ENERGY TECHNOLOGY INNOVATION POLICY

A joint project of the Science, Technology and Public Policy Program and the Environment and Natural Resources Program
Belfer Center for Science and International Affairs

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Synthesis of Comments Received on "Policy Options for Reducing Oil Consumption and Greenhouse-Gas Emissions from the U.S. Transportation Sector"

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2008 - 01
January 2008

energytechnologypolicy.org

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January 2, 2008

Introduction

On July 27, 2007, the *Innovation in Transportation*[2] project of the Energy Technology Innovation Policy group at the John F. Kennedy School of Government at Harvard published a discussion paper on policy options for reducing oil consumption and greenhouse gas emissions from the U.S. transportation sector.[3] Dozens of comments on the paper were solicited and received from representatives from government, non-profit organizations, the private sector, including from automobile firms and fuels providers (both biofuel and fossil fuel), labor unions, and others. Because the comments we received were so interesting and potentially useful to all those concerned, we thought it worthwhile to publish the comments in a synthesized not-for-attribution manner. A list of the affiliations of those who submitted comments is appended.

This synthesis is organized differently from the original paper. It simply groups the comments by topic. The topics that will be reviewed here are the ones for which we received the most comments: rationales for new policies, vehicle-miles traveled, discount rates and price elasticities, innovation, cap-and-trade policies, taxes, biofuels, CAFE, the role of consumers, feebates, costs, and other policy suggestions.

Many relatively minor suggestions were made for how to improve the paper and we do not include them here, but we will incorporate most of them into a revised version of the options paper. The comments below are often paraphrased, but direct quotes are in quotations. In a number of cases, the comment could have been categorized under two or more topics, and in

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[2] This project is supported by the U.S. Environmental Protection Agency, William and Flora Hewlett Foundation, and the Energy Foundation.
[3] Gallagher, Kelly Sims, Collantes, Gustavo, Holdren, John P., Lee, Henry, and Robert Frosch, "Policy Options for Reducing Oil Consumption and Greenhouse Gas Emissions from the U.S. Transportation Sector," Discussion Paper, Cambridge, MA: Energy Technology Innovation Policy, Belfer Center for Science and International Affairs, John F. Kennedy School of Government, Harvard University, July 27, 2007.

these cases, the comment is listed under the most relevant topic, but not repeated elsewhere for the sake of brevity.

Rationales for new policies

"Clear thinking on oil security."

"When considering the question of why the transport sector should be targeted for reducing GHG emissions, it is important to remember that oil and coal have very different commodity values. CO_2 emissions from gasoline are 67 kg/GJ and from coal, they are 88 kg/GJ. But, gasoline is approximately $3 per gallon ($25/GJ) compared with $30 per ton of coal ($1/GJ). In other words, coal is a much less valuable source of energy than gasoline so when one increases the cost of energy due to CO_2 content, the cost of coal will increase approximately 30 times faster than the cost of gasoline. When taking into account the costs of the investment and operational costs of a coal-fired power plant, one can predict that the cost of coal-fired electricity would rise about 10 times faster than the cost of gasoline. All of this just reinforces the point that economy-wide policies will not have much influence in the transportation sector."

"A fair treatment of the issues. The focus of any new program has to be on reducing the demand for conventional gasoline. This cannot be done if you do not put a price on carbon."

"This paper underappreciates the effects of price signals in guiding the behavior of consumers of transportation services and vehicle manufacturers. The central problem with price is its volatility." One option to address this would be a variable oil import fee designed to keep U.S. price at a constant level.

The United States acting alone would only have a modest impact on the world oil price and hence revenue flow to terrorists.

"Overall, well done. This is the first paper that really addresses the interrelationship between climate and energy security. It was refreshing."

Principles for new policies

"Everyone will measure future proposals against your policy principles now."

"Most people forget that one of the goals should be to enhance the competitiveness of U.S.-based industry."

Two new principles should be added. First, policies should be developed in the context of a global engagement rather than being designed individually for each country. Policy harmonization would be helpful. Also, maximize the use of energy efficiency opportunities.

Four new principles should be added: 1) policies should be attractive politically; 2) policies should include multiple, complementary signals to consumers, automakers, and fuel producers

alike; 3) policies should be performance-based and technology neutral; and 4) economic incentives will be required to help the private sector make the necessary investments in R&D.

"The ten principles seem to be reasonable. But, they are not applied to analyze the policy options consistently."

