CANADA'S PUBLIC POLICY FORUM
DES POLITIQUES PUBLIQUES DU CANADA

REDUCING TRANSPORTATION GHG EMISSIONS IN CANADA

A Dialogue on a Lower Carbon Future

REPORT ON THE TORONTO ROUNDTABLE, SEPTEMBER 10, 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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Background

Canada's Public Policy Forum has undertaken a project to examine the potential for greenhouse gas (GHG) emissions reductions in Canada's transportation sector, with a focus on road transportation. With the sponsorship of the Canadian Fuels Association, the Forum has launched *Reducing Transportation GHG Emissions in Canada: A Dialogue on a Lower Carbon Future.* This project includes a literature review of the issue and a series of dialogue sessions, each of which examine a specific element of the highly complex policy environment surrounding GHG emissions.

On September 10th, 2013, the Forum convened a roundtable discussion in Toronto to explore some of the challenges and opportunities related to advanced vehicle technologies and their ability to reduce GHG emissions. This session involved leaders and experts from across sectors, including industry, associations, academia, non-governmental organizations and the public sector.

Two expert contributors provided opening remarks. K.G. Duleep of H-D Systems provided his international expertise and perspective on low emissions technology development and deployment. Dennis DesRosiers of DesRosiers Automotive Consultants offered insight on the consumer dimension of vehicle technology development.

Discussions in these two areas generated a great deal of interest. The dialogue focused on understanding the challenges facing vehicle technology advancement on the GHG reduction front, and on the necessary leadership actions to address these barriers. Vehicle technology was recognized as having great potential to tangibly curtail GHG emissions. However, the path to such results is not without difficulties, and will require critical decisions and broad stakeholder input and acceptance.

Context

The continued increase in GHGs is a major concern given the associated environmental, social and economic impacts. The interaction of many factors which contribute to GHG emissions creates a very complex system, one for which no simple solutions exist.

Transportation is a leading contributor to Canadian and global GHGs. Approximately 25% of Canada's GHG output is related to this sector. This figure is even greater if certain fuel-production emissions are factored in. While this is in line with global averages for developed countries, it does suggest an opportunity for efforts to encourage reductions. However, transportation is also an intrinsic to the Canadian way of life. Canada is a large, cold country. We are also a major trading and exporting nation. Our ability to move people and goods safely and efficiently is essential to our standard of living.

Any efforts to decrease GHGs in the Canadian transportation sector must consider these complex relationships. Focus should be placed on using innovation to achieve the greatest most economically viable reductions. There is great potential to achieve this end, but it will require collaboration and leadership. New partnerships will be needed, requiring frank and open discussion about the issues. The purpose of this project is to provide a forum for such a dialogue.

Low Emissions Technology Development & Deployment

Presentation

The session began with remarks from Mr. K.G. Duleep, a Washington D.C.-based expert, who provided some international context around advanced vehicle technology development. His perspective is particularly relevant in light of the regulatory harmonization currently underway between Canada and the U.S. on fuel economy standards.

Canada and the U.S. have stated intentions to move ahead with new regulations which will reportedly require a 4.3 L/100 km (54.5 mpg) fleet-wide fuel economy rating by manufacturers by 2025. However, this figure is somewhat misleading. With multiplier factors acting as incentives for technology development, and other mechanisms within the proposed regulations, the effective standard is likely closer to 5.3 L/100 km (44 mpg).

Even at 5.3 L/100 km, this is a difficult standard to achieve, requiring a 50% improvement in fleet fuel economy over the 2010 baseline. There is good and bad news when it comes to manufacturers' ability to meet this standard. The good news: conventional vehicle technology is advancing so well in areas such as engine and transmission design that conventional technology can likely make a greater contribution to reaching the standard than previously thought. The mid-point standards set for 2020 could be achieved for about $1,000 per vehicle in conventional technology advancement.

The bad news: eventually, conventional technology will reach its limits. There is no way to know when this will occur, or how it will affect fuel economy. But it is likely that post-2020, fleets will need to include more hybrids and electric vehicles to meet the standards. However, the recent and continuing progress of conventional technology marginalizes the advantages of hybrids and electric vehicles in the current market, to the point where they are now stalled in their U.S. market penetration. Battery and fuel cell technologies are becoming more sophisticated and less expensive, but not at the rate some had predicted. This pushes out the potential dates for wider uptake and greater market penetration. In short, leading up to 2020, the standards look attainable; but post-2020, it is likely to be much more challenging.

