

HEALTHY ENVIRONMENT

HEALTHY CANADIANS

# the air we breathe

AN INTERNATIONAL COMPARISON OF  
AIR QUALITY STANDARDS AND GUIDELINES



David  
Suzuki  
Foundation

SOLUTIONS ARE IN OUR NATURE



AUGUST 2006

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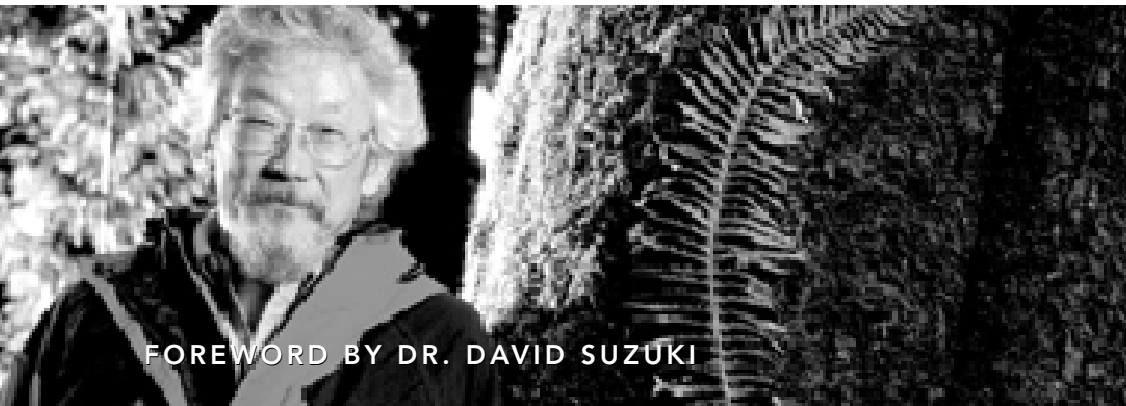
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*Fresh air keeps the doctor poor.*

— DANISH PROVERB



In Canada, hardly a day goes by without a news story about the debate over the future of health care. But while we fight to maintain and improve one of the world's best health-care systems, we have ignored new, important preventative actions that can save us from illness and death. We should pay attention to keeping healthy people healthy, instead of focusing on treating illness after it sets in.

Preventing pollutants and toxins from entering our air, water and food would have a profound effect on public health in Canada.

Air pollution contributes to premature death for thousands of Canadians each year. It strikes hardest at those who need our care most – children, the elderly and people who are already sick. And the damage is measurable: in Ontario, the number of infants admitted to hospital for pneumonia and bronchitis in the summer months increases by 20 per cent when pollutant levels rise. The Canadian Institute of Child Health says that exposure to toxic substances in the environment has likely contributed to a 25 per cent increase in childhood cancer over the past 25 years.

If our health and the health of our children aren't reason enough for change – they should be – then consider that illness caused by pollution can affect the health care system and the economy. The Ontario government, for example, estimates that the health and environmental costs of air pollution in that province alone are more than \$9 billion annually.

Even very low-level contamination of food, drinking water and outdoor air with a wide array of pollutants of varying toxicities presents a chemical stress to which virtually every person is vulnerable.

In the first of a series of reports on environmental health in Canada, the David Suzuki Foundation looks at Canada's air quality guidelines and compares them to those of the United States, Australia, the European Union and the World Health Organization.

We possess the capacity to improve our health and our children's health; it's as simple as breathing clean air, drinking clean water and eating food that's free from harmful pollutants. To guarantee a clean natural environment and healthy citizens, we require adequate systems, laws, policies and commitments by government. Individuals can also play a role by taking the steps outlined in our Nature Challenge.

Our Foundation is committed to achieving sustainability within a generation in Canada. Living within the earth's limits is not easy, but it's essential. A healthy environment – including clean air, clean water, and healthy food – is a vital cornerstone of a sustainable, prosperous future.

A handwritten signature in black ink, appearing to read "David Suzuki". The signature is fluid and cursive, with a large, sweeping initial "D".

David Suzuki  
CHAIR, DAVID SUZUKI FOUNDATION





# Introduction

**T**here is strong evidence that air pollution is the most harmful environmental problem in Canada in terms of human health effects, causing thousands of deaths, millions of illnesses, billions of dollars in health care expenses, and tens of billions of dollars in lost productivity every year.<sup>1</sup> To put these figures in context, the level of deaths and illnesses caused by air pollution in Canada is equivalent to a Walkerton water disaster happening on a daily basis.<sup>2</sup> Put another way, air pollution leads to more premature deaths than traffic accidents annually in Canada, yet generates less media attention and less government action.

