The Honourable Julie Dabrusin, P.C., M.P.
Minister of Environment and Climate Change Canada
House of Commons
Ottawa, Ontario
K1A 0A6

July 27, 2026

Measuring the Economic Health Benefits of Tailpipe Emission Standards

Dear Minister Dabrusin:

On behalf of a group of health, air-quality, and climate organizations, we urge the Government of Canada to include the monetized health benefits of reduced air pollution in the regulatory impact analysis statement (RIAS) for the forthcoming tailpipe emission standards. Excluding these benefits would understate the public value of reducing vehicle emissions, including avoided illness, premature deaths, and associated health-care costs.

As the Government of Canada finalizes the next generation of tailpipe emission standards, it is essential that public health outcomes be accounted for alongside climate impacts. Using Health Canada's published methodology, TAF's analysis found that the Electric Vehicle Availability Standard would have delivered over $90 billion in health benefits for Canadians over the next 25 years, preventing up to 11,000 premature deaths (see Appendix for methodology and calculations). Including the health impacts of tailpipe emission standards is therefore essential to ensuring that regulatory decisions reflect the full public value for Canadians.

We ask that the regulatory impact analysis statement of the tailpipe emission standards quantify health benefits using Health Canada's 'benefits per tonne' methodology, building on Environment and Climate Change Canada's previous commitment to review these impacts.

The health impacts of tailpipe emission standards need to be transparent

The health case for reducing traffic-related air pollution is compelling and should be presented transparently in the RIAS. These benefits are not abstract; they represent fewer asthma attacks, reduced risks of lung cancer and cardiopulmonary disease, lower hospital utilization and health-care costs, and measurably cleaner air in Canadian communities. Omitting them from the RIAS would leave a significant share of the regulation's public value unaccounted for.

Many studies over the last few years have underscored the health impacts of on-road vehicles. According to Health Canada, on-road vehicles contribute to smog, asthma, lung disease, and approximately 1,200 premature deaths each year. Nearly half of Canadians live near busy roads, increasing their exposure to traffic-related air pollution. Health Canada's 2022 national assessment found that traffic-related air pollution is associated with $9.5 billion

in annual health damages. A 2026 McGill University study found that shifting to cleaner transportation in Toronto and Montreal, specifically, could prevent thousands of premature deaths and significantly improve public health. Together, these findings underscore why the health impacts of reducing vehicle pollution should be quantified and explicitly reflected in regulatory analyses.

Quantifying these benefits won't slow down the RIAS

Health Canada's published "benefits-per-tonne" (BPT) methodology was developed specifically to enable cost-benefit analysis of transportation related air pollution reduction policies and regulations. Its primary input is avoided emissions of key air pollutants – figures Environment and Climate Change Canada is already producing for the RIAS. The methodology links emission reductions and air pollutant concentrations to health outcomes like avoided mortality, morbidity, and hospitalizations, and assigns a monetary value to those avoided outcomes. Applying these established BPTs to the emissions estimates of this regulation can be done quickly without delaying the RIAS.

Federal vehicle regulations have historically delivered measurable climate, economic, and health benefits. The California Air Resources Board and the U.S. Environmental Protection Agency have previously monetized the health benefits of air pollutant reductions in their vehicle emissions regulations, an approach that has long been standard practice for our closest regulatory partner. Without this quantification, the RIAS risks presenting an incomplete picture of what the standards will deliver for Canadians. We welcome the opportunity to meet with you and your officials to discuss our recommendation and share the analysis and methodology underpinning our assessment.

Sincerely,

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cc Prime Minister Mark Carney, the Honourable Marjorie Michel (Minister of Health Canada), Maggie Chi (Parliamentary Secretary to the Minister of Health), constituency office for Don Valley North, Wade Grant (Parliamentary Secretary to the Minister of Environment and Climate Change), constituency office for Vancouver Quadra.

