

# Institute *for* Policy Integrity

NEW YORK UNIVERSITY SCHOOL OF LAW

May 2, 2018

Subject: Comments on the notice of proposed rulemaking,  
Docket ID No. NHTSA-2018-0017, RIN 2127-AL94

The Institute for Policy Integrity (“Policy Integrity”) at New York University School of Law<sup>1</sup> respectfully submits the following comments to the National Highway Traffic Safety Administration (NHTSA), regarding the proposal to “retain the current civil penalty rate” of \$5.50 per tenth of a mile per gallon for automobile manufacturers that do not meet applicable fuel economy standards. 83 Fed. Reg. 13,904 (“proposed rule”).

Policy Integrity is a non-partisan think tank dedicated to improving the quality of government decisionmaking through advocacy and scholarship in the fields of administrative law, economics, and public policy. We write to make the following comments:

- NHTSA’s proposed interpretation of the term “civil monetary penalty” is not consistent with the Inflation Adjustment Act of 2015.
- NHTSA should explain why it is justified in reducing the penalty from \$14 to \$5.50.
- NHTSA should consider the potential benefits when considering whether the civil penalties will have a “negative economic impact.”
- The Inflation Adjustment Act of 2015, not the Energy Policy and Conservation Act of 1975, governs this proceeding.
- The proposed rule is a significant rulemaking subject to Executive Order 12,866.

## **I. NHTSA unreasonably misinterprets the clear statutory language of “civil monetary penalty”**

NHTSA proposes that the bipartisan Inflation Adjustment Act of 2015 (2015 Act) should not apply to CAFE civil penalties because “the CAFE civil penalty rate is not a ‘civil monetary penalty,’ as defined by the 2015 Act.”<sup>2</sup> In particular, NHTSA argues that CAFE civil penalties are neither a “specific monetary amount” nor a “maximum amount,” but “[r]ather . . . are part of a complicated market-based enforcement mechanism.”<sup>3</sup> This argument contorts the plain, clear statutory language, ignores the agency’s longstanding interpretation of that language, and fundamentally misunderstands the relationship between a market-based compliance option like credit trading and penalties to punish non-compliance.

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<sup>1</sup> This document does not purport to present New York University School of Law’s views, if any.

<sup>2</sup> 83 Fed. Reg. at 13,904.

<sup>3</sup> *Id.* at 13,905; *see also id.* at 13,909.

**A. \$5.50 per 0.1mpg is a “specific” civil monetary penalty for non-compliance; Credit trading is a tool for coming into compliance, and does not result in variable penalties**

NHTSA wrongly asserts that the agency’s “previous *Federal Register* notices on its inflation adjustments under the 2015 Act did not consider whether the CAFE civil penalty rate fit the definition of a ‘civil monetary penalty’ subject to adjustment under the 2015 Act.”<sup>4</sup> In its July 5, 2016 interim final rule (“2016 Civil Penalties Rule”), NHTSA classified CAFE penalties as one of the “civil penalties for violations of statutes and regulations that NHTSA administers.”<sup>5</sup> In the December 28, 2016 final rule, NHTSA elaborated that the then-existing rate was specifically “\$5.50 per tenth-of-a-mile-per-gallon,” and explained that manufacturers that do not either install sufficient fuel economy-improving technologies, or else take advantage of market-based compliance flexibilities like credit trading and transfers, are “liable for civil penalties.”<sup>6</sup> In fact, the relevant definition of “civil monetary penalty” dates back to the 1990 Inflation Adjustment Act.<sup>7</sup> That definition covers “any penalty, fine or other sanction” that (1) either “is for a specific monetary amount” or “has a maximum amount,” and (2) is “assessed or enforced” both “by an agency” and “pursuant to an administrative proceeding or a civil action.”<sup>8</sup>

In short, CAFE penalties are for a specific amount assessed by NHTSA through an administrative proceeding. The reinterpretation (and misinterpretation) that NHTSA now offers is a change in position from those 2016 rulemakings. NHTSA admits as much, saying that its new interpretation “reflects a change in NHTSA’s position on this issue” from the 1997 rulemaking that first inflated the CAFE penalties from \$5 to \$5.50.<sup>9</sup> NHTSA has not sufficiently explained its sudden change in statutory interpretation.

NHTSA’s attempt to explain this sudden change in statutory interpretation hinges on a complete misunderstanding of the role of market-based compliance options like credit trading. The agency claims that the old penalty of \$5.50 per tenth-of-a-mile-per-gallon is not a “specific monetary amount,” because it is “part of a complex, statutory formula used to calculate a variable penalty.”<sup>10</sup> In particular, NHTSA insists that the ultimate penalty assessed against non-compliant manufacturers is not within the agency’s control, but rather depends on the manufacturer’s own decisions about whether to purchase or transfer credits, as well as on other manufacturers’ decisions about whether to sell credits, such that the penalty is not a specific amount but rather a “function of market forces.”<sup>11</sup> This argument attempts to complicate an enforcement system that is really straightforward and standard. Many, if not all, civil monetary penalties assessed by any agency depend, on some level, on the regulated entity’s decisions about whether or not, and how, to comply. The CAFE standard’s system of credit trading and transfers are simply market-based tools capping compliance costs.<sup>12</sup> Manufacturers’ decisions about whether to purchase and use credits

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<sup>4</sup> *Id.* at 13,904.

<sup>5</sup> 81 Fed. Reg. 43,524, 43,525 (July 5, 2016).

<sup>6</sup> 81 Fed. Reg. 95,489, 95,489 (Dec. 28, 2016).

<sup>7</sup> Compare 28 U.S.C. § 2461 note with Pub. L. 101-410, 104 Stat. 890 (1990).

<sup>8</sup> 28 U.S.C. § 2461 note, section 3(2).

<sup>9</sup> 83 Fed. Reg. at 13,908; see also 62 Fed. Reg. 5167, 5167-68 (Feb. 4, 1997) (classifying CAFE penalties as a civil penalty administered by NHTSA, to which the Federal Civil Monetary Penalty Inflation Adjustment Act of 1990, as amended by the Debt Collection Improvement Act of 1996, applies).

<sup>10</sup> 83 Fed. Reg. at 13,909.

<sup>11</sup> *Id.* at 13,905 & 13,909.

<sup>12</sup> *E.g.* 74 Fed. Reg. 14,196, 14206 (Mar. 30, 2009) (“Under Part 536, credit holders . . . will have credit accounts with NHTSA, and will be able to hold credits, apply them to compliance with CAFE standards,

are no different than any other decision about whether and how to comply with a regulatory standard. Credit trading and transfers allow the manufacturer to reduce its incidence of non-compliance, but the penalty per incidence of non-compliance remains fixed and specific: \$5.50 (before inflation) for each tenth of a mile-per-gallon shortfall. No amount of credit trading changes the fact that, for each tenth of a mile-per-gallon shortfall, NHTSA must ultimately and specifically assess at least \$5.50 (before inflation).

NHTSA's argument that a manufacturer's level of compliance changes depending on the use of credits or credit-trading based on the use credit-trading<sup>13</sup> could also have unpredictable consequences both for the status of credit-trading markets under the CAFE program and for the many other regulatory programs that rely on market-based flexible compliance options.<sup>14</sup> Regardless of the use of credit or trading, the underlying penalty remains the same. As a leading agency in the use of market-based flexible compliance options,<sup>15</sup> NHTSA needs to be more careful about how it characterizes the relationship between credit trading and compliance.

In conclusion, credit trading is a compliance option, and does not change the specific penalty assessed per tenth of a mile-per-gallon shortfall is \$5.50 (before inflation).

**B. \$10 per 0.1mpg is a “maximum” civil monetary penalty, and must also be adjusted for inflation**

NHTSA also “tentatively concludes” that the Energy Policy and Conservation Act of 1975's (EPCA) \$10 cap on CAFE penalties should not be adjusted for inflation,<sup>16</sup> though the agency asks for comments on this matter.<sup>17</sup> NHTSA argues that the 2015 Act does not apply because “NHTSA cannot assess or enforce the \$10 cap against anyone”; “[r]ather, it is a limit on the amount NHTSA can set for the CAFE civil penalty rate if the required determinations are made.”<sup>18</sup> NHTSA misreads the statute's definition of a “civil monetary penalty.” That definition covers, in relevant part, “any penalty, fine, or other sanction that . . . has a maximum amount provided for by Federal law and is assessed or enforced by an agency.”<sup>19</sup> Later the Act instructs agencies to increase “the maximum civil monetary penalty or the range of minimum and maximum civil monetary penalties, as

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transfer them to another ‘compliance category’ for application to compliance there, or trade them.”); *id.* at 14,218 (“In the event that a manufacturer does not comply with a CAFE standard, even after the consideration of credits, EPCA provides for the assessing of civil penalties.”); 81 Fed. Reg. at 95,489 (“[S]ince the introduction of credit trading and transfers for MY 2011 and after, many manufacturers have taken advantage of those flexibilities rather than paying civil penalties for non-compliance.”).

<sup>13</sup> See 83 Fed. Reg. at 13,906.

<sup>14</sup> For example, lingering uncertainty about the legal status of water quality trading programs has made regulated entities reluctant to participate. Jason A. Schwartz, *Marketable Permits: Recommendations on Applications and Management* 23 (Final Consultant Report to the Administrative Conference of the United States, Dec. 11, 2017),

<https://www.acus.gov/sites/default/files/documents/Marketable%20Permits%20Report-final.pdf>.

<sup>15</sup> See 82 Fed. Reg. 56,181, 56,182-84 (in its Request for Information on adding market-based flexibilities to one of its regulatory programs, the Department of Energy uses the CAFE program of averaging and trading as its leading example).

<sup>16</sup> 83 Fed. Reg. at 13,905 n.1; *accord. id.* at 13,908 & 13,916.

<sup>17</sup> 83 Fed. Reg. at 13,905 & 13,916.

<sup>18</sup> 83 Fed. Reg. at 13,916.

<sup>19</sup> 28 U.S.C. § 2461 note.

applicable, for each civil monetary penalty.”<sup>20</sup> The references to a maximum penalty, which much be adjusted for inflation, apply quite straightforwardly to EPCA’s \$10 upper-limit on penalties.

Moreover, if the \$10 maximum were a permanent cap never subject to inflation, that would defeat Congress’s stated purposes for the 2015 Act: namely, to “allow for regular adjustment for inflation of civil monetary penalties” and to “maintain the deterrent effect of civil monetary penalties and promote compliance with the law.”<sup>21</sup> Not only could the required adjustment of the old \$5.50 penalty to the current \$14 penalty not take full effect if the \$10 limit were read as an un-adjustable cap, but no further adjustments for inflation could ever occur, and the CAFE penalty would quickly lose deterrent effect. The \$10 limit must therefore also be fully adjusted for inflation, to the \$25 figure set by NHTSA in 2016.<sup>22</sup>

### **C. The CAFE standards’ increasing stringency is not a unique feature that warrants exemption**

The agency suggests that Congress could not have intended for the CAFE penalties to ever adjust for inflation, because Congress already required the CAFE standards to “continually increase . . . to maximum feasible level.”<sup>23</sup> The apparent implication is it would be so unfair to require both “mandatory penalty inflation adjustments *and* continuous fuel standard increases” that Congress could never have intended such a result.<sup>24</sup> The agency concludes its argument by alleging that this combination of regular inflation adjustments plus increasing stringency “does not occur with other types of penalties.”<sup>25</sup>

First, the penalties-adjustment under the 2015 Act is not even an increase in real terms. The penalties-adjustment only “increases” the penalty to be more in line with inflation. As such, the penalties-adjustment cannot conflict with the fuel-standard increases.

Second, adjusting the penalty and increasing the standard have different purposes, and so it should not be surprising that Congress would have intended both the adjustment and increase to occur regularly. EPCA requires regular review of the standards’ stringency, so that the standards always reflect the level of efficiency that is technologically feasible. In contrast, the Inflation Adjustment Act was meant to maintain the deterrent effect of the penalties in light of inflation, regardless of any changes in technology that might inform the review of the standards’ stringency.

In any event, NHTSA’s entire argument is based on a false premise. Many regulatory standards undergo statutorily required reviews at regular intervals to increase stringency, and other agencies have had no trouble applying inflation adjustments to the civil penalties associated with such regulatory requirements. For example, the Department of Energy’s energy conservation program for appliances and commercial equipment—authorized under the EPCA, the act that created the CAFE program—requires that the agency assess every six years<sup>26</sup> whether the energy efficiency standards “achieve the maximum improvement in energy efficiency . . . [that] is technologically feasible and economically justified.”<sup>27</sup> As recently as January 2018, the Department of Energy

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<sup>20</sup> 28 U.S.C. § 2461 note.

<sup>21</sup> 28 U.S.C. § 2461 note.

<sup>22</sup> 81 Fed. Reg. at 43,526.

<sup>23</sup> 83 Fed. Reg. at 13,911.

<sup>24</sup> *Id.*

<sup>25</sup> *Id.*

<sup>26</sup> 42 U.S.C. § 6295(m).

<sup>27</sup> 42 U.S.C. § 6295(o)(2)(A).

applied the 2015 Act to adjust the civil penalties for its standards—standards which the agency must regularly increase up to maximum feasible levels.<sup>28</sup> There is nothing unique about the CAFE civil penalties that would suggest Congress intended to exempt them from the 2015 Act.

#### **D. Neither the CAFE penalty's dollar size nor revenue estimates justify an exemption**

NHTSA's other arguments for why the 2015 Act should not apply to the CAFE civil penalties are equally unconvincing. The agency argues that the discrepancy between the Congressional Budget Office's assessment of the 2015 Act's revenue effects, compared to industry commenters' allegations about their anticipated cost increases from inflating the CAFE penalty, "further suggests Congress had not considered the [CAFE] civil penalty rate subject to the 2015 Act's inflation adjustment."<sup>29</sup> Not only are Congressional Budget Office estimates poor evidence of congressional intent,<sup>30</sup> but—as further discussed below—industry's dire predictions about their own costs, made in an attempt to justify deregulation, provide no evidence of congressional intent.

The agency's argument that the Act's rule about rounding to the nearest dollar creates a *de minimis* exemption for the "small dollar value CAFE civil penalty rate"<sup>31</sup> ignores basic math. Here, fully adjusting the penalty for inflation since 1975 would have increased the penalty four-fold, from \$5.50 to \$22.<sup>32</sup> The 2015 Act's limit on initial catch-up increases to 150% would drop that adjusted rate to \$13.75, but the rounding rule pushes the final penalty up slightly higher to \$14.<sup>33</sup> None of these figures is a *de minimis* increase from \$5.50. As explained in Part II, applying the Inflation Adjustment Act of 2015 to the CAFE penalty will have a meaningful effect on fuel economy and deterrence.

## **II. NHTSA should explain why it is justified in reducing the penalty from \$14 to \$5.50**

In the proposed rule, NHTSA claims that it is "proposing to retain the current civil penalty rate" of \$5.50 per tenth of a mile-per-gallon.<sup>34</sup> But the "current civil penalty rate" was set at \$14 per tenth of a mile-per-gallon in 2016 through a final agency action.<sup>35</sup> NHTSA did attempt to suspend that rule, but NHTSA's suspension was recently vacated by the U.S. Court of Appeals for the Second Circuit.<sup>36</sup> Therefore, the proposed rule does not "retain" the \$5.50 penalty. The proposed rule *rescinds* the \$14 penalty and reinstates the \$5.50 penalty. As explained below, in lowering the penalty from \$14 penalty to \$5.50, NHTSA has caused forgone benefits, which will have a significant impact on the

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<sup>28</sup> 83 Fed. Reg. 1289, 1291 (Jan. 11, 2018) (applying the Inflation Adjustment Act of 2015 to 10 U.S.C. part 429 (which sets penalties for "certification, compliance, and enforcement for consumer products and commercial and industrial equipment") and part 431 (which sets penalties for "energy efficiency program for certain commercial and industrial equipment")).

<sup>29</sup> 83 Fed. Reg. at 13,911.

<sup>30</sup> *Laumann v. Nat'l Hockey League*, 56 F.Supp.3d 280, 297 (S.D.N.Y. 2014) (to determine whether a regulated entity is exempt from a statute, "a CBO cost estimate is not persuasive evidence of congressional intent."); *Sharp v. U.S.*, 580 F.3d 1234, 1239 (Fed. Cir. 2009) ("the CBO is not Congress"); *Kelsoe v. Federal Crop Ins. Corp.*, 724 F.Supp. 448, 450 (E.D. Tex. 1988) ("the letter from the Director of the Congressional Budget Office . . . is also wholly unpersuasive on the issue of Congressional intent.").

<sup>31</sup> 83 Fed. Reg. at 13,911.

<sup>32</sup> 81 Fed. Reg. at 43,526.

<sup>33</sup> *Id.*

<sup>34</sup> 83 Fed. Reg. 13,904, 13,904 (Apr. 2, 2018) ("proposed rule").

<sup>35</sup> 81 Fed. Reg. 43,524 (July 5, 2016) ("2016 Civil Penalties Rule"); *see also* Response to Pet. For Reconsideration, 81 Fed. Reg. 95,489 (Dec. 28, 2016).

<sup>36</sup> Order, *Natural Resources Def. Council v. NHTSA*, No. 17-2806 (2d Cir. Apr. 23, 2018), ECF No. 194.

environment. NHTSA's failure to address the forgone benefits and the environmental impact is arbitrary and capricious.

#### **A. Lowering the penalty causes forgone benefits**

“[T]he purpose of civil penalties for non-compliance is to encourage manufacturers to comply with the CAFE standards.”<sup>37</sup> In economic terms, the penalties work like safety valves because they allow car manufacturers to comply with the CAFE standards or pay the penalty if their compliance costs would otherwise be too high.<sup>38</sup> The penalties also allow manufacturers to increase compliance partially and pay only partial penalties. Thus, when an individual manufacturer's marginal costs of compliance with the standards exceed the penalty, the company can be expected to choose to pay the penalties. But when the marginal cost of compliance is lower than the penalty, the company will comply with the standards.

The statute also allows manufacturers to earn tradable compliance credits for compliance with future stricter standards or higher penalties, with each credit representing a tenth of a mile-per-gallon for the manufacturer's fleet.<sup>39</sup> Thus, when the penalty is adjusted, depending on the predicted value of credits, a company may choose to overcomply in order to earn credits in advance of future compliance needs.

In this way, the proposed rule would be expected to particularly affect compliance plans of manufacturers that face marginal compliance costs between \$5.50 and \$14 per tenth of a mile-per-gallon. With the 2016 Civil Penalties Rule, those manufacturers would be expected to increase compliance.<sup>40</sup> The 2016 Civil Penalties Rule would also increase the incentive to earn credits for earlier and more aggressive investments in compliance. Consequently, even some of the manufacturers who would be fully compliant under \$5.50 penalty are expected to increase the fuel efficiency of their fleet to generate additional compliance credits that they can sell to other manufacturers. And without the 2016 Civil Penalties Rule, those manufacturers would not be expected to increase their compliance or invest in obtaining credits.

Policy Integrity used NHTSA's own model, the CAFE Compliance and Effects Model, commonly referred to as “the CAFE model” or “the Volpe model,” to assess the impact of the reduced penalty

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<sup>37</sup> 81 Fed. Reg. at 95,490.

<sup>38</sup> See 2017 and Later Model Year Light-Duty Vehicle Greenhouse Gas Emissions and Corporate Average Fuel Economy Standards, 77 Fed. Reg. 62,624, 63,127 (Oct. 15, 2012); See also NHTSA, CAFE Pub. Info. Ctr., Civil Penalties (“Manufacturers that do not meet the applicable standards in a given model year can pay a civil penalty.”); NHTSA, CAFE Overview (describing the availability of penalties for manufacturers that do not meet the applicable standards); John K. Stranlund, *The Economics of Enforcing Emissions Markets: A Review of the Literature*, 11 Rev. Envtl. Econs. Policy 231, 238 (2017) (describing the economics of compliance); Henry D. Jacoby & A. Denny Ellerman, *The Safety Valve and Climate Policy*, 32 Energy Policy 481 (2004) (describing the use of the safety valve principle to limit the cost of emissions restrictions); Marc J. Roberts & Michael Spence, Effluent charges and licenses under uncertainty, 5 J. Public Econ. 203 (1976) (describing the benefits of a penalty system enhancing the emission licensing when the abatement costs are unknown); William A. Pizer, *Combining Price and Quantity Controls to Mitigate Global Climate Change*, 85 J. Public Econ. 431 (2002) (describing the welfare benefits of enhancing quantity controls by using price controls like penalties when the compliance costs are unknown to the regulator).

<sup>39</sup> 49 U.S.C. § 32903(f) (2016).

<sup>40</sup> See Mark R. Jacobsen, *Evaluating U.S. Fuel Economy Standards in a Model with Producer and Household Heterogeneity*, 5 Am. Econ. J. 148, 156 (2013) (describing how compliance status is affected by marginal costs of compliance and penalties).

on fuel economy.<sup>41</sup> To perform the analysis, we used the model software and source code that are available on NHTSA's website.<sup>42</sup> And we used the data underlying the 2016 Draft Technical Assessment Report for Model Years 2022-2025 Passenger Cars and Light Trucks ("NHTSA data").<sup>43</sup>

To estimate the impact of the proposed rule, we left the model inputs constant, with one exception,<sup>44</sup> and assumed that the \$14 penalty would never apply. The default modeling horizon for the Volpe model is 2032. Thus, we used the \$5.50 penalty from prior to the 2016 Civil Penalties Rule through the year 2032, in order to obtain an estimate of the impact of a permanent reduction.

We then compared that scenario with a "baseline scenario," where the \$14 penalty applies starting with Model Year 2019, as established in the 2016 Civil Penalties Rule.<sup>45</sup> In comparing the proposed rule scenario with the baseline scenario, we were able to obtain an estimate of the impact that the proposed rule would have on average fuel economy for each year through 2032. Figure 1, below, provides this information over time.

Specifically, we determined that reducing the 2016 Civil Penalties Rule would lower the average passenger car fuel economy by 2.24 mpg from 46.63 mpg (under the baseline scenario) to 44.39 mpg in the year 2022, representing a 200% growth in non-compliance. In the year 2032, the proposed rule will cause average passenger car fuel economy to drop almost 5 mpg, from a baseline

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<sup>41</sup> See NHTSA, Compliance and Effects Modeling System: The Volpe Model, <https://www.nhtsa.gov/corporate-average-fuel-economy/compliance-and-effects-modeling-system>; See also Draft Technical Assessment Report Midterm Evaluation of Light-Duty Vehicle Greenhouse Gas Emission Standards and Corporate Average Fuel Economy Standards for Model Years 2022-2025 at Section 5.4.2, Environmental Protection Agency, National Highway Traffic Safety Administration and California Air Resources Board (July 2016) (describing the model and engineering assumptions underlying it).

<sup>42</sup> See NHTSA, Compliance and Effects Modeling System: The Volpe Model, <https://www.nhtsa.gov/corporate-average-fuel-economy/compliance-and-effects-modeling-system>.

<sup>43</sup> The technology file we used was "technologies\_2016-05-14\_ATxP.xlsx." In the scenario file, we used the "Augural CAFE Standards" as the basis for simulations. That data included all of the CAFE standard increases that have been set so far by the agency. See NHTSA and EPA, 2017 and Later Model Year Light-Duty Vehicle Greenhouse Gas Emissions and Corporate Average Fuel Economy Standards, 77 Fed. Reg. 62,624, 62,627-28 (Oct. 15, 2012) (describing standards for 2017 and later); EPA, Final Determination on the Appropriateness of the Model Year 2022-2025 Light-Duty Vehicle Greenhouse Gas Emissions Standards under the Midterm Evaluation (2017), <https://nepis.epa.gov/Exe/ZyPDF.cgi?Dockkey=P100QQ91.pdf> (determining that it was appropriate to maintain the standards as set in 2012). In April 2018, NHTSA withdrew the 2017 Final Determination, announcing an intention to reduce fuel economy standards for model years 2022-2025. 83 Fed. Reg. 16,077, 16,078 (Apr. 13, 2018). But NHTSA has yet to finalize any revision of the standards.

<sup>44</sup> The default inputs into the Volpe model assume that non-European manufacturers will choose to comply with CAFE standards regardless of how high compliances costs become, but that assumption is not reasonable. The assumption appears to be based on historic compliance levels during a time when regulation stringency was much lower as compared to future standards. See Union of Concerned Scientists, Response to Automaker Comments Regarding Raising CAFE Fines at 5 (Dec. 21, 2017),

<https://www.regulations.gov/document?D=NHTSA-2017-0059-0019>. With an increased penalty and more stringent fuel economy standard, historic compliance levels are likely to change. See *id.* Indeed, NHTSA recently acknowledged that "manufacturers are falling behind the standards for model year 2016 and increasingly so for model year 2017" and so "it is likely that many [more] manufacturers will face the possibility of paying larger CAFE penalties over the next several years than at present." Reconsideration of Final Rule on Civil Penalties, 82 Fed. Reg. 32,140, 32,141. While there might be factors other than economic considerations affecting the decision whether to pay penalty or comply, in running the model, we have assumed that all manufacturers behave consistently with standard economic theory and observations and pay the penalty when it is less expensive than their costs of compliance.

<sup>45</sup> See Response to Pet. For Reconsideration, 81 Fed. Reg. 95,489 (Dec. 28, 2016).

scenario of 54.75 mpg to 49.75 mpg. For the passenger car fleet, vehicles can be expected to consume an additional 25 billion gallons between 2017 and 2032. For the total fleet, the expected increased fuel consumption amounts to 54 billion gallons between 2017 and 2032.

Figure 1 illustrates the impact of the proposed rule on fuel economy over time.

