

Climate Solutions

APRIL 2003

Reducing Greenhouse Gas Emissions in Ontario

The Union of Concerned Scientists and the Ecological Society of America recently published a new report that explores the potential impacts of climate change on the Great Lakes Region. Released in Canada with the David Suzuki Foundation, *Confronting Climate Change in the Great Lakes Region*, was written by experts from Ontario and the U.S. who compiled evidence showing that the climate in this region is already changing. Average annual temperatures are increasing, winters are getting shorter, lake ice cover is decreasing, and heavy rainstorms have become more frequent. Over the coming century, average temperatures in the region are expected to increase by 3 to 6 degrees Celsius in the winter and 4 to 8 degrees in the summer due to climate change. This warming trend will likely lead to an overall decline in the water levels of the Great Lakes, increased air pollution, changes in forest composition, and displacement of native species of plants, fish, and wildlife.

But the most serious consequences of climate change are not inevitable. Taking action today can help delay and avoid some of the impacts of climate change. Reducing fossil fuel use and greenhouse gas emissions should be the first priority of governments, corporations and individuals when it comes to addressing climate change. To do otherwise would saddle current and future generations with enormous infrastructure, health and ecological costs. For example, municipalities in the Great Lakes Region, home to more than 60 million people, face significant upgrades in their water and sewage treatment infrastructure to cope with changes in water availability and flooding events. Other adaptation costs are likely to be incurred in the agricultural, tourism, forestry, and health care sectors. Avoiding these additional costs should be a key factor considered by decision-makers when undertaking economic evaluations of energy, transportation and infrastructure policies.

Dramatic cuts in energy use are both possible and necessary if we are to move towards the deeper emission reductions that will lead to climate stability. In addition, reducing our dependence on fossil fuels helps business and consumers by shielding them from energy price instability and freeing up capital and income to be spent in more productive areas of the economy. As a result of energy efficiency improvements between 1970 and 1998, Canadians saved 3,900 petajoules of energy and over \$50 billion. The energy savings were greater than all of the new sources of energy that came on line during this period: 3,800 petajoules. (A petajoule equals 278 gigawatt hours (GWh) – enough electricity to meet the needs of 20,000 households.)

Actions to Reduce Emissions

Between 1990 and 2000, Ontario's greenhouse gas emissions grew from 181 megatonnes (Mts) to 207 Mts, an increase of 14 per cent. The key areas of growth were in electricity production, transportation and buildings. Controlling and reducing greenhouse gas emissions will require focused efforts aimed at changing the design of buildings and communities, replacing coal-fired electricity with renewable energy, efficiency and conservation, and curbing the growth of energy use in automobile and heavy freight transportation. Since these actions deliver multiple benefits to the environment, the economy and society, they are worth doing in and of themselves.



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Union of
Concerned
Scientists

Citizens and Scientists for Environmental Solutions

Buildings and Communities

The types of communities and buildings we live and work in have a significant influence on the amount of energy we use. Provincial government policies, regulations and funding priorities strongly influence how our communities develop and the nature of building construction. In order to move to a less greenhouse gas intensive economy, working with the federal and municipal governments and with appropriate industries, the province of Ontario should:

- **Establish a retrofit program for residential housing, commercial and institutional buildings**

This program would provide building owners with financial incentives such as tax credits, easy access to financing, energy audits, and energy performance labeling. Retrofit financing for the commercial and institutional sector could be modeled after the successful Toronto Better Buildings Partnership, which uses a revolving fund to provide leveraged financing. Ideally, this would be a federal-provincial initiative, building on climate change funding announced in the 2003 federal budget.

- **Update provincial energy efficiency standards for equipment and appliances**

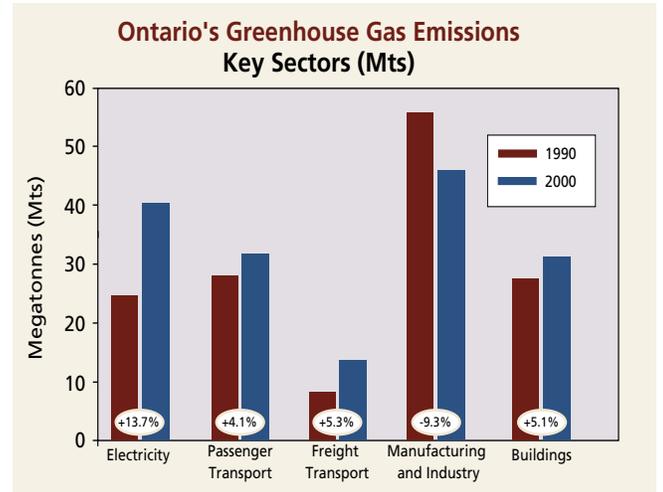
The province should be developing and adopting new minimum efficiency standards for products such as natural gas furnaces and hot water heaters, electric air conditioners, lighting and refrigeration equipment. For federally regulated appliances, the federal government should be upgrading efficiency standards to ensure that the least efficient appliances are taken off the market.

