free allowances, and why.

The government needs to plan for the possibility that California's cap and trade system may not continue to operate in its present form and/or may not be reauthorized after 2020.

The government should set legally binding carbon budgets well in advance, within which a cap and trade system would operate.

The government must prioritize the approval of offset protocols to enable the creation of a timely and ample supply of high-quality Ontario offsets.

### The Greenhouse Gas Reduction Account (Chapter 5)

---

The government should publicly adopt a complete set of evaluation criteria for proposed GGRA expenditures and an explicit policy on how to allocate GGRA funds between competing objectives.

The GGRA should only be used to pay for new or expanded initiatives that will directly produce emission reductions on top of those that will be created by existing systems, by the cap and trade system and by initiatives already funded through the GGRA.

The government should keep detailed records of the justification for each GGRA expenditure, in a form that can readily be provided to the Legislative Officers, and should be summarized in the Minister of the Environment and Climate Change's annual public report.

### The Climate Change Action Plan (Chapter 6)

---

In developing the green bank, the government should:

- follow the four OECD principles,
- require the green bank to achieve additional emission reductions in Ontario, and
- ensure accountability and transparency for its financial and emissions reduction results.

The government should do more to discourage, and to make unnecessary, travel by petroleum-fueled vehicles. It should also prioritize funding for projects and transit that support dense, complete communities.

Government support for clean tech from the GGRA should have a direct, substantial and transparent connection to additional GHG reductions.

The government should reduce approval and procurement barriers to the use of low-carbon clean tech innovations within Ontario, especially those that have been developed with public funds.

Subsidizing electricity rates should not be considered an acceptable use of GGRA funds.

A Renewable Fuel Standard regulation should include a low carbon performance standard. It should only incent the production of biofuels that are grown sustainably, without damaging natural ecosystems or biodiversity, and while building up soil carbon.

The government should make public all data necessary to assess the effectiveness and cost-effectiveness of its GHG reduction systems.