

**ACEEE Attachment 3**  
**Response to request for comments on credits and other flexibilities**

The agencies request comment on a wide range of possible changes to the off-cycle credit provisions and other incentives and flexibilities in the standards program. These changes have the potential to help the industry capture and receive credit for additional real-world reductions in fuel consumption and emissions, but some changes on which the agencies request comment would provide credits that do not correspond to energy or emissions reduction. Our primary concern is that the credit programs and any other flexibilities continue to reflect or lead to real-world emissions reductions.

I. Off-cycle credits

The off-cycle credit program was developed to provide credit for the use of “new and innovative” technologies that decrease real-world emissions and fuel consumption but are not detectable using the regulatory (2-cycle) test procedure.<sup>1</sup> The credit program was initially designed to ensure the standards as-set would still provide real-world reductions in emissions and fuel consumption.

Based on these considerations, ACEEE and other NGOs articulated three principles for the award of off-cycle credits in a joint response (Attachment 4) to a NHTSA notice regarding a petition for rulemaking submitted by the Alliance of Automobile Manufacturers and the Association of Global Automakers.<sup>2</sup>

1. *Demonstration of off-cycle benefits must be rigorous and fully documented.*<sup>3</sup> Off-cycle credits are to be awarded only based on a credible technical demonstration that the technologies will provide benefits in the real-world, which is typically a complex, data-heavy undertaking. Any data and analysis of data used to justify credits must be thoroughly reviewed and approved by the EPA and must be made available to the public along with the manufacturer’s petition for credit. The viability of the off-cycle program depends heavily on the credibility of evidence that the credits are deserved. Under no circumstance should credits be approved by default.
2. *Off-cycle credits should be limited to new and innovative technologies.* Off-cycle credits should not be awarded for technologies that were prevalent in the market at the time of rule adoption.<sup>4</sup> In general, an off-cycle technology that is anticipated to reduce emissions and to be widely available in the time frame of the standards should be included in the stringency of the standards.
3. *To be eligible for credit, a technology must reduce emissions from the vehicle receiving the credit.* Technologies such as automatic braking and other features that allegedly reduce

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<sup>1</sup> 2012-2016 Final Rule. <https://www.federalregister.gov/articles/2010/05/07/2010-8159/light-duty-vehicle-greenhouse-gas-emission-standards-and-corporate-average-fuel-economy-standards>

<sup>2</sup> “Grant of petition for rulemaking submitted by the Alliance of Automobile Manufacturers and the Association of Global Automakers.” Docket ID No. NHTSA—2016—0135.

<sup>3</sup> “If the manufacturer finds that the technology is such that the benefit is not adequately captured using the 5-cycle approach, then the manufacturer would have to develop a robust methodology, subject to EPA approval, to demonstrate the benefit and determine the appropriate CO<sub>2</sub> gram per mile credit.” Federal Register 75 (88), p. 25439

<sup>4</sup> “As proposed, EPA is adopting an optional credit opportunity intended to apply to new and innovative technologies that reduce vehicle CO<sub>2</sub> emissions....Eligible innovative technologies are those that are relatively newly introduced in one or more vehicle models, but that are not yet in widespread use in the light-duty fleet.” Federal Register 75 (88), p. 25438.

emissions primarily by changing the operation of vehicles other than the one in which the technology is installed (through collision avoidance or other means of improving traffic flow) are not eligible for off-cycle credit.<sup>5</sup> This is appropriate, because the benefits of such technologies are subject to great uncertainty, and these technologies' effects on fuel consumption and emissions are qualitatively different from those the standards programs were designed to measure and promote.

As shown by the multiple references to EPA regulatory language, these principles are entirely consistent with the stated intent of the EPA as it has implemented the credit program.

These principles remain relevant to this proposed rulemaking. Without consistent application of these principles, changes to the credit program risk nullifying many of the benefits the standards provide.

#### A. Streamlining off-cycle credit petitions

EPA requests comment on providing a variety of expansions or changes to the off-cycle credit program to simplify the program and increase the number of technologies earning credits (PRIA p.1603). This includes streamlining the current process, in which manufacturers seeking credit must submit a petition to EPA that is put through a public review process. A manufacturer must submit such an application to apply for credits not on the pre-defined menu, or to request a higher credit value than on the menu.

EPA asks for comment on removing this process for automakers seeking credits for technologies which EPA has already approved through the existing petition process. EPA asks for comment on granting credits, once they are granted to any manufacturer through the petition process, to all other manufacturers, effectively bypassing the petition process. These manufacturers would be permitted to base their request on the methodology used by that first manufacturer's granted petition for credits, though they would still be required to submit data and details along with their use of that methodology (PRIA pg. 1604).

To the extent that streamlining the process for obtaining off-cycle credits would limit public review or eliminate the petition requirement, such changes are not warranted at this time, as they could lead to the award of credits that do not correspond to real-world emissions reductions.

