

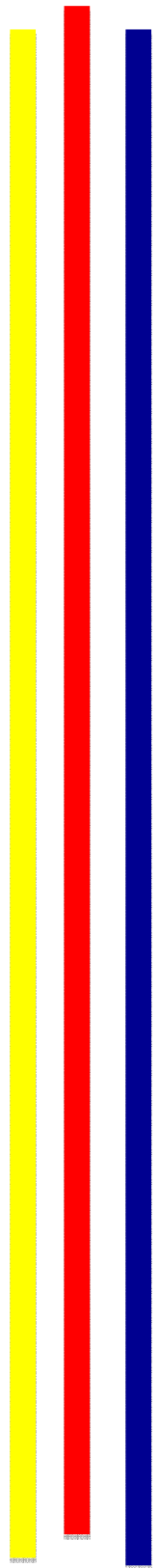
SPECIAL SERIES: THE ROLE OF FEDERALISM IN PROTECTING THE PUBLIC'S HEALTH

Canada-Wide Standards for Particulate Matter and Ground-level Ozone: A Shared Approach to Managing Air Quality in Canada

Karen Thomas

**Institute of Intergovernmental Relations
School of Policy Studies, Queen's University**

Public Health 2008(4)



INTRODUCTION

Air quality is a growing public health concern in Canada. An increasing number of smog days and rising levels of health-related incidents (e.g., asthma) has focused public attention on this issue. Impacts on vulnerable populations, such as children and the elderly, are of particular concern. That is why, in the 2001 Speech from the Throne, clean air was recognized as a priority for the Government of Canada. Of particular interest to public health has been the impact of particulate matter and ground-level ozone as these are the primary pollutants in smog. Protecting the environment and human health from these substances necessarily requires coordination of activities across orders of governments. Since air pollution does not respect political boundaries, failure to address air safety by one jurisdiction could necessarily undermine the efforts of adjacent jurisdictions which receive downstream air currents from neighbouring regions. The recent political turmoil over the proposed national Clean Air Act demonstrates both the rising public interest in this issue and the sensitivity and diverging interests surrounding air policy management in Canada. However, before the idea of a national act was introduced, there was recognition of the need to have a more integrated approach to dealing with air pollution and its impacts on public health.

The Canadian Council of Ministers of the Environment provides a forum for coordination of issues, such as air quality, which require interjurisdictional cooperation. The intent is to develop national guidelines and objectives to provide consistency across the country with regards to environmental quality. The Canada-Wide Standards are one mechanism developed through the Canadian Council of Ministers of the Environment

framework for environmental protection or health risk reduction issues that need to be addressed across Canada in a standard, or harmonized way.

This chapter examines the intergovernmental framework governing air quality in Canada and its impact on public health. Specifically, the *Canada-Wide Standards for Particulate Matter and Ground-level Ozone (O₃)*, signed in 2000, were used as a case study to explore this issue. This policy initiative is a joint federal-provincial/territorial program intended to improve coordination and cooperation on national air standards and the collection and analysis of ambient air data.¹ While the development of the Canada-Wide Standards for particulate matter and Ozone is an example of an inherently collaborative relationship between the federal-provincial-and-territorial governments, by design implementation of the Standards is disentangled as it is left to the discretion of individual jurisdictions to develop action plans. Further, while the federal government has taken a lead role in both developing the Canada-Wide Standards for particulate matter and Ozone and in implementing activities under national authority, ultimately the

Methods

Drawing on the framework developed by Harvey Lazar and Tom McIntoch, this study conducted a descriptive and evaluative analysis of the intergovernmental relationship surrounding the development and implementation of the Canada-Wide Standards for particulate matter and ozone. British Columbia and New Brunswick were selected as provincial case studies as both of these areas were identified in a 1998 report on smog as having persistent air quality problems (Labelle, 1998). British Columbia historically has high levels of particulate matter and ozone, particularly in the Lower Fraser Valley Region. New Brunswick has been identified as an area where transboundary pollution from the United States is an issue. It is also an area where local geographic and weather conditions have a strong influence on air quality. As a policy initiative the Canada-Wide Standards have not been the focus of much external research and most materials available on the subject are comprised of government policy documents and guidelines. The methodology for this study involved document analysis as well as semi-structured interviews with twelve policy actors from May to June 2005: NB Department of Environment and Local Government; NB Department of Health and Wellness; BC Ministry of Water, Land, and Air Protection; BC Ministry of Health; Environment Canada, Pacific and Yukon Region; Environment Canada, Atlantic Region; Greater Vancouver Regional District; Saint John Citizens Coalition for Clean Air; Canadian Lung Association; BC Lung Association; and Tsawwassen First Nation.

effectiveness of the initiative, both for environmental quality and impacts to public health, will depend on combined efforts across the country.

AIR QUALITY AS A PUBLIC HEALTH ISSUE

In 2004, Pollution Watch released a report on pollution trends across Canada using data reported under the National Pollutant Release Inventory. The report found that of all chemicals generated at company sites in 2002, 71 percent ended up in the air - a total of 3,868,302,111 kilotonnes. Of this, 96 percent were suspected respiratory toxins (including particulate matter and precursors to ozone). Furthermore, that releases to the air increased by 11 percent from 1995-2002 (Pollution Watch, 2004).

Air quality and its impact on public health has been an increasing concern across Canada. It is a complicated issue since pollution to the air varies locally as a result of local emissions, topography, weather, and long-range transport. As well, a number of pollutants, alone or in combination with each other, can result in reduced air quality. The adverse human health effects of air pollution are principally to the body's respiratory and cardiovascular systems. Health Canada advises that health effects caused by air pollutants include difficulty breathing, coughing, and aggravation of existing respiratory and cardiac conditions (e.g., asthma). These effects result in increased medication use, increased doctor or emergency room visits, more hospital admissions, and premature death. A Health Canada study of eight cities across Canada estimated that 5900 deaths per year in these cities can be attributed to air pollution (Health Canada, 2004). In British Columbia, estimates of public health impacts related to poor air quality include 140 to 400 deaths, 700 to 2000 hospital admissions, and 900 to 2700 emergency room visits per year (British Columbia, 2004).

Smog is perhaps the most recognized air quality problem in Canada. The two main components in smog that effect human health are ground-level ozone and particulate matter. As scientific background to the development of the Canada-Wide Standards, the The Canadian Council of Ministers of The Environment developed an in-depth review of available literature related to human health effects of particulate matter and ozone. In 1999, Federal-Provincial Working Groups on Air Quality Objectives and Guidelines for Canada-Wide Standards reviewed over 40 studies of the effects of particulate matter and ground-level ozone on: human health; vegetation; the atmosphere; and materials (Canada, 1999). In 2001, the Canadian Council of Ministers of the Environment requested Health Canada prepare reports on changes in the state of knowledge regarding the health science of particulate matter and ozone since the signing of the Canada-Wide Standards in 2000. These update reports were completed in July 2004 and focused on literature published from 1997-2002. Taken as a whole, the Working Groups concluded that the demonstrated association between particulate matter and ozone and adverse health effects could not be accounted for by confounding factors or co-varying pollutants.² Their effects on human health are varied and have been shown to have both short and long term implications. Moreover, these impacts are exacerbated when vulnerable groups are involved. Table 1 provides an overview of some of the main sources of particulate matter and ozone and associated health effects.

Ground-level ozone is a colorless and highly irritating gas, produced when nitrogen oxides and volatile organic compounds react in sunlight. Ozone has a variety of adverse effects on humans. It has been linked to respiratory illnesses such as decreased

lung function, chronic and acute bronchitis, asthma, and pulmonary emphysema, as well as to headaches, burning eyes, and irritated sinuses.

Airborne particulate matter is divided into two size ranges: particulate matter $_{2.5}$ (fine) and particulate matter $_{10}$ (coarse). Particulate matter $_{2.5}$ causes the greatest harm to human health. These fine particles are one-twentieth the width of a human hair and can be inhaled deep into the lungs reaching areas where there are no cilia to act as filters. Particulate matter is also an effective delivery mechanism for other toxic pollutants, which attach themselves to particulate matter $_{2.5}$ and are then delivered into the lungs. In humans, particulate matter has been linked to cardio-respiratory diseases, decreased lung function, increased respiratory stress, and an increase in chronic bronchitis and asthma.

