

Air Pollution Series

Actions on Air Quality in North America

Executive Summary



Context

In North America,¹ air pollution remains a serious health risk despite the large improvements in air quality that have been achieved by regulatory measures implemented under the Canadian Environmental Protection Act (CEPA) and the U.S. Clean Air Act (CAA). In addition, disparities in air pollution exposure by socioeconomic status persist and the burden of disease attributable to air pollution in North America is significant.

Actions on Air Quality in North America: Canadian and U.S. Policies and Programmes to Reduce Air Pollution provides a review of policy actions of Canada and the United States of America per the mandate provided by United Nations Environment Assembly (UNEA) resolution 3/8 on *Preventing and reducing air pollution to improve air quality globally*. This report builds on the United Nations Environment Programme (UNEP) report *Actions on Air Quality 2021*, which was recently released to provide an update on actions undertaken by countries around the world, focusing on a set of measures that, if adopted, would significantly improve air quality. The North American regional report documents more in-depth actions in key sectors as well as regional trends and priorities.

Status and trends

Both countries in the region have made great progress towards reducing air pollution through air quality management planning. Effective air quality management has occurred following decades of sustained effort due to the extraordinary level of technical and scientific information needed to establish effects-based standards, measure key pollutants, inventory sources and their emissions, develop and estimate costs for alternative control scenarios, and forecast and assess results. Underpinning these efforts are legislative and regulatory frameworks that mandate careful monitoring and establish accountability through airshed management approaches that result in continuous improvement and reduced exposure over time. Although Canada and the United States of America have different approaches to achieve these goals, both systems have resulted in a long-term reduction in emissions and exposure for their populations. (See Figures 1 and 2).

Despite this progress, more work is needed to reduce the negative health and environmental impacts of air pollution. Emissions of most major air pollutants have declined over decades, but progress is uneven for some pollutants and progress has been difficult to maintain as levels have been reduced overall. The increased frequency and severity of wildfires associated with



Pollution monitoring device
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climate change is also a major source of intermittent emissions in both countries, posing substantial management challenges. According to the most recently available data, approximately 3 out of 10 Canadians and Americans live in areas where one or more of their respective ambient air quality standards are not met.

Actions for cleaner air

This report provides an overview of the legislative and management structures that are in place in the North America region, along with a more detailed assessment of how those structures are implemented in each of five key sectors (industrial emissions, vehicles and transport, waste management, indoor air quality and agriculture), analysing how these programmes have evolved over time. These sectors were selected to align with the UNEP global report, providing insight into how each of these key sectors is being addressed in each region. The report also assesses progress since the last *Actions on Air Quality* report (2016) in North America by reviewing recent progress in each of the key sectors as well as integrated strategies that are not specific to any one sector. The information surveyed and assessed for this report has led to several key findings.