Comparisons of nations belonging to the Organization for Economic Cooperation and Development (OECD), conducted by researchers at the University of Victoria and Simon Fraser University, show that Canada consistently ranks among the three worst industrialized nations for per capita sulphur dioxide emissions, nitrogen dioxide emissions, emissions of volatile organic compounds (VOCs), carbon monoxide emissions, and greenhouse gas emissions.<sup>3</sup> Weak laws and guidelines are a major reason why these emissions continue to be a problem and why the ongoing costs of air pollution in Canada are so high. Unless laws and regulations are strengthened and additional actions are taken, pressures from population and economic growth will result in increasing hazardous air emissions.

Polling data indicate that the overwhelming majority of Canadians are deeply concerned about environmental threats to their health and the health of their children.<sup>4</sup> The vast majority of Canadians support stronger regulations to address air pollution.<sup>5</sup> In light of the foregoing factors, it is imperative that the substandard legal protection for air quality currently provided by the Government of Canada be substantially strengthened.

In this report, the David Suzuki Foundation has compared Canada's existing air quality guidelines with the air quality standards in force in the United States, Australia, and Europe, as well as the guidelines recommended by the World Health Organization. The numbers tell a disturbing tale. Canada's current voluntary guidelines for air quality lag badly

behind the legally enforceable standards found in most western industrialized nations, including the U.S., Australia, and all members of the European Union. In order to catch up with our peers, Canada urgently needs strong national standards for air quality and ambitious long-term targets and timetables for reducing air pollution. It is also critical to understand that burning fossil fuels (oil, coal, and natural gas) not only generates the majority of air pollution in Canada but is the main source of greenhouse gas emissions. Policies should be designed to reduce air pollution and concurrently address climate change.

# The Health and Economic Consequences of Air Pollution in Canada

**A**ir pollution, primarily from burning fossil fuels, involves many compounds that hurt our health: carbon monoxide, nitrogen oxides, sulphur oxides, volatile organic compounds, small airborne particulates, and other harmful substances (e.g. hazardous air pollutants/airborne toxins). These pollutants can cause impaired lung function, shortness of breath, wheezing, asthma attacks, cardiovascular disease, cancer, and premature death.<sup>6</sup> There is new evidence, including a study conducted in Vancouver, that air pollution may also play a role in adverse outcomes at birth, such as early fetal loss, preterm delivery, and lower birth weight.<sup>7</sup>

Across Canada, air pollution causes thousands of premature deaths, tens of thousands of hospitalizations, and hundreds of thousands of days absent from work and school annually. Estimates of the number of preventable premature deaths, predominantly among senior citizens, caused annually by air pollution in Canada range from 5,900 to 16,000. The most recent study by the federal government estimated 5,900 premature deaths annually in eight large Canadian cities.<sup>8</sup> This underestimates the total Canadian death toll as the study covered only one-third of the Canadian population, albeit many of those who are most likely to be affected by urban air pollution. The Ontario Medical Association (OMA) estimated that there were 5,800 premature deaths due to air pollution in Ontario alone in 2005. The OMA projected that the annual figure will grow to 10,000 premature deaths by 2026 unless effective steps are taken to reduce smog.<sup>9</sup>

In addition to premature deaths, the OMA estimated there were 16,000 hospital admissions and 60,000 emergency room visits in Ontario in 2005 because of air pollution exposures, primarily associated with respiratory and cardiovascular illnesses. The OMA also estimated that there were 29 million minor illness days, defined as days where individuals either suffered from asthma symptoms or had to restrict their activities. Most of the people affected by these so-called minor illness days are children. In British Columbia, the Provincial Officer for Health published a conservative estimate in 2004 that air pollution in B.C.

is causing between 140 and 400 premature deaths, 700 to 2,100 hospital stays, and between 900 and 2,750 emergency room visits each year.<sup>10</sup>

Asthma affects over 2.7 million Canadians, including one in eight children. In Canada, rates of childhood asthma have risen dramatically. From 1978 to 1999, the percentage of children with asthma increased five fold to its current level of greater than 12 per cent.<sup>11</sup> Studies have established that asthma is the leading cause of emergency room visits, the leading cause of school absenteeism, and the third leading reason for absence from work. Across Canada, asthma causes 500 deaths and imposes direct health care costs of \$600 million annually.<sup>12</sup> Experts believe that reducing exposure to indoor and outdoor air pollution is one of the five key actions required to reduce the health impacts of asthma.<sup>13</sup>

