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November 30, 2018

Acting Administrator Andrew Wheeler
U.S. Environmental Protection Agency
EPA Docket Center, Air and Radiation Docket
Mail Code 28221T
1200 Pennsylvania Avenue NW
Washington, D.C. 20460

RE: Light-Duty Vehicle GHG Program Technical Amendments, Docket No. EPA-HQ-OAR-2017-0755; Rulemaking to Revise Light-duty Vehicle Greenhouse Gas Emission Standards, Docket No. EPA-HQ-OAR-2018-0283; The Safer Affordable Fuel-Efficient Vehicles Rule for Model Years 2021-2026 Passenger Cars and Light Trucks, Docket No. NHTSA-2018-0067

Dear Acting Administrator Wheeler,

On behalf of our half million members and supporters, the Union of Concerned Scientists ("UCS") submits the below comments on the technical amendments to the light-duty vehicle (LDV) greenhouse gas (GHG) emissions standards regulations. While the two amendments proposed by the Agency may seem minor, they cannot simply be viewed in isolation—rather, they must be considered in context with other changes to the program, including the notice of proposed rulemaking (NPRM) to freeze standards at model year (MY) 2021 levels through MY2026, heretofore referred to as the 2021-2026 NPRM. While those dockets closed on October 26, 2018, the timing of this submission is reasonable because the proposed amendments were only published on October 1, 2018, leaving UCS insufficient time to enter these comments in the dockets for the 2021-2026 NPRM. Therefore, while we speak specifically to the proposed technical amendments, because these changes will also affect the context of the 2021-2026 NPRM, we are submitting these comments for consideration under that proposal as well (Docket Nos. EPA-HQ-OAR-2018-0283 and NHTSA-2018-0067).

EPA's MY2012-2016 and MY2017-2025 GHG emissions standards for LDVs, together with the fuel economy standards coordinated with and proposed by NHTSA, represent the single largest policy to reduce greenhouse gas emissions and oil usage that this country has ever taken. In addition to

effecting those changes, this policy provides consumers in both the new and used vehicle market with more efficient choices, acting to save them money at the pump while promoting a healthier economy, an improved environment, and a more secure nation. Though these technical amendments are just tone component of that policy, they have the potential to affect the overall impact and success of the program in significant ways. While we consider each amendment separately below, we also offer a third section discussing the appropriateness of flexibilities such as those considered under this amendment, and what it means for the protection of the health and welfare of the public.

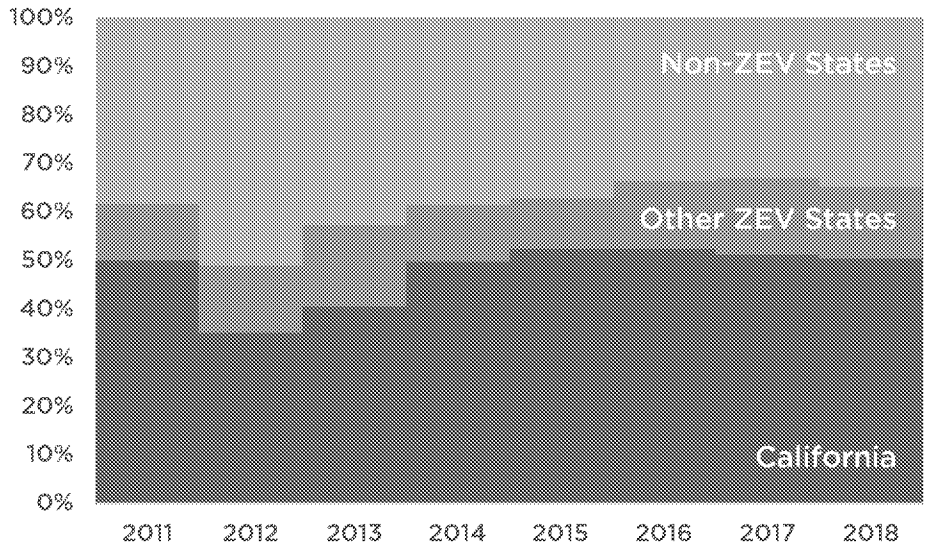
CLARIFICATION OF ADVANCED TECHNOLOGY VEHICLE MULTIPLIER REGULATIONS

The advanced technology vehicle multiplier over-credits the production of electric vehicles and natural gas vehicles, multiplying the production numbers by a value spelled out in the regulations (40 CFR 86.1866-12(b)). According to the Agency,

