

SEEING THROUGH THE HAZE

# CLIMATE CHANGE

AIR POLLUTION AND YOUR HEALTH  
SOME BASIC ANSWERS TO SOME BIG QUESTIONS



Canadian Public Health Association

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# CLIMATE CHANGE

## AIR POLLUTION AND YOUR HEALTH

### SOME BASIC ANSWERS TO SOME BIG QUESTIONS

This insert was written by Peggy Edwards. Advice on the final draft was provided by the Canadian Public Health Association's Plain Language Service (see [www.pls.cpha.ca](http://www.pls.cpha.ca)).

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The [Canadian Public Health Association \(CPHA\)](#) is a national, independent, voluntary association representing public health in Canada with links to the international public health community.

CPHA seeks closer collaboration between public health advocates and people who are concerned about the effects of climate change on the environment and the economy. Our mutual long-term goal must be to develop policies and practices that protect human and ecosystem health and prevent environmental threats to health in the first place. We welcome your comments and ideas by telephone: (613) 725-3769 or by e-mail: [ccah@cpha.ca](mailto:ccah@cpha.ca).

An electronic version of this document is available at <http://www.cpha.ca/english/natprog/rndtable/haze.htm>

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## SOME BASIC ANSWERS TO SOME BIG QUESTIONS

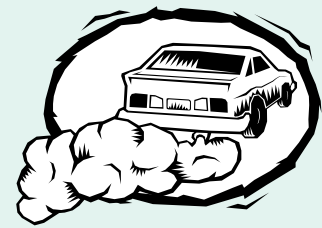
Recent stories in the media rang alarm bells for many Canadians. The Intergovernmental Panel on Climate Change – which is supported by over 400 top scientists and 200 governments – made some alarming predictions. Unless we take action now, the worldwide results of increasing temperatures or “global warming” could include:

- increased deaths and illness from heat stress,
- more weather disasters and water shortages,
- the spread of tropical diseases, and
- social unrest caused by these catastrophes.

In Canada, the effects of climate change are expected to be both positive and negative. The positive effects could include changes such as longer growing seasons. The negative effects could involve increases in severe weather like the 1998 ice storm in Quebec and Ontario.

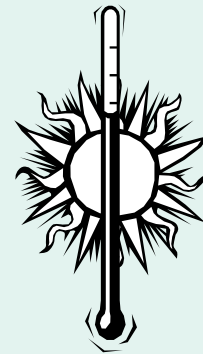


Global warming is also a concern because the problems caused by air pollution increase in hot weather. Already, almost two out of three Canadians say that pollution has made their health worse. More than one out of two people say they are very concerned about air quality.



Most of us have a lot of questions about air pollution and climate change:

- Is the world really getting warmer?
- Is air pollution getting worse?
- How will global warming affect the health of my children and my older parents?
- Am I making the problem worse?
- What should I be doing differently?
- What should governments, industries and communities be doing to resolve problems related to climate change and air pollution?



This article asks and answers some of these basic questions. It is a starting point to understand how climate change and air pollution affect the public's health. It also provides some common sense solutions – how we as individuals, families, communities and nations can take action now to protect and improve our health.



### Is the climate changing?

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Our climate changes all the time, both in the short term and over thousands of years. The average temperature of the earth has warmed 0.5 degrees centigrade (C) over the last century. Scientists expect another 2 to 6 degrees of global warming in the next 100 years.

This does not sound like much. But consider this. In the last ice age (some 20,000 years ago), world temperatures were only 9 degrees cooler than today. All of North America was buried under ice at the time.

### What causes global warming?

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Some of the factors that change the climate are natural, such as volcano eruptions and shifts in the temperature of the oceans. Other changes are caused by human activities. A major cause of global warming is the burning of fossil fuels, including gasoline, coal, oil and natural gas. This releases carbon dioxide (CO<sup>2</sup>) and other “greenhouse gases” into the air. The atmosphere is made up of several layers of gases that surround the earth. The amount of CO<sup>2</sup> released in the atmosphere has risen sharply since the Industrial Revolution in the 1700s, and has doubled in the last 30 years.

