



# **Review of August 2018 NHTSA/EPA Proposed Rulemaking Reducing the Stringency of CAFE and CO<sub>2</sub> Standards**

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**Applied Economics Clinic**

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### Applied Economics Clinic

The Applied Economics Clinic is a 501(c)(3) non-profit consulting group housed at Tufts University's Global Development and Environment Institute. The Clinic provides expert testimony, analysis, modeling, policy briefs, and reports for public interest groups on the topics of energy, environment, consumer protection, and equity, while providing on-the-job training to a new generation of technical experts. For more information on the clinic: [www.aeclinic.org](http://www.aeclinic.org). Clinic Senior Researcher Ricardo Lopez, PhD and Researcher Bryndis Woods contributed to this white paper under the supervision of Clinic Senior Economist Elizabeth A. Stanton, PhD.

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## Introduction

In April 2018, the U.S. Environmental Protection Agency (EPA) released its revised *Mid-Term Evaluation of Greenhouse Gas Emissions Standards for Model Year 2022-2025 Light Duty Vehicles*.<sup>1</sup> In its evaluation, EPA argues that the current carbon dioxide (CO<sub>2</sub>) standards may be too stringent and should be revised. Based on their analysis, EPA asserts that current standards present too many challenges for auto manufacturers, raise concerns related to vehicle safety, and result in costs to consumers, especially low-income families.

In August 2018, the National Highway Traffic Safety Administration (NHTSA) and EPA published a Notice of Proposed Rulemaking regarding “The Safer Affordable Fuel Efficient (SAFE) Vehicles Rule for Model Years 2021-2026 Passenger Cars and Light Trucks.”<sup>2</sup> This Proposed Rulemaking, if approved, would revise Corporate Average Fuel Economy (CAFE) and CO<sub>2</sub> standards, making them less stringent. In it, NHTSA/EPA claim that existing standards are “no longer appropriate and reasonable” and that the new, less stringent, standards would save money and reduce highway fatalities. A Preliminary Regulatory Impact Analysis (PRIA) released with the Proposed Rulemaking describes NHTSA/EPA’s analysis of the impacts of this change.<sup>3</sup>

This white paper debunks four claims made by NHTSA/EPA in their August 2018 Proposed Rulemaking related to the relationship between CAFE and CO<sub>2</sub> standards, the global price of oil, and the U.S. economy.

***NHTSA/EPA Claim #1: Less stringent CAFE and CO<sub>2</sub> standards will raise the global price of oil with no harm to the U.S. economy.*** NHTSA/EPA’s claim that higher oil prices will have no negative impact on the U.S. economy ignores short-term effects, relies on net energy export projections that do not include the proposed less stringent CAFE and CO<sub>2</sub> standards, and depends on uncertain oil supply forecasts.

***NHTSA/EPA Claim #2: Some negative impacts on U.S. consumers are unimportant.*** Real costs to consumers from less stringent CAFE and CO<sub>2</sub> standards, such as higher prices of goods and services due to higher gas prices, are important to U.S. economic well-being. NHTSA/EPA minimize some consumer costs and fails to examine the distribution of these costs across U.S. households.

***NHTSA/EPA Claim #3: The U.S. economy will not be impacted by global oil price shocks and supply disruptions.*** NHTSA/EPA’s claim that the U.S. economy will be increasingly insulated from global oil price

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<sup>1</sup> U.S. EPA. April 13, 2018. Federal Register. Vol. 83, No. 72. Notices: Mid-Term Evaluation of Greenhouse Gas Emissions Standards for Model Year 2022-2025 Light Duty Vehicles. Available at: <https://www.gpo.gov/fdsys/pkg/FR-2018-04-13/pdf/2018-07364.pdf>

<sup>2</sup> U.S. NHTSA/EPA. August 24, 2018. Federal Register. Vol. 83, No. 165. Notice of Proposed Rulemaking (NPRM): *The Safer Affordable Fuel-Efficient (SAFE) Vehicles Rule for Model Years 2021–2026 Passenger Cars and Light Trucks*. Available at: <https://www.gpo.gov/fdsys/pkg/FR-2018-08-24/pdf/2018-16820.pdf>

<sup>3</sup> U.S. NHTSA/EPA. July 2018, Preliminary Regulatory Impact Analysis (PRIA). *The Safer Affordable Fuel-Efficient (SAFE) Vehicles Rule for Model Year 2021 – 2026 Passenger Cars and Light Trucks*. Available at: <https://www.nhtsa.gov/sites/nhtsa.dot.gov/files/documents/ld-cafe-co2-nhtsa-2127-al76-epa-pria-180823.pdf>

fluctuations is tenuous, applies only to the uncertain long-term, and fails to address the risks of future oil price shocks and supply disruptions.

***NHTSA/EPA Claim #4: Greater petroleum demand due to less stringent CAFE and CO<sub>2</sub> standards will not result in an increase in U.S. military spending.*** NHTSA/EPA's suggestion that more imports probably will not increase military spending ignores the long-term trend of U.S. military spending rising together with the value of U.S. oil consumption, and the widely acknowledged influence of U.S. oil imports on U.S. military spending.

## **1. Impact of high oil prices on the U.S. economy**

In their Proposed Rulemaking, NHTSA/EPA argue that more demand for gasoline due to less stringent CAFE and CO<sub>2</sub> standards will raise gas prices, but that those higher prices will not harm the U.S. economy. NHTSA/EPA's claim rests on the prediction that in the future the United States will export and import about the same amount of petroleum products—so any price increase would be a wash. NHTSA/EPA's argument, however, rests on the accuracy of their forecasting of long-run U.S. oil drilling and turns a blind eye towards shorter term impacts on the economy.

In their *2016 Draft Technical Report: Midterm Evaluation of Light-Duty Vehicle Greenhouse Gas Emissions Standards for Model Years 2022-2025*, NHTSA/EPA and the California Air Resources Board (CARB) expected lower global oil prices due to CAFE and CO<sub>2</sub> standards to have a positive effect on the U.S. economy: “[O]ne benefit of decreasing U.S. oil purchases due to improvements in the fuel economy of light-duty vehicles is the potential decrease in the crude oil price paid for all crude oil purchased.”<sup>4</sup> This has consistently been NHTSA/EPA's expectation in prior rulemakings. In 2012, for example, NHTSA/EPA stated “a decrease in the world oil price as the U.S. reduces its consumption of imported oil...is clearly a benefit to the U.S. when considered from a domestic perspective.”<sup>5</sup>

The August 2018 Proposed Rulemaking departs from NHTSA/EPA's previous economic impact assumptions. NHTSA/EPA still maintain that “[h]igher U.S. fuel consumption will produce a corresponding increase in the nation's demand for crude petroleum, which is traded actively in a worldwide market. The U.S. accounts for a large enough share of global oil consumption that the resulting boost in global demand will raise its worldwide price.”<sup>6</sup> The agencies, however, now claim that the U.S. economy will be insulated from the effects of rising global oil prices stating that an “increase in domestic production is projected to decrease U.S. reliance on foreign oil substantially over the next two decades.”<sup>7</sup>

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<sup>4</sup> U.S. NHTSA/EPA/CARB, July 2016. Draft Technical Report: Midterm Evaluation of Light-Duty Vehicle Greenhouse Gas Emission Standards and Corporate Average Fuel Economy Standards for Model Years 2022-2025. Available at: <https://nepis.epa.gov/Exe/ZyPDF.cgi/P100OXEO.PDF?Dockey=P100OXEO.PDF>. p.10-25.

<sup>5</sup> U.S. NHTSA/EPA. October 15, 2012. Federal Register. Vol. 77, No. 199. Rules and Regulations. 2017 and Later Model Year Light-Duty Vehicle Greenhouse Gas Emissions and Corporate Average Fuel Economy Standards. Available at: <https://www.gpo.gov/fdsys/pkg/FR-2012-10-15/pdf/FR-2012-10-15.pdf>. p.62940.

<sup>6</sup> U.S. NHTSA/EPA. August 24, 2018. NPRM. Federal Register. Vol. 83, No. 165. p.43105.

<sup>7</sup> U.S. NHTSA/EPA. July 2018. PRIA. p.114.