*Figure 1*

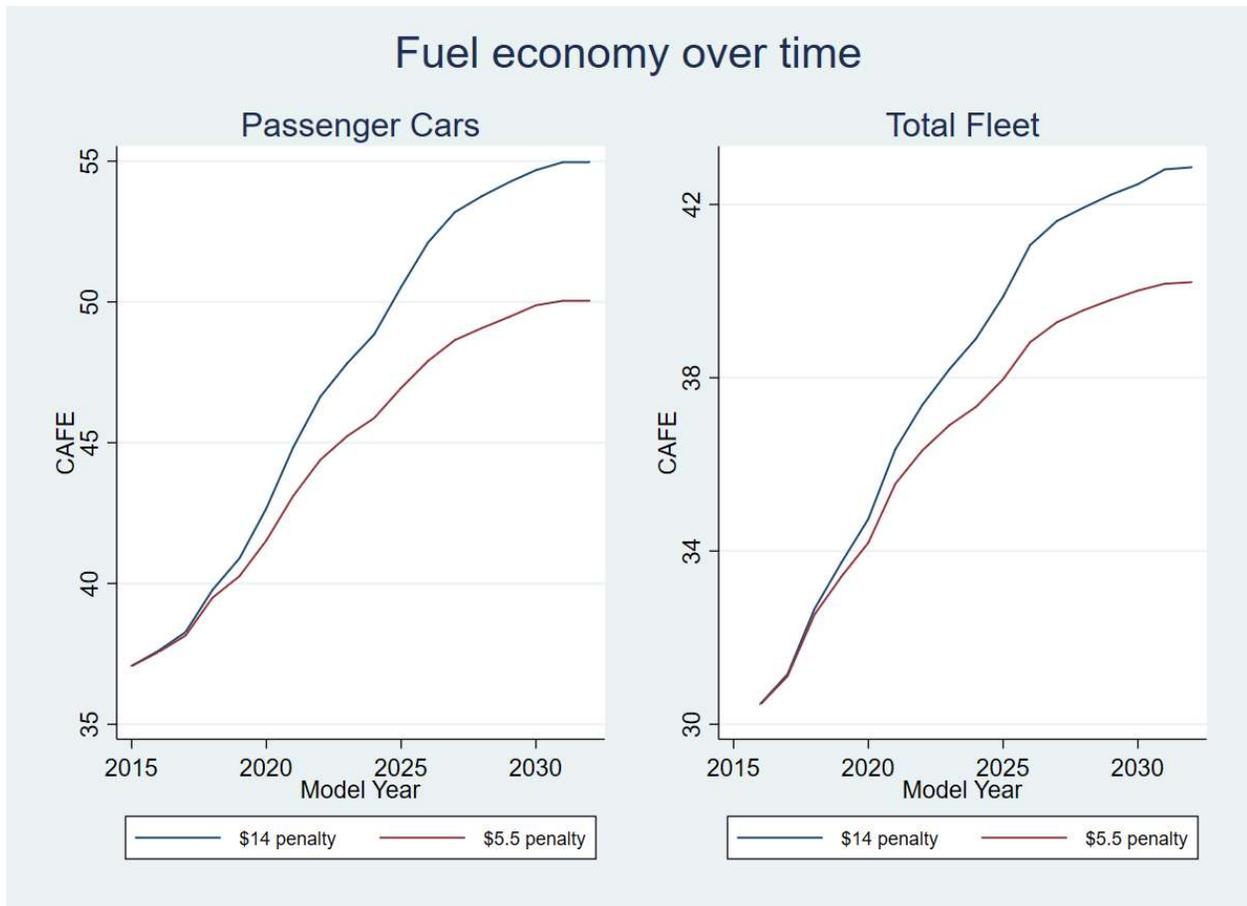
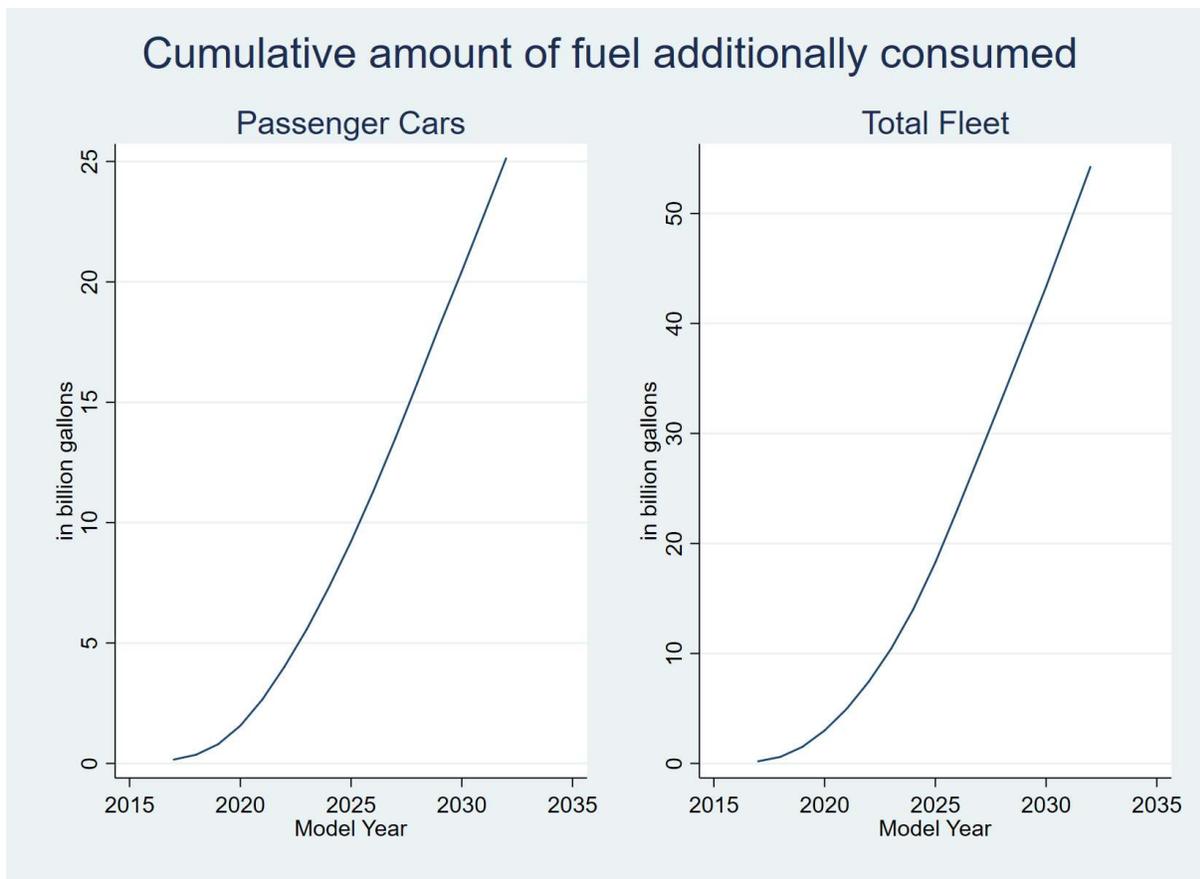


Figure 2 shows the cumulative amount of additional gallons consumed as a result of the proposed rule, for both passenger cars and the total fleet, per year.

Figure 2



And with these losses in fuel economy come significant harms, including increased emissions of greenhouse gases and conventional pollutants, increased fueling time, and decreased fuel savings.<sup>46</sup> NHTSA acknowledged as much in its proposal to reconsider the 2016 Civil Penalties Rule, explaining that an increased CAFE penalty rate would lead to “greater fuel savings and other benefits.”<sup>47</sup>

The numbers presented in the figures were obtained based on the fuel price predictions used for 2016 Draft TAR for Model Years 2022-2025. To calculate the potential impact of changes in fuel price developments and forecasts, we re-ran the Volpe model using data from Annual Energy Outlook 2018.<sup>48</sup> The results we obtained were very similar to the results using the predictions in the 2016 Draft TAR for Model Years 2022-2025. With the updated fuel prices, reducing the 2016 Civil Penalties Rule would lower the average passenger car fuel economy by 1.88 mpg from 46.91 mpg (under the baseline scenario) to 45.04 mpg in the year 2022. In the year 2032, the proposed rule will cause average passenger car fuel economy to drop by 4 mpg, from a baseline scenario of

<sup>46</sup> See 77 Fed. Reg. at 63,057-62 (describing and quantifying the benefits of improved fuel economy).

<sup>47</sup> Reconsideration of Final Rule, 82 Fed. Reg. 32,140, 32,142 (July 12, 2017).

<sup>48</sup> Available at <https://www.eia.gov/outlooks/aeo/>.

55.45 mpg to 51.48 mpg. For the passenger car fleet, vehicles can be expected to consume an additional 20 billion gallons between 2017 and 2032. For the total fleet, the expected increased fuel consumption amounts to 52 billion gallons between 2017 and 2032.

### **B. NHTSA's failure to address the forgone benefits is arbitrary and capricious**

When an agency cancels or rescinds a regulation, it removes the protections and benefits that the regulation would have provided to society—causing a cost in the form of forgone benefits.<sup>49</sup> “Although an agency is entitled to change its policy positions, it has an obligation to adequately explain the reason for the change and its rejection of its earlier factual findings.”<sup>50</sup> In that explanation, an agency must (1) “examine the relevant data” and (2) “articulate a satisfactory explanation for its action including a rational connection between the facts found and the choice made.”<sup>51</sup> This requirement that agencies engage in reasoned decisionmaking “prevents officials from cowering behind bureaucratic mumbo-jumbo.”<sup>52</sup>

Forgone benefits are an important category of “relevant data” that NHTSA must take into account.<sup>53</sup> As explained above, the proposed rule will cause forgone benefits. But in the proposed rule, NHTSA has not addressed those forgone benefits at all. Instead, NHTSA’s analysis assumes that the proposed \$5.50 penalty is simply a continuation of the status quo. That is not correct. NHTSA’s proposed rule disrupts the status quo and lowers the penalty from \$14 to \$5.50.<sup>54</sup> NHTSA’s failure to address the impact of that reduction is a “serious flaw undermining” the agency’s analysis of benefits and harms and it renders the proposed rule unreasonable.<sup>55</sup>

### **C. NHTSA's NEPA analysis is factually inaccurate**

In the NEPA analysis in the proposed rule, NHTSA asserts that increasing the penalty will result in “only marginally better level of compliance.”<sup>56</sup> NHTSA also states that the proposed action will have “no impact or a small positive impact on the quality of the human environment.”<sup>57</sup> This NEPA analysis is faulty for two reasons.

First, NHTSA has misleadingly misidentified the no action alternative. On December 28, 2016, NHTSA finalized an inflation adjustment of the CAFE penalty to \$14 per tenth of a mile-per-gallon.<sup>58</sup> Though NHTSA later attempted to stay the effective date of that final rule, the 2016 Civil Penalties Rule remains the final rule until it is repealed or replaced through a proper notice-and-comment proceeding (and furthermore, the U.S. Court of Appeals for the Second Circuit recently invalidated

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<sup>49</sup> See *California v. U.S. Bureau of Land Mgmt.*, 277 F. Supp. 3d 1106, 1122 (N.D. Cal. 2017) (BLM’s failure to consider forgone benefits was arbitrary and capricious.).

<sup>50</sup> *Id.*

<sup>51</sup> *Motor Vehicle Mfrs. Ass’n v. State Farm Mut. Auto. Ins. Co.*, 463 U.S. 29, 43 (1983) (internal quotation marks omitted).

<sup>52</sup> *Competitive Enter. Inst.*, 956 F.2d at 326-27.

<sup>53</sup> *State Farm*, 463 U.S. at 43; See also *Michigan v. EPA*, 135 S. Ct. 2699, 2707 (2015) (“Consideration of cost reflects the understanding that reasonable regulation ordinarily requires paying attention to the advantages and the disadvantages of agency decisions.”); *Mingo Logan Coal Co. v. EPA*, 829 F.3d 710, 730 (D.C. Cir. 2016) (Kavanaugh, J., dissenting) (considering the costs of a repeal “is common sense and settled law”).

<sup>54</sup> See *California*, 277 F. Supp. 3d at 1120 (explaining how a suspension disrupts the status quo).

<sup>55</sup> *Nat’l Ass’n of Home Builders v. EPA*, 682 F.3d 1032, 1040 (D.C. Cir. 2012).

<sup>56</sup> 83 Fed. Reg. at 13,918.

<sup>57</sup> *Id.*

<sup>58</sup> 81 Fed. Reg. 95,489.

NHTSA's stay as illegal). Consequently, the \$14 penalty should be the no action alternative, against which the agency may compare its preferred proposal of reverting back to the \$5.50 penalty.

Second, again, NHTSA's own model easily demonstrates that that NHTSA's claim that the proposed rule would only have a "negligible"<sup>59</sup> impact on the environment is false. As described above, reducing the 2016 Civil Penalties Rule would lower the average passenger car fuel economy by 2.24 mpg from 46.63 mpg (under the baseline scenario) to 44.39 mpg in the year 2022, representing a 200% growth in non-compliance. In the year 2032, the proposed rule will cause average passenger car fuel economy to drop almost 5 mpg, from a baseline scenario of 54.75 mpg to 49.75 mpg. For the passenger car fleet, vehicles can be expected to consume an additional 25 billion gallons between 2017 and 2032. For the total fleet, the expected increased fuel consumption amounts to 54 billion gallons between 2017 and 2032.

NHTSA should monetize the forgone emission reductions. Because NHTSA seemingly wishes to rely in part on the environmental impact statements prepared separately for the CAFE standards themselves, these comments hereby incorporate our previous comments, submitted recently by Policy Integrity and other organizations, on the requirement under NEPA for NHTSA to use the social cost of greenhouse gases to assess the environmental impact of its CAFE standards.<sup>60</sup> The arguments on the need to use the social cost of greenhouse gases apply with equal force to any NEPA analysis conducted on changes to the CAFE civil penalties.

### **III. NHTSA's proposed analysis of "negative economic impact" is arbitrary and capricious**

#### **A. NHTSA should consider the benefits of the 2016 Civil Penalties Rule when considering whether the civil penalties will have a "negative economic impact"**

The 2015 Act provided that NHTSA must adjust the civil penalties to reflect inflation. But the Act also authorized NHTSA to adjust the penalty by less than the amount otherwise required if NHTSA determines that "increasing the civil monetary penalty by the otherwise required amount will have a negative economic impact."<sup>61</sup>

NHTSA proposes to interpret the term "negative economic impact" without reference to any potential benefits of the 2016 Civil Penalties Rule.<sup>62</sup> But "negative economic impact" must mean "negative net economic impact" and if there are enough benefits the economic impact would be positive. Even if the question presented by this proposed rule were simply a question of whether NHTSA should "retain"<sup>63</sup> the \$5.50 penalty (and it is not, as explained above)—NHTSA's proposal would be arbitrary and capricious.<sup>64</sup> It is well-settled that ignoring the benefits of a regulatory action while relying only on the costs is arbitrary and capricious.<sup>65</sup> In fact, in a case addressing a

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<sup>59</sup> 83 Fed. Reg. at 13,918.

<sup>60</sup> See **Exhibit A**.

<sup>61</sup> Pub. L. 114-74 § 701(c) (2015) ("The purpose of this Act is to establish a mechanism that shall allow for regular adjustment for inflation of civil monetary penalties; maintain the deterrent effect of civil monetary penalties and promote compliance with the law; and improve the collection by the Federal Government of civil monetary penalties.").

<sup>62</sup> 83 Fed. Reg. at 13,913.

<sup>63</sup> 83 Fed. Reg. at 13,904.

<sup>64</sup> *Id.* at 13,913.

<sup>65</sup> *Competitive Enter. Inst. v. Nat'l Highway Traffic Safety Admin.*, 956 F.2d 321, 326-27 (D.C. Cir. 1992) (holding that agency was required to explain whether safety concerns outweighed benefits of energy savings in new

NHTSA decision, the U.S. Court of Appeals for the Ninth Circuit held that NHTSA could not “put a thumb on the scale by undervaluing the benefits and overvaluing the costs” when finalizing a fuel-economy standard.<sup>66</sup> The same principle applies here.

Though Congress did not define the phrase “negative economic impact,” OMB did determine that such circumstances were intended to be “rare.”<sup>67</sup> And any rational understanding of that phrase should include some showing of a significant and net negative economic impact. The mere existence of some negative effect on some individual or automaker cannot be enough to invoke the exception, because otherwise the exception would swallow the rule. Any increase in the penalty could diminish profits for those individual firms that would not comply with the standards but for this inflation adjustment (i.e., counterfactual “non-compliant” firms). If that were sufficient grounds to invoke the exception, the exception would always apply and would not be narrow and “rare” as intended.<sup>68</sup> Instead, the impact must be a significant impact, and significance is best measured by comparison to other costs and benefits.<sup>69</sup>

Indeed, there is substantial overlap between the analysis necessary under the “negative economic impact” exception and the next exception in the statute, which is designed to cover a circumstance where the “social costs of increasing the civil monetary penalty by the otherwise required amount outweigh the benefits.”<sup>70</sup> The two sections, when read together, suggest that Congress could not have meant the term “negative economic impact” to be an unlimited concept. NHTSA argues that the use of the concept of “net” social costs in that section supports a finding that “negative economic impact” does not entail any comparison to benefits.<sup>71</sup> But Congress used the term “negative” and that term by itself must entail some analysis of what it means to be “negative.” And, as explained above, the only rational way of understanding that term is to look at it in comparison to the benefits.

The exception for “negative economic impact” is only warranted if updating the penalty would have a significant, net negative effect. Those circumstances do not apply here.

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fuel economy standards); *New York v. Reilly*, 969 F.2d 1147, 1153 (D.C. Cir. 1992) (remanding rule where agency failed to explain how economic benefits would justify forgoing promised air benefits); *Sierra Club v. Sigler*, 695 F.2d 957, 979 (5th Cir. 1983) (holding, with respect to an environmental impact statement, that when an agency “trumpet[s]” the economic benefits of a project, it must also disclose costs, and that “logic, fairness, and the premises of cost-benefit analysis, let alone NEPA, demand that a cost-benefit analysis be carried out objectively”); *Johnston v. Davis*, 698 F.2d 1088, 1094-95 (10th Cir. 1983) (remanding an environmental study because it made “no mention” of a crucial factor that would make the action net costly).

<sup>66</sup> *Center for Biological Diversity v. National Highway Traffic Safety Admin.*, 538 F.3d 1172, 1198 (9th Cir. 2008).

<sup>67</sup> Shaun Donovan, OMB Director, Memorandum to Heads of Executive Departments and Agencies, on Implementation of the Federal Civil Penalties Inflation Adjustment Act Improvements Act of 2015 (Feb. 24, 2016), <https://www.whitehouse.gov/sites/whitehouse.gov/files/omb/memoranda/2016/m-16-06.pdf>

<sup>68</sup> *Id.*

<sup>69</sup> This is in the spirit of any cost-benefit analysis and is based on Kaldor–Hicks type of welfare criterion, which assumes that, as almost any change makes some people better off and others worse off, the welfare effects of a change need to be evaluated by reference to whether gainers could compensate losers for their losses. See Nicholas Kaldor, *Welfare Propositions in Economics and Interpersonal Comparisons of Utility*, 49 THE ECONOMIC JOURNAL, 549–552 (1939).

<sup>70</sup> Pub. L. 114-74 § 701(c).

<sup>71</sup> See 83 Fed. Reg. at 13,913.

## B. NHTSA's analysis of the potential compliance costs of the \$14 penalty is unreasonable

### 1. NHTSA's cost estimate is inflated

NHTSA's proposes that the "negative economic impact" of the 2016 Civil Penalties Rule justifies the proposed rule. To make this claim, NHTSA relies predominantly on the estimates of additional costs provided by the car industry in their comments.<sup>72</sup> Those in turn are generated using NHTSA's publicly available model: the CAFE Compliance and Effects Model, commonly referred to as "the CAFE model" or "the Volpe model."<sup>73</sup>

While the Volpe model is one of the best publicly available tools for analyzing the effects of fuel economy regulation and offers substantial transparency and comparability for the analyses, the model has some substantial shortcomings. Those shortcomings will tend to overestimate fuel economy costs.

First, Volpe is "overly conservative in capturing the effects of technology innovation and engineering improvements, cost reductions, and learning-by-doing by auto manufacturers as well as vehicle suppliers."<sup>74</sup> Consequently, some of the available technologies that were already utilized by automakers were not reflected properly in the model.<sup>75</sup> Additionally, given that the last version of Volpe was released in 2016, all the fuel-saving technologies that became market-ready since 2016 will also not be reflected in the results, contributing to an inflated cost estimate.<sup>76</sup>

Second, Volpe currently does not take credit trading between manufacturers into account. Economists widely believe that credit trading (or trading of emission permits) has a substantial potential to reduce costs because it equalizes marginal compliance costs among regulated entities. In fact, for some programs, the expected cost savings from employing a market-based policy (allowing trade in compliance credits between regulated units) relative to uniform standards can be as high as 50%.<sup>77</sup>

To illustrate, assume manufacturers did not have the option of credit-trading. If a manufacturer falls below the standards by X miles per gallon and has no banked credits, increasing the penalty from \$5.50 to \$14 per 0.1mpg (a difference of \$8.5 per 0.1mpg, or \$85 per mpg) would cause the manufacturer potentially to face a maximum increase in costs of \$85 times X miles (i.e., 85X).<sup>78</sup> If

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<sup>72</sup> See *id.* at 13,916.

<sup>73</sup> Letter from Auto Alliance and Global Automakers to Heidi King at 10-11 (Oct. 10, 2017), <https://www.regulations.gov/document?D=NHTSA-2017-0059-0005>.

<sup>74</sup> See Environmental Law & Policy Center et al., Comments on Proposed Reconsideration of the Final Determination of the Mid-Term Evaluation of Greenhouse Gas Emissions Standards for Model year 2022-2025 Light-Duty Vehicle, at 26 (Oct. 5, 2017), <https://www.regulations.gov/document?D=NHTSA-2017-0059-0011> (see attachment 13-NRDC Comment on Reopened Final Determination).

<sup>75</sup> *Id.*

<sup>76</sup> The Agency's analysis also does not consider the fact that the stringency of its regulation may also have impact on the innovation rate in the fuel efficiency technologies. Economic literature provides strong evidence for such a directed technical change. See, e.g. Philippe Aghion et al., *Carbon Taxes, Path Dependency and Directed Technical Change: Evidence from the Auto Industry*, 124 J. POLIT. ECON. 1-56 (2016).

<sup>77</sup> See, e.g., Richard G. Newell & Robert N. Stavins, *Cost Heterogeneity and the Potential Savings from Market-Based Policies*, 23 J. REGUL. ECON. 43-59, 56 (2003). For empirical estimates see, for example, Curtis Carlson et al., *Sulfur Dioxide Control by Electric Utilities: What Are the Gains from Trade?*, 108 J. POLIT. ECON. 1292-1326 (2000) (for gains from trade in transferable sulfur dioxide emission allowances among electric utilities).

<sup>78</sup> Raising the penalty from \$5.50 per 0.1 mpg to \$14 per 0.1 mpg creates a difference for 0.1 mpg of \$8.5. So if the firms undercomplies by 1 mpg, we'd expect an increase in the penalty of \$85 per mpg.

that manufacturer had access to technologies that would increase the fuel efficiency of its fleet at cost of \$Y per additional 0.1 mpg, whereby Y is higher than \$55 but lower than \$140, he would adopt that technology.<sup>79</sup> Consequently, the manufacturer's additional costs related to the increase in penalty would fall somewhere between  $(Y-5.5)X$ <sup>80</sup> dollars and 85X dollars.

But fuel economy technologies may be less costly than \$Y for some manufacturers. And if another company can increase its fuel efficiency at a lower cost, equal \$Z per additional 0.1 mpg, there will be gains from credit trades between the non-compliant and compliant firm. The new additional costs related to increase in penalty would now be lower than in the no-trade case, with the lower costs range equal to  $(Z-5.5)X$ .<sup>81</sup> The gains from the credit-trade will depend on the heterogeneity of the manufacturers, expressed as the difference between their costs of additional fuel economy, Y and Z. Given the substantial differences in the technologies available to the companies, as well as the different segments of the car market that the manufacturers target (e.g. luxurious or sports cars and family cars), the compliance credit trades between manufacturers may significantly lower the costs of compliance with CAFE.<sup>82</sup> The higher the penalty rate, the more profitable trade opportunities will be available and the higher the overestimation of the compliance costs will be when the credit trade is not allowed.

Third, the Volpe model assigns technologies to the manufacturer's fleet to find how the manufacturer might comply with CAFE standards at the lowest possible costs given the predicted car fleet.<sup>83</sup> This implies that the model disregards the changes in fleet composition that producers might introduce to comply with standards. The model also assumes that the increased costs of compliance are fully passed on to consumers through increased car prices (100% pass-through rate). In reality, though, when deciding how to meet the standards, automotive firms will be able to take into account consumers' demand for individual vehicle models and their attributes. Manufacturers can adjust prices across their fleet to optimally attract customers toward more fuel-efficient vehicles—a practice called *mix-shifting*.<sup>84</sup> Automakers can also roll out more fuel efficiency and emissions control improvements in luxury vehicles, a segment of the market where consumers are relatively less price-sensitive. In their pursuit of profits, the automobile manufacturers can be

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<sup>79</sup> If the technology costs less than \$5.5 per 0.1 additional mpg, the manufacturer would rather apply it than pay the \$5.5 penalty. If the technology is more costly than \$14 per 0.1 additional mpg, the manufacturer probably will not apply it even with increased penalty for non-compliance.