> "These temporary regulatory incentives are justified under CAA [Clean Air Act] section 202 (a) as they promote the commercialization of technologies that have, or of technologies that can be critical facilitators of next-generation technologies that have, the potential to transform the light-duty vehicle sector by achieving zero or near-zero GHG emissions and oil consumption, but which face major near-term market barriers." (77 FR 62811).

The multiplier's purpose has critical implications for the proposed amendments.

FIGURE 1. Electric vehicle marketshare, by model year and region



Approximately two-thirds of electric vehicle sales are in states with Zero Emission Vehicle requirements (CA, CT, MA, MD, ME, NJ, NY, OR, RI, VT), with half of total sales occurring in California alone. For comparison, nationally California makes up just 12 percent of the market, while the rest of the ZEV states represent less than 17 percent of the total market. Though the Advanced Technology Vehicle multiplier began with the 2017 model year, this pattern has largely remained unchanged over an eight-year span, excepting for a brief period in 2012-2013 when sales were dominated (86 percent) by just four models, all of which were available nationwide, a far cry from recent relative levels of EV model availability (Reichmuth and Anair 2016).

Note: The model year begins in October of the preceding year. Data includes sales from January 2011 through August 2018.
SOURCE: AAM 2018

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Currently, adoption of electric vehicles has been concentrated in states that have adopted zero emission vehicle (ZEV) sales requirements, led overwhelmingly by California (Figure 1). In many regions and localities interested in increasing EV sales, there also exist complementary policies such as state rebates for EVs, priority access for parking and HOV lanes, and targeted infrastructural development in order to further increase the adoption of these vehicles, and a federal tax rebate is available nationwide which further incentivizes EV adoption. Given the broad range of policies targeting growth of the EV market and the concentration of sales to date in those states that have these complementary policies, it is not clear to what degree ***EPA*** incentives have significantly advanced the national adoption of EVs. For example, while EPA incentives ***may*** be a contributing factor in overcompliance with state ZEV standards and deployment of EVs outside of ZEV states, such credits applied to vehicles sold in those states which already have a minimum sales requirement act ***primarily*** as a subsidy for these vehicles, giving away credits for actions that would have occurred even in the absence of EPA incentives.

The Agency should consider as part of this proposed action the net impact of its amendment to this program and to what extent it is accelerating national electric vehicle adoption. We estimate that treating EVs as 0 g/mile vehicles, combined with the proposed amendment to the EV multiplier formula, will result in a loss of overall program emissions benefits that is nearly six times the real-world benefits of the EVs sold outside of state ZEV requirements in this timeframe, specifically because the agency cannot take credit for emissions reductions resulting from compliance with those state programs. EPA should carefully and clearly explain the value in such a trade-off as part of a formal impact analysis, something it has not done to date and has not included in this proposal.

Validity of proposed technical amendment

EPA has incorrectly asserted in this rulemaking that the change to its calculation of compliance with the use of an advanced vehicle multiplier are a "correction." However, this ignores the Agency's own explanations of how the advanced technology vehicle multiplier would be implemented.

When introducing the vehicle multiplier, EPA noted that "[t]hese proposed advanced technology credits are in the form of a multiplier that would be applied to the number of vehicles sold, such that each eligible vehicle counts as more than one vehicle ***in the manufacturer's fleet average*** [emph. added]" (74 FR 49483). EPA even provided manufacturers with a clear calculation for how compliance with the adoption of the multiplier would be calculated (Table 1). In both the text of the rule and the calculation described, it is clear that the multiplier is applied ***only*** in the calculation of fleet average emissions, and ***not*** in the total credit calculation.