The direct and indirect costs of air pollution on the health of Canadians are estimated to be in the billions of dollars. The Ontario government estimates health and environmental costs of air pollution in that province alone at more than \$9 billion annually.<sup>14</sup> According to the Ontario Medical Association, in 2005, air pollution costs were estimated at:

- \$374 million in lost productivity and work time;
- \$507 million in direct health care costs;
- \$537 million in pain and suffering due to non-fatal illness; and
- \$6.4 billion in social welfare loss due to premature death.<sup>15</sup>

These huge cost figures are consistent with estimates of the cost of air pollution in other countries. A recent study estimated the total health costs of air pollution in the European Union are between 305 billion and 875 billion Euros.<sup>16</sup>

Some types of air pollution have decreased in recent decades (e.g. emissions of sulphur dioxide, which causes acid rain, and lead emissions from gasoline). It is critical to understand that these success stories were primarily a result of strong regulations, not voluntary programs or incentive-based approaches. However, smog problems continue to plague many parts of Canada. The majority of Canadians are exposed to smog at concentrations that pose a threat to their health. In southern regions of Ontario and Quebec, levels of ground-level ozone and particulate matter exceed Canadian health standards many days each summer.<sup>17</sup> In 2005, there were a record 53 smog advisory days in Ontario, 24 in Quebec, and three in Atlantic Canada. For the first time in Canadian history, winter smog advisories were issued – ten days in Quebec and five days in Ontario. As Canada's Environment Minister observed, "it is unacceptable that such days happen, when children with asthma and elderly people with respiratory conditions can't even leave their home."<sup>18</sup>

# International Comparison of Standards and Guidelines for Air Quality

Unlike the majority of industrialized nations, Canada does not have any legally binding national air quality standards. Although there are Canada-Wide Standards (CWS) for ozone and particulate matter, established in 2000, these are not ‘standards’ in the ordinary legal sense. It is more accurate to describe the CWS as voluntary guidelines, because they are non-binding on any level of government and have no legal consequences if they are not met. These so-called standards are supposed to be achieved by all jurisdictions by 2010. In 2004, the latest year for which Ontario data are available, and a year when meteorological conditions were quite favourable, 18 out of 19 Ontario municipalities were unable to meet the CWS for ozone. In fact, ozone levels in Ontario have risen over the past decade.<sup>19</sup>

Canada also has National Ambient Air Quality Objectives (NAAQOs) established pursuant to the *Canadian Environmental Protection Act, 1999*. Again, the NAAQOs are non-binding voluntary guidelines. Although this study will compare the CWS and NAAQOs with the air quality standards in other jurisdictions, it is vital to understand that these Canadian guidelines provide a very weak form of protection for outdoor air quality. An extensive body of research has demonstrated that voluntary approaches to environmental protection are generally ineffective.<sup>20</sup>

This study compares air quality standards and guidelines in Canada, the United States, the European Union, and Australia, as well as guidelines published by the World Health Organization (WHO). The U.S. and Australia both have legally binding and enforceable national air quality standards. This is of particular interest to Canada because all three nations share the federal form of government, yet only Canada lacks legally binding national standards for air quality. The European Union ambient air quality standards must be transposed into national law and achieved by a series of dates ranging from 2005 to 2010. The guidelines from the WHO are not legally binding because the WHO lacks the legal authority to enact or enforce binding standards.

The analysis focuses on six substances, known as criteria air pollutants – ozone, particulate matter, sulphur oxides, nitrogen oxides, carbon monoxide, and lead. It should be noted that humans are exposed to many other harmful substances through the air, such as mercury, benzene, and literally hundreds of other airborne toxins. While these other air pollutants are certainly important, there are not ambient air quality standards for these pollutants. Instead, nations tend to rely on regulations that address emissions on a source-by-source basis. For example, in addressing the health and environmental threats posed by mercury, some nations have established regulations governing mercury emissions from coal-fired electricity plants, hazardous waste incinerators, consumer products containing mercury (from cars to thermometers), and dental amalgam. Focusing on the six criteria air pollutants facilitates international comparison.

The results of the international comparison indicate that for each of these six criteria air pollutants – ozone, particulate matter, sulphur oxides, nitrogen oxides, carbon monoxide, and lead – there is at least one jurisdiction, and as many as all three of the other jurisdictions, that have more stringent outdoor air quality standards than Canada. [See Table 1, below.] Furthermore, Canada does not have the highest level of health protection for any of the six criteria air pollutants.

