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Air and Radiation Docket
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1200 Pennsylvania Avenue, NW.
Washington, DC 20460

Docket Management Facility, M-30
U.S. Department of Transportation
West Building
Ground Floor, Rm. W12-140
1200 New Jersey Avenue, SE
Washington, DC 2059

ATTN: Docket ID Nos. EPA-HQ-OAR-2009-0472 and NHTSA-2009-0059

To Whom It May Concern:

On behalf of our 275,000 members and supporters, please accept the attached technical comments from the Union of Concerned Scientists regarding the proposed rulemaking for light duty vehicle greenhouse gas emissions standards and Corporate Average Fuel Economy for model years 2012-2016. In addition, we urge the agencies to consider the individual comments submitted to the docket by over 15,000 UCS supporters.

Last May, President Obama set a historic goal of cutting fleetwide greenhouse gas tailpipe emissions to 250 grams per mile by model year 2016. This represents the largest improvement in fuel economy and emissions reductions from light duty vehicles in over three decades. Achieving this goal will help tackle the threat of climate change, save consumers money at the gas pump, and cut America's dependence on oil.

UCS applauds the work of both agencies for moving quickly to issue the proposed rulemaking to make President Obama's commitment a reality. Overall, the proposed rule takes a dramatic step forward. However, certain aspects of the rule could erode the potential benefits unless they are effectively implemented and enforced. In order to maximize the environmental, economic, and security benefits of this program, it is critical that the 250 grams per mile goal is achieved.

We look forward to the final rule and are confident that it will be the start of a necessary transition to a cleaner and more efficient vehicle fleet.

Sincerely,

Jim Kliesch
Senior Analyst
Clean Vehicles Program
Union of Concerned Scientists

Comments Concerning EPA's and NHTSA's Notice of Proposed Rulemaking to Establish Light-Duty Vehicle Greenhouse Gas Emission Standards and Corporate Average Fuel Economy Standards – Model Years 2012-2016

Docket ID Nos. EPA-HQ-OAR-2009-0472 & NHTSA-2009-0059

Submitted on behalf of:
Union of Concerned Scientists

By:
Jim Kliesch
Senior Analyst
Clean Vehicles Program

November 25, 2009

Introduction

The National Program announced in May 2009 by President Obama marks a critical milestone in our nation's dependence on oil and commitment to carbon emission reductions. Successfully meeting the interests of California, the automotive industry, the U.S. Environmental Protection Agency and the U.S. Department of Transportation, the administration's proposal sets a critical, and eminently achievable[1], set of greenhouse gas emission and fuel economy standards for model years 2012-2016. It is a clear example of how the Clean Air Act and Energy Policy and Conservation Act can work together to achieve overlapping, though individual, sets of goals.

The proposed vehicle standards represent the largest increase in fuel economy in three decades and the first national greenhouse gas standards for cars and trucks. Agency staff responsible for putting together this strong set of new standards deserves significant credit for the money, emissions, and jobs that will be saved if these rules are effectively implemented and strengthened as needed.

While the NPRM marks an impressive collection of work, certain aspects of the proposed rule would benefit from further refinement. UCS is concerned that certain assumptions used in the determination of standard stringencies, along with a number of "compliance flexibilities" built into the National Program, will inadvertently rob the program of anticipated oil and greenhouse gas emissions savings. Modifications to the proposed rule to address these shortcomings would help ensure that the following goals touted by the President are met:

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[1] As noted on p. 201 of the preamble, the technologies face "no significant technical or engineering issues with projected deployment…across the fleet."

"As a result of this agreement, we will save 1.8 billion barrels of oil over the lifetime of the vehicles sold in the next five years. And at a time of historic crisis in our auto industry, this rule provides the clear certainty that will allow these companies to plan for a future in which they are building the cars of the 21st century." [2]

Below is a list of "top-tier" issues which UCS believes warrant further attention and modification by the agencies prior to release of the final rule. Following this list is further detail on each.

- The agencies should include a backstop to ensure that the 250 g/mi is reached regardless of changes in the market or industry gaming of class definitions and program flexibilities. UCS suggests one that includes an automatic re-computation or "ratchet" of stringencies for subsequent years, such that the National Program's cumulative emissions reductions and oil savings goals are fully achieved in 2016, even if early years fall short.
- The 250 g/mi standard falls below the maximum potential of technology to cost-effectively cut emissions and improve fuel economy. Rulemakings beyond 2016 should use the total cost = total benefit approach to set minimum standards in support of the emissions reductions, consumer savings, jobs and strong auto industry that American innovation can deliver.
- The risk of flexibility mechanisms turning into loopholes should be minimized by:
    - Accounting for upstream emissions associated with plug-in hybrids, fuel cell and battery electric vehicles.
    - Advanced technology credits should be set at a maximum of 1.2 and then fully phased out by 2016. The credits should not be made available before 2012 and should not be tradable.
    - Defining the baseline for early action credits as equivalent to the *more stringent* of CAFE or the California standard, not just the California standard.
    - Providing for public comment on any "alternative" approach to assessing off-cycle credits before any credits are granted to manufacturers.
    - Ensuring that the temporary lead time allowance program remains temporary.
    - Following through with its proposed handling of FFV credits for model years 2016 and beyond, without modification.
- The agencies should further improve transparency by having a clear public accounting of all credits and program compliance, including the performance of each manufacturer with and without credits and a running balance of banks/debits.
- The agencies should abandon the use of the 2003 Kahane analysis and the supposed "worst case" assessment and instead do a thorough analysis that uses up-to-date FARS data and evaluates the likely safety benefits of reducing weight while maintaining vehicle size. NHTSA should also reevaluate and strengthen its current safety standards,