"Why is 'burden sharing' listed? Is this a moral or pragmatic preference?"

"All policies are not equal. This paper has a tendency to treat all policies as inherently equal."

"You may want to think of these principles as being "Pareto improving" – in other words, that low income people must be at least as well off as they were before, for example."

"Enhancing the competitiveness of U.S. based industry can be considered protectionism, which may be at odds with market efficiency."

Why should protection of low-income workers and U.S.-based industry be a policy principle? It seems like these aspects should be considered more in the realm of political feasibility, not design criteria.

Economy-wide vs. transportation-specific carbon policies

"Very appreciative of this discussion." The transportation sector needs to do its part. This is a political matter.

"GHG standards in the transportation sector do get oil reductions because of the oil-intense nature of the sector, whereas oil reduction standards do not necessarily get GHG reductions."

"It is important to recognize that various policy elements can legitimately have different purposes and they may operate at very different (explicit or implicit) prices of carbon. Therefore, different policy elements with different carbon/permit prices *cannot* be linked together via trading or the higher cost of a carbon policy measure will be neutralized."

"Also, because various policy elements can have different purposes, what appears to be 'double-counting' may be legitimate support for the delivery of more than one policy goal. There are two reasons why economy-wide carbon prices have such limited impact on transport: (1) consumers apply very high discount rates and therefore do not respond to the carbon price, and (2) motorists value their personal mobility lifestyle very highly. There is therefore scope for additional policy measures that have specific purposes in the transport sector, such as policies that have the effect of compensating for consumer discount rates (like feebates) and policies that incentivize major new technology deployment. Such special incentives should ideally disappear as the returns to scale are reached."

While certain policies could be economically efficient, the transportation sector may not be sensitive enough to policies to result in changes in the transportation sector. In the long run, the transportation sector will have to reduce its GHG emissions, but the short-term results from a cap

and trade policy could be that the transportation sector may only buy its credits from other sectors without having any of its technologies. By the time when the transportation-sector needs to have technology changes, it may become too late since the technology development and deployment will take a long time in the transportation sector.

"Setting up a separate system for transportation would simply add to the marginal cost of abatement for transport fuels, thereby giving up one of the big advantages of economy-wide pricing – equalizing marginal costs of abatement across emissions."

"There is a disconnect between admitting that economy-wide GHG emissions reduction policies will have little impact on the transportation sector, and then using GHG standards and carbon taxes as examples of a policy package. It is important not to hide behind climate change policies if the policy goal is to reduce the use of oil. In other words, you might as well use CAFE standards and a gasoline tax instead of GHG performance standards and carbon tax. For better or worse, CAFE is here to stay."

"If resources could be shifted from one sector to another in response to a tax, then a single-sector tax would have undesirable effects, driving resources into untaxed alternatives. A tax increase on just one kind of financial asset would lead to money leaving the more heavily taxed asset and shifting into lower-tax alternatives. But no one is going to shift resources between transportation and electricity generation because of differential carbon taxes. Supply and demand alternatives in these sectors are essentially independent (plug-in hybrids are decades away from being a large part of the market). A carbon tax that is sufficient to shift electricity producers away from coal plants might be too small to have any effect on transportation."

Vehicle-miles traveled (VMT)

Chart 2 is "outstanding". The contributing problems of sprawl and land-use issues are not addressed well here.

The paper needs to provide concrete policy options for addressing VMT growth. "The paper does a good job of explaining the challenge of VMT growth, but could benefit from additional solutions."

VMT is also determined by where people live, how expensive gasoline is, the availability of electric railroads, and whether or not city living is inviting.

"We ought to strive to have the full marginal cost better recognized in the market. People routinely calculate the cost of a trip, counting only the gas. If they paid for insurance and the distance component of depreciation as they drove, the effect on VMT really would be large. There are proposals to make insurance dependent on miles driven, and more ideas must lie in this direction."

It is hard to believe EIA's projection that people will drive twice as much as today "given that the value of travel time increases with real wage growth and that urban areas are going to become ever-more gridlocked."

“There are significant ancillary externality benefits from reducing VMT, including reducing congestion, accidents, and local pollution.”