- **Establish the R-2000 standard for residential buildings and the C-2000 standard for commercial buildings**

The province should establish updated energy efficiency standards for single family and multi-family residential buildings and commercial buildings to ensure that new building stock uses the best available technologies and practices.

- **Implement sustainable communities policies**

Unrestricted low-density development is the leading source of increased greenhouse gas emissions in Ontario. This is being facilitated by highway development which encourages individual automobile use and detached single family homes, the most energy



intensive form of urban design. In order to restrain the growth of low-density, sprawling communities, the province should adopt legislation that protects ecologically significant areas and agricultural lands, establishes minimum density levels and encourages compact development. The success of this policy is ultimately dependent on the type of transportation policy the province adopts, since sprawling development depends on an infrastructure that promotes more automobile use, while compact development can be encouraged with dedicated transit lines.

Electricity

In response to growing consumer concerns about high prices for electricity, the Ontario government recently set a price cap of ¢4.3 per kilowatt hour on electricity purchases. While consumers are well aware of the high environmental cost of nuclear power and coal-fired thermal plants. For example, in 2001 the Nanticoke coal generating station produced 20.2 million tonnes of greenhouse gases, which is equivalent to six million new cars. In addition to temporarily capping the price of electricity, the province should work towards optimizing the electricity system by improving energy efficiency, establishing a renewable energy portfolio standard, and supporting energy conservation efforts. Taking these steps will allow Ontario to completely phase out coal and nuclear power, thereby eliminating significant sources of environmental degradation.

Conservation and energy efficiency are the fastest, most effective and cheapest ways to prevent potential brownouts or blackouts and reduce costly peak demand. This will give us the breathing space necessary to bring on-line clean, renewable energy from micro-hydro, wind, bio-gas and solar power which will meet our electricity needs without creating the air pollution that costs Ontario's health care system hundreds of millions of dollars per year. Since renewable energy prices are more predictable and because conservation and efficiency reduce their electricity needs, businesses and consumers would be less susceptible to the electricity price volatility experienced in the last two years.



Warren Grez, National Renewable Energy Labs

- **Phase out coal-fired power plants in Ontario**

Ontario can cost effectively eliminate coal-fired power through a combination of demand side management and increasing low impact renewable electricity generation such as bio-gas, wind and micro-hydro. Coal-fired electricity imposes enormous environmental and health costs on Ontario. According to the Ontario Medical Association, approximately 1,900 premature deaths occur in Ontario each year as a result of air pollution. A further 9,800 people are admitted to the hospital and 13,000 people make emergency room visits. These health impacts result in \$10 billion in overall economic costs to Ontario each year. Eliminating this source of air pollution will not only reduce Ontario's greenhouse gas emissions, but public health will also improve.

- **Establish a renewable portfolio standard**

Every company that sells electricity in Ontario should be required to purchase 20 per cent of its electricity supply from producers using clean renewable sources such as wind, solar, micro-hydro and bio-gas. Recent estimates published by the David Suzuki Foundation and the Canadian Institute for Environmental Law and Policy in *Green Power Opportunities for Ontario* show that there is approximately 20,000 GWh of available, low-environmental impact renewable energy in the province.

- **Act on utilities' conservation opportunities**

The province should establish an energy conservation board with a mandate to implement demand-side management and efficiency measures throughout the Ontario economy. In partnership with community delivery agencies and distribution utilities, the conservation board would develop and implement a public provincial energy conservation plan with specific timelines and delivery dates. *Green Power Opportunities for Ontario* shows that there is a minimum of 20,000 GWh of enhanced energy efficiency that can easily be achieved in Ontario by the implementation of demand side management initiatives for the electricity sector. Funding for this conservation should be through a surcharge on users of electricity and natural gas, commonly known as a 'wire charge.'