Canada's air quality guidelines are weaker than the European Union standards on five out of six air pollutants. Canada's air quality guidelines are weaker than the Australian

**TABLE 1**  
**International Comparison of Ambient Air Quality Standards and Guidelines,<sup>21</sup>**  
**as compared with recommendations of the World Health Organization (WHO)**

POLLUTANT	WORLD HEALTH ORG	EUROPEAN UNION	AUSTRALIA	UNITED STATES	CANADA
<b>Ozone</b> 8 hour, parts per billion	50	60	80	80	65
<b>Fine particulate</b> 24 hour, micrograms per cubic meter	25	50	25	65	30
<b>Sulphur dioxide</b> 24 hour, ppb	8	48	80	140	115
<b>Nitrogen dioxide</b> Annual, ppb	21	21	30	53	53
<b>Carbon monoxide</b> 8 hour, ppm	9	9	9	9	13
<b>Lead</b> Micrograms per cubic meter	–	0.5	0.5	1.5	–

NOTE: A dash (–) indicates that no standard or guideline has been established for a particular parameter.

standards on five out of six air pollutants. Canada's air quality guidelines are weaker than the World Health Organization recommendations for all five air pollutants with WHO standards (neither the WHO nor Canada has a guideline for lead). Only in comparison to the U.S. does Canada fare slightly better, with Canada having more stringent numerical values than the U.S. for three air pollutants while the U.S. has more stringent numerical targets than Canada for two pollutants. However all of the U.S. standards are inherently stronger because they are legally binding and enforceable while the Canadian guidelines are merely voluntary goals.

## Ozone

### HEALTH EFFECTS

Ozone irritates the respiratory tract. Exposure to ozone in sensitive people can cause chest tightness, coughing, and wheezing. Children who are active outdoors during the summer, when ozone levels are elevated, are particularly vulnerable. Other groups at risk include individuals with pre-existing respiratory disorders, such as asthma and chronic obstructive pulmonary disease. As a result of these negative health effects, ozone contributes to premature mortality, increased hospital admissions for acute respiratory diseases, aggravated asthma, and reduced lung function.<sup>22</sup> It is important to note that there is no threshold concentration of ozone below which no health effects are found. In other words, there is no safe level of ozone – negative health effects will occur in some people even at very low levels, and the proportion of people impacted will rise as ozone levels rise. Ground level ozone, which causes adverse health effects, must be distinguished from stratospheric ozone, which provides the vital service of blocking ultraviolet radiation from the sun.

### SOURCES

Ground level ozone is a key component of smog, and is formed by atmospheric reactions involving nitrogen oxides, volatile organic compounds, and sunlight. Sunlight intensity and higher temperatures exacerbate the formation of ozone. These factors explain why smog is generally a worse problem during summer months.

### COMPARATIVE ANALYSIS

The Canada-Wide Standard (i.e. guideline) for ozone is 65 parts per billion (ppb), averaged over an eight hour time period, and is intended as a goal to be achieved in all jurisdictions by 2010. This is weaker (i.e. less protective of public health) than the European standard, which also is to be achieved by 2010. Canada's ozone guideline is also significantly weaker than the guideline recommended by the World Health Organization. Although the Canada-Wide Standard for ozone is merely a voluntary guideline, Canada sets a more ambitious numerical target for ozone than the U.S. standard and the Australian standard.

## Particulate matter

### HEALTH EFFECTS

Particulate matter refers to airborne particles that include both solids and liquid droplets suspended in the air. Particles are classified according to size, and research indicates that fine particles less than 10 microns in size are more likely to enter the lungs through the respiratory system and cause adverse health effects.

Evidence indicates that particulate matter causes premature mortality from cardiovascular and respiratory diseases, increased hospital admissions for cardiovascular and respiratory diseases, increased prevalence of bronchitis, increased risk of lung cancer, aggravation of asthma, and decreased lung function. Children in particular are likely to suffer from a range of respiratory ailments as a result of exposure to particulate matter. The elderly and individuals with heart ailments are also particularly vulnerable.<sup>23</sup> It is important to note that there is no threshold concentration of fine particulate matter below which no health effects are found. In other words, there is no safe level of fine particulate matter – negative health effects will occur in some people even at very low levels, and the proportion of people impacted will rise as levels of fine particulate rise.

### SOURCES

Fine particulate matter is created primarily by the combustion of fossil fuels, while coarse particulate matter originates from road dust, diesel engines, and crushing and grinding operations.