<sup>80</sup> The difference between cost of the technology applied under the higher penalty and the lower penalty multiplied by the undercompliance. This cost would be incurred if the manufacturer reached full compliance with the newly applied technology.

<sup>81</sup> The costs that would be incurred if the compliant manufacturer could increase its fuel efficiency by X at \$Z per 0.1 mpg and sell the achieved additional credits to the non-complier.

<sup>82</sup> Jonathan Rubin, Paul N. Leiby & David L. Greene, *Tradable Fuel Economy Credits: Competition and Oligopoly*, 58 J. ENVIRON. ECON. MANAGE. 315–328 (2009) (showing the huge potential of cost savings associated with credit trading between the firms for CAFE program).

<sup>83</sup> See Government Accountability Office, *NHTSA and EPA's Partnership for Setting Fuel Economy and Greenhouse Gas Emissions Standards Improved Analysis and Should Be Maintained*, Appendix II (2010), available at <https://www.gao.gov/assets/310/301194.pdf>.

<sup>84</sup> See Jason M. Luk, Bradley A. Saville & Heather L. MacLean, *Vehicle Attribute Trade-Offs to Meet The 2025 CAFE Fuel Economy Target*, 49 TRANSP. RES. PART D TRANSP. ENVIRON. 154–171 (2016) (discussing mix-shifting); see also Pinelopi K. Goldberg, *The Effects of the Corporate Average Fuel Efficiency Standards in the US*, 46 J. IND. ECON. 1–33 (1998); see also David Austin & Terry Dinan, *Clearing the air: The Costs and Consequences of Higher CAFE Standards and Increased Gasoline taxes*, 50 J. ENVIRON. ECON. MANAGE. 562–582 (2005).

expected to pursue any available means of reducing compliance costs. By not taking those possibilities into account, the Volpe model's cost estimates are overinflated.

## **2. The cost estimate is not large relative to the cost of an average car**

In any event, even if the cost estimate were not inflated, the cost increase should be presented in the proper perspective. The \$1 billion per year estimate,<sup>85</sup> while representing a substantial (if overestimated) number on its own, is actually only a tiny fraction of total sales. The United States has one of the largest automotive markets in the world, with yearly sales equaling around \$619.4 billion (in 2016) so the increase in the compliance costs claimed by the Agency would constitute only 0.2% of the industry's revenue.<sup>86</sup> The profit margins for manufacturers hover around 7-10%.<sup>87</sup> With the latest annual sales reaching over 17.8 million cars,<sup>88</sup> the additional cost claimed by the Agency, translates into a \$56 increase in the car price.<sup>89</sup> As an average price of a new car in December 2017 was over \$36,000, the price increase is negligible, especially given that the fuel savings that the customers will enjoy due to higher penalties (see discussion in Section IIA).<sup>90</sup>

## **3. The 2016 Civil Penalties Rule was not punitive**

NHTSA proposes that the \$14 penalty has "severe punitive implications."<sup>91</sup> But CAFE penalties are not punitive. The penalties work like safety valves, because they allow the car manufacturers to avoid the requirements imposed by vehicle standards in case compliance costs are too high. Such penalty systems are a common element of environmental regulation, and are viewed as price ceilings that limit high-side abatement cost risk.<sup>92</sup> In the case of CAFE requirements, penalties effectively determine the upper limit to the compliance costs per vehicle, capping the cost of the vehicle standards on industry. The economics of safety valves are well understood.<sup>93</sup> In particular, it

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<sup>85</sup> 83 Fed. Reg. at 13,916.

<sup>86</sup> See Wards Auto, Data Center, US Vehicle Sales, 1931-2016 (2017); see also Nat'l Automobile Dealers Ass'n., *Driving the United States' Economy* (2017), available at <https://www.nada.org/WorkArea/DownloadAsset.aspx?id=21474837318>; see also BEA, *Gross Domestic Product and Related Measures* 21, tbl.3A (2017), [https://www.bea.gov/newsreleases/national/gdp/2017/pdf/gdp2q17\\_adv.pdf](https://www.bea.gov/newsreleases/national/gdp/2017/pdf/gdp2q17_adv.pdf) (for data regarding the size of the motor vehicle industry relative to GDP).

<sup>87</sup> See, e.g., Ford Motor Company, 2017 Annual Report (2017) <https://corporate.ford.com/microsites/sustainability-report-2016-17/doc/sr16-annual-report-2016.pdf>; see also Form 10-K, ANNUAL REPORT PURSUANT TO SECTION 13 OR 15(d) OF THE SECURITIES EXCHANGE ACT OF 1934, GENERAL MOTORS, at 22, <https://www.gm.com/shareholderinformation.html> (last visited Apr. 27, 2019).

<sup>88</sup> According to WardsAuto, 17,865,773 Cars and Trucks were sold in the U.S. in 2016. WARDS AUTO, DATA CENTER, US VEHICLE SALES, 1931-2016 (2017).

<sup>89</sup> *Id.*

<sup>90</sup> Average New-Car Prices Set Record High, Up Nearly 2 Percent In December 2017, According To Kelley Blue Book (Jan 3, 2018) <https://www.prnewswire.com/news-releases/average-new-car-prices-set-record-high-up-nearly-2-percent-in-december-2017-according-to-kelley-blue-book-300576732.html> based on Kelley Blue Book data.

<sup>91</sup> National Highway Traffic Safety Administration, Civil Penalties, 83 Fed. Reg. 13904, 13913 (Apr. 2, 2018).

<sup>92</sup> John K Stranlund, *The Economics of Enforcing Emissions Markets: A Review of the Literature*, 11 REV. ENVIRON. ECON. POLICY 227-246 (2017).

<sup>93</sup> Henry D. Jacoby & A. Denny Ellerman, *The Safety Valve and Climate Policy*, 32 ENERGY POLICY 481-491 (2004), William A. Pizer, *Combining Price and Quantity Controls to Mitigate Global Climate Change*, 85 J. PUBLIC ECON. 409-434 (2002), John K Stranlund, *The Economics of Enforcing Emissions Markets: A Review of the Literature*, 11 REV. ENVIRON. ECON. POLICY 227-246 (2017).

is clear that the compliance efforts firms are willing to exert depends on the penalty itself. Whenever the marginal costs of compliance with the rules exceed the penalty, companies choose to pay penalties. Increasing the penalty raises the amount the companies are willing to spend on compliance, bringing them closer to the standards.

Moreover, the 2016 Civil Penalties Rule simply adjusts the penalty to be more in line with inflation and thus cannot have a punitive impact. Congress adopted the 2015 Act with a clear purpose: to maintain the deterrent effect of civil penalties set years ago.<sup>94</sup> Without adjustments, the amount that the manufacturers were willing to spend on additional 0.1 mpg fuel efficiency was decreasing over time in real terms, decreasing the incentives to comply with CAFE requirements. In other words, the adjustment of the penalty does not actually *raise* the penalty. It was necessary simply to avoid further deterioration of the compliance incentives.

Moreover, the impact of any adjustment would be very small when viewed relative to the average price of a car. As shown in Section III B 1, any negative effects of higher penalties on profits would be experienced only by those firms that, in the absence of the inflation adjustment, would not comply with the standards (i.e., the “counterfactual non-compliers”). The fuel economy deficiency reached by those producers (the difference between the fuel economy of the individual cars in the fleet and the applicable standards for them weighted by car sales) will decrease for them under the \$14 penalty. The total additional cost imposed by the \$14 penalty for a counterfactual non-complier will be strictly less than the difference between the penalty rates (\$8.5) multiplied by the fuel economy deficiency reached under the \$5.5 penalty (“counterfactual under-compliance”) and would be a function of the lowest marginal fuel economy costs among all the car manufacturers. Simulations with Volpe suggest that, in accordance with intuition, the counter-factual under-compliers will occur mostly for luxurious and sports cars. Given that those tend to sell at prices well above the average price of \$32,000, the increase in costs should not be thought of as severe.

#### **4. NHTSA’s concern that the 2016 Civil Penalties Rule will increase unemployment is unfounded**

NHTSA claims that the \$14 penalty “could plausibly cause a significant increase in unemployment in a State or a region of a State.”<sup>95</sup> But when looking at the employment changes within the industry, the Agency needs to use a proper methodology to evaluate the effects of any changes in employment within the industry of the affected workers, in accordance with established practices of cost-benefit methodologies.<sup>96</sup>

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<sup>94</sup> Pub. L. 114-74 § 701(b)(2)(b) (2015) (“The purpose of this Act is to establish a mechanism that shall allow for regular adjustment for inflation of civil monetary penalties; maintain the deterrent effect of civil monetary penalties and promote compliance with the law; and improve the collection by the Federal Government of civil monetary penalties.”).

<sup>95</sup> 83 Fed. Reg. at 13,905.

<sup>96</sup> The main cost of induced unemployment is the difference between the wages lost and the opportunity costs of the employment lost. When the laid-off person directly moves to a newly created job with a wage equal to the previous wage, which often happens when the economy is in full employment state, the cost would be zero. On the other hand, if a person loses a job and remains unemployed, the opportunity cost would encompass the value of increased leisure. The additional costs of policy-induced unemployment might include transitional costs, e.g. costs of moving because of the new workplace, and psychological costs of being (temporarily) unemployed. See Timothy J. Bartik, *Including Jobs in Benefit-Cost Analysis*, 4 ANNU. REV. RESOUR. ECON. 55–73 (2012) and Timothy J. Bartik, *The Social Value of Job Loss and its Effect on the Costs of U.S. Environmental Regulations*, 9 REV. ENVIRON. ECON. POLICY 179–197 (2015).

Indeed, this point is made clear in John G. Morrall III's comments, submitted in October 2017, on behalf of car manufacturers.<sup>97</sup> In his comments, Morrall complained that the effect of a fuel economy standard in diverting resources to clean technology is often "mistakenly treated as a benefit."<sup>98</sup> Even though "jobs and investments may be created in industries supplying the required compliance technology," according to Morrall, "these jobs represent opportunity costs not benefits since labor and resources must be diverted from other useful activities."<sup>99</sup> Symmetric logic should be applied to potential automotive jobs lost due to increase in CAFE penalties: jobs loss in the car industry frees workforce for other industries, thus creating benefits for those industries that compete with car manufacturers for employees.

Consequently, looking only at the employment changes within the car manufacturing industry and the associated changes in total wages in the industry will be ill-conceived for any evaluation the employment impact of the policy. One of the main reasons for that is that a job impact within the regulated industry does not directly translate into changes in employment levels for the economy as a whole. Workers laid off from the automobile sector and related businesses may quickly be absorbed by other industries. Economic studies suggest that even substantial job losses in the regulated industry can be offset by increased employment in the unregulated (clean) sector, leading to very small net effects of the regulation.<sup>100</sup> Conversely, jobs created to comply with standards may be staffed with workers transferring from non-regulated industries rather than with the previously unemployed workers. Currently, the United States labor market is robust and near full employment.<sup>101</sup> Therefore, economists would expect the transition to new employment to be relatively swift and new jobs to be created at the expense of already existing positions. Focusing on a single industry and failing to include general equilibrium employment effects is irrational and, given that the US economy is currently thought to be at full employment levels, would improperly overestimate the changes in employment level in the economy. Confining the analysis to employment changes in the regulated sector without determining job effects in other sectors distorts the evaluation of the regulation and contradicts the agencies' obligation to look at all relevant factors under the Administrative Procedure Act.

If the agency engages in an analysis of employment impacts, the importance using an economy-wide analysis has been broadly acknowledged.<sup>102</sup> NHTSA would therefore need to conduct this

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<sup>97</sup> John F. Morrall III, Analysis of the Potential "Negative Economic Impact" of Increasing Civil Monetary Penalties for Non-Compliance with Corporate Average Fuel Economy Regulations at 12 (Oct. 6, 2017), <https://www.regulations.gov/document?D=NHTSA-2017-0059-0005>.

<sup>98</sup> *Id.*

<sup>99</sup> ALLIANCE AND GLOBAL AUTOMAKERS, JOHN F. MORRALL III, ANALYSIS OF THE POTENTIAL "NEGATIVE ECONOMIC IMPACT" OF INCREASING CIVIL MONETARY PENALTIES FOR NON-COMPLIANCE WITH CORPORATE AVERAGE FUEL ECONOMY REGULATIONS 12-13 (Oct. 6, 2017).

<sup>100</sup> Nicholas Rivers, Renewable Energy and Unemployment: A General Equilibrium Analysis, 35 RESOUR. ENERGY ECON. 467-485 (2013); Marc A.C. Hafstead & Roberton C. Williams, Unemployment and Environmental Regulation in General Equilibrium, 160 J. PUBLIC ECON. 50-65 (2018).

<sup>101</sup> See, e.g., Reuters, *Janet Yellen Says the U.S. Is Close to Full Employment*, FORBES, <http://fortune.com/2017/01/18/janet-yellen-federal-reserve-full-us-employment/> (for comments made by Federal Reserve).

<sup>102</sup> In their annual reports on the costs and benefits of federal regulations, OMB has repeatedly advised agencies not to fall into the "pitfall" of ignoring long-run and economy-wide effects: "a short-run, industry-specific job-counting model would give the impression that regulation reduces employment. . . . However,

analysis before making any assumptions about the impact of the 2016 Civil Penalties Rule on employment. For the analysis of the total employment effects, the modeling would need to include linkages between the automotive sector and the rest of the economy, as well as proper representation of other sectors. The final product that could allow a thorough and reliable analysis of employment effects would be relatively complex. To ensure transparency and enable researchers and interested parties to reproduce the results of the study, it is crucial that NHTSA use only non-proprietary tools for such forecasts and make the model available for independent scholars and researchers to review.

The assumptions underlying the economy-wide modeling will have the potential to hugely affect the outcomes. For instance, there are indications that standard full-employment models, in which unemployment is inferred from number of hours worked, tend to seriously overestimate the economy-wide net change in the number of jobs as opposed to new search-economy-wide models with labor-search frictions.<sup>103</sup> NHTSA should therefore not rely on the standard full-employment economy-wide models, but should use the new search-economy-wide models.

Moreover, special care needs to be taken to ensure that the model's analysis takes into account all features of regulation that are relevant for how the regulation impacts jobs in the regulated sector. In general, the impact of regulation on employment in the regulated industry is not obviously negative.<sup>104</sup> For example, when a regulation causes production costs to rise, leading to lower sales and less demand for labor, more inputs, including labor, may be necessary to produce the same amount of output. This has the potential to offset any reduction in sales and thus labor, which could have a positive impact on the economy. Additionally, compliance activities may be more labor-intensive than conventional production.<sup>105</sup> Thus, the potential effects of compliance in an industry can vary between job gains to job losses, depending on the types of requirements imposed by regulation, characteristics of compliance technology, demand and supply elasticities and other factors. Indeed, a review of empirical studies reveals a mixed picture of how regulation changes employment in the regulated industry.<sup>106</sup> If a model

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these apparent reductions or increases in employment often will, in the medium or long run, turn out to be shifts in employment among economic sectors." In other words, agencies must not focus on only one sector, but rather must consider general equilibrium employment effects. See [https://obamawhitehouse.archives.gov/sites/default/files/omb/inforeg/2015\\_cb/2015-cost-benefit-report.pdf](https://obamawhitehouse.archives.gov/sites/default/files/omb/inforeg/2015_cb/2015-cost-benefit-report.pdf) at 42. See also SAB Advice on the Use of Economy-Wide Models in Evaluating the Social Costs, Benefits, and Economic Impacts of Air Regulations, Environmental Protection Agency Science Advisory Board Economy-Wide Modeling Panel (2017).

<sup>103</sup> Marc A. C. Hafstead, Roberton C. Williams III & Yunguang Chen, Environmental Policy, Full-Employment Models, and Employment: A Critical Analysis, 24505 NBER (Working Paper 2018).

<sup>104</sup> See ECONOMIC REPORT OF THE PRESIDENT AND THE ANNUAL REPORT OF THE COUNCIL OF ECONOMIC ADVISORS 91 (2018); Richard D. Morgenstern, William A. Pizer & Jhih-Shyang Shih, *Jobs Versus the Environment: An Industry-Level Perspective*, 43 J. ENVIRON. ECON. MANAGE. 412–36 (2002).

<sup>105</sup> Richard D. Morgenstern, William A. Pizer & Jhih-Shyang Shih, *Jobs Versus the Environment: An Industry-Level Perspective*, 43 J. ENVIRON. ECON. MANAGE. 412–36 (2002).

<sup>106</sup> See, e.g., Richard D. Morgenstern, William A. Pizer & Jhih-Shyang Shih, *Jobs Versus the Environment: An Industry-Level Perspective*, 43 J. ENVIRON. ECON. MANAGE. 412–436 (2002); Akio Yamazaki, *Jobs and Climate Policy: Evidence from British Columbia's Revenue-Neutral Carbon Tax*, 83 J. ENVIRON. ECON. MANAGE. 197–216 (2017); Matthew A Cole & Rob J Elliott, *Do Environmental Regulations Cost Jobs? And Industry-Level Analysis of the UK*, 7 B. E. J. ECONOM. ANAL. POLICY 1–32 (2007); Wayne B. Gray et al., *Do EPA Regulations Affect Labor*

captures only the lost sales through cost increases, it is bound to find negative job impacts even though the real effect may be neutral or even positive. A misrepresentation of one of the channels through which regulation impacts jobs, may tilt the net employment effects from positive to negative, or vice versa. For instance, using elevated consumer price sensitivity will lead to an overestimate of the job losses. Therefore, for establishing the true employment effects, a very careful and balanced modeling of the mechanisms is needed, whenever possible enhanced by sensitivity analyses.

#### **IV. The 2015 Act, not EPCA, governs this proceeding**

NHTSA claims that it must determine that the increase will “not” have a substantial deleterious impact on the economy.<sup>107</sup> But that argument is based on a misunderstanding of the statutory requirements here.

Over time, the real value of a penalty falls if not adjusted by inflation. The inflationary updates to the CAFE penalties are intended to maintain the level of deterrence effectuated by the civil monetary penalties, and to prevent the deterrent effect from being diminished by inflation. With nominal prices in the economy increasing over time, keeping the value of the penalty constant deteriorates its real value. As the CAFE penalty’s level has been essentially unchanged since 1975, incentives to comply with fuel economy have been strongly degrading over the time. Since 1975, inflation has increased indexed consumer prices by over 350%.<sup>108</sup> As a result, a penalty first set in 1975 has lost significant deterrent effect. In 2015, Congress decided to remedy that problem with the 2015 Act, and mandated (“shall adjust”<sup>109</sup>) that agencies update their civil penalties with a clear purpose: to maintain the deterrent effect of civil penalties set years ago by counteracting inflation, and to improve federal collections of penalties.<sup>110</sup>

NHTSA proposes that it must nonetheless find that an increase from \$5.50 to \$14 “will not have a substantial deleterious impact on the economy” under EPCA.<sup>111</sup> But the goals of EPCA are distinct from the goals of the 2015 Act. EPCA’s provisions on increasing the penalty were intended to allow NHTSA to increase the real value of the penalty to encourage compliance and “substantially further substantial energy conservation.”<sup>112</sup> In contrast, the Inflation Adjustment Act was meant to maintain the real value of penalties as originally set in order to maintain the original deterrent

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*Demand? Evidence from the Pulp and Paper Industry*, 68 J. ENVIRON. ECON. MANAGE. 188–202 (2014); W. Reed Walker, *The Transitional Costs of Sectoral Reallocation: Evidence from the Clean Air Act and the Workforce*, Q. J. ECON. 1787–1835 (2013); See ECONOMIC REPORT OF THE PRESIDENT AND THE ANNUAL REPORT OF THE COUNCIL OF ECONOMIC ADVISORS 91 (2018); and Richard D. Morgenstern, William A. Pizer & Jih-Shyang Shih, *Jobs Versus the Environment: An Industry-Level Perspective*, 43 J. ENVIRON. ECON. MANAGE. 412–436 (2002).

<sup>107</sup> 82 Fed. Reg. at 13,910.

<sup>108</sup> The Consumer Price Index Calculator maintained by the Bureau of Labor Statistics shows that \$5 in 1975 has the same buying power as \$23.56 today. <https://data.bls.gov/cgi-bin/cpicalc.pl?cost1=5.00&year1=197501&year2=201708>.

<sup>109</sup> Pub. L. 114-74 § 701(b)(4)(b)(1)(A) (“the head of an agency shall adjust civil monetary penalties through an interim final rulemaking”).

<sup>110</sup> Pub. L. 114-74 § 701(b)(2)(b) (2015) (“The purpose of this Act is to establish a mechanism that shall allow for regular adjustment for inflation of civil monetary penalties; maintain the deterrent effect of civil monetary penalties and promote compliance with the law; and improve the collection by the Federal Government of civil monetary penalties.”).

<sup>111</sup> 83 Fed. Reg. at 13,913-14.

<sup>112</sup> 49 U.S.C. § 32,912(c)(1)(A)(i).

effect. The criteria from EPCA on increasing the value of the penalty are not relevant to this rulemaking on adjusting the penalty to counteract inflation. Indeed, the 2015 Act explicitly contained very specific and very narrow exceptions<sup>113</sup> (neither of which applies here), and NHTSA should not presume that Congress implicitly intended to create an entirely unwritten additional exemption just for CAFE.

NHTSA continues to conflate nominal and real value by suggesting, in the alternative, that EPCA's requirements for increasing the real value of the penalty should be overlaid on top of the 2015 Act's procedures for adjusting for inflation.<sup>114</sup> The criteria from EPCA on adjusting the nominal value of the penalty are not relevant to updating the real value of the penalty to counteract inflation. Because the 2015 Act's two narrow exceptions do not apply here (see above), NHTSA must update the CAFE penalties for inflation, consistent with the 2016 Civil Penalties Rule.

## **V. The proposed rule is a significant rulemaking subject to Executive Order 12,866**

NHTSA claims that it "cannot definitively . . . determin[e]" whether its proposed rule is significant "until the final rule stage, as it depends entirely on the civil penalty rate established in the final rule."<sup>115</sup> Waiting until the notice of final rulemaking to publish an economic analysis unreasonably deprives the public of transparency and of the opportunity to participate meaningfully in the rulemaking.<sup>116</sup> Moreover, NHTSA is wrong that it cannot determine the proposal's significance.

Under Executive Order 12,866, a regulatory action is economically significant if it will (a) "have an annual effect on the economy of \$100 million or more," or (b) "adversely affect in a material way the economy, a sector of the economy, productivity, competition, jobs, the environment, public health or safety, or State, local, or tribal governments or communities."<sup>117</sup> The Office of Information and Regulatory Affairs has clarified that the \$100 million threshold "includes benefits, costs, or transfers."<sup>118</sup>

Even if NHTSA's reference<sup>119</sup> to \$1 billion per year in cost savings is realistic (and it is not), the rule is still significant. As these comments show, reducing the penalty from \$14 back down to \$5.50 will have negative consequences for compliance with the fuel economy standards, with the associated negative consequences of increased vehicle emissions, and increased negative effects on public health and the environment, as well as on consumer fuel savings. Thus, the proposed rule will "adversely affect in a material way" public health, the environment, and economic sectors and productivity related to consumer savings. As such, the proposed rule is an economically significant rulemaking.

If NHTSA wishes to move forward with this ill-advised and irrational proposal to reduce the CAFE penalty from \$14 back down to \$5.50, it must complete a full economic analysis pursuant to Executive Order 12,866, and it must publish that analysis for public comment before finalizing any regulatory action. The analysis must monetize all significant forgone benefits from reducing the

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<sup>113</sup> Pub. L. 114-74 § 701(b)(4)(c)(1).

<sup>114</sup> 83 Fed. Reg. at 13,905, 13,913-14.

<sup>115</sup> 83 Fed. Reg. at 13,917.

<sup>116</sup> *Cf.* 5 U.S.C. § 553(c).

<sup>117</sup> Exec. Order 12,866 § 3(f).

<sup>118</sup> OIRA, *Regulatory Impact Analysis: Frequently Asked Questions* 1 (2011), [https://www.whitehouse.gov/sites/whitehouse.gov/files/omb/assets/OMB/circulars/a004/a-4\\_FAQ.pdf](https://www.whitehouse.gov/sites/whitehouse.gov/files/omb/assets/OMB/circulars/a004/a-4_FAQ.pdf).

<sup>119</sup> 83 Fed. Reg. at 13,916.

penalty from \$14 back down to \$5.50. Pursuant to Executive Order 12,866, NHTSA should then only move forward with its proposal “upon a reasoned determination that the benefits of the intended regulation justify its costs.”<sup>120</sup>

We also attach here Policy Integrity’s October 2017 comments filed in response to NHTSA’s announcement that it was reconsidering the civil penalties and request for comments.<sup>121</sup> Policy Integrity’s October 2017 comments are consistent with our comments and recommendations here and we request that they be included in the rulemaking record.<sup>122</sup>

Sincerely,

Dr. Sylwia Bialek, Ph.D.  
Bethany Davis Noll  
Jason Schwartz

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<sup>120</sup> Exec. Order 12,866 § 1(b)(6).

<sup>121</sup> 82 Fed. Reg. at 32,140.

<sup>122</sup> See **Exhibit B**.

# **Exhibit A**



September 25, 2017

To: James Tamm, Chief, Fuel Economy Division, NHTSA

**Docket: NHTSA-2017-0069**

Subject: Comments on Quantifying and Monetizing Greenhouse Gas Emissions in the Environmental Impact Statement for Model Year 2022-2025 Corporate Average Fuel Economy Standards

**Submitted by:** Environmental Defense Fund, Institute for Policy Integrity at New York University School of Law, Natural Resources Defense Council, Sierra Club, and Union of Concerned Scientists

Our organizations respectfully submit these comments on the need for NHTSA's environmental impact statement on new Corporate Average Fuel Economy standards to quantify and monetize the climate effects due to greenhouse gas emission changes. NHTSA should value the social cost of those emissions as thoroughly, accurately, and transparently as possible, drawing from the best available scientific and economic data and methodologies. Our organizations may separately submit other comments regarding other aspects of the scoping process for the anticipated EIS.