NHTSA/EPA's argument is that domestic oil production will grow more quickly than increasing demand—even under less stringent CAFE and CO<sub>2</sub> standards—with the result that U.S. oil imports will soon equal U.S. oil exports. Under these circumstances, NHTSA/EPA claim, higher global oil prices will have little impact on the U.S. economy: higher export revenue will balance out higher import payments in U.S. gross domestic product (GDP). As NHTSA/EPA state in the PRIA:

*Higher U.S. consumption of crude oil or refined petroleum products increases the magnitude of external economic costs...conversely, reducing U.S. consumption of crude oil or refined petroleum products (by reducing motor fuel use) can reduce these external costs. While these costs are considerations, the United States has significantly increased oil production capabilities in recent years, to the extent that the U.S. is currently producing enough oil to satisfy nearly all of its energy needs and is projected to continue to do so, or become a net energy exporter.<sup>8</sup>*

NHTSA/EPA's new logic suffers from several critical weaknesses: (1) it ignores short-term effects, effectively skipping ahead to focus on a supposedly rosier long-term; (2) it relies on net energy export projections that do not include less stringent CAFE and CO<sub>2</sub> standards; (3) it is entirely dependent on uncertain oil supply forecasts; and (4) it relies on claims not supported either in the Proposed Rulemaking or the PRIA.

***Ignores short-term effects, effectively skipping ahead to focus on a supposedly rosier long-term***

NHTSA/EPA claim that when U.S. imports of oil equal U.S. exports of oil, the impact of oil prices on the U.S. economy disappears,<sup>9</sup> but acknowledge in the Proposed Rulemaking that: “uncertainty in the long-term import-export balance makes it difficult to precisely project how [the effects of increased global petroleum prices that result from higher U.S. demand] might change in response to [growing U.S. oil] production.”<sup>10</sup>

What NHTSA/EPA fail to address is the impact that high oil prices would have on the U.S. economy in the short-run period from the implementation of new, less stringent CAFE and CO<sub>2</sub> standards until the year 2028 when NHTSA/EPA expect oil imports and exports to balance out. To be clear: (1) NHTSA/EPA themselves assert—as they have in previous rulemakings and evaluations that less stringent CAFE and CO<sub>2</sub> standards raise the global price of oil,<sup>11</sup> (2) NHTSA/EPA do not dispute their long-standing position that net U.S. imports of oil plus higher oil prices are detrimental to the U.S. economy,<sup>12</sup> and (3) NHTSA/EPA acknowledge that the United States is currently a net importer of oil.<sup>13</sup> Based on the facts presented by NHTSA/EPA, therefore, for at least the next ten years, less stringent CAFE and CO<sub>2</sub> standards will negatively affect the U.S. economy.

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<sup>8</sup> U.S. NHTSA/EPA. July 2018. PRIA. p.114.

<sup>9</sup> U.S. NHTSA/EPA. July 2018. PRIA.

<sup>10</sup> U.S. NHTSA/EPA. August 24, 2018. NPRM. Federal Register. Vol. 83, No. 165. p.43105.

<sup>11</sup> U.S. NHTSA/EPA. July 2018. PRIA. p.1066-1068.

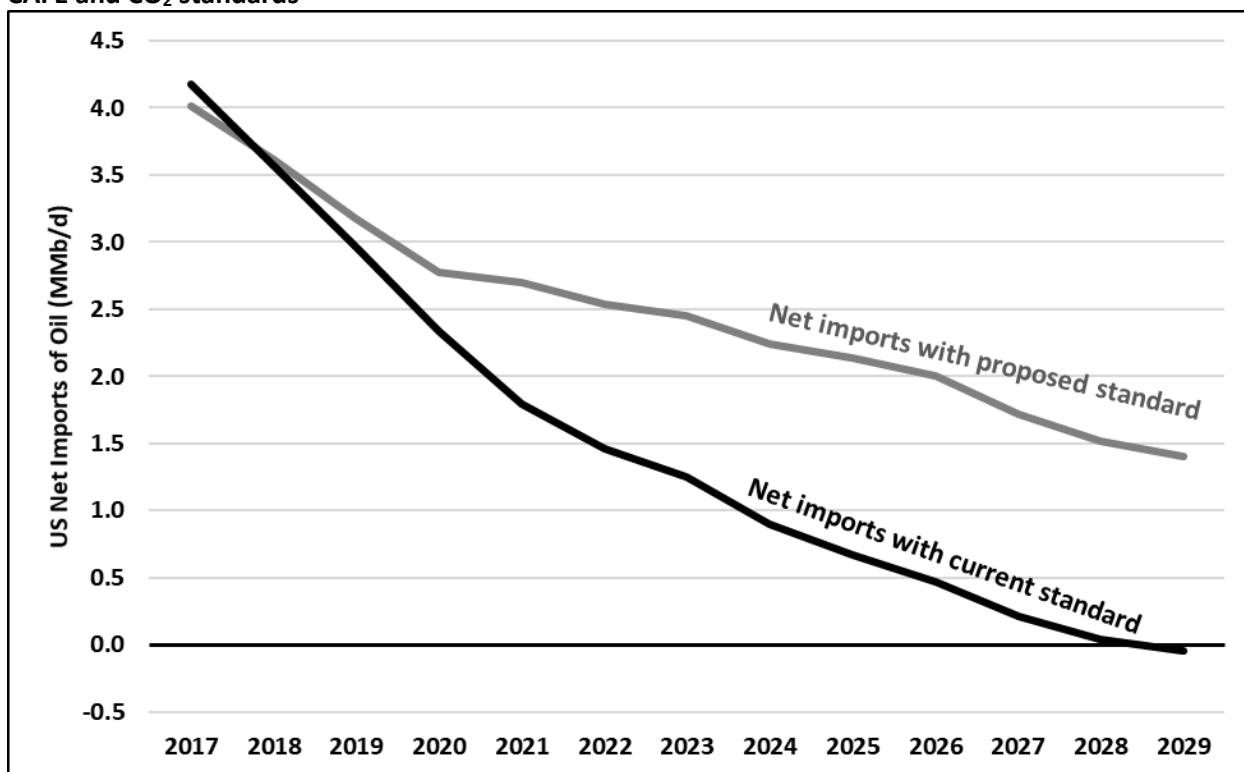
<sup>12</sup> U.S. NHTSA/EPA. July 2018. PRIA. p.1072.

<sup>13</sup> U.S. NHTSA/EPA. July 2018. PRIA. p.1068.

***Relies on net energy import projections that do not include less stringent CAFE and CO<sub>2</sub> standards***

NHTSA/EPA take their projections of the future balance between U.S. oil imports and exports from the U.S. Energy Information Administration’s (EIA) *Annual Energy Outlook 2018* (AEO 2018), which shows near net zero (or slightly negative) U.S. oil imports from 2029 forward (see Figure 1). These AEO 2018 projections were constructed using the assumption that current CAFE and CO<sub>2</sub> standards would remain in place. An AEO 2018 scenario that included the less stringent CAFE and CO<sub>2</sub> standards presented in the August 2018 Proposed Rulemaking would project net positive U.S. oil imports (see estimate in gray line in Figure 1).<sup>14</sup> Simply put, NHTSA/EPA’s claim of net zero oil imports—and all the arguments that they make on this basis—are based on the wrong projection. Under these less stringent CAFE and CO<sub>2</sub> standards, U.S. oil imports remain positive and higher global oil prices impact the U.S. economy.

