Meeting the ZEV 30@30 target

Supplementary information on the Green Budget Coalition Recommendation for investing in zero-emission vehicles in Budget 2019

The Green Budget Coalition Recommendations for Budget 2019 include a proposal for a temporary zero-emission vehicle purchase incentive of $6,000 to complement a federal ZEV sales mandate and accelerate adoption of clean electric vehicles.

The David Suzuki Foundation developed the proposal based on results from SFU research using a model that projects future ZEV sales under different conditions and policies.

BACKGROUND

Transportation accounts for about a quarter of Canada's greenhouse gas emissions, making it the second-highest source, slightly behind the oil and gas industry. ZEVs will play a critical role in reducing emissions from the transportation sector and supporting Canada in meeting its Paris commitments

At the 2017 International Clean Energy Ministerial meeting in China, Canada joined other countries in committing to a global goal of increasing electric vehicle market share to 30 per cent of new vehicle sales by 2030 (30@30). This could play a critical role in reducing carbon emissions from the transportation sector. New measures are needed to accelerate the transition to zero-emission vehicles and support achievement of the 30@30 target. Under current policies and projected technological trends, ZEV sales may be as low as 10 per cent of total vehicle sales in Canada in 2030.

RATIONALE

The recommendation for a two-year purchase incentive to complement a federal ZEV sales mandate is based on the findings reported in Canada's ZEV Policy Handbook authored by the SFU Sustainable Transportation Action Research Team. The authors use the REspondent-based Preference and Constraint (REPAC) model that allows for policy options to be evaluated by accounting for consumer vehicle purchasing behaviour, incentives, constraints (e.g., availability of charging infrastructure), technology (vehicle range), vehicle costs, fuel cost and government policies to explore how to meet Canada's 30 per cent ZEV by 2030.[1]

In the ZEV policy handbook, three options are identified that would allow Canada to reach 30@30:

1. A demand-focused policy package that includes national long-term incentives of $6,000 per ZEV for 20 years. This package is like Norway's approach to ZEV policy.
2. A supply-focused policy package that includes a national ZEV mandate of 40 per cent by 2040, coupled with short term incentives ($6,000 per ZEV for two years). This approach is a stronger version of California's approach to ZEV policy.
3. An alternative supply-focused policy package that includes a strengthened national vehicle emissions standard of about 71 g CO_2e by 2040 (combined average for light-trucks and cars), coupled with short-term incentives ($6,000 per ZEV for two years). For context, the emissions requirement is roughly 60 per cent below the current fleet average. This emissions-based approach is like a stronger version of the European Union's approach to ZEV policy.

In subsequent research published in a leading transportation journal, researchers from START use the REPAC model to explore four scenarios, one with a mandate and three that use incentives but that do not include a ZEV mandate.[2] All scenarios involve a ZEV incentive of $6,000 per new vehicle, with the difference in scenarios being how many years the incentives are available: Two (with mandate), four, eight and until 2030. The results show that once the subsidy is dropped and if no other policies to promote demand are in place, EV sales will sag and the 2030 target of 30 per cent by 2030 is unlikely to be met.

The study identifies the most cost-effective approach as a two-year $6,000 incentive program in conjunction with a ZEV mandate that requires manufacturers to ensure ZEVs makeup at least 20 per cent of new vehicle market share by 2025, and 30 per cent by 2030.

The costs of the incentive programs are as presented the following table:

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[1] The authors acknowledge that there are a range of uncertainties (e.g., gas prices), some of the inputs to the model lack data and actual outcomes will depend on how EV technology comes down in costs and improves in performance, how consumer attitudes evolve, etc. They address these issues using sensitivity analysis.
[2] Axsen, J., & Wolinetz, M. (2018). Reaching 30% plug-in vehicle sales by 2030: Modeling incentive and sales mandate strategies in Canada. *Transportation Research Part D: Transport and Environment*, *65*, 596–617. https://doi.org/10.1016/j.trd.2018.09.012

Policy option	Budget implications	Cost per additional ZEV
Mandate + 2 years of $6,000 incentive *(GBC recommendation)*	$573 million to $1.9 billion	$121 to $673
4 years of $6,000 incentive	$2.1 to $6.7 billion	$4,700 to $6,300
8 years of $6,000 incentive	$6.2 to $19.9 billion	$7,700 to $7,900
11 years of $6,000 incentive (to 2030)	$14.6 to $47.6 billion	$9,900 to $9,700

CONCLUSION

Modelling shows a sales mandate is a cost-effective policy that can quickly accelerate the penetration of EVs in the Canadian market. ZEV mandates, which require a certain percentage of vehicle sales to be zero emissions, have been used in California, nine other states and Quebec to grow ZEV market share. In November 2018, B.C. announced it will require all vehicles sold in the province to be zero-emission vehicles by 2040, with interim targets of 10 per cent by 2025, and 30 per cent by 2030. The new B.C. ZEV targets have the potential to be the gold standard for North America (depending on the details of the enacting provincial legislation forthcoming in the spring of 2019).

A two-year consumer incentive can complement a mandate by stimulating early adoption and help ensure broad support. Both B.C. and Quebec offer purchase incentives, in addition to the provincial sales mandates. It is important to note, however, that the incentive approach is expensive if maintained beyond two to four years or in the absence of a mandate. For this reason, the GBC recommends coupling a federal ZEV sales mandate with a two-year purchase incentive of $6,000, starting in Budget 2019.

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