Table 1: Sources and Health Effects Associated with Particulate Matter and Ozone

Pollutant	Sources	Health Effects	
		Short-term Exposure	Long-term Exposure
Fine Particulate Matter (particles smaller than 2.5µm in diameter)	<ul style="list-style-type: none"> ➤ Combustion (vehicles, forest fires, woodstoves and fireplaces) ➤ Industrial activity ➤ Garbage incineration ➤ Road dust ➤ Pollen 	<ul style="list-style-type: none"> ➤ Lung inflammatory reactions ➤ Respiratory symptoms – increase in chronic bronchitis and asthma ➤ Adverse effects on the cardiovascular system ➤ Increase in hospital admissions; mortality 	<ul style="list-style-type: none"> ➤ Adverse affects on lower respiratory symptoms ➤ Reduction in lung function ➤ Increase in chronic obstructive pulmonary disease ➤ Reduction in life expectancy due to cardiopulmonary mortality and lung cancer
Ground Level Ozone (formed by chemical reactions between VOCs and nitrogen oxides in sunlight)	Sources of nitrogen oxides and VOCs: <ul style="list-style-type: none"> ➤ Burning coal ➤ Gasoline/other fuel ➤ Vegetation ➤ Vehicle emissions ➤ Industrial activity 	<ul style="list-style-type: none"> ➤ Adverse effects on pulmonary function ➤ Lung inflammatory reactions ➤ Increase in respiratory symptoms – acute bronchitis, asthma ➤ Increase in hospital admissions; mortality 	<ul style="list-style-type: none"> ➤ Reduction in lung function development ➤ Adverse effects on respiratory symptoms ➤ Increase in mortality

Source: Adapted from: World Health Organization Europe. *Health Aspects of Air Pollution: Results from the WHO Project “Systematic Review of Health Aspects of Air Pollution” in Europe*. June 2004; British Columbia, Ministry of Water, Land, and Air Protection. *Guide to Airshed Planning in British Columbia*. March 2004.

THE CANADA-WIDE STANDARDS FOR PM AND OZONE

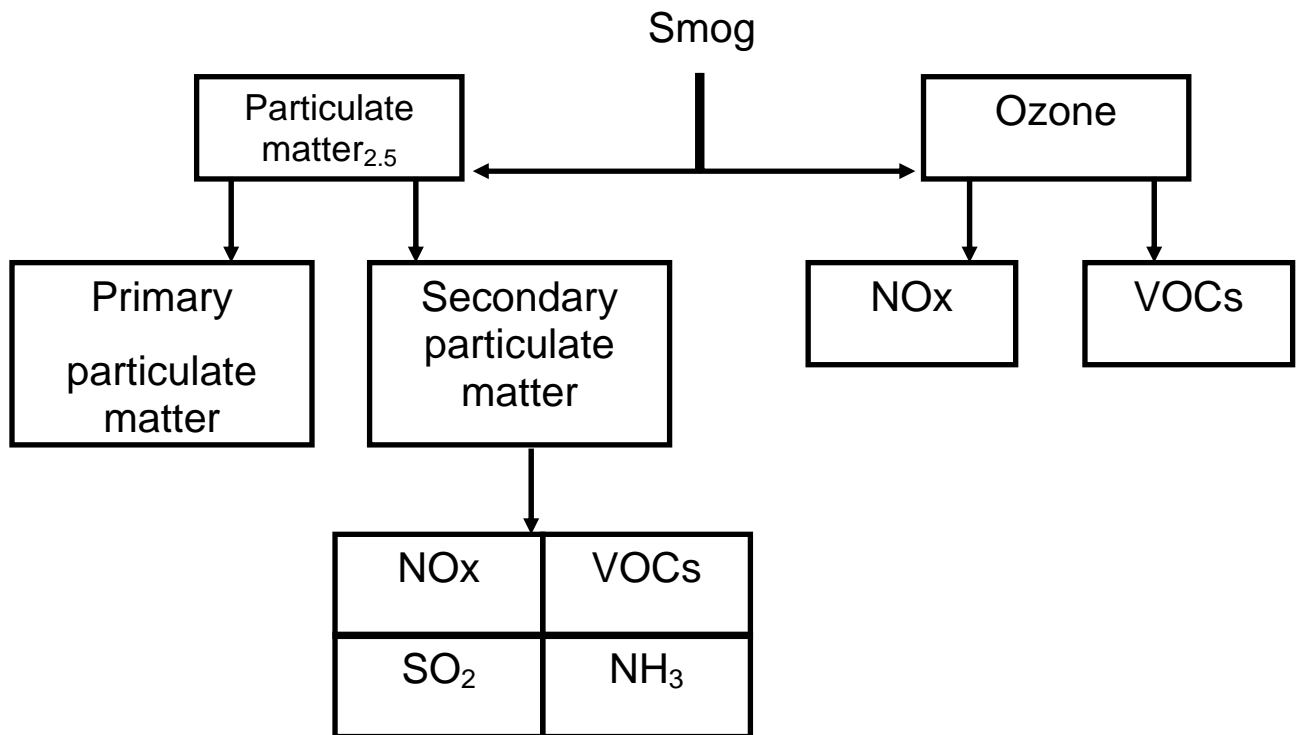
The *Canada-Wide Standards for Particulate Matter and Ground-level Ozone* were signed in 2000 by ministers of the environment for the federal government and provincial/territorial governments (except Quebec). The purpose of the Standards is to commit participating governments to significantly reduce particulate matter and ozone by 2010. The Canadian Council of Ministers of the Environment states that:

The Canada-wide Standards for particulate matter and Ozone are an important step towards the long-term goal of minimizing the risks of these pollutants to human health and the environment. They represent a balance between achieving the best health and environmental protection possible and the feasibility and costs of reducing the pollutant emissions that contribute to particulate matter and ground-level ozone in ambient air (Canadian Council of Ministers of the Environment, 2008).

As part of achieving these objectives, the Standards consider particulate matter and ground-level ozone together as they share common sources and are significant contributors to smog (see Figure 1). Particulate matter can be both a primary and secondary pollutant. Primary particles are emitted directly to the atmosphere from such sources as windblown dust, pollen, industrial releases, and motor-vehicle exhaust emissions. Secondary particles are formed through chemical reactions involving the precursors nitrogen oxides, volatile organic compounds, sulphur dioxide, and ammonia. The Canada-Wide Standards for particulate matter and Ozone are focused on the fine fraction of particulate matter (<2.5 microns), known as particulate matter_{2.5}. Ground-level ozone is a secondary pollutant produced through a chemical reaction of two primary precursor pollutants: nitrogen oxides and volatile organic compounds. Human activities are responsible for the majority of ozone levels: nitrogen oxides are produced from the burning of coal, gas, and oil in motor vehicles, industries, and power plants; volatile

organic compounds are produced mainly from gas combustion and from the evaporation of liquid fuels and solvents. Particulate matter is a problem throughout all seasons and in all regions of the country, while ozone is mainly a summer regional problem; ozone levels are highly dependent on the weather, with the highest levels occurring in the warmer months. For example, ozone levels in the Lower Fraser Valley in British Columbia are mainly due to local emissions, while those in southern New Brunswick and Nova Scotia are largely due to long-range transport of pollutants, mainly from the United States.

Figure 1: Key Components of Smog



The main goal of the Standards is achievement of the numerical targets and timelines as illustrated in Table 2 below. Other key components of the Standards include a commitment to: “Continuous Improvement” and “Keeping Clean Areas Clean”. What these provisions mean is that jurisdictions that meet the targets must still take actions and cannot simply sit back and allow levels to rise. For example, jurisdictions that meet the standards could implement pollution prevention strategies to ensure areas such as natural parks are maintained. The standards also include provisions to account for transboundary flow and high background levels of particulate matter and ozone through natural sources (e.g., forest fires) when tracking and calculating commitments. This allows jurisdictions to indicate that “best efforts” have been made to reduce particulate matter and ozone levels in cases where they are able to demonstrate that exceedances of the targets are due primarily to transboundary flow or natural background levels

Table 2: Canada-Wide Standards for Particulate Matter and Ozone: Numerical Targets and Timeframes

Substance	Goals under the Canada-Wide Standard
particulate matter _{2.5}	<ul style="list-style-type: none"> • 30 µg/m³ averaged over 24 hours by 2010 • Achievement to be based on the 98th percentile ambient measurement annually, averaged over 3 consecutive years
Ozone	<ul style="list-style-type: none"> • 65ppb averaged over 8 hours to be achieved by 2010 • Achievement to be based on the 4th highest measurement annually, averaged over 3 consecutive years • Provisions related to transboundary flow

Source: Adapted from Canada. Canadian Council of Ministers of the Environment. *Canada-Wide Standards for Particulate Matter and Ozone*. 2000.