**Figure 1. Liquid fuels: net imports as share of product supplied, with and without proposed changes to CAFE and CO<sub>2</sub> standards**



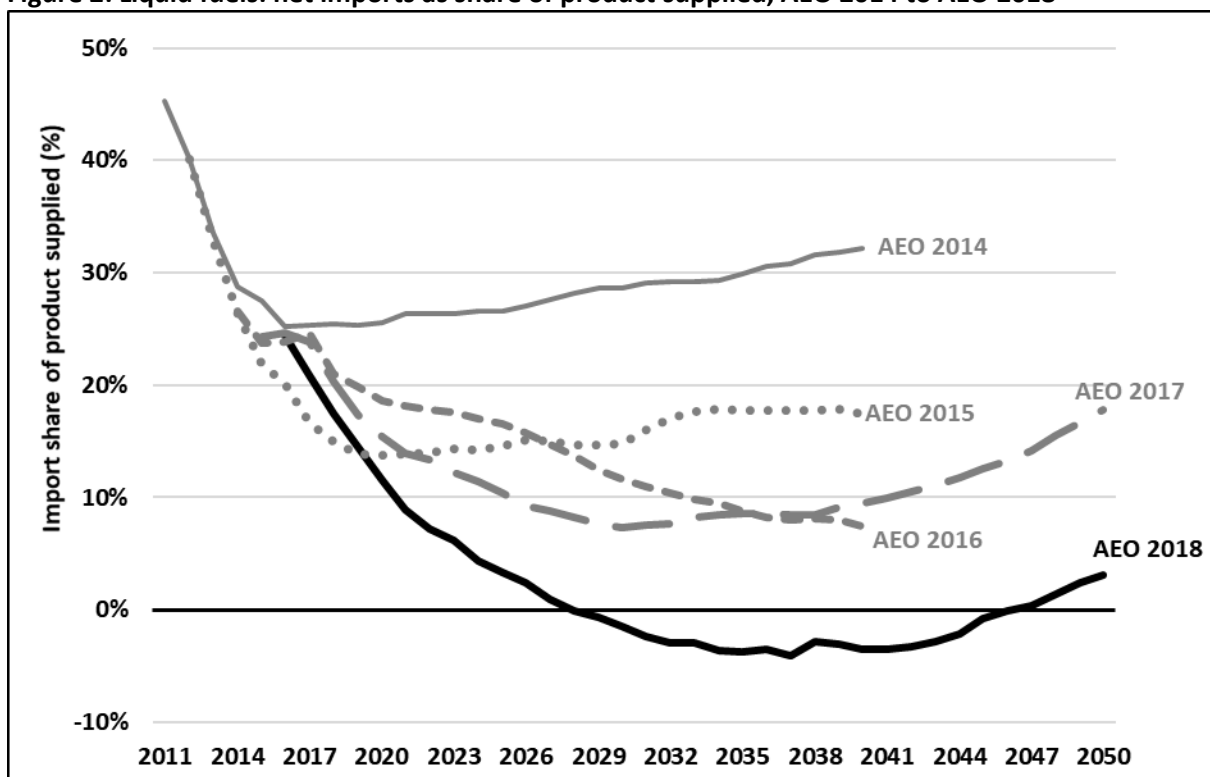
Source: U.S. EIA. *Annual Energy Outlook 2018*. Reference case, and U.S. NHTSA/EPA. July 2018. PRIA. Tables 1-65

<sup>14</sup> U.S. EIA. *Annual Energy Outlook 2018*. “No new efficiency requirements, reference case”. Available at: <https://www.eia.gov/outlooks/aeo/>. See U.S. EIA. August 2018. Annual Energy Outlook 2018 Case Descriptions. p.9: “The No New Efficiency Requirements case assumes that joint CAFE and GHG emissions standards for LDVs and the efficiency standards for residential and commercial major end-use equipment are not increased beyond provisions effective in MY 2021 (for LDVs) or in 2018 (for end-use equipment).”

and 1-66. Gallons of gasoline from proposed CAFE and CO<sub>2</sub> standards converted to millions of barrels of oil per day (MMb/d) using U.S. EIA conversion factor: <https://www.eia.gov/tools/faqs/faq.php?id=327&t=9>.

It is also worth noting that EIA’s projection of the oil imports and exports has not been consistent over time. Figure 2 presents net fuel imports as a share of total supply, where net zero imports appear—in the AEO 2018 projection—as numbers slightly lower than zero starting in 2029. EIA projections made in the recent past have not forecast net zero oil imports.

**Figure 2: Liquid fuels: net imports as share of product supplied, AEO 2014 to AEO 2018**



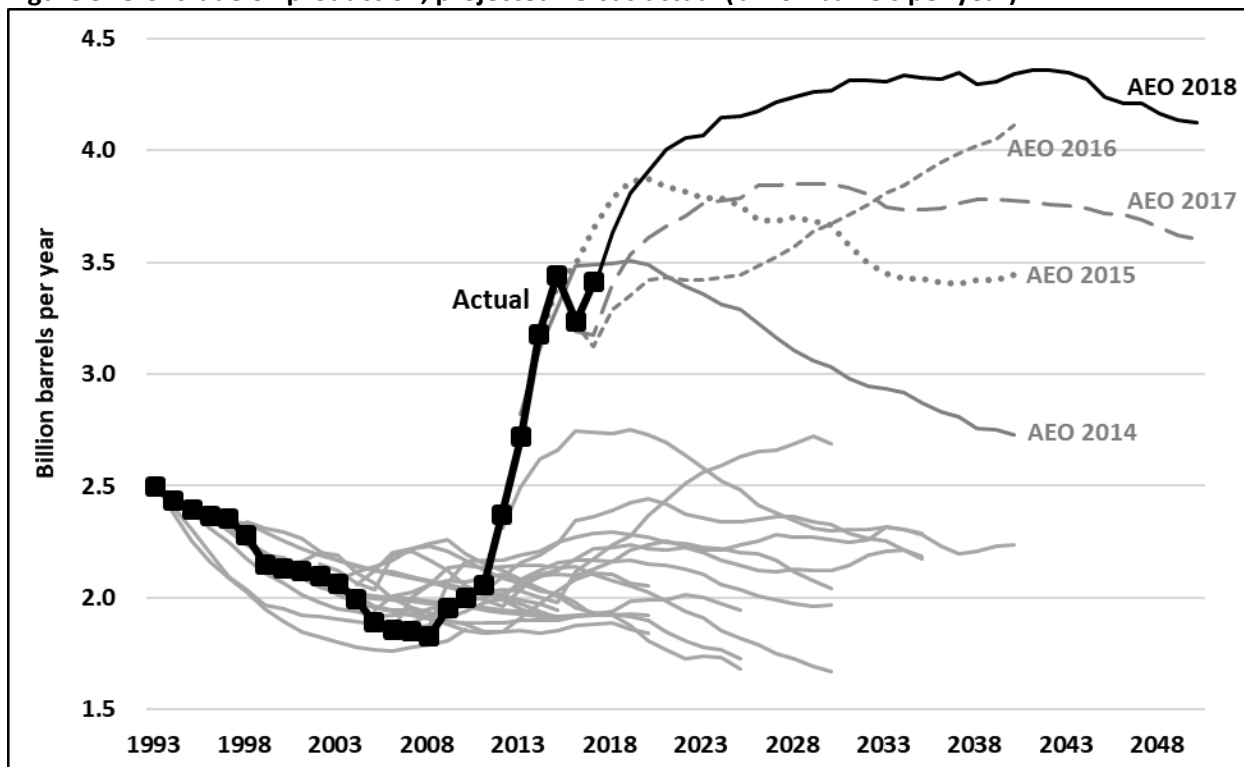
Source: U.S. EIA. Annual Energy Outlook 2018, 2017, 2016, 2015, 2014. Reference case.

**Entirely dependent on uncertain oil supply forecasts**

At some point in the future, NHTSA/EPA claim, domestic oil production will outstrip domestic oil demand—even if gasoline purchases are accelerated due to less stringent CAFE and CO<sub>2</sub> standards. Faster growth in U.S. oil production together with slower growth in U.S. oil demand would shrink both imports and exports, eventually reaching net zero U.S. oil imports (when net oil imports approximately equal net oil exports). There is, however, no crystal ball for accurate oil supply predictions, and the year in which U.S. oil imports are projected to reach net zero is highly dependent on EIA’s most recent U.S. oil supply forecast.

Accurate oil supply forecasting is notoriously difficult to achieve.<sup>15,16</sup> Since the early 1990s, EIA oil supply forecasts have varied substantially from year to year, with EIA forecasting oil supply more or less accurately (defined as within a 10 percent margin) about 60 percent of the time (see Figure 3).