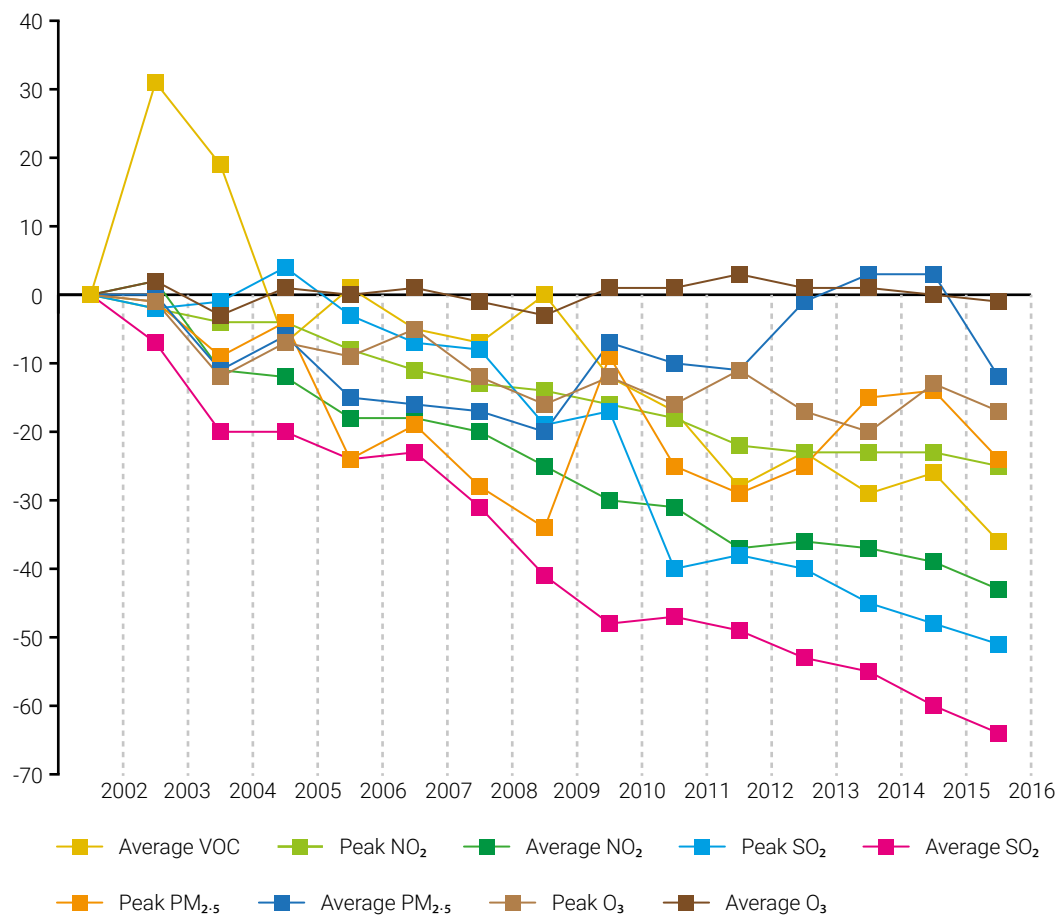
Key findings

Ambient air quality standards with widespread monitoring provide a foundational accountability framework for air quality management planning

Clear air quality standards (whether at the national, provincial/territorial or state levels) and widespread and routine air quality monitoring are crucial in understanding

¹ Throughout this report, the term "North America" is used to refer to the two countries of UNEP's North America region – Canada and the United States of America.

Figure 1. Trends in air pollution concentrations across populated regions of Canada between 2002 and 2016



Source: Environment and Climate Change Canada (2021)²

where air quality action is required. They can also, in part, address environmental inequalities, since addressing “non-attainment” conditions (when the standards are not met) is a key element of the environmental justice action agenda to reduce disproportionately high and adverse human health or environmental effects on minority and low-income populations, wherever they may be. (See Box 1 and Box 2). Declaration of non-attainment status triggers further interventions in those areas.

Air pollution does not respect political boundaries, giving rise to the need for regional cooperation

The combined contribution of many dispersed emission sources can be as important as – or sometimes more important than – the contribution of local emission sources for maintaining clean air. Thus, while it is crucial for any jurisdiction to understand and regulate emissions within its boundaries, it is also important to work collaboratively with neighbouring jurisdictions whose emissions may contribute to local non-attainment

