EXCERPT FROM

Proposed Rulemaking to Establish) Environmental Protection Agency
Light-Duty Vehicle Greenhouse Gas) 40 CFR Parts 86 and 600
Emission Standards and Corporate) Department of Transportation
Average Fuel Economy Standards) 49 CFR Parts 531,633, 537, et al.

Comments of the Consumer Federation of America

PP. 56-64

November 28, 2009

The Important Role of the Supply-side in the Energy Market Failure

Since the sources of market failure on the consumer side have been acknowledged in the Notice and supporting materials, and worked over thoroughly in the literature, we believe it is important to elaborate on the supply-side caused of market failure. As depicted in Exhibit III-5, which is from our comments in the 2008 proceeding, we view the supply-side problems as antecedent to the demand-side problems. Because the Notice has raised the consumer welfare issue and the prospect of a joint standard setting process opens the possibility of altering the approach to standard setting, in these comments we expand the discussion of market failure, especially on the supply-side.

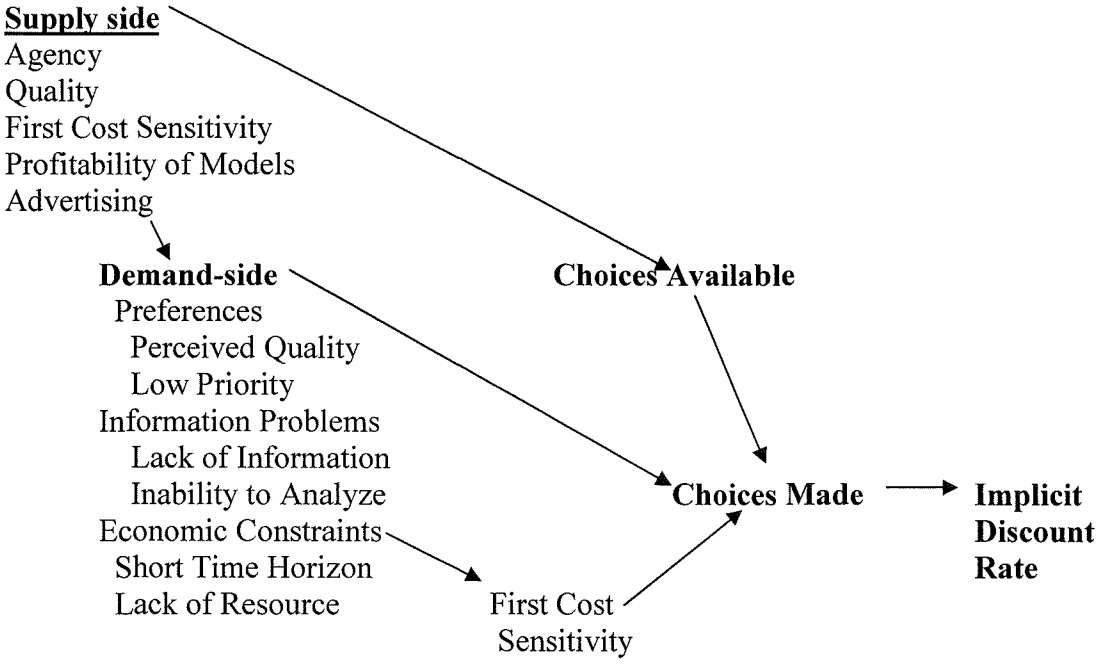
In 2008 we summarized the important role of supply side and market structural factors as follow; here we expand on that discussion.

> The cars that are sold in the marketplace reflect not only what consumers want to but also, what automakers want to sell. Automakers spend millions on advertising and promotions to move the metal that makes the most profit for them. It is simply wrong to claim that all the advertising and marketing has no effect.
>
> Failing to recognize the imperfections on the supply-side leads NHTSA to an over reliance on automaker product plans. Thus, it is a much better representation of reality to say that the auto market undervalues fuel economy. The problem is not just the consumer. Indeed, the automakers may be a bigger part of the problem. If automakers are required to produce and sell more fuel efficient vehicles, they will have to change their advertising and marketing focus. With the automaker resistance to more fuel efficient vehicles dampened, the apparent market valuation of fuel economy will rise quickly. It is the automakers who have been at least as large a drag on fuel economy as consumers.
>
> Auto makers prefer to sell certain models because they are more profitable. They prefer simple technologies that are less demanding to produce and maintain. They have a first cost bias,

seeking to keep the sticker price low. They seek to influence the public to purchase the vehicles that best suit their interests.

On the supply-side there is an agency problem – a separation between the builder or purchaser of buildings and appliances and the user. Suppliers may not choose to manufacture or stock efficient vehicles if they are less profitable, hoping that advertising and showroom persuasion can point consumers in the direction the manufacturers want them to go.

EXHIBIT III-5:
IMPERFECTIONS IN THE AUTO MARKET



Source: Comment of the Consumer Federation of America, on National Highway Traffic Safety Administration Notice of Proposed Rulemaking; Docket No. NHTSA 2008-0089, RIN 2127-AK29; Average Fuel Economy Standards, Passenger Cars and Light Trucks; Model Years 2011-2015, July 1, 2008.

Consumers are influenced by advertising and my not perceive quality properly. The priorities afforded to any particular attribute are difficult to discern in a multi-attribute product. They lack the information necessary to make informed choices. The life cycle cost calculation is difficult, particularly when projections about future gasoline prices and vehicle use are necessary.

Even when they do consider efficiency investments, they may not find the more efficient vehicles to be available in the marketplace.