Discussion

The dialogue on vehicle technology, particularly its ability to contribute to meeting new fuel economy standards, focused on Canada's strengths. It was noted that new materials and lightweight technologies can deliver real gains in conventional fuel economy, and that Canadian work in these fields is strong.

The complexity of the proposed fuel regulations was also discussed, with participants agreeing that there is no simple way to summarize them. While manipulations of the ratings (e.g. not using air conditioning systems) present a somewhat distorted picture, there was general agreement that the multiplier incentives in the regulations to support advanced vehicle technology are valuable. However, more work must be undertaken to support the infrastructure and innovation necessary to enable further technology advancements (e.g. plug-in stations for electric vehicles, fueling infrastructure for fuel cells).

The complexity of the manufacturing process and the sheer volume of production must be recognized and addressed. Manufacturers have made enormous investments in their plants, and it is usually more economically feasible to improve existing products rather than start anew. This advantage for conventional technology must be balanced with support that allows companies to develop new technologies, and that helps grow the necessary markets.

Human capital is another key factor. Engineering experience will be required across numerous disciplines (e.g. high-power electric motors, software engineering) to help facilitate continued technology advancement. Canada has world-class post-secondary educational institutions, but we don't excel at transferring research talent from our universities and colleges into innovative companies that commercialize products. Greater attention should be paid to this issue, not only for the sake of GHG emissions, but for national economic growth as well.

Another important point of discussion centered on auto parts suppliers. Vehicle manufacturers, it was noted, are becoming more like systems integrators, and a lot of the innovation related to fuel economy and emissions reductions actually happens at the supplier level. It was noted that 70% of technology on any new vehicle is from a supplier, as opposed to the final manufacturer. Canada has a limited number of top-tier parts suppliers, and greater focus could be placed on improving their innovation capacity. These suppliers make parts for companies all over the world. Improvements they make to decrease GHGs can have significant impact. Specific policy issues which may need to be addressed include the lack of federal R&D support for prototype tooling.

Canada's position in the global advanced technology market was noted to be largely that of a 'technology-taker' – but with an ability to make substantial contributions to overall advancement. Canada may, for example, be better suited as a market foothold for cleaner diesel technology than the U.S. However, in our efforts to support the technology advancements for which Canada is best suited, we should not sacrifice regulatory harmonization. Canada has an integrated vehicle market with the U.S., and participants agreed that we should have equivalent standards. A unique set of Canadian standards would increase costs and reduce competitiveness. Provincial incentive standards currently differ, but these will likely soon be phased out as funding expires and greater market uptake of new technologies negates the need for incentives.

Overall, it was agreed that, with regard to public policy in support of vehicle technology, Canada needs a much stronger focus on product-development relative to the heavier weighting towards research-focused approach. The basic research capacity in Canada is strong, but more attention must be paid to actually supporting the product development initiatives of manufacturers and suppliers in the marketplace. A systems approach, incorporating supplier and consumer perspectives, will support the areas that most need attention. Canada can be a competitive centre for product development if we can set aside what one international expert termed our "small country angst", and if we collaborate to achieve broader gains.

The Consumer Dimension

Presentation

Dennis DesRosiers opened the second half of the roundtable discussion with what he believes if the most important barrier to GHG reduction: consumer preference.

Canada has a relatively large number of personal vehicles on the road – in excess of 20 million. The technology in these vehicles has undergone substantial advancements in recent years, largely in response to changing social priorities. First were social concerns around safety. Governments mandated safety standards, and companies responded with safer cars. Next, the issue was air pollutants. Again, governments mandated change and the development of new technologies allowed the industry to create vehicles and fuels that produced significantly reduced pollutants. The challenges we are currently facing are fuel efficiency and GHG emissions.

Mr. DesRosiers expressed his confidence that the industry will meet the fuel efficiency challenge, and contribute to lower GHG emissions. While this may not be achieved according to the schedules and approaches set by government, the industry will nevertheless, over time, address them.