The process currently codified in 40 CFR § 86.1866-12(b) is entirely consistent with the above process, and the regulatory text adopted is nearly identical to that originally proposed and outlined in Table 1.[1] For this reason, the proposed amendment cannot reasonably be viewed as a "correction"—rather, EPA is redefining the regulation's intention and its intended credit for model years that are already in production and, in the case of MY2017, have already been submitted for compliance. No information

[1] Compare: "When calculating the fleet average CO2 emissions according to the provisions of part 600 subpart F of this chapter, the manufacturer may multiply the number of advanced technology vehicles produced by [1.2–2.0]." (74 FR 49763); "the manufacturer may use the production multipliers in this paragraph (b) when determining the manufacturer's fleet average carbon-related exhaust emissions under § 600.512 of this chapter." (77 FR 63164).

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has been provided, through either the finalization of the 2017-2025 standards or the current proposed technical amendment, to explain any difference in intent between the proposed 2012-2016 multipliers and those finalized for 2017-2021. On the contrary, the final rule for 2017-2025 explicitly points to the ***preexisting*** 2012-2016 rule "for a detailed explanation of credit program implementation, sample credit and deficit calculations, and end-of-year reporting requirements" (77 FR 62885).

TABLE 1. Example calculation of advanced technology credits, according to EPA

Summary for Manufacturer A: Earning Basic and Advanced Technology Credits			
		CO_2	**Totals**
Total production	Conventional: 475,000 PHEV: 25,000	290 g/mi 100 g/mi	500,000
Fleet average standard		300 g/mi	
Fleet average	[(475,000 × 290) + ((2x25,000) × 100)] ÷ [475,000+(2×25,000)]	272 g/mi	
Credits	[(300-272) × 500,000 × 190,971] ÷ 1,000,000	=	2,673,594 Mg

In this table reproduced from the agency's 2012-2016 proposal, it is shown that the advanced technology vehicle multiplier is included in the calculation of the fleet average efficiency only (highlighted in yellow), while credits are based solely upon a manufacturer's actual production values (highlighted in green). This is consistent with the regulations as they stand today and indicates that the agency's original intent is not the "correction" proposed.
SOURCE: Table III.E.5-2, 74 FR 49568

Therefore, the proposed technical amendment to the calculation of credits using advanced technology vehicle multipliers is arbitrary. It represents a retroactive and unsubstantiated change in intent, upsetting settled expectations and reliance interests, which has significant impact on the benefits conferred by the rules as finalized.

Impact of proposed technical amendment on finalized standards for MY2017-2025

The proposed amendment is not just at odds with the agency's prior explanation of how the multiplier should work—it is also at odds with its assessment of the value of the credit and the emissions lost as a result. This flaw is further evidence that this amendment is not a correction but rather an unjustified change in agency intent.

While the Agency did not include the impact of the ATV multiplier in its modeling of technology deployment (p. 3-26, 2017-2025 RIA), EPA did estimate the impact on the benefits of the rule (Table III-1, 77 FR 62771). We were unable to assess how the agency arrived at the values provided; however, we were able to reproduce substantially similar values through the application of the multiplier as it is codified today (Table 2). It is also worth noting that our estimate of the credit utilization under the amended application of the credit is substantially larger than either EPA's calculation or our value under the current regulations, indicating that it is highly unlikely that EPA calculated the impact of the credit multiplier using the proposed amendment. It is dubious that this was a deliberate and rational choice by EPA, since, if it were EPA's intent, one would expect the calculated impacts to reflect as much.