- **Use federal electricity initiatives**

Using some of the funds dedicated to climate change in the 2003 federal budget, Ottawa should offer new financial incentives to producers to encourage the development of low-impact renewable power technologies, including solar, tidal, wave, hydro and bio-gas energy. This could be achieved by expanding the current incentives for wind energy, (the Wind Power Production Incentive). Additional incentives should be available to producers in provinces that establish complementary policy mechanisms matching or exceeding the value of the wind incentive. At the same time, capital financing incentives and an accelerated capital cost allowance should be developed for technologies that can be used to provide co-generation of heat and electric power for large and medium sized industries.

Passenger Transportation

The use of the single occupant vehicle as the main means of personal transportation continues to be a source of many ecological problems. As a facilitator of sprawling suburban development, the automobile provides the means by which thousands of hectares of farmland and ecologically sensitive lands are replaced by roads, subdivisions, parking lots, shopping malls and "big box" retail outlets. In response to advertising pressure aimed at security, safety and the outdoor "adventure" market, increasing numbers of larger vehicles, like Sport Utility Vehicles, are replacing more energy efficient cars. The combined effect is a switch to high fuel consumption vehicles for longer commuter and leisure trips and ever growing emissions of greenhouse gases and other forms of damaging air pollution.

Vehicle Choice Makes a Big Difference

Emissions from passenger transportation have increased in Ontario from 29 million tonnes in 1990 to 33 million tonnes by 2000. Over this period emissions from cars dropped by 2 million tonnes while emissions from SUVs, minivans and trucks grew by 6 million tonnes. All of the growth in emissions can be attributed to the switch from cars to SUVs and minivans, which use much more fuel than cars. On average a new car uses 7.7 litres per 100 kilometres while a new SUV uses 11 litres per 100 kilometres. Each year a new car uses 1,386 litres of gasoline, while an SUV uses 1,980 litres of gasoline to drive the same distance. Driving an SUV instead of a car means an extra 1.5 tonnes of carbon dioxide is emitted to the atmosphere each year.

- **Improve vehicle fuel efficiency standards**

As part of its climate change implementation plan the federal government has stated that by 2010, the fuel efficiency of all new vehicles will be 25 per cent better than today's average new vehicles. This goal should be accomplished by implementing improved fuel efficiency standards for domestic and imported automobiles. California recently passed legislation that allows the state to regulate the amount of greenhouse gases that are emitted by new automobiles and light trucks, beginning with the 2009 model year. The primary way to achieve this is by improving the fuel efficiency of automobiles. Canada should join with California and U.S. states to create a large market for these automobiles. This will encourage mass deployment of the best technologies available today, such as those employed in the hybrid gas-electric vehicles already on the market. Ontario should also use its recently announced funding support for the automobile industry as a lever to improve fuel efficiency.

- **Enhance public transit service**

Ontario should improve public transit services and expand service areas by providing long-term stable financing. Major transportation infrastructure projects, such as inter-urban rail, light rail, and dedicated bus lanes, should also be undertaken in order to encourage automobile users to shift from single occupant vehicle travel.

- **Provide incentives for car sharing**

The province can facilitate the development of more car sharing where members have joint access to a fleet of vehicles located in their neighbourhood. Members pay a one-time registration fee and user fees based on kilometres driven and time used. Car sharing programs can be implemented by the private sector and non-governmental organizations. In large metropolitan areas the program should include incentives, priority parking and transit discounts for members.

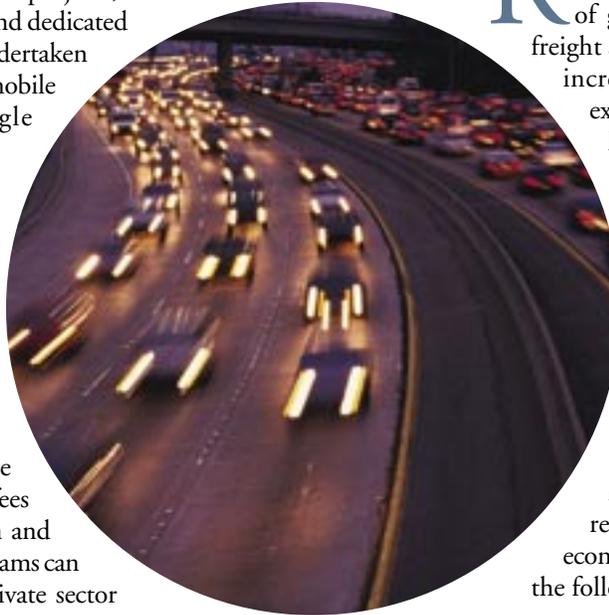
- **Implement mandated trip reduction initiatives**

Employers with more than 50 employees should be mandated to participate in a trip-reduction program that includes carpool matching, preferential parking, telecommuting programs and a guaranteed ride home. Strategies for government would include public outreach and partnering with the private sector, municipally based ridesharing programs and incentives.

