Many Miles to Paris: A Sectoral Innovation System Analysis of the Transport Sector in Canada in Light of the Paris Agreement

DEMAND

Road
Increasing demand and increasing emissions. 80% of total transportation emissions.

Rail
Slight increase in demand. Approximately 6% of total emissions.

Water
Important increase of container transportation in international freight transportation. The rest of the sub-sector is stable. Around 5% of emissions.

Air
Rapid increase of demand in recent years, also reflected on the increased fuel consumption. Approximately 4% of total transport emissions.

ACTORS & NETWORKS

Transportation Carriers
Urban transportation networks as well as numerous public and private companies operating in every sub-sector (road, rail etc.)

Petroleum Companies & Vehicle Manufacturers
PETROLEUM: Suncor Energy and Canadian Natural Resources (Canadian), Chevron and Exxon Mobil (American)
Vehicles: GM, Toyota, Bombardier

Universities & Research Institutes
- Transportation Research Institute of the University of Toronto
- University of Concordia, Quebec

KNOWLEDGE, LEARNING PROCESSES AND TECHNOLOGIES

Knowledge Flow: The processes are enhanced and improved and then used by the actors of the transportation sector

INSTITUTIONS

National Legislation
PCF Transport Measures
The Pan-Canadian Framework for Clean Growth and Climate Change (PCF) measures for transport are separated in 4 pillars:
- Stricter standards and increased energy efficiency
- Increased penetration of zero-emission vehicles
- Investment on public transit and infrastructure
- Cleaner fuels

GHGPPA
Greenhouse Gas Pollution Pricing Act (GHGPPA) (late 2018):
- Established charge rated for fuel use dependent on the emissions of each fuel type
- In force in: Ontario, New Brunswick, Manitoba, Saskatchewan and Alberta; and Yukon and Nunavut
- It affects the whole supply chain of fossil fuels such as fuel distributors, fuel producers and specific road, rail, marine and air carriers

Transportation 2030
Aiming to transform Canada’s transportation system into a more efficient, safer and greener sector by 2030.
Only in 2017 more than half a billion dollars were invested in electric vehicles and alternative fuels, on GHG regulation development as well as on the support of Clean Energy and Clean Transportation Innovation Programming.

Province Legislation
- Quebec and Alberta: Own carbon pricing regulations
- Ontario and Saskatchewan: Although having their own carbon pricing schemes, they have opposed to the federal GHGPPA

CUTA, TAC, RAC, ATAC, FMA
PETROLEUM: Suncor Energy and Canadian Natural Resources (Canadian), Chevron and Exxon Mobil (American)
Vehicles: GM, Toyota, Bombardier

94% of newly registered cars use petrol, 4% use diesel and the remaining 2% are hybrids and EVs.
4-8% of biofuels mixed with fossil fuels.
All other transportation means are also dominated by fossil fuels.

Innovations: Electrification Biofuels Hydrogen

Provincial and federal governments have started to provide incentives for EV purchases.
Electric mobility for trucks, ships and planes has also been examined on a research level.
Canada has the largest biomass reserves per capita, and 7% of the world’s potential biomass production; hence biofuel penetration increase is also examined.
Important research activity in hydrogen exploitation in the transportation sector. Many stakeholders such as hydrogen producers and car manufacturers.