You state that it is difficult to attain any decrease in total passenger vehicle gasoline consumption if nothing is done to curb the growth in vehicle-miles traveled. “I cannot stress how important this fact is in state and local fights on reducing VMT.” We must have more modal shifts and land-use changes if we want to address the problems. “Elected officials desperately want to believe that it is a techno ‘clean car’ fix that will solve the problem. Good progressive environmental elected officials are fighting for highway expansions because they say technology will fix the transportation oil and GHG problem.”

“Although tough, it does make sense to include VMT because without VMT reduction, it is very tough to meet 2020 reduction goals.” Also, automakers and fuels providers are very concerned that they will be “stuck” with controlling VMT in a system that implicitly requires them to be responsible. So, there are other policies you should consider.”

To address VMT, there are really two options: a gasoline tax or a fee based on VMT. The VMT fee is probably cheaper. Oregon has done some interesting analysis of this. The fee approach seems to make sense.

Discount rates and price elasticities

Evidence from Espy, Dreyfus, and Viscusi suggests that consumers discount fuel economy benefits at about the same rate as the market interest rate, which questions the market-failure hypothesis.

“The conclusion of Hughes et al. that consumers have become less responsive to increases in gasoline prices is only true in the short-run.” The long term elasticity of VMT with respect to gasoline price is still quite large at around -0.4 to -0.6. Market research shows that what really matters is consumers’ expectations of long-term changes in fuel prices. “The inertia effect of such decisions ensures that the results are not seen for quite some time in actual vehicle travel or fuel use numbers.”

“Fuel price demand responsiveness or elasticity of demand is lowest in the transportation sector not because auto consumers are irrational but because it is the highest-cost sector in which to achieve GHG reductions; as these costs increased and incomes grew over time fuel price elasticities have declined.”

If the Hughes et al. result is correct, this is incredibly close to zero. This would mean you would need an 18% increase in price to reduce demand by 1%. Presumably this makes it clear that no realistic carbon tax will cause a noticeable change in the short-run demand for gasoline. Short-run here probably means with the existing fleet of vehicles unchanged. There probably is a greater long-term elasticity.

Innovation

A distinction should be made in the paper about innovation versus technology forcing. You can force technologies off the shelf without inducing innovation.

"Could we go a step further and argue that, in principle, creating a demand for innovative solutions is likely to be more effective than forcing a supply (that suffers from the absence of a market)? Pull will be more powerful than push. Rather than just stimulating innovation, the objective is to stimulate a market that requires innovation."

"There seems to be an unwillingness to acknowledge that technology solutions could be significant. The point of innovation is that it doesn't just move down the cost curve, it can shift the whole cost curve down."

"What we need here is a technology revolution, and what we know about the history of technology revolutions is that they are never started by the industry incumbents. Entrepreneurship is the key to the revolution, and stimulation of entrepreneurial activity in the energy sector is a policy that would cut across all other packages."

"A carbon tax or upstream credit trading program generates the most rapid innovation because it utilizes price signals to ensure breakthrough technologies will occur first where they are most cost effective, because price signals generate continuous innovation and innovation beyond any quantitative target, and because it does not generate distortions that reduce the effectiveness and raise the costs associated with the sector-specific designs that include fuel economy standards."

Cap-and-trade policies

"We oppose cap-and-trade policies of all kinds (both economy-wide and transportation-sector specific) because the transaction costs are much higher than most people think, and there could be unintended consequences, particularly price volatility in the early stages of implementation."

"The paper should make it clear that although individual transportation sources may not be good candidates for a cap-and-trade program, there are sources (such as auto manufacturers and fuels providers) that could be regulated under a cap-and-trade approach. Trading between vehicle manufacturers and fuel producers should be included as an option to help reduce costs and increase flexibility and innovation. Trading might lead to increased coordination and planning of vehicle/fuel combinations."

"A transportation cap-and-trade program is not a viable alternative. Since such a system would be applied to vehicles at point of sale, it would not consider the use of the vehicle."

"A downside that is not always brought forth is that living under an uncertain CO_2 price creates a cost. It is financially cheaper to operate in an environment where future costs are known since there is less risk." This can be easily seen when one compares the results of different programs to promote renewables in Europe. Programs that have fixed subsidies have produced new renewable capacity clearly cheaper than ones that have used auctioning or certificate trade.

Fixed subsidy systems have created a lot more capacity as well, but that is strongly influenced by the level of the subsidies.

Cap-and-trade programs could be highly discriminatory depending on how allocation of permits is handled. If, for example, allowances were allocated to favor the automobile industry, this would be unacceptable to the oil industry, especially if it resulted in U.S.-based oil firms subsidizing foreign auto firms, or conversely, foreign oil companies subsidizing U.S. automobile firms.

