Institute *for* Policy Integrity
New York University School of Law

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VIA ELECTRONIC SUBMISSION

Environmental Protection Agency
Air and Radiation Docket
Attention Docket ID No. EPA-HQ-OAR-2009-0472

Subject: Comments on Proposed Rulemaking to Establish Light-Duty Vehicle Greenhouse Gas Emission Standards and Corporate Average Fuel Economy Standards, 74 Fed. Reg. 49,453 (Sep. 28, 2009), Docket ID Nos. EPA-HQ-OAR-2009-0472 and NHTSA-2009-0059

The Institute for Policy Integrity strongly supports the efforts of the Environmental Protection Agency (EPA) and the National Highway Transportation and Safety Administration (NHTSA) to address the problem of greenhouse gas (GHG) emissions from light-duty vehicles in this joint rulemaking.[1] This joint proposal of new Corporate Average Fuel Efficiency Standards (CAFE) from NHTSA and greenhouse gas emission standards (GHG Standards) from EPA for light-duty motor vehicles is an important move toward meeting EPA's obligations under the Clean Air Act (CAA), as defined by the Supreme Court in *Massachusetts v. EPA*.[2]

However, this is only the first step. Several petitions are pending before EPA to regulate a variety of other mobile sources that produce significant greenhouse gas emissions,[3] including a petition from this Institute.[4] In order to fully comply with its mandates under the Clean Air Act, EPA must address all significant sources of greenhouse gas emissions and must respond to these petitions.[5]

The Institute for Policy Integrity (IPI) at New York University School of Law is a non-partisan advocacy organization and think-tank dedicated to improving the quality of government decisionmaking in the areas of environmental, public health, and safety regulation. IPI advocates using rational economic analysis as a tool to advance socially-beneficial regulation.

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[1] Proposed Rulemaking to Establish Light-Duty Vehicle Greenhouse Gas Emission Standards and Corporate Average Fuel Economy Standards, 74 Fed. Reg. 49,453 (proposed Sep. 28, 2009) (to be codified at 40 C.F.R. pts. 86, 531, 533, 537-38, and 600) [hereinafter Proposed Rulemaking].

[2] *Massachusetts v. EPA*, 549 U.S. 497 (2007) (finding a clear statutory duty to regulate carbon dioxide emissions from new motor vehicles and reversing EPA's determination to decline rulemaking on discretionary and statutory grounds).

[3] *See* Proposed Rulemaking, 74 Fed. Reg. 49,508.

[4] Institute for Policy Integrity, New York University School of Law, PETITION FOR RULEMAKING UNDER SECTIONS 211 AND 231 OF THE CLEAN AIR ACT TO INSTITUTE A CAP AND TRADE SYSTEM FOR GREENHOUSE GAS EMISSIONS FROM VEHICLE FUELS (Jul. 29, 2009) *available at* http://policyintegrity.org/projects/documents/7.29.09IPIPetitiontoEPA.pdf. *See also* Inimai M. Chettiar & Jason A Schwartz, *The Road Ahead* (Institute for Policy Integrity Report No. 3, Apr. 2009) *available at* http://policyintegrity.org/publications/documents/TheRoadAhead.pdf (basis for petition) [hereinafter *The Road Ahead*].

[5] *Massachusetts v. EPA*, 549 U.S. 528–529 (Clean Air Act definition of "air pollutant" is capacious enough to include GHG emissions); *see The Road Ahead* at 20–32 (noting the legal impact of the *Massachusetts v. EPA* decision*);* Proposed Rulemaking, 74 Fed. Reg. 49,508 (listing Clean Air Act authority for petitions); *The Road Ahead* at 17–18 (listing petitions for rulemaking on GHGs pending before the EPA).

These comments call the agencies' attention to considerations in program design as well as in the calculation of certain costs and benefits. In particular, these comments focus on five main issues:[6]

- For policy and legal reasons, the agencies must—to the best of their abilities—quantify any potential lost consumer welfare. However, economic concepts like the Positional Goods Effect predict that any loss will be limited and temporary.
- The agencies should employ a distributional analysis to address the energy security gains related to demand/monopsony effects.
- EPA should build a broader cap-and-trade program for vehicle fuels, to target greenhouse gas emissions from motor vehicles in a more comprehensive and efficient manner.
- EPA should reconsider setting a single standard for all greenhouse gas pollutants, to increase flexibility and improve efficiency.
- EPA should reconsider its treatment of electric vehicles, to account for the lifecycle emissions of electric vehicles and to avoid over-subsidizing a single technology.

IPI has also submitted separate comments jointly with Environmental Defense Fund on the agencies' calculation of the social cost of carbon (SCC).

In general, the agencies should follow best practices for economic analysis and should carefully consider all quantitative and qualitative effects of a range of policy alternatives, in order to design a final rule that will best maximize net benefits.

Comments Applicable to Both EPA's and NHTSA's Proposals

(1) Valuation of Consumer Welfare

The agencies calculate that the proposed regulations will generate significant consumer benefits: most importantly by saving consumers money on fuel, but also by freeing up time otherwise spent refueling, extending the driving range, and creating opportunities to enjoy increased vehicle use.

However, consumers arguably already have the option to generate these benefits for themselves, by voluntarily selecting the more fuel-efficient vehicle models currently on the market. It appears consumers value something about the less fuel-efficient choices they make. If the proposed regulations restrict consumers' choices, do consumers then lose welfare? How much?

The agencies review the relevant literature and conclude that the available economic models are too imprecise and inconsistent to predict the likely loss to consumer welfare. EPA admits it "is not able to estimate the consumer welfare loss…and so any such loss must remain unquantified."[7] NHTSA even more openly acknowledges that since "the likely impacts of adopting higher CAFE standards on consumer welfare remain unknown[,]…the magnitude and even the direction of the net private economic impact of adopting stricter CAFE standards also remain[ ] unknown."[8]

This is a risky place to stop the analysis, both from the perspective of setting rational, efficient policy, as well as from a legal perspective. The agencies should instead do their best to quantify the net effects on consumer welfare, even if some uncertainty persists. In particular, the agencies should explore the theoretical and empirical support for how the Energy Efficiency Paradox, the

[6] The proposed regulations are long and complex, and necessarily these comments do not include an exhaustive presentation of IPI's views. For example, IPI also supports the agencies' use of publicly available data to establish baseline fleets and future predictions, instead of the historical reliance on confidential industry data, and IPI encourages the agencies to explore a wider range of regulatory alternatives that might better maximize net benefits.

[7] Proposed Rulemaking, 74 Fed. Reg. 49,604.

[8] *Id.* at 49,723.

Positional Goods Effect, and the Bandwagon Effect influence consumer choices and valuations. As a result of such effects, any lost consumer surplus should be much smaller and more temporary than classic economic theory might predict, and considerable net private benefits will exist.

Best Practices Require Quantification

Without quantifying what the agencies call "an important component of the total private costs and benefits,"[9] it is impossible to conclude whether the proposed standards are too stringent or not stringent enough to maximize net benefits. A review of EPA's estimates for the rule's costs and benefits through the year 2050 will help demonstrate this point:[10]

EPA's Estimates for Costs and Benefits (Millions of 2007$)

		3% Discount Rate	7% Discount Rate
Compliance Costs		$390,000	$216,600
Quantified Social Benefits (Pollution Reduction Benefits + Energy Security Benefits – Accident/Congestion Costs)	with SCC starting at $5	$126,000	$53,500
	with SCC starting at $10	$195,800	$82,000
	with SCC starting at $20	$320,400	$133,400
	with SCC starting at $34	$514,300	$213,400
	with SCC starting at $56	$818,800	$339,100
Quantified Private Benefits (Pre-Tax Fuel Savings + Reduced Refueling + Value of Increased Driving)		$1,951,900	$869,800
Quantified Social + Private Benefits		$2,078,500 to $2,770,700	$923,300 to $1,208,900
Total Benefits – Lost Consumer Welfare		?	?

*Shaded cells indicate benefit estimates that exceed compliance cost estimates. "SCC" means "social cost of carbon."