Appendix – Monetizing Health Impacts

This Appendix sets out the detailed methodology and calculations behind our $90 billion estimate, provided as context for our analysis. That estimate was calculated for the Electric Vehicle Availability Standard (the ZEV sales mandate), not the tailpipe emission standards currently under development. We include it here to illustrate how the BPT methodology works in practice; applying the same approach to ECCC's own emissions estimates for the tailpipe standards would produce a different, standards-specific figure.

In 2023, TAF estimated the health co-benefits of the ZEV sales mandate using Health Canada's benefits per tonnes (BPTs) of reduced air pollutants emissions metrics[1]. BPTs represent a monetary value of the source emissions reduction and are useful proxies to assess how changes in emissions from a given source in a particular region can benefit human health.

The table below summarizes the cumulative health impacts (billion $) of the original ZEV mandate compared with a set of alternative scenarios. These scenarios explore different combinations of delaying the start year and shifting or weakening backend targets.

Scenario	Policy Timeline	Cumulative Health Benefits Savings (Billions $)
Original ZEV mandate Scenario (Baseline)	20% in 2026, 60% in 2030, 100% by 2035	91.9
One year Delay – Shifted Timeline Scenario	20% in 2027, 100% by 2036	83.8
One year delay + weakened backend Scenario	20% in 2027, 80% by 2035	71.3
One year delay + delayed backend Scenario	20% in 2027, 100% by 2040	72.1
Weakened backend Scenario + No more ban on sales of new gasoline vehicles in 2035	60% in 2030, 90% in 2035	83.5

Methodology

Region Selection

In 2023, TAF estimated the health benefit of reducing air pollution resulting from the ZEV sales mandate across three major regions: southwestern British Columbia (SWBC) and the Windsor-Quebec City Corridor (WQCC) which represent 65% of Canada's population as well as 83% of total new passenger vehicle sales, and 74% of new truck sales in Canada. This approach follows Health Canada's recommendations of limiting the use of BPTs to these three regions as gaseous BPTs are highly impacted by proximity to population and thus are not transferable to less populated areas.

[1] Health Canada. "*Health Benefits Per Tonne of Air Pollutant Emissions Reduction,*" 2022. Available: https://publications.gc.ca/collections/collection_2022/sc-hc/H144-111-2022-eng.pdf

Pollutant Selection

On-road traffic is the main source of criteria air contaminants (CACs) such as PM2.5, NOx, VOCs, and NH3, which after released, go through a set of chemical transformations in the atmosphere and convert to ambient PM2.5, O3, and NO2. There is robust scientific evidence of the adverse health effects of PM2.5, O3, and NO2 pollutants2 which are most consistently associated with mortality in epidemiological studies.

Calculation Process

TAF estimated the monetized health impacts of the ZEV sales mandate based on the following steps:

1) **Projected new passenger car and light truck sales between 2026-2050**

TAF obtained the 2021[3] Statistics Canada new passenger car and truck sales which includes light and heavy trucks, buses, vans, minivans and SUVs[4]. We projected new passenger automobile and light truck sales to 2050 by using population growth as proxy[5]. Also, we assumed 50% of the truck sales are light-duty trucks including pick-up trucks, vans, minivans and SUVs.

2) **Projected the ZEV passenger car and light truck sales between 2026-2050**

a) We projected the incremental ZEV sales between 2026-2050 based on the Canada's original 2030 emissions reduction plan: 20% of sales are ZEV by 2026, 60% by 2030 and 100% by 2035[6]. The plug-in hybrid electric vehicle (PHEV) penetration of passenger automobiles and light trucks is modeled as 45% for 2026, 30% for 2027 and 20% for 2028 and beyond, following the Canada's PHEV's penetration assumptions[7].

b) (2025 update): We projected incremental ZEV sales between 2026–2050 under three different scenarios to test how changes in the ZEV sales mandate - such as delaying the target start and weakening/shifting later targets - would affect the cumulative health benefit savings compared to the original scenario.