Manufacturers who have previously been granted additional or alternative values of credits for technologies on the pre-defined credit menu have in some cases relied upon methodologies and data that are unique to their products and even their customers. For example, in 2013, Mercedes Benz petitioned to receive a higher value of credits for its start-stop technology, for model years 2012-2016, than the pre-defined menu provides.<sup>6</sup> Mercedes claimed that its start-stop system utilized a more-

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<sup>5</sup> "Thus, for a technology to be 'counted' under the credit provisions, it must make direct improvements to the performance of the specific vehicle to which it is applied." Federal Register 77 (199), p. 62733. "Off-cycle credits may not be approved for crash-avoidance technologies, safety critical systems or systems affecting safety-critical functions, or technologies designed for the purpose of reducing the frequency of vehicle crashes." 40 CFR § 86.1869-12(a).

<sup>6</sup> "Alternative method for calculating off-cycle credits for Mercedes-Benz vehicles under the light-duty greenhouse gas emissions program." Docket ID No. EPA-HQ-OAR-2023-0643. Mercedes requested credits ranging from 9.1 g/mi to 19 g/mi for its passenger cars, depending on size, and 17.1 g/mi for its light trucks. In the automaker's rebuttal, it requested credits ranging from 6.92 to 8.72 g/mi for passenger cars, depending on size, and 7.56 g/mi

optimal control strategy, and evaluated effectiveness by monitoring the driving behavior of 30 of its customers.<sup>7</sup>

Mercedes' first request raised concerns with both the agency and the public. Their initial petition for credits was denied by EPA. The existing process, with opportunity for public review, concluded that Mercedes' request was not reflective of likely reductions in CO<sub>2</sub> as they claimed. Mercedes submitted a rebuttal based on limited on-road testing, resulting in far lower value of credits than the initial petition, but it was the subsequent public review which allowed for additional scrutiny of Mercedes' methodology. This provided the agency with feedback to complement its own analysis, which led ultimately to the granting of a more realistic value of credits, thus capturing the likely real-world benefits of the technology.<sup>8</sup>

In the NPRM, the agency discusses this particular request for petition, and acknowledges that "[The agency] has learned that some stop-start systems may be less effective in the real world than the agency estimated in its 2012 rulemaking." (PRIA p. 1606) This shows that similar to Mercedes' petition, even the agencies' pre-defined menu value based on the average of the entire fleet, is invalid for some automakers. Any action taken to otherwise streamline the process to ease the burden and timeline for automakers to request comments through this mechanism must maintain the requirement of a thorough methodology showing real-world benefits, as well as the public review process.

We also note that in our comments on Mercedes-Benz's off-cycle credit petition, ACEEE pointed out a mathematical error in the calculation of stop-start off-cycle emissions reductions (Attachment 5 p.3). The result of fixing the error would be to substantially reduce the estimated off-cycle emissions reductions from start-stop systems.<sup>9</sup> EPA stated in its decision document that our comment "has some merit." The agency declined to fix the problem as part of its decision, however, because doing so would have created an "inconsistency" with the Phase 2 rule, which reflects the same mathematical error.<sup>10</sup> The agencies should now correct this error, and any update to the credit table value must reflect such a correction.

## B. Credit menu

The off-cycle credit provisions include default credit values (the "pre-defined credit menu") available to all automakers. In the NPRM, EPA requests comment on a revision that would allow EPA to add technologies to the pre-defined credit menu without a rulemaking (PRIA p. 1605). The revision in question would allow the agency effectively to adopt industry methodology, through automaker petitions (like the petition mentioned above), to modify credit values for a "same or similar technology",

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for its light trucks. EPA granted credits ranging from 3.7 to 4.3 g/mi for passenger cars, and 3.6 g/mi for its light trucks. The pre-defined menu provides up to 2.5 g/mi for passenger cars, and 4.4 g/mi for light trucks.

<sup>7</sup> <https://www.epa.gov/sites/production/files/2016-09/documents/mercedes-benz-my2012-beyond-ghg-credits-advance-tech-petition.pdf>

<sup>8</sup> <https://nepis.epa.gov/Exe/ZyPDF.cgi/P100KB8U.PDF?Dockey=P100KB8U.PDF>

<sup>9</sup> As noted by J. German of the ICCT, the attached ACEEE comments failed to double the bag 2 weighting in the FTP calculation. Fixing this problem increases the ratio of the FTP to the highway on a time basis is 75.1% to 24.9% (not 74% to 26%, as reported in ACEEE's comments). The net result is to lower even further the appropriate level of off-cycle credit for start-stop systems.

<sup>10</sup> "EPA Decision Document: Mercedes-Benz Off-cycle Credits for MYs 2012-2016." EPA-420-R-14-025. September 2014. p.14.

or to include additional technologies, on the pre-defined off-cycle credit menu. EPA is also requesting comment on revising the regulation to allow the agency to adjust credit values, scalable credit values, and “technology definitions or other criteria”, through a decision document. Both requests would give the agency free reign to modify the pre-defined menu with only a public review process, but no formal rulemaking. This would eliminate the requirement for manufacturers to submit individual applications seeking credits. It is clear from the example above that EPA should maintain its current process and requirement for a formal rulemaking.