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TABLE 2. Average credit to passenger cars related to ATV multipliers, under the MY 2008 baseline fleet projection

Year	EPA	Current (△ from EPA)	Amended (△ from EPA)
2017	0.6 g/mi	0.5 g/mi (-0.1 g/mi)	1.6 g/mi (+1.0 g/mi)
2018	1.1 g/mi	0.9 g/mi (-0.2 g/mi)	1.9 g/mi (+0.8 g/mi)
2019	1.6 g/mi	1.2 g/mi (-0.4 g/mi)	2.3 g/mi (+0.7 g/mi)
2020	1.5 g/mi	1.2 g/mi (-0.3 g/mi)	2.2 g/mi (+0.7 g/mi)
2021	1.2 g/mi	1.0 g/mi (-0.2 g/mi)	1.8 g/mi (+0.6 g/mi)

EPA estimated the total credit value for passenger cars utilizing the ATV multiplier when finalizing the 2017-2025 standards. Our estimate of the credit calculated as currently implemented in the regulation is largely consistent with the values provided by the agency, while those which would be implied under the amended standard are substantially larger, indicating the likelihood that the agency intended the impact of the credit to reflect the current formula.
SOURCES: Table III-1, 77 FR 62771 and UCS analysis

EPA has not provided an impact analysis of their proposed change; however, we have calculated these impacts, and they are significant (Table 3). EPA estimated a reduction in benefits of around 10 million metric tons of emissions as a result of this credit multiplier. However, compliance with state ZEV regulations would result in significantly more EV sales than originally projected, exceeding the initial calculated impacts without incentivizing any additional EV sales. Amending the credit formula as proposed would result in 3 to 4 percent additional benefit erosion just for compliance with these state programs, and, if the program incentivized a rapid growth in EV sales as suggested by EPA, the amendment could erode up to 8 percent of the 2017-2021 benefits.[2]

TABLE 3. Impact of ATV multipliers for different EV scenarios, calculated under current and proposed formulae

Scenario	2017-2021 EV Sales (#)		GHG credits/emissions (Mg/metric tons)			Decrease in 2017-21 Benefits
	BEVs	PHEVs	Current	Proposed	Difference	
FRM, 2008 Baseline	461,736	27,187	9,791,106	19,813,793	10,022,687	1.7%
TAR ZEV Compliance	856,447	673,061	29,101,127	44,647,825	15,546,698	2.7%
UCS ZEV Compliance	901,662	240,922	12,589,980	35,129,805	22,539,825	3.9%
UCS High EV Growth	2,110,138	873,852	40,723,395	87,200,248	46,476,853	8.0%

Altering the formula used to calculate the impact of EV multipliers could significantly undermine the program in the 2017-2021 timeframe, more than doubling the impact initially calculated, and reducing the program's benefits by 3 to 4 percent just for compliance with state ZEV programs. Should the incentive significantly increase EV sales (targeting 10 percent by 2025), as much as 8 percent of the 2017-2021 would be eliminated as a result of this amendment.
SOURCE: UCS analysis, based on data from EPA 2012, EPA 2016, and Cooke 2016.

It is not surprising that such a calculation would have such a dramatic impact on the program's benefits—when originally proposing the incentives adopted for the 2017-2025 program, EPA

[2] Here we have considered an aggressive target of 10 percent sales in 2025. This is larger than the Agency considered in the TAR but is comparable to what could be cost-effective for manufacturers under different automaker proposals for future extension and/or expansion EV incentives as part of the 2021-2026 NPRM.

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acknowledged that the "multiplier, in combination with the zero grams per mile compliance value, would be excessive" (75 FR 25436). Moreover, the Agency recognized the potential problem these incentives raise with significant electric vehicle sales: "such incentives could lead to a significant reduction in program GHG savings, particularly if EV/PHEV/FCV sales increase significantly" (77 FR 62813). While the Agency was referring to sales increases and incentives beyond the 2021 timeframe, the argument holds true for current sales because it did not anticipate EV sales as high as we see today resulting from novel manufacturers like Tesla and state sales requirements as implemented under the ZEV program.

