

Reducing Transportation GHG Emissions in Canada

A dialogue on a lower carbon future



FINAL REPORT
DECEMBER 2013

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The Public Policy Forum is an independent, not-for-profit organization dedicated to improving the quality of government in Canada through enhanced dialogue among the public, private and voluntary sectors. The Forum's members, drawn from business, federal, provincial and territorial governments, the voluntary sector and organized labour, share a belief that an efficient and effective public service is important in ensuring Canada's competitiveness abroad and quality of life at home.

Established in 1987, the Forum has earned a reputation as a trusted, nonpartisan facilitator, capable of bringing together a wide range of stakeholders in productive dialogue. Its research program provides a neutral base to inform collective decision making. By promoting information sharing and greater links between governments and other sectors, the Forum helps ensure public policy in our country is dynamic, coordinated and responsive to future challenges and opportunities.

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INTRODUCTION

A global transition to lower carbon economies is underway. The main driver is concern about increasing greenhouse gas emissions (GHGs) and effects on our climate. The environmental, social and economic implications of this challenge are immense and complex, necessitating new approaches to technology development, policy, planning, financing, governance and collaboration.

The transportation sector is a key contributor to GHGs in Canada and globally. Approximately 25% of GHGs in our country come from transportation, and the overall carbon emissions from the sector are not projected to decrease before 2020.¹ This suggests that concerted efforts to reduce Canadian emissions should include a focus on transportation if we are to achieve meaningful reductions. With Canada's commitment to reduce GHG emissions 17% below 2005 levels by 2020, exploring options for significant reductions becomes an imperative. Taking actions to reduce emissions in the short-term is necessary if Canada is to realize its longer-term goals; however, the implications of actions should be measured and considered to avoid unintended negative consequences.

Canada depends on transport. Our size, climate, economic structure and cultural history have fostered a significant reliance on personal vehicles. Our trading orientation also creates substantial demand for freight transport, both within our vast country and across the border with our most significant trading partner, the U.S. However, there is also a strong realization that reducing GHG emissions is critically important for the well-being of our population and environment, as well as our economic prosperity.² Due to these factors, Canada faces a particularly complex range of policy issues related to transportation GHG reductions, and the intricate interrelation of these challenges makes finding solutions all the more difficult.

At its core, the GHG challenge is not purely environmental, but also economic. And while often viewed as a cost, the challenge also presents an economic opportunity. Rather than viewing efforts to cut emissions just as an expense and a cost of doing business, there is growing realization that the need to reduce GHGs could produce economic benefits, as well as an opportunities for emerging low-carbon goods and services. The complexity of policy discussion relates directly to how these economic means can become an avenue for emissions reductions.

To explore this complex policy area, Canada's Public Policy Forum, in partnership with the Canadian Fuels Association, undertook a project to examine the potential for GHG reductions in Canada's transportation sector, with a focus on road transportation.

In June of 2013 the Forum launched *Reducing Transportation GHG Emissions in Canada: A Dialogue on a Lower Carbon Future*, which included three roundtable discussions examining key facets of this highly complex challenge: fuel switching and alternatives (Vancouver, June 11th, 2013); vehicle technology advancements (Toronto, September 10th, 2013); and infrastructure and municipal planning (Ottawa, September 17th, 2013). We convened leading experts from across the public, private, research and non-governmental sectors to explore the issues associated with reducing GHG emissions, and where potential areas of consensus exist for addressing some of the most difficult challenges. It is recognized that these discussions are the start of a policy dialogue, designed to bring together expert opinions. The intent is to inform leaders and decision-makers in their search for solutions. Reports from each of these roundtables summarized the discussions. This final report synthesizes the cross-cutting themes, and provides a précis of insights from some of Canada's leaders in this field.

We paid particular attention to the differing perspectives of stakeholders, and focused the dialogue on the most economically achievable and environmentally beneficial efforts. Though the challenge is significant, there was agreement that real gains can be made to reduce GHGs in Canada's transportation sector, and that collaborative and creative approaches are generating optimism. However, new partnerships are needed, requiring further open discussion about the issues. Our project launched this dialogue, but there remains much more work to be done.

COMMON FACTORS

Each roundtable session focused on a particular thematic element of the transportation GHG issue. These elements — fuel switching and alternatives, vehicle technology advancements, and infrastructure and municipal planning — are deeply interconnected in the discussion of how to lower transportation emissions. Several key factors relating to the development of new policy and practices were discussed in all three sessions:

- Complexity
- Partnerships and collaboration
- Policy integration
- Consumer issues

i. Complexity

Complexity is the undercurrent of the GHG challenge in Canada. This is particularly true in the transportation sector. This relates to both the corporate sector, but also the individual consumer. All levels of government are grappling with complexity; however, roles and responsibilities are not always clear regarding who should take action. Within the broader transportation sector, the challenges and solutions could reside within many different areas: fuels, vehicle technologies, modes of transport, urban infrastructure and land use planning, to name a few. Many of the potential solutions are closely related to consumer choice.