DEVELOPMENT OF THE CANADA-WIDE STANDARDS: INSTITUTIONAL FRAMEWORK

The Canada-Wide Standards are part of the larger framework of the Canadian Council of Ministers of the Environment. Due to the complex nature of environmental governance in Canada, the Canadian Council of Ministers of the Environment plays a key role in framing relations between the federal and provincial/territorial governments. Jurisdiction over air quality management is a joint federal-provincial responsibility; thus, the management of air issues in Canada is a complex process involving many levels of government with a plethora of legislative and policy guidelines. This is further complicated by the diverging interests of health, environment, and industry stakeholders.

The Canadian environmental policy regime has been described as federal in theory, but often provincial in nature. Deborah Van Nijnatten (1997) has noted that the decentralized nature encourages a high degree of vertical fragmentation as authority is split among a variety of departments and across several levels of government. The traditional policymaking environment has been characterized as closed, informal and consensual in nature, however, more recent studies have argued that the political culture is changing. For example, increases in environmental litigation, increased reliance on partnerships and cooperative or voluntary initiatives, and increased multi-stakeholder consultation indicate a move towards a more open and consultative approach (Hessing and Howlett, 1997; Parson, 2000; Howlett, 2000).

The Canadian Council of Ministers of the Environment is comprised of the 14 environment ministers from the federal, provincial, and territorial governments and was designed to promote intergovernmental cooperation and a coordinated approach to national environmental issues, without changing individual authorities of the participating

jurisdictions (Canadian Council of Ministers of the Environment, 2006). Several of the operating principles of the Canadian Council of Ministers of the Environment (2006) illustrate this commitment, focusing on accountability, transparency, partnerships, and a cooperative commitment to action.

Textbox**Select Operating Principles of the Canadian Council of Ministers of the Environment*****Issues of concern to The Canadian Council of Ministers of the Environment members:***

The agenda is made up of issues that are national, international and intergovernmental in nature and of interest to a significant portion of the Canadian Council of Ministers of the Environment member governments/regions.

Results based: The Canadian Council of Ministers of the Environment will focus on achieving environmental results through cooperative action.

Consensus decision-making: The organization employs consensus decision-making.

Accountability: Each Minister remains responsible to act and to be held accountable within his or her jurisdiction. The responsibility for implementing any decision of Canadian Council of Ministers of the Environment rests with elected governments.

Commitment to Action: governments will work cooperatively and with a commitment to take action within their areas of jurisdiction on agreed-upon approaches to environmental matters.

Openness and transparency: The Canadian Council of Ministers of the Environment will provide information to the public in a timely fashion and undertake appropriate consultations, providing for the meaningful participation in jurisdictions of stakeholders and Aboriginal peoples. Each Minister shall be responsible for public consultation within his or her own jurisdiction.

Partnerships: The organization will use a partnership approach among jurisdictions, while recognizing their individual competence and diverse experience, to maximize efficiency and effectiveness.

Source: Adapted from: Canadian Council of Ministers of the Environment. *About Canadian Council of Ministers of the Environment*.
<http://www.ccme.ca/about/index.html>. Accessed June 2006.

In 1989, the first ministers of the federal and provincial/territorial governments endorsed a Statement of Inter-jurisdictional Cooperation on Environmental Matters, providing an overall framework for joint environmental action between the two levels of government. In 1993, the federal and provincial/territorial governments approved a Comprehensive Air Quality Management Framework for Canada. This framework provided a formal basis for, and encouraged all jurisdictions to coordinate and cooperate in the management of air quality issues.

Currently, one of the key frameworks for the work of the Canadian Council of Ministers of the Environment is the Canada-Wide Accord on Environmental Harmonization. Signed in 1998 (with the exception of the province of Quebec), the Accord was designed to improve cooperation among the governments on several environmental issues (Canadian Council of Ministers of the Environment, 1998). The Accord included several sub-agreements, one of which was the Canada-Wide Environmental Standards Sub-Agreement.³ The Standards Sub-agreement supports governments working together to address key environmental protection and health risk reduction issues that require common standards across the country (Canadian Council of Ministers of the Environment, 2006). There are several Canada-Wide Standards related to air quality; there are separate Standards processes for benzene, mercury, dioxins and furans, and particulate matter and ground-level ozone. The Canada-Wide Standards for particulate matter and Ozone were chosen for this study since, as described, these substances have been shown to have a strong connection to human health.

The Canadian Environmental Protection Act allows the federal government to set guidelines and objectives related to air quality. Under The Canadian Environmental

Protection Act, the National Ambient Air Quality Objectives set “national goals for outdoor air quality that protect public health, the environment, or aesthetic properties of the environment.” (Canada, 1999; i) The development of National Ambient Air Quality Objectives involves two stages. The first stage involves a risk assessment based on a scientific review of a substance, its sources, potential effects on health and the environment, and exposures. *The Canadian Environmental Protection Act*, Federal/Provincial Working Group on Air Quality Objectives and Guidelines, comprised of representatives of federal, provincial and territorial departments of environment and health, is the main body responsible for this review. Science Assessment documents for both particulate matter and ozone were developed in 1999 and set out the scientific basis for setting target levels and objectives for these substances. The second stage in the development of National Ambient Air Quality Objectives involves the integration of these results into a risk management framework. With the signing of the Harmonization Accord in 1998, the federal, provincial and territorial governments had a new process through which to manage national environmental issues. It was agreed that air pollutants that are identified by governments as needing to be managed would be targeted for either Canada-Wide Standards or the development of National Ambient Air Quality Objectives, not both. With the identification of particulate matter and ozone as a priority area under the Canada-Wide Standards, the National Ambient Air Quality Objectives were integrated into the Canada-Wide Standards process and the Science Assessment Documents formed the basis of the risk assessment process for the development of the Standards for particulate matter and Ozone. Figure 2 illustrates this more streamlined process.

Figure 2: Development of National Ambient Air Quality Objectives or Canada-Wide Standards For Air Pollutants

Stage 1: Risk Assessment

Under The Canadian Environmental Protection Act by the Working Group on Air Quality Objectives and Guidelines			
Evaluation of Hazards	Assessment of Exposure	Dose-Response Evaluation	Risks of Various Ambient Levels
Peer review and public consultation			

Stage 2: Risk Management

Canada-wide Standards

Under Canada-Wide Standards by the Federal/Provincial/Territorial Environment and Health Representatives				
Development of Options	Analysis of Implementation and Costs and Technological Feasibility	Recommendation for Standards and Associated Implementation Plans to Canadian Council of Ministers of the Environment Ministers	Approval of Standards and Implementation Plans by Canadian Council of Ministers of the Environment Ministers	Jurisdictions to Deliver Implementation Plans
Public Consultation				

OR

National Ambient Air Quality Objectives

Under The Canadian Environmental Protection Act by the Working Group on Air Quality Objectives and Guidelines				
Development of Options for NAAQOS	Consideration of Social Significance and Acceptability, and Potential for Achievability	Recommendation to Federal Health and/or Environment Ministers	Approval by Federal Health and/or Environment Ministers	Jurisdictions to Use as they see fit
Public Consultation				

Source: Adapted from Health Canada, Regulations Related to Health and Air Quality, http://www.hc-sc.gc.ca/ewh-semt/air/out-ext/reg_e.html#4

ALLOCATION OF RESPONSIBILITIES FOR THE CANADA-WIDE STANDARDS

AGENDA SETTING

As an initiative of the Canadian Council of Ministers of the Environment, the development of the Canada-Wide Standards for particulate matter and Ozone were a shared effort between the federal and provincial/territorial governments, as well as other interested stakeholders. A wide range of organizations and agencies participated in the development of the Standards through a variety of consultation measures, including workshops and meetings. Participants at these events included: the federal government (e.g., Environment Canada, Transport Canada, Industry Canada, and Health Canada); environment and health agencies representing provincial/territorial governments; municipal governments;⁴ non-government organizations such as the Canadian Lung Association and Pollution Probe; industry groups; and First Nations.⁵ While the development of the Standards was a joint endeavor, the federal government appears to have taken the lead, both in setting the agenda and in terms of administrative oversight of this process.