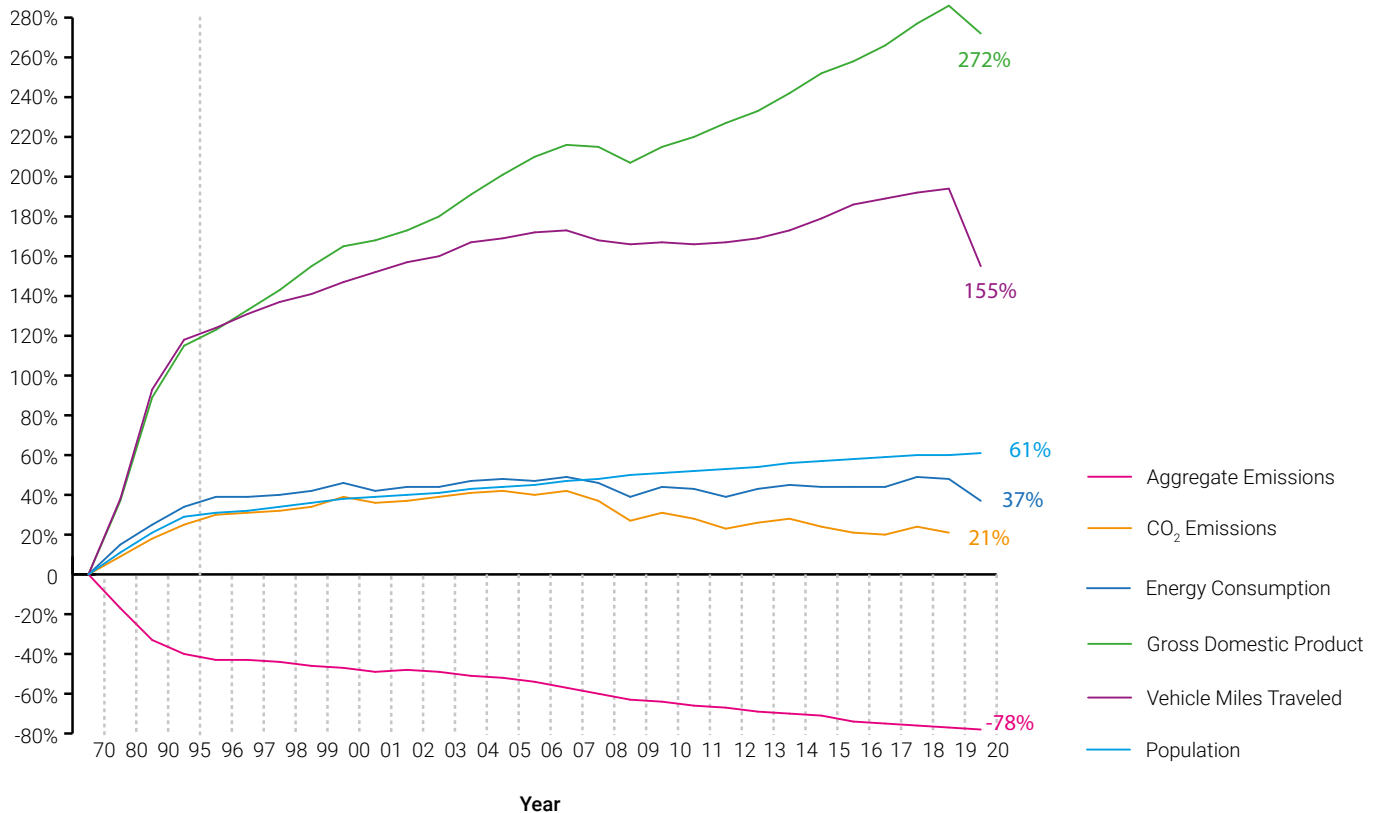
or whose non-attainment (downwind) may be in part attributable to local emissions.

Iterative review and refinement of air quality management programmes are critical to long-term progress and the equitable and effective improvement of air quality

Air quality monitoring must be continually used in conjunction with air quality modelling to track progress and identify whether programme goals are being achieved. If not, standards can then be strengthened, additional areas of non-attainment can be identified, and additional regulatory programmes can be developed where needed to ensure that the specific source categories or specific geographical areas reduce emissions necessary to achieving standards. In the North America region, this has included many specialized programmes to address specific issues that have been identified over time (such as acid rain, visibility, air toxics and marine emissions).

² <https://www.canada.ca/en/environment-climate-change/services/environmental-indicators/air-quality.html>. Accessed 18 November 2021

Figure 2. Comparison of growth areas and emissions in the United States between 1970 and 2020



Source: U.S. EPA (2021)³

Strong legal and regulatory frameworks make programmes resilient over time

The structure of air quality management frameworks in the North America region have provided sustained and long-term air pollution reductions despite the routine change in political administrations and governing philosophies. By embedding standards in legal instruments that require action when standards are not met, North American air quality planning has demonstrated significant resilience in the face of changing political parties or popular sentiment regarding environmental regulation.