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[2] President Obama Announces National Fuel Efficiency Policy. May 19, 2009. White House Press Office. http://www.whitehouse.gov/the_press_office/President-Obama-Announces-National-Fuel-Efficiency-Policy/

especially when it comes to rollovers and roof strength, vehicle aggressivity, vehicle compatibility, and seatbelt use.

- In finalizing the rule, the agencies should use a significantly higher value for the social cost of carbon. At a minimum, the lower bound value should be much higher than the unrealistic $5 per metric ton. The agencies should also provide justification for the weighting provided to their upper and lower bounds when picking a social cost of carbon to evaluate the benefits of the rule.
- The agencies should continue to include private benefits when calculating the total benefits of the program and should not shift to a system that would include consumer choice models in the benefits assessments. It was those same consumer choice models that led many companies to dismiss hybrid vehicles, airbags, and many other innovations that have seen significant market success.
- The agencies should continue to promulgate a rule that preserves state authority and supports the recognition that California is not preempted from setting its own standards. California, along with many states, has led the nation in reducing emissions from cars and trucks and that role must be preserved to ensure continued progress in the years and decades to come.

Ensuring 250 g/mi is Reached

In the Draft Joint Technical Support Document, the agencies identify fleet mix assumptions used in the NPRM. Based on projections by CSM-Worldwide, the agencies suggest that passenger cars will make up nearly 67 percent of the new vehicle fleet in 2016, when accounting for recent changes in the regulatory definition of light trucks (that shift most 2wd SUVs under 6,000 lb GVWR into the passenger car category).[3]

Averaged at a 67%/33% (car/truck) sales mix, the car and light truck GHG stringencies yield the widely publicized fleet average of 250 grams per mile. A question, however, remains: since one of the paramount goals of the regulation is to achieve a fleet average emissions level of 250 g/mi and save 1.8 billion barrels of oil over the lives of the model years covered, how much erosion can occur if the 67%/33% sales mix is not obtained? Under the proposed rules, this can actually happen quite easily.

First, is the possibility that fleet sales do not skew toward passenger cars over the next seven years to the extent that is predicted by CSM-Worldwide and the agencies issuing the proposed rule. According to the Joint Technical Support Document, the agencies forecast that between 2008 and 2016, the passenger car market (according to the 2008 definition) will climb from 51 percent to 58 percent.[4] While UCS believes the recent downturn in the economy and volatile gasoline prices have resulted in a drop in consumer interest for full-size SUVs and other inefficient light trucks (and a corresponding increase in interest for passenger cars and crossover vehicles), we are not convinced it will result in as dramatic a shift between 2008 and 2016 as is forecast by the agencies. For example, despite significant increases in gasoline prices and

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[3] Table 1-3 AEO Volumes New NHTSA Car Truck Definition After Projections, Draft Joint Technical Support Document, p. 1-14

[4] Table 1-12 Vehicle Segment Volumes, Draft Joint Technical Support Document, p. 1-23

changes in the economy, the fraction of cars sold in the U.S. was essentially unchanged at 53 percent from 2006 to 2008.[5]

Second, as noted above, one of the contributing factors to the predicted new passenger car fleet fraction of nearly 67% in 2016 is the reclassification of roughly 1.4 million annual vehicles from the light truck category into the passenger car category. NHTSA is implementing this reclassification beginning in model year 2011, and thus it is appropriate that the agencies include the shift in their assessment of overall fleet mix. However, it does not appear that the agencies considered the possibilities that manufacturers may, as a compliance strategy, opt to outfit the vehicles in question with 4-wheel drive transmissions (or increase gross vehicle weight rating) in order to have them "re-reclassified" as light trucks. According to agency forecasts, doing so could change the fleet mix from approximately 67%/33% (passenger car/light truck) in 2016 to as little as 58%/42%, elevating the GHG fleet average from 250 g/mi to approximately 257 g/mi – an erosion of nearly 1 mpg-equivalent through vehicle classification gaming alone.

Given the possibility that a fleet average of 250 g/mi may not be reached – either by renewed interest in light trucks or by industry gaming of light truck classifications – it is critical that the agencies add a backstop in order to guarantee that the President's emissions reductions and energy savings goals are met. While a backstop could take numerous forms,[6] UCS suggests one that includes an automatic re-computation or "ratchet" of stringencies for subsequent years, such that the National Program's cumulative emissions reductions and oil savings goals are fully achieved in 2016, even if falling short in early years of the program.

Determination of Standard Stringencies

While UCS supports the fleet average stringency of 250 g/mi by model year 2016 (albeit with a backstop to ensure the fleet average is, in fact, achieved), it should be noted that detailed discussion by both agencies on the feasibility of the proposed standards concludes that standards could actually be cost-effectively set at levels notably more stringent than what is called for in the NPRM.[7] We concur with that assessment.