During this study, interviewees identified several “drivers” for the development of the Canada-Wide Standards for particulate matter and Ozone. First, an increase in public awareness or interest in air pollution and impacts on public health raised the profile of this issue with government. For example, issues related to increasing number of smog days in many urban centres and elevated levels of asthma and other respiratory problems had been gaining public attention. This also resulted in an increase in activity by environment and health nongovernment organizations, applying pressure to government

agencies. As noted, the Canada-Wide Standards for particulate matter and Ozone built upon work by the Federal-Provincial Working Group on Air Quality Objectives. Thus, the Standards targeted pollutants known to have an impact on human health and for which there was sufficient scientific evidence and data. Second, those involved in the development of the Standards were cognizant of commitments under the Canada-U.S. Air Quality Agreement. For example, the ozone standard uses a comparable metric to that used in the United States, facilitating discussions on transboundary air pollution. Third, the Harmonization Accord marked a change in federal-provincial/territorial relations; namely a desire for a more formal approach to managing environmental contaminants in a coordinated manner.

Jurisdictions were tasked with developing standards using a risk-based approach based in firm science, consideration of socio-economic factors, and an understanding of technical feasibility.⁶ The developments of the Standards were a very slow process, involving a large volume of research and considerable staff time and resources from the various jurisdictions. The Canada-Wide Accord on Environmental Harmonization and its accompanying Sub-Agreements were signed in 1998, with the Canada-Wide Standards for particulate matter and Ozone passed in June 2000. Considerable work was completed in the intervening years in order to provide the background to recommendations to the Ministers, including several national workshops. As well, work completed by the Federal-Provincial Working Group on Air Quality Objectives and Guidelines provided the scientific basis for the standard through its Science Assessment Report on Particulate Matter (1998) and Ozone (1999). However, due to limited staff time and resources among the federal and provincial/territorial governments, there was a perception of

inequity between jurisdictions in their ability to participate in the development of the standard.

STRUCTURE AND LEGISLATIVE AUTHORITY FOR THE CANADA-WIDE STANDARDS

Since the *Constitution Act* does not specifically refer to the environment, the management of air pollution in Canada is necessarily a shared responsibility. According to the distribution of legislative powers, Section 91 of the Constitution provides the federal government with authority to control air pollution through its powers over: navigation and shipping (S.91(10)); criminal law (S.91 (27)); inter-provincial and international transportation and communications (S.91 (10) (a)); and works declared to be for the general advantage of Canada (S. 91 (10) (c)). Additionally, the federal government has wider powers to act through the peace, order and good government residual power (S. 91, introduction) (Commission for Environmental Cooperation, 1995).

Section 92 and 92A of the Constitution provide the provincial/territorial governments with authority over air quality through their powers over: natural resources (S. 92A (1) (b)); municipal institutions (S. 92 (8)); all matters of a local or private nature (S. 92 (16)); and the regulation of matters related to property and civil rights (S. 92 (13)) (Commission for Environmental Cooperation, 1995; Morton, 1996).

While specific responsibilities will vary according to the specific standard, the Canada-Wide Standards Sub-Agreement lists the following general functions for the federal government and provincial/territorial governments:

Federal Government

- (1) providing technical and scientific support;
- (2) implementing measures at international borders;
- (3) implementing measures on federal lands;
- (4) representing Canada internationally and promoting actions at international level to achieve reductions in Canada; and
- (5) implementing standards that require a product/substance approach.

Provincial/Territorial Governments

- (1) providing scientific and technical support; and
- (2) implementing measures requiring action from industrial, municipal, and other sectors

The Canada-Wide Standards does not alter existing legislative authority for air policy; each jurisdiction is responsible for implementing the standard within their mandate. At the national level, the *Canadian Environmental Protection Act* is the main piece of legislation used by the federal government to develop regulations related to air quality. These include measures to improve fuel quality, control vehicle emissions, regulate transboundary air pollution, and limit the release of air pollutants that are assessed as toxic under the Act (Environment Canada, 2005). In 2001, the federal government declared particulate matter less than 10 microns in diameter (particulate matter₁₀) to be toxic and included in The Canadian Environmental Protection Act 1999, with an emphasis on the finer fraction particulate matter_{2.5}. In 2003, the primary precursor pollutants to the secondary formation of particulate matter_{2.5} and ground-level ozone (SO₂, nitrogen oxides, volatile organic compounds and NH₃) were also declared to be toxic and added to Schedule 1 of The Canadian Environmental Protection Act, the List of Toxic Substances (Environment Canada 2006).

Through The Canadian Environmental Protection Act, a number of emission sources fall under federal authority. These include marine vessels, aircraft, railways, and offroad engines. (Environment Canada, 2006). Some examples of recent legislative actions aimed at meeting the Canada-Wide Standards for particulate matter and Ozone include: The *On-Road Vehicle and Engine Emission Regulations*, adopted on January 1, 2003, prescribing more stringent emission standards for on-road vehicles and engines; the *Sulphur in Gasoline Regulation*, adopted July 2002 to limit the amount of sulphur in gasoline to an average of 150 and 30 parts per million in 2002 and 2005 respectively; and the *Sulphur in Diesel Fuel Regulation*, passed on July 31, 2002, which mandates that the limit of sulphur in diesel fuel will be reduced from 50 mg/kg to 15mg/kg in mid-2006 (Environment Canada 2001; 2003).

The federal government also has primary responsibility for international agreements. The 1991 *Canada-United States Air Quality Agreement* is the main mechanism governing air quality between the two countries (Environment Canada, 2004). The Ozone Annex was signed under the Agreement in 2000 and provides for joint action to reduce emissions of nitrogen oxides and volatile organic compounds in provinces and states within the Pollutant Emission Management Area (includes Ontario and Quebec in Canada). In 2004, a joint Canada-United States assessment report was produced to assess the need for a particulate matter annex pursuant to the Air Quality Agreement (Canada, 2004) and in April 2007, the governments of Canada and the United States announced the start of negotiations on this annex (US Environmental Protection Agency, 2007).

Additionally, a rising concern is emissions from large marine vessels while in harbour. International controls on air pollution from shipping are being developed by the federal government through the International Maritime Organization. The International Maritime Organization has introduced an international agreement⁷ to limit sulphur content in marine fuels to 4.5 percent and to designate “special areas” (e.g., the Greater Vancouver Regional District) where sulphur limits would be restricted to 1.5 percent (Environment Canada, 2001).

Under the Constitution, the provinces/territories have jurisdiction over much of the land and resources within their areas and they are responsible for most aspects of urban planning, transportation, vehicle regulations, and controlling emissions from industrial sources, usually through operating permits which stipulate allowable emissions limits. For the most part, the provinces/territories regulate air pollution from fixed sources.⁸ For example, in British Columbia the *Environmental Management Act* provides the basis for regulating industrial point sources through site-specific permits. These permits contain provisions limiting the amount of specific emissions which can be released to the air. In addition, regulations made under the Act, such as the *Open Burning Smoke Control Regulation*, *Clean Gas Regulation*, and the *Wood Residue Burner and Incinerator Regulation*, also take actions to reduce emissions to the air.⁹ Local governments also have authority to pass bylaws that restrict certain activities in their areas (e.g., backyard burning). The BC government created a model bylaw on backyard burning in 1997 to make it easier for municipalities to pass their own “anti-smoke bylaws” (British Columbia, 1997).

British Columbia is fairly unique in that the Greater Vancouver Regional District has been delegated authority for air quality under the *Waste Management Act* (British Columbia, 2003).¹⁰ Through the *Waste Management Act* (amended to the *Environmental Management Act* 2004), the Greater Vancouver Regional District is responsible for air quality management within its jurisdiction, including 21 cities and municipalities in the Greater Vancouver metropolitan area. The Air Quality Management Bylaw No. 937 defines control of industrial emissions, generally through a fee-based permitting system.

The *Environmental Management Act* also provides the basis for area-based planning in the province. Area-based plans take a bottom-up approach, with a high level of involvement by local communities. The plans also take into account regional growth strategies and community activities to ensure a balance between economic and population growth and air quality. The province has developed a *Guide to AirShed Planning in British Columbia* (2004) to provide a framework for the development of plans. However, the pervasiveness of airshed planning in BC is not as prominent in other parts of the country; limited examples include the Province of Alberta which has a management framework under the Clean Air Strategic Alliance and the City of Toronto which has developed a strategy based on an airshed approach.

Given their involvement in public transit and land-use planning, municipalities have a key role to play in improving local air quality. However, the relationship between provincial/territorial governments and local governments varies across the country, with a range of municipal involvement in air quality management apparent. On the one hand, local governments in British Columbia are developing airshed management plans to

structure planning in their regions. Further, the Greater Vancouver Regional District has been delegated provincial powers for air quality management in the region. On the other hand, municipalities in New Brunswick appear to play a minor role in managing air pollution.