**EPA should not increase the fleet average off-cycle credit menu cap from 10 g/mi to 15 g/mi without additional evidence of the efficacy of the credit program**

EPA also requests comment on increasing the off-cycle credit menu cap from 10 g/mi to 15 g/mi. **Error! Bookmark not defined.** The cap for off-cycle technology credits from the pre-defined menu should not be increased without an understanding of the other changes EPA might consider making to the off-cycle credit program. As of MY 2016, no automaker has hit the cap for credits from the menu, indicating that automakers have yet to take full advantage of established technologies, although the number of credits claimed has increased each model year.<sup>11</sup> It is reasonable to assume that manufacturers are likely to hit the existing 10 g/mi cap in coming years. Increasing the cap may at some point be warranted, but only once the real-world CO<sub>2</sub> and fuel savings benefit of the program have been better established.

**EPA should not consider an individual manufacturer credit menu cap that scales with its fleetwide CO<sub>2</sub> performance**

EPA requested comment on a new concept to replace the current cap with one that scales with a manufacturer’s average fleetwide target level (PRIA p. 1593). It is not entirely clear whether the intention was to base this concept on the calculated average CO<sub>2</sub> target, or the average CO<sub>2</sub> level achieved for a manufacturer’s fleet. EPA first describes this concept where the cap “would be based on a percentage of a manufacturer’s average fleetwide target levels,” but follows by stating “The cap would be based on a percentage of the manufacturer’s fleetwide 2-cycle emissions performance, for example at 5-10% of CO<sub>2</sub> a manufacture’s emissions fleet wide target” and that “in many cases the emissions benefits of off-cycle technologies correlate with the CO<sub>2</sub> levels of the vehicles.”

Scaling by a manufacturers’ emissions is unacceptable, because it rewards manufacturers who have lagged behind the rest of the industry. Even if the proposal is to scale by the average CO<sub>2</sub> target, we oppose this idea without a better understanding of how the agency might apply the concept. This change would simply reward manufacturers who sell a greater number of large vehicles with higher allowable CO<sub>2</sub> emissions for the rest of their fleet, and could provide an incentive to do so. By using this concept, and assuming a cap equal to 5-10% of a manufacturer’s CO<sub>2</sub> target, the effective fleet-wide average cap on off-cycle credits in MY2025 under the existing GHG standards would range from 9 g/mile to 17.5 g/mile, as compared to the existing 10 g/mi off-cycle credit cap. Thus any such change would require a very robust process for demonstrating the validity of technologies on or added to the off-cycle credit menu.

**II. Advanced technology incentives**

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<sup>11</sup> 2016 EPA Manufacturer Performance Report

The agencies request comment on extending certain advanced technology incentives. Credit-earning technology incentives, such as the full-size pickup advanced technology credits, differ from off-cycle credits in that CO<sub>2</sub> benefits from the technology eligible for incentives are already captured on the 2-cycle test cycle. As a result, these credits reduce the emissions reductions from the standards, because they allow the remainder of the fleet to emit more than it otherwise would. The justification for the existence of such credits is that they may expedite the adoption of advanced technology, which will make possible greater emissions reduction in the long term. However, any such incentive must short-lived and carefully designed, since such credits allow automakers to build other, less-efficient vehicles while still meeting fleet-average targets, and act effectively as a rollback on their own.

As we show below, expansion of these flexibility mechanisms has the potential to greatly reduce the emissions reductions and fuel savings of the standards programs. Consequently, any changes to the proposed rule that would expand the availability of such flexibilities would require a supplemental NPRM and an opportunity for public comment.

A. Extending and expanding the pickup truck advanced technology credits to all light trucks and passenger cars and removing sales thresholds

The current program provides incentives of 10 g/mile and 20 g/mile for full-size pickup trucks with mild- and strong-hybrid powertrains, respectively, meeting a pre-defined sales threshold. The program also provides credits for any full-size pickup truck achieving “similar benefits” to hybridization when exceeding CO<sub>2</sub> targets by 15% or 20%, also at 10 g/mile and 20 g/mile, respectively, while meeting specified sales thresholds. EPA request comment on extending these credits to all light-duty trucks, and for extending the hybrid credits to passenger cars. Advanced technology credits intended for full-size pickups were implemented in recognition that full-size pickup trucks not only make up a significant portion of the fleet with higher levels of emissions than other vehicles, and are “often used for commercial purposes and have generally higher payload and towing capacities than other light-duty vehicles.” The agency believed that offering such incentives would foster adoption of technologies that can provide significant emissions and fuel consumption reductions, decrease technology costs, and to “promote greater fuel savings overall and make these technologies more cost effective and available in the later model years.” It is inappropriate to extend these credits to vehicles with characteristics and regulatory challenges different than those for which they were intended. The agency previously responded to requests to extend these credits to other vehicle categories, stating concern that it would “dilute the intended credit focus” and that doing so would “amount to ... a de facto lowering of overall program stringency.”<sup>12</sup> That is because provision of these credits would allow manufacturers to forgo improvements to other vehicles, given that compliance with the standards permits averaging across manufacturers’ products.