3) **Quantified the carbon impact of ZEV passenger car and light truck implementation**

For 2026, we used annual carbon emissions of 3.7 tCO2eq for internal combustion engine (ICE) passenger cars, 1.1 tCO2eq for electric passenger cars, 4.2 tCO2eq for light-duty ICE trucks, and 1.6 tCO2eq for electric trucks (estimated by TAF). We assumed a fuel efficiency improvement of 30% by 2050 (applied a lower fuel efficiency improvement rate between 2026-2050 compared

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[2] Health Canada. "*Health Impacts of Air Pollution in Canada,*" 2019. Available: H144-51-2019-eng.pdf (publications.gc.ca)

[3] The most recently reported year is 2021.

[4] Statistics Canada. "*New motor vehicle sales by type of year*," *2023.* Available link.

[5] Statistics Canada. "*Population Projections for Canada*," 2023. Available: https://www150.statcan.gc.ca/n1/pub/91-520-x/91-520-x2022001-eng.htm

[6] Government of Canada. "*Canada Gazette, Part I, Volume 156, Regulations Amending the Passenger Automobile and Light Truck Greenhouse Gas Emission Regulations*," 2023. Available: https://www.gazette.gc.ca/rp-pr/p1/2022/2022-12-31/html/reg1-eng.html

[7] Government of Canada. "*Canada Gazette, Part I, Volume 156, Regulations Amending the Passenger Automobile and Light Truck Greenhouse Gas Emission Regulations*," 2023. Available: https://www.gazette.gc.ca/rp-pr/p1/2022/2022-12-31/html/reg1-eng.html

to Canada's federal light-duty vehicle regulations 41% projected rate for 2010-2025)[8]. We adopted the gasoline emissions factor of 0.00232 tCO2eq/L to estimate the quantity of gasoline and diesel savings.

Please note that using the above process, the total carbon emissions reduction of the ZEV sales mandate across the SWBC and WQCC regions (where the BPT can be used) is estimated to be 374 $MtCO_2eq$. This captures the total emission reductions of operating the purchased ZEVs between 2026-2050. This is below Canada's estimated ZEV carbon emission reduction is 430 $MtCO_2eq$[9] because of the regional constraints. The SWBC and WQCC captures 65% of Canada's population, 83% of total new passenger vehicle sales, and 74% of new truck sales in Canada.

4) **Quantified the change in air pollutant emissions resulting ZEV passenger car and light truck sales.**

Air pollution reductions were calculated based on a reduction of gasoline consumption from light-duty passenger cars and trucks (LDPV-car and LDPV-truck). We used the CAC emissions factors in Table 1 to estimate the annual air pollutant impacts of gasoline. Since the vehicle kilometer travelled was not available, we relied on the fuel efficiency of 0.06 L/km for LDPV-car and 0.1 L/km for LDPV-Truck starting in 2026[10] and adopted a fuel efficiency improvement of 30% by 2050.

Table1-Criteria Air Contaminants Emission Factors

Fuel Type	Sector	Unit	$PM_{2.5}$	NO_x	VOC	NH_3
Gasoline	LDPV-Car	g/km	0.01	0.56	0.66	0.05
Gasoline	LDPV-Truck	g/km	0.01	0.70	0.71	0.05

5) Calculated the health BPTs of air pollutant reductions

The BPTs reported by Health Canada represent the monetary value of health impacts per tonne of emissions reduced. While the BPTs are limited to the SWBC and WQCC regions, actual health impacts are not limited to these areas and impact the entire Canadian population. BPTs associated with $PM_{2.5}$ are by far the largest in magnitude and associated risk compared to the other emitted pollutants. BPTs for the gas-phase pollutants (NO_x, VOCs, NH_3) are impacted by local weather conditions and the local atmospheric mix of reactive pollutants and can vary considerably by region.