It is important to note that the Canada-Wide Standards are a *standard*; it is not legally binding and has no enforcement capabilities on its own. Parties are able to withdraw from the agreement, with three months notice. This would change if the standards are specifically written into legislative initiatives such as into provincial certificates of approval or permits for industrial facilities. For the most part, the Standards rely on the political commitment by ministers and public accountability to ensure the targets are met. However, there is no punitive language in the Canada-Wide Standards and no sanctions for noncompliance. In theory, the federal government may be able to take unilateral action under the *Canadian Environmental Assessment Act*, but for political reasons the chances of this happening are low. Further, it is unlikely that the provinces/territories would want this to happen as it is better for them to work within the auspices of the Canadian Council of Ministers of the Environment and have the flexibility to achieve the standards on their own terms.

IMPLEMENTATION OF THE CANADA-WIDE STANDARDS

Part two of the Canada-Wide Standards for particulate matter and Ozone outlines the implementation actions to be taken by each jurisdiction (Canadian Council of Ministers of the Environment, 2000). This includes provisions for the development and implementation of “jurisdictional implementation plans” to achieve the target levels, the establishment and maintenance of monitoring networks to assess and track progress

across Canada, implementation of activities to meet the principles for Continuous Improvement and Keeping Clean Areas Clean, and activities to reduce transboundary flow of particulate matter and ozone into Canada. To assist in the implementation of the Canada-Wide Standards for particulate matter and Ozone, a Joint Implementation Action Coordinating Committee was established with representatives from each jurisdiction.¹¹ As well, Ministers agreed upon a set of “joint initial actions” to reduce levels of particulate matter and ozone. These included activities related to emissions from transportation, residential wood burning appliances, and industry sectors, codes of practice for the construction and demolition sector, databases for ambient air quality, improving scientific knowledge, and the development of alternative energy models (Canadian Council of Ministers of the Environment, 2000).

Jurisdictions are required to develop implementation plans to achieve the Standards and report on progress. Comprehensive reports on progress are to be produced every five years, starting in 2006, with annual reports on achievements and maintenance of the standards starting in 2011. The requirements to report on achievement of the Canada-Wide Standards apply only to population centres over 100,000. In order to ensure consistency and comparability in reporting by jurisdictions, supporting documents have been developed; the *Guidance Document on Achievement Determination* includes methodologies, criteria, and procedures related to monitoring and reporting on achievements of the Standards (Canadian Council of Ministers of the Environment, 2002).

In 2001, the federal government announced a *10-Year Action Plan on Clean Air* which contained actions for reducing emissions from transportation and marine sources,

transboundary pollution, and industrial sources. This plan was broad in nature, making commitments to improve air quality in general. Specific activities related to the commitments under the Canada-Wide Standards for particulate matter and Ozone were first outlined in the *Interim Plan 2001 on Particulate Matter and Ozone*. An updated report was also provided in the *Clean Air in Canada: 2003 Progress Report on Particulate Matter and Ozone* which provides a summary of achievements of the federal government and progress on meeting the Standards. It does not appear that the provinces/territories have been as rigorous in their reporting, although some have provided status reports starting in 2006 (as per the Canada-Wide Standards commitments).

Each jurisdiction is responsible for implementation of mechanisms to achieve the Canada-Wide Standards for particulate matter and Ozone in their area, and the agreement provides them with the flexibility to do so in whatever manner they choose. Implementation activities correspond to the legislative authority for air quality and do not alter existing roles or responsibilities. For example, the federal government has passed several pieces of legislation within their constitutional authority to reduce levels of air pollutants (i.e., *On-Road Vehicle and Engine Emission Regulation, Sulphur in Gasoline Regulation, and the Sulphur in Diesel Fuel Regulation*). In 2002, Environment Canada added an additional seven criteria air contaminants to the National Pollutant Release Inventory monitoring list (including particulate matter_{2.5}, SO₂, nitrogen oxides, volatile organic compounds, and Carbon Monoxide). As well, the federal government invested \$22 million over 4 years into the National Air Pollution Surveillance network to improve monitoring equipment and techniques, to better measure substances of concern such as

particulate matter, and to expand the network to include more monitoring sites (Environment Canada 2001; 2003).

Jurisdictions may also use a variety of non-regulatory mechanisms. In British Columbia, the Motor Vehicle Emissions Inspection and Maintenance Program (aka "AirCare") has been operating since 1992.¹² The program was developed in partnership with the Ministry of Water, Land and Air Protection and the Greater Vancouver Regional District to address the deteriorating air quality of the Lower Fraser Valley. AirCare tests vehicles for several regulated air pollutants. British Columbia has also implemented the Alternate Fuel Tax Exemption to encourage the use of natural gas, propane, and high-level alcohol blends and the SCRAP Program which provides financial incentives to take older polluting vehicles off the road. (British Columbia, 2003).

The level of involvement at the municipal level varied between the two provinces examined in this study. In New Brunswick, it appeared that municipal governments are not playing a large role in the implementation of the Canada-Wide Standards for particulate matter and Ozone. Three larger municipalities were contacted, with none indicating an involvement in the Standards. In addition, limited use of by-laws related to reducing levels of air pollution was found. On the other hand, municipalities in British Columbia play a very strong role in air quality management. Nine municipalities (2005) have developed airshed management plans; these are community-based, led by local government and with a high level of stakeholder involvement. The plans also take into consideration regional growth strategies and community plans. The province's "Guide to Airshed Planning in British Columbia" provides guidance and tools to municipalities and ensure consistency across the province (British Columbia, 2004). The Greater

Vancouver Regional District was the first region in Canada to develop and implement an airshed management plan in 1994. As noted earlier, the Greater Vancouver Regional District is somewhat unique in that under provincial legislation it is responsible for managing air quality in the region. To promote sustainability and improve air quality in the region, the current (2005) plan includes 33 activities under three strategic areas: (1) reduce emissions from major regional sources; develop and implement local air quality management plans; and (3) enhance air quality information and public awareness (Greater Vancouver Regional District, 2005). As noted earlier, such plans are not as prominent outside British Columbia.

Other stakeholders also play a key role in the implementation of activities for the Canada-Wide Standards for particulate matter and Ozone. Industry may be required to develop and implement new technologies and/or equipment to achieve reductions specified by the provinces/territories through the approvals and permitting process. The general public also has an important part to play as levels of particulate matter and ozone can be reduced through vehicle usage/maintenance, outdoor burning activities, and use of wood burning appliances. Non-government organizations are often the first point of contact for the public and manage a variety of education and incentive programs. One example is the Canadian Lung Association which offers a number of educational resources on understanding health affects from air pollution and how to limit exposures (Canadian Lung Association, 2006).

In terms of funding implementation activities under the Canada-Wide Standards for particulate matter and Ozone, each jurisdiction is responsible for bearing the costs of its commitments to achieve the standards. Regarding activities related to ambient air

quality monitoring, data monitoring and reporting networks generally work through cost-sharing arrangements between the federal and provincial/territorial governments. The federal government also assists by partnering with jurisdictions and providing funding for joint pilot projects such as the Georgian Basin-Puget Sound project in British Columbia. Other stakeholders will also bear some costs. Further, the federal government established the Green Municipal Funds¹³ to stimulate municipal investments in innovative environmental infrastructure projects and practices related to cleaner air, water and soil. Industry may be required to pay additional costs for new equipment and/or technologies required under provincial/territorial approvals processes and the general public may face some costs related to improving vehicular maintenance and improving the efficiency of wood burning appliances.

SUMMARY

Table 3 provides a general overview of the allocation of responsibilities for the Canada-Wide Standards between the federal, provincial/territorial, and municipal levels of government. Overall, both the development and implementation of the Canada-Wide Standards for particulate matter and Ozone is a shared responsibility. This follows the general vision under the Canadian Council of Ministers of the Environment's Harmonization Accord; "governments working in partnership to achieve the highest level of environmental quality for all Canadians" (Canadian Council of Ministers of the Environment, 1998: 1). The standards were developed jointly by the federal and provincial/territorial governments in an open and consultative manner. The standards do not change the legislative roles/responsibilities of the parties and each jurisdiction is able to take appropriate actions to meet its commitments through their respective authorities. From this, implementation activities generally fall under the same legislative division of Public Health 2008(4)

responsibilities, with some exceptions where a joint approach is required (e.g., monitoring networks). The goal of the Canada-Wide Standards is to achieve consistent standards across the country, through a partnership which respects the roles and responsibilities of the jurisdictions, aiming to ensure that each jurisdiction undertakes those activities to which they are best suited.