Manufacturers have already shown through current models and future product announcements, the intention to bring such technologies to market as standard or optional equipment on a significant portion of their light-duty fleets. Incentives are not needed for these technologies when applied to vehicles such as highly-popular car-based SUVs and passenger cars. Providing additional credits when manufacturers had already planned to produce these vehicles without an incentive creates a “free rider”

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<sup>12</sup> Final Rule for Model Year 2017 and Later Light-Duty Vehicle Greenhouse Gas Emissions and Corporate Average Fuel Economy Standards. P. 62738

problem, which reduces the emissions reductions and fuel savings benefits of the standards and ensures that they are not “maximum feasible.”

Under the current standards, extending the hybrid and advanced technology credits to all light-duty trucks would increase CO<sub>2</sub> emissions by 19.8 MMT over the lifetime of MY2021-2029 vehicles, at a minimum, according to the agencies’ compliance modeling. Extending these credits to passenger cars over the same period would increase emissions by at least another 17 MMT CO<sub>2</sub>. These estimates are purely for free riders, namely for vehicles the manufacturers would produce absent an incentive.<sup>13</sup> Should the additional credits serve their purpose of driving additional production of advanced technology vehicles, the loss in emissions and fuel consumption benefits of the standards, ironically, would be greater. Furthermore, if such credit extensions were to be paired with a weakening of the numerical values of the standards, as in the agencies’ proposed alternative in the NPRM, this would greatly add to the free rider problem and compound the loss in program benefits that the proposed alternative itself would cause.

In the same request, EPA cites industry asks to remove the minimum sales thresholds for advanced technology credits, stating that automakers believe it discourages the application of technology, because they cannot be confident in meeting those thresholds. Removing these thresholds would increase CO<sub>2</sub> emissions by an additional 8.1 MMT, at a minimum, over the lifetime of MY 2021-2029 vehicles.

These credit provisions could be weakened in yet other ways. For example, the mild hybrid credit is currently available only through MY 2021. By making these credits available indefinitely to all vehicles meeting the basic technical or performance requirements, tailpipe CO<sub>2</sub> emissions would increase by another 90 MMT over the lifetime of these vehicles, based simply on the compliance pathway shown in the NPRM. This is a reduction of approximately 9% of total benefit of the CO<sub>2</sub> standard. For reasons explained elsewhere in these comments, we do not believe the agencies’ compliance scenario to be a realistic portrayal of the technology mix that would be required to achieve the augural standard but it serves nonetheless to demonstrate the magnitude of possible effect of ill-considered changes to the credit programs.

Extending these credits falls under our earlier concern that, because these credits are specifically to incentivize increased penetration of fuel-saving technology, the success of these incentives at driving a high rate of adoption would therefore lead to automakers claiming a very high number of these credits and forgoing further improvements elsewhere in their fleet. There also comes a point where a technology no longer requires incentive, and providing these credits is nothing more than a handout and, perhaps, would disincentive automakers from investing in or deploying other technologies. These technologies already increase a manufacturer’s average fuel economy, and by nature, allows a lower fuel economy of its other vehicles. Providing additional credits for making improvements to particular vehicles, an automaker could simply make even fewer improvements to its fleet, likely well below what

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<sup>13</sup> Based on the fleet makeup according to agency modeling for the proposed rule (Volpe outputs, CAFE\_ss, vehicles\_report). Credits are applied only to light trucks or passenger cars meeting existing conditions of the full-size pickup advanced technology credits, including sales thresholds and other conditions, such as the five-year allowance for exceeding CO<sub>2</sub> targets by 20%.

is feasible. The intention of these standards is to improve fuel economy to the maximum feasible level, and extending these credits could undermine that objective.

#### B. Off-cycle credits for connected and automated vehicle technologies

EPA requests comment on providing off-cycle credits for connected and automated vehicle technologies. Efforts exist to quantify the potential emissions and fuel consumption impact of these technologies, but there currently exists little real-world data to justify granting of off-cycle credits for automated vehicle technologies. The agency states that “demonstrating the incremental real-world benefits of these emerging technologies will be challenging” and believes that “any near-term incentive program should include some demonstration that the technologies will be both truly new and have some connection to overall environmental benefits.” (PRIA p. 1608) We agree with these statements. Until data exists proving benefits of the vehicles in which the technology is installed, no off-cycle credits should be awarded.