### What is the greenhouse effect?

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The greenhouse effect is the warming of the air near the surface of the earth. This happens when the earth's atmosphere traps the heat from the sun. Without this natural greenhouse effect, our planet would be covered with ice. The concern is that the gases we have added to the atmosphere since the Industrial Revolution have created too much of a good thing. The widespread use of gasoline-powered vehicles has made the situation worse. The greenhouse is over-heated and is adding to the unnatural rise in temperature called global warming.

### How will global warming affect health?

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Global warming will affect the health and quality of life of people all over the world. It will also affect people's access to food, fresh water and safe housing. Developing countries and people living in coastal areas would be hardest hit by flooding, changes in the sea level and poor crop yields.

In Canada, air pollution would get worse. The number of illnesses and deaths related to the heat could rise. Young children, older people, or people who are badly affected by heat or who have breathing problems, may suffer the most. Climate change may create more favourable conditions for ticks and insects which spread illnesses such as Lyme disease and West Nile virus fever.

Severe storms and floods could increase in some areas. Other areas may experience droughts, a drop in fresh water supplies, and an increase in wildfires. In some areas, reduced water supplies may threaten traditional food sources and the farming and fishing industries.

## What is the ozone hole?

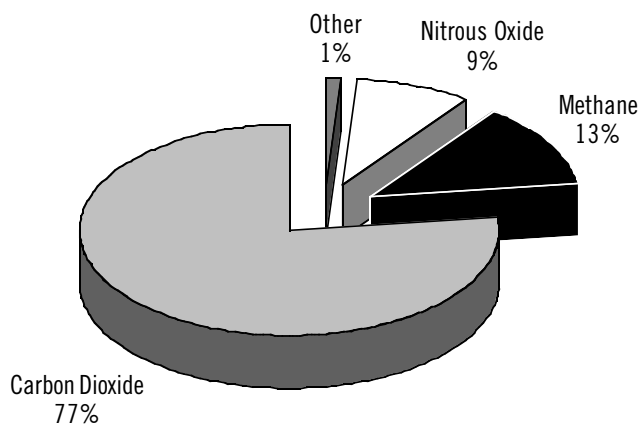
The layer of ozone in the atmosphere forms a filter that protects us from the sun's ultraviolet rays. Unfortunately, human use of products containing chlorine, fluorine and carbon (CFCs) has created chemical reactions that destroy the ozone layer in the upper atmosphere. This has caused the protective layer to thin, and sometimes to develop holes. This lets in more of the damaging ultraviolet rays from the sun. In the 1980s, scientists found a hole in the ozone layer. This discovery led to a series of international agreements calling on all countries to reduce and finally stop producing CFCs.



## How does the ozone hole affect health?

The ozone layer protects us from sunburn, skin cancer and eye damage. Less ozone means there will be increases in these serious health problems. CFCs that were used in products such as refrigerators and air conditioners have been replaced by substitutes that are more friendly to the ozone layer. However, the CFCs that have already been released into the air can float around for another 50 to 100 years. The greenhouse effect raises temperatures near the earth's surface but makes the layers of gases higher up in the atmosphere colder. This may increase ozone layer losses.

### Canada's Greenhouse Gas Emissions (1997)



Source: Environment Canada, 1998

The main greenhouse gases are carbon dioxide (CO<sup>2</sup>), nitrous oxide and methane. While nitrous oxide and methane have a more powerful effect on global warming, carbon dioxide has the biggest effect because we emit so much of it. The burning of coal, oil and natural gas to produce energy for our homes, vehicles, communities and industries is the major source of CO<sup>2</sup>.

So, we are likely to continue to see problems with skin cancer and eye damage caused by ultraviolet sun rays for some time to come. This is why it is so important to limit the time you spend in the sun in the middle of the day, and to protect yourself and your children with sunglasses, clothing, hats and sunscreen.