Thus far, the emphasis on cooperation and coordination of efforts appears to be working. The biggest problem has been in the fact that jurisdictions across Canada are not equal with regards to their level of financial and staff resources. Thus, not every province/territory was able to participate in the development of the standards to the same degree. The same provinces will have a more difficult time meeting the commitments of the Canada-Wide Standards.

Very soon however, the dynamics of federal-provincial-territorial authorities and relationships may change; on October 19, 2006 the Government of Canada tabled the *Canada's Clean Air Act* to help protect human health and the environment. This new legislation aims to take an integrated approach to reducing emissions of both air pollutants and greenhouse gases. At this point, progress on the Act has been plagued by political and public discord so it is difficult to know for certain what the final regulatory changes will comprise. But, as currently proposed, the Act would significantly strengthen the authority of the federal government to regulate air pollution.

Table 3: Allocation of Roles and Responsibilities for the Canada-Wide Standards for Particulate Matter and Ozone

Activity	Allocation of Responsibilities		
	Federal	Provincial/Territorial	Local
Setting the Agenda	X	X	X Limited role
Legislative Authority	X	X	X Limited role
Implementation	X	X	X Varies by Municipality
Funding	X	X (some cost-sharing for monitoring programs)	X
Note: Other stakeholders have also played a strong role in the development of the Canada-Wide Standards (setting the agenda) and the implementation of activities to meet the commitments under the Canada-Wide Standards.			

EXAMINING THE NATURE OF INTERGOVERNMENTAL RELATIONS

In Canada, no jurisdiction has sole authority to manage all aspects of air quality as the Constitution does not designate specific responsibility for environmental matters. Thus, joint and complementary actions are required between the levels of government. The Canadian Council of Ministers of the Environment was formed specifically to assist in promoting intergovernmental cooperation and coordinated approaches to issues such as air quality which necessitate a joint approach across the country.

Within this framework, the overall working relationship for the Canada-Wide Standards for particulate matter and Ozone can be classified as one of collaborative federalism, with a high level of interdependency. Air pollution does not respect political boundaries and each jurisdiction is responsible for different areas of air quality management. Thus, interdependencies among the jurisdictions are a necessary function due to the nature of the issue. Within each jurisdiction, there are also various agencies involved (e.g., health, environment, and transportation agencies), resulting in internal interdependencies as well. For example, in the federal government, Environment Canada has the lead responsibility for managing air quality, shared with Transport Canada, Health Canada, Agriculture and Agri-Food Canada, and Natural Resources Canada.

All jurisdictions worked together to develop the Canada-Wide Standards and each will be responsible for implementation activities to meet their commitments. Due to the inter-jurisdictional nature of air quality management, each jurisdiction has a defined role to play within their respective legislative authorities. Levels of particulate matter and ozone will not be reduced and, thus, national air quality will not be improved, without joint actions by all levels of government. That being said, it is clear that the federal and provincial/territorial governments have a much larger role to play than the local level. A clear exception to this is the province of British Columbia in which the Greater Vancouver Regional District has been given responsibility for managing air quality in the region. There is, however, room for municipalities to start to play a larger role as many air quality issues are at the local level and improvements to public health and reductions in emissions can be accomplished through local initiatives, such as zoning by-laws for areas near children (schools, playgrounds), improvements to public transit, and idling by-

laws. The airshed management planning process in British Columbia is a good starting point for such activities. However, placing such additional burdens on local government requires increased funding from the provinces/territories and the federal government.

Thus, the result is a somewhat disjointed framework with coordinated and complementary efforts needed across the country to improve air quality, involving activities at all levels of government as well as various agencies within each jurisdiction. However, this is a function of the nature of the issue (e.g., transboundary pollution) and the structure of the Canadian Constitution. Therefore, air quality management in Canada can be a slow and complex process.

By choosing the collaborative approach, the federal government has foregone other potential options for federal governance. The disentangled option- where each order of government operates within its own constitutional boundary – does not appear to be a feasible option because of the spillover effects of air pollution, and in fact was the form of federalism which was replaced by the collaborative strategy. Importantly, however, the current Standards do retain some disentangled components. While the institutional framework for the Standards is certainly collaborative in nature, the actual implementation is left to the discretion of the various jurisdictions and can better be classified as a disentangled relationship (see Table 4 and 5). The Standards themselves are not binding commitments and each government is responsible for developing and acting upon their own implementation plan. Moreover, the cost of doing so is born by the individual jurisdiction with very little cost sharing from the federal government (i.e., mainly for monitoring programs). However, it is important to note that while implementation activities are not interdependent, actions (or lack thereof) in one

jurisdiction can have impacts on neighbouring areas. A more hierarchical approach, or perhaps best defined as coercive due to the constitutional overlap of responsibilities, could have been chosen by the federal government. This could have involved using legislative powers through The Canadian Environmental Protection Act to require provinces/territories to meet federal standards. Alternatively, the federal government could have cost-shared the implementation of air pollution control mechanisms in provinces in exchange for federal standards being met.

Table 4: Nature of Intergovernmental Relationship: Agenda Setting

Government Relationship	Nature of Intergovernmental Relationship: Agenda Setting of the Canada-Wide Standards		
	Hierarchical	Interdependent	Form of Relationship
Federal-Provincial	No	Yes	Collaborative <i>*Strong Relationship through Canadian Council of Ministers of the Environment framework</i>
Provincial-Local	Yes	Yes	Unilateral
Exception: GVRD	No	Yes	Collaborative
Federal-Local	Yes	Yes	Unilateral <i>*Limited Relationship</i>
Provincial-Provincial	No	High	Collaborative <i>*Strong Relationship through Canadian Council of Ministers of the Environment framework</i>

Table 5: Nature of Intergovernmental Relationship: Implementation

Government Relationship	Nature of Intergovernmental Relationship: Implementation of the Canada-Wide Standards		
	Hierarchical	Interdependent	Form of Relationship
Federal-Provincial	No	No	Disentangled *Relationship through Canadian Council of Ministers of the Environment provides framework
Provincial-Local	Yes	Yes	Unilateral
Exception: GVRD	No	No	Disentangled
Federal-Local	Yes	Yes	Unilateral
Provincial-Provincial	No	No	Disentangled <i>*Jurisdictions develop and implement action plans individually, but these activities can impact nearby jurisdictions</i>

EVALUATING THE EFFECTIVENESS OF THE CANADA-WIDE STANDARDS

The intent of the Canadian Council of Ministers of the Environment framework and the development of the Canada-Wide Standards under the Harmonization Accord is to foster a cooperative and coordinated approach to the protection of the environment and public health across Canada. In this regard, the development of the Canada-Wide Standards for particulate matter and Ozone is a good example of collaborative federalism. With the exception of some inequity issues for regions with fewer staff and resources, all jurisdictions were at the table and involved in assessing the need for the Standards (i.e., the state of scientific knowledge and connections to human health) and the development of the targets and guidelines themselves. This process was also fairly open with mechanisms for public consultation and participation. However, the effectiveness of the initiative is limited, primarily through its own design. Further, the implementation of action plans by individual jurisdictions results in a disentangled framework in which jurisdictions are, on the one hand, not legally obligated to adhere to the commitments in the Standards and, on the other hand, dependent on each other's actions to ensure that overall air quality improves. These issues are explored further below with respect to three areas of analysis: policy effectiveness; respect for principles of democracy; and impact on Canadian Federalism. Table 6 provides a summary of key findings.

POLICY EFFECTIVENESS

The impact of air pollution on public health, particularly smog and its primary pollutants particulate matter and ozone, are an ever increasing policy issue in Canada. In this regard, the Canada-Wide Standards for particulate matter and Ozone can be considered an improvement over the former status quo as they have resulted in consistent

targets and guidelines across the country. In practice, however, the actual design and targets for the Standards are limited and could certainly be improved to provide for better protection of public health.

The use of a collaborative strategy resulting in the development of the Canada-Wide Standards for particulate matter and Ozone involved a high level of scientific research into the health effects of these pollutants and the resulting documents go a long way towards making these connections. Indeed, the “rationale” for the Standards states that “significant adverse effects have been demonstrated for the air pollutants particulate matter and ozone on human health and the environment” (Canadian Council of Ministers of the Environment, 2000: 2). However, ultimately the Standards were a compromise between political and economic feasibility versus protecting the environment and public health. Indeed the document goes on to indicate that:

They represent a balance between the desire to achieve the best health and environmental protection possible in the relative near-term and the feasibility and costs of reducing the pollutant emissions that contribute to elevated levels of particulate matter and ozone in ambient air. As such, while they will significantly reduce the effect of particulate matter and ozone on human health and the environment, they may not be fully protective and may need to be re-visited at some future date. There are also additional benefits to reducing and maintaining ambient levels below the Canada-Wide Standards where possible (Canadian Council of Ministers of the Environment, 2000: 2).