**Figure 3: U.S. crude oil production, projected versus actual (billion barrels per year)**



Source: U.S. EIA. *Annual Energy Outlook 2004 to 2018 and Annual Energy Outlook Retrospective Review: Evaluation of 2016 and Prior Reference Case Projections*, Table 5, September 2017.

<https://www.eia.gov/outlooks/aeo/retrospective/pdf/retrospective.pdf>.

EIA’s projections of U.S. oil supply vary greatly from year to year of publication. EIA’s forecast of U.S. oil supply in 2020 has ranged from 1.8 to 3.9 billion barrels over the last 15 years of annually published predictions. In the last five years, forecasts of oil supply in 2025 have ranged from 3.3 to 4.2 billion barrels. These projections have been “right” (within 10 percent of actuals) just a little bit more often than they have been wrong. NHTSA/EPA’s expectation of net zero U.S. oil imports and all of the conclusions that flow from that assumption—including the U.S. economy’s indifference to global oil prices—are only as good as these supply projections turn out to be.

<sup>15</sup> Henke, P. May 2014. “IEA and Oil: Track record analysis and assessment of oil supply scenarios in WEO 2000-2013.” *Uppsala University*. Available at: <https://www.diva-portal.org/smash/get/diva2:725939/FULLTEXT01.pdf>.

<sup>16</sup> Wachtmeister, H., Henke, P. and Höök, M. 2018. “Oil projections in retrospect: Revisions, accuracy and current uncertainty.” *Applied Energy*. Available at: <https://www.sciencedirect.com/science/article/pii/S0306261918303428>. Volume 220, p.138-153.



***Relies on claims not supported either in the Proposed Rulemaking or the PRIA***

The Proposed Rulemaking and accompanying PRIA do not contain information sufficient to prove the claim that higher gas prices will not harm the U.S. economy. To successfully substantiate NHTSA/EPA's claim would require data and analysis demonstrating that higher consumer spending on oil equals (or approximately equals) the increase in revenue for U.S. oil producers. Even if this were the case—and no evidence has been presented that this is so—the reduction of complex U.S. economic impacts to a single measure—changes in GDP—is specious, as is discussed in the next section.

## **2. Hidden impact on U.S. consumers**

The August 2018 Proposed Rulemaking asserts that higher oil prices will have no impact on the U.S. economy if oil imports are just as big as oil exports. Hidden in this dry, technical assumption is a value judgment that, once revealed, is as politically unpalatable as it is inaccurate. In claiming that higher oil prices do not affect the U.S. economy when oil price imports are “net zero,” NHTSA/EPA are saying that higher gasoline costs for consumers can be washed away by higher profits for petroleum company shareholders with no net impact for the U.S. economy.

Higher gas prices result in significant costs for all U.S. families, with middle class and rural households likely to experience the largest impacts on their household budgets. Corporate profits rise with higher prices, yes, but a claim that net zero GDP impact mean no detrimental effects to the U.S. economy requires a remarkably shallow definition of U.S. economic well-being.

In the Proposed Rulemaking, NHTSA/EPA acknowledge that U.S. consumers will pay more as a result of the increase in the world oil price: “the increase in global petroleum prices that results from higher U.S. demand causes a transfer of revenue to oil producers worldwide from not only buyers of new cars and light trucks, but also other consumers of petroleum products in the U.S. and throughout the world, all of whom pay the higher price that results.”<sup>17</sup> NHTSA/EPA repeat this explanation in the PRIA:

Some of the increased payments by U.S. consumers for the petroleum products... is a financial drain on the U.S. economy, so from a domestic perspective it may be reasonable to view it as an additional cost to the U.S. economy from permitting new cars and light trucks to meet the lower proposed standards.<sup>18</sup>

Despite this admission—“a financial drain on the U.S. economy”—NHTSA/EPA seem to shrug away some of the higher consumer costs as a transfer among U.S. interests: “[T]o an increasing extent, however, the additional payments by U.S. consumers that result from upward pressure on the world oil price are a transfer entirely within the nation's economy, because a growing fraction of domestic petroleum consumption is being supplied by U.S. producers.”<sup>19</sup>

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<sup>17</sup> U.S. NHTSA/EPA. August 24, 2018. NPRM. Federal Register. Vol. 83, No. 165. p.43105.

<sup>18</sup> U.S. NHTSA/EPA. July 2018. PRIA. p.1068.

<sup>19</sup> U.S. NHTSA/EPA. July 2018. PRIA. p.1068.

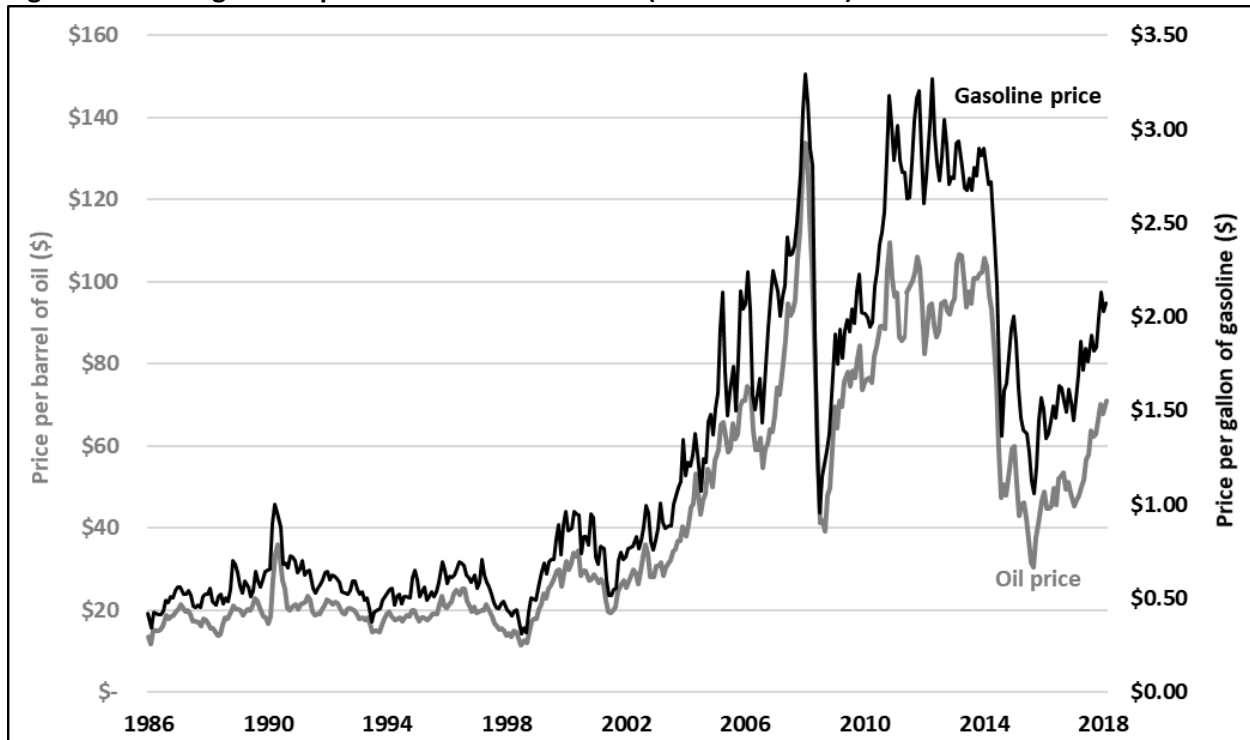


NHTSA/EPA ignore some of the real costs to consumers from less stringent CAFE and CO<sub>2</sub> standards—justifying the omission by trivializing its impact as minor from a national perspective—and fails to examine the distribution of these costs across U.S. households. However, other costs that could be considered “minor” from a national perspective—such as “additional congestion and noise”<sup>20</sup>—are quantified and accounted for by NHTSA/EPA.

***Ignores additional costs to consumers from less stringent CAFE and CO<sub>2</sub> standards***

The PRIA reports that higher oil prices have real costs for consumers by way of increased gas prices. While these costs are included in the calculations of costs and benefits of lower CAFE and CO<sub>2</sub> standards, the agencies fail to consider the effect of higher gasoline prices on the price of goods and services that households consume. Figure 4 (below) shows the global oil price and the price of gas in the United States moving in lock step over a period of 30 years.

