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Public Interest Comment¹ on

The Environmental Protection Agency and National Highway Traffic Safety Administration's Proposed Rule:

Greenhouse Gas Emissions and Fuel Efficiency Standards for Medium- and Heavy-Duty Engines and Vehicles – Phase 2

Docket Nos. EPA-HQ-OAR-2014-0827 & NHTSA-2014-0132 RINs: 2060-AS16 & 2127-AL52

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¹ This comment reflects the views of the author, and does not represent an official position of the GW Regulatory Studies Center or the George Washington University. The Center's policy on research integrity is available at <u>http://regulatorystudies.columbian.gwu.edu/policy-research-integrity</u>.

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Introduction

In response to a directive from President Obama,³ and using their respective statutory authorities, the Environmental Protection Agency (EPA) and the Department of Transportation's National Highway Traffic Safety Administration (NHTSA) have jointly proposed a set of standards⁴ to regulate greenhouse gas emissions and (almost equivalently) fuel efficiency for medium and heavy-duty engines and vehicles. In contrast to the Corporate Average Fuel Economy (CAFE) Standards that NHTSA has long administered, the vehicles covered by the current proposal are almost entirely commercial vehicles used by businesses – not by households.

The President said: "[I]mproving gas mileage for these trucks are [sic] going to drive down our oil imports even further. That reduces carbon pollution even more, cuts down on businesses' fuel costs, which should pay off in lower prices for consumers. So it's not just a win-win, it's a win-win-win. You've got three wins. . . And businesses that buy these types of trucks have sent a clear message to the nearly 30,000 workers who build them: We want trucks that use less oil, save more money, cut pollution."

Do the proposed standards create a win-win-win? And if they do, why must they be mandated? Isn't the "clear message" sent by the businesses that buy these trucks sufficient? These are the kinds of questions that should be answered in the Draft Regulatory Impact Analysis (RIA) that accompanies the proposed standards. Unfortunately, while the RIA contains some good economic analysis, it ultimately makes claims about the standards' fuel-saving benefits that are not plausible. The majority of the forecast benefits take the form of cost savings by the businesses that buy and use the regulated vehicles – businesses that are already well-informed about their own cost structure, and are well-positioned to make the optimum choices. Forcing businesses to make investments that they have thoroughly studied, and rejected, cannot create economic surplus.

There are, of course, other categories of benefits detailed in the RIA that are distinct from the private fuel savings. But the credibility of the overall analysis is undermined by the fact that it appears to be hard-wired to produce a "win-win-win" result. It is as if the analysis contains a "defeat device" designed allow the standards to pass the benefit-cost test; the RIA demonstrates that the standards will produce very large net benefits on paper – benefits that the standards cannot possibly achieve on the road.

³ <u>Remarks by the President on Fuel Efficiency Standards for Medium and Heavy-Duty Vehicles</u>, February 18, 2014.

⁴ "Greenhouse Gas Emissions and Fuel Efficiency Standards for Medium and Heavy-Duty Engines and Vehicles— Phase 2; Proposed Rule." Federal Register Vol. 80, No. 133, July 13, 2015 (Book 2 of 3 Books), pp. 40137– 40766.

The Proposed Standards

EPA and NHTSA have jointly proposed Phase 2 fuel economy standards that will apply to companies that manufacture, sell, or import either heavy duty engines or trucks, including tractor-trailer trucks, "vocational" (e.g., garbage) trucks, all types of buses, RVs, and pick-ups and vans in the ³/₄ ton to 1 ton range. This rulemaking is part of President Obama's Climate Action Plan;⁵ it expands on earlier fuel economy standards for light duty vehicles, and on "Phase 1" standards for medium and heavy-duty vehicles (MDVs and HDVs). The proposed Phase 2 standards for MDVs and HDVs will impose various requirements for model years 2018 through 2027, including, for the first time, requirements (affecting aerodynamic and rolling resistance) that apply to trailers, which by themselves do not generate any emissions.