However, there is a complication with the fuel efficiency issue: consumer preference. Safety and air pollutants were dealt with largely out of view of the consumer, and never played a large role in affecting consumer demand. This is not the case with fuel efficiency, which involves the consumer to a much greater degree. The issue of consumer acceptance will likely be an even bigger challenge for GHG emissions reductions than actual technology development. Regulations are focused primarily on auto manufacturers, but it is likely that consumers will be the real drivers of change.

North Americans want more. In the case of cars and trucks, they want bigger, more powerful vehicles. A casual survey of roundtable participants by Mr. DesRosiers demonstrated how people tend to opt for more (e.g. power and features) when given a choice. When consumer preferences are combined with the fact that the proposed new regulations require a rapid acceleration of the rate of improvement in fuel economy, it is more than likely that the aggressive new standard will not be achieved. The market uptake of new technologies which could help reduce GHG emissions provides ample demonstration. Hybrids have now been on the market in Canada for 14 years, with substantial incentives, and yet have only recently reached 100,000 sales over this period.

The auto sector is relatively risk-averse to new technology. Given the volumes at which they must produce, and the investment required to adapt their processes, introducing any new technology means overcoming considerable inertia. The key is not regulations, but consumer demand. Public policy should focus on the market-element of the fuel efficiency issue.

Policy in this area must be carefully developed. Existing approaches, such as incentives and "fee-bates", have proven ineffective. "Stick" approaches to regulations (e.g. carbon taxes) are more likely to affect desired change, but are politically unpopular. Whatever path policy-makers choose, they must recognize two facts: automakers will adapt to meet this challenge, as they have before; and doing so will require changes in consumer behavior, which may take longer than anticipated.

Discussion

Participants agreed that the consumer dimension is essential. The impacts of visible vs. invisible technologies (i.e. those a consumer sees/knows about and those they don't) were raised throughout the dialogue. Some participants argued that efforts must be made to raise awareness, through education and other efforts, of the technologies which facilitate fuel economy and reduce emissions, so that they become more 'visible' in consumers' minds.

Awareness should also be raised regarding the consumer advantages of advanced technologies. For example, charging electric vehicles at home at night is cost effective and, in some provinces, draws from clean power grids. For consumers worried about a lack of public charging stations, better communication about the practicalities of electric technology may be necessary. It was also acknowledged that electric vehicles, at present, are not as good as they could be in areas such as driving range and battery cost. However, emphasis must be placed on product development, and continuous consumer engagement, in order to help this technology mature. As one expert noted "all roads lead to electric" – but it may be long journey.

Roundtable discussants underlined the importance of seeing both dimensions of the consumer: the individual purchasing a car and the citizen concerned about GHG emissions. Better linking these two dimensions may be important, and key actors in the vehicle purchase transaction, such as dealers, are critically important.

We should not underestimate consumers' ability to adjust. The average car in France is smaller than that in China, and even luxury cars now regularly incorporate the latest fuel-saving mechanisms. Consumers do learn and adapt, even if history is not a perfect guide as to precisely how they will respond. With this in mind, the ambitious fuel economy gains required under the proposed regulations may not be fully attainable, but there is cause for some optimism that progress will be made.

To help develop this market, the toolkit of policy options under consideration is diverse. Specific issues, such as taxation, require broader discussion and careful consideration. Other levers, such as carefully crafted social marketing, might also be successful in supporting vehicles which help reduce GHG emissions. All participants agreed that what Canadians do not want is a market where regulators dictate consumer choice.

Conclusion

General agreement among roundtable participants was reached that Canada needs more targeted support aimed at product development and automotive supplier innovation. A greater degree of cross-sector collaboration will be needed to reach this state, but it is achievable. Particular attention must be paid to training and retaining the top engineering talent in Canada to help facilitate this shift.

The proposed new fuel economy regulations for 2017-2025 will emphasize vehicle technology advancements. But in order to see the desired gains in fuel economy and GHG emissions reduction, consumer preferences cannot be ignored. Efforts to make fuel economy an integral part of the consumer equation are vital, and specific policy approaches (sticks, not carrots) are worthy of more thorough discussion.