### COMPARATIVE ANALYSIS

The Canada-Wide Standard for fine particulate matter is 30 micrograms/m<sup>3</sup> averaged over a 24-hour time-period, and is to be achieved by 2010. This Canadian guideline is weaker than the legally binding Australian standard and the World Health Organization guideline. Although the CWS is merely a voluntary guideline, Canada sets a more ambitious numerical target for fine particulate matter than the American and European standards.

## Sulphur dioxide

### HEALTH EFFECTS

Exposure to sulphur dioxide causes severe problems for people with asthma and is also associated with increased risk of lung cancer and chronic bronchitis. Sulphur dioxide also reacts with other air pollutants in the atmosphere to form particulate matter.<sup>24</sup>

### SOURCES

Most sulphur dioxide emissions are produced by the combustion of fossil fuels containing sulphur, including coal, oil, gasoline, and diesel, as well as coal-fired electricity plants and metal smelters.



## COMPARATIVE ANALYSIS

Canada's voluntary National Ambient Air Quality Objectives for sulphur dioxide are substantially weaker than the corresponding standards in Australia and the EU, as well as the guidelines recommended by the World Health Organization. Only the U.S. standards for sulphur dioxide are set at higher numerical targets than the Canadian guidelines.

## Nitrogen oxides

### HEALTH EFFECTS

Exposure to elevated levels of nitrogen oxides can contribute to respiratory illness, aggravation of asthma in children, and reduced lung growth.<sup>25</sup> Nitrogen oxides react with other air pollutants in the atmosphere to form smog.

### SOURCES

Nitrogen oxides are produced by the combustion of fossil fuels.

## COMPARATIVE ANALYSIS

Canada's voluntary guidelines for nitrogen dioxide are substantially weaker than the Australian and European standards, but are set at the same numerical value as the United States standard. The guideline recommended by the World Health Organization is also much more stringent than Canadian guidelines.

## Carbon monoxide

### HEALTH EFFECTS

Unlike the other air pollutants, carbon monoxide does not appear to affect the respiratory system. However, exposure to elevated levels of carbon monoxide can adversely affect the functioning of the heart, resulting in cardiac ischaemia, increased hospital admissions, and possibly increased cardiac mortality.<sup>26</sup> Outdoor concentrations of carbon monoxide rarely reach dangerous levels, whereas indoor concentrations are more likely to occur at harmful levels.

### SOURCES

Carbon monoxide is produced by the incomplete combustion of fossil fuels, largely from motor vehicles and other mobile sources.

## COMPARATIVE ANALYSIS

In addition to being merely voluntary, Canada's National Ambient Air Quality Objective for carbon monoxide is the weakest among the industrialized nations surveyed in this study. Canada's voluntary NAAQO for carbon monoxide is 13 ppm (averaged over an eight hour period). The American, European, and Australian standards for carbon monoxide is 9 ppm (averaged over an eight hour period). The WHO also sets a target of 9 ppm.

## Lead

### HEALTH EFFECTS

There is an overwhelming body of evidence proving that lead has extensive negative health effects, affecting children, menopausal women, and the elderly. Among children, lead exposure can cause cognitive deficits, developmental delays, hypertension, impaired hearing, attention deficit disorder, reduced intelligence, and learning disabilities. While lead has been considered a major threat to children's health for many years, only recently has evidence begun to accumulate about the dangers posed by lead to menopausal women and the elderly.<sup>27</sup> As bones become thinner with age, lead is released into the blood, contributing to an array of negative health effects including cataracts, Alzheimer's, Parkinson's and other forms of dementia, high blood pressure, and impaired kidney function.

For many decades, the level of lead deemed 'safe' in children's blood has been declining. This reflects a common pattern for environmental contaminants – over time our understanding about health effects improves, and acceptable levels of specific contaminants decline. Medical experts and the U.S. Environmental Protection Agency now recognize harmful health effects may occur at blood lead levels so low that there is essentially no safe level of exposure (although risks are lower with lower exposures).<sup>28</sup>

### SOURCES

In the past, leaded gasoline was the primary source of lead emissions to the air. Today, the majority of lead emissions to the air are from lead smelters. Dust, paint chips, consumer products, and lead shot are other important sources of exposure to lead.

### COMPARATIVE ANALYSIS

The U.S., the EU, and Australia have all established standards for acceptable levels of lead in ambient air. The EU and Australia established the most stringent target, setting an identical goal of limiting the level of lead in the air to less than 0.5 micrograms per cubic meter by the end of 2008.