While it appears that the social benefits might outweigh compliance costs and that gross private benefits certainly outweigh compliance costs, by failing to quantify lost consumer welfare, the agencies leave uncertain "the magnitude *and even the direction* of the net private economic impact." Consequently, the agencies expose themselves to the criticism that the rule's benefits might not justify its costs after all. Perhaps more importantly, since the net benefits of the proposal are unknown, the agencies cannot determine whether an alternative standard (such as a more stringent standard) might better maximize net benefits.

Failing to quantify such a crucial value simply because of uncertainty in the economic models runs counter to recommended best practices on cost-benefit analysis. For example, the White House Office of Management and Budget (OMB) recommends:

> When benefit and cost estimates are uncertain…, you should report benefit and cost estimates…that reflect the full probability distribution of potential consequences.…If fundamental scientific disagreement or lack of knowledge prevents construction of a scientifically defensible probability distribution, you should describe benefits or costs under plausible scenarios and characterize the evidence and assumptions underlying each alternative scenario.[11]

In short, a best guess is better than doing nothing. At the very least, if quantification is truly impossible for benefits or costs that might affect a policy choice, OMB advises agencies to "include

[9] *Id.*

[10] Data adapted from Proposed Rulemaking, 74 Fed. Reg. 49,624-27.

[11] WHITE HOUSE OFFICE OF MGMT. & BUDGET, CIRCULAR A-4 18 (2003).

detailed information on the nature, timing, likelihood, location, and distribution of the unquantified benefits and costs."[12] So far, the agencies have not lived up to these standards for best practices.

Legal Standards Require Quantification

Once an agency undertakes a cost-benefit analysis and relies on that analysis in its rulemaking, it cannot perform the cost-benefit analysis in an arbitrary and capricious manner.[13] If a cost-benefit analysis used in rulemaking "fail[s] to consider *an important aspect* of the problem" or "runs counter to the evidence before the agency," a reviewing court will invalidate the rule under the Administrative Procedure Act.[14] Perhaps crucially, NHTSA has clearly identified the potential lost consumer welfare as "*an important component* of the total private costs and benefits."[15]

Failing to quantify an important element in a cost-benefit analysis can constitute arbitrary and capricious action. A cost-benefit analysis must be as accurate as reasonably possible, and agencies must estimate costs and benefits in a responsible manner.[16] Courts have criticized Department of Transportation rulemakings in the past for trying to justify a failure to quantify by citing uncertainty. In *Public Citizen v. FMCSA*, the court warned that:

> The agency's job is to exercise its expertise to make tough choices about which of the competing estimates is most plausible, and to hazard a guess as to which is correct.... Regulators by nature work under conditions of serious uncertainty, and *regulation would be at an end if uncertainty alone were an excuse* to ignore a congressional command.[17]

Similarly, in *Center for Biological Diversity v. NHTSA,* NHTSA believed the economic models on the benefits of reducing greenhouse gas emissions were too uncertain and inconsistent to support an explicit valuation. The Ninth Circuit Court of Appeals held that NHTSA's reasoning was arbitrary and capricious because "while the record shows that there is a range of values, the value…is certainly not zero."[18] In the present rulemaking, the agencies also fail to quantify an important element of the cost-benefit analysis and thus unnecessarily expose themselves to legal challenges.

The Potential Lost Consumer Welfare

Manufacturers will respond to the proposed regulation in three ways: (1) adding fuel-efficient technologies, thereby increasing vehicle prices; (2) changing vehicle design (particularly size and

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[12] *Id.* at 27.

[13] *See Ctr. for Biological Diversity v. NHTSA*, 538 F.3d 1172, 1198 (9th Cir. 2008) (holding that once an agency voluntarily decides to rely on a cost-benefit analysis, "it cannot put a thumb on the scale by undervaluing the benefits and overvaluing the costs" in an arbitrary and capricious manner); *Pub. Citizen v. FMCSA*, 374 F.3d 1209, 1217-19 (D.C. Cir. 2004) (finding agency's rulemaking to be "troubling" because it relied on a "questionable" cost-benefit analysis that employed "dubious" assumptions and distorted the costs and benefits).

[14] *Motor Vehicle Mfrs. Ass'n vs. State Farm Mut. Auto Ins. Co.*, 463 U.S. 29, 43 (1983).

[15] Proposed Rulemaking, 74 Fed. Reg. 49,723.

[16] *Ctr. for Biological Diversity*, 538 F.3d at 1200 (finding that agency refusal to monetize and include important cost and benefits in its analysis was arbitrary and capricious); *Pub. Citizen v. FMCSA*, 374 F.3d at 1219-20 (stating that FMCSA's cost-benefit justifications for its rule would have been unlikely to pass judicial scrutiny because the agency failed to estimate and quantify costs and account fully for benefits).

[17] 374 F.3d at 1220-21 (emphasis added); *see also Chamber of Commerce of U.S. v. SEC*, 412 F.3d 133, 144 (D.C. Cir. 2005) ("Uncertainty may limit what an agency can do, but it does not excuse an agency from its statutory obligation to do what it can to apprise itself—and hence the public and the Congress—of the economic consequences of a proposed regulation before it decides whether to adopt the measure.").

[18] 538 F.3d at 1172. NHTSA's reasoning was also arbitrary and capricious because it has monetized other uncertain benefits but not this one. *Id.* at 1202. The court chastised NHTSA for impermissibly "put[ting] a thumb on the scale by undervaluing the benefits and overvaluing the costs of more stringent standards." *Id.* at 1198.

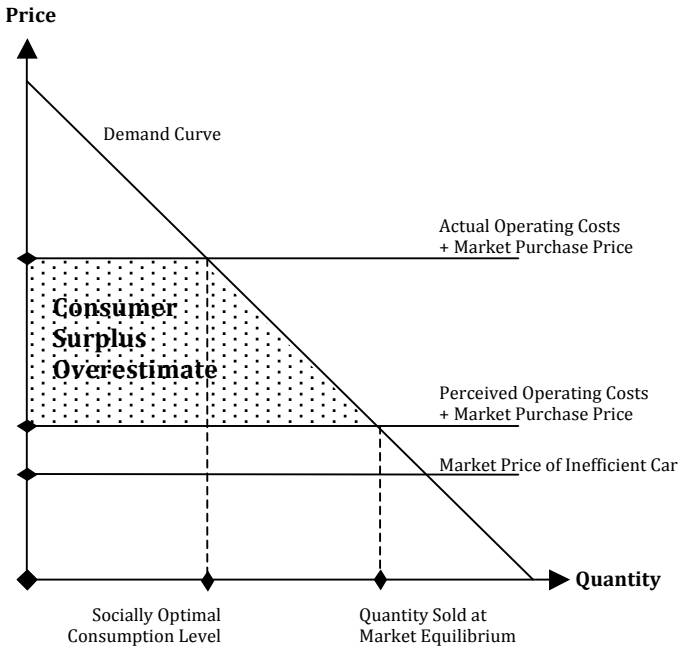
power) to increase fuel efficiency; and (3) raising prices of fuel-inefficient models.[19] The agencies assume that manufacturers will not change the performance, carrying capacity, safety, or comfort of their vehicles in order to comply and, therefore, have included the cost of maintaining these attributes as part of the estimated compliance costs. However, as the agencies also acknowledge, manufacturers may in fact elect to change these attributes.[20]

As a result, consumers can expect either increased vehicle purchase prices or different vehicle design features (or some combination thereof). In the former case, consumers could experience lost welfare if the fuel savings and other private benefits from greater fuel efficiency do not fully compensate them for the increased purchase price.[21] In the latter case, consumers could experience lost welfare if they do not value the new fuel efficiency as highly as they value the design features that have been sacrificed. Three economic concepts will affect the measurement of consumer valuations: the Energy Efficiency Paradox, the Positional Goods Effect, and the Bandwagon Effect.

The Energy Efficiency Paradox

All other things equal, fully informed and perfectly rational consumers should be indifferent between a $1 increase in vehicle purchase price and a $1 savings in net present value of fuel costs. Yet a growing body of evidence suggests that consumers under-weigh costs that are less salient or accrue in the future, such as shipping and handles charges, management fees, sales tax, electricity, and fuel.[22] One very recent study using a novel design and conservative assumptions found a significant average undervaluation of vehicle operating costs: consumers were willing to pay only 25 cents extra to reduce the net present value of expected gas costs by $1.[23]

This discrepancy—called the Energy Efficiency Paradox—can be depicted graphically. At a car's market price, some consumers will not buy, and others would actually be willing to pay more.