EPA and NHTSA claim that, in the early years, the proposed standards can be achieved using existing technologies. In later years, however, the standards are technology-forcing – that is, the agencies assume innovations will be developed to allow the industry to comply with standards that, today, are not technically achievable. Some flexibility is built into the proposed standards in the form of averaging, banking, and trading (ABT) programs. But the flexibility is limited: "The ABT programs allow for emission and/or fuel consumption credits to be averaged, banked, or traded within each of the regulatory subcategories. However, credits are not allowed to be transferred across subcategories."

The other form of flexibility in the proposed standards is the use of various exemptions for small manufacturers, which exemptions may be grandfathered (i.e., not available to new entrants), capped (at historic production levels), and time-limited. These exemptions were developed in consultation with incumbent small manufacturers; similarly, the broadly applicable standards were developed in consultation with incumbent large manufacturers.

Regulatory Impact Analysis

This comment focuses on the Draft Regulatory Impact Analysis prepared by EPA and NHTSA jointly, and especially on the RIA's framework for benefits and costs and the conceptual framework for evaluating impacts. The RIA estimates that the standards will save vehicle owners \$170 billion in fuel costs over the lifetime of the vehicles sold, plus an additional \$60 billion in environmental and other external benefits. It estimates that the average household

⁵ The White House, The President's Climate Action Plan (June, 2013). <u>www.whitehouse.gov/share/climate-action-plan</u>.

could save nearly \$150 a year by 2030, and \$275 a year by 2040, due to reduced transportation costs for goods that they consume.

It is important to remember why we do regulatory analysis. It is not to serve as a marketing tool, or to generate political talking points. Regulations have the force of law and, by their nature, are coercive. Before regulatory agencies use force against U.S. citizens, we ask them to justify it by demonstrating that the action will do more good than harm.⁶ That requires an honest appraisal of who is made better or worse off, and by how much. This RIA is designed to tell a happy story where everybody wins, but it is a false one. The claim that the private benefits due to the Phase 2 standards will many times larger than the private costs cannot be reconciled with the basic principles of benefit-cost analysis.

The discussion below touches on several other features of the RIA – both strengths and weaknesses – before returning to the question of private benefits.

Rebound Effect

The RIA makes a considerable effort to characterize and quantify the "rebound effect" - the changes in fuel consumption and in other variables that result when more energy-efficient vehicles are used more intensively because the cost of using them has declined.⁷ The agencies should be applauded for recognizing the importance of rebound effects, which other agencies have been known to ignore. Markets are elastic, in countless dimensions, and it can be very difficult to anticipate the ways in which their dynamic response to regulatory interventions may differ from the static model that may represent the regulator's intent. There is an unfortunate tendency in the literature to coin new terms (see "leakage," and "backfire effect," in addition to "rebound") to describe these market responses, as if they were something new and surprising. The reality is that economists have known for a long time about the complexity and responsiveness of dynamic markets. Generally, unless a regulatory intervention is very carefully designed, the various price elasticities and cross-elasticities will tend to frustrate the attempts of regulators to move markets in a direction they are not willing to go, so that the forecast benefits may not fully materialize. Agencies should be encouraged to use models that fully reflect the elasticity of markets in the real world, and should be prepared to abandon regulatory strategies that, however well intentioned, do not appear to be effective under real-world conditions.

⁶ Executive Order 12866: *Regulatory Planning and Review*. September 30, 1993.

⁷ RIA, pp. 8-10 to 8-29.