**Figure 4: Oil and gasoline prices in the United States (nominal dollars)**



Source: U.S. EIA, *Spot Prices for Crude Oil and Petroleum Products*. Available at: [https://www.eia.gov/dnav/pet/pet\\_pri\\_spt\\_s1\\_m.htm](https://www.eia.gov/dnav/pet/pet_pri_spt_s1_m.htm) (accessed September 11, 2018). Oil price: Cushing, OK WTI Spot Price FOB. Gasoline price: New York Harbor Conventional Gasoline Regular Spot Price FOB.

The global oil price is a key determinant of changes in the U.S. price of gasoline. Thus, increasing gasoline prices will have a direct impact on consumers through a higher price of gasoline and an indirect

<sup>20</sup> U.S. NHTSA/EPA. July 2018. PRIA. p.537.

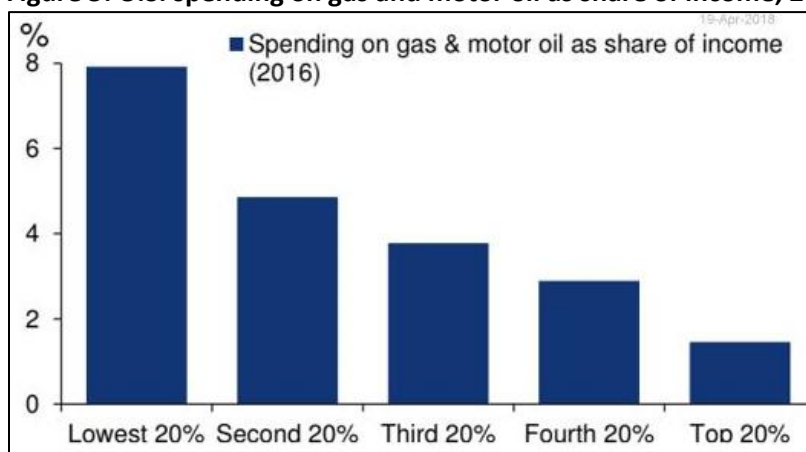
effect though higher prices of goods and services. The PRIA fails to consider this second effect in the costs and benefits of the lower standards.

Economic analyses consistently demonstrate that, as gas prices rise, disposable income shrinks, and consumer spending on other goods falls.<sup>21</sup> Similarly, when gas prices fall, disposable income grows, and consumer spending on other goods grows too.<sup>22, 23</sup> The Proposed Rulemaking omits consideration of the additional impact that increasing gas prices will have on the price of other goods and services that households buy.

### ***Fails to examine the distribution of these costs across U.S. households***

It has been well-documented that the impacts of higher gas prices are felt most acutely by low- and middle-income households, for whom gas expenditures account for a larger share of their total disposable income.<sup>24</sup> Figure 5, reproduced from the Wall Street Journal, shows the percentage of household income that is spent on gasoline for five groups of households, sorted by household income.

**Figure 5: U.S. spending on gas and motor oil as share of income, 2016**



Source: Reproduced from Borodovsky, L. April 19, 2018. “The Daily Shot: Rising Gas Prices More Than Offset Tax Cuts for Low-Income Americans.” Wall Street Journal. <https://blogs.wsj.com/dailyshot/2018/04/19/the-daily-shot-rising-gas-prices-more-than-offset-tax-cuts-for-low-income-americans/> (accessed September 12, 2018).

<sup>21</sup> Edelstein, P. and Kilian, L. 2009. “How sensitive are consumer expenditures to retail energy prices?” *Journal of Monetary Economics* 56(6): 766-779. Available at: <https://ideas.repec.org/a/eee/moneco/v56y2009i6p766-779.html>.

<sup>22</sup> Farrell, D. and Greig, F. October 2015. *How Falling Gas Prices Fuel the Consumer*. JP Morgan Chase & Co. Available at: <https://www.jpmorganchase.com/content/dam/jpmorganchase/en/legacy/corporate/institute/document/jpmc-institute-gas-report.pdf>.

<sup>23</sup> Baumeister, C. and Kilian, L. 2016. “Lower Oil Prices and the U.S. Economy: Is This Time Different?” *Brookings Papers on Economic Activity*. Available at: <https://www.brookings.edu/wp-content/uploads/2017/02/baumeistertextfall16bpea.pdf>.

<sup>24</sup> Paraskova, T. July 4, 2018. “Rising gas prices are taking a big chunk out of people’s disposable income.” *Business Insider*. Available at: <https://www.businessinsider.com/rising-gas-prices-are-taking-a-big-chunk-out-of-peoples-disposable-income-2018-7>.

Poorer households pay a larger share of their income on gas: The richest fifth of U.S. households spends less than 2 percent of income on gasoline while the poorest fifth spends 8 percent. The Brookings Institute found that for every dollar increase in the price of gasoline, low and moderate-income households spend an extra \$530 per year. Further, while some of these households may be able to invest in more fuel efficient means of transportation in the long run, “in the short-run they may have few options but to cut back on other expenditures in the family budget. Since low- and moderate-income families’ [sic] spend most of their income on average, in the very short run they can only choose between spending less on other items and going further into debt.”<sup>25</sup>

While NHTSA/EPA argue that, “[f]or some low-income purchasers or credit-challenged purchasers, the cost savings may make the difference between being able or not to purchase the desired vehicle,”<sup>26</sup> the agencies disregard the negative effect of higher fuel prices on low-income households.

### **3. Impact of price shocks and supply disruptions**

In their August 2018 Proposed Rulemaking, NHTSA/EPA recognize that U.S. consumers are not only vulnerable to higher gasoline prices but also to sudden fluctuations in fuel prices due to international price shocks and supply disruptions.<sup>27</sup> The agencies trivialize this risk, however, using the same argument debunked in the previous sections: that gains from oil revenues wash away harm done by spiking petroleum import prices. NHTSA/EPA do not address current economic indicators that may point to a weakness in the mechanism used to dampen swings in the global price of oil, and maintain that evidence regarding the likelihood of future supply disruptions has not changed since 2005.<sup>28</sup>

In the 2016 Midterm Evaluation, NHTSA/EPA/CARB maintained that an increase in domestic oil consumption would leave the United States vulnerable to price shocks and supply disruptions, noting that:

*[I]t is generally agreed that it is beneficial to reduce petroleum fuel consumption from an energy security standpoint. It is not just imports alone, but both imports and consumption of petroleum from all sources and their role in economic activity, that may expose the U.S. to risk from price shocks in the world oil price. Reducing fuel consumption reduces the amount of domestic economic activity associated with a commodity whose price depends on volatile international markets.*<sup>29</sup>

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<sup>25</sup> Sawhill, I.V. 2012. “How Higher Gas Prices Hurt Less Affluent Consumers and the Economy.” The Brookings Institute. Available at: <https://www.brookings.edu/opinions/how-higher-gas-prices-hurt-less-affluent-consumers-and-the-economy/>.

<sup>26</sup> U.S. NHTSA/EPA. August 24, 2018. NPRM. Federal Register. Vol. 83, No. 165. p.43223.

<sup>27</sup> U.S. NHTSA/EPA. July 2018. PRIA. p.1069.

<sup>28</sup> U.S. NHTSA/EPA. July 2018. PRIA. p.1073.

<sup>29</sup> U.S. NHTSA/EPA/CARB, July 2016. Draft Technical Report: Midterm Evaluation of Light-Duty Vehicle Greenhouse Gas Emission Standards and Corporate Average Fuel Economy Standards for Model Years 2022-2025. Available at: <https://nepis.epa.gov/Exe/ZyPDF.cgi/P100OXEO.PDF?Dockey=P100OXEO.PDF>. p.10-33.