Based on the agencies' discussions, we believe a convincing argument is not made for why the standards were set at the stringency levels specified instead of higher, but still cost-effective, levels. We commend EPA for its consideration of redesign timing and lead time requirements, limiting stringencies in the early years of the program. However, we believe too much leniency is given on this point, as many automakers will have already undertaken efforts to improve fleet fuel economy and greenhouse gas performance in anticipation of both California vehicle greenhouse gas standards and fuel economy legislation laid out in the Energy Independence and Security Act of 2007.

Similarly, we appreciate the efforts that were made to reach a fleet average stringency consistent with California standards to enable a National Program, and are supportive of it as a first step in

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[5] U.S. EPA, "Light-Duty Automotive Technology, Carbon Dioxide Emissions, and Fuel Economy Trends: 1975 Through 2009," EPA420-R-09-014, November 2009.

[6] EPA capably discusses pros and cons of various backstop approaches in its ANPR preamble, available online at epa.gov/climatechange/emissions/downloads/ANPRPreamble.pdf

[7] This discussion occurs in the PRIA by NHTSA and in Section III.D. of the Preamble by EPA.

improving fleet fuel economy and GHG performance. That said, with respect to NHTSA, we are disappointed that the agency appears to have disregarded its mandate to set "maximum feasible" standards. The agency's own analysis indicates that substantially more stringent standards could have cost-effectively been set, offering dramatically greater fuel economy fuel savings and CO_2 reductions. According to Table IV.F.2 (p. 492), the proposed standards could cost-effectively be set well above the proposed level, yielding a *minimum* 40% improvement in CO_2 reductions and minimum 45% improvement in fuel savings. By the agency's own analysis, setting standards at a cost-effective TC=TB level would yield even greater savings.

Meanwhile, EPA assesses two alternative sets of CO_2 standards, a 4% per-year rate of reduction, and a 6% per-year rate of reduction. UCS concurs with EPA's assessment that "the 250 g/mi proposal is technologically feasible in this time frame at reasonable costs, and provides higher GHG emissions reductions at a modest cost increase over the 4% per year alternative."[8] However, EPA's rationalization for dismissing the 6% assessment lacks a solid basis. The agency claims: "EPA is not concluding that the 6% per year alternative standards are technologically infeasible, but EPA believes such standards for this time frame would be overly stringent given the significant strain it would place on the resources of the industry under current conditions."[9] In other words, while standards could feasibly be set higher, the agency chose not to because of the current economic conditions facing the industry.

This troubles us for a number of reasons. First, numerous manufacturers' steadfast unwillingness to improve their fleet fuel economies over the past couple of decades (choosing instead to direct efficiency improvements to increased vehicle power and weight) contributed significantly to the industry's current economic woes. Second, as acknowledged throughout the agencies' documents, the technologies being employed in this proposed rule pay for themselves, provide an increase in industry and supplier jobs, and yield net benefits to consumers purchasing the vehicles. These facts strike us as reasons to accelerate technology adoption to help an auto industry (and consumers) facing a weakened economy. Finally, we would like to note that the decision arrived at by the agency is incongruous with the technology forcing role of the Clean Air Act. Standards should be set based on the maximum potential of the technology to mitigate emissions at a reasonable cost. If access to capital is a concern, the agencies should work with Congress to ensure that resources are made available for sufficient investment in the future prosperity of both the auto industry and American consumers rather than leaving them more vulnerable to future gasoline price spikes than is warranted.

Given that the proposed standards are well below economically practicable levels, we firmly believe this justifies substantial tightening of fleet average stringencies in the next (post- model year 2016) round of standards.

Minimization of Loopholes

UCS is concerned about the extent to which flexibility mechanisms being proposed in this rulemaking will erode oil and emissions savings. While we are supportive of compliance options that provide manufacturers multiple ways to meet regulatory obligations, it is critical that any

[8] Preamble, p. 208
[9] Preamble, p. 210

credits being given to the manufacturers correspond to actual avoided emissions in a real-world context. Below are a series of discussions addressing this issue in the context of (a) advanced technology vehicle credits and the treatment of upstream fuel cell, plug-in hybrid and battery electric vehicle emissions; (b) early credits; (c) A/C credits; (d) off-cycle technology credits; (e) temporary lead-time allowance alternative standards, and; (f) flex fuel vehicle credits. While all of these issues have the potential to erode the fleetwide benefits of the program, we are particularly concerned with the advanced technology vehicle credits. If poorly implemented or abused, these credits could undermine the effectiveness of the current proposal as well as set a negative precedent for future rulemakings.

Before addressing these issues, however, we would like to note our concern that the erosive impact of a number of flexibility mechanisms, such as banking, borrowing, and early action credits, were not quantified in the proposed rule. Before setting these policies in motion, we urge the agency to undertake an effort to quantify the impact of these flexibilities, to ensure that the finalized regulations do not inadvertently fall short of their goal.

Advanced Technology Vehicle Credits and the Treatment of Upstream EV Emissions

EPA has requested comment on proposed credit flexibilities that "encourage the early commercialization of advanced vehicle powertrains, including electric vehicles (EVs), plug-in hybrid electric vehicles (PHEVs), and fuel cell vehicles."[10] We break these flexibilities up into two categories.