Social Cost of Carbon

The goal of the President's Climate Action Plan is to reduce emissions of greenhouse gases. The proposed Phase 2 standards will primarily reduce emissions of carbon dioxide, although some other greenhouse gases are also covered, and are converted to their "carbon equivalent" for purposes of the analysis. The RIA uses a Social Cost of Carbon (SCC, or SC-CO₂) to assign benefits to the estimates of reduced emissions. There are numerous complexities and controversies surrounding the estimation of the SCC. Nonetheless, as we have argued elsewhere, it is correct, in principle, for agencies to use a uniform SCC in evaluating programs designed to reduce carbon emissions.⁸

In doing a sensitivity analysis, the RIA uses multiple estimates of the SCC – including one that is intended to explore the "fat tails" of the probability distribution. "The fourth value is the 95th percentile of the SC-CO2 from all three models at a 3 percent discount rate. It is included to represent higher-than-expected impacts from temperature change further out in the tails of the SC-CO2 distribution (representing less likely, but potentially catastrophic, outcomes)."⁹ Note, however, that only the hot tail is considered. We know from the geological record that very large climate risks exist on the cold side. A major glacial advance, which has happened dozens of times in the past, would wipe out much of North America and northern Europe. The RIA's use of only one tail of the distribution is an indication of bias in the analysis.

There is another flaw in the SCC used to calculate the climate benefits of the standards: the agencies are using an estimate that is global. That is, the SCC mostly (an estimated 80% to 93%) represents benefits that accrue to other countries, rather than to the United States. This is a useful exercise to go through as part of an international conversation on climate change and what to do about it. It is not, however, suitable for estimating the benefits of a unilateral domestic rulemaking.¹⁰ Imposing costs on U.S. businesses and consumers in order to deliver

⁸ Brian Mannix & Susan E. Dudley, "Public Comment on the Interagency Technical Support Document: Technical Update of the Social Cost of Carbon for Regulatory Impact Analysis under Executive Order No. 12866." *The George Washington University Regulatory Studies Center*, Washington, DC. February 26, 2014. <u>https://regulatorystudies.columbian.gwu.edu/sites/regulatorystudies.columbian.gwu.edu/files/downloads/OMB_20</u> <u>13-0007_SCC.pdf</u>

⁹ RIA, p. 8-37.

¹⁰ Gayer and Viscusi note that "imposing a global perspective on benefits will increase the apparent desirability of the policy but will overstate the actual benefits to the American people."

See Ted Gayer and Kip Viscusi, "Determining the Proper Scope of Climate Change Benefits." *The George Washington University Regulatory Studies Center*, Washington, DC. June 4, 2014. <u>http://regulatorystudies.columbian.gwu.edu/sites/regulatorystudies.columbian.gwu.edu/files/downloads/Gayer-Viscusi_Determining%20the%20Proper%20Scope%20of%20Climate%20Change%20Benefits.pdf</u>

benefits to other countries cannot be characterized as a "big step to grow our economy."¹¹ Nor is it clear that delivering foreign aid is consistent with the statutory authorities on which the agencies rely in this rulemaking. A domestic SCC would be a sounder basis for evaluating the benefits of the standards.

Employment Impacts

As required by President Obama's Executive Order 13563 (January 18, 2011), the RIA includes an analysis of employment impacts of the proposed standards.¹² President Obama's message announcing the standards indicated that he believed they would "bring jobs back to America."

The RIA acknowledges the difficulty of the task, reviews the literature, and makes heroic efforts to develop a credible model that would allow it to forecast job impacts within the motor vehicle manufacturing sector. Ultimately it is not able to reach a definitive conclusion:

The overall effect of these proposed rules on motor vehicle sector employment depends on the relative magnitude of the output effect and the substitution effect. Because we do not have quantitative estimates of the output effect, and only a partial estimate of the substitution effect, we cannot reach a quantitative estimate of the overall employment effects of these proposed rules on motor vehicle sector employment or even whether the total effect will be positive or negative.¹³

The RIA reaches similar conclusions about other sectors likely to be affected. One danger of this type of partial equilibrium analysis, which focuses primarily on the sectors directly affected by a rule, is that the analysis might have identified direct employment impacts while missing indirect impacts in sectors beyond the scope of the analysis. This is Bastiat's classic "seen and unseen" problem, and the RIA appears to be sensitive to the danger: "In an economy with full employment, the primary employment effect of a rulemaking is likely to be to move employment from one sector to another, rather than to increase or decrease employment."¹⁴ It might have added that the same is likely to be true in an economy that does not exhibit full employment, at least within the limits of our ability to analyze such effects.