One potential downside to cap-and-trade from an inequality point of view is that rents under grandfathered permits are likely to go to wealthy households through their stockholdings in firms receiving the permit endowment.

Regarding cap and trade policies, it would be inappropriate to mandate before the RD&D sequence is completed. Otherwise, you can have big sunk costs. Look at electric vehicles. Batteries are still a core issue. Without the technological solutions, cannot set a cap. Setting a cap will only distract investment in low-carbon technologies.

Performance standards

"A more detailed examination of GHG performance standards is warranted, including a better balance between benefits and disadvantages. The paper should explain how this approach can work as well as they ways in which it might not."

A more comprehensive approach to the pros and cons of GHG emission standards is needed, equivalent to the one on fuel economy standards. " It might be interesting to examine European and Japanese experiences as well.

It would be more up-to-date to say that the European Commission has published a proposed relaxation of the 120 g/km voluntary standard to 130 g/km by 2012.

Taxes

"We are supportive of carbon tax so long as distributional issues are resolved. It just seems like the most efficient way to do it. Obviously, transportation fuels should be taxed differently. We are all coming around to a carbon tax. A slow but steadily escalating carbon tax would be best." .

"There is a lot of merit in a carbon tax, but it is probably not politically do-able."

Other advantages of carbon taxes that you do not mention are that there are efficiency gains from recycling tax revenue in income tax reductions (estimated to be roughly $20 billion under a $10 CO_2 tax) and abatement cost uncertainty diminishes (see Karp). Also, taxes exploit all the behavioral responses for reducing fuel use-reduced driving, better fuel economy of conventional vehicles, and substitution into alternative fuels.

Why would the carbon tax need to serve a general revenue source for the government? This may go too far in that the two tax schemes serve very different purposes.

"Either a carbon tax or an upstream design for a carbon cap-and-trade regulation is more cost-effective than mid-stream designs. . . because it uses fuel price signals to capture the 'lowest hanging fruit' to ensure the largest reductions in carbon consumption occur in their lowest valued uses."

"Carbon taxes dominate cap-and-trade systems for carbon pricing on efficiency grounds in the presence of uncertainty over marginal abatement costs for carbon."

"Carbon tax reform could be designed in a distributionally neutral fashion. But, your statement that a tax is easier to administer is a bit misleading. A tax is easier to administer in the sense that we already have an administrative structure set up for taxes (the IRS) whereas we'd have to create something from scratch for cap and trade."

Biofuels

You should expand the discussion of biodiesel and some of the problems that it causes in vehicles.

Given the massive subsidies to ethanol, it would be useful to compare subsidies to ethanol with subsidies to the oil and auto industries. .

"We would support a low-carbon fuel standard, but we are very concerned about how it is implemented and the level of the targets. It's really not clear how to do the lifecycle analysis, and this could lead to the wrong investments being made. For example, certain lifecycle cost calculations could push a producer to meet all of the requirements through changes at the refineries rather than in the fuel. Targets should be back-loaded so that we don't get locked into corn-based ethanol. Weaker targets in the beginning (3-5 years) can be strengthened in later years to give incentive for innovation."

"One major concern is that EPA will develop regulation for LCFS that is different from the CARB standards because if they are different, it will be a nightmare to comply with both."

"The argument that consumers may be reluctant to purchase flex fuel vehicles unless alternative fuels are available should be turned around. Consumers have indeed been purchasing flex fuel vehicles since there is no price premium for flex fuel capability, but many have not been aware that they purchased one."

"Regarding the structure of a LCFS, another possibility is for the standard to cover only the upstream (well-to-pump) emissions (accounting for plant uptake and farming practices for renewables). This would be particularly attractive when considering a fuel performance standard in concert with a vehicle standard, particularly if trading is allowed between the two. A LCFS could incorporate a straight-forward approach to the measurement of carbon intensity, including the use of "appropriate default values."

"Trading could encourage companies to go beyond a standard, depending on how it is designed."

Biomass-to-liquid fuels are one example of second-generation biofuels, but they were not mentioned in the paper. This is a prime option for the future.

It would be good to provide more explanation of volumetric requirements. They seem like a huge potential distortion.

