

## ***Climate Change in Ontario***

There is broad scientific consensus on the reality of climate change. It is happening, and it has serious implications – for our health, our economy, and our future.

Human activities, including the heavy use of fossil fuels for heating, transportation and electricity, release greenhouse gases that are accumulating and causing global warming. Average global temperatures are rising – the 20th century was the warmest the world has seen in 1,000 years, and the 1980s and 1990s were the warmest decades on record. As a northern country, Canada will feel the impacts of climate change more than most countries.

Scientists estimate that Ontario will warm an average of 2°C to 5°C within the next 75 to 100 years. The winter months are projected to warm faster than the summer months, and extreme events, such as floods, droughts, and storms will likely become more common and severe. These changes will have severe consequences for our lives and the ecosystems that support us.

### **Health**

Global climate models suggest that over the next 50 years, heat waves will increase in frequency, intensity, and duration in southern Ontario. There are likely to be as many as 30 days over 30 Celsius each summer, instead of the current average of 10 days. An increase in very hot days (over 35°C) could increase the risk of heat stress related health problems, especially in the very old, the very young, and those with chronic lung diseases, such as asthma. Higher temperatures would increase the number of "bad air days". A warmer climate and longer frost-free seasons may also permit the spread of diseases such as Lyme disease.

### **Managing extremes**

Small changes in average climate conditions are expected to generate large changes in extreme events. For example,

experts predict that extremely hot days, severe thunderstorms, and freezing rain events will all increase in frequency due to climate change. Extreme weather events such as these have been shown to increase deaths, injuries, and stress-related disorders. However, it is also likely that the number of extremely cold days will decrease, which could have an impact on cold weather mortality rates.

### **The Great Lakes**

Global climate models project that by 2050, lake levels will be lower than they are now, perhaps by more than one metre. Models also suggest a smaller and earlier spring runoff. This will impact:

- **Hydroelectricity:** Lower water levels and flows will result in less hydropower production.

- **Recreational boating:** Lower water levels create problems for cottagers, marine operators, and for launching, hauling out, and boat operation in shallow areas.
- **Water supply:** Higher water temperatures reduce water quality by creating a more favourable environment for microbes and algae blooms, while lower water levels can affect the ability of intakes to draw water.
- **The environment:** Shoreline wetlands and other critical habitats may suffer from extended periods of low lake levels.

### **Agriculture**

Warmer temperatures and earlier and longer frost-free periods (longer by as much as five weeks) will extend the grazing season and increase the potential yield of warmer weather crops such as corn, soybeans, and tomatoes. It is also possible that farmers may cultivate these crops farther north,

depending on the suitability of the soil and the frequency and severity of droughts. In southern Ontario, the potential for growing specialty fruits and vegetables may increase.

However, less rainfall at different times could increase the need for irrigation in southwestern Ontario, particularly on drought-prone soils, and for shallow-rooted crops, such as potatoes. In some areas, milder winters and less consistent snow cover are likely to increase injury damage to over-wintering crops.

### **Forests**

Forests will suffer from greater stress due to drought, and more frequent and extreme storms, wind damage, fires, and insect outbreaks. However, where drought is not a limiting factor, marginal soils may become more productive, as warmer temperatures cause plant debris under trees to decompose and add nutrients to the soil more quickly.

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## ***Taking Action***

Given the potentially serious and long-term nature of the risks associated with these impacts, the only prudent course is to take action now to reduce the emissions that contribute to climate change. Analysis shows that the impact on Canadian jobs and economic growth associated with reducing greenhouse gas reductions can be kept modest and manageable relative to the strong growth expected over the next decade.

To give a sense of the possible order of magnitude of the impacts on industry, the estimated economic impact of implementing steps one and two in the Climate Change Plan for Canada to meet Canada's Kyoto commitments ranges from -0.4 percent to -1.6 percent of Canada's gross domestic product, dependent on various assumptions.

This is a modest impact relative to the strong economic growth expected over this period. Analysis shows job growth of 1.08 to almost 1.26 million jobs by 2010, compared to just over 1.32 million in a business as usual scenario. That means a delay in job creation of about 62,000 jobs across Canada in the year 2010. By comparison, the Canadian economy is currently creating new jobs at a rate of about 46,000 per month.

Estimates indicate that with the implementation of actions to reduce greenhouse gas emissions, Ontario's provincial gross domestic product in the year 2010 would grow to a level that would be about 0.17 percent higher than in a business as usual scenario. Growth in new jobs would slow by approximately 0.3 percent, or a delay in job creation over the next eight years of about 18,200 new jobs. To put this into context, Ontario's economy created approximately 183,600 jobs over the past year.