NHTSA/EPA/CARB also noted that “[d]ependence on imported petroleum leads to many risks [including] the threat of supply disruptions which can have significant economic and national security ramifications.”<sup>30</sup>

The August 2018 PRIA agrees with this earlier assessment of the effect of oil price shocks, explaining that “[p]etroleum consumption can impose external economic costs because it exposes the U.S. economy to the risk of rapid increases in prices triggered by global political events that may also disrupt the supply of imported oil, and U.S. consumers of petroleum products are unlikely to recognize that their purchases contribute to these risks.”<sup>31</sup> NHTSA/EPA further acknowledge that “[i]n addition to influencing global demand and prices, U.S. petroleum consumption—and the fraction of it supplied by imports—may impose costs on the domestic economy that are not fully reflected in the market price for petroleum, or in the prices paid by consumers of refined products such as gasoline.”<sup>32</sup>

The current Proposed Rulemaking goes on to claim, however, that there will be less exposure to price shocks and supply disruptions because it expects lower U.S. oil imports in the future.<sup>33</sup> NHTSA/EPA estimate the cost of oil shocks to the U.S. economy but then argues that their own methodology (repeated from previous rulemakings) is incorrect. NHTSA/EPA choose to assume that “75% of the increase in fuel consumption resulting from lower CAFE and CO<sub>2</sub> emissions standards will be reflected in increased U.S. imports.”<sup>34</sup> NHTSA/EPA then reduce the expected cost of petroleum price shocks from increased fuel consumption before including these costs in their overall analysis.<sup>35</sup>

NHTSA/EPA’s claim that the U.S. economy will be increasingly insulated from global oil price fluctuations is not supported by the materials presented in the Proposed Rulemaking or the PRIA: 1) the agencies’ evidence for net zero oil imports is tenuous and applies only to the uncertain long-term; 2) no examination is presented of the risks of future oil price shocks and supply disruptions; and 3) NHTSA/EPA’s rule-of-thumb adjustment to their own cost estimates is inadequately substantiated.

### ***Evidence for net zero oil imports is tenuous and applies only to the long-term***

As discussed in Section 1, NHTSA/EPA’s expectation of net zero oil imports rests on uncertain long-term predictions of future U.S. oil production. In the shorter run, with positive U.S. oil imports, the evidence presented by NHTSA/EPA suggests negative impacts on the U.S. economy, not only from higher oil prices but from fluctuations in the prices due to international price shocks and supply disruptions. In both the short- and long-run, NHTSA/EPA acknowledge the vulnerability of U.S. consumers to higher oil prices. Similarly, consumers are exposed to the effects of price shocks and supply disruptions, regardless of whether U.S. oil imports are net zero or not.

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<sup>30</sup> U.S. NHTSA/EPA/CARB, July 2016. Draft Technical Report: Midterm Evaluation of Light-Duty Vehicle Greenhouse Gas Emission Standards and Corporate Average Fuel Economy Standards for Model Years 2022-2025. p.1-22.

<sup>31</sup> U.S. NHTSA/EPA. July 2018. PRIA. p.1069.

<sup>32</sup> U.S. NHTSA/EPA. July 2018. PRIA. p.1069.

<sup>33</sup> U.S. NHTSA/EPA. July 2018. PRIA. p.1072.

<sup>34</sup> U.S. NHTSA/EPA. July 2018. PRIA. p.1073.

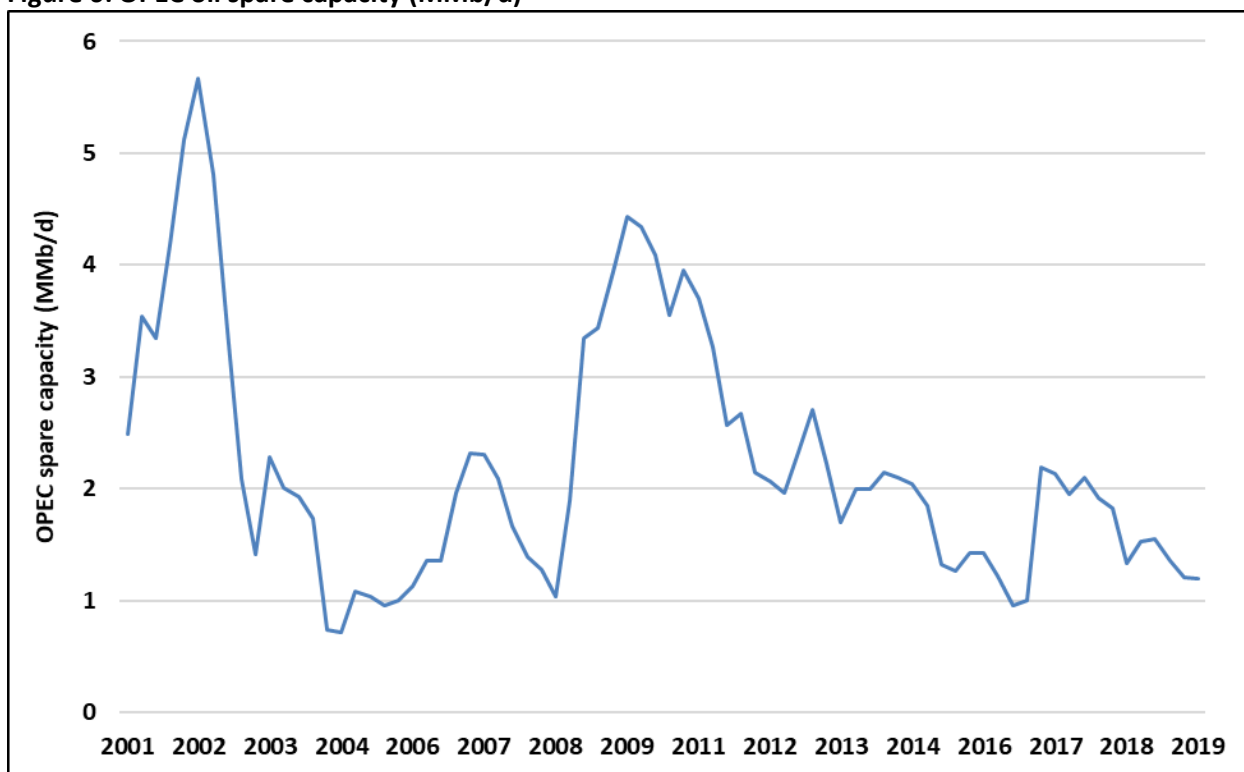
<sup>35</sup> U.S. NHTSA/EPA. July 2018. PRIA. p.1073.

**No examination presented of the risks of future oil price shocks and supply disruptions**

Consumers’ exposure to oil price shocks and supply disruptions depends not only on how dependent the U.S. economy is on oil but also on the ability of world oil suppliers to quickly respond to supply disruptions. NHTSA/EPA provide no evidence regarding expected future risks of rapid fluctuations in oil prices.

One measure of world oil suppliers’ ability to quickly respond to supply disruptions is “OPEC spare capacity”—the amount of oil that Organization of the Petroleum Exporting Countries (OPEC) can rapidly provide in the event of a supply disruption. EIA publishes monthly estimates of OPEC spare capacity, which is estimated as “the volume of production that can be brought on within 30 days and sustained for at least 90 days.” Figure 6 shows current OPEC spare capacity below 2 million barrels per day (MMb/d), one of the lowest levels of spare capacity for OPEC countries in the last fifteen years.

**Figure 6: OPEC oil spare capacity (MMb/d)**



Source: U.S. EIA website, “Energy & Financial Markets: What Drives Crude Oil Prices: What drives crude oil prices: Supply OPEC.” Available at: <https://www.eia.gov/finance/markets/crudeoil/supply-opec.php> (Updated September 11, 2018).

Low OPEC spare capacity means that in case of a disruption to oil supply, world oil producers will have fewer reserves from which to quickly supply oil. The International Energy Agency has expressed concern regarding its own short-run forecasts of OPEC spare capacity: “[T]hrough 2020, record supply from non-OPEC countries more than covers expected demand growth. But by 2023, if investments remain insufficient, the effective global spare capacity cushion falls to only 2.2% of demand, the lowest number

since 2007. This raises the possibility of oil prices becoming more volatile until new supplies come on line.”<sup>36</sup> A clear understanding of the risks from and buffers against price shocks and supply disruptions is essential to an accurate prediction of the impact of reduced CAFE and CO<sub>2</sub> standard stringency.