[19] The agencies mostly focus their cost estimates on the first compliance strategy, but others do exist. *See* Christopher R. Knittel, *Automobiles on Steroids: Product Attribute Trade-Offs and Technological Progress in the Automobile Sector* (U.C. Davis Inst. of Transportation Studies UCD-ITS-RR-09-16, 2009).

[20] Proposed Rulemaking, 74 Fed. Reg. 49,503; *id.* at 49,722 ("Although NHTSA believes it has employed estimates of costs…that include adequate allowances for any accompanying modifications…any changes in these attributes that manufacturers elect to make will represent additional private costs.").

[21] Of course, if consumers are fully compensated (and we expect they likely are), there should be no deadweight loss. Also, over time, the effect of new technologies on purchase price should be limited. *See* M.E. Porter & C.V.D. Linde, *Toward a New Conception of the Environment-Competitiveness Relationship*, 9 J. OF ECON. PERSPECTIVES 97 (1995); Daniel Sperling et al., *Analysis of Auto Industry and Consumer Response to Regulations and Technological Change* (U.C. Davis Inst. of Transportation Studies UCD-ITS-RR-04-17, 2004).

[22] *See* Hunt Allcott & Nathan Wozny, *Gasoline Prices, Fuel Economy, and the Energy Paradox*, Nov. 4, 2009, *available at* http://web.mit.edu/allcott/www/papers.html (reviewing the relevant literature);

[23] *Id.* at 5.

The area between the demand curve and the market price—the "consumer surplus"—defines the value consumers attach to a good above its market price. Consumers will buy a car up the point where the purchase price plus the perceived operating costs equals their willingness to pay. However, if *actual* operating costs are much higher than *perceived* operating costs, consumers will buy more of this particular car model than they rationally should. Moreover, economic studies that look only at consumers' choices would overestimate consumer surplus and would therefore overestimate the lost consumer welfare from restricting the consumers' ability to select that particular model.

Explanations for the Energy Efficiency Paradox will inform the appropriate regulatory response. NHTSA raises the possibility that no paradox exists: rather, consumers might be making a rational choice given uncertainty about future fuel prices and their vehicle's expected lifetime and usage.[24] Consumers might compare the known, irreversible, upfront purchase price against an unknowable future stream of fuel savings, and choose to minimize the former. Regulations restricting such a choice would reduce consumer welfare. The current empirical evidence for such an explanation seems mixed at best:[25] NHTSA should consider whether the evidence is sufficient to warrant adjusting its estimate of the Energy Efficiency Paradox, but overall support does not seem to justify a conclusion that no paradox exists.

Another possible explanation is that consumers lack the necessary information to make a rational choice, do not fully appreciate the information presented, or are unable to translate information on fuel efficiency into expected fuel savings. This almost certainly is part of the problem, and the agencies should continue efforts in the proposed rulemaking to improve the labeling and information available to consumers, especially in light of recent research demonstrating how mere differences in the presentation of numbers can alter consumer valuations.[26]

But even if consumers had full information, the Energy Efficiency Paradox might persist if consumers apply a high discount rate to operating costs or are especially averse to short-term loss. In such a case, there is a legitimate role for government regulation to encourage consumers to consider the long-term costs of car ownership. And, as explored more fully in the next section, government regulation may be necessary to correct market failures that lead consumers to make sub-optimal choices about fuel efficiency.

The Positional Goods Effect

A "positional good" is something whose value depends strongly on how it compares with the things owned by others.[27] Smith might be relatively happy with her house's size if it matches the neighborhood's average size, but she might value the same house less if a mansion goes up next door: housing size is positional. By comparison, Smith might not care how many vacation days her neighbors have so long as she gets the amount she wants: vacation days are non-positional.

Positionality and status matter for reasons that go beyond psychology, biological hardwiring, or envy—although those factors should not be ignored.[28] Status can be "instrumental," in that higher

[24] Proposed Rulemaking, 74 Fed. Reg. 49,724.

[25] *Id.* (citing theory and evidence both for and against this proposition).

[26] *See* Christopher K. Hsee et al., *Specification Seeking: How Product Specifications Influence Consumer Preference*, 35 J. OF CONSUMER RES. (2009) (reporting, for example, that people are willing to pay more to get the same large pizza instead of a small pizza if square inches are given (180 versus 100) compared to if the diameter is given (13.75 versus 11.25)).

[27] Robert H. Frank, *The Demand for Unobservable and Other Nonpositional Goods*, 75 AM. ECON. REV. 101, 101 (1985).

[28] Envy certainly may be a factor, and status may be an end into itself. The case for biological and psychological hardwiring is also strong: natural selection rewards those who compete for higher status that carries better or more mating opportunities, as well as those who compete for status for their offspring, to ensure success of their progeny.

status itself can create better consumption opportunities and access to better employment opportunities.[29] "Conspicuous consumption" of positional goods thus becomes a signal for status:

> When an individual's ability level cannot be observed directly, such observable components of his consumption bundle constitute a signal to others about his total income level, and on average, therefore, about his level of ability….[I]mperfect information about ability might create incentives for people to rearrange consumption patterns to favor observable goods.[30]

In other words, theory predicts that more visible goods will be more positional, and that people will over-consume visible goods. Visibility depends not necessarily on physical visibility, but on whether "society has direct means to correctly assess the expenditure involved."[31]

According to a recent U.S. survey on the visibility of 31 expenditure categories (from food to mobile phones), new or used motor vehicle purchases was the second most visible expenditure; related expenditures on gasoline/diesel, vehicle maintenance, and insurance were all substantially less visible.[32] Surveys also consistently confirm that cars are highly positional goods, that people prefer a relative increase in a car's value to an absolute increase,[33] and that the more visible features of cars are more positional.[34] Financial savings, in contrast, are typically considered non-positional.[35]

The more observable prestige features of vehicles include newness, brand, size, design, and power. While all these traits have functional value (such as capacity, safety, and performance),[36] they also all have relative value: consumers value power not just for speed but for the status signal and for the ability to out-accelerate others at a traffic light; consumers do not necessarily want a *big* car,

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[29] Ed Hopkins & Tatiana Kornienko, *Running to Keep in the Same Place: Consumer Choice as a Game of Status*, 94 AM. ECON. REV. 1085, 1087 (2004) (noting also that quality marriage opportunities might depend on status).

[30] Frank, *supra* note 27, at 107. Consumption patterns might vary depending on the relevant population in the status competition. People might compete among friends, neighbors, and coworkers; within their socio-economic class; with higher classes; or on a society-wide basis. *See* Fredrik Carlsson et al., *Do You Enjoy Having More than Others? Survey Evidence of Positional Goods*, 74 ECONOMICA 586, 590 (2007). If a particular population has more reliable, independent information on abilities or income, consumption patterns for observable goods might shift. Frank, *supra* note 27, at 108.

[31] Ori Heffetz, *A Test of Conspicuous Consumption: Visibility and Income Elasticities* 9 (2009), *available at* http://papers.ssrn.com/sol3/papers.cfm?abstract_id=1004543.

[32] *Id.* at 13, 17, 34 (vehicle purchase had a visibility index of 0.73, second only to tobacco products (0.76); gasoline/diesel had a visibility index of 0.39).

[33] Specifically, a majority of people surveyed would prefer a world in which their car is superior to other people's but less valuable overall, versus a world in which their car has more absolute value but is inferior to the societal average. *See*, *e.g.*, Carlsson et al., *supra* note 30, at 588, 593 (reporting results of a Swedish survey); Francisco Alpizar et al., How *Much Do We Care About Absolute Versus Relative Income and Consumption?*, 56 J. OF ECON. BEHAVIOR & ORG. 405, 412 (2005) (reporting results of Costa Rican survey). Though some such surveys were conducted in other countries, if anything positionality for cars could be stronger in the United States, given the American affinity for cars and the income distribution. *See* Reid R. Heffner et al., *Effects of Vehicle Image in Gasoline-Hybrid Electric Vehicles* 2 (U.C. Davis Inst. of Transportation Studies UCD-ITS-RR-05-08, 2005) ("In the words of automobile psychologist G. Clotaire Rapaille, Americans are in 'a permanent search of an identity' and 'cars are very key…[they are] maybe the best way for Americans to express themselves.'"); Hopkins & Kornienko, *supra* note 29 (noting that positional effects increase as society's income increases, because the portion of income spent on conspicuous consumption increases). On the other hand, cars are often more a necessity and less a luxury in the United States than in other countries. *See* Mark Grinblatt et al., *Interpersonal Effects in Consumption: Evidence from the Automobile Purchases of Neighbors* (Yale ICF Working Paper No. 04-10, 2004).