The agency nonetheless requests comment on offering credits to incentivize the adoption of automated and connectivity technologies because they enable future, if undefined, transportation system efficiencies. The agency suggests that for connected vehicles, a set amount of credit could be provided for each vehicle with vehicle to vehicle (V2V) technology. Such a method would fail to account for any real-world benefits that might exist. EPA acknowledges that V2V technology is “unlikely to impact emissions [on an individual vehicle] in any meaningful way.” **Error! Bookmark not defined.** While the agency proposes no specific value of credit for automated or connected vehicle technologies, a draft house bill in 2015 provides an instructive example. The bill proposed 3 g/mile for vehicles making use of three automated technologies, and an additional 6 g/mile for vehicles with vehicle-to-vehicle communications technology.<sup>14</sup>

In 2017, 19% of automakers included at least some of these automated vehicle technologies. Automakers representing 99% of the U.S. automobile market pledged in 2017 that it would equip all new vehicles with automatic emergency braking and forward collision warning by 2022. By 2022, nearly 100% of vehicles on the road will feature a combination of these technologies.<sup>15</sup> These technologies account for two of the three automated vehicle technologies identified in the aforementioned bill. Assuming a gradual deployment of these technologies and the resulting number of credits earned between 2017 and 2022, even a 3 g/mile credit could increase tailpipe CO<sub>2</sub> emissions by 100 MMT over the lifetime of MY 2021-2029 vehicles. This would decrease the CO<sub>2</sub> benefits of the current standard by nearly 10%. Providing automakers credits for deploying technologies which are driven by demands other than fuel savings and emissions reduction only allows them to make fewer real-world emissions reductions elsewhere.

While automated technologies are being adopted at a high rate and can impact all vehicles on the road, any advantage of connected technologies is entirely dependent on other vehicles in the fleet also being so-equipped. Very few vehicles today are equipped with connectivity technology, and there is no consensus on future rates of adoption or energy and environmental benefits of these technologies. There already exists a proposed action by NHTSA to require that all vehicles come equipped with V2V

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<sup>14</sup> <https://docs.house.gov/meetings/IF/IF17/20151021/104070/BILLS-114pih-DiscussionDraftonVehicleandRoadwaySafety.pdf>

<sup>15</sup> <https://www.nhtsa.gov/press-releases/nhtsa-iihs-announcement-aeb>

communication technology, but the agency decided to put that rulemaking process on hold, but a planned long-term action.<sup>16</sup> This sort of policy is far better suited for bringing the safety benefits of V2V technology to the market, and would avoid displacing technologies with known, real-world emissions and fuel-saving benefits with one that is entirely dependent on other vehicles and may be nothing but a direct weakening of the standard.

### C. Incentives for ridesharing and autonomous vehicles

EPA also requests comment on a stakeholder request that credits be provided for automated and connected vehicles placed in ridesharing services or other high mileage applications. **Error! Bookmark not defined.** These services have the potential to introduce new types of efficiencies into the transportation system such as the right-sizing of vehicles. However, ridesharing not only has the potential to greatly increase overall VMT and therefore emissions, it has already added 5.7 billion vehicle miles in nine major cities over the last six years.<sup>17</sup> While automated vehicles promise all-new possibilities and efficiencies in transportation and the use of infrastructure, the net impact on transportation sector energy use and emissions is unknown. No credits or incentives, through the greenhouse gas or fuel economy programs, should be awarded to automated vehicles or to vehicles used in ridesharing service, except for those explicitly demonstrating the ability to meet the aim of these two programs which is to reduce fuel consumption and greenhouse gas emissions of light-duty vehicles.

Ridesharing services have taken a clear interest in developing automated vehicles. Companies like Lyft are developing their own automated vehicles, hoping to replace private car ownership with a subscription service.<sup>18</sup> These services could be markedly more affordable than owning a private vehicle, and provide convenient access to transportation. This unfortunately has the potential to trigger a rise in the number of trips a person makes by light-duty vehicle, potentially replacing the use of more efficient modes of transportation. Even simply replacing traditional vehicles with autonomous vehicles can, on its own, increase VMT. A report looking at the effects of shared autonomous vehicles in the Austin, Texas market determined that VMT could increase by 8% when only 1.3% of regional trips are made in a shared autonomous vehicle due to unoccupied vehicles travelling to provide service elsewhere, or in anticipation of changing demand for service.<sup>19</sup> Other studies predict that VMT could increase by 4-20%.<sup>20</sup> In any reasonable period of time, this increase would lead to large increases in greenhouse gas emissions and energy consumption.