First, is the proposed use of advanced technology vehicle credits for EVs, PHEVs, and FCVs in which a multiplier is applied to the number of vehicles sold, thus counting as more than one vehicle in the manufacturer's fleet average. These credits would be an additional incentive above and beyond existing, and substantial, vehicle R&D tax incentives, loans, grants, and joint development programs for such technologies. EPA proposes a multiplier in the range of 1.2 – 2.0 and solicits comment on both its magnitude and whether it should be held constant or ramp down over time.

UCS recognizes the rationale for such credits, but we are concerned about the magnitude of the multiplier and its effect on eroding actual emissions savings offered by the rule. At least one manufacturer – Nissan – has already announced plans to produce up to 150,000 EVs annually beginning as early as 2012.[11] Given Nissan's stated intentions, one questions whether advanced technology vehicle credits will encourage early adoption of EV technology, or whether they will merely provide windfall surplus credits to a company whose advanced technology development efforts are already underway.

The same is especially true for model year 2009-2011 EVs, for which EPA also proposes providing credits. Given EPCA's requirement of finalizing rules 18 months before the model

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[10] Preamble, p. 161

[11] "Nissan expects 20,000 initial orders for Leaf EV." Automotive News, September 29, 2009. Online at http://www.autonews.com/article/20090929/ANA05/909299990/1186.

year, such vehicles already have fully developed marketing plans that will not be affected by the MY2012-MY2016 rule. Providing credits for these model years simply provides the manufacturers with windfall credits, an approach fundamentally inconsistent with the stated objective of the policy.

Second, EPA proposes use of an emission factor of zero g/mi in the assessment of EVs, (the electric portion of) PHEVs, and FCVs. While EPA acknowledges that "in reality the total emissions…is not zero,"[12] it rationalizes the use of such a factor because it "is also interested in promoting very advanced technologies such as EVs which offer the future promise of significant reductions in GHG emissions."[13]

UCS strongly objects to this approach, as it lacks technical justification, erodes savings of the program, and even stands in stark contrast to recent assessments performed by the agency itself. According to the joint EPA-DOE website fueleconomy.gov, a recent (2003) pure electric vehicle is responsible for nearly half as much heat-trapping emissions as its gasoline-powered counterpart. The 2003 RAV4 EV has a stated annual carbon footprint of 3.9 tons of CO_2, while the gasoline (2-wheel drive, automatic transmission) version has an annual carbon footprint of 8.0 tons.

Credit Consequences

As demonstrated below, the consequences of offering either of these advanced technology incentives – individually or together – at volumes in line with Nissan's stated production are not trivial. According to Automotive News, Nissan expects to have 20,000 Leafs pre-sold by the third quarter of 2010, and intends to produce 150,000 units annually starting in late 2012. For the purpose of examining the upper bound impacts, let us assume Nissan's 2012 car sales reside at 958,696 units[14] (including electric vehicles) with a conventional passenger car fleet average stringency of 263 g/mi[15]. The inclusion of 0 g/mi for 150,000 passenger car electric vehicles would provide Nissan with approximately 7.5 million megagrams of credit, with no multiplier in effect. If an advanced technology vehicle credit multiplier were used, the credit amount would increase further, to between 8.8 million megagrams and 13.0 million megagrams (corresponding to a multiplier of 1.2 and 2.0, respectively). By contrast, the use of an emission factor that acknowledges the upstream environmental impact of electric drive vehicles would dampen the quantity of surplus credits that could be accrued, resulting in credits more reflective of actual tons saved. Assuming no multiplier, the use of a 130 g/mi emission factor (the value assigned to EVs in the California Pavley 1 program) would yield credits of 3.8 million megagrams. Multiplier use would increase credit amounts to between 4.4 million and 6.6 million megagrams (again, corresponding to a multiplier of 1.2 and 2.0, respectively). As summarized in Table 1, the effect of choosing a 0 g/mi factor over an alternative EV factor such as 130 g/mi yields the generation of between 3.7 and 6.4 million additional megagrams of credit. Similarly, as shown in Table 1, use of a 2.0 sales multiplier dramatically boosts manufacturer credits an additional 2.8 million to 5.5 million megagrams.

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[12] Preamble, p. 162
[13] Ibid
[14] Draft Joint Technical Support Document, Table 1-13.
[15] Table III.B.1-1

Table 1. Possible Credit Accrual Resulting from Sale of 150,000 Nissan Leaf EVs (megagrams)

	0 g/mi	130 g/mi	Difference Betwe g/mi and 130 g/
No Multiplier	7.53 million	3.81 million	3.72 million
Multiplier of 1.2	8.77 million	4.43 million	4.33 million
Multiplier of 2.0	13.03 million	6.59 million	6.44 million

Putting this into a comparative context, even assuming the more modest multiplier of 1.2, adoption of a 130 g/mi factor for 150,000 Leaf EVs would weaken the compliance stringency for Nissan's remaining passenger car fleet from 263 g/mi to 293 g/mi. Use of a 0 g/mi factor would weaken the compliance stringency from 263 g/mi to a troubling 322 g/mi (an erosion of an astounding 6.2 mpg-equivalent from Nissan's passenger car fleet). These values are higher than those of the average Model Year 2008 car and fleet.[16]

