

Climate Change, Energy and Net Zero: A Canadian Perspective

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Project team members

- Co-authors
 - Charles Lin, Retired atmospheric scientist (U of T, McGill, ECCC)
 - James Lin, PhD in energy economics (University of Alberta Alumni)
- Acknowledgement
 - Stephen Phoon, sustainability expertise (formerly of Mitsubishi Electric)
- Project refined when Charles was a 2019 Fellow of the Advanced Leadership Initiative (ALI) of Harvard University

Introduction

- Net zero is a scientific concept
 - But its realization goes beyond science
- 83%: Percentage of Canadians who are “extremely, very, or quite concerned about climate change”, Abacus Data 2019 survey
- 2050: Trudeau government committed Canada to reach Net Zero
 - Canadian Institute for Climate Choices
 - Generation Energy
 - Low Carbon Cities Canada (LC3)

Individual actions

- Example: Going car-less
 - Charles and family have not owned a car since 1991 (Paris, France; Montreal, Toronto)
 - Raised 3 children
 - Today's language: A lifestyle choice to reduce individual carbon footprint
- Scale up to impact on GHG emissions (tonnes CO2 equivalent)
 - 2: GHG emission reduction from living car free by one citizen for one year⁽¹⁾
 - 5 million: GHG emission from personal vehicles in Toronto in 2016⁽²⁾
 - 32 million: GHG emission from cars, light trucks and motorcycles in Ontario in 2016⁽²⁾
 - 143 million: GHG emission from road transportation in Canada in 2016⁽²⁾
- Policy actions are needed: carrots and sticks
 - Example: Carbon tax
 - 2018 Ontario EV sales declined when Doug Ford reduced incentives for their purchase

(1) Wynes and Nicholas, Environ. Res. Lett. 2017

(2) National Inventory Report 1990-2016, ECCC

Energy sector: Fossil fuels (coal, oil, gas)

- 85%: World primary energy consumed in 2018 derived from fossil fuels⁽¹⁾
- 85%: Canada's primary energy produced in 2016 in fossil fuels⁽²⁾
 - 6th: Canada's rank in primary energy producing countries in 2015⁽²⁾
 - 22%: Energy trade as a fraction of Canada's total goods exports⁽²⁾
- Fossil fuel sector and net zero
 - International: BP, Shell and Total announced "ambition" to reach net zero by 2050
 - Canada oil sands producers
 - Cenovus: targeting net zero by 2050
 - Suncor: no formal net zero targets, aim to reduce emission intensity
 - Canadian Natural: long term aspirational goal to reach net zero
- Precise pathways to reach net zero are not yet well defined
 - Technology such as carbon capture and storage (CCS)
 - Policy instruments such as carbon pricing and trading

(1) BP Stat. Rev. World Energy 2019

(2) NRCan Energy Factbook 2018-19

Financial sector: ESG driver

- ESG (Environmental, Social, Governance) considerations
 - Emerging driver in investment in corporations and business
- Blackrock, Largest asset management company in the world (US\$7T)
 - CEO Larry Fink (2020) letter to CEOs: “Climate risk is investment risk ... Every government, company, and shareholder must confront climate change.”
- Mark Carney, former Governor, Bank of England
 - Led an open letter on climate-related financial risks (2019)
 - On transition to net zero by 2050: “This requires a massive reallocation of capital. If some companies and industries fail to adjust to this new world, they will fail to exist.”

For Canada to reach Net Zero by 2050

- Government leadership
 - Transitions away from the current regime of heavy fossil fuel use, in transportation, industrial, and agriculture sectors
 - Magnitude of the transitions and their impact on society are unprecedented
 - Transitions would only happen with government intervention
- Engagement of fossil fuel industry
 - Determine pathways to reach Net Zero
- Scale up individual actions to city level
 - Cities are developing urban climate solutions

Project mission

- Gaps
 - Public is not aware of magnitude of task to reach Net Zero
 - Constructive engagement of fossil fuel industry is essential
- I have assembled a team (James, Stephen), working part-time
- Project mission
 - To widen/advance pathways for Canada to reach Net Zero by 2050
 - Harvest the power of collective actions of informed citizens through cities
 - Create opportunities to synergize corporate ambition and public actions

Thank you. Questions?

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