Relevant to the quantification and monetization of climate effects, NHTSA's notice of intent to prepare an EIS makes three statements that are inconsistent with best practices and legal requirements.

First, NHTSA wrongly concludes that it need not monetize climate effects in its EIS.<sup>1</sup> In fact, NHTSA has monetized climate effects in past EISs, and the social cost of greenhouse gas protocols remain appropriate for use in EIS analyses. Under legal standards for rational decisionmaking, agencies must monetize important greenhouse gas effects when their decisions are grounded in cost-benefit analysis. More broadly, it is appropriate to continue estimating the social cost of greenhouse gases in EISs, because monetizing such values advances the National Environmental Policy Act's goals of informing decisionmakers and the public.

Second, NHTSA wrongly asserts that, due to uncertainty, "[i]t is difficult to quantify how the specific impacts due to the potential temperature changes attributable to new CAFE standards may affect many aspects of the environment."<sup>2</sup> It is not: the social cost of greenhouse gas protocols provide a thorough, quantitative treatment of uncertainty, including uncertainty relating to temperature changes, environmental impacts, and the translation of those impacts into monetary estimates.

Third, NHTSA identifies its Model Year 2021 CAFE standards as the baseline for the no action alternative,<sup>3</sup> ignoring how the future of EPA's coordinated emissions standards should factor into its no action baseline. While the existing Model Year 2021 standards would provide the appropriate baseline should NHTSA engage in any reconsideration of standards for Model Year 2021 (standards that NHTSA should not reconsider), NHTSA must consider EPA's Model Year 2022-2025 emissions standards and its own augural standards in setting any baseline for new CAFE standards for Model Years 2022-2025.

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<sup>1</sup> 82 Fed. Reg. 34,740, 34,744 (July 26, 2017).

<sup>2</sup> *Id.*

<sup>3</sup> *Id.* at 34,742.

After detailing more thoroughly why NHTSA should monetize climate effects, should follow the treatment of uncertainty contained in the social cost of greenhouse gas protocol, and should rethink its baseline, these comments offer additional guidance on how to monetize climate effects consistent with the currently best available science and economics—specifically, by selecting a central estimate of global damages using a 3% or lower discount rate. Notwithstanding a recent Executive Order disbanding the Interagency Working Group (IWG) on the Social Cost of Greenhouse Gases, the estimates updated by that group in 2016 are still the best estimates of the lower bound of the social cost of greenhouse gases, reflecting current best practices and best scientific and economic literature. Any departure from those estimates would require agencies to engage with the complex integrated assessment models and ensure consistency with the most current scientific and economic literature, which overwhelmingly supports a global estimate based on a 3% or lower discount rate. Indeed, since the IWG’s estimates omit important damage categories and so are best treated as a lower bound, if anything the social cost of greenhouse gas values used by agencies should be even higher.

## **1. NHTSA Must Monetize the Social Cost of Greenhouse Gases in its EIS**

NHTSA announces that “to streamline its documentation,” the agency will not monetize climate effects (or health effects) directly in the EIS, but rather will incorporate by reference the regulatory impact analysis, which “will...include[ ]” such monetizations.<sup>4</sup> To begin, NHTSA appropriately commits to monetizing climate effects in its regulatory impact analysis. When doing so, NHTSA should consider these comments on how to monetize climate effects consistent with the best science and economics—that is, it must follow the social cost of greenhouse gas protocols in selecting a central estimate of global damages based on a 3% or lower discount rate. For purposes of the regulatory impact analysis, the 2016 estimates developed by the Interagency Working Group on the Social Cost of Greenhouse Gases remain the best currently available estimates based on the best scientific and economic literature (notwithstanding the recent Executive Order disbanding that group), and those estimates should be used as agencies’ lower bounds for calculating the cost of greenhouse gas emissions.

However, the fact that NHTSA plans to monetize climate effects in its regulatory impact analysis does not excuse the agency from properly analyzing and contextualizing climate effects in its EIS. The standard for when an agency may incorporate material by reference is not based solely on the desire to “eliminate redundancy.” Rather, regulations developed by the Council for Environmental Quality provide that agencies can incorporate by reference only if they can do so “without impeding agency and public review of the action.”<sup>5</sup> In other words, even if interested persons can readily access the material via a citation, incorporation by reference is not permitted if it would “imped[e] agency and public review.” Here, incorporation by reference would impede review for three reasons:

- First, the inconsistency with past NHTSA practices could create confusion. NHTSA has monetized climate effects directly in the EISs for previous CAFE standards. Changing the analytical approach on the standards’ most central environmental impact could misleadingly signal to reviewers that climate effects are not as significant or harder to quantify than in earlier rulemakings.
- Second, because of the global nature and magnitude of the problem of climate change, providing a qualitative-only accounting of climate effects in the EIS without proper contextualization may mislead the public and decisionmakers into underestimating and discounting the significance of climate effects.

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<sup>4</sup> 82 Fed. Reg. at 347,744.

<sup>5</sup> 40 C.F.R. § 1502.21.

- Third, if NHTSA ultimately monetizes other costs or benefits directly in its EIS, failing to do the same for climate effects would be misleadingly arbitrary and would undermine the goals of NEPA.

In previous CAFE rulemakings, NHTSA monetized climate effects both directly in the EIS as well as in the regulatory impact analysis. Most importantly, when NHTSA finalized its standards for Model Years 2017-2021 and announced its “augural” standards for Model Years 2022-2025, its accompanying Final EIS comprehensively reviewed the environmental effects from the full range of model years: 2017 through 2025.<sup>6</sup> Therefore, for any new standards NHTSA now proposes for Model Years 2022-2025, the public and decisionmakers will naturally compare a new EIS against the original EIS that already covered those same years. In the Final EIS for Model Years 2017-2025, NHTSA both directly monetized climate effects<sup>7</sup> and appended the regulatory impact analysis,<sup>8</sup> which also monetized climate effects.<sup>9</sup> Because the earlier EIS documents monetized the climate effects, and because climate effects remain the most central environmental impact of the CAFE standards, failing to monetize the climate effects in new EIS documents would be misleading and create confusion among public and agency reviewers.

The next several subsections address the two additional reasons to not rely on incorporating by reference monetized climate effects from the regulatory impact analysis. Given the global nature and magnitude of the problem of climate change, providing a qualitative-only accounting of climate effects without proper contextualization may lead the public and decisionmakers to underestimate and discount the significance of climate effects. Furthermore, if NHTSA ultimately monetizes other costs or benefits in its EIS, failing to do the same for climate effects would be misleadingly arbitrary and would undermine the goals of NEPA.

### ***NEPA Requires Monetizing Climate Effects If Other Costs and Benefits Are Monetized***

NEPA requires “hard look” consideration of beneficial and adverse effects of each alternative option for major federal government actions. The U.S. Supreme Court has called the disclosure of impacts the “key requirement of NEPA,” and held that agencies must “consider and disclose the actual environmental effects” of a proposed project in a way that “brings those effects to bear on [the agency’s] decisions.”<sup>10</sup> Courts have repeatedly concluded that an EIS must disclose relevant climate effects.<sup>11</sup> Though NEPA does not require a formal cost-benefit analysis,<sup>12</sup> agencies’ approaches to assessing costs and benefits must be balanced and reasonable. Courts have warned agencies, for example, that “[e]ven though NEPA does not require a cost-benefit analysis, it was nonetheless arbitrary and capricious to quantify the

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<sup>6</sup> NHTSA, Final Environmental Impact Statement: Corporate Average Fuel Economy Standards, Passenger Cars and Light Trucks, Model Years 2017-2025 (2012) [hereinafter “2012 FEIS”].

<sup>7</sup> *Id.* at 5-24.

<sup>8</sup> *Id.* at Appendix G.

<sup>9</sup> NHTSA, Preliminary Regulatory Impact Analysis: Corporate Average Fuel Economy for MY 2017-MY 2025 Passenger Cars and Light Trucks (2011) at 7, 650.

<sup>10</sup> *Baltimore Gas & Elec. Co. v. Natural Res. Def. Council*, 462 U.S. 87, 96 (1983).

<sup>11</sup> As the Ninth Circuit has held: “[T]he fact that climate change is largely a global phenomenon that includes actions that are outside of [the agency’s] control . . . does not release the agency from the duty of assessing the effects of *its* actions on global warming within the context of other actions that also affect global warming.” *Ctr. for Biological Diversity v. Nat’l Highway Traffic Safety Admin.*, 538 F.3d 1172, 1217 (9th Cir. 2008); *see also* *Border Power Plant Working Grp. v. U.S. Dep’t of Energy*, 260 F. Supp. 2d 997, 1028-29 (S.D. Cal. 2003) (failure to disclose project’s indirect carbon dioxide emissions violates NEPA).

<sup>12</sup> 40 C.F.R. § 1502.23 (“[T]he weighing of the merits and drawbacks of the various alternatives need not be displayed in a monetary cost-benefit analysis.”).

*benefits* of [federal action] and then explain that a similar analysis of the *costs* was impossible when such an analysis was in fact possible.”<sup>13</sup>

While often eschewing formal cost-benefit analysis in environmental impact statements, agencies typically include in their NEPA reviews both quantitative and monetized analyses of the economic benefits and distributional effects of the decision, often including such factors as effects on wages and jobs.<sup>14</sup> NHTSA’s prior EIS for Model Years 2017-2025 included details on the monetary value of refueling time, congestion, and noise.<sup>15</sup> When agencies quantify and monetize the financial and distributional effects of regulations, they must also treat climate effects with proportional analytical rigor.

The recent withdrawal of the Council on Environmental Quality’s guidance on greenhouse gas emissions does not—and legally cannot—remove agencies’ statutory requirement to fully disclose the environmental impacts of greenhouse gas emissions. As CEQ explained in its withdrawal, the “guidance was not a regulation,” and “[t]he withdrawal of the guidance does not change any law, regulation, or other legally binding requirement.”<sup>16</sup> In other words, when the guidance originally recommended the appropriate use of the social cost of greenhouse gases in EISs,<sup>17</sup> it was simply explaining that the social cost of greenhouse gases is consistent with longstanding NEPA regulations and case law, all of which are still in effect today.

Numerous federal agencies support using the social cost of greenhouse gases in EISs. EPA has called on agencies to include a monetized estimate of anticipated greenhouse gas effects in their environmental impact statements,<sup>18</sup> and multiple agencies have applied the social cost of carbon in their environmental impact statements, including the Office of Surface Mining Reclamation and Enforcement,<sup>19</sup> the Bureau

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<sup>13</sup> *High Country Conservation Advocates v. Forest Service*, 52 F. Supp. 3d 1174, 1191 (D. Colo. 2014); *accord*. *MEIC v. Office of Surface Mining*, 15-106-M-DWM, at 40-46 (D. Mt., August 14, 2017) (holding it was arbitrary for the agency to quantify benefits in an EIS while failing to use the social cost of carbon to quantify costs, as well as arbitrary to imply there would be no effects from greenhouse gas emissions).

<sup>14</sup> *See, e.g.*, *Forest Service, Federal Coal Lease Modifications COC-1362 & COC-67232*, at pp. 190–91 (Aug. 2012); *Forest Service, Pawnee National Grassland Oil and Gas Leasing Final Environmental Impact Statement* 317, at 291–98 (Dec. 2014); *Bureau of Land Mgmt., Final Environmental Impact Statement for the Wright Area Coal Lease Applications*, ES-60-61, 4-130-50 (July 2010).

<sup>15</sup> 2012 FEIS, *supra* note 6, at table 2.3.2-2.

<sup>16</sup> 82 Fed. Reg. 16,576, 16,576 (Apr. 5, 2017).

<sup>17</sup> *See* CEQ, *Revised Draft Guidance on Consideration of Greenhouse Gas Emissions and the Effects of Climate Change in National Environmental Policy Act Reviews* at 16 (Dec. 2014), available at [https://obamawhitehouse.archives.gov/sites/default/files/docs/nepa\\_revised\\_draft\\_ghg\\_guidance\\_searchable.pdf](https://obamawhitehouse.archives.gov/sites/default/files/docs/nepa_revised_draft_ghg_guidance_searchable.pdf) (“When an agency determines it appropriate to monetize costs and benefits, then, although developed specifically for regulatory impact analyses, the Federal social cost of carbon, which multiple Federal agencies have developed and used to assess the costs and benefits of alternatives in rulemakings, offers a harmonized, interagency metric that can provide decisionmakers and the public with some context for meaningful NEPA review. When using the Federal social cost of carbon, the agency should disclose the fact that these estimates vary over time, are associated with different discount rates and risks, and are intended to be updated as scientific and economic understanding improves.”); *see also* CEQ, *Final Guidance for Federal Departments and Agencies on Consideration of Greenhouse Gas Emissions and the Effects of Climate Change in National Environmental Policy Act Reviews* at 33 n.86 (Aug. 2016), available at [https://obamawhitehouse.archives.gov/sites/whitehouse.gov/files/documents/nepa\\_final\\_ghg\\_guidance.pdf](https://obamawhitehouse.archives.gov/sites/whitehouse.gov/files/documents/nepa_final_ghg_guidance.pdf).

<sup>18</sup> Letter from Cynthia Giles, Assistant Adm’r, U.S. Environmental Protection Agency, to Jose W. Fernandez & Dr. Kerri Anne Jones, U.S. Department of State (Apr. 22, 2013), at 2.

<sup>19</sup> Available at <http://www.wrcc.osmre.gov/initiatives/fourCorners/documents/FinalEIS/Section%204.2%20-%20Climate%20Change.pdf>; *see also* <http://www.wrcc.osmre.gov/initiatives/fourCorners/documents/FinalEIS/Appendix%20A%20-%20Air%20Quality%20and%20Climate%20Change%20Information.pdf>.

of Land Management,<sup>20</sup> the National Highway Traffic Safety Administration,<sup>21</sup> and the Forest Service.<sup>22</sup> Clearly, there are no legal, conceptual, methodological, or practical barriers to applying the social cost of greenhouse gases in NEPA reviews, and principles of reasoned decisionmaking require its use where an agency has already quantified other costs and benefits.

### ***Economic Principles Support Monetizing Climate Effects to Fulfill NEPA's Goals***

NEPA's goals are to inform decisionmakers and the public by providing a "hard look" at the full range of environmental consequences of the government's proposed action and any feasible alternatives.<sup>23</sup> To inform decisionmakers and the public, NEPA reviews should aim to present information in the manner that most easily facilitates comparison across alternatives and that best avoids any information-processing biases that might distort rational decisionmaking. The economic literature supports monetizing climate effects to achieve these goals.

Monetization provides much-needed context for otherwise abstract consequences of climate change. If the NEPA review for an agency action merely quantifies greenhouse gas emissions by metric ton, or only qualitatively discusses the general effects of global climate change, decisionmakers and the public will tend to overly discount that individual action's potential contribution. Without context, it is difficult for many decisionmakers and the public to assess the magnitude and climate consequences of, for example, an additional million tons of carbon dioxide. Monetization, on the other hand, allows decisionmakers and the public to weigh all costs and benefits of an action—and to compare alternatives—using the common metric of money. Monetizing climate costs, therefore, better informs the public and helps "brings those effects to bear on [the agency's] decisions."<sup>24</sup>

The tendency to ignore non-monetized effects is the result of common but irrational mental heuristics like probability neglect and base-rate bias. For example, the phenomenon of probability neglect causes people to reduce small probabilities entirely down to zero, resulting in these probabilities playing no role in the decisionmaking process.<sup>25</sup> This heuristic applies even to events with long-term certainty or with lower-probability but catastrophic consequences, so long as their effects are unlikely to manifest in the immediate future. Weighing the real risks that, decades or centuries from now, climate change will fundamentally and irreversibly disrupt the global economy, destabilize earth's ecosystems, or compromise the planet's ability to sustain human life is challenging; without a tool to contextualize such risks, it is far easier to ignore them. Monetization tools like the social cost of carbon and social cost of methane are designed to solve this problem: by translating long-term costs into present values, instantiating the harms of climate change, and giving due weight to the potential of lower-probability but catastrophic harms.

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<sup>20</sup> Bureau of Land Management, Environmental Assessment DOI-BLM-MT-C020-2014-0091-EA, 76 (May 2014).

<sup>21</sup> Available at [http://www.nhtsa.gov/staticfiles/rulemaking/pdf/cafe/FINAL\\_EIS.pdf](http://www.nhtsa.gov/staticfiles/rulemaking/pdf/cafe/FINAL_EIS.pdf) at 9-77; see also [http://ntl.bts.gov/lib/55000/55200/55224/Draft\\_Environmental\\_Impact\\_Statement\\_for\\_Phase\\_2\\_MDHD\\_Fuel\\_Efficiency\\_Standards.pdf](http://ntl.bts.gov/lib/55000/55200/55224/Draft_Environmental_Impact_Statement_for_Phase_2_MDHD_Fuel_Efficiency_Standards.pdf).

<sup>22</sup> Forest Service, *Rulemaking for Colorado Roadless Areas: Supplemental Final Environmental Impact Statement* (Nov. 2016), available at [https://www.fs.usda.gov/Internet/FSE\\_DOCUMENTS/fseprd525072.pdf](https://www.fs.usda.gov/Internet/FSE_DOCUMENTS/fseprd525072.pdf) (using both the social cost of carbon and the social cost of methane).

<sup>23</sup> See *Robertson v. Methow Valley Citizens Council*, 490 U.S. 332 (1989).

<sup>24</sup> See *Baltimore Gas & Elec. Co.*, 462 U.S. at 96.

<sup>25</sup> Cass R. Sunstein, *Probability Neglect: Emotions, Worst Cases, and Law* (John M. Olin Law & Economics, Working Paper No. 138, 2001), available at <http://ssrn.com/abstract=292149>.

Agencies and the public might also suffer from base-rate bias, which causes the undervaluation of information that is generally applicable across a range of scenarios.<sup>26</sup> Agencies fall into this trap when their NEPA reviews provide generic narrative descriptions of climate change yet conclude that climate change is too global and general a problem to address in a project-specific environmental impact statement. This approach inappropriately forecloses the possibility of mitigating the effects of climate change.

Metrics like the social cost of carbon and social cost of methane allow and encourage agencies to identify such mitigation opportunities by monetizing the effects on climate change from the emission of as little as a single ton of greenhouse gases. In fact, these monetization tools were developed to assess the cost of actions with “marginal” impacts on cumulative global emissions, and so are well suited to projects or rules with even relatively small net changes in greenhouse gas emissions. The estimates are derived from three integrated assessment models, which translate emissions into changes in atmospheric greenhouse concentrations, atmospheric concentrations into changes in temperature, and changes in temperature into economic damages, which can then be adjusted according to a discount rate. The marginal cost is attained by first running the models using a baseline emissions trajectory, and then running the same models again with one additional unit of emissions. The difference in damages between the two runs is the marginal cost of one additional unit. The approach assumes that the marginal damages from increased emissions will remain constant for small emissions increases relative to gross global emissions. In other words, the monetization tools are in fact perfectly suited to measuring the marginal effects of project-level resource management decisions.

### ***Standards of Rationality Require Attention to and Consistent Treatment of Important Factors***

The Supreme Court defined the standard of rationality for agency actions under the Administrative Procedure Act as follows:

Normally, an agency rule would be arbitrary and capricious if the agency has relied on factors which Congress has not intended it to consider, *entirely failed to consider an important aspect of the problem*, offered an explanation for its decision that runs counter to the evidence before the agency, or is so implausible that it could not be ascribed to a difference in view of the product of agency expertise.<sup>27</sup>

Furthermore, the Court found that the standard requires agencies to “examine the relevant data and articulate . . . a rational connection between the facts found and the choice made.”<sup>28</sup>

Two federal courts of appeals have already applied arbitrary and capricious review to require or approve of the use of the social cost of greenhouse gases in agency decisionmaking. In *Center for Biological Diversity v. National Highway Traffic Safety Administration*, the U.S. Court of Appeals for the Ninth Circuit ruled that, because the agency had monetized other uncertain costs and benefits of its vehicle fuel efficiency standard, its “decision not to monetize the benefit of carbon emissions reduction was arbitrary and capricious.”<sup>29</sup> Specifically, it was arbitrary to “assign[ ] no value to *the most significant*

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<sup>26</sup> See Fallacy Files, *The Base Rate Fallacy*, <http://www.fallacyfiles.org/baserate.html>; David B. Graham, Capt. Thomas D. Johns, *The Corporate Emergency Response Plan: A Smart Strategy*, 27 NAT. RESOURCES & ENV'T 3 (2012) (on normalcy bias).

<sup>27</sup> *Motor Vehicle Manufacturers Assoc. v. State Farm Mutual Auto. Ins. Co.*, 463 U.S. 29, 41-43 (1983) (emphasis added); see also *id.* (“[W]e must ‘consider whether the decision was based on a consideration of the relevant factors and whether there has been a clear error of judgment.’”).

<sup>28</sup> *Id.*

<sup>29</sup> 538 F.3d 1172, 1203 (9th Cir. 2008).

*benefit* of more stringent [vehicle fuel efficiency] standards: reduction in carbon emissions.”<sup>30</sup> When an agency bases a rulemaking on cost-benefit analysis, it is arbitrary to “put a thumb on the scale by undervaluing the benefits and overvaluing the costs.”<sup>31</sup> As that case concerned a previous NHTSA set of CAFE standards, it obviously has special relevance to these new CAFE proceedings.

More recently, in *Zero Zone Inc. v. Department of Energy*, the U.S. Court of Appeals for the Seventh Circuit found that “the expected reduction in environmental costs *needs* to be taken into account” for the Department of Energy “[t]o determine whether an energy conservation measure is appropriate under a cost-benefit analysis.”<sup>32</sup> More specifically, in response to petitioners’ challenge that the agency’s consideration of the global social cost of carbon was arbitrary, the Seventh Circuit responded that the agency acted reasonably in monetizing the global climate effects.<sup>33</sup>

Two federal district courts have also found the failure to use the social cost of carbon in NEPA analyses to be arbitrary and capricious. In *High Country Conservation Advocates v. Forest Service*, the U.S. District Court of Colorado found that it was “arbitrary and capricious to quantify the *benefits* of the lease modifications and then explain that a similar analysis of the *costs* was impossible when such an analysis was in fact possible”—specifically, by applying the “social cost of carbon protocol.”<sup>34</sup> In *Montana Environmental Information Center v. Office of Surface Mining*, the U.S. District Court of Montana followed the lead set by *High Country* and likewise held an environmental assessment to be arbitrary and capricious because it quantified the benefits of action while failing to use the social cost of carbon to quantify the costs.<sup>35</sup>

In short, agencies must monetize important greenhouse gas effects when their decisions are grounded in cost-benefit analysis.<sup>36</sup>

### ***New Executive Order Encourages Continued Monetization of the Social Cost of Greenhouse Gases***

Executive Order 13,783 officially disbanded the Interagency Working Group on the Social Cost of Greenhouse Gases (IWG) and withdrew its technical support documents that underpinned their range of estimates.<sup>37</sup> Nevertheless, Executive Order 13,783 assumes that federal agencies will continue to “monetiz[e] the value of changes in greenhouse gas emissions” and instructs agencies to ensure such

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<sup>30</sup> *Id.* at 1199.

<sup>31</sup> *Id.* at 1198.

<sup>32</sup> No. 14-2147, at 40 (Aug. 8, 2016) (emphasis added).

<sup>33</sup> *Id.* at 44. See also *Sierra Club v. FERC*, No. 16-1329, 2017 WL 3597014, at \*10 (D.C. Cir. Aug. 22, 2017) (requiring that, on remand, if FERC declines to use the social cost of carbon, the agency must explain and justify why not).

<sup>34</sup> 52 F. Supp. 3d 1174, 1191 (D. Colo. 2014).

<sup>35</sup> 15-106-M-DWM, at 40-46, Aug. 14, 2017 (also holding that it was arbitrary to imply that there would be zero effects from greenhouse gas emissions).

Three cases from different courts have declined to find that specific failures to use the social cost of carbon in NEPA analyses rise to the level of arbitrary and capricious action, but the cases are all distinguishable by the scale of the action or by whether other effects were quantified and monetized in the analysis. See *League of Wilderness Defenders v. Connaughton*, No. 3:12-cv-02271-HZ (D. Ore., Dec. 9, 2014); *EarthReports v. FERC*, 15-1127, (D.C. Cir. July 15, 2016); *WildEarth Guardians v. Zinke*, 1:16-CV-00605-RJ, at 23-24, (D. N.M. Feb. 16, 2017). More recently the U.S. Court of Appeals for the District of Columbia Circuit confirmed that NEPA requires a rigorous analysis of climate effects and, in its remand to FERC, required the agency to explain and justify its position if it decides not to use the social cost of carbon. *Sierra Club v. FERC*, No. 16-1329, 2017 WL 3597014, at \*10 (D.C. Cir. Aug. 22, 2017).

<sup>36</sup> See generally Peter Howard & Jason Schwartz, *Think Global: International Reciprocity as Justification for a Global Social Cost of Carbon*, 42 *Columbia J. Envtl. L.* 203 (2017) for more on applying standards of rationality to the social cost of carbon.