[34] Carlsson et al., *supra* note 30, at 588, 593 (finding support for hypothesis that "visible goods and their characteristics, such as the value of cars, are more positional than less visible goods and their characteristics, such as car safety.").

[35] *See, e.g.* Omer Moav & Zvika Neeman, *Savings Rates and Poverty: The Role of Conspicuous Consumption and Human Capital* (2009), *available at* http://www.hecer.fi/Seminars/Papers/moav_paper.pdf.

[36] Carlsson et al., *supra* note 30, at 595, could not provide a clear answer to the question of whether cars are completely positional. On average cars are highly positional, but that reflects a good deal of heterogeneity: cars may be completely positional for some people, but are possibly completely non-positional for others. *Id.* at 596.

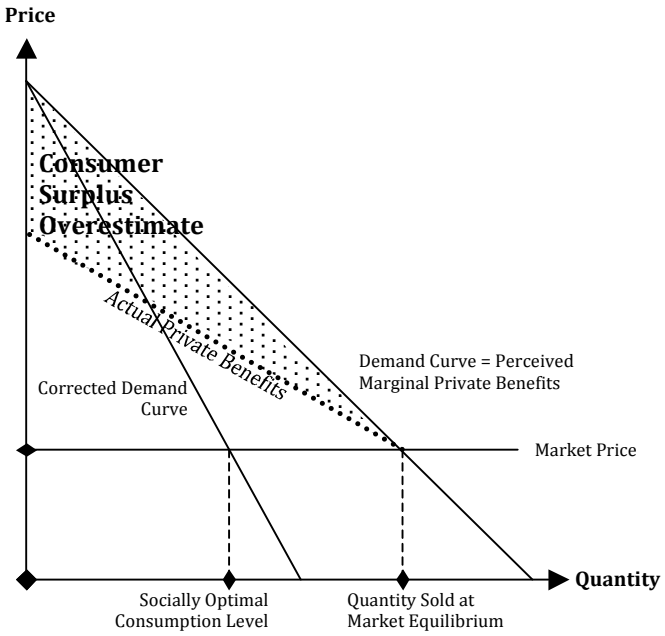
but they do want a *bigger* car.[37] As Bob Lutz, Vice Chairman of General Motors, has stated, "aspirational aspects overwhelm the functional differences" when customers choose cars.[38] Importantly, many vehicle prestige features—especially larger size and increased performance—reduce fuel efficiency.[39] And given the low visibility of gasoline expenditures and of financial savings, fuel efficiency itself is currently a relatively non-positional good.

A vehicle's size and weight are also positional for safety reasons, in addition to status motivations. To the extent smaller cars fare worse in crashes with bigger cars,[40] consumers may value bigger cars not because of any intrinsic safety value, but because of the average fleet size.

The problem with positional goods is that an increase in aggregate consumption does not necessarily increase consumer welfare. If Smith invests in a positional good to move up the status hierarchy, Jones will feel relatively worse off and so will match that investment to catch up. As a result, both consumers spend resources without actually improving their relative status.[41]

The conspicuous consumption status competition is wasteful because consumers invest more in positional goods than they would if they were motivated purely by the goods' functional value, as consumers try to capture a status advantage that never materializes. In the end, positional goods do not produce the welfare that consumers expect, due to a negative externality caused by positionality: as soon as the second consumer also buys the big car, it reduces the value to the first consumer of her big car.[42]

This negative externality can be depicted graphically. Consider a good where status depends on exclusivity of ownership. For such a status good, each subsequent consumer is willing to pay a little less, as exclusivity decreases. But each subsequent purchase also retroactively reduces the welfare of previous consumers by reducing exclusivity. Thus, the actual private benefits enjoyed by consumers (dotted line) is lower than they had originally perceived. As a result,



[37] Erik Verhoef & Bert van Wee, *Car Ownership and Status: Implications for Fuel Efficiency Policies from the Viewpoint of Theories of Happiness and Welfare Economics* 4 (Tinbergen Institute Discussion Paper TI 2000-076/3, 2000) ("However, most cars in most Western countries have engines with much more power than needed, given the characteristics of infrastructure, speed limits, and travel distances.").

[38] George Will, *Americans and Their Cars*, TOWNHALL DAILY, Apr. 18, 2002, *available at* http://townhall.com/columnists/GeorgeWill/2002/04/18/americans_and_their_cars.

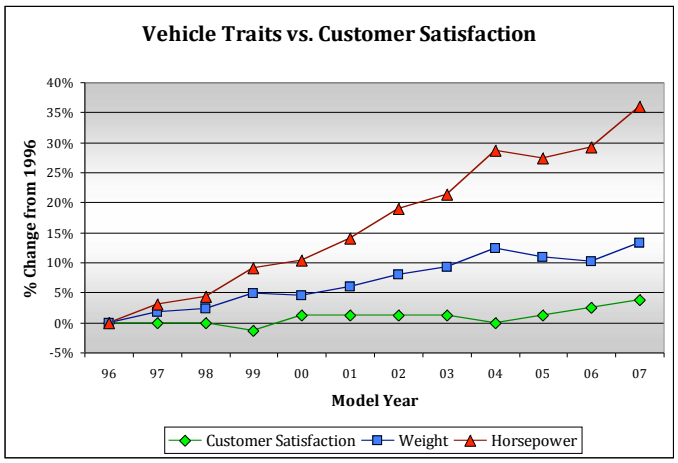
[39] *See* Knittel, *supra* note 19.

[40] Proposed Rulemaking, 74 Fed. Reg. 49,462.

[41] *See* Frank, *supra* note 27, at 104, 108 ("One individual's 'offensive' signal is cancelled by another's 'defensive' signal, and in the end too many resources are devoted to the consumption of observable goods.").

[42] *See* Hopkins & Kornienko, *supra* note 29 ("[E]ach individual consumer in turn marginally affects the utility from consumption enjoyed by others, but does not take these effects into account when deciding on the particular variant and quantity to be consumed."); Verhoef & van Wee, *supra* note 37, at 5-6.

traditional economic models might overestimate consumer surplus (by the shaded area). Moreover, if this negative externality could be accounted for, the corrected demand curve would be defined by aggregating actual private benefits, resulting in a lower optimal consumption level.[43]



Some empirical evidence seems to bear out that consumer welfare has not increased with the addition of positional features like vehicle size or performance. This chart shows considerable changes in the average weight and horsepower of new vehicles since 1996, whereas average consumer satisfaction (for new and used vehicle purchases) has stayed relatively flat.[44]

Because consumption decisions are made non-cooperatively but in fact alter the spending behavior of others, consumers get stuck on a "positional treadmill" that does not increase welfare.[45] Yet if any individual opts out of this "expenditure arms race," it would only move that consumer backwards on the status hierarchy, which for most consumers is unacceptable.[46] And given limited resources and limited market options, the over-consumption of positional goods results in under-consumption of non-positional goods (such as fuel efficiency).

In short, a market failure blocks optimal investment in fuel efficiency. It can be especially hard for consumers to move themselves down the status scale voluntarily on visible, positional features like vehicle size and horsepower.[47] Yet if consumers could maintain their relative economic position, they might be more willing to pay for non-positional goods.[48]

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[43] Graph based on example from Verhoef & van Wee, *supra* note 37, at 7. ("Due to this externality, the actual benefits for an arbitrary non-marginal consumer…will have become smaller than what they would have been if this consumer were the marginal consumer himself, which is given by the D=MPB curve. Instead, the benefits derived from consumption will, for example, amount to those given by the dotted curve. Note that for each consumption level considered, we must draw another dotted curve; for graphical clarity only the one applying to the free market equilibrium is shown. The MPB curve thus overestimates the consumers' surplus (the difference between the 'monetized' value attached to consumption and the market price). Taking the consumption externality into account, a curve like MSB [the Corrected Demand Curve in this depiction of the graph] (below MPB, with an intersection at the vertical axis) represents the marginal social benefits of consumption. MSB is found by correcting MPB for the negative welfare effect for all non-marginal consumers; *i.e.* by considering the marginal impact on the area as bounded by the vertical axis, the dotted curve and D.").