The Standards also contain a 100,000 population threshold under which reporting on achievement of the standards is not required. With the exception of a few areas, most jurisdictions in Canada will not have difficulties meeting the targets for particulate matter and ozone. Data for New Brunswick indicate that, for the most part, the standard for particulate matter and ozone are being met with the exception of the city of Saint John.

However, the data also suggests a general trend of increasing levels of pollutants, so actions will need to be taken to stop this upward trend (New Brunswick, 2004). A similar situation is apparent in British Columbia where only four areas meet the population threshold, with none exceeding the numerical targets. This raises the question of whether the standards were set low enough. This is also where the criteria of “continuous improvement” and “keeping clean areas clean” become important to ensure ongoing efforts are made to reduce levels of air pollution.

Further, transboundary pollution and background levels are exempt from the calculation of achievement; jurisdictions only have to account for emissions/levels of pollutants generated within their own jurisdictions. In New Brunswick, a large portion of air pollution originates from outside the region. Major weather systems bring pollutants from more industrialized and populated areas of central Canada and the United States. However, the province is also taking part in other initiatives to address this issue. For example, the Conference of New England Governors and Eastern Canadian Premiers which includes eleven jurisdictions and promotes cooperation among the two countries and collaboration with the private sector. The Conference has developed an action plan to address acid rain and a regional program to reduce sulphur dioxide emissions, both of which will assist in improving overall air quality by reducing levels of key pollutants.

In the end, the Standards are a political compromise; a balance between what is protective of human health and the environment and what could be mutually agreed upon by all jurisdictions when factoring in technical and economic considerations. Thus, while the collaborative approach was successful in fostering cooperation among jurisdictions and moving towards a more consultative and transparent policymaking process, the

resulting Standards are actually less stringent than what might have been achieved through a different process. For example, if the federal government had taken a more aggressive role and used The Canadian Environmental Protection Act to regulate particulate matter and ozone. An alternative approach, and one which is more of a middle ground, would be to have regionally-based standards. These may be easier to develop with fewer parties at the table, and neighbouring jurisdictions would have an incentive to find mutually beneficial approaches due to the transboundary nature of air pollution.

The Standards do provide, however, a firm starting point for commitments to reducing emissions, improving monitoring and data sharing, and continued research. It also provides for a consistent standard for particulate matter and ozone across the country; something that was lacking before the Standards were developed. Due to background levels and natural sources of particulate matter and ozone, levels will never reach zero. Thus, efforts to reduce controllable sources of emissions is critical. And although individual jurisdictions are not legally bound to comply with the Standards, the political and public fallout of not doing so would be significant. At an economic level, the Canada-Wide Standards for particulate matter and ozone will, hopefully, lead to better economies of scale. Besides the numerical targets, the Standards include mechanisms for research and data sharing and joint monitoring. This should result in a reduction in duplication and overlap across the country.

These limitations to the Standards were recognized by the parties involved. The Canada-Wide Standards for particulate matter and Ozone include a commitment for the end of 2010 to assess the need for revisions for target years beyond 2015. It also includes several recommendations for improvements to the standard, including adding the coarser

fraction of particulate matter₁₀, seasonal or annual average targets, and assessing the adequacy of the targets for the protection of vegetation, visibility impairment, or material damage. Thus, it acknowledges the need for future changes to the targets and continuous improvements to the commitments. Future assessment and revisions to the Standards will be needed to positively impact public health in Canada.

IMPACT ON DEMOCRATIC PROCESSES

The development of the Standards involved a high level of public input and consultation with industry, municipal governments, environment, health, and First Nations. In fact, there was general consensus among those interviewed in this study that the development of the Canada-Wide Standards for particulate matter and Ozone was a very inclusive process.

Under the collaborative approach, a variety of consultation mechanisms were employed to support consultation, including: advisory groups; various stakeholder workshops; posting of information on the Canadian Council of Ministers of the Environment website; and an electronic listserv to notify interested stakeholders of new information. A Core Advisory Group made up of industry, First Nations, and environment and health organizations was a key component in the development of the Standards. The Core Advisory Group met with the Joint Action Implementation Coordinating Committee at least twice a year, and was involved in the science workshops and review of the science and policy documents. The group worked in an advisory capacity (i.e., sat at the side of the negotiating table) and was able to make recommendations, however the Joint Action Implementation Coordinating Committee had authority for final decisions. There was, however, an expectation that the Joint

Action Implementation Coordinating Committee would need to explain any actions or decisions which went against the advice of the Core Advisory Committee. Additionally, as figure 2 demonstrates, the formal process for the development of the National Ambient Air Quality Objectives (or Canada-Wide Standards) for air pollutants includes public consultation mechanisms.

In terms of opportunities for open forums, numerous workshops and consultations were held throughout the development and implementation stage of the Canada-Wide Standards for particulate matter and Ozone. Stakeholder consultations were held in 1998 and 1999 as part of the development of the standard. Multi-stakeholder workshops were also held in 2002 and 2003 to consult on options to reduce emissions from residential woodburning appliances and requirements for continuous improvement and keeping clean areas clean. A multi-stakeholder workshop on options for the development of a Guidance Document for Keeping Clean Areas Clean and Continuous Improvement was held in March 2003. A variety of stakeholders from industry, government, and environmental and health groups attended and provided feedback on guiding principles and the development of implementation plans and monitoring and reporting (Arms Consulting Services 2003). A Smog Stakeholder Science Workshop was also held in Toronto in March 2005 to provide stakeholders with a progress report on the science basis of the Canada-Wide Standards for particulate matter and Ozone.

However, while it appears that the Standards process employed a strong level of open consultation, there remain some problems in terms of its level of transparency, accountability, and inclusiveness. First, air quality issues are very technical in nature, making it difficult for the average citizen (or even many nongovernment organizations) to

understand. This limits the level of participation by non-experts and reduces the transparency of the process. Second, participation in the development and implementation of the Standards has mainly been by health and environment organizations and there is an inherent assumption that such groups represent the interests of the general public. Moreover, discussion with a First Nations organization in British Columbia indicated that some organizations were unable to participate as fully as they would have liked due to financial constraints. Funding support by the federal and/or provincial/territorial governments would lead to more equity in the ability of groups to participate in events.

Since the Canada-Wide Standards are a public commitment (i.e., do not include formal enforcement mechanisms), it will be up to the constituency in each jurisdiction to hold officials accountable for achieving their commitments under the standards. As a national initiative, however, the Canada-Wide Standards for particulate matter and Ozone are not well known among the general public; thus, there is a need to increase public education and awareness at two levels. First, education and awareness in conjunction with incentive programs could be used to reduce levels of particulate matter and ozone coming from human activity. For example, incentives to use public transit and rebate programs for fuel-efficient or low-emission cars. Second, constituencies need to be aware of the national and political commitments under the Standards and put pressure on government to ensure these are met.

Finally, due to the complicated institutional structure governing air quality in Canada broadly, and the Canada-Wide Standards for particulate matter and Ozone in particular, it is difficult to ascertain accountability through this collaborative structure.

Action plans are being developed by the federal government and individual provinces and territories, resulting in a large number of new regulations and activities. Understanding how these are integrated, as well as which level of government to hold accountable is confusing. The added institutional complexity of having multiple agencies involved at each level of government (e.g., environment, health, transportation) adds to the problems of transparency and accountability. Several government representatives noted that it is difficult for them to understand the intricacies of the various agencies involved and how different policies and regulations connect; imagine how confusing it must be for the public.

IMPACT ON FEDERALISM

As indicated previously, the development and implementation of the Canada-Wide Standards for particulate matter and Ozone has mainly been a joint approach, based in coordinated and collaborative efforts. However, beyond this macro-governance structure, several issues became apparent with regards to the more practical aspects of intergovernmental relations.

At an operational level, within each jurisdiction there are a number of agencies involved in the implementation of the Standards, necessitating better integration and dialogue between these "silos" which are used to working within their individual parameters. Moreover, many of the priority issues facing environmental agencies are health related, so more crossover with the respective health agencies is critical. Taking a more hierarchical approach could result in worsening intergovernmental relations at a time when cooperation and coordination is critical. For example, for the most part there is a lack of consideration of the cumulative and/or competitive effects of regulations on

related air issues. (e.g., some pollution controls create other pollution problems). We need an integrated environmental management approach to improve efficiency and effectiveness, as well as to provide greater certainty for the industrial sector. Further, to improve the quality of information used to assess and evaluate air quality, we need to have more integrated monitoring and data collection across the country.