***NHTSA/EPA’s rule-of-thumb adjustment to their own cost estimates is inadequately substantiated***

In the PRIA, NHTSA/EPA argue that the methodology used in previous rulemakings to estimate the cost of petroleum price shocks is incorrect. NHTSA/EPA present the “per-gallon estimates of external costs from potential oil price shocks used in this analysis to estimate the increase in the total value of these costs that is likely to result from this proposed action” but then goes on to argue that these calculations result in overestimates. The reasoning provided is that the estimates “depend in part on projected future oil prices, U.S. petroleum consumption and imports, and the total value of petroleum purchases in relation to U.S. economic output (as measured by [GDP]),” and “all of these factors have evolved in directions that would reduce them, so the figures...are likely to overestimate the increase in expected costs to the U.S. economy from potential oil price shocks calculated in this analysis, perhaps significantly.”<sup>37</sup>

NHTSA/EPA then proceed to adjust their cost of oil shocks estimates based on simulations run with the Energy Information Administration’s National Energy Modeling System (NEMS).<sup>38</sup> Over the 2018 to 2050 period, the modeling system produced adjustment percentages ranging from 53 to 92 percent. Rather than acknowledging the substantial uncertainty in expected outcomes indicated by such a wide range of potential adjustments, NHTSA/EPA chose to take the average—75 percent, assuming “that 75% of the increase in fuel consumption resulting from lower CAFE and CO<sub>2</sub> emissions standards will be reflected in increased U.S. imports.”<sup>39</sup> The practice of selecting the average from a wide-distribution of uncertain potential results and using that average as in input to other calculations is not best gauged to provide accurate predictions. The modeling system projected deep uncertainty; NHTSA/EPA erase this uncertainty by calling the midpoint a forecast.

While the Proposed Rulemaking assumes that 75 percent of the increase in demand due to lower standards will be reflected in higher imports, the previous Rulemaking of 2012 assumed that 95 percent of the decrease in demand due to higher standards will be reflected in lower imports. In other words, NHTSA/EPA’s new methodology has the effect of reducing the expected impact of supply shocks.

NHTSA/EPA’s rule-of-thumb method for updating their past forecast of the costs of price shocks and oil supply disruptions is not a new analysis; it’s a short-cut adjustment to an old analysis. For the purpose of revising these existing standards, a full analysis of price shocks and oil supply disruptions is necessary to understanding their effects on U.S. households.

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<sup>36</sup> International Energy Agency. March 2018. “Oil 2018 Report.” Available at: <https://webstore.iea.org/market-report-series-oil-2018>. p.5.

<sup>37</sup> U.S. NHTSA/EPA. July 2018. PRIA. p. 1072.

<sup>38</sup> U.S. NHTSA/EPA. July 2018. PRIA. p. 1073.

<sup>39</sup> U.S. NHTSA/EPA. July 2018. PRIA. p. 1073.

#### 4. Impacts on military spending

Historically, the United States' reliance on fossil fuels has necessitated the import of oil from oil-producing countries, often from countries that are chronically unstable or even actively engaged in violent conflict. As a result, the United States has long had a military presence in or near oil-producing countries, especially those located in the cluster of oil reserves in the Middle East.

Previously, NHTSA/EPA claimed that the United States would spend less money on military expenditures as domestic oil demand decreased due to CAFE and CO<sub>2</sub> standards because we would have less need for foreign oil supply and fewer oil imports. While not included in NHTSA/EPA's cost-benefit analysis, the Final Ruling of 2012 noted that "U.S. consumption and imports of petroleum products impose costs on the domestic economy that are not reflected in the market price for crude petroleum" and that "[h]igher U.S. imports of crude oil or refined petroleum products increase the magnitude of these external economic costs...[c]onversely, reducing U.S. imports of crude petroleum or refined fuels or reducing fuel consumption can reduce these external costs."<sup>40</sup> These external costs included:

*[E]xpenses for maintaining a U.S. military presence to secure imported oil supplies from unstable regions, and for maintaining the strategic petroleum reserve (SPR) to provide a response option should a disruption in commercial oil supplies threaten the U.S. economy, to allow the United States to meet part of its International Energy Agency obligation to maintain emergency oil stocks, and to provide a national defense fuel reserve.<sup>41</sup>*

In the August 2018 PRIA, NHTSA/EPA acknowledge that higher oil demand may cause higher military spending: A "potential effect of increasing U.S. demand for petroleum is an increase in U.S. military spending."<sup>42</sup> The PRIA goes on to recognize the U.S. military's role in securing "the supply of oil imports from potentially unstable regions of the world and protect against their interruption."<sup>43</sup> According to NHTSA/EPA, military spending on oil supply production is a cost of reducing the stringency of CAFE and CO<sub>2</sub> standards:

*If the increase in fuel consumption that results from reducing CAFE and CO<sub>2</sub> standards leads to higher military spending to protect oil supplies, this might represent an additional external or social cost of the agencies' proposal. Some analysts also argue that increased costs to maintain the U.S. Strategic Petroleum Reserve (SPR) are another external cost of increased U.S. petroleum use, because it is intended to cushion the U.S. economy against disruptions in the supply of imported oil or sudden increases in the global price of oil.<sup>44</sup>*

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<sup>40</sup> U.S. NHTSA/EPA. October 15, 2012. Federal Register. Vol. 77, No. 199. Rules and Regulations. 2017 and Later Model Year Light-Duty Vehicle Greenhouse Gas Emissions and Corporate Average Fuel Economy Standards. p.62669.

<sup>41</sup> U.S. NHTSA/EPA. October 15, 2012. NPRM. Federal Register. Vol. 77, No. 199. p.62669.

<sup>42</sup> U.S. NHTSA/EPA. July 2018. PRIA. p.1073.

<sup>43</sup> U.S. NHTSA/EPA. July 2018. PRIA. p.1073.

<sup>44</sup> U.S. NHTSA/EPA. July 2018. PRIA. p.1073.



Unlike in their previous rulemakings, however, NHTSA/EPA posit that, while increased military spending could result from less stringent CAFE and CO<sub>2</sub> standard that—for reasons that are not adequately explained—it probably will not:

*[I]t seems unlikely...that military spending would rise in response to any increase in U.S. imports that did result from this proposed action. As a consequence, the analysis of alternative CAFE and CO<sub>2</sub> emission standards for future model years applies no increase in government spending to support U.S. military activities as a potential cost of allowing new cars and light trucks to achieve lower fuel economy and thus increasing domestic petroleum use.<sup>45</sup>*

In lieu of evidence to this point, NHTSA/EPA assert that:

*[T]he value of both the nation's total petroleum purchases and its imports of foreign oil—again measured relative total economic output—actually rose throughout most of [the 1960 to 2015] period, even as military spending declined. This history suggests that U.S. military activities—even in regions of the world that have historically represented vital sources of oil imports—serve a broader range of security and foreign policy objectives than protecting oil supplies.<sup>46</sup>*

In the end, NHTSA/EPA claim that U.S. oil imports could cause an increase in military spending, and then suggest—without evidence—that more imports probably will not increase military spending. NHTSA/EPA argument is unconvincing on at least two grounds: U.S. military spending has risen together with the value of U.S. oil consumption; and U.S. oil imports are widely acknowledged to have an influence on U.S. military spending.

### ***U.S. military spending has risen together with the value of U.S. oil consumption***

NHTSA/EPA choose to represent trends in military spending as a share of GDP (see Figure 7). While U.S. military spending as a share of GDP has fallen over time, military spending in absolute dollars has not (see Figure 8 below). NHTSA/EPA argue that military spending (as a share of GDP) has been falling during the same period that the value of oil consumption (in dollars, again as a share of GDP) has been raising, and therefore arrives at the conclusion that more oil consumption does not lead to more military spending. When viewed in absolute terms (dollars and barrels as shown in Figure 8), however, military spending and oil consumption both increased between 1960 and 2015. NHTSA/EPA's claim of falling military spending during this period is incorrect.