[44] Data for chart taken from the American Customer Satisfaction Index, Scores by Industry: Automobiles & Light Vehicles, http://www.theacsi.org/index.php?option=com_content&task=view&id=147&Itemid=155&i=Automobiles+%26+Light+Vehicles (last visited Nov. 21, 2009)); EPA OFFICE OF TRANSPORTATION & AIR QUALITY, EPA420-R-09-014 LIGHT-DUTY AUTOMOTIVE TECHNOLOGY, CARBON DIOXIDE EMISSIONS, AND FUEL ECONOMY TRENDS: 1975 THROUGH 2009 (2009).

[45] Robert H. Frank, *Positional Externalities Cause Large and Preventable Welfare Losses*, 95 AM. ECON. REV. 137, 137 (2005).

[46] Frank, *supra* note 27, at 105-06.

[47] *See* Sara J. Solnick & David Hemenway, *Is More Always Better?: A Survey On Positional Concerns*, 37 J. ECON. BEHAVIOR & ORG. 373, 379 (1998) ("[S]ubjects were more likely to select the positional situation when it was presented first (the 'gain' context) rather than second"); Yew-Kwang Ng & Jianguo Wang, *Relative Income, Aspiration, Environmental Quality, Individual and Political Myopia: Why May the Rat-Race for Material Growth be Welfare-Reducing?*, 26 MATHEMATICAL SOCIAL SCI. 3, 6-7 (1993) (noting that personal attitudes and aspirations for future consumption depend on current and past personal consumption, which in turn are influenced by other people's consumption behavior).

[48] Robert H. Frank & Cass R. Sunstein, *Cost-Benefit Analysis and Relative Position*, 68 UNIV. OF CHICAGO LAW REV. 323, 326 (2001) ("If people could maintain their relative economic position, they would be willing to pay more, and possibly a great deal more, to purchase many of the goods that regulation attempts to deliver….[W]hen an individual buys additional

The proposed regulation is a cooperative solution that allows consumers to achieve what they could not in the non-cooperative open market: namely, an increase in fuel efficiency without losing position in the status hierarchy.[49] Regulations similarly help consumers select fuel efficiency without falling behind in the safety/size rankings, since with time the average fleet size will shift. Regulations also correct a supply-side problem, since theory predicts manufacturers will devote their research and development budget to status goods until government adjusts the incentives.[50]

Finally, regulations help counteract the high discount rate that consumers place on future fuel savings. In a non-cooperative market, a consumer's desire to invest in future savings must compete against the desire to invest in immediate, conspicuous, positional goods.[51] The proposed regulations allow consumers to enjoy the private benefits of fuel efficiency without risking long-term lost welfare.

The Positional Goods Effect predicts that actual consumer surplus from fuel-inefficient vehicles is limited, and that many potential losses to consumer surplus will disappear over time as relative preferences shift. In particular, the proposed standards will have the following effects:

- In the short-term, new buyers may have to choose less prestigious cars, with some lost status. But as average vehicle size and power decrease, all existing car owners will feel slightly better about their car status, since their size will improve relative to the mean.[52] The latter status gains could partially offset the former status losses.[53]
- In the long-term, consumers will simply rank themselves around a new status distribution for positional vehicle attributes like size and power. The first wave of buyers who initially felt some status loss will mostly find themselves restored to their original position.[54]

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safety in isolation, he experiences not only an absolute decline in the amounts of other goods and services he can buy, but also a decline in his relative living standards. In contrast, when a regulation requires *all* workers to purchase additional safety, each worker gives up the same amount of other goods, so no worker experiences a decline in relative living standards. If relative living standards matter, then an individual will value an across-the-board increase in safety more highly than an increase in safety that he alone purchases.").

[49] Correcting for negative externalities and collective action problems is a classic case for regulation. "Analytically, positional externalities are no different from ordinary environmental pollutants." *Id.* at 364. Such regulation is not about taking public action just because one consumer's increased consumption makes another consumer unhappy or envious; rather, regulation is justified to address a market failure. *Id.* at 365. Even if not everyone wants to solve this particular collective action problem, "we do not require unanimity as a precondition for unquestionably legitimate collective action in other spheres." *Id.* at 366. *See also* Verhoef & van Wee, *supra* note 37, at 13-14. ("On the free market, consumers would inefficiently strongly stimulate each other to purchase more luxurious variants. Corrective taxes [or a CAFE standard with tradable permits] may protect consumers against such treadmills.").

[50] Ben Cooper et al., *Status Effects and Negative Utility Growth*, 111 ECON. J. 642 (2001).

[51] *See* Frank, *supra* note 45, at 115. ("[F]orced savings programs might have a coherent role to play even in a world populated by rigidly disciplined consumers with perfect foresight. The problem of inadequate savings arose here not because of character defects, but because of a divergence between individual and collective incentives to save.").

[52] Verhoef & van Wee, *supra* note 37, at 10 ("[I]f consumption externalities occur, an individual's benefits of consumption *increase* in the consumption of inferior qualities [by others], and *decrease* in the consumption of superior qualities.").

[53] Since consumers value losses more than gains, the offset might not be perfectly equivalent. *See* Frank & Sunstein, *supra* note 48, at 340-41 ("It is now well-established that people dislike losses more than they like corresponding gains….But loss aversion does not undermine our basic claims. Even if people dislike losses from the status quo more than they like equivalent gains, people's fears that losses will produce significant subjective losses is not borne out by reality.").

[54] The positional treadmill will likely restart, though the regulation slowed it down for a few years, saving waste and improving fuel efficiency. *Id.* at 327 ("Many actual and imaginable laws can stop or slow down the positional treadmill, thus maintaining people's relative position while also giving them something of value.").

- The regulations could reduce the positional benefits some current hybrid vehicle owners enjoy from exclusivity of ownership.[55]
- With time and under new labeling requirements that could increase the visibility of fuel efficiency, it is possible fuel efficiency may emerge as an increasingly positional trait.[56]

Overall, the Positional Goods Effect suggests that any consumer welfare loss will be limited and temporary. A final analytical concept, explored next, builds on the last bullet point from above: the regulation itself may cause consumers to value fuel efficiency more highly than they did before.

The Bandwagon Effect

If fuel efficiency becomes a sufficiently visibility trait, it is possible that consumers could start competing for the highest fuel efficiency. But even if that does not happen, consumers' valuation of fuel efficiency will undoubtedly change over time and as a result of the proposed regulation.[57]

The Bandwagon Effect occurs when the perceived attractiveness of a good increases as more people consume it. Growing empirical evidence suggests an environmental bandwagon: people are more likely to make environmental choices when they think everyone else is doing the same.[58]

The separate though conceptually related effects of information diffusion and habit formation might also affect the market for more fuel-efficient vehicles. Car choices are strongly influenced by the purchases of peers,[59] perhaps because consumers often deal with the need to justify their choices by deferring to the preferences of others.[60] Consumers might currently have a negative opinion of vehicles running on unknown technology or of unknown model types;[61] but once more fuel-efficient vehicles increase market share and become more familiar to consumers as a result of the proposed regulations, new consumer habits will form, and willingness to pay for fuel efficiency might increase.

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[55] Heffner et al., *supra* note 33, at 2 ("Another study indicates that HEV owners are motivated more by 'a commitment to be pioneers' and by their perception of the gasoline hybrid as 'the right vehicle for society' than by economic benefits such as fuel cost savings."). It is possible they will be driven to pursue even higher fuel-efficient vehicles.