There also exists no guarantee that these vehicles will be battery electric, in fact, it is likely that early models will still rely on a gasoline engine in some capacity. The power demand to process data for current autonomous vehicles is between 1.5 kW and 2.75 kW<sup>21</sup>, increasing gas consumption or, in the case of an electric vehicle, decreasing range. While a rideshare service utilizing battery electric vehicles could simply deploy additional vehicles to meet demand with respect to charging needs, doing so will

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<sup>16</sup> <https://www.reginfo.gov/public/do/eAgendaViewRule?pubId=201810&RIN=2127-AL55>

<sup>17</sup> [https://www.washingtonpost.com/news/dr-gridlock/wp/2018/07/25/a-new-study-says-services-like-uberpool-are-making-traffic-worse/?utm\\_term=.bc15cd9fae0e](https://www.washingtonpost.com/news/dr-gridlock/wp/2018/07/25/a-new-study-says-services-like-uberpool-are-making-traffic-worse/?utm_term=.bc15cd9fae0e)

<sup>18</sup> <http://fortune.com/2016/09/18/lyft-no-car-ownership-by-2025/>

<sup>19</sup> [http://www.cae.utexas.edu/prof/kockelman/public\\_html/TRB15SAVsInAustin.pdf](http://www.cae.utexas.edu/prof/kockelman/public_html/TRB15SAVsInAustin.pdf)

<sup>20</sup> <https://psrc.github.io/attachments/2014/TRB-2015-Automated-Vehicles-Rev2.pdf>

<sup>21</sup> SAE Automotive Engineering May 2017. "Overcoming the CO2 penalty of autonomous vehicles" Statement by Borg Warner CTO Chris Thomas. [autoengineering.sae.org](http://autoengineering.sae.org)



require additional infrastructure along with increased VMT, and for the foreseeable future, demand for electricity from charging would be from a grid with considerable greenhouse gas emissions. In the short-term, these vehicles will have a considerably higher power demand than traditional vehicles from the array of sensors and processing requirements, and the limited range of BEVs make it no guarantee that autonomous vehicles will be battery electric.

The long-term benefits are equally uncertain, and there is little known about how the technology will change how people travel. Work cited by EPA in the proposed determination finds that while vehicle automation “offers the potential for substantial reductions in energy consumption and emissions [...] these reductions are not assured, since they are generally are not direct consequences of automation per se. Instead, they follow from other changes in vehicle operations, vehicle design, or transportation system design which may be facilitated by automation.” The paper finds that “total automobile travel and fuel consumption could increase significantly, if automation sharply reduces the cost of drivers’ time and sufficient energy intensity benefits are not realized.”<sup>22</sup> Finally, the authors suggest to policymakers to “focus their energies less on accelerating Level 4 automation [...] and more on measure that promote the application of automation toward socially desirable objectives.” We agree, and do not believe this is the platform to encourage or incentivize automated vehicles nor the services that deploy them.

Consequently, it is inappropriate to incentivize technologies that risk either short- or long-term increases in CO2 emissions and energy consumption under these programs, with no immediate or known benefit to the individual vehicles for which those technologies are applied. While these standards do contribute to reducing emissions and fuel consumption of the transportation system on-whole, they were intended to target specific reductions at the vehicle level. Rather than a blanket incentive in this or any other regulatory program, agencies should instead ensure that maximum social and environmental benefits are realized from automated vehicles by enacting separate policies. Where appropriate, credits should only be awarded under these programs if real-world reductions are realized by a technology and at the vehicle-level.

Credits should be available for these technologies only when they deliver verifiable real-world reductions in fuel consumption and emissions. These opportunities should be demonstrated and not based on speculative or overly optimistic assessments of outcome, especially when there is a risk that the technology in question may lead to no, or even negative, benefits.

### **The agencies should not extend or expand multipliers for alternative fuel vehicles beyond MY 2021.**

EPA requests comment on extending or increasing advanced technology incentives, including BEV multipliers in the range of 2 to 4.5 (PRIA p. 1602). Industry groups have also requested a multiplier of 3.5. These multipliers allow a manufacturer to claim alternative fuel vehicles, such as battery electric vehicles, as multiple sales in calculating its overall average compliance CO2 emissions. This is a valuable compliance tool, as electric vehicles are currently counted as 0 g/mile vehicles. The alternative fuel multiplier for BEVs gradually decreases between MY 2019 and 2021, expiring after that year. Providing multiplier incentives for any longer, or at a greater rate, would create windfall credits for manufacturers. The industry has planned and invested in developing its future products without counting on such an

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<sup>22</sup> Wadud, MacKenzie, Leiby. [http://ac.els-cdn.com/S0965856415002694/1-s2.0-S0965856415002694-main.pdf?\\_tid=7c4a2aa4-29cb-11e7-8fcc-00000aacb35f&acdnat=1493134139\\_abc9ec7c7413da61ea84ab86fab427e0](http://ac.els-cdn.com/S0965856415002694/1-s2.0-S0965856415002694-main.pdf?_tid=7c4a2aa4-29cb-11e7-8fcc-00000aacb35f&acdnat=1493134139_abc9ec7c7413da61ea84ab86fab427e0).

incentive and most have announced plans to introduce new BEV models in coming years even without additional incentives. Given the number of BEVs in the agency’s analysis for this proposal, providing multipliers ranging from 2 to 4.5 would lead to a CO2 emissions increase ranging from 36 MMT to 127 MMT for MY 2021-2029 vehicles, losing as much as 12% of the total benefits of the current standards.