## What is air pollution?

Air is a mixture of water vapour and gases. Air can also contain “pollutants” – undesirable gases and particles – that are harmful to health. Air pollution problems are expected to increase in the next ten years. Areas such as the Windsor-Quebec corridor, Saint John, Halifax and Vancouver will be the hardest hit.

## What causes air pollution? Is it related to climate change?

Some air pollutants come from natural sources such as forest fires, chemical reactions in the soil, dust and volcanoes. However, a large proportion of air pollutants is caused by human activities. These include:

- the burning of fossil fuels to produce electrical power and petroleum products, and
- exhaust and pollution from vehicles and metal refineries, as well as waste or emissions from pulp and paper mills and other industries.

Air pollution and climate change are related in three ways:

- Air pollution levels tend to increase with higher temperatures.
- The causes of global warming and air pollution are similar.
- Fortunately, the solutions are also similar. By reducing our use of fossil fuels, we can slow down climate change. At the same time, we can prevent many of the health problems caused by air pollution.

## How does air pollution affect our health?

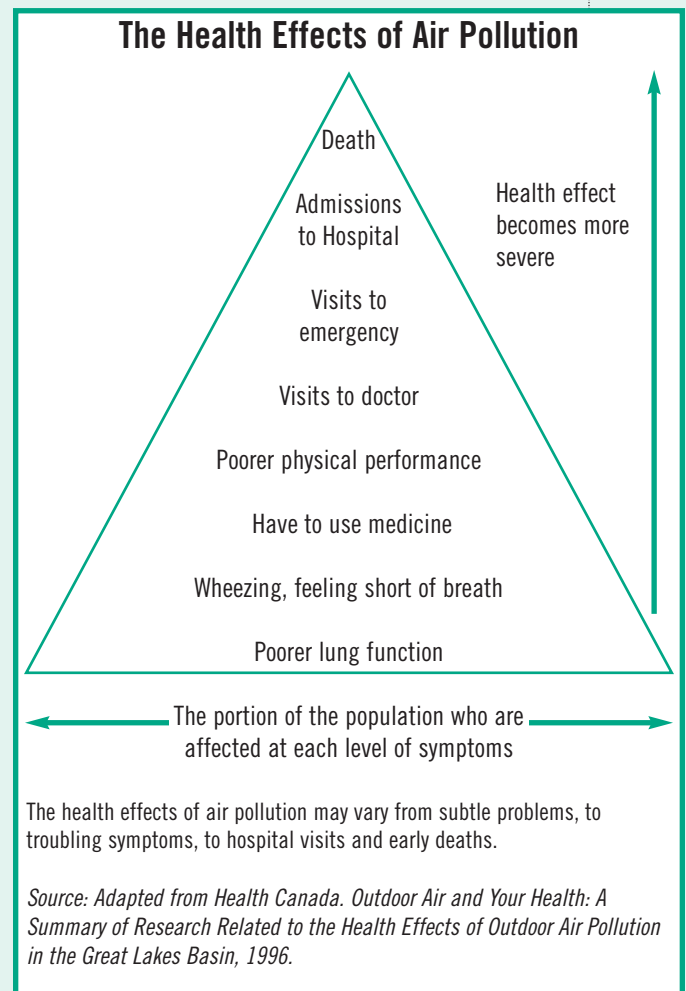
Pollutants in the air damage our lungs and breathing systems.

Pollutants can increase allergies, irritate eyes and cause wheezing and shortness of breath. Some air pollutants have been linked to cancer.

In Canada each year, some 16,000 early deaths and many more hospital visits are associated with air pollution.<sup>1</sup> Between 1980 and 1990, 28% more boys and 18% more girls were admitted to hospital due to asthma.<sup>2</sup> Asthma is a breathing problem that is made worse by air pollution.

## Why are children more at risk?

Infants’ lungs are not fully developed at birth. The new tissue that grows during childhood is more sensitive to pollutants in the air. Children are also less able than adults to get rid of harmful pollutants. Children in poor families are the most at risk for illnesses that are caused or worsened by air pollution. They are most likely to live in neighbourhoods near highways and factories and to live in buildings with poor air circulation.



