Background: Electric Vehicles in Canada

Reducing greenhouse gas emissions from Canada’s transportation sector will be essential in meeting federal and provincial emissions targets. Electric vehicles are likely to be a key component in the transition to a lower emissions transportation system, as they can reduce emissions 45% to 98% compared to a gasoline vehicle with Canada’s current electricity grid.

In Canada, the market for electric vehicles has been growing, but remains small. In 2015, electric vehicles made up only 1% of new light-duty passenger vehicle sales in Canada. Research shows there is significant interest in electric vehicles among Canadian consumers, but this interest is constrained by a range of factors such as limited awareness, home recharge access and electric vehicle model variety.

Research Objective
To evaluate the effectiveness of electric vehicle supportive policies in Canada’s 10 provinces toward achieving significant long-term electric vehicle adoption.

Policy Goal
Research indicates that widespread adoption of electric vehicles will likely be necessary to meet longer-term climate targets. The International Energy Agency suggests that 40% of new passenger vehicle sales must be electric by 2040 to limit global warming to 2 degrees C: studies in Canada suggest that even greater adoption may be needed.

We frame our evaluation around the level of electric vehicle adoption likely needed to meet deep greenhouse gas reductions, using the goal of 40% new vehicle sales or “market share” by 2040.

Electric vehicle supportive policies
Research and real-world experience demonstrate that strong electric vehicle supportive policy can encourage sales. Policies that stimulate uptake can be categorized as demand-focused or supply-focused.

Demand-focused policies aim to support or encourage consumer demand for electric vehicles by, for example, offering financial incentives or providing charging infrastructure.

Supply-focused policies encourage or require suppliers such as auto manufacturers and dealerships, to develop and sell electric vehicles by, for example, specifying that a certain share of vehicles sold in a jurisdiction have zero tailpipe emissions, or through support for research and development.

Our Method
We evaluate each policy against a “policy benchmark”, which reflects the maximum stringency (how strong the policy is and duration (how long the policy is intended to be in place for)) of a specific policy type that is likely to be politically acceptable in North America. Our evaluation framework considers eight types of policies.

Our Method
1. Identify electric vehicle supportive policies
2. Identify the benchmarks our policies are compared against
3. Assign letter grades on how well our policy performs against the benchmark

We draw on the literature to estimate the impact of each policy benchmark on electric vehicle market share in 2040. In some cases, policy benchmarks are based on actual policies implemented around the world, while other benchmarks are based on stronger policies indicated in the electric vehicle literature. To evaluate the impact of a policy, we compare the stringency and duration of that policy to its policy benchmark.

Limitations
1. Policy impacts in the literature are uncertain, much research into policy impacts remains to be done.
2. We assume that anticipated policy impacts for other jurisdictions (e.g. the US) will similarly apply to Canada.
3. Our framework deals with policies individually and doesn’t account for interactions among them.
4. We don’t account for all policies, specifically, research and development programs and information campaigns because impacts are uncertain and difficult to quantify.

Grading Policy
For a province to achieve an “A” they need to have policies in place that put them on track for an electric vehicle market share of 40% by 2040.

Key Policy Implications
1. The majority of provinces have undertaken little or no substantive efforts to boost PEV adoption. Three provinces account for 80% of policies identified in Canada.
2. No province is on track to meet the policy goal of 40% PEV market share by 2040. Additional and stronger policies are needed.
3. The most effective current policies include a Zero Emission Vehicle mandate, strong and long-duration financial incentives, and strong encouragement on gasoline or carbon pricing.
4. Different combinations of stringent policy can be used to achieve an “A” in our framework. Policymakers will want to determine which effective policies are best suited for their region.
5. The Canadian government could raise the grades of all provinces to “A”s and “B”s with effective federal-level policies.