¹¹ <u>Remarks by the President on Fuel Efficiency Standards for Medium and Heavy-Duty Vehicles</u>, February 18, 2014.

¹² RIA Section 8.11, p. 8-93 ff.

¹³ RIA, p. 8-101.

¹⁴ RIA, p. 8-103.

This does not mean that unemployment is not a serious and chronic problem, nor that regulation is not an important cause of it. Regulation may be especially harmful when it inhibits recovery from a recession, and there are good reasons to examine the effect of regulatory policy on employment more broadly. Nonetheless, unless the rule affects the terms of employment directly, a forecast of employment impacts is not likely to be reliable or informative for any particular regulatory decision. The RIA is right to be cautious about generating such forecasts.¹⁵

Impact on Competition

The RIA does not include an analysis of the impact of the proposed standards on competition. Generally it is a good idea to explore such impacts, particularly to counteract the tendency of a benefit-cost analysis to point to one apparently "optimum" solution to a given problem. Such a calculated solution is rarely optimal, and never optimal for very long, so it is important not to lock it in. Moreover, competition remains the most effective overall regulator of economic performance and efficiency, and by-the-book regulators need to be very careful, while pursuing their own missions, not to inflict a greater harm by impairing competition. The proposed standards appear to have been developed in close consultation with industry incumbents, and incorporate prescriptive requirements that are likely to create barriers to entry. Rather than encouraging innovation, the standards are likely to make innovation very difficult. Even the exemptions for small manufacturers incorporate caps and grandfather features that appear to be designed to suppress competition.

The danger of impaired competition is even greater when regulations require the use of proprietary technologies. Complying with the proposed Phase 2 standards will require vehicle manufacturers to use a range of advanced technologies, discussed in detail in Chapter 2 of the RIA. In many cases these technologies appear to be proprietary. For example, the RIA discusses the effectiveness of SABIC Roof Fairing Technology¹⁶ in reducing drag, but does not discuss the potential costs that can result when a regulation effectively requires the use of patented technologies,¹⁷ leaving manufacturers at the mercy of the patent holder. The agencies seem unconcerned about the danger of creating mandated monopolies: "We are currently coordinating with SABIC [Saudi Arabia Basic Industries Corporation] on future efforts to

¹⁵ For a more complete discussion of this problem, see Brian F. Mannix, "Employment and Human Welfare: Why Does Benefit-Cost Analysis Seem Blind to Job Impacts?" Chapter 10 in *Does Regulation Kill Jobs?*, University of Pennsylvania Press, 2013; Cary Coglianese, Adam Finkel, and Christopher Carrigan, editors.

¹⁶ RIA, p. 2-19.

¹⁷ "Saudi Basic Industries Corporation (SABIC) has passed the milestone of having more than 10,000 patents either issued or pending approval, making it the largest owner of intellectual property in the Middle East." Arab News, "SABIC becomes region's largest patent developer," 13 June 2014. <u>http://www.arabnews.com/news/585811</u>

determine feasibility and capability of this concept on additional areas of the tractor (e.g., bumper, hood, fuel tank/chassis skirt fairings, cab side extenders)."¹⁸ The proposed standards appear to be dramatically increasing our dependence on proprietary intellectual property, even "as we take another big step to grow our economy and reduce America's dependence on foreign oil."¹⁹

Private Benefits

Increasingly, agencies that issue regulations mandating increased energy efficiency have made the claim that they are producing "private benefits" – somehow making consumers better off by depriving them of the choices that they would make on their own.²⁰ These claims are always suspect, and are sometimes justified by a claim that consumers suffer from "internalities" – behavioral anomalies that prevent consumers (but not regulators) from acting in their own best interest.²¹ Such claims become especially implausible in the case of the proposed Phase 2 standards. Under every scenario and set of assumptions, fuel savings are the largest component of benefits, accounting for more than 50 percent of all benefits.²² Yet this rule, because it applies to intermediate goods (vehicles) that are bought by sophisticated users, is ideal for illustrating what is wrong with the analytical techniques that are used to produce inflated estimates of private benefits. The RIA states the problem:

Economic theory suggests that interactions between vehicle buyers and sellers in a normally-functioning competitive market would lead HDV manufacturers to incorporate all technologies that contribute to lower net costs into the vehicles they offer, and buyers to purchase them willingly. Nevertheless, many readily available technologies that appear to offer cost-effective increases in HDV fuel efficiency (when evaluated over their expected lifetimes using conventional discount rates) have not been widely adopted, despite their potential to repay buyers' initial investments rapidly. This economic situation is commonly known as the "energy efficiency gap" or "energy paradox." This situation is perhaps

¹⁸ RIA, p. 2-20.

¹⁹ President's remarks.

²⁰ For example, Miller (2015) calculates that private benefits comprise 88% of all benefits from energy efficiency standards. Miller, Sofie E. "Whose Benefits Are They, Anyway? Examining the Benefits of Energy Efficiency Rules 2007 – 2014." *The George Washington University Regulatory Studies Center*, Washington, DC. September 2, 2015.

²¹ Dudley & Mannix, "Please Don't Regulate My Internalities," *Journal of Policy Analysis and Management*, 2015. <u>http://www.appam.org/pointcounterpoint-please-dont-regulate-my-internalities-/</u>

²² See Table 8-38, RIA p. 8-88.

more challenging to understand with respect to the heavy-duty sector versus the light-duty vehicle sector. Unlike light-duty vehicles – which are purchased and used mainly by individuals and households – the vast majority of HDVs are purchased and operated by profit-seeking businesses for which fuel costs represent a substantial operating expense. Nevertheless, on the basis of evidence reviewed below, the agencies believe that a significant number of fuel efficiency improving technologies would remain far less widely adopted in the absence of these proposed standards.²³

The RIA notes that one explanation for apparently irrational behavior on the part of regulated businesses is ". . . requirements of other regulations on HDVs."²⁴ The RIA does not identify what these requirements are, nor does it explain how issuing conflicting regulations is supposed to make things better. It offers other candidate theories to explain the anomaly:

Imperfect information in the new and used vehicle markets. Imperfect or asymmetrical information is often invoked as a reason to regulate, but it is difficult to make that case here. Vehicle buyers know how they plan to drive the vehicles, with what loads, under what conditions (altitude and temperature), and at what speeds. The RIA describes the industry as highly sophisticated and notes that some HDV buyers actually test the vehicles (including tractor-trailer combinations) for their performance under field conditions, with actual loads and drivers. This is far better information about fuel economy than EPA and NHTSA can ever hope to have.

Principal-agent problems. The RIA speculates that the HDV buyer may not be directly responsible for its future fuel costs, or the individual who will be responsible for fuel costs may not participate in the HDV purchase decision. These are routine matters of internal corporate management or marketplace bargaining. Companies are very good at figuring out their cost structure, and all the evidence in the RIA indicates that they put a great deal of effort into getting the fuel economy right. The only parties to all these transactions who may have a principal-agent problem are the regulatory agencies, and that is a reason to refrain from regulating, rather than a reason to intervene.

Uncertainty about future fuel cost savings. "HDV buyers may be uncertain about future fuel prices, or about maintenance costs and reliability of some fuel efficiency technologies." And rightly so. Any casual observation of fuel prices in recent years leads to the conclusion that

²³ RIA, p. 8-3.