### Consider this:

The health benefits of improved air quality in Canada could save our health care system \$8 billion over 20 years.<sup>1</sup>

### What can I do to reduce air pollution and global warming?

Canadians produce nearly 1/3 of Canada's greenhouse gas emissions (GGE) from daily activities such as heating our homes, driving our cars, and using electricity. Fortunately, we can become more energy-efficient in the following ways:

- Reduce our use of energy in our homes, and change our transportation habits, and lifestyle choices. For example, use appliances that are energy-efficient; use buses or bicycles, or walk to work; buy local produce.
- Urge businesses, schools, hospitals and governments to use energy more efficiently and to use clean energy sources that are renewable. These include solar (sun) power, wind power and fuel cells (for example in vehicles instead of gas).

The above two strategies will help us achieve "healthy, energy-efficient living."

### What are the advantages of "healthy, energy-efficient living"?

"Healthy, energy-efficient living" means making choices that reduce our use of fossil fuels and using clean energy sources when possible. This does not need to be a hardship. People in Europe and Japan already use much less energy per person than North Americans and they are comfortable, productive and secure. In fact, energy-efficient living can:

- save money
- protect the environment
- improve health and quality of life
- protect our children and the generations to come

### Pedal Power

#### Our most efficient and healthy form of transportation

Tune up your bicycle. Cycling is our most efficient and healthy form of transportation. Consider this:

- A cyclist consumes food, not gas. Regular cycling helps you control your weight.
- Cycling strengthens your heart, lungs and leg muscles.
- Cycling helps you relax. Driving in traffic increases stress.
- Almost half of car trips are bike-sized (3 kilometres or less). These short rides are the most important because almost all of the emissions from a short car trip are generated in the first two kilometres.
- Cycling to work or school is often faster than driving there in heavy traffic.
- It is far less costly to provide paved shoulders or pathways for bicycles than to widen a road to handle more traffic.

### What kind of transportation choices save energy and reduce air pollution?

Here is a checklist of ways you can make energy-efficient, healthy transportation choices:

- Use public transportation (e.g., bus, subway) when possible. Car-pool to work, school and outings.
- Maintain your vehicle. This can reduce fuel consumption by 10% and can increase your safety. Keep your brakes, wheels and tires in good shape.
- Use less fuel. Avoid idling and keep to the speed limit.
- Buy the most fuel-efficient car that fits your needs. Try to avoid vehicles that get very few kilometres per litre (Sport Utility Vehicles, trucks and vans are the worst offenders). See [www.climatechangesolutions.com](http://www.climatechangesolutions.com) for ratings on fuel efficiency and guides on which vehicles consume less fuel.

## TAKING ACTION: YOU AND I

- Consider buying a hybrid car that has both a gasoline engine and an electric motor, if you are in the market for a new car. These cars get from 3.2 to 4.7 litres per 100 kilometres. Since the batteries are automatically recharged, there is no need to plug them in at night.
- Walk, bicycle or roller blade to work, school or on short errands. These forms of “active transportation” are fun and improve your health. They save you money and produce zero pollution.
- Ask your employer to support active transportation (for example, by providing bike racks and showers). You could also ask your employer about incentives for car-pooling or using public transportation (e.g., reduced price for bus tickets).
- Talk with your employer about the possibility of working from home some of the time, if you have a desk job. By working from home, you can reduce greenhouse gas emissions, save fuel and parking costs, and reduce the depreciation on your vehicle.
- Lobby for urban and rural planning that makes it easier to use public transportation (e.g., low fares, stops and routes close to homes and schools, rapid trains in areas surrounding cities).

### How can I make my home more energy-efficient?

If you make your home more energy-efficient, your home will produce less carbon dioxide. This will help to improve health. Being energy-efficient will also save you money!