"The notion that consumers in the market for liquid fuels will have the option of choosing a fuel which is cheaper is somewhat simple minded. The fuel price differential cannot be maintained unless the government decides to forego tax revenue, or gives explicit subsidies for certain fuels. Otherwise, the fuels market will ensure that fuels that are substitutes will be priced so that they cost roughly the same on an energy basis. In short, the price of fuel will always be determined by whichever is more expensive at the moment."

CAFE

"Slow but steady attribute standards are the best way to go."

"The paper would benefit from a more balanced treatment which acknowledges what CAFE has achieved. For example, the 2002 NAS report on CAFE projected that gasoline consumption and oil imports might be as much as 2.8 MBPD higher in the absence of CAFE. CAFE standards are also popular with the public (polls consistently show 60-80% in support). Also, CAFE standards are no more difficult to implement than any other legal obligation (where does one set a cap, for example, and how high to set a tax). The CAFE discussion also overestimates the difficulty in measuring fuel economy. The long-run rebound effect may be smaller than the paper asserts when one looks at more recent years. The long-run rebound effect may be as small as 11% (see Small and Van Dender paper in Energy Policy 2007)."

"In general, the comments on the drawbacks of fuel-economy standards seems to be too negative." The cited rebound effects may be too large. That they fail to encourage technological innovation beyond the standard is not relevant for some firms as they have been improving their own CAFE level beyond the standard. Also, not necessarily so complex to implement since they have a long history of implementation

"Most complementary policies such as energy and carbon taxes, feebates, better fuels, procurement policies would do little without CAFE." A CO_2 standard could probably be roughly equivalent to CAFE in effectiveness, but the major difference is really jurisdictional (EPA versus NHTSA and Senate Environment and Public Works versus Commerce committees). The rebound effect is very slight, no more than 10%. The current CAFE was the biggest single step to cutting GHG emissions to date, with the current law eliminating about 600 million metric tons of CO_2 per year.

The rebound effect is not as large as cited. Recent studies (e.g. Small 2005) show that it is more like 2.6 to 12.1 percent.

CAFE may be complex, but the essence of CAFE is understandable to the public. They may not understand cap and trade.

"The paper states that OEMs get credits for producing flex-fuel vehicles capable of running on 85% ethanol. But, the overwhelming majority of these vehicles do not run on E85. The net effect is that the Big 3 get to lower their CAFE standard thus reducing the overall benefit for reducing oil consumption – precisely the opposite of the intended incentive of producing an E85 vehicle. This should be noted."

You state that automakers state the consumers don't value fuel economy when buying a car. "The Big 3 spend billions advertising horsepower for the big mark-up, profitable vehicles. They have a financial interest in advertising their most gas guzzling line of vehicles because of the bigger profit margins. So when the Big 3 say, 'don't value' that is because the Big 3 is heavily invested in creating markets, not responding to them."

"A lot of people are very fond of the CAFE program, and get upset if they hear that CAFE has not even done what it was supposed to do. They would argue, rightly, that the failure does not lie with the CAFE program itself, but with Congress and the general public who lost any appetite for further fuel economy increases after the oil prices crashed in 1985."

"We didn't think there was a balanced treatment on CAFE. In our view, CAFE is a mandate on OEMs. From a fuels provider perspective, they don't have a mandate. There should be balance across stakeholders. If there has to be CAFE, then there should be something like that on fuels. Of course, we don't support mandates, but if you are going to impose them, then they should be imposed across all the stakeholders."

"We would disagree with the characterization of light truck standards as 'weaker'. Trucks are different from cars so the challenge is similar for both."

Role of consumers

"Changing the behavior of a dozen automakers is much easier than changing that of 250 million drivers and 176,000 gas stations."

"Maintaining consumer choice is really important for full-line manufacturers. Choice and function is very important to consumers."

Regarding the consumer willingness to pay, it is very difficult in today's environment of overcapacity in the industry to charge for technology. This is certainly the case for hybrids. Not only the variable costs, but also the fixed R&D costs. This needs to come out more in the paper. While some assume that consumers are willing to pay, this is not clear at all. In fact, the willingness to pay for fuel efficiency in vehicles is zero. This is just expected by consumers to be include in the base price of the vehicle, even when gas prices are high.

“Education is going to be key. The better educated people are, the more motivated they are then to make decisions that are consistent with the goals.”