Increasingly complicated issues, and a lack of common understanding of them, is a significant barrier to making progress. If more cross-sector partnerships, better consumer understanding and more effective policy integration all require attention, then efforts to generate a common understanding of these complex issues must be undertaken.

With the range of diverse stakeholders in this policy area, there is an obvious need for enhanced coordination and information-sharing. Dialogue is an essential first step, such as was undertaken through this project. There are important areas, such as urban planning, where sharing information is critical due to the complex nature of potential GHG reduction opportunities.

There are also key practical considerations that need to be better understood. For example, to support advanced vehicle technology, such as electric and hybrid vehicles, infrastructure must be adapted to develop a network of

charging stations, and the distribution system will need significant upgrades and modernization. In order to make these infrastructure changes, municipal planning will likely need to adapt and change to accommodate different patterns of vehicle and electricity use. Similarly, to help facilitate switching to a lower-emission fuel, it must be cost competitive with conventional fuels, and readily available. This requires substantial changes to retail infrastructure.

Recent challenges encountered with these many interconnected issues to support technology uptake and fuel switching reaffirm the need for a full-system perspective. The best means to reduce GHGs is through a well-coordinated, comprehensive set of policy options that account for the many facets of transportation energy use, and which can help overcome the barriers and practical considerations which may otherwise limit opportunities.

ii. Partnerships and collaboration

Governments cannot be held solely responsible for achieving carbon emissions reductions. They can “set the table”, but the private sector must also assume leadership. Given the many differing voices, roles, and responsibilities, a partnership-based model is called for.

Governments are not the only players in many of the areas which most directly affect the carbon output of the transportation sector. Certain functions, such as infrastructure planning and development, now see increasing private sector participation. However, there is cause to go beyond the traditional model of public-private partnerships, and explore new arrangements that can facilitate substantial changes required. Indeed, the need to support new innovative approaches in cross-sector collaboration is viewed as critical to achieving emissions reductions. Given the public good provided by GHG reductions, it would be appropriate for governments to share some of the risks associated with such new approaches, through new forms of partnerships. For example, on the issue of fuel standards, collaboration with fuel producers is not just desirable, but essential to support lower-carbon alternatives. Similarly, transitioning to hybrid and electric plug-in vehicles will require not only substantial private infrastructure — such as charging facilities — but also considerable public investment in electricity production and distribution modernization.



Partnering throughout the policy development process is seen as key to future progress in this area, and successes should be noted and encouraged to raise awareness of effective approaches. Highlighting early successes in policy and partnership practices, and working to share these successes in other jurisdictions, may help support broader development and uptake of similar policies across the country. Partnership approaches should ideally extend beyond the government-private sector interface to include a range of sectors and communities, including the general public.

iii. Policy integration

While some progress is being made to reduce GHGs, there is growing support for a more comprehensive, integrated approach to public policy in this important area. To achieve meaningful reductions, policy will have to facilitate or mandate changes in practice that will result in real and significant emission reductions. A reconsideration of the current largely decentralized and fractured approach, and a move towards a more integrated model for policy development and implementation, is required for Canada to live up to its reduction commitments. Existing policies have seen limited success or attention, perhaps due to a single-issue focus on emissions. In reality, the complexity of the situation requires policies that integrate the GHG objective into a broader framework that includes transport, energy, infrastructure, and urban and land-use planning, with a view to achieving economic gains in addition to GHG reductions.

Policy integration must occur on several levels and in different ways. Municipal, provincial, federal and international alignment will be key in the achieving the necessary policy shifts, most prominently in regulation. Encouraging better stakeholder engagement throughout regulatory development, in an effort to craft smarter and more responsive regulatory frameworks, will likely reduce unintentional consequences. The earliest possible engagement on this issue was of noted importance.

A significant part of the challenge is the existence of fragmented, and therefore ineffective, regulations across different levels of government.³ On issues such as fuel standards, provincial and federal governments differ substantially. Some provinces, for example, have adopted

low carbon fuel standards, while others have supported increased use of biofuels. Both are important and potentially positive measures, but in isolation they are much less likely to be effective.

Similar gaps are seen in regulating the emissions of certain classes of vehicles, inspection regimes, and in carbon taxation. Mixed policy signals from different levels of government on fundamental questions — such as fuel standards, emissions regulation and fuel efficiency — not only hampers understanding of the objectives, but hinders the ability of leaders in the private sector to actually conform to prescribed regulations. Clearly, a degree of policy integration is required. International cooperation on essential standards, such as alignment of Canadian light vehicle fuel economy and emissions standards with the U.S., is viewed positively throughout the country — and perhaps serves as an indicator of the fact that policy harmonization is indeed possible in this complex sector.