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- **Provide tax-exempt transit passes**

The federal and provincial governments should change income tax laws to allow employees to either receive tax-exempt transit benefits from their employer or purchase monthly transit passes using pre-tax income. This would encourage a shift from auto to urban transit use and help increase transit ridership. Such a change could be implemented immediately and would balance the current practice of allowing employee parking to be tax-free. Currently, the province of Quebec allows bus passes to be tax deductible either by an employer who provides a transit pass, by an employee who receives a pass from their employer, or by an employee who purchases a transit pass.



Freight Transportation

Rail moves 60 per cent of overland freight in Canada, yet accounts for less than 15 per cent of greenhouse gas emissions in the overland freight sector. Canada's railways have the ability to increase their freight capacity and also have exceptionally competitive freight rates – the lowest per tonne-kilometre of all railways in the industrial world. The movement of freight on roads via heavy diesel tractor-trailers has been growing steadily for the past decade. Recent studies by the Railway Association of Canada suggest that this is causing serious economic damage to roads, bridges and other transportation infrastructure. In addition, it is far less energy efficient to transport freight on road than it is on rail, resulting in avoidable environmental damage. To reduce air emissions from this sector of the economy, Ontario and Canada should implement the following programs:

- **Support federal freight initiatives**

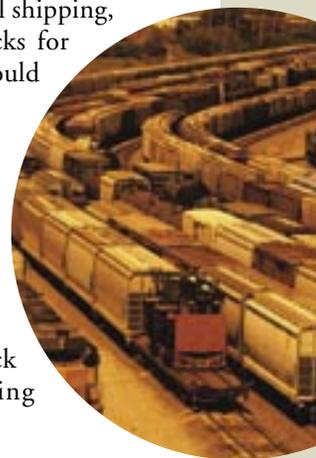
With the provinces, the federal government should also develop policies to encourage the movement of freight off highways and onto rail, especially in the Toronto-Windsor corridor. Such policies could include reforming the tax structure to create a level playing field between freight truck transportation and rail and providing incentives to promote inter-modal connections, which better integrate freight movement. There are also a number of co-benefits to optimizing freight movement. For example, by utilizing inter-modal shipping, which relies on rail for long distance and trucks for shorter routes, Canada-US border congestion could be relieved.

- **Improve training for drivers of heavy trucks to enhance fuel-efficient driving and maintenance practices**

Trucking fleets should be required to implement driver training programs addressing fuel efficiency and greenhouse gas emissions reductions emphasizing best driving and truck maintenance practices and return on training investment.

- **Reduce heavy-duty truck idling**

The province should pass regulations that require trucking fleets to reduce the amount of total engine-idling time in their fleet. Some fleets may then elect to acquire technologies to help them address this issue.



Canada's Kyoto Commitment: Challenges and Opportunities

As a first step to address climate change, Canada ratified the Kyoto Protocol and committed to keep annual emissions at 6 per cent below 1990 levels between 2008 and 2012. This means that emissions must be reduced by 21 per cent from today's levels – cutting emissions from 726 million tonnes (Mts) to 570 Mts. Specific national policies are required to achieve this goal since by 2010, under a “business as usual” scenario, emissions are projected to increase to 809 Mts. These policies, some of which are described in preceding sections, should be implemented in collaboration with provincial and municipal governments and with the private sector to maximize efficiency and pollution reduction. Two critical areas that will have a large influence over Canada's Kyoto commitment are the large industrial sectors and the contribution of biological carbon sinks.

• Reduce emissions from large industries

The federal government is currently negotiating a set of binding covenants, or specific agreements, that require large industrial emitters (utilities, refineries, heavy industries) to achieve a 55 Mt reduction from their projected levels of emissions for 2012. This policy is in addition to 25 Mts of reductions, which are supposed to come from actions and policies described in Canada's Action Plan 2000.

Combined, these actions will allow industrial emissions to stabilize at 345 Mts, which is about 6 per cent below today's levels of 366 Mts. In designing the covenants the government is planning to allow participants to use emissions trading as a means of achieving the targets in an economically efficient manner. In allocating emissions targets and allowances,

the system should be designed to promote the adoption of the most efficient technology when new plants and facilities are being built or major renovations and retrofits are occurring. This is necessary to ensure that fossil fuel use is minimized and that, as old plants are retired, we move towards the 50 to 60 per cent reduction in greenhouse gases needed to protect the climate.



What is a Carbon Sink?