For the most part, the bulk of regulatory authority for air quality falls to the federal and provincial/territorial governments. Certainly with respect to the implementation of the Canada-Wide Standards for particulate matter and Ozone, municipalities do not have an institutionalized role to play through the Canadian Council of Ministers of the Environment process. However, in practice municipal governments do have authority to pass local by-laws which can assist in achieving the goals of the Standards and protect the environment and human health (e.g., anti-idling by-laws; incentives for public transit). With the exception of the Greater Vancouver Regional District which has been delegated regulatory authorities, municipalities are required to follow provincial guidelines and legislation. Bottom-up approaches like airshed planning in British Columbia offer opportunities for greater community involvement and consideration of air pollution into local planning processes (e.g., zoning). Thus, while municipalities have a key role to play in managing air quality in their regions and need to be more involved, funding by the federal and/or provincial/territorial governments is needed to support local activities.

At a purely theoretical level, the collaborative approach taken in the development of the Canada-Wide Standards for particulate matter and Ozone respects jurisdictional sovereignty. The underlying intent of the Harmonization Accord and the Canada-Wide

Standards is for responsibilities to lie with the jurisdiction best situated to undertake actions. While the federal government could step in under the authority of The Canadian Environmental Protection Act, it is unlikely that the federal government will take action as long as the provinces are achieving the set goals. While The Canadian Environmental Protection Act does offer an avenue for a federal regulatory “stick” to ensure the targets are met, the general tone of intergovernmental relations in this initiative suggests that it is better to have the provinces/territories as willing partners, working in a collaborative manner. As noted previously, it is also in the best interest of the provinces/territories to cooperate so as to ensure that they are involved in the decision-making processes, rather than having policy dictated from above.

The biggest problem of the collaborative approach, both in terms of the development of the Standards and implementation activities, is an inequity among jurisdictions with respect to staff and financial resources. The federal government has played a larger role in the Canada-Wide Standards, mainly because they have more staff, technical expertise, and resources to contribute. However, inequities between the provinces/territories have resulted in divergent abilities to participate in the research and development of the standards. Often, political commitments do not take into consideration the level of work and resources required to meet the obligations and, thus, some regions may have a more difficult time meeting their commitments under the standards.

Table 6: Summary: Effectiveness of the Canada-Wide Standards for Particulate Matter and Ozone

	Summary
Policy Effectiveness	
Health	<ul style="list-style-type: none"> • Canada-Wide Standards for particulate matter and Ozone were a political compromise; balancing health concerns with economic and technical feasibility. To ensure buy-in across the country, the targets were set at a lower level. • While better than the status quo, the Standards are not fully protective and will need to be updated at a later date to ensure further reductions and future health protection. • A stronger federal role may be required to ensure the revised Standards are more stringent. • Levels of particulate matter and ozone will never reach zero, due to background levels and natural sources (e.g., forest fires). The principles of “Continuous Improvement” and “Keeping Clean Areas Clean” are critical to ensure ongoing advancements in air quality levels. • Canada-Wide Standards for particulate matter and Ozone include mechanisms for research and data sharing and joint monitoring which will result in less duplication and overlap.
Economic	
Democracy	<ul style="list-style-type: none"> • Development of Canada-Wide Standards for particulate matter and Ozone included numerous mechanisms for consultation and stakeholder participation. • The technical nature of air issues presents an obstacle to understanding and involvement by some stakeholder groups and the general public. • Inequity in ability of some groups to participate due to financial constraints. • Public pressure will play a key role in ensuring the commitments are upheld

	Summary
	<p>since the Standards do not include formal enforcement mechanisms.</p> <ul style="list-style-type: none"> • Complexity of agencies involved and lack of integration between activities results in poor transparency and accountability.
Federalism	<ul style="list-style-type: none"> • Collaborative approach in the Canada-Wide Standards for particulate matter and Ozone respects jurisdictional sovereignty. • The transboundary nature of air pollution and the delegation of authorities under the Constitution necessitates coordinated actions between jurisdictions. • More vertical and horizontal linkages is needed as there are many agencies and levels of government involved in air management in Canada. • Municipalities have a key role to play and additional funding is needed to improve their involvement. • Some inequity in ability of jurisdictions to participate in the development of the Standards and meet their commitments (i.e., burden on “have-not” provinces).

CONCLUSION AND RECOMMENDATIONS

The transboundary nature of air pollution issues necessitates cooperation among jurisdictions, nationally and internationally. Activities cannot be dictated by political boundaries and the future of public health and the environment in Canada depends on interdependencies among the jurisdictions. Thus, due to the decentralized structure of air management in Canada, the provinces/territories have a strong role to play. This is unlikely to change due to the constitutional framework for this policy area and has resulted in both vertical and horizontal fragmentation. Due to this institutional structure, the development and implementation of the Canada-Wide Standards for particulate matter and Ozone has emphasized consultation, both among the jurisdictions and with the public. This is important as many reductions in levels of pollutants can be accomplished through actions at an individual level. Further, since the Canada-Wide Standards are not legally binding, the political commitments of each jurisdiction can be influenced through public pressure.

However, due to the need to have agreement from all jurisdictions, the Canada-Wide Standards for particulate matter and Ozone did result in sub-optimal targets. While a more aggressive federal role may have resulted in more stringent standards and better protection of public health, this may have been at the detriment of intergovernmental relations. Some level of cooperation and coordination is necessary, both vertically and horizontally, simply due to the nature of air policy as a policy issue. It is an area that does not respect political boundaries, one in which the constitutional division of powers is complex, and one that requires integrated policies between environment, health, and other agencies, both within and between jurisdictions.

Given the current political climate and focus on air policy in Canada, these circumstances may change. If a national Clean Air Act is passed, it will have significant impact on intergovernmental relations and the legislative authorities for managing impacts of air pollutants on the environment and public health. To reduce smog and improve air quality, we need to reduce levels of the various contributing pollutants. Canada needs a comprehensive approach that addresses all the precursors and integrates the various initiatives for related air issues, such as acid rain and climate change. Governments must seek to develop a comprehensive air management strategy that provides an integrated approach and more coordinated action among linked air issues. Linkages can be pursued between issues, across initiatives, and between jurisdictions.

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ENDNOTES

¹ The Canada-Wide Standards for Particulate Matter and Ozone provide for a consistent standard and emission reduction target across the country. The exception is the province of Quebec which did not sign the Harmonization Accord, under which the standards sub-agreement was established.

² Overall, the weight of evidence linking these pollutants to adverse human health effects is stronger in epidemiology studies than controlled human exposure due to the obvious ethical limitations of conducting controlled human exposure studies.

³ Other components of the Harmonization Accord include: Environmental Assessment Sub-agreement; Inspections and Enforcement Sub-agreement; A Statement of Principles on Monitoring and Reporting; and an Annex to the Accord on Public Accountability and Stakeholder Consultation.

⁴ Involvement by municipal governments appeared to be limited to mainly a few larger cities in Canada (e.g., Toronto and Vancouver).

⁵ There appeared to be limited involvement by First Nations. There was some indication from those interviewed that this was mainly due to limited resources of First Nations to attend the many meetings and workshops.

⁶ Details on the development and structure of the Canada-Wide Standards are available on the website of the Canadian Council of Ministers of the Environment at (http://www.ccme.ca/ourwork/environment.html?category_id=108). Accessed January 2006.

⁷ Canada indicated intent to join the agreement in 2006.

⁸ In New Brunswick, the *Clean Air Act* controls the type and amount of contaminants that are released into the air through a system of air quality approvals.

Through the *Air Quality Regulation*, conditions are attached to a facility's approval (or permit) specifying the conditions under which contaminants can be released and the amount that can enter the atmosphere.

⁹ For a full review of regulations related to air quality in British Columbia, refer to the Ministry of Water, Land, and Air Protection website at www.gov.bc.ca/air/airregs.html.

¹⁰ Under the Act, the Greater Vancouver Regional District has been delegated provincial powers for air quality management within its jurisdiction, including 21 cities and municipalities. In 1994, the Greater Vancouver Regional District developed the first regional Air Quality Management Plan in the province. Few local level governments have this authority in Canada; the Greater Vancouver Regional District and the City of Montreal are the largest and most well developed examples.

¹¹ The JIACC has now been disbanded.

¹² Information on the AirCare Program in British Columbia is available at www.aircare.ca.

¹³ The Green Municipal Funds are managed by the Federation of Canadian Municipalities at arms length from the federal government.