While UCS supports policies that encourage advanced technology development, we see no reasonable justification to provide windfall credits of this sort. Given the numerous incentives already in place to promote advanced technology development (R&D tax incentives, loans, grants, joint development programs, etc.), UCS strongly recommends that (a) no credits be offered before model year 2012 or after model year 2016 (by when commercialization decisions will have been made); (b) the use of a 0 g/mi emission factor be abandoned; (c) an emission factor reflective of actual in-use emissions, consistent with current research, be adopted; and (d) a multiplier no higher than 1.2 be used, with a rampdown of 0.05 per year (i.e. 1.20 in 2012; 1.15 in 2013; declining to 1.0 in 2016). This rampdown would provide a smooth transition for manufacturers while rewarding the earliest actors, as well as ensure that credits see a proper sunset. Alternatively, a more aggressive rampdown could be employed that is triggered once a manufacturer reaches a specific cumulative sales level, such as the first 200,000 units.

Further, it was unclear from our reading of the proposed rule whether the agency plans to allow trading, banking, or borrowing of advanced technology vehicle credits. UCS believes that any credits accrued for advanced technologies should not be available for trading, banking, or borrowing. The proposed advanced vehicle credits do not represent actual emission reductions and thus should not be available to manufacturers for the purpose of balancing emission deficits, or for trading to other manufacturers. Moreover, banking of credits would slow future technology adoption, undermining the concept behind the credit.

Should the agency decide to employ advanced technology credits, we urge the agency to consider that manufacturers have a history of becoming dependent on credits, opting to choose them over actual improvements when more cost effective. As such, it is critical that any advanced technology credits be limited in availability (quantity and duration), and that they be designed to truly accelerate technology as well as to minimize the loss of near term emission reductions that will occur.

Lastly, on a related note, UCS questions the underlying methodology used for computing advanced technology vehicle credits. The calculations assume approximately 191,000 miles of

[16] U.S. EPA, "Light-Duty Automotive Technology, Carbon Dioxide Emissions, and Fuel Economy Trends: 1975 Through 2009," EPA420-R-09-014, November 2009.

lifetime travel for passenger cars, and more than 220,000 miles of lifetime travel for light trucks. We believe it is unreasonable to assume that the first round of advanced technologies such as EVs, FCVs and PHEVs would see lifetime VMT as high as their conventional counterparts, and that use of the higher VMT artificially inflates the savings that those vehicles could provide the environment. Technology limitations as well as infrastructure limitations (causing, for example, limits to EV driving range) each play into advanced vehicle VMT levels, and should be accounted for when assessing the value of credits accrued by such technologies. As such, UCS recommends the agencies modify VMT assessments for advanced technology vehicles in the calculation of credits.

Early Credits

EPA proposes an opportunity for manufacturers to accrue "early credits" in model years 2009-2011 by over-compliance with a baseline standard. According to EPA,

> The baseline standard would be set to be equivalent, on a national level, to the California standards. Potentially, credits could be generated by over-compliance with this baseline in one of two ways – over-compliance by the fleet of vehicles sold in California and the CAA section 177 states (i.e., those states adopting the California program), or over-compliance with the fleet of vehicles sold in the 50 states. EPA is also proposing early credits based on over-compliance with CAFE, but only for vehicles sold in states outside of California and the CAA section 177 states.[17]

UCS is concerned that the approach as stated will erode the rule's energy and emissions benefits because the credits offered will not reflect real, surplus emissions. In order to ensure that the credits accrued are based on actual emissions reductions, it is essential that the baseline for each model year not be defined as equivalent to the California standards, but rather as the *more stringent* of CAFE or the California standard. Because model years 2009 and 2010 will see California standards less stringent than CAFE standards, the rule as proposed would supply manufacturers with credits simply for complying with the law. Further, it also appears that based on the proposed rule, manufacturers may be able to acquire credits simply by shuffling cleaner vehicles into California or CAA Section 177 states. While we are generally supportive of flexibility mechanisms, we recommend that the agency modify its proposal to close these early credit loopholes.

A/C Credits

UCS supports the availability of credits tied to A/C leakage and efficiency improvements. However, we believe it is critical that credit magnitudes accurately reflect real-world emissions reductions. We were surprised by the discrepancy between individual credits specified in the proposed rule, and those previously specified by the California Air Resources Board. We speculate this may be a result of differing baselines chosen by EPA and CARB, though other factors could be contributing to this as well. Since accurately reflecting emissions benefits offered by improved A/C systems is the ultimate goal, we suggest EPA have additional conversations with CARB to assess discrepancies before issuing its final rule.

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[17] Preamble, p. 61

Additionally, on the issue of system efficiency with the use of alternative refrigerants, EPA states,

> It is possible that alternative refrigerants could, without compensating action by the manufacturer, reduce the efficiency of the A/C system (see discussion of the A/C Efficiency Credit below.) However, EPA believes that manufacturers will have substantial incentives to design their systems to maintain the efficiency of the A/C system, therefore EPA is not accounting for any potential efficiency degradation.[18]

The agency does not elaborate on the "substantial incentives" manufacturers have for maintaining the efficiency of the A/C system. Given that the A/C system's efficiency (or lack thereof) will not appear on the 2-cycle test, it strikes us that manufacturers, rather, would *not* have the incentive to maintain the A/C efficiency system. We recommend the agency review this issue to account for efficiency degradation associated with certain alternative refrigerants.