Generally, there was cautious optimism about how Canada fits into the equation of vehicle technology advancement in support of GHG reductions. We are an acknowledged technology-taker; however, Canada has avenues to contribute to necessary improvements. Our focus should be on how Canada – our parts suppliers, researchers, product developers, students and highly qualified personnel – can make meaningful contributions.

Appendix A: Session Agenda

Reducing Transportation GHG Emissions in Canada
A Dialogue on a Lower Carbon Future

Toronto Session: Vehicle Technology

September 10th, 08:00 – 12:30
The University Club of Toronto
380 University Avenue ~ Toronto ~ Ontario

8:00 a.m. **Session Begins**
Coffee and light refreshments available

8:10 a.m. **Welcoming Remarks**
David Mitchell, President & CEO, Canada's Public Policy Forum
- Overview of the meeting objectives and proceedings

8:20 a.m. **Contextual Introduction**
Jill Baker, Vice President, Canada's Public Policy Forum
- Project overview noting the complex relationships which affect Canada's transportation GHG emissions profile (fuels, vehicle technology, economy, and consumer behavior) and implications to cost-effective emissions reductions
- Overview of Canada/US integrated market and regulatory harmonization context for vehicle emissions reductions (i.e. 2017-2025).

8:30 a.m. **Presentation: Low Emissions Technology Development & Deployment**
K.G. Duleep, President, H-D Systems

8:45 a.m. **Q&A and Moderated Discussion**
- In Canada, what are the key technology development and deployment challenges associated with the 2017-2025 Canada/US regulatory requirements for vehicle emissions?
- What are the high potential emission reduction technologies? What are the implications for energy sources, fueling infrastructure, etc.?
- What is a realistic pace for the deployment of lower emissions technologies? Are the 2017-2025 requirements currently achievable? How can public policy respond to uncertainties surrounding the 2017-2025 requirements?

10:15 a.m. **Health Break**

10:30 a.m. **Presentation: The Consumer Dimension**
Dennis DesRosiers, President, DesRosiers Automotive Consultants

10:45 a.m. **Q&A and Moderated Discussion**
- What challenges do consumer preferences and behavior present for market penetration of lower emission vehicle technologies and vehicles?
- From a consumer perspective, what are the most compelling opportunities and most significant impediments to achieving the 2017-2025 regulatory requirements for vehicle emissions?
- What are the implications for Canada, in a competitive and integrated NA vehicle market place in which Canada is only a small portion? What are the implications for the public policy?

12:15 p.m. **Concluding Comments and Thanks**

12:30 p.m. **Meeting Adjourns**

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Appendix B: List of Participants

David Adams
President
Global Automakers of Canada

Jill Baker
Vice President
Public Policy Forum

Peter Boag
President and Chief Executive Officer
Canadian Fuels Association

Eric Bristow
Director
Canadian Fuels Association

Mark Cauchi
Director, Transportation Division
Environment Canada

Cara Clairman
President and Chief Executive Officer
Plug n Drive

Ryan Conway
Project Lead
Public Policy Forum

Ken Delaney
Partner
Prism Economics

Dennis DesRosiers
President
DesRosiers Automotive Consultants

K.G. Duleep
President
H-D Systems, Inc

Deborah Elson
Vice President of Membership, Stakeholder Relations and Industry Promotions
Canadian Renewable Fuels Association

Judy Fairburn
Executive Advisor
Cenovus

Peter Frise
Scientific Director and Chief Executive Officer
AUTO 21

Kathryn Grond
Technical and Policy Analyst, Transportation
Pembina Institute

Chris Hill
President and Chief Executive Officer
Electric Mobility Canada

Mark Kozdras
Program Manager, Materials for Energy and Use, CanmetMATERIALS
Natural Resources Canada

Gord Lambert
Executive Advisor Sustainability and Innovation
Suncor Energy Inc

David Mitchell
President and Chief Executive Officer
Public Policy Forum

Bob Oliver
President and Chief Executive Officer
Pollution Probe

Ben Sharpe
Senior Researcher & Canada Lead
International Council on Clean Transportation

Samantha Stuart
Senior Advisor, Strategic Planning
Cenovus

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