**Cumulative savings loss for fleet under augural standards**

Excluding the effects of any potential change to the off-cycle menu cap, the aforementioned changes together would result in the loss of more than 30% of the total CO2 benefits of the augural (current) standard based entirely on the production of vehicles shown in the agencies’ compliance scenario (figure 1). This loss in benefits would be in effect a major rollback of the standards on its own. Again, we do not believe the agencies’ compliance scenario to be a realistic portrayal of the technology mix that would be required to achieve the augural standard but use it here to illustrate the possible effect of ill-considered changes to the credit programs.

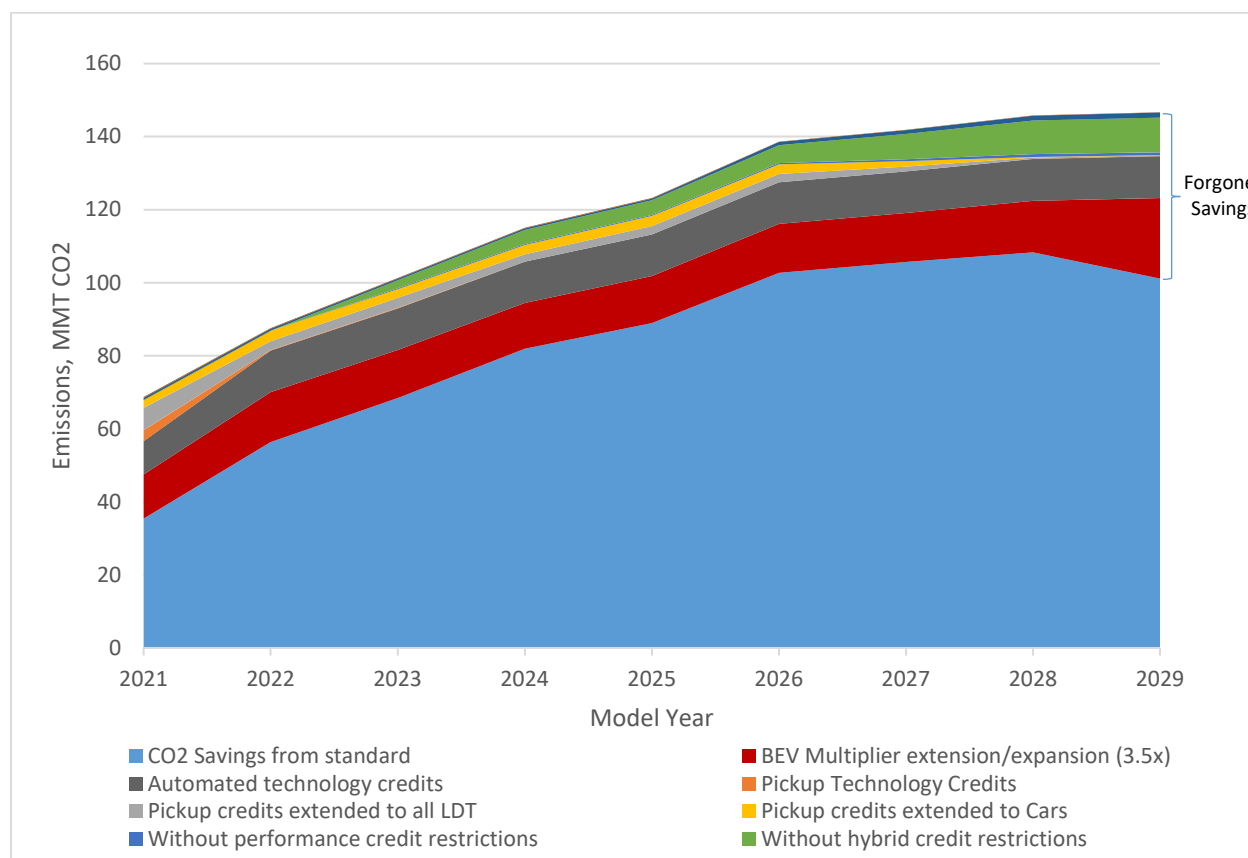


Figure 1. Augural standard CO2 benefits lost by adopting technology incentives, based on CO2 benefits and fleet from agency NPRM analysis (Volpe outputs, CAFE\_ss, vehicles\_report)

**GHG emissions could increase under the proposed (0% per-year) standards**

We also consider the result of expansion and extension of these flexibilities under the agencies’ proposed standards. We assume that under this scenario, automakers would make little-to-no improvement in average fuel economy beyond what is already planned in product redesigns over

coming years. This assumption is based on the industry’s long track record of improving fuel economy only as a response to regulation.