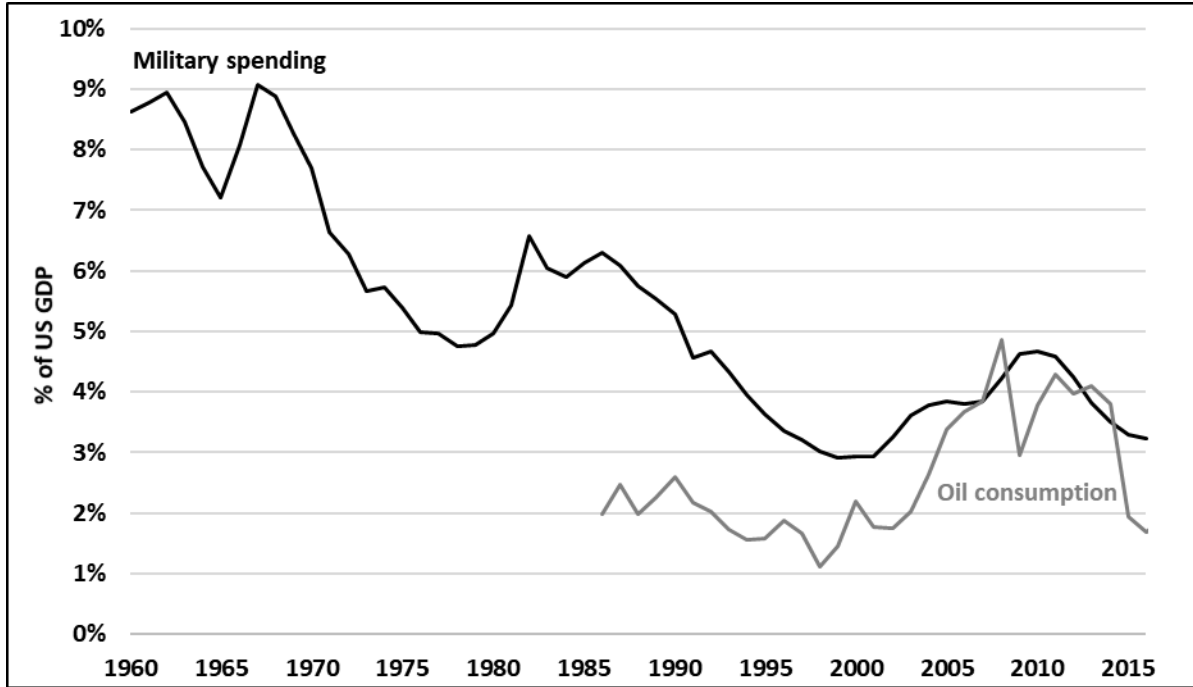
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<sup>45</sup> U.S. NHTSA/EPA. July 2018. PRIA. p.1077.

<sup>46</sup> U.S. NHTSA/EPA. July 2018. PRIA. p.1074.

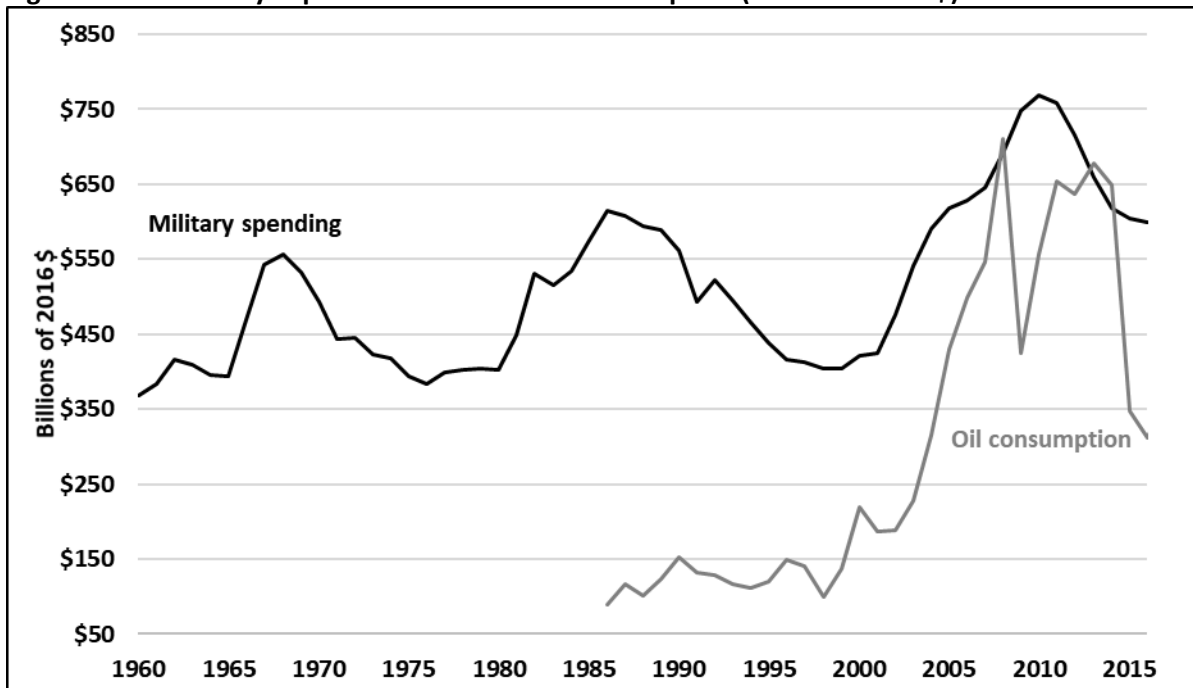


Figure 7: U.S. military expenditure and U.S. oil consumption (percent of GDP)



Source: SIPRI Military Expenditure Database. Available at: <https://www.sipri.org/databases/milex> (accessed August 31, 2018) and U.S. EIA: Product supplied of crude oil. FRED: WTI Crude oil prices, GDP.

Figure 8: U.S. military expenditure and U.S. oil consumption (billions of 2016\$)



Source: SIPRI Military Expenditure Database. Available at: <https://www.sipri.org/databases/milex> (accessed August 31, 2018) and U.S. EIA: Product supplied of crude oil. FRED: WTI Crude oil prices, GDP.



***U.S. oil imports are widely acknowledged to have an influence on U.S. military spending***

The literature on the topic of military spending as it relates to U.S. oil dependency shows clear evidence of a widely shared understanding that U.S. military spending is strongly tied to U.S. oil demand. NHTSA/EPA's assertion that "it seems unlikely...that military spending would rise in response to any increase in U.S. imports that did result from this proposed action"<sup>47</sup> seems to directly contradict this common understanding.

A brief survey of recent literature resulted in assessments from the RAND corporation, the journal *Energy Policy*, and the nonpartisan thinktank Securing America's Future Energy (SAFE) stating that:

*"[W]ere oil security no longer a consideration, the United States could expect to avoid periodic military operations that respond to threats to the production and global transit of oil."*<sup>48</sup>

and,

*"[W]ere there no oil in the Persian Gulf, then U.S. combined peacetime and wartime defense expenditures might be reduced in the long run by roughly \$27–\$73 billion per year (in 2004 dollars)."*<sup>49</sup>

and,

*"At minimum, approximately \$81 billion per year is spent by the U.S. military protecting global oil supplies... 'If we reduced our oil consumption by half, [the U.S. military] would act differently,' says ESLC member Admiral Dennis C. Blair, the former Director of National Intelligence and Commander in Chief of the U.S. Pacific Command"*<sup>50</sup>

NHTSA/EPA fail to present evidence supporting their unusual assumption that U.S. military spending is largely unaffected by U.S. oil imports.

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<sup>47</sup> U.S. NHTSA/EPA. July 2018. PRIA. p.1077.

<sup>48</sup> Crane, K. et al. 2009. "Imported Oil and U.S. National Security". Santa Monica, CA: RAND Corporation. Available at: <https://www.rand.org/pubs/monographs/MG838.html>. p.74.

<sup>49</sup> Delucchi, M.A. and Murphy, J.J. 2008. "US military expenditures to protect the use of Persian Gulf oil for motor vehicles." *Energy Policy* 36 (6): 2253-2264. Available at: <http://faculty.cbpp.uaa.alaska.edu/jmurphy/papers/DelucchiMurphy2008.PDF>. p.2253.

<sup>50</sup> Securing America's Future Energy. September 20, 2018. The Military Cost of Defending Global Oil Supplies. Available at: <http://secureenergy.org/report/military-cost-defending-global-oil-supplies/>.