- Turn down the temperature of your water heater to the “warm” setting. For each 10% you reduce the temperature, you save about 13% on your water heating bill. You’ll also protect family members from burning their hands!
- Wrap your water heater in an insulation blanket, available at most hardware stores.
- Install high-efficiency showerheads. These provide excellent showers and use less water. Use of these showerheads can save up to about \$23 per month, or about \$276 per year.
- Replace 60 and 100-watt incandescent lights with compact fluorescent lights (CFLs). Because CFLs last ten times as long as standard incandescent bulbs, they will cost you half as much in the long run.
- Use the energy saving settings on your refrigerator, dishwasher, washing machine and clothes dryer. Consider replacing old machines with newer, more energy-efficient ones.
- Regularly clean or replace the filters in your furnace and air conditioner.
- Install a clock thermostat in your home to turn the heat down at night and when there is no one at home.
- Replace leaky windows with energy-efficient windows or boost their efficiency with weather-stripping and storm windows.
- If possible, use a clothesline. Sun energy is free and renewable and it does not add to global warming.

#### Bright Ideas

Compact fluorescent lights (CFLs) use only one quarter of the energy to produce the same amount of light. CFLs come in many shapes – such as tubes, hoops, loops and corkscrews – and they fit most fixtures.





### How much does Canada contribute to climate change?

According to the United Nations Development Report, Canada ranks second highest in the world in the amount of carbon dioxide emissions per person. Overall, Canada's annual greenhouse gas emissions are about 2% of the global total of man-made contributions. In 1997, Canada agreed to reduce our greenhouse gas emissions by 6% below 1990 levels in the international Kyoto Protocol. However, it is currently believed that Canada's greenhouse gas emissions will be somewhere between 20 and 25% above 1990 levels by 2010 unless we take action now.

Canada's National Implementation Strategy and First National Business Plan to help meet the Kyoto goals involve governments at federal, provincial and territorial levels. However, we are clearly far behind the Kyoto Protocol goals.

### What can governments and industries do?

Governments and industries need to act now to reduce greenhouse gas emissions. They must also take action to adapt to and minimize the negative effects of climate change, and to take advantage of new opportunities. Canada

has the scientific knowledge and resources to lead the world into an era that is powered by the sun, fuel cells and other clean energy sources. Governments need to support the development of these new technologies and provide incentives for industries and consumers to reduce their use of fossil fuels. This kind of action can strengthen our economy by creating growth and jobs while producing less pollution.

Because of the effect of vehicle emissions on air pollution and health, "green" policies in the transportation sector may be especially important. These must include serious efforts to make other forms of transportation available and affordable. This is a challenge in cities, but even more so in rural areas.

Governments can set efficiency standards for appliances, buildings, vehicles and fuel that can effectively lower emission levels. They need to monitor air pollution and set safe limits. Local and provincial/territorial governments need to put policies and programs in place to limit air pollution levels and to protect people's health when levels rise too high.

#### **A Framework for Collaborative Action**

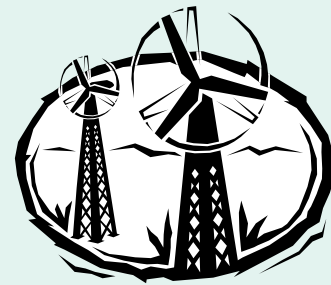
The Canadian Public Health Association (CPHA) has prepared a document entitled *Strategic Plan on Health and Climate Change: A Framework for Collaborative Action*. This report builds on key findings from a Roundtable on Health and Climate Change (involving many stakeholders) and a review of key studies. The strategic plan identifies the core elements to advance knowledge and action related to the health impacts of climate change, as well as some key priority activities. The core elements include research and knowledge, policy development, public outreach and engagement, adaptation and response capability and promoting personal action. The plan is an important first step in suggesting how the health sector can work with other partners to take collaborative action now. Please contact CPHA for a copy of the plan.

### What can communities and schools do?

Sixty-one Canadian cities have joined the Partners for Climate Protection Program which aims to reduce greenhouse gas emissions through municipal action. All communities stand to gain if they are less dependent on fossil fuels. Communities can be more fuel-efficient and use clean energy sources in local transportation, water and waste management and land use decisions. This kind of local action can save money, reduce air pollution, create jobs, improve quality of life and enhance people's health.