Adopting these incentives under the preferred 0% per year alternative would increase greenhouse gas emissions (figure 2), as it would allow manufacturers to increase CO2 emissions elsewhere in their fleets. Furthermore, if these incentives were effective in increasing penetration of these technologies and thus increased the number of credits claimed, it would simply allow automakers to make an even less-efficient and higher-emitting fleet.

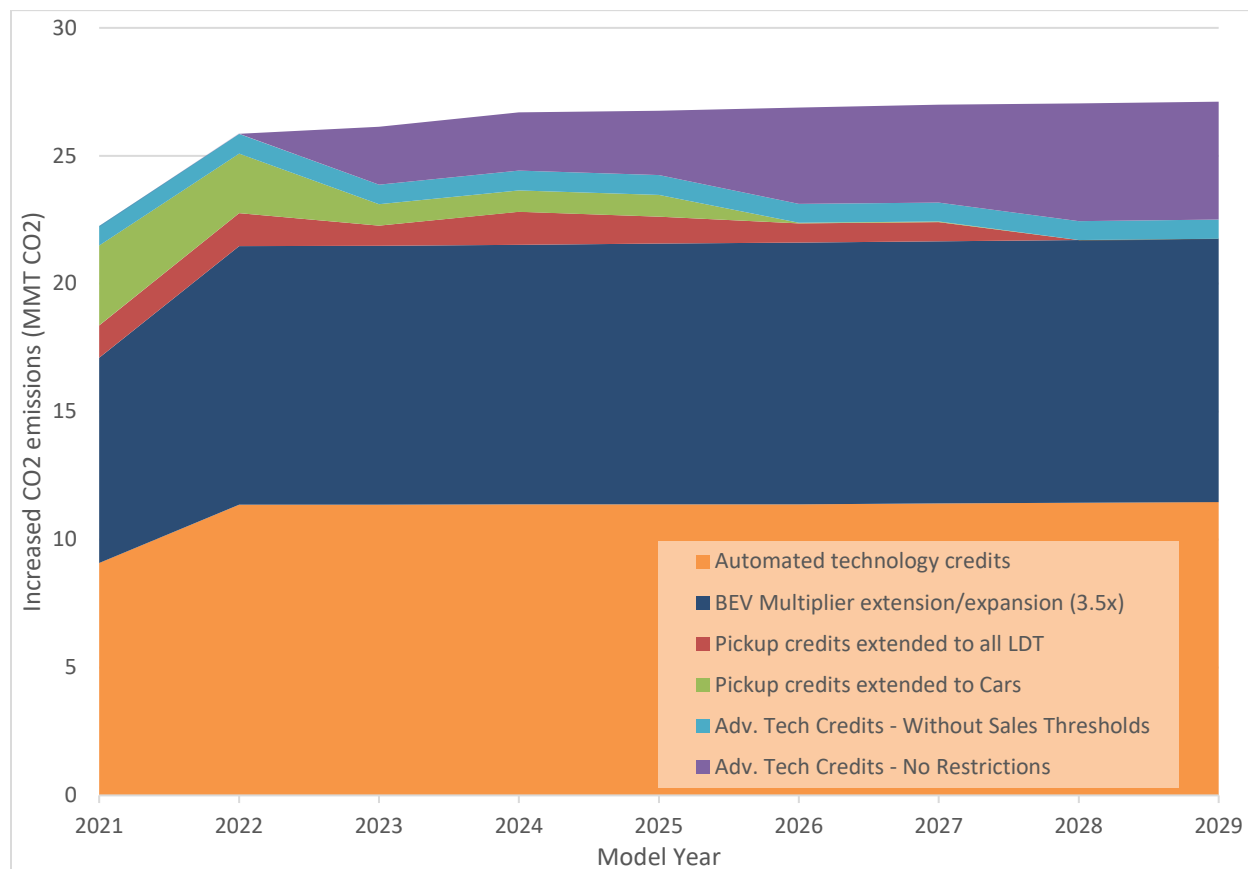


Figure 2. Increased CO2 emissions due to new credits awarded under 0% per year proposed alternative scenario in CAFE model, based on NPRM analysis (Volpe outputs, CAFE\_ss, vehicles\_report)

### Conclusion

As we have demonstrated, expansion of these flexibility mechanisms has the potential to greatly reduce the emissions reductions and fuel savings of the standards programs. Such an outcome would be in tension with the agencies’ respective statutory mandates to mitigate dangerous air pollution and conserve energy, and should be prevented by rigorous application of principles such as those articulated above. Furthermore, given their significance, any changes to the proposed rule that would expand the availability of such flexibilities would require a supplemental NPRM and an opportunity for public comment. New technologies will continue to emerge promising to reduce emissions and fuel consumption. The agencies have an obligation to set standards at the appropriate and maximum feasible level. Providing credits to already widely-available technology or to all-new technologies that

will be adopted at a high rate regardless of whether they are eligible for greenhouse gas credits, would require an adjustment to the stringency of the standards to reflect the agencies' obligation to set standards at the maximum feasible level.