The modeling suggests that Ontario manufacturing and automobile industries will likely benefit from the move to a more energy efficient society as demand increases for new investments, technology and equipment to help implement the Canadian climate change plan.

Under the plan, the production cost of energy and raw materials such as steel and aluminum required for manufacturing, would rise only slightly, and the cost of gasoline, which is so important for the distribution and export of manufactured goods, would not rise beyond business as usual levels. Indeed, the modeling suggests that investments and activities to meet the first two steps of the plan would lead to a slight increase in provincial gross domestic product compared to business as usual forecasts.

These economic forecasts do not reflect the significant environmental and health benefits of addressing climate change. Taking action will provide broader benefits including cleaner air, reduced health costs and other environmental and social benefits for Canadians.

The impact on personal disposable income by 2010 would be approximately 0.08 percent higher than business as usual. Relative to what they would otherwise be, electricity prices could drop by about 0.18 cents/KWh. Gasoline prices are expected to remain at their business-as-usual level in 2010.

An illustrative example of production increases for major industrial emitters in the province as a result of measures to reduce greenhouse gases (national averages) is as follows:

- **conventional oil** would rise by 3 cents per barrel, or by 0.09 percent
- **natural gas** would rise by 0.5 cents/million cubic feet, or 0.14 percent
- **electricity** – coal would rise by 0.14 cents per KWH, or by 1.94 percent
- **electricity** – gas would rise by 0.04 cents per KWH or 0.60 percent
- **steel** – conventional would rise by 0.29 percent, about \$2.10 per tonne
- **steel** – electric arc would rise by 0.08 percent, or 60 cents per tonne

- **aluminum** would rise by 0.23 percent, or \$4.73 per tonne

Canada's approach to reducing greenhouse gas emissions is designed to minimize costs and maximize opportunities for Canadian technology. It envisions an economy that is based on cleaner sources of energy, using leading edge technologies. The Plan proposes strategic investments in innovative climate change proposals and the creation of a Partnership Fund that will cost-share emission reductions in collaboration with provincial and territorial governments as well as municipalities, Aboriginal communities and the private sector.

By drawing on Canadian innovation, and by ensuring that different sectors of the economy, regions and consumers play a role in taking action on climate change, the impact is more manageable for all. Working together, Canada can position itself as a strong competitor as the world moves to a new, less carbon-intensive economy.

Ontario-based companies and communities are already showing leadership in meeting the challenges of climate change<sup>1</sup>:

- Iogen Corporation is a specialty chemical manufacturer that is the world's leading developer of ethanol-from-cellulose, a clean transportation fuel. In co-operation with Petro-Canada and the Government of Canada, Iogen is developing and demonstrating a cost-effective process for the production of ethanol from biomass, including existing agricultural waste and dedicated crops such as switchgrass. Iogen expects to produce ethanol at a lower cost than the corn-based ethanol and anticipates this technology will lead to the widespread use of 10 percent ethanol, blended with gasoline, as a motor vehicle fuel in Canada.
- The Toronto Better Buildings Partnership is proving that municipal governments can undertake major building retrofits to improve energy efficiency and achieve cost savings, while simultaneously realizing large reductions in greenhouse gas emissions. The program reduced the city's annual greenhouse gas

emissions by 110,000 tonnes per year during the first four years of operation, while cutting annual building operating costs by \$11.8 million and creating 3,000 person-years of employment.

- IBM Canada reduced energy use at Canadian facilities by 36 percent between 1990–1998, leading to a 32 percent decrease in carbon dioxide emissions.
- With ongoing Government of Canada support, Conserval Engineering Inc. developed the Solarwall<sup>tm</sup>, the world's most efficient solar heating system. In recent years, companies such as Bombardier, General Motors and the Ford Motor Company have purchased solarwalls to retrofit their complexes.
- Sudbury Ontario and Toromont Energy Ltd. developed a district-energy system that uses a central plant to meet the energy needs of a cluster of buildings, eliminating their need for individual building based furnaces, air-conditioning units and boilers. The system is an environmentally friendly, cost-effective approach to providing energy.

<sup>1</sup> Examples are taken from the public record.

**To find out more about what the Government of Canada is doing  
and what you can do,**

please call 1 800 O-Canada (1 800 622-6232), TTY 1 800 465-7735  
or visit [www.climatechange.gc.ca](http://www.climatechange.gc.ca)

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