<sup>37</sup> Exec. Order. No. 13,783 § 5(b), 82 *Fed. Reg.* 16,093 (Mar. 28, 2017).

estimates are “consistent with the guidance contained in OMB Circular A-4.”<sup>38</sup> Consequently, while NHTSA and other federal agencies no longer have technical guidance directing them to exclusively rely on the IWG’s estimates to monetize climate effects, by no means does the new Executive Order imply that agencies should not monetize important effects in their regulatory analyses or environmental impact statements. In fact, Circular A-4 instructs agencies to monetize costs and benefits whenever feasible.<sup>39</sup> The Executive Order does not prohibit agencies from relying on the same choice of models as the IWG, the same inputs and assumptions as the IWG, the same statistical methodologies as the IWG, or the same ultimate values as derived by the IWG. To the contrary, because the Executive Order requires consistency with Circular A-4, as agencies follow the Circular’s standards for using the best available data and methodologies, they will necessarily choose similar data, methodologies, and estimates as the IWG, since the IWG’s work continues to represent the best available estimates.<sup>40</sup> The Executive Order does not preclude agencies from using the same range of estimates as developed by the IWG, so long as the agency explains that the data and methodology that produced those estimates are consistent with Circular A-4 and, more broadly, with standards for rational decisionmaking.

Similarly, as explained above, the Executive Order’s withdrawal of the CEQ guidance on greenhouse gases does not and cannot change agencies’ obligations to appropriately monetize climate effects in their EISs. The CEQ guidance had merely summarized and applied longstanding NEPA regulations and case law, all of which are still in effect today. Using the best currently available estimates of the social cost of greenhouse gases is still consistent with, and may be required by, NEPA.

As explained in the final section of these comments, the IWG’s estimates of the social cost of greenhouse gases are, in fact, already consistent with the Circular A-4 and represent the best existing estimates of the lower bound of the range for the social cost of greenhouse gases. Therefore, the IWG estimates or those of a similar or higher value<sup>41</sup> should be used in regulatory analyses and environmental impact statements.

## **2. NHTSA Should Follow the Social Cost of Greenhouse Gas Protocol’s Treatment of Uncertainty**

In its notice, NHTSA announces that it

anticipates uncertainty in estimating the potential environmental impacts related to climate change. To account for this uncertainty, NHTSA plans to evaluate a range of potential global temperature changes that may result from changes in fuel and energy consumption and GHG emissions attributable to new CAFE standards. It is difficult to quantify how the specific impacts due to the potential temperature changes attributable to new CAFE standards may affect many aspects of the environment.<sup>42</sup>

Fortunately for NHTSA, it is not actually so “difficult to quantify” how greenhouse gas emission changes from its CAFE standards will affect temperature and the global environment. As discussed throughout

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<sup>38</sup> *Id.* § 5(c).

<sup>39</sup> OMB, Circular A-4 at 27 (2003) (“You should monetize quantitative estimates whenever possible.”).

<sup>40</sup> Richard L. Revesz et al., *Best Cost Estimate of Greenhouse Gases*, 357 SCIENCE 6352 (2017) (explaining that, even after Trump’s Executive Order, the social cost of greenhouse gas estimate of around \$50 per ton of carbon dioxide is still the best estimate).

<sup>41</sup> See, e.g., Richard L. Revesz et al., *Global Warming: Improve Economic Models of Climate Change*, 508 NATURE 173 (2014) (explaining that current estimates omit key damage categories and, therefore, are very likely underestimates).

<sup>42</sup> 82 Fed. Reg. at 34,744.

these comments, a sophisticated protocol has already been developed by the IWG, which included the Department of Transportation as a participating agency.<sup>43</sup> Irrespective of Executive Order 13,783, the approach developed and utilized by the IWG remains the best methodology, based on the best currently available scientific and economic data. In particular, the IWG modeled the uncertainty over the value of the equilibrium climate sensitivity parameter using the Roe and Baker distribution calibrated to the IPCC reports. Using well-established analytic tools to capture and reflect uncertainty, including a Monte Carlo simulation to randomly select the equilibrium climate sensitivity parameter and other uncertainty parameters selected by the model developers, the IWG quantitatively modeled the uncertainty underlying how greenhouse gas emissions affect temperature. Rather than guess about “a range of potential global temperature changes that may result,” NHTSA must undertake a quantitative assessment of uncertainty and can rely on the same models and methodologies as the IWG to connect each ton of greenhouse gases avoided or emitted as a result of the CAFE standards with the associated global climate effects.<sup>44</sup>

To further deal with uncertainty, the IWG recommended to agencies a range of four estimates: three central or mean-average estimates at a 2.5%, 3%, and 5% discount rate respectively, and a 95<sup>th</sup> percentile value at the 3% discount rate. While the IWG’s technical support documents disclosed fuller probabilities distributions, these four estimates were chosen by agencies to be the focus for decisionmaking. In particular, application of the 95<sup>th</sup> percentile value was not part of an effort to show the probability distribution around the 3% discount rate; rather, the 95<sup>th</sup> percentile value serves as a methodological shortcut to approximate the uncertainties around low-probability but high-damage, catastrophic, or irreversible outcomes that are currently omitted or undercounted in the economic models.

The shape of the distribution of climate risks and damages includes a long tail of lower-probability, high-damage, irreversible outcomes due to “tipping points” in planetary systems, inter-sectoral interactions, and other deep uncertainties. Climate damages are not normally distributed around a central estimate, but rather feature a significant right skew toward catastrophic outcomes. In fact, a 2015 survey of economic experts concludes that catastrophic outcomes are increasingly likely to occur.<sup>45</sup> Because the three integrated assessment models that the IWG’s methodology relied on are unable to systematically account for these potential catastrophic outcomes, a 95<sup>th</sup> percentile value was selected instead to account for such uncertainty. There are no similarly systematic biases pointing in the other direction which might warrant giving weight to a low-percentile estimate. Consequently, in any treatment of uncertainty, NHTSA should give sufficient attention to the long tail on the probability distribution that extends into high temperature ranges and catastrophic damages.

Additionally, the 95<sup>th</sup> percentile value addresses the strong possibility of widespread risk aversion with respect to climate change. The integrated assessment models do not reflect that individuals likely have a higher willingness to pay to reduce low-probability, high-impact damages than they do to reduce the likelihood of higher-probability but lower impact damages with the same expected cost. Beyond

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<sup>43</sup> See Interagency Working Group on Social Cost of Carbon, Technical Support Document: Social Cost of Carbon for Regulatory Impact Analysis under Executive Order 12866 (2010) (listing the Department of Transportation as a participant).

<sup>44</sup> NHTSA may have used other methodologies for quantitative assessment of uncertainty in the past.

<sup>45</sup> Policy Integrity, *Expert Consensus on the Economics of Climate Change 2* (2015), available at <http://policyintegrity.org/files/publications/ExpertConsensusReport.pdf> [hereinafter *Expert Consensus*] (“Experts believe that there is greater than a 20% likelihood that this same climate scenario would lead to a ‘catastrophic’ economic impact (defined as a global GDP loss of 25% or more).”). See also Robert Pindyck, *The Social Cost of Carbon Revisited* (National Bureau of Economic Research, No. w22807, 2016).

individual members of society, governments also have reasons to exercise some degree of risk aversion to irreversible outcomes like climate change.

In short, the 95<sup>th</sup> percentile estimate attempts to capture risk aversion and uncertainties around lower-probability, high-damage, irreversible outcomes that are currently omitted or undercounted by the models. There is no need to balance out this estimate with a low-percentile value, because the reverse assumptions are not reasonable:

- There is no reason to believe the public or the government will be systematically risk seeking with respect to climate change.<sup>46</sup>
- The consequences of overestimating the risk of climate damages (i.e., spending more than we need to on mitigation and adaptation) are not nearly as irreversible as the consequences of underestimating the risk of climate damage (i.e., failing to prevent catastrophic outcomes).
- Though some uncertainties might point in the direction of lower social cost of greenhouse gas values, such as those related to the development of breakthrough adaptation technologies, the models already account for such uncertainties around adaptation; on balance, most uncertainties strongly point toward higher, not lower, social cost of greenhouse gas estimates.<sup>47</sup>
- There is no empirical basis for any “long tail” of potential benefits that would counteract the potential for extreme harm associated with climate change.

Moreover, even the best existing estimates of the social cost of greenhouse gases are likely underestimated because the models currently omit many significant categories of damages—such as depressed economic growth, pests, pathogens, erosion, air pollution, fire, dwindling energy supply, health costs, political conflict, and ocean acidification—and because of other methodological choices.<sup>48</sup> There is little to no support among economic experts to give weight to any estimate lower than the 5% discount rate estimate.<sup>49</sup> Rather, even a discount rate at 3% or below likely continues to underestimate the true social cost of greenhouse gases.

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<sup>46</sup> As a 2009 survey revealed, the vast majority of economic experts support the idea that “uncertainty associated with the environmental and economic effects of greenhouse gas emissions increases the value of emission controls, assuming some level of risk-aversion.” See *Expert Consensus*, *supra* note 45, at 3 (citing 2009 survey).

<sup>47</sup> See Richard L. Revesz et al., *Global Warming: Improve Economic Models of Climate Change*, 508 *NATURE* 173 (2014). R. Tol, *The Social Cost of Carbon*, 3 *Annual Rev. Res. Econ.* 419 (2011) (“[U]ndesirable surprises seem more likely than desirable surprises. Although it is relatively easy to imagine a disaster scenario for climate change—for example, involving massive sea level rise or monsoon failure that could even lead to mass migration and violent conflict—it is not at all easy to imagine that climate change will be a huge boost to human welfare.”).

<sup>48</sup> See Revesz et al., *Global Warming: Improve Economic Models of Climate Change*, *supra* note 47; Peter Howard, *Omitted Damages: What’s Missing from the Social Cost of Carbon* (Cost of Carbon Project Report, 2014); Frances C. Moore & Delavane B. Diaz, *Temperature Impacts on Economic Growth Warrant Stringent Mitigation Policy*, 5 *NATURE CLIMATE CHANGE* 127 (2015) (demonstrating SCC may be biased downward by more than a factor of six by failing to include the climate’s effect on economic growth).

<sup>49</sup> The existing estimates based on the 5% discount rate already provides a lower-bound; indeed, if anything the 5% discount rate is already far too conservative as a lower-bound. A recent survey of 365 experts on the economics of climate change found that 90% of experts believe a 3% discount rate or lower is appropriate for climate change; a 5% discount rate falls on the extremely high end of what experts would recommend. *Expert Consensus*, *supra* note 45, at 21; see also Drupp, M.A., et al. *Discounting Disentangled: An Expert Survey on the Determinants of the Long-Term Social Discount Rate* (London School of Economics and Political Science Working Paper, May 2015) (finding consensus on social discount rates between 1-3%). Only 8%

The National Academies of Sciences did recommend that the IWG document its full treatment of uncertainty in an appendix and disclose low-probability as well as high-probability estimates of the social cost of greenhouse gases.<sup>50</sup> However, that does not mean it would be appropriate for individual agencies to rely on low-percentile estimates to justify decisions. While disclosing low-percentile estimates as a sensitivity analysis may promote transparency, relying on such an estimate for decisionmaking—in the face of contrary guidance from the best available science and economics on uncertainty and risk—would not be a “credible, objective, realistic, and scientifically balanced” approach to uncertainty.

More generally, agencies should remember that uncertainty is not a reason to abandon the social cost of greenhouse gas methodologies; rather uncertainty supports higher estimates of the social cost of greenhouse gases, because most uncertainties regarding climate change entail tipping points, catastrophic risks, and unknown unknowns about the damages of climate change. Because the key uncertainties of climate change include the risk of irreversible catastrophes, applying an options value framework to the regulatory context strengthens the case for ambitious regulatory action to reduce greenhouse gas emissions. There are numerous well-established, rigorous analytical tools available to help agencies characterize and quantitatively assess uncertainty, such as Monte Carlo simulations, and the IWG’s social cost of greenhouse gas protocol incorporates those tools.

### **3. NHTSA Must Account for EPA Regulations in its No Action Baseline**

Any analysis of regulatory impacts requires a baseline. NHTSA announces that its “no action” baseline to analyze alternative CAFE standards for Model Years 2022-2025 will “assume[ ] . . . that NHTSA would issue a rule that would continue the current CAFE standards for MY 2021 indefinitely.”<sup>51</sup> This is an inappropriate approach to setting the baseline.

NHTSA has announced that, in addition to new standards for Model Years 2022-2025, the agency “may evaluate the MY 2021 standards it finalized in 2012 to ensure they remain ‘maximum feasible.’”<sup>52</sup> Yet NHTSA fails to describe the baseline for such a re-evaluation. The current Model Year 2021 standards provide the appropriate baseline for any re-evaluation of those standards. However, in setting the baseline for Model Years 2022-2025, NHTSA has failed to account for EPA’s currently existing emissions standards for those model years.

#### ***Baseline for MY 2021***

In its forthcoming substantive rulemaking, NHTSA should not propose to lower the current fuel efficiency standards for Model Year 2021 vehicles. Those standards are fully supported by NHTSA’s own extensive record as well as by EPA’s record, although they are now more easily achievable than when NHTSA set them in 2012. If NHTSA were to review the Model Year 2021 standards, the standards should be increased, because the maximum achievable fuel efficiency for these vehicles now exceeds the current standards.

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of the experts surveyed believe that the central estimate of the social cost of carbon is below \$40, and 69% of experts believed the value should be at or above the central estimate of \$40. *Expert Consensus, supra* note 45, at 18.

<sup>50</sup> Nat’l Acad. Of Sci., *Assessment of Approaches to Updating the Social Cost of Carbon* 49 (2016) (“[T]he IWG could identify a high percentile (e.g., 90<sup>th</sup>, 95<sup>th</sup>) and corresponding low percentile (e.g., 10<sup>th</sup>, 5<sup>th</sup>) of the SCC frequency distributions on each graph.”).

<sup>51</sup> 82 Fed. Reg. at 34,742.

<sup>52</sup> *Id.*

In case NHTSA increases the Model Year 2021 standards, it must use the current standards for that year as a baseline to analyze the effects of adopting more stringent standards. Because the current standards for 2021 are final and currently in effect, they represent the “no action” baseline for Model Year 2021 vehicles.

#### **Baseline for MY 2022-2025**

NHTSA proposes setting its “no action” baseline for analysis on the assumption that, if the agency does not act to develop new standards specific to the Model Years 2022-2025, it would most likely “continue the already existing and enforceable [MY 2021] standards indefinitely without further change.”<sup>53</sup> However, selecting Model Year 2021 standards as the “no action” baseline ignores the other “already existing and enforceable standards”—namely, EPA’s greenhouse gas standards for passenger cars and light trucks for Model Years 2017-2025—as well as NHTSA’s prior selection of parallel “augural” fuel economy standards for this period.<sup>54</sup> All alternatives must be compared against a “no action” baseline that accounts for these existing finalized and augural standards.<sup>55</sup> Informed decisionmaking requires NHTSA to analyze and fully explain the effects that would be created by any deviation, in any model year, from the standards that are in existence.

It is also important that NHTSA’s EIS reflect the potential for change to EPA’s standards, given that EPA has announced its intention to reconsider the Final Determination of the Mid-term Evaluation of Greenhouse Gas Emission Standards for the Model Years 2022-2025.<sup>56</sup> The EIS can reflect this potential by analyzing the climate and other environmental and health impacts of each alternative CAFE standard level proposed under two scenarios: (1) a scenario in which EPA’s standards remain in place and (2) a scenario in which NHTSA’s CAFE standards are the binding driver of fuel economy (that is, if EPA’s standards did not exist or were weaker than the NHTSA standards). By presenting this analysis, the EIS will avoid the potential for the public to not understand the important role that NHTSA’s standards could have if EPA were to change its standards.

#### **4. NHTSA Must Continue to Use Current Estimates of the Social Cost of Greenhouse Gases That Reflect the Best Available Data and Methodologies**

In 2016, the IWG published updated central estimates for the social cost of greenhouse gases: \$50 per ton of carbon dioxide, \$1440 per ton of methane, and \$18,000 per ton of nitrous oxide (in 2017 dollars for year 2020 emissions).<sup>57</sup> Agencies must continue to use estimates of a similar or higher value<sup>58</sup> in their regulatory analyses and environmental impact statements. In particular, when estimating the social cost of greenhouse gases, agencies must use multiple peer-reviewed models, a global estimate of climate damages, and a 3% or lower discount rate for the central estimate. These methodological approaches are consistent with NEPA’s directive that agencies adopt a global perspective and consider the effects of their actions on future generations.

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<sup>53</sup> *Id.*

<sup>54</sup> 77 Fed. Reg. 62,623 (2012).

<sup>55</sup> See OMB, Circular A-4 (2003) (requiring agencies to factor into their baseline other existing regulations, including

<sup>56</sup> 82 Fed. Reg. 14,671 (Mar. 22, 2017).

<sup>57</sup> U.S. Interagency Working Group on the Social Cost of Greenhouse Gases (IWG), “Technical support document: Technical update of the social cost of carbon for regulatory impact analysis under executive order 12866 & Addendum: Application of the methodology to estimate the social cost of methane and the social cost of nitrous oxide” (2016; <https://obamawhitehouse.archives.gov/omb/oira/social-cost-of-carbon>).

<sup>58</sup> See, e.g., Richard L. Revesz et al., *Global Warming: Improve Economic Models of Climate Change*, 508 NATURE 173 (2014) (explaining that current estimates omit key damage categories and, therefore, are very likely underestimates).

### **Agencies Must Not Rely on a Single Model, but Must Use Multiple, Peer-Reviewed Models**

NEPA requires “scientific accuracy” in environmental impact statements, and agencies must “insure the professional integrity, including scientific integrity, of the discussions and analyses.”<sup>59</sup> As the U.S. Court of Appeals for the Tenth Circuit has explained, NEPA requires agencies to use “the best available scientific information.”<sup>60</sup> OMB’s *Circular A-4* provides helpful guidance on the standards for accuracy in monetizing costs and benefits. *Circular A-4* requires agencies to use “the best reasonably obtainable scientific, technical, and economic information available. To achieve this, you should rely on peer-reviewed literature, where available.”<sup>61</sup>

Since the IWG first issued the federal social cost of carbon protocol in 2010, this methodology has relied on the three most cited, most peer-reviewed integrated assessment models (IAMs). These three IAMs—called DICE (the Dynamic Integrated Model of Climate and the Economy<sup>62</sup>), FUND (the Climate Framework for Uncertainty, Negotiation, and Distribution<sup>63</sup>), and PAGE (Policy Analysis of the Greenhouse Effect<sup>64</sup>)—draw on the best available scientific and economic data to link physical impacts to the economic damages of each marginal ton of greenhouse gas emissions. As noted previously, each model translates emissions into changes in atmospheric greenhouse gas concentrations, atmospheric concentrations into temperature changes, and temperature changes into economic damages, which can then be adjusted according to a discount rate. These three models have been combined with inputs derived from peer-reviewed literature on climate sensitivity, socio-economic and emissions trajectories, and discount rates. The results of the three models have been given equal weight in federal agencies’ estimates and have been run through statistical techniques like Monte Carlo analysis to account for uncertainty.

In a 2017 report, the National Academies of Sciences (NAS) recommended future improvements to this methodology. Specifically, over the next five years the NAS recommends unbundling the four essential steps in the IAMs into four separate “modules”: a socio-economic and emissions scenario module, a climate change module, an economic damage module, and a discount rate module.<sup>65</sup> Unbundling these four steps into separate modules could allow for easier, more transparent updates to each individual component in order to better reflect the best available science and capture the full range of uncertainty in the literature. These four modules could be built from scratch or drawn from the existing IAMs. Either way, the integrated modular framework envisioned by NAS for the future will require significant time and resource commitments from federal agencies.

In the meantime, the NAS has supported the continued near-term use of the existing social cost of greenhouse gas estimates based on the DICE, FUND, and PAGE models, as used by federal agencies to date.<sup>66</sup> In short, DICE, FUND, and PAGE continue to represent the state-of-the-art models. The

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<sup>59</sup> 40 C.F.R. § 1502.24.

<sup>60</sup> *Custer Cty. Action Ass’n v. Garvey*, 256 F.3d 1024, 1034 (10th Cir. 2001).

<sup>61</sup> OMB, *Circular A-4*, at 17.

<sup>62</sup> William D. Nordhaus, *Estimates of the social cost of carbon: concepts and results from the DICE-2013R model and alternative approaches*, 1 JOURNAL OF THE ASSOCIATION OF ENVIRONMENTAL AND RESOURCE ECONOMISTS 1 (2014).

<sup>63</sup> David Anthoff & Richard S.J. Tol, THE CLIMATE FRAMEWORK FOR UNCERTAINTY, NEGOTIATION AND DISTRIBUTION (FUND), TECHNICAL DESCRIPTION, VERSION 3.6 (2012), available at <http://www.fund-model.org/versions>.

<sup>64</sup> Chris Hope, *The Marginal Impact of CO<sub>2</sub> from PAGE2002: An Integrated Assessment Model Incorporating the IPCC’s Five Reasons for Concern*, 6 INTEGRATED ASSESSMENT J. 19 (2006).

<sup>65</sup> Nat’l Acad. Sci., Eng. & Medicine, *Valuing Climate Damages: Updating Estimates of the Social Cost of Carbon Dioxide 3* (2017) [hereinafter “NAS, Second Report”] (recommending an “integrated modular approach”).

<sup>66</sup> Specifically, NAS concluded that a near-term update was not necessary or appropriate and the current estimates should continue to be used while future improvements are developed over time. Nat’l Acad. Sci., Eng. & Medicine, *Assessment of*

Government Accountability Office found in 2014 that the estimates derived from these models and used by federal agencies are consensus-based, rely on peer-reviewed academic literature, disclose relevant limitations, and are designed to incorporate new information via public comments and updated research.<sup>67</sup> In fact, the social cost of greenhouse gas estimates used in federal regulatory proposals and EISs have been subject to over 80 distinct public comment periods.<sup>68</sup> The economics literature confirms that estimates based on these three IAMs remain the best available estimates.<sup>69</sup> In 2016, the U.S. Court of Appeals for the Seventh Circuit held the estimates used to date by agencies are reasonable.<sup>70</sup> Just last month, the District of Montana rejected an agency's Environmental Assessment for failure to incorporate the federal social cost of carbon estimates into its cost-benefit analysis of a proposed mine expansion.<sup>71</sup>

Regardless of Executive Order 13,783's withdrawal of the guidance requiring federal agencies to rely on IWG's technical support documents to estimate the social cost of greenhouse gases, IWG's choice of DICE, FUND, and PAGE, its use of inputs and assumptions, and its statistical analysis still represent the state-of-the-art approach based on the best available, peer-reviewed literature. This approach satisfies both NEPA's and Circular A-4's requirements for information quality and transparency. Therefore, in complying with the Executive Order's instructions to ensure that social cost of greenhouse gas estimates are consistent with Circular A-4, agencies will necessarily have to rely on models like DICE, FUND, and PAGE, to use the same or similar inputs and assumptions as the IWG, and to apply statistical analyses like Monte Carlo.

The unavoidable fact is that DICE, FUND, and PAGE are still the dominant, most peer-reviewed models,<sup>72</sup> and most estimates in the literature continue to rely on those models.<sup>73</sup> Each of these models has been developed over decades of research, and has been subject to rigorous peer review, documented in the published literature. While other models exist, they lack DICE's, FUND's, and PAGE's long history of peer review or exhibit other limitations. For example, the World Bank has created ENVISAGE, which models a more detailed breakdown of market sectors,<sup>74</sup> but unfortunately does not account for non-market impacts and so would omit a large portion of significant climate effects. Models like ENVISAGE are therefore not currently appropriate choices under the criteria of Circular A-4.<sup>75</sup>

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*Approaches to Updating the Social Cost of Carbon: Phase 1 Report on a Near-Term Update 1* (2016) [hereinafter "NAS, First Report"].

<sup>67</sup> Gov't Accountability Office, *Regulatory Impact Analysis: Development of Social Cost of Carbon Estimates* (2014).

<sup>68</sup> Howard & Schwartz, *supra* note 36, at Appendix A.

<sup>69</sup> *E.g.*, Richard G. Newell et al., *Carbon Market Lessons and Global Policy Outlook*, 343 *SCIENCE* 1316 (2014); Bonnie L. Keeler et al., *The Social Costs of Nitrogen*, 2 *SCIENCE ADVANCES* e1600219 (2016); Richard L. Revesz et al., *Global Warming: Improve Economic Models of Climate Change*, 508 *NATURE* 173 (2014) (co-authored with Nobel Laureate Kenneth Arrow, among others).

<sup>70</sup> *Zero Zone*, 832 F.3d at 678-79 (7<sup>th</sup> Cir. 2016) (finding that the agency "acted reasonably" in using global estimates of the social cost of carbon, and that the estimates chosen were not arbitrary or capricious).

<sup>71</sup> *Montana Environmental Information Center*, 2017 WL 3480262, at \*12-15, 19.

<sup>72</sup> See Interagency Working Group on the Social Cost of Carbon, *Response to Comments: Social Cost of Carbon for Regulatory Impact Analysis under Executive Order 12,866* at 7 (July 2015) ("DICE, FUND, and PAGE are the most widely used and widely cited models in the economic literature that link physical impacts to economic damages for the purposes of estimating the SCC."), citing Nat'l Acad. Sci., Eng. & Medicine, *Hidden Cost of Energy: Unpriced Consequences of Energy Production and Use* (2010) ("the most widely used impact assessment models").

<sup>73</sup> R.S. Tol, *The Social Cost of Carbon*, 3 *Annual Rev. Res. Econ.* 419 (2011); T. Havranek et al., *Selective Reporting and the Social Cost of Carbon*, 51 *Energy Econ.* 394 (2015).

<sup>74</sup> World Bank, *The Environmental Impact and Sustainability Applied General Equilibrium (ENVISAGE) Model* (2008), available at <http://siteresources.worldbank.org/INTPROSPECTS/Resources/334934-1193838209522/Envisage7b.pdf>.