The biological carbon cycle is a natural phenomenon that determines how carbon dioxide moves between plants, animals, soil, the atmosphere, and the oceans. Over millions of years the system has been relatively balanced and stable. However, the widespread use of fossil fuels is causing the atmospheric component of the carbon cycle to increase at a greater rate than can be accommodated by carbon “sinks,” which are the processes that transfer carbon dioxide out of the atmosphere and eventually into long-term storage in carbon “reservoirs.” A growing tree is a carbon sink, while the deepest layers of soil are reservoirs. The clear-cutting of a forest is, in turn, a major release of carbon, particularly when residual material is burned and the soil and root network disturbed.

• Advance the science of biological carbon sinks

A key element of the United Nations Framework Convention on Climate Change is to protect and enhance carbon reservoirs and sinks, such as forests and agricultural soils. As part of a climate protection strategy, the federal government must legislate strict parameters for biological carbon sinks enhancement and reservoir protection.

At a minimum, sinks enhancement must meet the following criteria if they are to contribute to climate change mitigation. They should be:

- Additional: Undertaken explicitly to raise terrestrial carbon storage beyond current rates.
- Permanent: Of sufficient duration to have a meaningful effect on atmospheric CO₂ concentrations.
- Verifiable: Measurable in terms of their effects on carbon storage.

The role of carbon storage and sinks as a means of addressing climate change is a complex and evolving area of science. Therefore, Canada should engage in further research on these issues and continue to participate in international negotiations fine-tuning the rules for implementation of carbon sink projects. Its major focus, however, should continue to be on efforts that lead to concrete and proven reductions of heat-trapping greenhouse gas emissions.



Photo: CIP/Frank Gunn

Conclusion

The Kyoto Protocol is an essential and positive first step on the path to reducing our greenhouse gas emissions. But much deeper cuts are needed to delay and avoid the most serious consequences of climate change. These reductions, on the order of at least 50 to 60 per cent below today's levels, will only take place if we significantly change how we use and produce energy. While the task may seem daunting, the benefits of such actions are enormous. Doing nothing is not an option.

If we reduce our use of fossil fuels to these levels by 2030, Canadian industry and consumers will save \$30 billion per year in reduced energy costs. In addition, we will achieve major reductions in local air pollutants and acid rain leading to ecological and public health improvements throughout the entire region. For example, by replacing coal with energy efficiency and renewable energy, Ontario will achieve 80 per cent of the Kyoto commitment, as it applies

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to Ontario. Eliminating coal-fired power will also result in reductions of approximately 40,000 tonnes of nitrogen oxides and 150,000 tonnes of sulphur dioxide, which contribute to acid rain and smog. As we make this transition, Canada should provide support and employment opportunities for energy workers and communities who may be affected by climate protection policies. At the same time, these

changes will mean new industries, new jobs and new opportunities.

Climate change is already taking place with potentially devastating consequences for the Great Lakes region. Taking action today will help prevent the worst aspects of climate change and also improve the quality of life in the region. Clearly these goals are worth achieving.

Individual Action • Help Make a Difference

How we lead our lives every day at home and in our communities affects the natural world around us. We can make small changes to reduce our use of fossil fuels and the greenhouse gas emissions responsible for climate change. We can also encourage our governments to develop cleaner energy sources and a more energy efficient economy.

- Urge political leaders to take action on climate change and join the Climate Action Team at www.davidsuzuki.org/greatlakes
- Increase the efficiency of your home with energy efficient appliances and lighting, and reduce drafts around doors and windows.
- Walk, bike, carpool or use public transit. If you really need a vehicle, make fuel efficiency a top priority.
- Find out more about climate change and energy at www.davidsuzuki.org/climate_change



David
Suzuki
Foundation

SOLUTIONS ARE IN OUR NATURE

219-2211 West 4th Avenue
Vancouver, B.C., Canada V6K 4S2
Tel: (604) 732-4228
Fax: (604) 732-0752
Email: solutions@davidsuzuki.org

Climate Solutions: Reducing Greenhouse Gas Emissions in Ontario supplements the findings of *Confronting Climate Change in the Great Lakes Region*, published by the Union of Concerned Scientists and the Ecological Society of America. This report is available at www.davidsuzuki.org/greatlakes or www.ucsusa.org/greatlakes.

For printed copies or more information, please contact the David Suzuki Foundation at 1-800-453-1533 or the Union of Concerned Scientists at 617-547-5552.



Two Brattle Street
Cambridge, MA 02238-9105
617-547-5552
ucs@ucsusa.org
www.ucsusa.org