Stakeholder engagement should focus on shared, reliable data and understanding of tools

Public processes should begin with agreement on the data and tools to be used for policy assessment. In order to build trust, ownership and a sense of shared responsibility, it is critical that citizens, cities, states/provinces and federal agencies ensure that their industry and public stakeholders buy into the assessment methods and processes. A process utilizing a multi-level governance approach will enable solutions that address air and climate pollution in both a horizontally (cross-

sectoral) and vertically (federal, state/provincial and local governments) integrated framework. It is essential that there be active engagement of federal and local officials as well as across ministries, affected industries and civil society organizations representing the public interest.

Air quality is one element of a larger sustainability framework

Both Canada and the United States of America have framed air quality as one element of larger efforts towards sustainability. The United Nations Sustainable Development Goals (SDGs) include many targets related to air quality, including air quality indicator 11.6.2 on population-weighted annual mean levels of fine particulate matter (PM_{2.5}). However, many of the other goals, targets and indicators relate to and depend on integrated planning efforts that can not only deliver improved air quality, but also mitigate climate change, improve public health, enhance resilience and preserve ecosystems. Integrated climate and air quality planning efforts should therefore place a special emphasis on reduction targets for both PM_{2.5} and greenhouse gases (GHGs).

³ National Air Quality: Status and Trends of Key Air Pollutants, Interactive Report – Our Nation's Air: Status and Trends through 2020. <https://www.epa.gov/air-trends>. Accessed 06 March 2021

Prioritizing short-lived climate pollutants, i.e. the black carbon component of PM_{2.5} and ground-level ozone (O₃) (to ensure that policies targeting health benefits skew towards those with additional climate benefits) along with the methane (CH₄)/short-lived hydrofluorocarbon (HFC) component of GHG emissions reductions (to ensure that climate policies skew towards those with additional health benefits through ground-level ozone formation and near-term climate stabilization, while remaining focused on long-term carbon dioxide (CO₂) targets) can protect public health and deliver multiple benefits simultaneously.

Conclusions

As highlighted by the key findings above, significant progress in achieving long-term emission reductions and progress towards cleaner air in the North America region can be attributed to several of the features of the Air Quality Management Planning Frameworks in place. These findings can thus also serve as a model for replication in other regions where air pollution is an urgent environmental, health and development challenge.

Box 1: Environmental justice in Canada

In Canada, general disparities in exposure to air pollution occur along various socioeconomic indicators and the observed patterns of disparity tend to be location-specific and reflect settlement patterns that are less consistent between cities. In Vancouver, indigenous populations had higher cumulative exposure burdens to several air pollutants, while in Montreal and Toronto the highest burdens were experienced by immigrants and low-income populations, respectively. Among children, those in lower-income areas were exposed to higher NO₂ concentrations in all three cities, while in Toronto and Vancouver, areas with more single-parent families had higher NO₂ as did areas in Montreal and Vancouver with higher percentages of visible minority children.

Relationships for PM_{2.5} were also different than those for NO₂, reflecting the spatial patterns in these pollutants and their interaction with population distributions. For example, unlike for NO₂, differences in PM_{2.5} exposure by socioeconomic status were not observed at the national level. However, within urban cores, residents of low-income households had somewhat higher PM_{2.5} exposures. On a national scale, immigrants (versus Canadian-born) and visible minorities (versus white populations) were consistently more highly exposed to PM_{2.5}, with elevated exposures for immigrants persisting even for those who had lived in Canada for 30 years.

These patterns persisted across all income levels. They were less pronounced or not present within cities and tend to reflect that such population groups preferentially live in large urban centres which in turn tend to be more highly polluted.

Outside urban areas, including in First Nations communities, residential woodsmoke is frequently an air quality concern and remote communities without access to the electrical grid can be affected by diesel generators, although a number of clean energy initiatives have been undertaken to reduce reliance on diesel power.

