

Economics and Environmental Policy Research Network

Research Symposium

February 27th – 28th, 2020

Session Notes for Parallel Session #5: Advancing Low Carbon Mobility Solutions

1. State of Existing Research and Discussion Context

This session examined the future of the Canadian transportation sector and the role that electric vehicles and other new technologies will play in reducing greenhouse gas emissions.

Key themes discussed in the session include:

Carbon Emissions Reductions

- **The Paris Agreement and Greenhouse Gas Targets:** The transportation sector is the second largest contributor of greenhouse gas emissions in Canada after the oil and gas sector, accounting for approximately 25% of all Canadian emissions. Transportation is heavily relied upon in Canada due to relatively low population density and a large geographic area. Communities rely on various modes of transportation to move both people and goods (e.g. many northern and remote communities rely upon air travel).
 - **Context:**
 - Canada has committed to an overall 19% emissions reduction below 2005 levels by the year 2030, but with current policies will only see a reduction of 13%. Additionally, due to the long lifespan of carbon dioxide in the atmosphere, there is a certain quantity of carbon “lock in” that leads to a time lag when it comes to seeing emissions reductions.
 - Canada has seen a slight rise in the purchase of electric vehicles, however better public transportation options, more electric vehicle charging infrastructure, lower battery costs, incentives like subsidies, and higher fuel prices will further incentivize people to reduce their carbon emissions.

Technology

- **Urban mobility revolution:** Over the past few years Canada has seen a transportation revolution consisting of ride-sharing programs, autonomous vehicles, and electric vehicles.
 - **Challenge or Opportunity:** Ride-share services (such as Uber and Lyft) can either be competition to public transit (ride hailing, car sharing) or can be integrated with public transit (on-demand services, connected autonomous shared and electric shuttles).
 - **Challenge or Opportunity:** To reduce carbon emissions, stakeholders (automobile companies, transit agencies, governments, mobility service providers, etc.) will need to work together.
- **Internal Combustion Engine vs. Battery Electric Vehicle paradigm:** The costs for battery electric vehicles are rapidly decreasing, and within the next few years they are expected to become cheaper than internal combustion engine vehicles.
 - **Opportunity:** Canadian automobile companies have the opportunity to grow in this market.

- **Challenge:** The usage of battery electric vehicles for public transit could be costly as it may involve having two electric vehicles to replace every diesel bus, allowing one to charge while the other is in use and vice-versa.

Governance

- **Federal implications:** There is a need for federal-provincial collaboration so that Canada is prepared if/when the Internal Combustion Engine sector sees an economic decline.
 - **Challenge:** The federal government also faces unique challenges, as they are the ones signing international agreements (such as the Paris Agreement) yet have no jurisdiction over municipalities and their transportation policies (e.g. urban densification, road tolls).
- **Provincial policy variances:** Canadian provinces have different policies and will likely see different futures regarding the shift to greener technology options.
 - **Challenges:**
 - Alberta will face challenges to energy transitions due to their economic and political reliance on fossil fuels.
 - Ontario could also be better prepared as part of their economy depends on the production of internal combustion engines.
 - There may be further issues with electric vehicles in certain provinces as electricity is generated by different means across Canada. There are currently no transit electrification strategies other than by Hydro-Québec, and if utility companies are not engaged with early on, then electric bus fleets (for example) may have to pay peak demand charges.
 - **Opportunities:**
 - Québec, on the other hand, has been investing in hydroelectricity since the 1970s and half of the electric vehicle purchases in Canada are from Québec.
 - Canada can also look at different American state policies for ideas. For example, although Texas has no greenhouse gas reduction plan, they do recognize the importance of greenhouse gas reductions from an economic development standpoint. Meanwhile, some other states – such as Oregon, Maryland, and Maine – have goals to be carbon neutral by 2045 by using forests and soils and carbon sinks.

Impacts on Society

- **Equity:** In order to properly electrify the transportation sector and reduce greenhouse gas emissions, we will need to ensure that nobody is left behind. This can involve subsidies to help those who cannot necessarily afford electric vehicles.
- **Gender gap:** Studies show that women tend to be less interested in plug-in electric vehicles yet play a key role in the purchasing process. The gender gap (which includes gender income inequality) plays a large role in the selection of vehicles to purchase. Additionally, because women tend to make multiple stops, their mileage is less predictable which can have implications on their ability to charge an electric vehicle. Issues such as the gender gap can therefore play an important role when it comes to regulatory questions.
- **Value of time:** Researchers will need to pay attention to the value of time. Shared vehicles and public transit can add time to rides as these mobility systems make multiple stops to pick up passengers. Time can therefore play a huge role when it comes to the decision on transportation modes.

2. Research Questions Identified

- **How would a fundamental change in our mobility systems impact (different regions in) Canada? Would mobility system changes contribute to positive economic development in Canada? Are the resulting employment opportunities inside or outside of Canada?**
- **Will the urban mobility revolution in fact reduce carbon emissions? Will it integrate with public transit? Will it contribute to reaching climate targets?**
- **Who is involved in electromobility experiments? Will these experiments lead to a fundamental change towards mobility as a service? Will the transition contribute to positive economic development in Canada?**
- **How quickly should we try to reach the Paris Agreement targets? What is the right combination of “carrots” and “sticks”?**
- **On which modes of transit should we focus our emission reduction targets? Should there be a focus on public transit rather than private vehicles?**
- **How much do we rely on cross-sectoral measures over sector-specific measures?**
- **What are the social equity impacts of cross-sectoral measures?**
- **Can we realistically go ‘fully’ electric with our transportation? What will happen when we get past the stage of early electric vehicle adopters?**
- **How can we think about customers from a regulatory perspective? E.g. customers tend to make emotional decisions, can have loyalty to brands, may not see the value of fixing an old vehicle, etc.**
- **How will automation and ride-sourcing services change travel, and what policies may be needed to ensure that these do not trigger significant increases in solo trip (or empty) vehicle travel?**