The absence of a national air quality guideline for lead is typical of Canada's failure to protect public health from this heavy metal, despite the fact that lead is one of the most universally acknowledged environmental threats. Canada was slow to prohibit the use of lead as a gasoline additive, slow to restrict the use of lead in paint, and slow to restrict lead content in children's jewelry.<sup>29</sup>

# Canada's Ability to Enact National Air Quality Standards

One of the objections likely to be raised in response to the recommendation that Canada adopt legally binding air quality standards is that the federal government lacks jurisdiction. According to this argument, the provinces bear the lion's share of the constitutional responsibility for air pollution. This excuse does not withstand scrutiny, as proved by the following discussion.

## Existing Legislation

It is true that the federal and provincial governments share constitutional authority regarding environmental matters. Provincial governments, because of their role in regulating natural resource industries and the manufacturing sector, have assumed a substantial proportion of the regulatory burden.

However, the federal government already has the requisite legislative authority, pursuant to the *Canadian Environmental Protection Act, 1999 (CEPA, 1999)*, to legislate the reduction of smog-producing pollutants such as nitrogen oxides, sulphur dioxide, volatile organic compounds, and particulate matter.<sup>30</sup> *CEPA 1999* also authorizes the establishment of national ambient air quality objectives, pollution prevention plans, emissions standards for certain industries, and an inventory of pollutants released into the environment.

All of the substances that contribute to smog have already been added to Schedule 1 of *CEPA, 1999*, known as the List of Toxic Substances.<sup>31</sup> As a result, the federal government now has both the statutory and the constitutional authority, confirmed by the Supreme Court of Canada, to regulate these substances.<sup>32</sup> In fact, a number of regulations addressing these pollutants already exist pursuant to *CEPA, 1999* (e.g. governing sulphur in gasoline, sulphur in diesel fuel, and emissions from motor vehicles).<sup>33</sup>

There is widespread agreement that the air pollution provisions in *CEPA, 1999* have not been adequately implemented or enforced. There are concerns that many hazardous

air pollutants are not yet regulated, that emission standards have not been set for a broad enough range of industries, and that problems remain in terms of unregulated pollution sources and weak regulations. The Organization for Economic Cooperation and Development, the Commission for Environmental Cooperation, and the World Economic Forum have all been critical of Canada's air pollution policies and programs.<sup>34</sup>

## International Law

The central role of the federal government in establishing legally binding and enforceable national air quality standards is reinforced by an examination of Canada's international legal responsibilities. Canada has both bilateral and multilateral obligations to reduce air pollution. In 1991, Canada signed the *Canada-U.S. Air Quality Agreement*, with commitments to reduce sulphur dioxide and nitrogen oxides (the main precursors of acid rain). In 2000, Canada and the U.S. signed an *Ozone Annex* to reduce smog by addressing volatile organic compounds and achieving further reductions in nitrogen oxides. A second Annex, dealing with particulate matter, is currently under negotiation.

Canada is a party to the 1979 *United Nations Economic Commission for Europe Convention on Long Range Transport of Air Pollution*, resulting in obligations to reduce sulphur dioxide and nitrogen oxide emissions. More recently and more importantly, Canada signed the *United Nations Economic Commission for Europe Protocol on Acidification, Eutrophication, and Ground-level Ozone*. Canada cannot ratify this international agreement until we have established national reduction targets for 2010 for sulphur dioxide, nitrogen oxides, and volatile organic compounds.

This brief review confirms that the federal government has the international obligation, the constitutional jurisdiction, and the existing legislative authority to enact binding national standards for air quality and ambitious long-term targets for the reduction of air pollution.

## Next Steps for Canada

Canada's dismal performance in the international comparison of air quality standards and guidelines warrants timely government action. As has been pointed out, the federal government already has the legislative authority to reduce smog-producing pollutants and other airborne toxins with the *Canadian Environmental Protection Act, 1999*. To be effective in improving air quality and protecting the health of Canadians, *CEPA 1999* needs to be strengthened, implemented, and enforced. By relying on existing legislation, federal government actions to reduce air pollution can be started immediately.