One promising area of opportunity can be found in urban and transportation planning. The zoning, infrastructure and transportation services offered in urban centres affect 80% of the Canadian population, directly impacting on daily commuting and mobility. A well-considered review of urban planning and transportation issues could create substantial emission reductions by limiting the distance people need to travel in their daily lives.

The effectiveness of urban and transport planning integration includes benefits for the trade of goods. The movement of people *and* goods must be considered in the same discussion to create the necessary harmonization for facilitating transportation flow and reducing emissions associated with congestion. Freight emissions represent a significant percentage of on-road GHG output, and while personal transportation emissions are projected to decline by 2020, freight emissions are projected to grow by 11%.⁴ In this case, integration with international policy is critical, given that Canadian freight transport is inextricably linked with trade to the U.S. As such, the scope for policy dialogue on the freight issue should be North American, rather than strictly Canadian.⁵

Given strong support from roundtable participants on the need for developing and implementing new policy options, one of the most pressing concerns may be determining which level of government is best suited to play particular roles. A discussion of the different roles and responsibilities



of governments, and how they can combine their policy and regulatory tools to work more effectively together, is clearly needed.

iv. Consumer issues

The consumer is central to transportation GHG reductions. Efforts to reduce carbon emissions from the transportation sector must generate action through consumer choices, and such demands will dictate success or failure in reaching reduction objectives.

A challenge, but also a possible avenue of opportunity, is the nature of consumer preference. In most areas related to personal transportation, consumers have choices: the fuel they use, the technology their vehicle uses, the mode of transportation and infrastructure they prefer. This poses challenges, as the public tendency is often to opt for a larger and more powerful car, more easily accessible fuel, and faster, more efficient means of travelling to a destination. These choices often run counter to what would be of the greatest benefit for GHG reduction. While some regions are seeing trends towards smaller vehicles, North American consumer behaviour still tends towards the “more” approach.

However, consumer choice can be an effective means of lowering emissions, if the options are clearly articulated. For example, opting for public transportation is a choice. If the service is convenient, reliable, and high quality, consumers will be likely to support it and emissions will go down. If the technology of low or zero-emission personal vehicles improves in key areas, such as driving range and affordability, more customers may buy them. If increased fuel efficiency in a new vehicle model can be demonstrated, then consumers will be more likely to purchase such vehicles.

Governments should create a policy environment which supports the adoption of lower-emission transportation options for consumers, as well as for industry. While the “carrot and stick approach” to policy has been discussed at length, there is a sense that incentives offered by government do not result in significant emission reductions, particularly in the transportation sector, and therefore are ineffective if they are used in isolation. A carefully considered combination of ‘stick’ conditions, such as a carbon tax, user-based pricing of transportation infrastructure, and fuel standards,⁶ is suggested to be a more suitable and effective means for governments to affect consumer behavior. Ultimately, a comprehensive framework of policies is needed, incorporating appropriate carrot and stick approaches to effectively to address the larger carbon output challenge.

In the case of personal vehicle preference, costs (purchase, maintenance, operations) and consumer confidence are the key determinants. The objective should be to provide consumers with a variety of choices, and to make sure that the best available options feature lower emissions. However, there is no call for governments to mandate specific options.

OPPORTUNITIES

While the common factors affecting emissions in the transportation sector point to numerous challenges and needs for improved policy and practice, they also indicate areas of opportunity. Key areas of opportunity include:

- Innovation
- Governance
- Consumer knowledge

i. Innovation

There is strong potential to realize significant GHG reductions in Canadian transportation through targeted innovation support and investment. A key consideration is to support policies which target various the many different components of the sector. The Canadian automobile parts value chain provides an opportunity. While auto manufacturers are significant drivers of innovation, many emission-reducing innovations have actually been developed by parts suppliers. With a few world-class Canadian parts companies, roundtable participants suggested that efforts to support these firms in the pursuit of innovations to improve fuel economy and reduce emissions could see significant results. Adapting R&D support mechanisms to help encourage this will be necessary.

Similarly, targeted investment in infrastructure, particularly to create multi-modal options, can help reduce congestion-related emissions in urban centres, while leading to a more efficient and productive economy. Canada has seen several decades of underinvestment in transportation infrastructure, and a renewed focus is called for through large-scale, integrated investment strategies. The key challenge will be creating the necessary partnerships to develop funding in an era of fiscal restraint. Some of Canada's major urban regions are currently investigating this issue, such as the Greater Toronto Region's Transit Investment Strategy Advisory Panel.⁷

Innovative methods and approaches for reducing GHGs should be widely shared so that lessons can be considered for application in other situations. For example, the current adoption of hydrogen fuel cell buses in Vancouver is meant to test the effectiveness of this option in public transport.