Off-Cycle Technology Credits

UCS is supportive of credits generated by "off-cycle" technologies, as long as the off-cycle credits being given correspond to actual greenhouse gas emissions reductions yielded by the technology in a real-world environment. We support the notion of measuring the credits under the 5-cycle test. However, the alternative option laid out in the proposed rulemaking, the case-by-case approach to assessing off-cycle credits, raises some concerns. While we wholeheartedly agree with EPA's position that "the [alternative option's] demonstration program should be robust, verifiable, and capable of demonstrating the real-world emissions benefit of the technology with strong statistical significance,"[19] the proposal does not appear to include any opportunity for public comment on the approach taken to quantify credits prior to the agency's acceptance of the approach. Given the broad number of stakeholders with experience in the issues pertaining to these technologies, we believe it would be prudent to add an additional step soliciting and heeding public comment on any "alternative" approach to assessing off-cycle credits before any credits are granted to manufacturers.

Temporary Lead-time Allowance Alternative Standards

While consumers and the environment would be better off if all automakers had to meet EPA's standards on the same schedule, we acknowledge the EPA's rationale for this allowance because its effect will be to phase out NHTSA's system of fines that allow some manufacturers to pay to avoid meeting fuel economy standards. Manufacturers that have previously relied on the payment of fines as a regulatory compliance option no longer have that option under the Clean Air Act, and limited interim year leniency at the level proposed will help transition those manufacturers to the more stringent system. That said, in order to prevent this flexibility from becoming simply another loophole eroding energy and emissions savings, it is critical that the temporary lead-time allowance alternative standards be kept at the proposed levels and, further, kept as a temporary measure. This is a transition mechanism that will allow certain manufacturers to shift from one form of compliance to another; broadening the scope of these

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[18] Preamble, p. 150
[19] Preamble, p. 165.

allowances or extending their use beyond this period would undermine the goal of assisting in a swift transition to adoption of clean technologies.

Additionally, with respect to EPA's proposal to restrict the use of banking and trading between companies of credits in the primary program in years in which the TLAAS is being used, UCS concurs and supports such a restriction.

Flex Fuel Vehicle Credits

UCS has long opposed the industry's use of flex fuel vehicle (FFV) credits to lower fuel economy obligations given the facts that the credits are overly generous and very few vehicles outfitted with FFV technology are regularly operated on E85. We applaud EPA for their proposal to phase this loophole out by model year 2016 and require that any post-model year 2015 credits accrued under the program be based on actual E85 use rather than vehicle capability. The loophole created by these credits has eroded oil savings and pollution reductions for more than a decade and, while it is currently set to phase out by 2020 under EPCA, this is not guaranteed; historically, FFV credits have seen multiple extensions beyond their originally prescribed duration. If the FFV program were to continue in its current state, it would likely erode the 2016 fleet average between 0.5 and 0.8 mpg-equivalent, depending on the extent of the credit's use.

UCS strongly urges that EPA follow through with its proposed handling of FFV credits for model years 2016 and beyond, without modification.

Transparency and Compliance Accounting

We would like to commend the agencies in general on their noticeable efforts to provide high levels of transparency in the proposed rulemaking, and particularly to laud EPA for its detailed and thoroughly credible assessments of technology availability and technology cost. We would like to compliment EPA on its approach of basing its finding not upon confidential business information, as has been the practice of NHTSA in recent rulemakings, but rather upon well-documented, proven, and transparent findings.

We believe the agencies could further improve transparency by having a clear public accounting of credits and program compliance. Over the years, it has been exceedingly difficult to independently verify whether manufacturers are complaint with their CAFE obligations, and we have concerns that the same will hold true with manufacturers' vehicle greenhouse gas obligations. Given the numerous compliance flexibility mechanisms being proposed by the agency – as well as significant opportunity for trading, transferring, banking, and borrowing of credits – we feel it is critical that manufacturers' compliance ledgers be documented, publicly available, and sufficiently granular to assess by which measures companies are complying with the regulations.

For example, for each model year, this would include, but not be limited to, each manufacturer's: actual car average greenhouse gas emissions performance; actual light truck average greenhouse gas emissions performance; amount of credits (on at least a fleet average basis) accrued or used through advanced technology vehicle credits, early credits, A/C credits, off-cycle technology credits, flex fuel vehicle credits, and use of temporary lead-time allowance alternative standards; amount of total banks/debits accrued in each year; and a running balance of banks/debits. We

urge the agency to undertake an effort to provide clear public accounting of credits and program compliance.