[56] *See* Carlsson et al., *supra* note 30, at 596 ("[W]e found that the mean degree of positionality for car safety is significantly larger than zero. This may in part be due to the fact that car safety has become more visible recently, when safety has become an important sales argument and various safety tests are frequently discussed in advertisement and in media more generally."); Heffner et al., *supra* note 33, at 5 ("All participants recognized some symbolic benefits rooted in their HEVs' reputation as 'green' environmental vehicles, an image which is reinforced by automakers, the media, and a growing list of vocal celebrity owners. This image is distinct from the vehicles' function, but related to it.").

[57] Heffner et al., *supra* note 30, at 3. ("As more hybrid models enter the market, the meanings of HEVs are likely to evolve.").

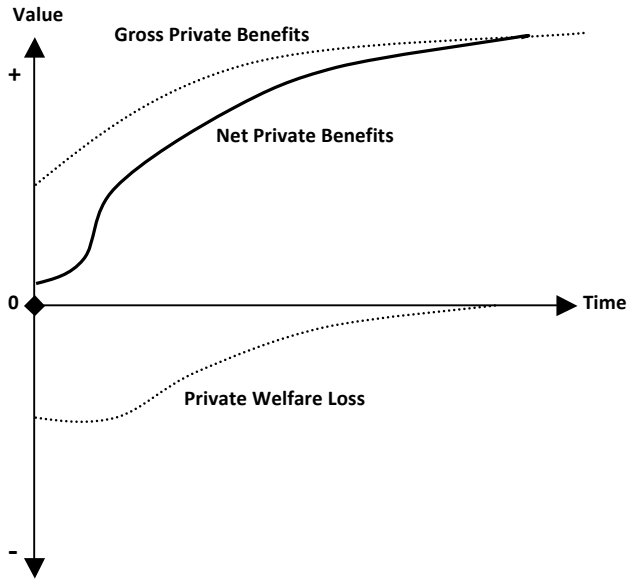
[58] For example, when hotel guests are told they should "join their fellow citizens" in saving water by reusing towels, reuse rates increase by 34%; similarly, when electric bills present a comparison of neighborhood consumptions, usage decreases by 2%. *See* Hunt Allcott & Sendhil Mullainathan, *Behavioral Science and Energy Conservation*, (MIT Working Paper July 2009); Allcott, *Social Norms and Energy Conservation* (MIT Ctr. for Energy & Envtl. Policy Res. 09-014, 2009).

[59] Grinblatt et al., *supra* note 30 (reporting results of study in Finland that found car purchases strongly influenced by purchases of neighbors, most likely because of information sharing).

[60] James Bettman et al., *Constructive Consumer Choice Processes*, 25 J. CONSUMER RES. 3 (1998).

[61] Eugenio Miravete & Maria Moral, *Qualitative Effects of Cash-For-Clunkers Programs* (2009), *available at* http://www.eugeniomiravete.com/papers/EJM-MJM-Clunkers.pdf.

Lost Consumer Welfare: Quantifiable, Limited, and Temporary



The agencies currently have left a potentially important element of their cost-benefit analysis unquantified, raising both policy and legal risks. At the very least, the agencies must clarify the likely direction of net private economic impacts and provide a rough approximation of the magnitude, even if some uncertainty persists. The agencies should also conduct surveys and behavioral studies on valuation and preference shifts after new products are introduced.

The agencies should use the best models available and take a guess at quantification, making reasonable assumptions. Those assumptions should include the predictions that—due to the Energy Efficiency Paradox, the Positional Goods Effect, and the Bandwagon Effect—any lost consumer welfare will be limited and temporary. Overall, significant net private benefits will exist.

(2) Energy Security Effects

The agencies consider how the proposed regulations might generate three possible benefits to "energy security" by reducing U.S. consumption of petroleum: (1) lower oil prices worldwide as U.S. demand drops; (2) decreased risk to the U.S. economy from a sudden disruption in oil supplies; and (3) reduced costs for U.S. energy security policies.[62] The first effect should be treated as a distributional consequence, not a standard efficiency benefit. The second effect should be valued as a benefit, so long as the agencies disaggregate any wealth transfers that occur during price shocks. The agencies were justified in not quantifying the last effect (i.e. treating it as having zero value), provided the agencies incorporate the increased protection value of the Strategic Petroleum Reserve into their calculation of disruption effects.

Demand Effects

Often referred to as a "monopsony" effect, oil consumers in the United States do, in aggregate, exert enough influence on the worldwide demand for oil that a variation in U.S. demand will affect prices (although recent evidence suggests the effect might be limited).[63] If the proposed regulations reduce U.S. demand, prices will drop, and U.S. consumers will experience some additional savings.

But these perceived savings come at the expense of lost revenue to the oil suppliers. Globally, there are no net benefits from the demand effects. The agencies currently choose not to calculate any benefits from demand effects because they select a global value for the social cost of carbon, and they believe a consistently global perspective on costs and benefits may be required.[64]

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[62] Proposed Rulemaking, 74 Fed. Reg. 49,462.

[63] NHTSA, Preliminary Regulatory Impact Analysis: Corporate Average Fuel Economy for MY 2012-MY2016 Passenger Cars and Light Trucks 378 (2009) [hereinafter NHTSA PRIA].

[64] See separate comments submitted jointly by IPI and Environmental Defense Fund on the social cost of carbon, for an explanation of why a global value must be used for the SCC.

However, the agencies seek comment on another possible approach:

> From one perspective, the global social cost of carbon is used in these calculation, not because the global net benefits of the rule are being computed (they are not), but rather because in the context of a global public good [like climate change mitigation], the global marginal benefit is the correct domestic benefit against which domestic costs are to be compared. Similarly, energy security is inherently a domestic benefit. Thus, should the two benefits, if they are both viewed from this domestic perspective, be counted in the net benefits estimates for this rulemaking, and more generally what are the overall implications of this approach to justifying regulation?[65]

The agencies repeatedly note that demand effects could be "significant."[66] But the issue of how to include demand effects is not a choice between a global or a domestic perspective on costs and benefits. Rather, the agencies should address the demand effects through a distributional analysis.

As the agencies note, wealth transfers are not typically included as a "benefit."[67] OMB guidance provided in the *Circular A-4* confirms that cost-benefit analysis focuses on measuring the economic efficiency of a regulation, and wealth transfers do not offer any efficiency gains or losses.[68] However, efficiency is not necessarily the only relevant policy consideration, and therefore such transfers and other distributional effects must be considered as part of a separate distributional analysis.[69]

The agencies should assess how demand effects might generate distributional gains for U.S. oil consumers at the expense of foreign (and domestic) oil producers. The agencies could consider how income- or other distributional weights might factor into such an analysis. The agencies should also, pursuant to OMB recommendations and the principles of Executive Order 12,866, incorporate such a study of demand effects into a broader distributional analysis.

Note that—given the agencies' statutory mandates—there is nothing inconsistent about using a global social cost of carbon estimate and still giving some preference to policies that generate distributional gains for the United States at the expense of foreign companies or countries.

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[65] Proposed Rulemaking, 74 Fed. Reg. 49,623; *accord. id.* at 49,673; NHTSA PRIA, *supra* note 63, at 380.

[66] *E.g.*, EPA Office of Transportation & Air Quality, EPA-420-D-09-003, Draft Regulatory Impact Analysis: Proposed Rulemaking to Establish Light-Duty Vehicle Greenhouse Gas Emission Standards and Corporate Average Fuel Economy Standards 8-15 (2009) [hereinafter EPA DRIA].

[67] *See* Proposed Rulemaking, 74 Fed. Reg. 49,673 n.511 (noting that "[t]he reduction in payments from U.S. oil purchasers to domestic petroleum producers is not included as a benefit, since it represents a transfer that occurs entirely within the U.S. economy").

[68] *See* CIRCULAR A-4, *supra* note 11, at 2 ("Where all benefits and costs can be quantified and expressed in monetary units, benefit-cost analysis provides decision makers with a clear indication of the most efficient alternative, that is, the alternative that generates the largest net benefits to society (ignoring distributional effects). This is useful information for decision makers and the public to receive, even when economic efficiency is not the only or the overriding public policy objective.").