Table 2 summarizes Health Canada's BPTs in the two regions for the 2015 base case. Health Canada used the estimates of monetized valuations for mortality and morbidity based on source year (1996, 1997, or 2007) and adjusted for inflation using the Statistics Canada's Consumer

[8] Canada Energy Regulator. "*Market Snapshot: Trucks account for larger share of new vehicle sales*" 2016. Available link.

[9] Government of Canada. "*Canada Gazette, Part I, Volume 156, Regulations Amending the Passenger Automobile and Light Truck Greenhouse Gas Emission Regulations*," 2023. Available: https://www.gazette.gc.ca/rp-pr/p1/2022/2022-12-31/html/reg1-eng.html

[10] Government of Canada. "*Fuel consumption ratings tool*," 2023. Available: https://fcr-ccc.nrcan-rncan.gc.ca/en

Price Index (CPI). Once the 2015 currency year values were determined, they estimated the BPTs for the 2015 year. We used CPI values[11] for 2015 and 2022 to estimate the 2022 BPTs.

Table 2-BPTs for 2015 and 2022

	2015 CAD		2022 CAD	
	BPT ($/tonne)		BPT ($/tonne)	
Emitted pollutant	**SWBC**	**WQCC**	**SWBC**	**WQCC**
Primary $PM_{2.5}$	410,000	520,000	489,668	621,043
NO_x	(140)	15,000	(167)	17,915
VOC	13,000	3,900	15,526	4,658
NH_3	100,000	130,000	119,431	155,261

In addition to limiting the use of BPTs to the SWBC and WQCC regions, Health Canada also recommends limiting the BPTs to small-to-moderate emission changes (up to 10% against baseline year for each pollutant). We used Canada's 2020 air pollutant emissions inventory (APEI)[12] for the regions as the baseline and we compared the estimated on-road emissions reduction potential in 2026. The change against the 2020 baseline was within the 10% threshold for all reported pollutants.

6) **Estimated the monetized health impacts of ZEVs implementation**

Using the information from Steps 1-5, we estimated each year's monetized health impacts ($/year) between 2026-2050 using the following equation:

A = B x C x D

A: monetized health impacts ($/year)
B: annual gasoline fuel savings (L/year), calculated by emission modeling
C: emission factors (tonnes/L gasoline or diesel), using Table 1
D: BPTs ($/tonne per year), using Table 2

Table 3 summarizes the cumulative monetized health impacts of newly purchased vehicles including the operational emission savings over the life of the EV vehicles between 2026 and 2050. The cumulative monetized health co-benefits of these two regions is $92B.

Table 3-Cumulative Health impacts ($)

Emitted pollutant	WQCC	SWBC
Primary $PM_{2.5}$	17,516,325,303	2,594,387,343

[11] Statistics Canada. "*Consumer Price Index, annual average not seasonally adjusted*," 2023. Available link.
[12] Government of Canada. "*Canada's Air Pollutant Emission Inventory*," 2023. Available: https://open.canada.ca/data/en/dataset/fa1c88a8-bf78-4fcb-9c1e-2a5534b92131

NO_x	32,130,923,417	-56,179,229
VOC	9,026,717,976	5,647,095,533
NH_3	21,895,406,629	3,163,887,003
Total	91,918,563,976	

Key Assumptions

- TAF assumed that NO_x, $PM_{2.5}$, NH_3 and VOC composition will not change significantly year over year, thus keeping the same state of atmospheric mix of reactive pollutants.
- There is no established linear correlation between BPTs and population growth and mortality, therefore it is difficult to project how BPTs change in future years. BPTs analysis here is assumed not to be impacted by population growth between 2022-2050. Thus, actual health impacts may be *larger* than the reported numbers in this analysis.
- Monetized health impacts estimated via BPTs represent an annual economic value ($/year). While TAF used the Consumer Price Index to determine the 2022 BPTs, a future projection of the index is not available.
- TAF estimated the increase of electricity consumed resulting from operating EVs to be 243TWh. However, Health Canada has not estimated the BPTs associated with electricity power generations, so the increase in air pollution due to additional electricity generation is excluded from the analysis.