OFF-CYCLE CREDIT CALCULATIONS BASED ON THE 5-CYCLE METHODOLOGY

The amendment proposed by EPA to correct the 5-cycle methodology for calculating off-cycle credits is sound and supports the overarching goal of the off-cycle program: drive real-world emissions reductions with novel technologies that cannot be captured under the current program. It is an especially important correction because it streamlines the off-cycle program without sacrificing certainty in reductions, employing a repeatable and verifiable test procedure that has been well-established and well-tested over the course of more than a decade.

We concur with EPA's finding that the process codified in 40 CFR § 86.1869-12(c) results in a double-crediting of the benefit of a given technology by failing to consider the benefit of a technology on the standard two-cycle test as measured by A/B comparison, allowing it to be counted both in the two-cycle certification and in the off-cycle credit. The proposed amendment eliminates this double-counting with an appropriate amendment to the federal regulations.

Reforming the 5-cycle technology off-cycle credit process in this way sufficiently responds to industry concerns (see AAM and AGA 2016 #9) without undermining the integrity of the program, as would occur should the agencies adopt any additional provision of the petition. We strongly oppose any further changes described in the automaker petition and incorporate, by attachment, joint comments previously submitted to NHTSA refuting the justifications for such alterations (Appendix A; see Docket ID No. NHTSA-2016-0135-0002).

We continue to have concerns about crediting technologies which were present in the fleet in advance of the 2012 model year and not incorporated into the baseline by which the rules are measured.[3] In its initial adoption of the off-cycle program, EPA required that off-cycle technologies must be "new, innovative, and not in widespread use," but has since dropped those requirements "because these terms are imprecise" (77 FR 62835). However, the Agency has further clarified that for the 5-cycle test, "technologies integral or inherent to the basic vehicle design...will not be eligible for credits" and has specifically excluded "technologies described in Chapter 3 of the TSD" as well as "technologies that may reduce the frequency of vehicle crashes" (77 FR 62836), using its discretion to provide some clarity

[3] Technologies such as window glazing and reflective paint were deployed in the baseline fleet but were not accounted for in developing the rule's targets, thus crediting business-as-usual deployment (Cooke et al. 2017).

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as to off-cycle credit availability on a technology-specific level. While EPA's discretionary review already allows it to further exclude technologies submitted under the 5-cycle off-cycle technology program (77 FR 62839), we believe it would be appropriate in this amendment process to clarify a threshold for "not in widespread use" to ensure that the newly streamlined off-cycle credit process does not result in unwarranted credits for baseline technologies while providing the certainty requested by industry to encourage deployment of ***new and novel*** non-safety off-cycle technologies. Such clarification could also respond to automaker request for clarity on the definition of a "baseline" technology.[4]

THE OVERALL IMPACT OF FLEXIBILITIES ON THE EFFICACY OF THE GHG PROGRAM

Flexibilities such as technology incentives and off-cycle credits can provide a framework for recognizing and promoting innovative ways to reduce greenhouse gas emissions. However, if these flexibilities are not considered when setting standards, they have the potential to significantly undermine and erode the benefits by crediting business-as-usual deployment[5] or underestimating the impact of such programs.

The agencies are seeking comment on these flexibilities explicitly as part of the 2021-2026 NPRM, including the petition to which the technical amendments are responding (83 FR 42998). Any impacts of these proposed amendments will have affect not only the current rules, but also those under consideration, potentially leading to significant reductions in emissions which the Agency has not yet considered under either rulemaking.

The harm of overcrediting is especially pronounced with the Agency's recent proposal to freeze greenhouse gas emissions standards at 2020 levels, which would affect not just the MY2021 standards to which the technical amendments directly refer, but also the trajectory of the technologies being incentivized and the impact of credits on those future, flat standards. This goes directly against the Agency's rationale for programs like the EV multipliers and therefore must be part of the consideration of these amendments:

> "Although the Agency rejected an incentive multiplier in the MYs 2012–2016 final rule, we proposed a multiplier for MYs 2017–2021 because, while advanced technologies were not necessary for compliance in MYs 2012–2016, ***we project that they will be necessary, for some manufacturers, to comply with the GHG standards in the MYs 2022–2025 timeframe*** [emph. added], and we believe that an incentive multiplier for MYs 2017–2021 can promote the initial commercialization of these advanced technologies that need to be available in later years." (77 FR 62813)

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[4] "The EPA should clearly define the term 'baseline technology (item and efficiency)'. Clarifying this term will help manufacturers determine what a baseline technology is and the associated baseline [off-cycle credit] value" (p. 96, EPA-HQ-OAR-2018-0283-6186).