<sup>75</sup> Similarly, Intertemporal Computable Equilibrium System (ICES) does not account for non-market impacts. See <https://www.cmcc.it/models/ices-intertemporal-computable-equilibrium-system>. Other models include CRED, which is worthy

An approach based on multiple, peer-reviewed models (like DICE, FUND, and PAGE) is more rigorous and more consistent with Circular A-4 than reliance on a single model or estimate. DICE, FUND, and PAGE each include many of the most significant climate effects, use appropriate discount rates and other assumptions, address uncertainty, are based on peer-reviewed data, and are transparent.<sup>76</sup> However, each IAM also has its own limitations and is sensitive to its own assumptions. No model fully captures all the significant climate effects.<sup>77</sup> By giving weight to multiple models—as the IWG did—agencies can balance out some of these limitations and produce more robust estimates.<sup>78</sup>

Finally, while agencies should be careful not to cherry-pick a single estimate from the literature, it is noteworthy that various estimates in the literature are consistent with the numbers derived from a weighted average of DICE, FUND, and PAGE—namely, with a central estimate of about \$40 per ton of carbon dioxide, and a high-percentile estimate of about \$120, for year 2015 emissions (in 2016 dollars, at a 3% discount rate). The latest central estimate from DICE’s developers is \$87 (at a 3% discount rate);<sup>79</sup> from FUND’s developers, \$12;<sup>80</sup> and from PAGE’s developers, \$123, with a high-percentile estimate of \$332.<sup>81</sup>

In fact, much of the literature suggests that a central estimate of \$40 per ton is a very conservative underestimate. A 2013 meta-analysis of the broader literature found a mean estimate of \$59 per ton of carbon dioxide,<sup>82</sup> and a soon-to-be-published update by the same author finds a mean estimate of \$108 (at a 1% discount rate).<sup>83</sup> A 2015 meta-analysis—which sought out estimates besides just those based on DICE, FUND, and PAGE—found a mean estimate of \$83 per ton of carbon dioxide.<sup>84</sup> Various studies relying on expert elicitation<sup>85</sup> from a large body of climate economists and scientists have found mean estimates of \$50 per ton of carbon dioxide,<sup>86</sup> \$96-\$144 per ton of carbon dioxide,<sup>87</sup> and \$80-\$100 per ton of carbon dioxide.<sup>88</sup> There is a growing consensus in the literature that even the best existing

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of further study for future use. Frank Ackerman, Elizabeth A. Stanton & Ramón Bueno, *CRED: A New Model of Climate and Development*, 85 *ECOLOGICAL ECONOMICS* 166 (2013). Accounting for omitted impacts more generally, E.A. Stanton, F. Ackerman, R. Bueno, *Reason, Empathy, and Fair Play: The Climate Policy Gap*, (Stockholm Environment Inst. Working Paper 2012-02), find a doubling of the SCC using the CRED model.

<sup>76</sup> While sensitivity analysis can address parametric uncertainty within a model, using multiple models helps address structural uncertainty.

<sup>77</sup> See Peter Howard, *Omitted Damages: What’s Missing from the Social Cost of Carbon 5* (Cost of Carbon Project Report, 2014), <http://costofcarbon.org/>.

<sup>78</sup> Moore, F., Baldos, U., & Hertel, T. (2017). Economic impacts of climate change on agriculture: a comparison of process-based and statistical yield models. *Environmental Research Letters*.

<sup>79</sup> William Nordhaus, *Revisiting the Social Cost of Carbon*, *Proc. Nat’l Acad. Sci.* (2017) (estimate a range of \$21 to \$141).

<sup>80</sup> D. Anthoff & R. Tol, *The Uncertainty about the Social Cost of Carbon: A Decomposition Analysis Using FUND*, 177 *Climatic Change* 515 (2013).

<sup>81</sup> C. Hope, *The social cost of CO2 from the PAGE09 model*, 39 *Economics* (2011); C. Hope, *Critical issues for the calculation of the social cost of CO2*, 117 *Climatic Change*, 531 (2013).

<sup>82</sup> R. Tol, *Targets for Global Climate Policy: An Overview*, 37 *J. Econ. Dynamics & Control* 911 (2013).

<sup>83</sup> R. Tol, *Economic Impacts of Climate Change* (Univ. Sussex Working Paper No. 75-2015, 2015).

<sup>84</sup> S. Nocera et al., *The Economic Impact of Greenhouse Gas Abatement through a Meta-Analysis: Valuation, Consequences and Implications in terms of Transport Policy*. 37 *Transport Policy* 31 (2015).

<sup>85</sup> Circular A-4, at 41, supports use of expert elicitation as a valuable tool to fill gaps in knowledge.

<sup>86</sup> Scott Holladay & Jason Schwartz, *Economists and Climate Change* 43 (Inst. Policy Integrity Brief, 2009 (directly surveying experts about the SCC)).

<sup>87</sup> Peter Howard & Derek Sylvan, *The Economic Climate: Establishing Expert Consensus on the Economics of Climate Change* (Inst. Policy Integrity Working Paper 2015/1) (using survey results to calibrate the DICE-2013R damage function).

<sup>88</sup> R. Pindyck, *The Social Cost of Carbon Revisited* (Nat’l Bureau of Econ. Res. No. w22807, 2016) (\$80-\$100 is the trimmed range of estimates at a 4% discount rate; without trimming of outlier responses, the estimate is \$200).

estimates of the social cost of greenhouse gases may severely underestimate the true marginal cost of climate damages.<sup>89</sup> Overall, a central estimate of \$40 per ton of carbon dioxide at a 3% discount rate, with a high-percentile estimate of about \$120 for year 2015 emissions, is consistent with the best available literature; if anything, the best available literature supports considerably higher estimates.<sup>90</sup>

Similarly, a comparison of international estimates of the social cost of greenhouse gases suggests that a central estimate of \$40 per ton of carbon dioxide is a very conservative value. Sweden places the long-term valuation of carbon dioxide at \$168 per ton; Germany calculates a “climate cost” of \$167 per ton of carbon dioxide in the year 2030; the United Kingdom’s “shadow price of carbon” has a central value of \$115 by 2030; Norway’s social cost of carbon is valued at \$104 per ton for year 2030 emissions; and various corporations have adopted internal shadow prices as high as \$80 per ton of carbon dioxide.<sup>91</sup>

### ***A Global Estimate of Climate Damages Is Required by NEPA***

NEPA contains a provision on “International and National Coordination of Efforts” that broadly requires that “all agencies of the Federal Government *shall* . . . recognize the worldwide and long-range character of environmental problems.”<sup>92</sup> Using a global social cost of greenhouse gases to analyze and set policy fulfills these instructions. Furthermore, the Act requires agencies to, “where consistent with the foreign policy of the United States, lend appropriate support to initiatives, resolutions, and programs designed to maximize international cooperation in anticipating and preventing a decline in the quality of mankind’s world environment.”<sup>93</sup> By continuing to use the global social cost of greenhouse gases to spur reciprocal foreign actions, federal agencies “lend appropriate support” to the NEPA’s goal of “maximize[ing] international cooperation” to protect “mankind’s world environment.” Furthermore, not only is it consistent with Circular A-4 and best economic practices to estimate the global damages of U.S. greenhouse gas emissions in regulatory analyses and environmental impact statements, but no existing

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<sup>89</sup> *E.g.*, Howard & Sylvan, *supra* note 87; Pindyck, *supra* note 88. The underestimation results from a variety of factors, including omitted and outdated climate impacts (including ignoring impacts to economic growth and tipping points), simplified utility functions (including ignoring relative prices), and applying constant instead of a declining discount rate. See Howard, *supra* note 77; Revesz et al., *supra* note 696; J.C. Van Den Bergh & W.J. Botzen, A Lower Bound to the Social Cost of CO2 Emissions, 4 *Nature Climate Change* 253 (2014) (proposing \$125 per metric ton of carbon dioxide in 1995 dollars, or about \$200 in today’s dollars, as the lower bound estimate). See also F.C. Moore & D.B. Diaz, *Temperature Impacts on Economic Growth Warrant Stringent Mitigation Policy*, 5 *Nature Climate Change* 127 (2015) (concluding the SCC may be six times higher after accounting for potential growth impacts of climate change). Accounting for both potential impacts of climate change on economic growth and other omitted impacts, S. Dietz and N. Stern find a two- to seven-fold increase in the SCC. *Endogenous growth, convexity of damage and climate risk: how Nordhaus' framework supports deep cuts in carbon emissions*. 125 *The Economic Journal* 574 (2015).

<sup>90</sup> Note that the various estimates cited in the paragraph have not all been converted to standard 2017\$, and may not all reflect the same year emissions. Nevertheless, the magnitude of this range suggests that \$40 per ton of year 2015 emissions is a conservative estimate.

<sup>91</sup> See Howard & Schwartz, *supra* note 36, at Appendix B. All these estimates are in 2016\$.

<sup>92</sup> 42 U.S.C. § 4332(2)(f) (emphasis added).

<sup>93</sup> *Id.*; see also *Environmental Defense Fund v. Massey*, 986 F.2d 528, 535 (D.C. Cir. 1993) (confirming that Subsection F is mandatory); *Natural Resources Defense Council v. NRC*, 647 F.2d 1345, 1357 (D.C. Cir. 1981) (“This NEPA prescription, I find, looks toward cooperation, not unilateral action, in a manner consistent with our foreign policy.”); *cf.* COUNCIL ON ENVIRONMENTAL QUALITY, GUIDANCE ON NEPA ANALYSIS FOR TRANSBOUNDARY IMPACTS (1997), available at <http://www.gc.noaa.gov/documents/transguide.pdf>; Exec. Order No. 12,114, *Environmental Effects Abroad of Major Federal Actions*, 44 Fed. Reg. 1957 §§ 1-1, 2-1 (Jan. 4, 1979) (applying to “major Federal actions . . . having significant effects on the environment outside the geographical borders of the United States,” and enabling agency officials “to be informed of pertinent environmental considerations and to take such considerations into account . . . in making decisions regarding such actions”).

methodology for estimating a “domestic-only” value is reliable, complete, or consistent with Circular A-4.

From 2010 through 2016, federal agencies based their regulatory decision and NEPA reviews on global estimates of the social cost of greenhouse gases. Though agencies often also disclosed a “highly speculative” range that tried to capture exclusively U.S. climate costs, emphasis on a global value was recognized as more accurate given the science and economics of climate change, as more consistent with best economic practices, and as crucial to advancing U.S. strategic goals.<sup>94</sup>

Opponents of climate regulation challenged the global number in court and other forums, and often attempted to use Circular A-4 as support.<sup>95</sup> Specifically, opponents have seized on Circular A-4’s instructions to “focus” on effects to “citizens and residents of the United States,” while any significant effects occurring “beyond the borders of the United States . . . should be reported separately.”<sup>96</sup> Importantly, despite this language and such challenges, the U.S. Court of Appeals for the Seventh Circuit had no trouble concluding that a global focus for the social cost of greenhouse gases was reasonable:

AHRI and Zero Zone [the industry petitioners] next contend that DOE [the Department of Energy] arbitrarily considered the global benefits to the environment but only considered the national costs. They emphasize that the [statute] only concerns “national energy and water conservation.” In the New Standards Rule, DOE did not let this submission go unanswered. It explained that climate change “involves a global externality,” meaning that carbon released in the United States affects the climate of the entire world. According to DOE, national energy conservation has global effects, and, therefore, those global effects are an appropriate consideration when looking at a national policy. Further, AHRI and Zero Zone point to no global costs that should have been considered alongside these benefits. Therefore, DOE acted reasonably when it compared global benefits to national costs.<sup>97</sup>

Circular A-4’s reference to effects “beyond the borders” confirms that it is appropriate for agencies to consider the global effects of U.S. greenhouse gas emissions. While Circular A-4 may suggest that most typical decisions should focus on U.S. effects, the Circular cautions agencies that special cases call for different emphases:

[Y]ou cannot conduct a good regulatory analysis according to a formula. Conducting high-quality analysis requires competent professional judgment. ***Different regulations may call for different emphases*** in the analysis, ***depending on the nature and complexity*** of the regulatory issues and the sensitivity of the benefit and cost estimates to the key assumptions.<sup>98</sup>

In fact, Circular A-4 elsewhere assumes that agencies’ analyses will not always be conducted from purely the perspective of the United States, as one of its instructions only applies “as long as the analysis is conducted from the United States perspective,”<sup>99</sup> suggesting that in some circumstances it is

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<sup>94</sup> See generally Howard & Schwartz, *supra* note 36.

<sup>95</sup> Ted Gayer & W. Kip Viscusi, *Determining the Proper Scope of Climate Change Policy Benefits in U.S. Regulatory Analyses: Domestic versus Global Approaches*, 10 Rev. Envtl. Econ. & Pol’y 245 (2016) (citing Circular A-4 to argue against a global perspective on the social cost of carbon); see also, e.g., Petitioners Brief on Procedural and Record-Based Issues at 70, in *West Virginia v. EPA*, case 15-1363, D.C. Cir. (filed February 19, 2016) (challenging EPA’s use of the global social cost of carbon).

<sup>96</sup> Circular A-4 at 15. Note that A-4 slightly conflates “accrue to citizens” with “borders of the United States”: U.S. citizens have financial and other interests tied to effects beyond the borders of the United States, as discussed further below.

<sup>97</sup> *Zero Zone v. Dept. of Energy*, No. 14-2147, at 44 (7<sup>th</sup> Cir., Aug. 8, 2016).

<sup>98</sup> Circular A-4 at 3.

<sup>99</sup> *Id.* at 38 (counting international transfers as costs and benefits “as long as the analysis is conducted from the United States perspective”).

appropriate for the analysis to be global. For example, EPA and DOT have adopted a global perspective on the analysis of potential monopsony benefits to U.S. consumers resulting from the reduced price of foreign oil imports following energy efficiency increases, and EPA assesses the global potential for leakage of greenhouse gas emissions owing to U.S. regulation.<sup>100</sup>

Perhaps more than any other issue, the nature of the issue of climate change requires precisely such a “different emphasis” from the default domestic-only assumption. To avoid a global “tragedy of the commons” that could irreparably damage all countries, including the United States, every nation should ideally set policy according to the global social cost of greenhouse gases.<sup>101</sup> Climate and clean air are global common resources, meaning they are freely available to all countries, but any one country’s use—i.e., pollution—imposes harms on the polluting country as well as the rest of the world. Because greenhouse pollution does not stay within geographic borders but rather mixes in the atmosphere and affects climate worldwide, each ton emitted by the United States not only creates domestic harms, but also imposes large externalities on the rest of the world. Conversely, each ton of greenhouse gases abated in another country benefits the United States along with the rest of the world.

If all countries set their greenhouse emission levels based on only domestic costs and benefits, ignoring the large global externalities, the aggregate result would be substantially sub-optimal climate protections and significantly increased risks of severe harms to all nations, including the United States. Thus, basic economic principles demonstrate that the United States stands to benefit greatly if all countries apply global social cost of greenhouse gas values in their regulatory decisions and project reviews. Indeed, the United States stands to gain hundreds of billions or even trillions of dollars in direct benefits from efficient foreign action on climate change.<sup>102</sup>

In order to ensure that other nations continue to use global social cost of greenhouse gas values, it is important that the United States itself continue to do so.<sup>103</sup> The United States is engaged in a repeated strategic dynamic with several significant players—including the United Kingdom, Germany, Sweden, and others—that have already adopted a global framework for valuing the social cost of greenhouse gases.<sup>104</sup> For example, Canada and Mexico have explicitly borrowed the U.S. estimates of a global social cost of carbon to set their own fuel efficiency standards.<sup>105</sup> For the United States to now depart from this collaborative dynamic by reverting to a domestic-only estimate would undermine the country’s long-term interests and could jeopardize emissions reductions underway in other countries, which are already benefiting the United States.

For these and other reasons, federal agencies have, since 2009, properly relied on global estimates of the social cost of greenhouse gases to justify their decisions. At the same time, some agencies have, in addition to the global estimate, also disclosed a “highly speculative” estimate of the domestic-only

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<sup>100</sup> See Howard & Schwartz, *supra* note 36, at 268-69.

<sup>101</sup> See Garrett Hardin, *The Tragedy of the Commons*, 162 *Science* 1243 (1968) (“[E]ach pursuing [only its] own best interest . . . in a commons brings ruin to all.”).

<sup>102</sup> Policy Integrity, *Foreign Action, Domestic Windfall: The U.S. Economy Stands to Gain Trillions from Foreign Climate Action* (2015), <http://policyintegrity.org/files/publications/ForeignActionDomesticWindfall.pdf>

<sup>103</sup> See Robert Axelrod, *The Evolution of Cooperation* 10-11 (1984) (on repeated prisoner’s dilemma games).

<sup>104</sup> See Howard & Schwartz, *supra* note 36, at Appendix B.

<sup>105</sup> See Heavy-Duty Vehicle and Engine Greenhouse Gas Emission Regulations, SOR/2013-24, 147 *Can. Gazette* pt. II, 450, 544 (Can.), available at <http://canadagazette.gc.ca/rp-pr/p2/2013/2013-03-13/html/sor-dors24-eng.html> (“The values used by Environment Canada are based on the extensive work of the U.S. Interagency Working Group on the Social Cost of Carbon.”); Jason Furman & Brian Deese, *The Economic Benefits of a 50 Percent Target for Clean Energy Generation by 2025*, White House Blog, June 29, 2016 (summarizing the North American Leader’s Summit announcement that U.S., Canada, and Mexico would “align” their SCC estimates).

effects of climate change. In particular, the Department of Energy always includes a chapter on a domestic-only value of carbon emissions in the economic analyses supporting its energy efficiency standards; EPA has also often disclosed similar estimates.<sup>106</sup> Such an approach is consistent with Circular A-4's suggestion that agencies should usually disclose domestic effects separately from global effects. However, as we have discussed, reliance on a domestic-only methodology would be inconsistent with both the inherent nature of climate change and the standards of Circular A-4. Consequently, it is appropriate under Circular A-4 for agencies to continue to rely on global estimates of the social cost of greenhouses to justify their regulatory decisions or their choice of alternatives under NEPA.

Moreover, no current methodology can accurately estimate a "domestic-only" value of the social cost of greenhouse gases. OMB, the National Academies of Sciences, and the economic literature all agree that existing methodologies for calculating a "domestic-only" value of the social cost of greenhouse gases are deeply flawed and result in severe and misleading underestimates. In developing the social cost of carbon, the IWG did offer some such domestic estimates. Using the results of one economic model (FUND) as well as the U.S. share of global gross domestic product ("GDP"), the group generated an "approximate, provisional, and **highly speculative**" range of 7–23% of the global social cost of carbon as an estimate of the purely direct climate effects to the United States.<sup>107</sup> Yet, as the IWG itself acknowledged, this range is almost certainly an underestimate because it ignores significant, indirect costs to trade, human health, and security that are likely to "spill over" into the United States as other regions experience climate change damages, among other effects.<sup>108</sup>

Neither the existing IAMs nor a share of global GDP are appropriate bases for calculating a domestic-only estimate. The IAMs were never designed to calculate a domestic SCC, since a global SCC is the economic efficient value. FUND, like other IAMs, includes some simplifying assumptions: of relevance, FUND and the other IAMs are not able to capture the adverse effects that the impacts of climate change in other countries will have on the United States through trade linkages, national security, migration, and other forces.<sup>109</sup> This is why the IWG characterized the domestic-only estimate from FUND as a "highly speculative" underestimate. Similarly, a domestic-only estimate based on some rigid conception of geographic borders or U.S. share of world GDP will fail to capture all the climate-related costs and benefits that matter to U.S. citizens.<sup>110</sup> U.S. citizens have economic and other interests abroad that are not fully reflected in the U.S. share of global GDP. GDP is a "monetary value of final goods and services—that is, those that are bought by the final user—produced in a country in a given period of time."<sup>111</sup> GDP therefore does not reflect significant U.S. ownership interests in foreign businesses, properties, and other assets, as well as consumption abroad including tourism,<sup>112</sup> or even the 8 million

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<sup>106</sup> Howard & Schwartz, *supra* note 36, at 220-21.

<sup>107</sup> INTERAGENCY WORKING GROUP ON SOCIAL COST OF CARBON, TECHNICAL SUPPORT DOCUMENT: SOCIAL COST OF CARBON FOR REGULATORY IMPACT ANALYSIS UNDER EXECUTIVE ORDER 12,866 at 11 (2010).

<sup>108</sup> *Id.* (explaining that the IAMs, like FUND, do "not account for how damages in other regions could affect the United States (e.g., global migration, economic and political destabilization)").

<sup>109</sup> See, e.g., Dept. of Defense, *National Security Implications of Climate-Related Risks and a Changing Climate* (2015), available at <http://archive.defense.gov/pubs/150724-congressional-report-on-national-implications-of-climate-change.pdf?source=govdelivery>.

<sup>110</sup> A domestic-only SCC would fail to "provide to the public and to OMB a careful and transparent analysis of the anticipated consequences of economically significant regulatory actions." Office of Information and Regulatory Affairs, *Regulatory Impact Analysis: A Primer 2* (2011).

<sup>111</sup> Tim Callen, *Gross Domestic Product: An Economy's All*, IMF, <http://www.imf.org/external/pubs/ft/fandd/basics/gdp.htm> (last updated Mar. 28, 2012).

<sup>112</sup> "U.S. residents spend millions each year on foreign travel, including travel to places that are at substantial risk from climate change, such as European cities like Venice and tropical destinations like the Caribbean islands." David A. Dana, *Valuing*

Americans living abroad.<sup>113</sup> At the same time, GDP is also over-inclusive, counting productive operations in the United States that are owned by foreigners. Gross National Income (“GNI”), by contrast, defines its scope not by location but by ownership interests.<sup>114</sup> However, not only has GNI fallen out of favor as a metric used in international economic policy,<sup>115</sup> but using a domestic-only SCC based on GNI would make the SCC metrics incommensurable with other costs in regulatory impact analyses, since most regulatory costs are calculated by U.S. agencies regardless of whether they fall to U.S.-owned entities or to foreign-owned entities operating in the United States.<sup>116</sup> Furthermore, both GDP and GNI are dependent on what happens in other countries, due to trade and the international flow of capital. The artificial constraints of both metrics counsel against a rigid split based on either U.S. GDP or U.S. GNI.<sup>117</sup>

Of course, there already are and will continue to be significant, quantifiable, localized effects of climate change. For example, a peer-reviewed EPA report, *Climate Change in the United States: Benefits of Global Action*, found that by the end of the century, the U.S. economy could face damages of \$110 billion annually in lost labor productivity alone due to extreme temperatures, plus \$11 billion annually in agricultural damages, \$180 billion in losses to key economic sectors due to water shortages, and \$5 trillion in damages U.S. coastal property.<sup>118</sup> But the existence of those examples of quantifiable estimates of localized damages does not mean that the current IAMs are able to extrapolate a U.S.-only number that accurately reflects total domestic damages—especially since, as already explained, the IAMs do not reflect spill overs.

As a result, in 2015, OMB concluded, along with several other agencies, that “good methodologies for estimating domestic damages do not currently exist.”<sup>119</sup> Similarly, the NAS recently concluded that current IAMs cannot accurately estimate the domestic social cost of greenhouse gases, and that estimates based on U.S. share of global GDP would be likewise insufficient.<sup>120</sup> William Nordhaus, the developer of the DICE model, cautioned earlier this year that “regional damage estimates are both incomplete and poorly understood,” and “there is little agreement on the distribution of the SCC by region.”<sup>121</sup> In short, any domestic-only estimate will be inaccurate, misleading, and out of step with the best available economic literature, in violation of Circular A-4’s standards for information quality.

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*Foreign Lives and Civilizations in Cost-Benefit Analysis: The Case of the United States and Climate Change Policy* (Northwestern Faculty Working Paper 196, 2009),

<http://scholarlycommons.law.northwestern.edu/cgi/viewcontent.cgi?article=1195&context=facultyworkingpapers>.

<sup>113</sup> Assoc. of Americans Resident Overseas, <https://www.aaro.org/about-aaro/6m-americans-abroad>. Admittedly 8 million is only 0.1% of the total population living outside the United States.

<sup>114</sup> *GNI, Atlas Method (Current US\$)*, THE WORLD BANK, <http://data.worldbank.org/indicator/NY.GNP.ATLS.CD>.

<sup>115</sup> *Id.*

<sup>116</sup> U.S. Office of Management and Budget & Secretariat General of the European Commission, *Review of Application of EU and US Regulatory Impact Assessment Guidelines on the Analysis of Impacts on International Trade and Development* 13 (2008).

<sup>117</sup> Advanced Notice of Proposed Rulemaking on Regulating Greenhouse Gas Emissions Under the Clean Air Act, 73 Fed. Reg. 44,354, 44,415 (July 30, 2008) (“Furthermore, international effects of climate change may also affect domestic benefits directly and indirectly to the extent U.S. citizens value international impacts (e.g., for tourism reasons, concerns for the existence of ecosystems, and/or concern for others); U.S. international interests are affected (e.g., risks to U.S. national security, or the U.S. economy from potential disruptions in other nations).”).

<sup>118</sup> EPA, *Climate Change in the United States: Benefits of Global Action* (2015).

<sup>119</sup> In November 2013, OMB requested public comments on the social cost of carbon. In 2015, OMB along with the rest of the Interagency Working Group issued a formal response to those comments. Interagency Working Group on the Social Cost of Carbon, *Response to Comments: Social Cost of Carbon for Regulatory Impact Analysis under Executive Order 12,866* at 36 (July 2015) [hereinafter, OMB 2015 Response to Comments].