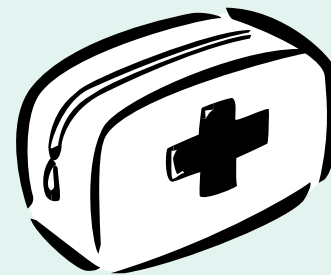
Hospitals and other health care facilities have a special responsibility to reduce their own greenhouse gas emissions. These facilities can undergo energy audits, then take concrete steps to increase their energy efficiencies and switch to cleaner energy sources.

Schools also have a special role – to protect our children, to educate them about climate change and health, and to encourage young people to be leaders for change. Check out the Go for Green program (see end of this article) for some good ideas. This program provides examples such as the walking school bus, and resources that will help you plan active and safe routes to school.



### What can health professionals do?

Nurses, doctors, public health workers and other health professionals need to understand how climate change and air pollution affect health. They need to explain these relationships to their patients and to the public, and to the administrators and funders of the health care system. Health workers can be informed advocates for those who are most likely to suffer poor health as a result of climate change – children, older people, homeless people, poor families and people with chronic illnesses such as asthma, emphysema, cancer and HIV/AIDS. They can warn these people to stay inside and advise that people leave their cars at home on days when air quality is poor or temperatures are very high.



Public health officials need to have emergency response programs ready for extreme events such as heat waves, floods and severe storms or the spread of imported diseases that may result from climate change. Most importantly, health workers need to join with others who are concerned about the environment to advocate protecting and enhancing both human and ecosystem health.

## IN CONCLUSION

*“We do not inherit the land from our fathers,  
we borrow it from our children.”*

This Aboriginal saying speaks to our joint responsibility for the health of our children and generations to come. Becoming less dependent on fossil fuels will improve health today and tomorrow. If we take action now, our children and grandchildren will not be held ransom to future environmental woes they did not create.



As individuals, we can take concrete steps to reduce our use of fossil fuels. We can lead by example. We can urge industries and governments at all levels to bring in programs and policies that reduce greenhouse gas emissions.

When we work together, we can accomplish even more. All of us – individuals, families, communities, governments, businesses, the health sector and voluntary groups – must do our part.

### ENDNOTES

1. Last, J., Trouton, K., Pengelly, D. (1998). Taking Our Breath Away: The Health Effects of Air Pollution and Climate Change.
2. Health Canada (1999). Toward A Healthy Future. Second Report on the Health of Canadians.

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## FOR MORE INFORMATION AND LINKS TO OTHER SOURCES

### **The Office of Energy Efficiency, Natural Resources Canada**

Tel: (613) 943-0792

Internet: <http://oee.nrcan.gc.ca>

Practical tips on how to be more energy-efficient at home, at work and on the road for consumers, businesses, governments and institutions. Tools for checking the energy efficiency of your car and home.

### **Environment Canada**

Tel: 1-800-668-6767 or (819) 997-2800

Internet: <http://www.ec.gc.ca/climate>

“The Green Lane” provides information on the effects of climate change, what we can do and opportunities for community group action.

### **Government of Canada Climate Change Web Site**

Internet: <http://climatechange.gc.ca>

Information on climate change, including a student’s lab and resources for teachers and the media.

### **Climate Change Solutions**

Internet: <http://www.climatechangesolutions.com>

An online resource centre of success stories, opportunity areas, tools and resources on how to reduce greenhouse gas emissions. An educational project of the Pembina Institute, a non-profit organization.

### **Go For Green**

The Active Living and Environment Program

Tel: (613) 562-5313 or 1-888-822-2848

Internet: <http://www.goforgreen.ca>

Fact sheets, success stories and resources on active transportation, including the “Walking School Bus”.

### **Canadian Public Health Association**

Tel: (613) 725-3769

Internet: <http://www.cpha.ca>

### **Health Canada – Climate Change and Health Office**

Tel: (613) 954-0161

Internet: <http://www.hc-sc.gc.ca>