Safety

The proposed rule includes a worst-case safety assessment based on a 2003 analysis conducted by NHTSA's Charles Kahane, an update of his previous work from 1997. UCS is concerned about the reliance upon this 2003 analysis, as it contains a fundamentally flawed methodological error that assumes a connection between vehicle weight and vehicle size. According to the agency,

> The underlying data used for that analysis does not allow NHTSA to analyze the specific impact of weight reduction at constant footprint because historically there have not been a large number of vehicles produced that relied substantially on material substitution. Rather, the data set includes vehicles that were either smaller and lighter or larger and heavier. The numbers in the NHTSA analysis predict the safety-related fatality consequences that would occur in the unlikely event that weight reduction for model years 2012-2016 is accomplished by reducing mass and reducing footprint. EPA concurs with NHTSA that the safety analysis conducted by NHTSA and presented in Section IV is a worst case analysis for fatalities, and that the actual impacts on vehicle safety could be much less. However, EPA and NHTSA are not able to quantify the lower-bound potential impacts at this time.[20]

This explanation elicits numerous responses. First, as noted, the 2003 Kahane study examines only the impact of reducing size and weight together and, further, only at an across-the-board weight cut, when in reality automakers would likely make most weight cuts in the larger vehicles (which would help save lives due to the reduction in aggressivity). By not separating out the individual impacts of size and weight, the analysis' assessment of the impact "reducing weight" by 100 pounds is actually an examination of the effect of reducing weight *and* size simultaneously. In these circumstances, the safety penalty of reducing size outweighs the impact of reducing weight, assuming no engineering improvements, so the analysis erroneously indicates an increase in fatalities.

By contrast, more recent research indicates that analysis can be done to separate the safety impacts of vehicle size and weight. Added research highlights the importance of design in determining safety. The modern body of research indicates that vehicle size and design – not weight – are the most relevant attributes associated with improved safety. In 2002 and 2003, Honda sponsored studies by DRI to look at these issues more carefully. The 2002 study helped address some fundamental flaws in Kahane's earlier work. The 2003 study separates out size and weight, and shows that what we expect from physics is, in fact, what we see in the safety statistics – namely that reducing weight, while maintaining size, reduces fatalities. Other research supports the findings that reducing size can be done safely with smart engineering. Research from Marc Ross (University of Michigan) and Tom Wenzel (LBNL), for example, show that well designed small cars can be as safe, or safer, than large SUVs and Pickups.[21]

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[20] Preamble, p. 271

[21] For more information on this issues, see S. Ahmad and D. Greene, 2004. "The Effect of Fuel Economy on Automobile Safety: A Reexamination"; M. Ross and T. Wenzel, 2002. "An Analysis of Traffic Deaths by Vehicle Type and Model"; R. M. Van Auken and J. W. Zellner. "A Further Assessment of the Effects of

Second, NHTSA decided upon size-based standards based on the findings of the 2003 DRI study, so any valid safety analysis of new CAFE standards must take into account the separate impacts of size and weight, as well as a realistic look at large vehicle aggressivity and how weight reduction would likely be distributed across the fleet. Under the footprint-based system, automakers are not helped by reducing passenger car or light truck size, because their targets only become more stringent. Further, reducing size reduces an important consumer attribute, something automakers are unlikely to do if there is no benefit in meeting standards. Reducing weight, on the other hand, helps manufacturers meet target stringencies without compromising customer utility and thus is a more likely approach for compliance. If anything, UCS is concerned that the size-based system will encourage automakers to upsize their fleet. Because larger vehicles have weaker requirements, automakers may try to steer consumers to these vehicles, much like they did with SUVs, which were, and still are, held to weaker standards. The result would be lower fuel economy and greater GHG emissions. As noted earlier in these comments, a backstop is crucial to helping avoid this.

Third, the 2003 Kahane study (and the 2003 DRI study, for that matter) is based on data from vehicles that are 10-20 years old. UCS recommends that any new assessment of safety impacts conducted by the agency include more recent data to account for the significant changes in safety design that have occurred in recent years. Honda, for example, has introduced their ACES body structure that does an even better job distributing the forces of a crash. Vehicles also now have more airbags, stability control systems, and even collision avoidance systems. Any analysis of safety impacts must include newer data to capture at least some of these effects.

Finally, while UCS recognizes the limited amount of time the agency had in issuing the proposed rule, we find it unacceptable that the agency draws misleading conclusions from dated data, and then uses the data set's shortcomings as justification for lack of a more rigorous assessment. Further, we find it irresponsible that NHTSA assess an upper fatality bound based on an "unlikely event," especially given the agencies' admitted inability "to quantify the lower-bound potential impacts at this time." Given the physics, the engineering, and the statistics on safety, it seems likely that increasing fuel economy and lowering greenhouse gas emissions will lead to fewer – not more – fatalities. Safety is a critical issue; in order to ensure that our roads become safer, NHTSA should reevaluate its current safety standards and strengthen them, especially when it comes to rollovers and roof strength, vehicle aggressivity, vehicle compatibility, and seatbelt use.