<sup>120</sup> NAS Second Report, *supra* note 65, at 53.

<sup>121</sup> William Nordhaus, *Revisiting the Social Cost of Carbon*, 114 PNAS 1518, 1522 (2017).

For more details on the justification for a global value of the social cost of greenhouse gases, please see Peter Howard & Jason Schwartz, *Think Global: International Reciprocity as Justification for a Global Social Cost of Carbon*, 42 Columbia J. Envtl. L. 203 (2017). Another strong defense of the global valuation as consistent with best economic practices appears in a letter published in a recent issue of *The Review of Environmental Economics and Policy*, co-authored by Nobel laureate Kenneth Arrow.<sup>122</sup>

### ***Reliance on a 3% or Lower Discount Rate for Intergenerational Effects—or a Declining Discount Rate—Is Consistent with NEPA’s Required Treatment of Future Generations***

Because of the long lifespan of greenhouse gases and the long-term or irreversible consequences of climate change, the effects of today’s emissions changes will stretch out over the next several centuries. The time horizon for an agency’s analysis of climate effects, as well as the discount rate applied to future costs and benefits, determines how an agency treats future generations. Current central estimates of the social cost of greenhouse gases are based on a 3% discount rate and a 300-year time horizon. Executive Order 13,783 instructs agencies to reconsider the “appropriate discount rates” when monetizing the value of climate effects.<sup>123</sup> By citing the official guidance on typical regulatory impact analyses (namely, Circular A-4), the Order implicitly called into question the IWG’s choice not to use a 7% discount rate. However, use of a 7% discount would not only be inconsistent with best economic practices but would violate NEPA’s required consideration of impacts on future generations.

NEPA requires agencies to weigh the “relationship between local short-term uses of man’s environment and the maintenance and enhancement of long-term productivity,” as well as “any irreversible and irretrievable commitments of resources.”<sup>124</sup> That requirement is prefaced with a congressional declaration of policy that explicitly references the needs of future generations:

The Congress, recognizing the profound impact of man's activity on the interrelations of all components of the natural environment . . . declares that it is the continuing policy of the Federal Government . . . to use all practicable means and measures . . . to create and maintain conditions under which man and nature can exist in productive harmony, and fulfill the social, economic, and other requirements of present and **future generations** of Americans.<sup>125</sup>

When the Congressional Conference Committee adopted that language, it reported that the first “broad national goal” under the statute is to “fulfill the responsibilities of each generation as trustee of the environment for future generations. It is recognized in this [congressional] statement [of policy] that each generation has a responsibility to improve, enhance, and maintain the quality of the environment *to the greatest extent possible for the continued benefit of future generations.*”<sup>126</sup>

Because applying a 7% discount rate to the social cost of greenhouse gases could drop the valuation essentially to \$0, use of such a rate effectively ignores the needs of future generations. Doing so would arbitrarily fail to consider an important statutory factor that Congress wrote into the NEPA requirements.

Moreover, a 7% discount rate is inconsistent with best economic practices, including under Circular A-4. In 2015, OMB explained that “Circular A-4 is a **living document**. . . [T]he use of **7 percent is not considered appropriate** for intergenerational discounting. There is wide support for this view in the

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<sup>122</sup> Richard Revesz, Kenneth Arrow et al., *The Social Cost of Carbon: A Global Imperative*, 11 REEP 172 (2017).

<sup>123</sup> Executive Order 13,783 § 5(c).

<sup>124</sup> 42 U.S.C. § 4332(2)(C).

<sup>125</sup> 42 U.S.C.A. § 4331.

<sup>126</sup> See 115 Cong. Rec. 40419 (1969); see also same in Senate Report 91-296 (1969).

academic literature, and it is recognized in Circular A-4 itself. <sup>127</sup> While Circular A-4 tells agencies generally to use a 7% discount rate in addition to lower rates for typical rules,<sup>128</sup> the guidance does not intend for default assumptions to produce analyses inconsistent with best economic practices. Circular A-4 clearly supports using lower rates to the exclusion of a 7% rate for the costs and benefits occurring over the extremely long, 300-year time horizon of climate effects.

Circular A-4 clearly requires agency analysts to do more than rigidly apply default assumptions: “You cannot conduct a good regulatory analysis according to a formula. Conducting high-quality analysis requires competent professional judgment.”<sup>129</sup> As such, analysis must be “based on the best reasonably obtainable scientific, technical, and economic information available,”<sup>130</sup> and agencies must “[u]se **sound and defensible values** or procedures to monetize benefits and costs, and ensure that key analytical assumptions are defensible.”<sup>131</sup> Rather than assume a 7% discount rate should be applied automatically to every analysis, Circular A-4 requires agencies to justify the choice of discount rates for each analysis: “[S]tate in your report what assumptions were used, *such as . . . the discount rates* applied to future benefits and costs,” and explain “clearly how you arrived at your estimates.”<sup>132</sup> Based on Circular A-4’s criteria, there are numerous reasons why applying a 7% discount rate to climate effects that occur over a 300-year time horizon would be unjustifiable.

First, basing the discount rate on the **consumption rate of interest** is the correct framework for analysis of climate effects; a discount rate based on the private return to capital is inappropriate. Circular A-4 does suggest that 7% should be a “default position” that reflects regulations that primarily displace capital investments; however, the Circular explains that “[w]hen regulation primarily and directly affects private consumption . . . a lower discount rate is appropriate.”<sup>133</sup> The 7% discount rate is based on a private sector rate of return on capital, but private market participants typically have short time horizons. By contrast, climate change concerns the public well-being broadly. Rather than evaluating an optimal outcome from the narrow perspective of investors alone, economic theory requires analysts to make the optimal choices based on societal preferences and social discount rates. Moreover, because climate change is expected to largely affect large-scale consumption, as opposed to capital investment,<sup>134</sup> a 7% rate is inappropriate.

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<sup>127</sup> OMB 2015 Response to Comments, *supra* note 119, at 36.

<sup>128</sup> Circular A-4 at 36 (“For regulatory analysis, you should provide estimates of net benefits using both 3 percent and 7 percent....If your rule will have important intergenerational benefits or costs you might consider a further sensitivity analysis using a lower but positive discount rate in addition to calculating net benefits using discount rates of 3 and 7 percent.”).

<sup>129</sup> *Id.* at 3.

<sup>130</sup> *Id.* at 17.

<sup>131</sup> *Id.* at 27.

<sup>132</sup> *Id.* at 3.

<sup>133</sup> *Id.* at 33.

<sup>134</sup> “There are two rationales for discounting future benefits—one based on consumption and the other on investment. The consumption rate of discount reflects the rate at which society is willing to trade consumption in the future for consumption today. Basically, we discount the consumption of future generations because we assume future generations will be wealthier than we are and that the utility people receive from consumption declines as their level of consumption increases. . . . The investment approach says that, as long as the rate of return to investment is positive, we need to invest less than a dollar today to obtain a dollar of benefits in the future. Under the investment approach, the discount rate is the rate of return on investment. If there were no distortions or inefficiencies in markets, the consumption rate of discount would equal the rate of return on investment. There are, however, many reasons why the two may differ. As a result, using a consumption rather than investment approach will often lead to very different discount rates.” Maureen Cropper, *How Should Benefits and Costs Be Discounted in an Intergenerational Context?*, 183 *RESOURCES* 30, 33.

In 2013, OMB called for public comments on the social cost of greenhouse gases. In its 2015 Response to Comment document,<sup>135</sup> OMB (together with the other agencies from the IWG) explained that

the consumption rate of interest is the correct concept to use . . . as the impacts of climate change are measured in consumption-equivalent units in the three IAMs used to estimate the SCC. This is consistent with OMB guidance in Circular A-4, which states that when a regulation is expected to primarily affect private consumption—for instance, via higher prices for goods and services—it is appropriate to use the consumption rate of interest to reflect how private individuals trade-off current and future consumption.<sup>136</sup>

The Council of Economic Advisers similarly interprets Circular A-4 as requiring agencies to choose the appropriate discount rate based on the nature of the regulation: “[I]n Circular A-4 by the Office of Management and Budget (OMB) the appropriate discount rate to use in evaluating the net costs or benefits of a regulation depends on whether the regulation primarily and directly affects private consumption or private capital.”<sup>137</sup> The NAS also explained that a consumption rate of interest is the appropriate basis for a discount rate for climate effects.<sup>138</sup> For this reason, 7% is an inappropriate choice of discount rate for the impacts of climate change.

Second, **uncertainty over the long time horizon** of climate effects should drive analysts to select a lower discount rate. As an example of when a 7% discount rate is appropriate, Circular A-4 identifies an EPA rule with a 30-year timeframe of costs and benefits.<sup>139</sup> By contrast, greenhouse gas emissions generate effects stretching out across 300 years. As Circular A-4 notes, while “[p]rivate market rates provide a reliable reference for determining how society values time within a generation, but for extremely long time periods no comparable private rates exist.”<sup>140</sup>

Circular A-4 discusses how uncertainty over long time horizons drives the discount rate lower: “the longer the horizon for the analysis,” the greater the “uncertainty about the appropriate value of the discount rate,” which supports a lower rate.<sup>141</sup> Circular A-4 cites the work of renowned economist Martin Weitzman and concludes that the “certainty-equivalent discount factor corresponds to **the**

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<sup>135</sup> Note that this document was not withdrawn by Executive Order 13,783.

<sup>136</sup> OMB 2015 Response to Comments, *supra* note 119, at 22.

<sup>137</sup> Council of Econ. Advisers, *Discounting for Public Policy: Theory and Recent Evidence on the Merits of Updating the Discount Rate* at 1 (CEA Issue Brief, 2017), available at [https://obamawhitehouse.archives.gov/sites/default/files/page/files/201701\\_cea\\_discounting\\_issue\\_brief.pdf](https://obamawhitehouse.archives.gov/sites/default/files/page/files/201701_cea_discounting_issue_brief.pdf). In theory, the two rates would be the same, but “given distortions in the economy from taxation, imperfect capital markets, externalities, and other sources, the SRTP and the marginal product of capital need not coincide, and analysts face a choice between the appropriate opportunity cost of a project and the appropriate discount rate for its benefits.” *Id.* at 9. The correct discount rate for climate change is the social return to capital (i.e., returns minus the costs of externalities), not the private return to capital (which measures solely the returns).

<sup>138</sup> NAS Second Report, *supra* note 65, at 28; see also Kenneth Arrow et al., Is There a Role for Benefit-Cost Analysis in Environmental, Health, and Safety Regulation?, 272 *Science* 221 (1996) (explaining that a consumption-based discount rate is appropriate for climate change).

<sup>139</sup> Circular A-4 at 34. See also OMB 2015 Response to Comments, *supra* note 119, at 21 (“While most regulatory impact analysis is conducted over a time frame in the range of 20 to 50 years”).

<sup>140</sup> Circular A-4 at 36.

<sup>141</sup> *Id.*

**minimum discount rate having any substantial positive probability.**<sup>142</sup> The NAS makes the same point about discount rates and uncertainty.<sup>143</sup>

Third, a 7% percent discount rate would be inappropriate for climate change because it is based on **outdated data and diverges from the current economic consensus**. Circular A-4 requires that assumptions—including discount rate choices—are “based on the best reasonably obtainable scientific, technical, and economic information available.”<sup>144</sup> Yet Circular A-4’s own default assumption of a 7% discount rate was published 14 years ago and was based on data from decades ago.<sup>145</sup> Circular A-4’s guidance on discount rates is in need of an update, as the Council of Economic Advisers detailed earlier this year after reviewing the best available economic data and theory:

The discount rate guidance for Federal policies and projects was last revised in 2003. Since then a general reduction in interest rates along with a reduction in the forecast of long-run interest rates, warrants serious consideration for a reduction in the discount rates used for benefit-cost analysis.<sup>146</sup>

In addition to recommending a value below 7% as the discount factor based on private capital returns, the Council of Economic Advisers further explains that, because long-term interest rates have fallen, a discount rate based on the consumption rate of interest “should be at most 2 percent,”<sup>147</sup> which further confirms that applying a 7% rate to a context like climate change would be wildly out of step with the latest data and theory. Similarly, recent expert elicitations—a technique supported by Circular A-4 for filling in gaps in knowledge<sup>148</sup>—indicate that a growing consensus among experts in climate economics for a discount rate between 2% and 3%; 5% represents the upper range of values recommended by experts, and few to no experts support discount rates greater than 5% being applied to the costs and benefits of climate change.<sup>149</sup> Based on current economic data and theory, the most appropriate discount rate for climate change is 3% or lower.

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<sup>142</sup> *Id.*; see also CEA, *supra* note 137, at 9: “Weitzman (1998, 2001) showed theoretically and Newell and Pizer (2003) and Groom et al. (2007) confirm empirically that discount rate uncertainty can have a large effect on net present values. A main result from these studies is that if there is a persistent element to the uncertainty in the discount rate (e.g., the rate follows a random walk), then it will result in an effective (or certainty-equivalent) discount rate that declines over time. Consequently, lower discount rates tend to dominate over the very long term, regardless of whether the estimated investment effects are predominantly measured in private capital or consumption terms (see Weitzman 1998, 2001; Newell and Pizer 2003; Groom et al. 2005, 2007; Gollier 2008; Summers and Zeckhauser 2008; and Gollier and Weitzman 2010).”

<sup>143</sup> NAS Second Report, *supra* note 65, at 27.

<sup>144</sup> CEQ regulations implementing NEPA similarly require that information in NEPA documents be “of high quality” and states that “[a]ccurate scientific analysis . . . [is] essential to implementing NEPA.” 40 C.F.R. § 1500.1(b).

<sup>145</sup> The 7% rate was based on a 1992 report; the 3% rate was based on data from the thirty years preceding the publication of Circular A-4 in 2003. Circular A-4 at 33.

<sup>146</sup> CEA, *supra* note 137, at 1; *id.* at 3 (“In general the evidence supports lowering these discount rates, with a plausible best guess based on the available information being that the lower discount rate should be at most 2 percent while the upper discount rate should also likely be reduced.”); *id.* at 6 (“The Congressional Budget Office, the Blue Chip consensus forecasts, and the Administration forecasts all place the ten year treasury yield at less than 4 percent in the future, while at the same time forecasting CPI inflation of 2.3 or 2.4 percent per year. The implied real ten year Treasury yield is thus below 2 percent in all these forecasts.”).

<sup>147</sup> *Id.* at 1.

<sup>148</sup> Circular A-4 at 41.

<sup>149</sup> Howard and Sylvan, *supra* note 72; M.A. Drupp, et al., *Discounting Disentangled: An Expert Survey on the Determinants of the Long-Term Social Discount Rate* (London School of Economics and Political Science Working Paper, May 2015) (finding consensus on social discount rates between 1-3%).

Fourth, Circular A-4 requires more of analysts than giving all possible assumptions and scenarios equal attention in a sensitivity analysis; if alternate assumptions would fundamentally change the decision, Circular A-4 requires analysts to select the **most appropriate assumptions from the sensitivity analysis**.

Circular A-4 indicates that significant intergenerational effects will warrant a special sensitivity analysis focused on discount rates even lower than 3%:

Special ethical considerations arise when comparing benefits and costs across generations. . . It may not be appropriate for society to demonstrate a similar preference when deciding between the well-being of current and future generations. . . If your rule will have important intergenerational benefits or costs you might consider a further sensitivity analysis using a lower but positive discount rate in addition to calculating net benefits using discount rates of 3 and 7 percent.<sup>150</sup>

Elsewhere in Circular A-4, OMB clarifies that sensitivity analysis should not result in a rigid application of all available assumptions regardless of plausibility. Circular A-4 instructs agencies to depart from default assumptions when special issues “call for different emphases” depending on “the sensitivity of the benefit and cost estimates to the key assumptions.”<sup>151</sup> More specifically:

If benefit or cost estimates depend heavily on certain assumptions, you should make those assumptions explicit and carry out *sensitivity analyses using plausible alternative assumptions*. If the value of net benefits changes from positive to negative (or vice versa) or if the relative ranking of regulatory options changes with alternative plausible assumptions, you should conduct further analysis to determine **which of the alternative assumptions is more appropriate**.<sup>152</sup>

In other words, if using a 7% discount rate would fundamentally change the agency’s decision compared to using a 3% or lower discount rate, the agency must evaluate which assumption is most appropriate. Since OMB, the Council of Economic Advisers, the National Academies of Sciences, and the economic literature all conclude that a 7% rate is inappropriate for climate change, agencies should select a 3% or lower rate. Applying a 7% rate to climate effects cannot be justified “based on the best reasonably obtainable scientific, technical, and economic information available” and is inconsistent with the proper treatment of uncertainty over long time horizons.

Similarly, a 300-year time horizon is required by best economic practices. In 2017, the National Academies of Sciences issued a report stressing the importance of a longer time horizon for calculating the social cost of greenhouse gases. The report states that, “[i]n the context of the socioeconomic, damage, and discounting assumptions, the time horizon needs to be long enough to capture the vast majority of the present value of damages.”<sup>153</sup> The report goes on to note that the length of the time horizon is dependent “on the rate at which undiscounted damages grow over time and on the rate at which they are discounted. Longer time horizons allow for representation and evaluation of longer-run geophysical system dynamics, such as sea level change and the carbon cycle.”<sup>154</sup> In other words, after selecting the appropriate discount rate based on theory and data (in this case, 3% or below), analysts should determine the time horizon necessary to capture all costs and benefits that will have important net present values at the discount rate. Therefore, a 3% or lower discount rate for climate change

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<sup>150</sup> Circular A-4 at 35-36.

<sup>151</sup> *Id.* at 3.

<sup>152</sup> *Id.* at 42.

<sup>153</sup> NAS Second Report, *supra* note 65, at 78.

<sup>154</sup> *Id.*

implies the need for a 300-year horizon to capture all significant values. NAS reviewed the best available, peer-reviewed scientific literature and concluded that the effects of greenhouse gas emissions over a 300-year period are sufficiently well established and reliable as to merit consideration in estimates of the social cost of greenhouse gases.<sup>155</sup>

Sincerely,

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Tomás Carbonell, Senior Attorney and Director of Regulatory Policy, Environmental Defense Fund  
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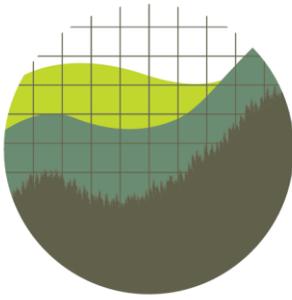
For any questions regarding these comments, please contact [jason.schwartz@nyu.edu](mailto:jason.schwartz@nyu.edu).

\* No part of this document purports to present New York University School of Law's views, if any.

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<sup>155</sup> NAS First Report, *supra* note 66, at 32.

# **Exhibit B**



Institute for  
**Policy Integrity**

NEW YORK UNIVERSITY SCHOOL OF LAW

October 10, 2017

To: Thomas Healy, Office of the Chief Counsel, NHTSA

Attn.: Docket No. NHTSA-2017-0059 (and Docket No. NHTSA-2017-0073)<sup>1</sup>

**Subject: Comments on Reconsideration of Final Rule on Civil Penalties**

The Institute for Policy Integrity at New York University School of Law<sup>2</sup> respectfully submits the following and attached comments regarding NHTSA's proposed reconsideration of its 2016 rule updating the civil penalties for violation of fuel economy standards.

First, NHTSA has not offered rational grounds for reconsidering a rulemaking finalized less than a year ago. NHTSA seemingly justifies its reconsideration on the grounds that "the consequences of this decision" to update civil penalties "are considerable and fairly permanent."<sup>3</sup> But nothing has changed on that front since the agency finalized the update in 2016. Though the update was first offered as an interim final rule,<sup>4</sup> NHTSA already gave stakeholders a full opportunity to comment and, indeed, revised its initial rule in response to industry concerns.<sup>5</sup> NHTSA offers no evidence of changed circumstances in the seven months between when the December 28, 2016 rule was finalized and the July 12, 2017 reconsideration was announced, nor does the agency contend that the December 2016 proceeding was legally insufficient in any way. As courts have repeatedly ruled, "although an agency is entitled to change its policy positions, it has an obligation to adequately explain the reason for the change and its rejection of its earlier factual findings."<sup>6</sup> NHTSA has offered no rational reason for reopening this decision now, and so the agency should not proceed with the proposed reconsideration.

If NHTSA does continue with the reconsideration, Policy Integrity offers the following comments:

- The Federal Civil Penalties Inflation Adjustment Improvements Act of 2015—and not the Energy Policy and Conservation Act of 1975—governs this regulatory proceeding. The default statutory mandate is to update penalties unless narrow exceptions apply—and those exceptions are not present here.
- Because updating the penalties would most certainly lead to net benefits, neither of the narrow exceptions under the Inflation Adjustment Act apply. In particular, any effect on sales will be of small magnitude, while updating the penalty should drive additional,

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<sup>1</sup> NHTSA instructs commenters "To ensure that your comments are correctly filed in the Docket, please include the Docket Number NHTSA-2017-0073 in your comments." 82 Fed. Reg. 32,140, 32,143 (July 12, 2017). However, we believe that is the incorrect docket number. Regulations.gov lists this regulatory proceeding as Docket NHTSA-2017-0059.

<sup>2</sup> This document does not purport to present New York University School of Law's views, if any.

<sup>3</sup> 82 Fed. Reg. at 32,142.

<sup>4</sup> 81 Fed. Reg. 43,524, 43,526 (July 5, 2016).

<sup>5</sup> 81 Fed. Reg. 95,489, 95,490 (Dec. 28, 2016).

<sup>6</sup> *California v. BLM*, case 3:17-cv-03885-EDL (N.D. Ca, summary judgment granted Oct. 14, 2017) (citing *FCC v. Fox Television Stations*, 556 U.S. 502, 515-516 (2009)).

valuable compliance, thus generating net benefits to the environment, consumer welfare, and national security.

- The base year for adjusting the penalty to account for inflation is the original 1975 enactment of EPCA. There is a high bar for interpreting congressional silence in 2007 as tacit re-endorsement of that original penalty, and that high bar has not been met.
- NHTSA should maintain the lead time established for the updated penalty in the December 2016 final rule, and the new penalties should apply at least to model years 2019 and beyond.
- In addition to updating the real value of the original penalties to maintain the deterrent effect in the face of inflation, NHTSA should separately consider raising the absolute value of the penalty to a more optimal level, under the criteria set by EPCA. To implement EPCA's factors for increasing the penalty, NHTSA should conduct a cost-benefit analysis of alternative penalty levels and select the penalty that maximizes net benefits. The maximum penalty level authorized by EPCA in 1975 (\$10 per 0.1mpg) must also be updated under the Inflation Adjustment Act; the current maximum, therefore, should be \$47 per 0.1mpg. NHTSA should consider what penalty level, up to \$47 per 0.1mpg, is optimal.

## **I. The Inflation Adjustment Act, not EPCA, governs this proceeding, and the default mandate is to update old civil penalties**

Congress adopted the Inflation Adjustment Act of 2015 with a clear purpose: to maintain the deterrent effect of civil penalties set years ago by counteracting inflation, and to improve federal collections of penalties.<sup>7</sup> Those goals are distinct from the provisions for adjusting penalties written into the original Energy Policy and Conservation Act of 1975, which were intended to allow NHTSA to “substantially further substantial energy conservation.”<sup>8</sup> The Inflation Adjustment Act was meant to maintain the real value of penalties as originally set in order to maintain the original deterrent effect, while EPCA was intended to allow NHTSA to increase the absolute value of the penalty to increase compliance. The December 2016 rule implemented the mandate under the Inflation Adjustment Act by maintaining the real, inflation-adjusted value of the CAFE penalties; the December 2016 rule did not rely on NHTSA's separate authorities under EPCA,<sup>9</sup> nor did it attempt to adjust the absolute value of the penalty above and beyond the inflation-correction. Therefore, any reconsideration of that December 2016 rule promulgated under the Inflation Adjustment Act must likewise follow the statutory mandates of the Inflation Adjustment Act. The criteria from EPCA on adjusting the absolute value of the penalty are not relevant to this rulemaking on updating the real value of the penalty to counteract inflation (though NHTSA should considered using its separate EPCA authorities in a separate rulemaking, as discussed below).

Over time, the real value of a penalty falls if not adjusted by inflation. The inflationary updates to the CAFE penalties are intended to maintain the level of deterrence effectuated by the civil monetary penalties, and to prevent the deterrent effect from being diminished by inflation. With nominal prices in the economy increasing over time, keeping the value of the penalty constant in

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<sup>7</sup> Pub. L. 114-74 § 701(b)(2)(b) (2015) (“The purpose of this Act is to establish a mechanism that shall allow for regular adjustment for inflation of civil monetary penalties; maintain the deterrent effect of civil monetary penalties and promote compliance with the law; and improve the collection by the Federal Government of civil monetary penalties.”).

<sup>8</sup> 49 U.S.C. § 32,912(c)(1)(A)(i).

<sup>9</sup> While NHTSA does explain that its December 2016 “effectively responds” to a petition to adjust the penalties under EPCA, that was because the Inflation Adjustment Act effectively mooted the petition's request. 81 Fed. Reg. at 95,491. NHTSA did not cite EPCA as authority for the December 2016 rule.

current dollars deteriorates its real value. As the CAFE penalty's level has been essentially unchanged since 1975, incentives to comply with fuel economy have been strongly degrading over the time. Since 1975, inflation has increased indexed consumer prices by over 350%.<sup>10</sup> As a result, a penalty first set in 1975 has lost significant deterrent effect.

In 2015, Congress decided to remedy that problem, and mandated ("shall adjust"<sup>11</sup>) that agencies update their civil penalties unless one of two narrow exceptions apply: (1) if increasing the penalty "will have a negative economic impact," or (2) "the social costs of increasing the civil monetary penalty...outweigh the benefits."<sup>12</sup> As neither exception applies here, NHTSA must update the penalties for inflation, consistent with the December 2016 rule.