If proven successful, and with proper investment, it may be more widely utilized in other urban centres.⁸ Electrification of train and bus networks and the continued proliferation of natural gas buses are also examples of a lower-carbon approach to public transportation being considered and implemented in municipalities across North America. For example, one in five buses sold in the United States operates on natural gas.⁹ In Canada, pilot tests of innovative and emissions-reducing approaches to liquefied natural gas and compressed natural gas transit buses are also underway. One example is BC transit pilot testing new technology on buses that combine natural gas with waste hydrogen, in efforts to achieve greater fuel efficiency.¹⁰ One of the key factors in determining such successes is consumer acceptance. Innovations with wider prospects for consumer adoption should be prioritized.

ii. Governance

Success in policy integration depends on a clear understanding of leadership roles and responsibilities. For example, transportation and urban planning integration will most often require a bottom-up leadership approach, privileging local leaders who better understand the needs and desires of members of communities who use transportation infrastructure and services. However, while the local level may lead, the provincial and federal levels of government must remain fully engaged in order to help fund, and, where appropriate and deemed necessary by stakeholders, to support pricing or tax schemes.

Governance models will need to adapt to partnership-based policy design and service delivery, particularly with increased roles for private sector leadership and public engagement. Moving in this direction will create an opportunity to reconsider the existing regulatory and policy process, to create a more inclusive and transparent policy structure. There are also prospects to reduce GHGs through more effective regulation. Key regulatory standards, such as progressively more stringent fuel economy requirements, and provisions which support advanced vehicle technologies, are options which governments may wish to consider.



iii. Consumer knowledge

Consumer choices will ultimately dictate the success or failure of efforts to reduce emissions from personal vehicles, hence the need to focus on improved knowledge-sharing. Fortunately, demographic change creates important opportunities to modify a broader cultural approach to transportation. Young Canadians, particularly those living in urban centres, are less likely to use a personal vehicle than previous generations. Efforts to market to this group, and to improve general awareness and knowledge of climate change issues, may help spur a cultural shift leading to more efficient personal vehicle use for generations to come. With appropriate focus on the preferences of an emerging generation to shape new lower-carbon alternatives for transportation, there is significant potential for long-term success.

Taking a customer-demand approach across a variety of areas — public transportation, personal vehicles, urban planning — has the potential help identify options which will reduce GHGs, while also appealing to individual consumer preferences.



CONCLUSION

The many connected issues which define the transportation GHG policy space — technology, infrastructure, integrated policy approaches, regulatory reform, partnerships — share a common need for multi-sector input in determining the best means of reducing emissions. In none of these areas is it appropriate or effective for a single actor — be it a government, a private company, a non-governmental organization, or the general public — to act in isolation. Reducing GHG emissions from the transportation sector will require a concerted and coordinated effort.

A call for collaboration does not absolve key stakeholders from taking leadership positions when best suited to do so. Local governments must lead integrated urban and transportation planning; the federal, provincial and territorial governments should lead on GHG emissions regulation and policy; and the private sector must lead on innovation. But there is a need for mutually reinforcing support from all stakeholders to help encourage collaborative action in this field.

The challenge of climate change is long-term; therefore the solutions must be enduring and sustainable. While some efforts are underway to regulate emission reductions, such as the Government of Canada's *Regulations Amending the Passenger Automobile and Light Truck Greenhouse Gas Emission Regulations*, more action is required, buttressed by much more discussion and collaboration. It's time to take significant steps toward understanding this challenge, creating a framework for partnerships leading to effective reforms.

The transportation sector is not the only contributor to Canadian carbon output. New projects, such as liquefied natural gas plants and continued natural resource development, will all contribute to increasing emissions, while simultaneously increasing demand for transportation to service these industries. Lowering GHG emissions from these areas will also be necessary.

This policy dialogue has endeavoured to create a vantage point on the complexity of the challenge and the key opportunities which may exist when different sectors work together. There is cause for optimism, so long as open and frank dialogue continues. The key to future discussions will be to reconsider the challenge not only as a GHG issue, but as a broader economic opportunity. By reducing GHG emissions, we will achieve both environmental and economic imperatives — and by aligning efforts with other key policy areas, we can realize efficiencies and productivity gains. Exploring these issues, and which governance structures can best accommodate a more comprehensive approach, are logical next steps.

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APPENDIX A

PARTICIPANTS

Vancouver Roundtable

June 11th, 2013

Moderated by:

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September 10th, 2013

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Ottawa Roundtable

September 17th, 2013

Moderated by:

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