[5] EPA explicitly noted this as a windfall for manufacturers, "providing credits for conduct which would occur anyway rather than creating an incentive to introduce new technologies" (77 FR 62833).

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The emphasized passage is in direct conflict with the 2021-2026 NPRM, in which the Agency's analysis notes no plug-in vehicle adoption necessary (83 FR 43219).[6] As argued already, the Agency is proposing to revise its calculation to credit these vehicles beyond what was originally intended—doing so in light of its latest proposal, which would perversely lower the need for the adoption of these vehicles and underminine its initial rationale for these credits, would result in a significant bank of credits which would further erode the benefits of these standards.

Relationship of proposed technical amendments to proposed rule for MY2021-2026

The proposed technical amendments affect two crediting programs on which the Agency has requested comment as part of the 2021-2026 NPRM (83 FR 43444-5). Furthermore, numerous commenters have publicly requested extension or expansion of these provisions as part of that proposed rulemaking.[7] The impact of the adoption of these proposals could be severe, but it is also dependent upon the very changes EPA is proposing in the instant technical amendments. Such changes to the program would dramatically reduce the benefits of the rules today if they were adopted, and that impact would be even worse under the proposed technical amendments.

TABLE 4. Changes to flexibilities proposed by automakers considered in UCS modeling

Organization	Stringency (2025)	EV multipliers	Hybrid credits	Tier 2/3 fuel flexibility	PC-LT definition
Honda	Current standards	Extended through 2026	Expand PU credit to LTs	Allow	No change
Global Automakers	PC: 165 g/mi LT: 238 g/mi	Extended through 2026	Expand PU credit to LTs; Add smaller credit for PCs	Allow	No change
General Motors	5% EVs + 1% per yr ICEV improvement	n/a (no GHG rule)	Expand PU credit to LTs	Allow	All utility vehicles are LTs
Alliance of Automobile Manufacturers	Current standards††	Extended + increased to: 4.5 (BEV), 4.8 (PHEV)	Expand PU credit to LTs	Allow	All utility vehicles are LTs

In addition to permanently ignoring emissions from electric vehicle use, manufacturers have asked for a number of changes to so-called "flexibilities" in the light-duty vehicle greenhouse gas program. This table is a subset of those changes which are more readily quantifiable, including the use of EV multipliers which EPA is proposing to change in this rulemaking. Impacts of changes to the off-cycle program proposed by the automakers, including "streamlining" the approval process such as EPA's proposed amendment to the 5-cycle credit process, were not quantified.

††Note: The Alliance proposed a reduction in stringency but did not specify, so we did not assume a specific number in our analysis.
SOURCE: Docket No. NHTSA-2018-0067, document nos. 11818, 11858, 12032, and 12073.

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[6] Though Table V-3 does indicate 1 percent battery-electric vehicle adoption in the MY2021-2026 timeframe, that level of EV adoption reflects the levels present in the baseline fleet—the Agency's Volpe runs show a 0 percent application rate for PHEV and BEV technologies to comply with the preferred alternative greenhouse gas emissions standards, while even the most stringent alternatives considered by the Agency show less than 0.1 percent application of plug-in electrification to comply.

[7] For example, "The Alliance supports the extension and expansion of advanced technology multipliers in the GHG program and their extension to the CAFE program" (p. 11) and "the Alliance supports several enhancements to the off-cycle application process" (p. 96, EPA-HQ-OAR-2018-0283-6186).