“Transportation choices are path-dependent, subject to lock-in based on previous choices embodied in residential density and transportation infrastructure (if you live in Manhattan, it’s hard to own and use a car; if you live in Los Angeles or most of America, it’s hard to do anything but own a car). Increasing returns operate on many levels: the more people that own a particular make of car, the easier it is to obtain parts and repair services; only an adventurous, mechanically-inclined subset of the population would contemplate being the only one in town with a rare type of car. The more your neighbors drive, the more your neighborhood will be built and rebuilt around driving; the choice may be made for you, as lock-in to private auto use occurs at a social level.”

Feebates

“There’s nothing more odious to U.S. industry and workers than feebates. They do nothing but pick on the Big Three automakers.”

“Feebates should be structured in a way that considers different vehicle categories, comparable to the Japanese top runner approach.”

“This kind of policy is not under serious consideration.”

“CAFE standards have indirectly led to ‘internal feebates’ for those automakers who are constrained by the standards because the Big Three have had to lower the prices of their high fuel-economy vehicles and raise the prices of their low fuel-economy vehicles to meet CAFE. Both CAFE and feebates can be static (fixed in time) or dynamic (changing over time to promote continuous improvement).”

“People are not very good at taking into account how much money they will spend on gasoline when they buy a car, but they will certainly see the price tag.”

“Because feebates are revenue neutral, there is greater scope to adjust the slope and neutral point of the policy over time than for taxes. Provided this is done in a managed way this may not be abhorrent to manufacturers. Therefore it is more feasible than taxes to adjust the signals until the desired response is achieved.” In addition, there is evidence from Lane (2006) that an initial purchase charge works best when it is reinforced by an ongoing distance-related CO_2 -based charge and/or a carbon tax.

Costs

“The authors are looking through the wrong end of the economist’s telescope. They should start by seeking the most effective and efficient means for the economy as a while to meet the challenges of climate change and energy security. Having answered this question, they should then ask how such efficient and effective programs would affect the transportation sector.”

Other policy suggestions and packages

"Package 3 (GHG performance standards for fuels and vehicles, feebates, and a carbon tax on transportation fuels with income tax rebates) is the preferred option." The feebates should be structured according to different vehicle categories, comparable to the Japanese "top runner" approach. "GHG performance standards for fuels in conjunction with a carbon tax would be a viable approach to facilitate the introduction of alternative fuels with a low-carbon footprint."

"The ideal package is a carbon tax with supplemental fuel standards and carbon efficiency standards for cars. You need the supplemental standards because Congress will never set the tax high enough and because the political forces demanding specific action on fuels and automobiles are too strong."
This is a "valuable and well-balanced" document. It summarizes the pros and cons of several options to reduce dependence from foreign oil and decrease GHG emissions, but "some areas could be more pronounced, especially infrastructure, dieselization, biofuels, and cap-and-trade." .

The paper does not sufficiently explain how closely linked fuels and engines actually are, and how that matters for policy.

Hybrid tax credits amount to subsidies for foreign automakers.

Another policy option to explore is manufacturer tax credits.

Congestion pricing is another option.

Significant improvements in oil consumption and GHG emissions can be achieved with an optimized infrastructure with very little effort required.

Dieselization of road transport is a simple and effective way to reduce both oil consumption and GHG emissions.

Eco-driving, adequate vehicle maintenance, road infrastructure development are not addressed in the paper, and they should be.

The paper should consider a variable oil import fee to keep the U.S. price at a constant level.

Other policies that target VMT are: incentives created through a cap and trade allocation scheme to state or municipalities to implement smart growth, transit, intelligent highway systems.

Traffic management is another way to improve conservation.

"Our recommendation would be for a hybrid approach – an upstream fuels cap combined with vehicle and fuels standards."

“I am glad to see that you talk about putting together different policies to address this problem. The nature of the problem requires that it be attacked at multiple levels rather than using a single heavy stick.”

Affiliations of Those Who Submitted Comments (alphabetical):[4]

Argonne National Laboratory
BP Group*
Chevron
Clemson University
Daimler Chrysler
Department of Energy
Environmental Protection Agency*
Ford Motor Company
General Motors*
Illinois Farm Bureau
Harvard University*
Honda North America
International Council on Clean Transportation
Kings County Government
Massachusetts Institute of Technology
Natural Resources Defense Council
Princeton University
Resources for the Future
Sierra Club
Shell Exploration and Production
Toyota Motor North America
Tufts University*
United Auto Workers
University of Minnesota

*Where noted, more than one individual from this place submitted comments.

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