Social Cost of Carbon

The main value discussed for the social cost of carbon, $20 per metric ton for carbon dioxide emissions occurring in 2007 and rising to about $40 per metric ton by 2040 (assuming a 3% per year growth rate), falls far short of capturing the potentially immense impacts of climate change on the U.S. and throughout the world. Further, the NPRM does not provide sufficient justification for simply picking the average of the two interim estimates ($33 and $5 per metric ton). Such a choice assigns equal likelihood to both. Yet assessments from both EPA and EIA

Vehicle Weight and Size Parameters on Fatality Risk In Model Year 1985-98 Passenger Cars and 1985-97 Light Trucks."

show that the cost of carbon dioxide allowances under HR 2454, the cap-and-trade bill recently passed by the U.S. House of Representatives, will be 2.5-6.5 times the minimum that would result from the $5 per metric ton value.[22]

In finalizing the rule, the agencies should use a significantly higher value for the social cost of carbon. At a minimum, the value for their lower bound should be higher than the allowance costs from EPA and EIA for H.R. 2454. The cap under H.R. 2454 starts us down the right path, yet by no means represents the most aggressive mitigation pathway to avoid the worst impacts of climate change, and further cuts may well be necessary. As such, the allowance price estimates will likely not represent the full social cost of carbon.[23] The agencies should also provide justification for the weighting provided to their upper and lower bounds when picking a social cost of carbon to be used in evaluating the benefits of the rule.

Private Benefits

It was disconcerting to read in the NPRM that there was some debate about the role of private benefits in assessing the total benefits and costs of the program. The argument against including these benefits boils down to an attempt to force the assumption of a perfect free market on to a situation that is far from it. As noted in the NPRM, if the car market had all the features of a perfect free market (e.g. full information, perfect foresight, perfect substitutes, etc.) then there would be an argument for excluding the private benefits. But we know that consumers can not have full information and perfect foresight. For example, EPA window stickers and the EPA Fuel Economy Guide note that "Your Fuel Economy Will Vary."[24] Further, not even the government's Energy Information Agency can accurately predict gasoline prices.[25] Consumers also cannot predict future traffic patterns, changes in job location and many other factors that will influence how much they could save on gasoline from various vehicle choices.

Consumers also have not had perfect substitutes available in the market. The assertion that "fuel efficient cars are currently offered for sale, and consumers' purchasing decisions may suggest a preference for lower fuel economy than the proposed rule mandates" indicates a lack of knowledge about the actual vehicle offerings. For example, in minivans available for Model Year 2010, consumer fuel economy choices range from 18-20 mpg. To achieve higher fuel economy a consumer has one choice, a 23 mpg model that is smaller and less powerful than the others on the market. While a consumer choosing the 20 mpg model instead of the 23 mpg model does indicate that they place more value on the available size and performance than on the benefit of a 3 mpg increase, it does not imply that they would experience a welfare loss if they

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[22] $5 per ton in 2007 would reach about $10 per metric ton by 2030 at a 3 percent growth rate. EPA's June 2009 assessment of HR2454 estimated an allowance price of about $26 per metric ton in 2030, while EIA's August 2009 assessment estimated about $65 per metric ton for their basic case.

[23] For more information on U.S targets to avoid the worst consequences of climate change, see Lures, et. al, "How to Avoid Dangerous Climate Change: A Target for U.S. Emissions Reductions," Union of Concerned Scientists, September 2007, available on the web at http://www.ucsusa.org/assets/documents/global_warming/emissions-target-report.pdf

[24] EPA Model Year 2010 Fuel Economy Guide available at http://fueleconomy.gov/feg/FEG2010.pdf

[25] Annual Energy Outlook Retrospective Review: Evaluation of Projections in Past Editions (1982-2008), DOE/EIA-06403, September 2008, available at http://www.eia.doe.gov/oiaf/analysispaper/retrospective/pdf/0640%282008%29.pdf

were given a 23 mpg vehicle with the same size and performance as the 20 mpg model. With the technology available to automakers, consumers will be able to purchase 2016 models with the same size and performance, and likely even better safety, than they have today while also saving money on fuel.

Finally, the argument that consumers have an intuition that allows them to act as if they were operating in a perfect market is belied by the shifts in sales away from large SUVs that occurred as gas prices shot up in 2007 and 2008. Consumers, and manufacturers, were clearly unprepared for these changes and lacked the foresight and substitutes to maintain their welfare. If this intuition exists, it must be based on some unknown ability, as recent work by Kurani and Turentine indicates that consumers "do not have the basic building blocks of knowledge to make an economically rational decision."[26]

The agencies should continue including the private benefits when calculating the total benefits of the program and should not shift to a system that would include consumer choice models in the benefits assessments. It was those same consumer choice models that led many companies to dismiss hybrid-electric vehicles like the Prius, airbags, and many other innovations that have seen significant market success.

State Authority

This NPRM marks a significant improvement over past NPRMs covering fuel economy standards thanks to the removal of any language challenging both the Clean Air Act and court rulings on preemption. The issue of fuel economy preempting state emissions standards should be considered settled law and not brought up in the final or future rules. The agencies should continue to promulgate a rule that preserves state authority. California, along with many states, has led the nation in reducing emissions from cars and trucks and that role must be preserved to ensure continued progress in the years and decades to come. By incorporating California's standards, this NPRM implicitly recognizes the past value of California's efforts and further substantiates the value of preserving and supporting California's authority into the future.

[26] Kurani, Kenneth S. and Thomas S. Turrentine (2004) Automobile Buyer Decisions about Fuel Economy and Fuel Efficiency. Institute of Transportation Studies, University of California, Davis, Research Report UCD-ITS-RR-04-31, available at http://pubs.its.ucdavis.edu/publication_detail.php?id=193