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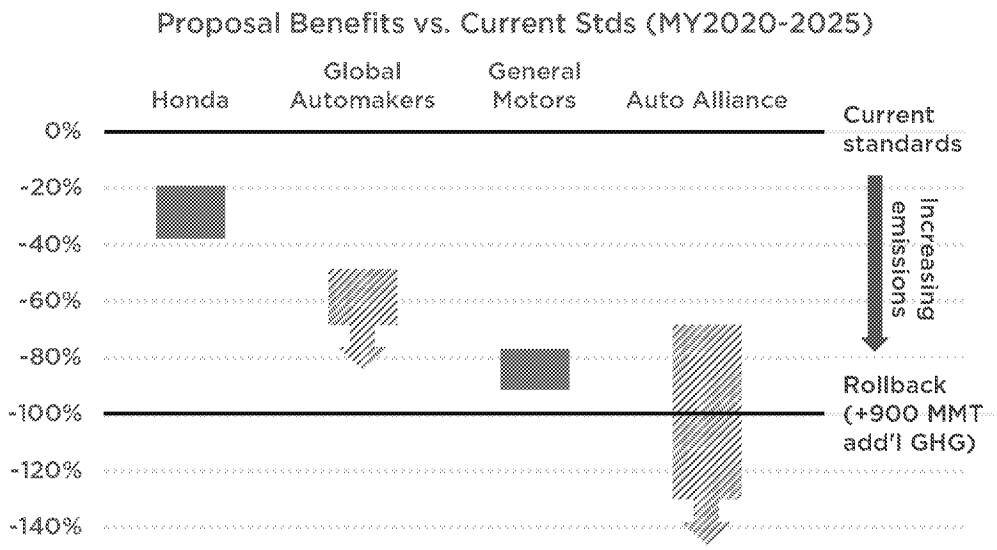
We have estimated the potential impact of these automaker proposals in light of the proposed amendment to the calculation of credit multipliers, in part, to illustrate why EPA should conduct an impact assessment of this and any further changes to the so-called "flexibilities" of the greenhouse gas program for light-duty vehicles.

FIGURE 2. Impact on greenhouse gas emissions of different automaker proposals for 2021-2026 flexibilities



Even the most aggressive positions by major automakers would represent a step backwards from the standards we have today, even if the stringency of the underlying curves were left intact. Our analysis shows that the magnitude of some of these proposals are so large that they could erode the standards as much as the flat-line alternative preferred by the Agency we have noted here as a "rollback."

Note. The hashed boxes indicate uncertainty around the year-over-year improvement requested by the organization, while the ranges reflect uncertainty about technology adoption. Arrows indicate additional, unquantified changes which would further shift the benefits of the proposal, including changes to the off-cycle program.

The automaker proposals are summarized in Table 4, with the impacts presented in Figure 2. As can be seen and is already evidenced in Tables 2 and 3, even without changing the stringency of the current program, changes to flexibilities such as the EV multiplier can have a dramatic effect on emissions reductions from the program. However, combined with changes in stringency as proposed by EPA for MY2021-2026, the proposed changes to various flexibilities could severely impact any of the alternatives proposed by the Agency, and therefore must be considered holistically with any proposals.

CONCLUSIONS

The Agency has requested comment on the automaker petition to which the proposed technical amendments respond as part of a separate, proposed rule (the 2021-2026 NPRM). The environmental impacts of these amendments have not been considered by the Agency under either rulemaking and arbitrarily contradict the agency's original intention and result in credits above and beyond the impacts considered in the original rule, potentially leading to significant reductions as a result.

We request that the Agency consider these proposed amendments in light of both the rules as they stand today and the 2021-2026 NPRM. While we concur with the Agency's concerns associated with

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double-counting under the 5-cycle off-cycle credit program and believe this change to be an appropriate way to incentivize novel technologies to reduce real-world emissions, we recommend that the Agency consider as part of its proposed technical amendment to this process a way to ensure that technologies widely available in the baseline fleet and excluded from its initial analysis continue to be excluded from the off-cycle program.

Sincerely,

Senior Vehicles Analyst
Union of Concerned Scientists

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