In Canada, the federal government has mechanisms in place to support environmental justice objectives. For example, the federal government is committed to using Gender-based Analysis Plus (GBA+). This analytical process is used by policymakers to examine the potential impacts (both intended and unintended) and opportunities of a policy, plan, programme or other initiative on diverse groups of people, taking into account gender and other identity factors (e.g. race, ethnicity, religion, age, and mental or physical disability).

The federal government has also called on its ministers to support these objectives. For example, the December 2019 mandate letter of the Minister of Environment and Climate Change outlined the federal government's commitment to using evidence-based decision-making that takes into consideration the impacts of policies on all Canadians. Likewise, the Prime Minister's January 2021 supplementary mandate letter directed that decisions made by the minister consider public policies through an intersectional lens in order to address systemic inequities including systemic racism, unconscious bias, gender-based discrimination, barriers for persons with disabilities, discrimination against lesbian, gay, bisexual, transgender, queer, two-spirited (LGBTQ2) communities, and inequities faced by all vulnerable populations.

The potential to address environmental justice issues through federal legislation is also increasingly being explored in various contexts in Canada. For example, a private member's bill was introduced in February 2020 and is currently being considered by Parliament. It would require the Minister of the Environment to develop and report on a national strategy to promote efforts across Canada to redress the harm caused by environmental racism.

Box 2: Environmental justice in the United States of America

Throughout the United States of America, lower-income, minority, and marginalized populations experience higher exposure levels and associated health effects. These communities often live near major air pollution sources, including industrial facilities, major roadways, and ports. As a result, these populations have been shown to experience more air pollution than they cause.

California has become the first state in the United States of America to formalize efforts aimed at addressing inequities in air pollution exposure at the community level, as research has revealed substantial differences in air pollution exposure among population subgroups in this state. Studies using CalEnviroScreen (<https://oehha.ca.gov/calenviroscreen>), an environmental justice screening tool developed specifically for California, have also revealed differences in cumulative pollution exposure burdens between population subgroups.

To address these inequities in air pollution exposure, in 2017 California established the Community Air Protection Program (CAPP), a state-wide air pollution programme focusing on reducing exposures in the communities most impacted by air pollution. The programme was created in response to California Assembly Bill 617 (A.B. 617) and builds on the California Air Resources Board's (CARB) earlier efforts to incorporate environmental justice into the state's existing air quality programmes. The CAPP is designed to reduce exposures in high-risk communities by:

- conducting community air monitoring and emissions reductions programmes;
- using targeted incentive funding and grants to deploy cleaner technologies that address localized air pollution;
- requiring accelerated retrofit of pollution controls on industrial sources (including increased penalty fees); and
- enhancing transparency and availability of air pollution and emissions data.

As the California programme is implemented and evaluated in the 10 (and soon more) selected communities, it is expected to serve as a model for other states experiencing large disparities in air pollution exposure.

New Jersey has taken a different approach to incorporating inequities into environmental management. In September 2020, the state passed a new law (S232) requiring the New Jersey Department of Environmental Protection (NJDEP) to only grant or renew permits for certain facilities if there are no disproportionate, cumulative environmental impacts on overburdened communities. "Overburdened communities" are defined as any Census Block Group with low-income, minority or non-English speaking populations exceeding specified thresholds. Approximately 310 municipalities in the state have overburdened communities within their municipalities.

Connecticut, Indiana, Minnesota and Oregon have also taken more limited steps to address disparities in air pollution exposure.

The administration of U.S. President Biden has committed to environmental justice as one of its top priorities. In January 2021, the Administration released Executive Order 14008 on Tackling the Climate Crisis at Home and Abroad, which directs federal agencies to integrate environmental justice into their programmes, policies and activities. It establishes both a White House Environmental Justice Interagency Council and a White House Environmental Justice Advisory Council and sets of a goal of delivering 40 per cent of the benefits of relevant federal investments to disadvantaged communities. It also initiates the development of a national-scale Climate and Environmental Justice Screening Tool, building from EPA's EJSCREEN tool (see <https://www.epa.gov/ejscreen>).

These state-level and federal actions represent significant advances towards environmental justice for marginalized communities in cities, in rural areas, and among tribal nations throughout the United States of America.



Renewable Energy
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