²⁴ RIA, p. 8-4.

investments in fuel economy, even if they work exactly as intended, are among the riskiest investments that a business might make.²⁵

Adjustment and transaction costs. These include the "costs associated with training drivers to realize potential fuel savings enabled by new technologies, or with accelerating fleet operators' scheduled fleet turnover and replacement to hasten their acquisition of vehicles equipped with these technologies." But these are real costs, and need to be accounted for in the benefit-cost analysis. Regulations cannot create economic benefits by instructing businesses to ignore these costs. EPA states:

Other explanations for the limited use of apparently cost-effective technologies that do not involve market failures include HDV operators' concerns about the performance, reliability, or maintenance requirements of new technology under the demands of everyday use, uncertainty about the fuel savings they will actually realize, and questions about possible effects on carrying capacity or other aspects of HDVs' utility.²⁶

These are not "failures of the HDV market," however; they are rational business decisions. Regulators' attempts to override them can only produce net private costs, not private benefits. Take, for example, uncertainty about fuel savings, which causes HDV buyers to discount such projected savings. One factor in this uncertainty is the price of fuel; the graph below is the retail price reported by Washington State's Department of Transportation:

²⁵ David R. Henderson, "The Economics of Fuel Economy Standards," *Regulation Magazine*, 1985, 47. <u>http://object.cato.org/sites/cato.org/files/serials/files/regulation/1985/1/v9n1-6.pdf</u>

²⁶ RIA, p. 8-4.



Investments in fuel-saving technology are among the riskiest investments that businesses make. And there are more risks beyond the price risk. Right now, millions of buyers of light Volkswagen diesel vehicles are very disappointed to learn that they are not getting the performance that they thought they would get. Buyers of HDVs must recognize that fuel-saving technology do not always deliver what they promise.

Uncertainties like this are one reason why the apparent discount rate that businesses apply to fuel-saving technologies is so high. Yet the RIA applies discount rates of 3 and 7 percent. It is standard practice for the government to use risk-free discount rates to its own investments, because the government is large enough to self-insure, and no one project is more than a small component of a very large portfolio of government projects. But buyers of HDVs generally are not using government funds. It is inappropriate to apply the parameters of public finance to private businesses that face real opportunity costs, capital constraints, and financial risks. It does not create economic value when regulation forces private businesses to forego higher or more certain investments in order to make mandated investments. Before applying a risk-free social discount rate to the stream of private costs and benefits associated with a regulation, the capital costs imposed on businesses and individuals should be converted to a consumption-

equivalent stream, using the actual discount rate of the businesses and individuals who experience them.

The most troubling aspect of the private benefit numbers is the extent to which the agencies believe that coercive regulation, even in the absence of any externalities, will make businesses more economically efficient.

Some of these explanations imply failures in the private market for fuel-saving technology beyond the externalities caused by producing and consuming fuel, while others suggest that complications in valuing or adapting to technologies that reduce fuel consumption may partly explain buyers' hesitance to purchase more fuel-efficient vehicles. In either case, adopting this proposed rule would provide regulatory certainty and thus generate important economic benefits in addition to reducing externalities.²⁷

The RIA has it backwards. These are not failures of the private market; these are failures of the economic analysis. Forcing businesses to make bad investments may provide regulatory certainty, but it emphatically does not "generate important economic benefits." Some businesses may see this type of regulatory certainty as privately advantageous because it protects them from competitors, drives out small businesses, and creates barriers to entry and innovation. But this business support is not evidence of economic benefit; rather, it suggests that there are additional economic harms that will flow from the regulation.

Conclusion

In conducting this Phase 2 rulemaking, EPA and NHTSA have completed extensive engineering and economic research, which is integrated into a Regulatory Impact Analysis that forecasts large benefits, mostly in the form of private fuel savings. Unfortunately the analysis fails to recognize that competitive markets are far better informed, and far better motivated, to pursue these fuel savings efficiently. The RIA's attempts to explain that limiting businesses' options will make them more efficient are not persuasive. The proposed Phase 2 standards seem likely to reduce both competition and innovation in MDV and HDV markets, resulting in additional costs not documented in the RIA. The net effect on U.S. households will be higher costs, not savings. There are other external benefits that might be used to justify the standards, but an honest RIA would acknowledge that these come at a price. This is not a win-win-win proposal.

²⁷ RIA, p. 8-5.