First of all, enforceable national standards for ambient air quality should replace the unenforceable and mis-named guidelines now known as Canada-Wide Standards and the National Ambient Air Quality Objectives. As Justice Dennis O'Connor wrote in his compelling analysis of the Walkerton water disaster, matters as important as safe drinking

water and public health “should have been covered by regulations which, unlike guidelines, are legally binding.”<sup>35</sup> The same logic applies to air quality. As discussed earlier, legally binding and enforceable national standards for air quality are the norm in industrialized countries, including the U.S., Australia, and member nations of the European Union. Again, the U.S. and Australia provide particularly relevant comparisons for Canada because they have similar federal systems of government.<sup>36</sup>

In addition to enforceable national air quality standards, the government must set ambitious targets and timelines for the reduction of the air pollutants that contribute to smog. National targets and timelines for reducing air pollutants and protecting air quality are a critical component of a broader suite of national targets and timelines for environmental protection. Nations that are acknowledged leaders in environmental protection, such as Sweden, the Netherlands, and Germany, have comprehensive and ambitious plans for achieving a sustainable future.

There are three other innovative approaches that merit serious consideration as part of the effort to provide Canadians with clean air. One promising policy that has resulted in significant reductions in air pollution in European nations is the imposition of a charge on each unit of pollution produced. Such an approach implements the widely endorsed “polluter pays principle,” addressing the fact that the costs of air pollution are an externality, not priced by the free market. Data on criteria air pollutants gathered by Canada’s National Pollutant Release Inventory could serve as the basis for such a policy, with the initial fees being relatively modest but projected to grow over time.

Another set of policies that has shown great promise in other jurisdictions are called market-based regulations – using regulations to further the development of new technologies such as renewable energy or zero-emission vehicles. These market-based regulations generally establish a minimum quota for procurement or sales of a specific technology, facilitating market penetration, lower costs, and movement along the learning curve.<sup>37</sup> Market-based regulations played a key role in American efforts to reduce sulphur oxides during the 1990s, as a cap and trade program was established under the U.S. *Clean Air Act*.<sup>38</sup>

A third possible component of new legislation is the recognition of the fact that Canadians have a right to breathe clean air. Environmental rights have been recognized in the constitutions of more than seventy nations as well as in a weaker legislative form by Ontario, Quebec, the Yukon, the Northwest Territories, and Nunavut. Although the federal government recently denied that Canadians have the right to live in a healthy environment, there are compelling reasons for the government to reconsider its position.<sup>39</sup>



## Conclusion and Recommendations

**T**he David Suzuki Foundation believes that Canadians should enjoy a level of protection from environmental threats that is equal to or better than the highest standard enjoyed by the citizens of other industrialized nations. Most Canadians would undoubtedly be upset to learn that the national air quality guidelines in Canada are substantially weaker than the air quality standards in other industrialized nations, including legally enforceable standards for air pollutants in the U.S., Australia, and Europe. In order to provide an adequate level of health protection for Canadians, the federal government needs to establish legally binding standards for air quality and ensure that these standards are equal to or stronger than the corresponding standards in other industrialized nations. By reducing air pollution, Canada has the ability to save thousands of lives, prevent millions of cases of illness, and save billions of dollars.

Strengthening *CEPA 1999* by providing national targets, timelines, and air quality standards, will reduce the unacceptably high health and environmental impacts caused by air pollution in Canada today. Such action would demonstrate a genuine commitment to environmental leadership, while increasing accountability and transparency. As well, by establishing national targets and standards, Canada will be in a much stronger position vis-à-vis the U.S. in ongoing bilateral negotiations about air pollution. Because much of Canada's air pollution burden originates in the U.S., this is a vital consideration.

Finally, it should be noted that the burning of fossil fuels generates the overwhelming majority of the air pollution in Canada. Thus there is an important synergy between improving air quality and the increasingly urgent need to reduce greenhouse gas emissions. Laws and policies that reduce air pollution will generally help to address climate change and vice versa. Where possible, policies and actions intended to improve Canada's air quality should also attempt to maximize reductions in greenhouse gas emissions. In the medium to long term, the negative effects of climate change on human health and well-being may dwarf the negative health effects of other types of air pollution.

The David Suzuki Foundation's five key recommendations for reducing the toll of air pollution on the health and well-being of Canadians are as follows:

## Recommendation 1

### ENACT, IMPLEMENT, AND ENFORCE NATIONAL STANDARDS FOR AMBIENT AIR QUALITY TO REPLACE EXISTING VOLUNTARY GUIDELINES

As noted earlier, the David Suzuki Foundation believes that Canadians should enjoy a level of protection from environmental threats that is equal to or better than the highest standard enjoyed by the citizens of other industrialized nations. The current lack of enforceable standards for air quality is unacceptable for one of the world's wealthiest, best educated, most technologically advanced nations. The United States, Australia, and the European Union all have legally binding standards for air quality. There is no reason why Canadians should not enjoy the same level of protection.