## **II. The data most likely cannot support an agency finding of significant negative economic impact from updating the penalties**

NHTSA has not shown that the penalties will have a "negative economic impact." As NHTSA acknowledges, OMB has already determined that such circumstances were intended to be "rare."<sup>13</sup>

Though Congress did not define the phrase, any rational understanding of "negative economic impact" should include some showing of a significant and net negative economic impact. The mere existence of some negative effect on some individual cannot be enough to invoke the exception, because otherwise the exception would swallow the rule. Any increase in the CAFE penalty could diminish profits for those individual firms that would not comply with the standards but for this inflation adjustment (i.e., counterfactual "non-compliant" firms). If that were sufficient grounds to invoke the exception, the exception would always apply and would not be narrow and "rare" as intended.<sup>14</sup> Instead, the impact must be a significant impact, and significance is best measured by comparison to other costs and benefits.<sup>15</sup> Indeed, there is substantial overlap between the analysis necessary under this exception and the second exception, which specifically compares social costs and benefits. Overall, the exception is only warranted if updating the penalty would have a significant, net negative effect. Those circumstances do not apply here.

In addition, NHTSA already concluded in 2016 that no exception to the Inflation Adjustment Act was warranted.<sup>16</sup> NHTSA does not now offer any evidence of changed circumstances that would justify revisiting that determination. Nor has NHTSA explained its changed position.

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<sup>10</sup> The Consumer Price Index Calculator maintained by the Bureau of Labor Statistics shows that \$5 in 1975 has the same buying power as \$23.56 today. <https://data.bls.gov/cgi-bin/cpicalc.pl?cost1=5.00&year1=197501&year2=201708>.

<sup>11</sup> Pub. L. 114-74 § 701(b)(4)(b)(1)(A) ("the head of an agency shall adjust civil monetary penalties through an interim final rulemaking").

<sup>12</sup> Pub. L. 114-74 § 701(b)(4)(c)(1); *id.* at (2) (OMB must also concur with the determination).

<sup>13</sup> Shaun Donovan, OMB Director, Memorandum to Heads of Executive Departments and Agencies, on Implementation of the Federal Civil Penalties Inflation Adjustment Act Improvements Act of 2015 (Feb. 24, 2016), <https://www.whitehouse.gov/sites/whitehouse.gov/files/omb/memoranda/2016/m-16-06.pdf>

<sup>14</sup> *Id.*

<sup>15</sup> This is in the spirit of any cost-benefit analysis and is based on Kaldor-Hicks type of welfare criterion, which assumes that, as almost any change makes some people better off and others worse off, the welfare effects of a change need to be evaluated by reference to whether gainers could compensate losers for their losses. See Nicholas Kaldor, *Welfare Propositions in Economics and Interpersonal Comparisons of Utility*, 49 THE ECONOMIC JOURNAL, 549-552 (1939).

<sup>16</sup> 81 Fed. Reg. at 95,490 (granting industry's petition to exempt earlier model years not on the grounds of a "negative economic impact," but rather only because such penalties would be retroactive punishment inconsistent with congressional intent); *more generally id.* (updating the penalties under the mandate of the Inflation Adjustment Act, and not invoking the exemptions).

In this section of our comments, we review why the negative impacts of the inflation-adjusted penalties should be of small magnitude, by looking at how the changes in penalty rate affect the manufacturers' costs and, consequently, vehicle sales, and employment. In the next section, we review why the positive impacts could be significant, and thus why social benefits will very likely outweigh social costs.

#### *Effect of penalty changes on manufacturers' production costs*

Any negative effects of higher penalties on profits would be experienced only by those firms that, in the absence of the inflation adjustment, would not comply with the standards (i.e., the "counterfactual non-compliers"). As explained below, those firms would need to bear additional costs due to ramping up of their compliance efforts and increased penalties for deviations from the standard.

The number of "counterfactual non-compliers" depends on how expensive adherence to the standards is. The data does not suggest that CAFE requirements have, so far, been very costly to comply with. The vast majority of companies has consistently complied with the standards, despite the penalties being relatively low and almost constant in nominal terms from 1975 through 2016. In spite of the increases in stringency of standards, the aggregate penalty payments by industry in years 1985-2013 remained roughly stable at the yearly level of about \$30 million,<sup>17</sup> according to the data gathered by NHTSA.<sup>18</sup> The average penalty paid by a company has also stayed at a similar level over the years.

The CAFE penalties work like safety valves, because they allow the car manufacturers to avoid the requirements imposed by vehicle standards in case the compliance costs are too high. Such penalty systems, which give the manufacturers flexibility on their compliance options, are a common element of environmental regulation, and are viewed as price ceilings that limit high-side abatement cost risk.<sup>19</sup> In the case of CAFE requirements, penalties effectively determine the upper limit to the compliance costs per vehicle, capping the cost of the vehicle standards on industry.

The economics of safety valves are well understood.<sup>20</sup> In particular, it is clear that the compliance efforts firms are willing to exert depends on the penalty itself. Whenever the marginal costs of compliance with the rules exceed the penalty, companies choose to pay penalties. Increasing the penalty raises the amount the companies are willing to spend on compliance, bringing them closer to the standards.

Because of the "safety valve" properties in the design of the punishment, one can learn a great deal about the compliance costs from the information on penalties paid. In particular, it can be concluded that for the compliant manufacturers, the marginal costs (in form of technological adaptations and changes in the design of the cars) have not been higher than \$5.5 per year, per car,

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<sup>17</sup> In recent years, the penalty payments started decreasing, probably due to the possibilities of credit trades between the manufacturers. See below for further discussion of interactions between CAFE penalties and credits.

<sup>18</sup> The data is publicly available at [https://one.nhtsa.gov/cale\\_pic/CAFE\\_PIC\\_Fines\\_LIVE.html](https://one.nhtsa.gov/cale_pic/CAFE_PIC_Fines_LIVE.html).

<sup>19</sup> John K Stranlund, *The Economics of Enforcing Emissions Markets: A Review of the Literature*, 11 REV. ENVIRON. ECON. POLICY 227–246 (2017).

<sup>20</sup> Henry D. Jacoby & A. Denny Ellerman, *The safety valve and climate policy*, 32 ENERGY POLICY 481–491 (2004), William A. Pizer, *Combining price and quantity controls to mitigate global climate change*, 85 J. PUBLIC ECON. 409–434 (2002), John K Stranlund, *The Economics of Enforcing Emissions Markets: A Review of the Literature*, 11 REV. ENVIRON. ECON. POLICY 227–246 (2017).

per 0.1 mpg added to meet the standards. For non-compliant firms, costs (in the form of penalties) were exactly \$5.5 per 0.1 mpg.

Using this logic, it is possible to approximate the future increases in cost per vehicle caused by the inflationary adjustment of the penalty. Specifically, the upper bound for the rise in costs for a given manufacturer can be obtained by multiplying its predicted non-compliance in 0.1 mpg<sup>21</sup> by \$8.5 (the difference between the new and old penalty rates). The approach would thus require identifying the “counterfactual non-compliers” and their counterfactual deviations from the standards. While this is a challenging task, for some vehicles it is already known that they will meet the CAFE requirements in the future. For example, EPA identified in 2016 over 100 car, SUV, and pickup versions on the market today that already meet 2020 or later greenhouse gas standards.<sup>22</sup> It is important to recognize that the compliant firms’ profits will not be negatively affected by changes in punishment scheme. (In fact, the profits of the compliant firms will increase through the credit trading mechanism. Please see section below for further explanation.)

The actual cost increase will be lower than the above described upper bound. The inflation-adjusted penalty will change the incentives for compliance, causing the firms with marginal compliance cost between \$5.5 and \$14 to boost their fuel efficiency efforts. For those switching firms, the rise in costs will be determined by their marginal compliance costs which, by definition, will be lower than \$14. The change in average costs per vehicle will therefore approximately equal the difference between the marginal abatement cost and the old penalty, multiplied by the average deviation from the standard.<sup>23</sup> If the abatement costs are close to the old penalty, for example around \$6, the updated penalties would strongly improve compliance (thus contributing to emission savings and decreasing the total penalty payments), while having a low impact on the manufacturers’ profits.

Any analysis of such effects needs to also take into consideration an additional flexibility mechanism: trading of compliance credits. Higher penalties raise the value of credits. As the value of compliance credits increases, the companies with the lowest fuel efficiency costs will implement more fuel efficiency in their cars to create additional credits and sell those to non-compliers. This further reduces the total penalty payments and decreases emissions, while decreasing the total costs of compliance and creating some profit redistribution between the manufacturers.

To claim that the inflation-adjusted penalties translate into a substantial cost surge for automobile manufacturers, the agency would need to prove that the marginal compliance costs for the “counterfactual non-compliers” are closer to \$14 than to \$5.5. NHTSA would further need to show that there are many of the “counterfactual non-compliers” and that their individual deviations from standards would be large. NHTSA would also have to show that there is no room for substantial decreases in payments through credits trading. In such analyses, the agency must avoid relying on

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<sup>21</sup> Non-compliance per vehicle is understood for the purpose of this exposition as the number of mpg that, in the absence of penalty adjustments, the fleet would deviate from compared to the relevant mpg stipulated in the CAFE standard.

<sup>22</sup> Given the close harmonization of GHG and CAFE standards, this finding suggests that the vehicles will also comply with CAFE standards. See EPA, Proposed Determination on the Appropriateness of the Model Year 2022-2025 Light-Duty Vehicle Greenhouse Gas Emissions Standards under the Midterm Evaluation, EPA-420-R, at 50 (2016) for more information on compliance projections.

<sup>23</sup> Since the standards are for fleet averages, the manufacturers seek to improve the fuel economy in those vehicles where it is the cheapest to do so or to promote more sales of fuel-efficient cars. Both effects further inhibit the cost growth.

any self-reported data, as it is in manufacturers' interest to overstate compliance costs. Finally, to show a substantial and net negative impact, NHTSA would need to compare these effects to the other effects of the updated penalties.

Invoking this exception therefore requires NHTSA to clear a high analytical hurdle, which existing data very likely do not support.

#### *Effect of penalty changes on car sales*

Elevated penalty rates may cause the "counterfactual non-compliant" car fleets to become more expensive and more fuel efficient. The degree to which the price increase would happen depends on the increases in manufacturers' costs discussed above and the degree to which the companies can pass higher costs to the consumers (i.e., the "pass through" rate).<sup>24</sup> The compliant fleets' prices will stay unaltered or could slightly fall, even as the compliant fleet becomes more fuel efficient as an effect of increased demand for compliance credits. The total sales effect of those two mechanisms (price and fuel economy change) will depend on the consumer valuation of fuel efficiency.<sup>25</sup> In general, one can expect the net effect to be rather small, especially if non-compliance is largely restricted to luxury cars.<sup>26</sup> Historically, it has been the case that penalties were paid almost exclusively by European manufacturers of luxury vehicles.

There will also be some substitution between the "counterfactual non-compliant" and compliant fleets, because of the change in their relative prices. This effect will contribute further to decreases in total emissions. However, the substitution may be of small magnitude if compliant and non-compliant vehicles come from different market segments.

#### *Effect of penalty changes on employment*

If the increases in automobile price for the "counterfactual non-compliant" fleet due to higher penalties exceed the consumer's valuation of the associated fuel savings, the consumer demand for that fleet could be reduced. Clearly, the vehicle manufacturers will spread the fuel economy adjustments across their fleet in a way that minimizes total sales losses.<sup>27</sup> On the other hand, the technologies used for compliance with fuel efficiency standards may differ from the counterfactual technologies in terms of the amount of labor needed to produce one automobile (the labor intensity) or the degree to which the technology relies on imports and thus fosters employment abroad instead of domestic jobs (import content). Both of the effects may change employment in automobile sector, however, they are confined to counterfactual non-compliers only.<sup>28</sup> Besides, the magnitude of the sales effect is determined by the manufacturers' marginal abatement costs. Should the cost be close the old penalty, the sales change will be near zero.

Importantly, workers laid off from the automobile sector and adjacent businesses may quickly be absorbed by other industries due to general equilibrium effects and the currently robust labor market leading to no changes in economy-wide employment. For more discussion on why the CAFE standards overall will likely have, at most, small employment effects that will be partly offset by

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<sup>24</sup> For the discussion on the importance of pass-through rate for estimating the impact of vehicle standards on vehicle prices see our attached comments on jobs and preferences, submitted to EPA and NHTSA on their proposed reconsideration of the midterm evaluation.

<sup>25</sup> *Id.*

<sup>26</sup> The relative impact of penalty increase is there is much smaller as those vehicles sell for substantially higher prices.

<sup>27</sup> See our attached comments on jobs and preferences, *supra*.

<sup>28</sup> Historically, the penalties were paid mostly by European manufacturers.

changes in the broader labor market, please see our attached comments that were submitted last week to EPA and NHTSA on their proposed reconsideration of the midterm evaluation.

#### *Interaction between the level of CAFE standards and the penalty*

The agency has based this proposed reconsideration in part on the fact that “CAFE standards are set to rise at a significant rate over the next several years,”<sup>29</sup> but in a separate proceeding, NHTSA has proposed to reconsider the midterm evaluation with the possible intention of revising the standards downwards.<sup>30</sup> Should NHTSA lower the standards for model years 2021 and beyond from the standards announced by the agency back in 2012, it would no longer have even its stated justification for lowering the penalties to rely on in this proceeding. Should the vehicle standards be indeed relaxed (and they should not be, as we have argued in separate comments to EPA and NHTSA<sup>31</sup>), the possible arguments against penalty increases become even weaker. First, failing to increase the standards in model years 2021 and beyond, combined with failing to update the penalties for model years 2019 and beyond, would imply double penalty relief for non-compliers starting with model year 2021. On the other hand, the manufacturers that have already made investments to comply with CAFE and will not change their fleet in response to the standards being adjusted downwards would be at a relative disadvantage compared to “counterfactual non-compliers.” The diminished penalties would bring them no direct gain; instead they would lose profits because of the decreased value of their compliance credits. Such a situation would punish compliance and reward non-compliance, thereby defying the goal of penalties. Second, the potential for negative economic impact would be lower with weaker standards,<sup>32</sup> while the benefits of enforcement would increase.

### **III. The social benefits of updating the penalties outweigh the costs**

As explained above, an increase in penalty raises the amount the companies are willing to spend on compliance. It can therefore be expected that, in response to the inflation-updated penalties, some otherwise non-compliant manufacturers will accelerate their fuel efficiency efforts and improve their fleet fuel performance. The degree to which this will happen depends on the marginal compliance costs of the non-compliers.<sup>33</sup> Industry has argued that “raising the penalty would have no impact on fuel savings and would simply hurt the manufacturers forced to pay it,”<sup>34</sup> but that is not plausible given what is known about compliance costs.

The boosts to fleet performance from updated penalties translate into reductions in greenhouse gas emissions and improvements in air quality and public health. Additionally, they lead to fuel savings for consumers. Those will be especially relevant if consumers do not fully account for the full value of fuel efficiency in their car purchase decisions, for example because of inattention or lack of information.<sup>35</sup> In such a case, the fuel economy of the vehicles will not be fully reflected in the vehicle price but should be counted towards social gains.

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<sup>29</sup> 82 Fed. Reg. at 32,141.

<sup>30</sup> 82 Fed. Reg. at 39,551.

<sup>31</sup> See our attached comments on jobs and preferences, and on the social cost of greenhouse gases.

<sup>32</sup> The number of manufacturers directly affected by changes in penalty rates decreases with relaxing the standards as, mechanically, lower standards imply higher compliance rates.

<sup>33</sup> The analysis of improvements in fuel standards due to penalty increases mirrors the attempts to quantify the additional penalty payments that the manufacturers will need to make.

<sup>34</sup> 75 Fed. Reg. 25,323, 25,667 (May 7, 2010).

<sup>35</sup> See our attached comments on jobs and preferences for discussion on the consumer valuation of fuel efficiency.

When the marginal abatement costs of the non-compliant car manufacturers are lower than \$14 per 0.1mpg, one may expect to observe a compliance rate close to 100%, with all the wide benefits of it easily quantifiable. To claim that there will be no substantial improvement in compliance (and, consequently, no associated benefits), the agency would need to show that for non-compliers marginal compliance costs well exceed \$14 per 0.1mpg (yearly). That does not seem reasonable given the predicted costs for various fuel efficiency technologies and designs discussed in Midterm Evaluation of Light-Duty Vehicle Greenhouse Gas Emission Standards.<sup>36</sup>

If NHTSA decides to reverse or lower the penalty, NHTSA must provide an explanation for disregarding the “facts and circumstances that underlay” the original rule.<sup>37</sup> As such, NHTSA would need to calculate the amount of lost benefits, including the benefits described above, that would be caused by any reconsideration and provide an explanation for depriving the public of those benefits.<sup>38</sup>

To value the changes in greenhouse gas emissions associated with changing the CAFE penalties, NHTSA should use the social cost of greenhouse gas methodology, as discussed in our attached comments submitted several weeks ago to NHTSA on the scoping for its environmental impact statement.

#### **IV. The base year for inflation should be 1975**

NHTSA asks commenters whether 2007 should be considered the base year for inflation, rather than 1975, because Congress updated other aspects of the CAFE program in the Energy Independence and Security Act of 2007 (EISA). Yet, EISA is completely silent on CAFE penalties. To interpret that silence as tacit re-endorsement of EPCA’s original penalties set in 1975 is akin to drawing a negative inference. Courts typically require a high bar for making a negative inference.<sup>39</sup> Unless NHTSA can identify clear evidence in the legislative history that Congress specifically considered the original penalties from 1975 and determined, through enacting EISA, to re-endorse maintaining those penalties without adjustment, then 1975 is still the appropriate base year for inflation. Treating 1975 as the base year best fulfills the intentions of Congress in 1975 to set a particular minimum level of deterrence, and of Congress in 2015 to maintain original levels of deterrence over time by updating penalties.

#### **V. No additional lead time is necessary to implement the adjusted penalties**

NHTSA asks how much lead time it should provide if it adopts a penalty level other than \$14. First, NHTSA should not lower the penalty from \$14. But if it does, manufacturers do not need additional lead time to comply with a lower penalty. If anything, lowering the penalty would mean less lead time is necessary. In December 2016, NHTSA delayed implementation of the inflation adjustment until model year 2019, explaining that some additional lead time was warranted because industry design and production cycles were fixed years in advance, such that it may be difficult to increase

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<sup>36</sup> Draft Technical Assessment Report: Midterm Evaluation of Light-Duty Vehicle Greenhouse Gas Emission Standards and Corporate Average Fuel Economy Standards for Model Years 2022-2025, Office of Transportation and Air Quality U.S. Environmental Protection Agency, National Highway Traffic Safety Administration U.S. Department of Transportation, And California Air Resources Board (2016).

<sup>37</sup> *F.C.C. v. Fox Television Stations, Inc. (“Fox”)*, 556 U.S. 502, 515 (2009).

<sup>38</sup> *See, e.g., California v. BLM*, slip op. at \*18-19 (No. 17-cv-03804) (N.D. Cal. Oct. 4, 2017).

<sup>39</sup> Courts require “confiden[ce]” that Congress specifically considered the matter. *See e.g., Shook v. District of Columbia Fin. Responsibility and Management Assistance Auth.*, 132 F.3d 775, 782 (D.C. Cir. 1998).

compliance rates without several advance years of lead time.<sup>40</sup> Not only might manufacturers be able to decrease their compliance rates in response to a lower penalty without several years of lead time, but NHTSA need not be in the business of facilitating lower compliance rates for its duly adopted regulations.

Penalties should be updated starting with model year 2019, as originally planned. Manufacturers are already on notice, and do not need additional lead time to comply.

## **VI. In a separate rulemaking, NHTSA should consider further raising the absolute penalties under EPCA**

Apart from the inflationary considerations, there are additional reasons for the agency to raise the absolute value of penalties.

The first reason is related to the growing stringency of CAFE. The vehicle standards have been in place for some 40 years, pushing the U.S. car market towards more and more efficient vehicles over time to ensure fuel savings. For example, the requirements for very small passenger cars began with a modest level of 18 mpg in 1978 and have been increasing, reaching 27.5 mpg in 1990 and 30.2 in 2011, and are set to go up to 60 mpg in 2025. The automobile industry has been able to update its technologies and designs to keep pace with the incremental increases in the standards. Presumably, however, the costs of compliance have also been growing through the years and will continue to do so in the future.<sup>41</sup> Given the option of paying a penalty instead of complying, the manufacturers largely make their decisions on fuel efficiency improvements based on the penalty system. For them, raising their fuel efficiency makes sense only up to the point where the marginal cost of compliance equals the penalty. Growing marginal compliance costs combined with constant penalty rate implies that over the years the violations of the standards may become more prevalent. Keeping the compliance constant would thus require heightening the penalty rates.

Additional support for changes in the absolute penalty comes from the economic literature on optimal penalties. From a societal perspective, it would be optimal for the agency to set the penalty equal to the social harm arising from non-compliance.<sup>42</sup> The social harm will encompass mostly the externalities associated with gas-guzzling vehicles, including emissions of greenhouse gases, criteria pollutants, and toxic pollutants.<sup>43</sup> It is not apparent that \$5 was the optimal penalty when Congress set it as the minimum penalty in 1975, and so it is not apparent that, even after adjusting for inflation, \$14 will be the optimal penalty. For example, if a passenger car manufacturer in 2007 missed the standard by one mpg, it would imply an extra 381.7 gallons of fuel used during the lifetime of the car.<sup>44</sup> Burning a gallon of gasoline that does not contain fuel ethanol produces around

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<sup>40</sup> 81 Fed. Reg. at 95,490.

<sup>41</sup> For the information on the predicted costs paths for the model years up to 2025, see Draft Technical Assessment Report: Midterm Evaluation of Light-Duty Vehicle Greenhouse Gas Emission Standards and Corporate Average Fuel Economy Standards for Model Years 2022-2025, Office of Transportation and Air Quality U.S. Environmental Protection Agency, National Highway Traffic Safety Administration U.S. Department of Transportation, And California Air Resources Board (2016)

<sup>42</sup> For the seminal contribution on economics of penalties see Gary S. Becker, *Crime and Punishment: An Economic Approach*, 76 J. POLIT. ECON. 169-217 (1968).

<sup>43</sup> Phase 2 Fuel Efficiency Standards for Medium- and Heavy-Duty Engines and Vehicles. Final EIS NHTSA-2014-0074, National Highway Traffic Safety Administration (2016).

<sup>44</sup> Assuming lifetime vehicle mileage of 278,134, as in EPA (2016), p. 10-8.

19.6 pounds of CO<sub>2</sub>,<sup>45</sup> which, combined with the 2007 social cost of carbon of \$28 per ton,<sup>46</sup> yields a carbon cost of non-compliance in value of almost \$100 per mpg. This value constitutes only a part of the social harm that is induced by non-compliance, as it does not consider other effects like the health consequences of non-GHG polluters. Clearly, the penalty of \$55 per mpg (\$5.5 per 0.1mpg) was lower than the social costs associated with carbon alone. Therefore, current CAFE penalties, even after adjusting for inflation, are likely below the optimal penalty.

EPCA contains authority to adjust penalties to a higher amount if NHTSA determines that the increase will “substantially further substantial energy conservation” and “will not have a substantial deleterious impact on the economy of the United States, a State, or a region.”<sup>47</sup> In 1975, EPCA set a maximum level to which NHTSA could raise the penalty: \$10 for each 0.1 mpg.<sup>48</sup> However, the Inflation Adjustment Act mandated the inflation not just of “a specific monetary amount as provided by Federal law” (such as the \$5 minimum originally set in 1975), but also “a maximum amount provided for by Federal law.”<sup>49</sup> Using the CPI inflation calculator, the \$10 maximum penalty set in 1975 should be updated under the IAA to \$47 today. Therefore, NHTSA has authority to increase the absolute penalty up to \$47 per 0.1 mpg.

NHTSA should undertake a rulemaking to explore its authority under EPCA to raise the absolute value of penalties. Under EPCA, to weigh substantial energy conservation against substantial deleterious impacts, NHTSA should use a full cost-benefit analysis and select the penalty that maximizes net benefits.

Sincerely,

Sylwia Bialek, Economics Fellow

Jason Schwartz, Legal Director

Attached:

Comments from Policy Integrity, to EPA & NHTSA, on Request for Comment on Reconsideration of the Final Determination of the Mid-Term Evaluation of Greenhouse Gas Emissions Standards for Model Year 2022-2025 Light-Duty Vehicles

Joint Comments from Policy Integrity et al., to NHTSA, on Quantifying and Monetizing Greenhouse Gas Emissions in the Environmental Impact Statement for Model Year 2022-2025 Corporate Average Fuel Economy Standards

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<sup>45</sup> Energy Information Administration <https://www.eia.gov/tools/faqs/faq.php?id=307&t=11>

<sup>46</sup> For simplification, the social value of carbon from 2007 was used for the whole lifecycle of the vehicle. The proper valuation would assign the miles driven in individual years the appropriate value of carbon which would result in substantially higher evaluation of harm as the cost of carbon is quickly increasing over time. For the numbers see Interagency Working Group on Social Cost of Greenhouse Gases, *Technical Support Document: Technical Update of the Social Cost of Carbon for Regulatory Impact Analysis Under Executive Order 12866*. (2016), at 16.

<sup>47</sup> 49 U.S.C. § 32912(c).

<sup>48</sup> 49 U.S.C. § 32912(c)(1)(C).

<sup>49</sup> Definition of a “civil monetary penalty” under the Inflation Adjustment Act of 2015.