[69] *Id.* at 14 ("Distributional effects may arise through 'transfer payments' that stem from a regulatory action as well. For example, the revenue collected through a fee, surcharge in excess of the cost of services provided, or tax is a transfer payment. Your regulatory analysis should provide a separate description of distributional effects (i.e., how both benefits and costs are distributed among sub-populations of particular concern) so that decision makers can properly consider them along with the effects on economic efficiency. Executive Order 12866 authorizes this approach. Where distributive effects are thought to be important, the effects of various regulatory alternatives should be described quantitatively to the extent possible, including the magnitude, likelihood, and severity of impacts on particular groups….Effects on the distribution of income that are transmitted through changes in market prices can be important, albeit sometimes difficult to assess.").

Disruption Effects

The agencies calculate how reducing U.S. oil consumption will decrease the risk of lost economic output during a sudden, unanticipated disruption in oil imports and supplies. However, the Joint Technical Support Document suggests part of this calculation might include the higher price of imported oil caused by a supply disruption and price shock, which, as the agencies acknowledge, is a "wealth transfer."[70] Such effects are no different analytically than the demand/monopsony effects considered above. Thus, any such import effects should be disaggregated from the disruption effects, and should instead be considered in the type of distributional analysis discussed above.

Security Policy Effects

The two main security policy effects of reducing U.S. demand for oil are: a possible impact on U.S. military activities in politically instable regions that supply oil; and a possible impact on the size or valuation of U.S. Strategic Petroleum Reserve.

The agencies have chosen not to calculate any budgetary outlays for military expenses as a benefit because, given the size of likely oil import reductions and the broad range of policy objectives targeted by various U.S. military missions, economic analysis predicts military costs are unlikely to change as a result of the proposed regulations.[71] Importantly, this case is distinct from the agencies' decision not to quantify other uncertain costs or benefits (particularly, lost consumer welfare), because zero is, according to the best economic analysis, a plausible estimate for this hard-to-quantify element. Therefore, fewer policy and legal risks are raised by the choice not to quantify. It is also commendable that NHTSA conducted a sensitivity analysis on potential military effects.[72]

By decreasing U.S. demand for oil, the proposed regulations could either decrease the need to maintain such a large Strategic Petroleum Reserve, or it could increase the protective value offered by the current Strategic Petroleum Reserve. The decision not to quantify any cost savings from maintaining a smaller Strategic Petroleum Reserve is justified so long as the agencies have incorporated the increased protective value from maintaining the current Strategic Petroleum Reserve into the calculation of disruption effects.[73]

Comments on EPA's Proposal

(3) Program Choice

The program proposed by EPA builds largely on the structure of its previous regulatory programs, taking the form of traditional command-and-control regulation.

EPA has submitted its positive endangerment finding on greenhouse gas pollutants under Section 202 of the Clean Air Act (CAA) to the White House Office of Management and Budget for final approval.[74] Once that finding is finalized, the CAA requires EPA to promulgate regulations. As explained in IPI's report, *The Road Ahead*, the statutory language in Title II of the CAA limits EPA in its choices to regulate under this section; regulations must be in the form of emissions standards mandating some type of limit on GHG emissions.[75] These types of command-and-control

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[70] EPA & NHTSA, Draft Joint Technical Support Document: Proposed Rulemaking to Establish Light-Duty Vehicle Greenhouse Gas Emission Standards and Corporate Average Fuel Economy Standards 4-27 (2009).

[71] Proposed Rulemaking, 74 Fed. Reg. 49,674; NHTSA PRIA, *supra* note 63, at 381.

[72] NHTSA PRIA, *supra* note 63, at 382.

[73] *See* OAK RIDGE NATIONAL LABORATORY, ENERGY SECURITY BENEFITS OF REDUCED OIL USE (2008).

[74] Proposed Endangerment and Cause or Contribute Findings for Greenhouse Gases Under Section 202(a) of the Clean Air Act, Proposed Rule, 74 Fed. Reg. 18,886 (Apr. 24, 2009) (final rule pending after comment and hearings) [hereinafter Proposed Endangerment Finding].

[75] *The Road Ahead*, *supra* note 5, at 96.

regulations will be detrimental to any subsequent cap-and-trade system that covers GHG emissions from vehicle fuel, whether created by Congress or by EPA.[76]

Assuming California's existing standards for motor vehicle emissions are close to efficient, EPA's attempt to harmonize its proposed GHG standards with Californian policy is the optimal regulatory choice. This harmonization will minimize any inefficient interaction of the standards with a subsequently enacted cap-and-trade system, by creating a single uniform regulatory regime. Through this method, EPA avoids increasing regulatory obligations on (or creating regulatory uncertainty for) car manufacturers, as manufacturers already need to comply with similar regulations for cars sold in California and the seventeen other states that have adopted California's standards.[77]

Although the proposed GHG regulations fulfill EPA's legal duty under Section 202, the program does not reach an efficient level of GHG reductions in the transportation sector. The proposal does not create a uniform regulatory framework applicable to all mobile sources and does not effectively maximize social welfare or minimize costs. In April 2009, IPI submitted a rulemaking petition to EPA requesting the creation of a comprehensive cap-and-trade system under Section 211 of the CAA for vehicle fuel used in all mobile sources.[78] A cap-and-trade rulemaking would be more effective at addressing GHG emissions of all mobile sources, including sources such as off-road vehicles and marine vessels, which are not subject to a similar statutory scheme as light-duty vehicles.[79] It would also allow EPA to regulate emissions at the source of fuel sale, manufacture, and import rather than requiring piecemeal command-and-control regulation of various vehicle sectors. The outlines of such a program, and the statutory authority for the program under the CAA, are more clearly outlined in IPI's petition and IPI's report *The Road Ahead*, included as attachments to these comments.[80]

A program regulating fuel sources would also eliminate some of the difficulties inherent in EPA's proposed program, such as the rebound effect, which would be fully accounted for in a cap-and-trade system. GHG emissions standards, as well as fuel efficiency standards, increase the efficiency of motor vehicles, which will lower the cost of driving per mile traveled. As driving becomes cheaper, the rebound effect will lead to an increase in vehicle miles traveled.[81] More miles driven equals more GHG emissions. Although the rebound effect created by these GHG regulations may be small given that that personal vehicle use is fairly inelastic (EPA estimates the effect at about 10%[82]), these regulations will not reduce GHG emissions as effectively as a cap-and-trade system on vehicle fuel.

A cap on the emissions of all vehicle fuel sold, as requested in IPI's petition, will increase the price of fuel, as well as the cost per mile of driving, and will therefore incentivize a small decrease in vehicle miles traveled. Introducing a GHG emissions standard into this system will add little

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[76] *See generally id.* ch. 4 (explaining interaction of command-and-control with cap-and-trade).

[77] Proposed Rulemaking, 74 Fed. Reg. 49,458 (program would allow manufacturers to sell a single, national fleet).

[78] Institute for Policy Integrity, New York University School of Law, PETITION FOR RULEMAKING UNDER SECTIONS 211 AND 231 OF THE CLEAN AIR ACT TO INSTITUTE A CAP AND TRADE SYSTEM FOR GREENHOUSE GAS EMISSIONS FROM VEHICLE FUELS (Jul. 29, 2009) *available at* http://policyintegrity.org/projects/documents/7.29.09IPIPetitiontoEPA.pdf.

[79] *See The Road Ahead* at 94–101 (providing basis for IPI's petition for rulemaking on vehicle fuel emissions).

[80] *See The Road Ahead* at 20–33.

[81] Some studies suggest that a 10 % increase in fuel efficiency for automobiles would likely result in a 1-2 % increase in vehicle miles traveled. *See Nat'l Research Council,* EFFECTIVENESS AND IMPACT OF CORPORATE AVERAGE FUEL ECONOMY (CAFE) STANDARDS 19 (2002); DAVID L. GREENE ET AL., FUEL ECONOMY REBOUND EFFECT FOR U.S. HOUSEHOLD VEHICLES, 20 Energy J. 1 (1999); JONATHAN HAUGHTON AND SOUMODIP SARKAR, GASOLINE TAX AS A CORRECTIVE TAX: ESTIMATES FOR THE UNITED STATES: 1970-1991, 17 Energy J. 103 (1996).