## Recommendation 2

### ENSURE THAT CANADA'S AIR QUALITY STANDARDS MEET OR BEAT THE AIR QUALITY STANDARDS OF OTHER INDUSTRIALIZED NATIONS

Based on the international comparison in this report, Canadian air quality standards should be equal to or better than the following standards:

POLLUTANT	RECOMMENDED CANADIAN STANDARD	CURRENT CANADIAN GUIDELINE
<b>Ozone</b> 8 hour, parts per billion <i>This recommendation matches the existing standard in Europe. It should be noted that the WHO has set a long-term objective for ozone of 50 ppb.</i>	60	65
<b>Fine particulate</b> 24 hour, micrograms per cubic meter <i>This recommendation matches the existing Australian standard and the WHO recommendation.</i>	25	30
<b>Sulphur dioxide</b> 24 hour, ppb <i>This recommendation matches the existing standard in Europe. It should be noted that the WHO has set a long-term objective for sulphur dioxide of 8 ppb.</i>	48	115
<b>Nitrogen dioxide</b> Annual, ppb <i>This recommendation matches the existing standard in Europe and the WHO recommendation.</i>	21	53
<b>Carbon monoxide</b> 8 hour, ppm <i>This recommendation matches the existing standard in the U.S., Australia, and Europe.</i>	9	13
<b>Lead</b> Micrograms per cubic meter <i>This recommendation matches the existing standard in Australia and Europe.</i>	0.5	NO GUIDELINE

### **Recommendation 3**

#### **ESTABLISH AND ACHIEVE SHORT, MEDIUM AND LONG-TERM TARGETS FOR THE REDUCTION OF AIR POLLUTION**

A report published by the David Suzuki Foundation in 2004, *Sustainability Within A Generation: A New Vision for Canada*, proposed a long-term goal of reducing emissions of the criteria air pollutants 80 per cent from current levels by 2030.<sup>40</sup> This goal was based on a review of objectives established by leading nations in the field of environmental sustainability as well as projections of technological improvements in the decades ahead. Environment Canada is developing a series of National Environmental Objectives, based on a similar evaluation of scientific evidence and international benchmarks. Environment Canada is proposing a long-term goal of reducing emissions of the criteria air pollutants 75 per cent from current levels by 2030.

### **Recommendation 4**

#### **IMPLEMENT A NATIONAL TAX ON POLLUTERS**

Canada should implement a national pollution tax. Pollution taxes are widely endorsed by both economists and environmentalists as the most effective, efficient, and equitable way to implement the polluter pays principle. European nations have used taxes on polluters with great success in reducing the release of toxic chemicals into air and water, reducing pesticide use, and reducing emissions of carbon dioxide, sulphur dioxide, and nitrogen oxides.<sup>41</sup> For example, Sweden used a tax on sulphur to reduce sulphur dioxide emissions by more than 80 per cent to levels that are one-eighth of the per capita level of sulphur dioxide emissions in Canada.<sup>42</sup> Data on criteria air pollutants gathered by Canada's National Pollutant Release Inventory could serve as the basis for such a policy, with the initial fees being relatively modest but projected to grow over time. The revenue from a Canadian pollution tax could be used to finance a just transition strategy for workers who lose jobs due to the elimination of toxic substances. The Ontario Task Force on the Primary Prevention of Cancer recommended this kind of tax on polluters and transition strategy in 1995.<sup>43</sup>

### **Recommendation 5**

#### **RECOGNIZE THAT CANADIANS HAVE THE RIGHT TO LIVE IN A HEALTHY ENVIRONMENT**

Canada should recognize that all Canadians enjoy a basic human right to breathe clean air, drink clean water, and live in a healthy environment. The Supreme Court of Canada has endorsed recognition of the right to live in a healthy environment.<sup>44</sup> In recent years more than 70 nations, including more than 20 in Europe, have explicitly acknowledged, in their constitutions, that all citizens have the right to a healthy environment.



## NOTES

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**T**here is strong evidence that air pollution is currently the most harmful environmental problem in Canada in terms of human health effects. *The Air We Breathe: An International Comparison of Air Quality Standards and Guidelines* is the first in a series of reports on how our environment affects human health in Canada.

In an effort to propose real, workable solutions, this report compares Canada's voluntary air quality guidelines to the legal standards in the United States, Australia, the European Union and to the recommendations of the World Health Organization.

The David Suzuki Foundation is committed to achieving sustainability within a generation in Canada. A healthy environment – including clean air, clean water, and healthy food – is a vital cornerstone of a sustainable, prosperous future.



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