A Compendium of Canadian Provincial Climate Change Mitigation Actions

Moe S. Esfahlani[1,2], esfahlani@ucalgary.ca

David B. Layzell[1], dlayzell@ucalgary.ca

[1] Canadian Energy Systems Analysis Research (CESAR) Initiative, Faculty of Science & [2]Department of Communication, Media and Film, University of Calgary.

INTRODUCTION

In the 2015 Paris Climate Agreement [1], Canada committed to reduce greenhouse gas (GHG) emissions to 30% below 2005 levels by 2030, and to do its share to keep global warming below 2°C by 2050 (*ca.* -80% of 2005 GHGs). The **Pan Canadian Framework** [2] recognizes the important role of provinces in defining and implementing the strategies to achieve these targets.

With support from the National Energy Board, CESAR engaged with all 10 provincial governments and drew on their published reports to summarize mitigation measures associated with each of the 7 economic 'sectors' that are being studied in the CESAR Pathways Project.

The preliminary findings from this exercise are being used by CESAR to inform technology and behaviour-rich scenario models that define Pathways to more sustainable energy systems.

METHODS

Using the research process summarized in **Figure 1**, we:

- Consulted with **33** policy makers on the climate change file across Canada's 10 provinces [3];
- Compiled more than **50** key documents describing provincial or federal policies, programs or regulations [4];
- Extracted more than **330** references from the literature [5];
- Assessed and extracted climate change measures being considered or already implemented;
- Developed metrics to quantify the measures in terms of:
  - ***Engagement:*** *Score / (Score + Blank Count)*

This reflects the engagement of each mitigation measure by provinces.

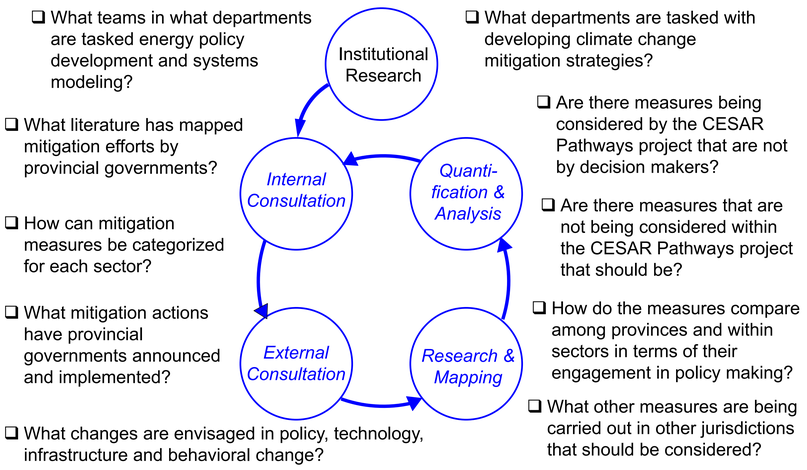

Figure 1. Research Process and Questions

RESULTS

Sector	Mitigation Measures	Engage-ment	BC	AB	SK	MB	ON	QC	NB	NL	NS	PEI
Personal Mobility (174 pt)	Renewable Fuel Standards	80%										
	Public Transit Infrastructure	76%										
	Vehicle Efficiency	76%										
	Electric Vehicle Infrastructure	64%										
	Carbon Tax	52%										
	Electric Vehicle Incentives	47%										
	Car Sharing	29%										
	Autonomous Vehicles	16%										
	Transportation as a Service (TaaS)	0%										
Supply Chains (203 pt)	Interprovincial Partnerships	91%										
	Renewable Fuel Standards	77%										
	Infrastructure Investment	68%										
	Multi-modal	63%										
	Vehicle Efficiency	62%										
	Intelligent Transport	61%										
	Carbon Tax	48%										
	CNG	38%										
	Mode-shift	32%										
	Electric or Fuel Cell Vehicles	0%										
Built Spaces (302 pt)	Community Energy Resources	90%										
	Energy Performance Standards	89%										
	Energy Efficiency	88%										
	Walkability	88%										
	Municipal Emission Management	76%										
	Appliance Efficiency	74%										
	Efficient Infrastructure	65%										
	Home Retrofit	63%										
	Indigenous Initiatives	56%										
	Urban Densification (through TaaS)	0%										
Energy Using Industries (225 pt)	GHG Reporting	87%										
	Efficiency & Electrification	78%										
	Innovative Technology	73%										
	Fuel Switch (Low Carbon)	70%										
	Carbon Tax	53%										
	Cap and Trade	53%										
	Renewable Energy Incentive	48%										
	GHG Limits & Targets	39%										
	Carbon Capture and Storage	38%										
Biosectors (239 pt)	Forest/Wetland/Agroforestry	88%										
	Waste Management	84%										
	Biomass/Biofuel/Cogen	73%										
	Manure Management	74%										
	Nutrient Management	70%										
	Carbon Offset Trade	67%										
	Agricultural & Range Management	49%										
	Carbon Sequestration	45%										
Power Generation (245 pt)	Interprovincial Transmission	94%										
	Renewable Targets & Subsidies	92%										
	Demand-Side Management	79%										
	Coal Phase-Out	73%										
	Distributed Generation	72%										
	Carbon Pricing	63%										
	Nuclear	43%										
	Cogeneration	29%										
	Capacity Market	24%										
Fossil Fuels Industries (78 pt)	Innovative Technology	53%										
	Carbon Tax	53%										
	Cap & Trade	49%										
	Cogen	41%										
	CCS/ CCUS	39%										
	Demand Reduction	0%										

Not Applicable | **3 pt.** Legislation & Regulation | **1 pt.** Expected soon | **2 pt.** Policies, Programs & funded initiatives | **1 pt.** Expected soon | **1 pt.** Strategies & Action Plans | **Opposed**

NOTE:

❑ Measures within the *Personal mobility & Supply Chain Sectors* have low engagement scores (174-201), but due to potential impacts on cities and oil production, are considered by CESAR to be among the most important sectors to achieve systems change.

❑ The high engagement score (302) reflects the fact that *Energy Efficiency* measures pay back, quickly and are popular with voters.

❑ Canada's vast natural resources in a world with a rapidly growing population suggest that these sectors may grow significantly by 2050. Reducing both their energy and their process emissions is likely to be a major challenge.

❑ Greening and growing the grid to meet new demand will be more challenging for some provinces than for others.

❑ Improved technologies and efficiencies are critical, but eventually demand reduction is needed.

CONCLUSIONS

The consultation and review process carried out in this project has identified many similarities and differences among provincial governments in terms of their climate change mitigation measures.

The study only identified the classes of measures and quantifies and compares their "Engagement" in policy making; an interprovincial comparison of differences in policy deployment and their likely GHG impacts are beyond the scope.

Insights from this work will inform **CESAR's Pathway Project** in which we define and model the nature and timing of technology, infrastructure and behavioural changes in Canada's energy systems to achieve climate change commitments.

CESAR's current work (other posters) has revealed that to achieve this goal, mitigation measures will be required that are beyond current policy efforts as mapped here.

Some of these initiatives will need to embrace and harness disruptive change in order to successfully address problems in human systems beyond GHG emissions.

REFERENCES

[1] http://unfccc.int/paris_agreement/items/9485.php
[2] https://www.canada.ca/en/services/environment/weather/climatechange/pan-canadian-framework.html

[3], [4], [5] For a full list of references (***54*** *provincial contacts,* ***58*** *key documents,* ***332*** *online references)* please contact the authors.

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