[82] Proposed Rulemaking, 74 Fed. Reg. 49,608.

benefit. Those regulations will not reduce GHG emissions below the economy-wide cap because actors will be incentivized to reach the limits of their permits or sell their permits to others to use. Drivers will still consume the same amount of fuel up to the cap—with or without a GHG emissions regulation. These regulations will create no benefit in GHG reduction or fuel consumption, but will increase compliance and administrative costs.[83]

If a cap-and-trade program is created—through statute or regulation—in the future, it will change the currently proffered justifications for this joint rulemaking. The goal of these regulations would no longer be to decrease GHG emissions, but would rather be for other reasons, such as conserving energy resources, preserving national security, or promoting economic welfare. Similarly, GHG emissions standards may still have some justification even within a cap-and-trade system, as consumers may not be fully responsive to increased fuel costs and may not demand the optimal level of fuel efficiency from manufacturers (as discussed in the consumer welfare context above). If a cap-and-trade program is implemented, EPA should revisit these GHG emissions, as they may need to become adjusted to be more or less stringent depending on the new justifications.

If, however, neither Congress nor EPA takes action to implement a cap-and-trade program, EPA should promulgate new more stringent GHG emissions rules for motor vehicles in the model years after 2016.[84]

(4) Caps for Methane and Nitrous Oxide

EPA proposes separate regulations imposing a per-vehicle cap on emissions of methane (CH_4) and nitrous oxide (N_2O), two potent GHGs, from cars and light trucks.[85] EPA should rethink these separate caps, and consider combining these gases into a single standard along with carbon dioxide (CO_2) emissions, accounting for all gases on a CO_2-equivalent basis.

EPA's proffered justification for this policy choice is that vehicles produce CH_4 and N_2O "largely independent[ly]" of CO_2, and that potential control technologies and strategies for these pollutant differ. EPA also notes that it lacks information on the emissions of CH_4 and N_2O from vehicles.[86]

Even if these gases are produced "largely" independently of one another, there is still some overlap as emissions of all these gases are caused by vehicles' combustion systems. Motor vehicles emit carbon dioxide during the fossil fuel combustion process. During combustion, the carbon stored in the fuels is oxidized and emitted as CO_2 and smaller amounts of other carbon compounds.[87] Motor vehicles emit methane through methane content in motor fuel, hydrocarbons passing uncombusted through the engine, and any post-combustion control of hydrocarbon emissions (such as catalytic converters).[88] Motor vehicles produce nitrous oxide when nitrogen and oxygen react during fuel combustion.

Current and future control technologies for these pollutants may overlap or may not. That is, however, irrelevant. EPA's goal in these regulations is to attempt to reduce global warming effects by reducing the amount of GHGs emitted by motor vehicles. In order to do this in the most efficient

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[83] Another inefficiency in either fuel efficiency or GHG limitation standards is created by the long useful life of vehicles currently on the road. It will be many years before motor vehicle fleet will be comprised of vehicles that are subject to the new regulations. It is also possible that because higher-efficiency vehicles are more expensive, consumers may choose to keep their older cars (which will be less efficient than newer models subject to the regulations) for longer before making a new purchase.

[84] *Id.*

[85] Proposed Rulemaking, 74 Fed. Reg. 49,524.

[86] *Id.*

[87] Proposed Endangerment Finding, 74 Fed. Reg. 18,907.

[88] *Id.* at 18,908.

and effective way, EPA should create a single standard to allow manufactures the most flexibility in achieving GHG reductions to allow for the most cost-effective compliance.

EPA's proposed scheme limits manufacturers' ability to reduce GHG emissions in the most efficient way possible. For example, it may be cheaper for a manufacturer to produce a vehicle that emits additional methane but less carbon dioxide, rather than maintain the vehicle's current methane emission level and decrease CO_2 emission only. EPA's goal is to achieve the most GHG reductions at the least cost, but the proposed regulations would not allow the manufacturer to opt for that cheaper option.

Further, EPA's choice to introduce different rules for these two gases further complicates an already complex regulatory scheme, imposing more compliance costs on manufacturers. Manufactures must now comply with CAFE standards, carbon dioxide standards, methane standards, and nitrous oxide standards—and achieving reductions in one area cannot be counted toward meeting reductions in another area. A simpler and more efficient regulation would set one standard for all GHG emissions on a carbon-dioxide equivalent basis.

It is unclear what additional information EPA needs to make this policy choice. As long as a single standard takes into consideration all GHGs produced by the vehicles and weighs them on a CO_2-equivalent basis, that standard will not allow for any total GHG emission increase.

(5) Electric Vehicles

EPA proposes providing incentives for automobile manufacturers to produce more electric vehicles. The structure of this incentive is to assign those vehicles zero carbon emissions and also to multiply their weight (counting them as 1.2 to 2.0 cars) during fleet averaging. EPA should reconsider this approach.[89] First, EPA itself recognizes that these electric vehicles do not have a zero carbon emissions value: electric vehicles run on energy from an electric grid, and producing this electricity emits carbon.[90] EPA's proposal does not account for these emissions. In contrast, California's standards assign electric vehicles a carbon emissions value of 130 g/mi—the average amount of GHGs emitted by the California grid to charge the battery and to construct the car.[91] EPA should pursue a similar policy—either by assigning all electric vehicles the average amount of GHGs emitted by use of electricity across the country's grid, or by requiring manufacturers to report the specific average amount of GHGs emitted for each electric vehicle model.

Second, by counting each electric vehicle as up to two vehicles when averaging, EPA's proposal actually increases the amount of GHG emissions emitted from motor vehicles. For example, suppose a manufacturer's 2016 fleet is comprised of 100 electric cars that emit 130 g/mi of carbon and 200 standard cars that emit 300g/mi of carbon (more than the 2016 carbon grams per mile standard). After accounting for electric cars as zero and doubling them, the manufacturer's average would be 150 g/mi,[92] well under EPA's standard of 205 g/mi of carbon. However, that fleet is actually emitting closer to 243 g/mi of carbon[93]—which is over EPA's standards and allows for much more GHG emission. Under the credit and trading system, however, the manufacturer will be granted credits. It can then sell these credits to another manufacturer with a fleet with GHG

[89] Proposed Rulemaking, 74 Fed. Reg. 49,533.

[90] *Id.*

[91] *Id.*

[92] Under the proposal, the fleet average would be: ((200 electric cars * 0 g/mi) + (200 standard cars * 300 g/mi))/ 400 cars = 150 g/mi fleet average.

[93] Using the California average emission for electric vehicles as a proxy for actual carbon emissions, the fleet average would be: ((100 electric cars * 130 g/mi) + (200 standard cars * 300 g/mi))/300 cars = 243 g/mi fleet average.

emissions above the limit—therefore allowing for increased GHG emissions not only from the first manufacturer's fleet but also from the second manufacture's fleet.

Moreover, through this system, as more manufacturers produce electric cars, the total amount of GHG emissions from motor vehicles will increase. The more electric cars produced (and counted as zero emissions and doubled in weight during averaging), the more GHG emissions will be allowed from other cars, fleets, and manufacturers. In essence, EPA's program allows for a triple undercounting of GHG emissions—once by not accounting for emissions from electric cars, twice by counting electric cars more than once when averaging, and finally by allowing the credits to be traded to other manufacturers—and allowing for increases in GHG emissions at every step.

Finally, this proposal inexplicably subsidizes one form of GHG reducing technology (electric cars) over others. As explained, this form of subsidization actually allows for more GHGs to be emitted as more electric cars are produced. Any form of subsidization of new technology should be neutral with respect to GHG emissions—and it should definitely not contribute to their increase. Although it may be a valid policy goal to incentivize new technology, EPA should achieve this goal by providing grants and subsidies to manufacturers and scientists exploring all promising GHG reducing technologies. By giving inflated regulatory incentives to a certain type of technology rather than allowing manufacturers to find the most efficient and effective solution, EPA will disincentivize other forms of technology that may be more cost-effective at reducing GHG emissions. Moreover, by attempting to subsidize technology through use of the averaging and trading system, EPA undervalues the real GHG emissions of manufacturers' fleets and distorts interferes with the GHG reduction benefits of the rule.

Conclusion

We applaud the agencies efforts to respond to the legal obligations under *Massachusetts v. EPA* and to the growing risks associated with GHG emissions. The recommendations contained in these comments will allow EPA to more efficiently and effectively meet these goals.

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