We view the apparent high discount rate attributed to consumers as the result of other factors not the root cause of the demand-side problem. We do not accept the claim that consumers are expressing irrational preferences for high returns on efficiency investments; irrational because they appear to be a return that is so much higher than they can get on other investments they routinely have available. Rather, we view the implicit discount rate as a reflection of the fact

that the marketplace has offered an inadequate range of options to consumers who are ill-informed and unprepared to conduct the appropriate analysis and who lack the resources necessary to make the correct actions.[1]

The apparently grossly irrational discount rate reflects market imperfections and failures, not irrational consumers.

> The implicit discount rates calculated from consumer choices reflect not only individual time preferences but a whole collection of variables that may depress the ultimate level of investment. The calculated discount rate is affected by consumers' price expectations and their levels of certainty about these; the extent to which available information is imperfect, mistrusted, or ignored; the purchase of some equipment to quickly replace nonfunctioning equipment rather than to minimize life-cycle cost; the presence in the market of builders, landlords, and other purchasers who will not pay for the energy the equipment uses; the fact that consumer with limited capital do not always purchase what they would if they had more capital; differential marketing efforts for different products, and so forth. Recognizing such possibilities, some analysts say that the data reflect "market discount rates."[2]

The implication is that policies that alter the supply-side conditions in which consumers make decisions will lead to different market outcomes.

In a recent analysis Greene focused attention on the consumer decision-making under uncertainty about investments in fixed assets as the origin of the market failure. He sees this as a problem that lies at the intersection of transaction cost[3] and behavioral economics,[4] but then pointed out that there are a host of potential supply-side problems that can drive the market from optimum efficiency. As those who control the information, automakers have the ability to exploit consumers opportunistically.[5] As the agents who choose which product attributes to

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[4] A variety of uncertainties make the investment in increased fuel economy a risky bet for consumers. Despite labeling, consumers are not sure what fuel economy will actually be achieved in real world driving. They cannot accurately predict future fuel prices any more than experts can. They are not even certain exactly how much driving they will do, or how long their car will last. Consumers preference for the status quo, combined with fuzzy preferences for future savings guarantee loss-averse behavior. Consumers may be rational and as well informed as possible, yet the market will still decline investments in energy efficiency that have positive expected net present value because of the combined effect of uncertainty and loss aversion. (Greene, p. 184)

[5] Information asymmetry occurs when one party to a market transaction possess knowledge superior to the other. The suppliers of air conditioners, for example, will have better information about their energy efficiency than the buyers. This enables unscrupulous sellers to deceive consumes, resulting in a reluctance of consumers to trust even scrupulous sellers' high efficiency claims. The adoption of fuel economy labeling has undoubtedly diminished the importance of this problem, yet manufacturers still advertise vehicles based on their highway mileage rather than their combined city/highway fuel economy rating. (Greene, p. 183)

bundle, they influence the range of choices available to consumers. The under investment in efficiency technologies becomes a market problem. "If markets undervalue energy efficient technology, it follows that companies will also undervalue investments in research and development to create new efficient technologies."[6] Other authors add additional endemic problems that arise in energy markets including moral hazard[7] and the failure of secondary markets to develop for energy efficiency.[8]

While this approach alone implicates the supply-side of the market in the overall market failure, one does not have to see the supply-side contribution to market failure as derivative of the demand-side problem. The supply-side is an independent cause of market failure, not simply a reflection of demand-side problems. "Actual Firms are more complicates and perhaps less efficient than simple profit-maximization models suggest, even when managers and employees are fully rational.[9]

The supply-side of the market is imperfect at the individual level, although here the unit of analysis is the firm. The deficiencies of the firm compound deficiencies of the individuals that make them up.

> This market failure has little to do with the working of neoclassical markets because the rational action approach fails to appreciate two critical points. First, innovation, organizations and technological substitution are socially regulated matters, and as such they are shaped by a host of non-economic factors. Second, while current technologies may be less than optimally efficient in energy and environmental terms, they enable a highly integrated network of industry actors to produce.. in uncertain environments...
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> It is a mistake to assume that either firms or consumers act in markets solely on the basis of rational self-interest. Economic calculations take place in social and cultural contexts. Social obligations, normative expectations, social status attainment, risk avoidance.
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> Economic actions are embedded in social relations, the natural evolution of even the most rational organizations involved the absorption of rational ends into a framework of cultural means. organizations as the tools of managers whose ends are not necessarily congruent with those of owners, employees or the long tern welfare of the enterprise... Organizations that appear rational frequently make serious mistakes, bad investments and poor management decisions... The behavior of firms seems to be shaped by a combination of cultural, institutional, macro-social/economics and technical factors).[10]

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[6] Greene, p. 2004

[7] Howarthand Anderson, p. 268, Finally, the problem of "moral hazard' might arise under either energy service contracts or performance guaranteed. To the extent that the energy intensity of a device depends on user behaviour, institutions that weaken user incentives to minimize direct energy costs might lead to reduced energy efficiency. .

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Decanio offers a similar set of observations pointing launching from the observation that performance by firms varies widely.[11] He points to a range of factors that push firms from optimum behavior, emphasizing the institutional challenges of large, bureaucratic organizations.

> Perceptive observers have identified a tendency in free societies toward rigidity and over-bureaucratization brought on by the accumulation of rent-seeking activities, political advantage of special interests, and institutionalization of otherwise transitory market advantages. The same kind of institutional arteriosclerosis can afflict business.
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> All of these explanations of why firms do not make profitable energy-savings investments can be fit within an expanded economic decision framework that includes transaction and monitoring costs, second-best solutions to information deficiencies and bounded rationality of individual members of organizations... Corporate culture, which fundamentally influences thee firm's attitude towards change and adaptation is too complex to be described in terms of economical simplification.[12]

He offers a litany of factors that drive firms from the optimum are Conflict of interest between the center of periphery of the organization, high hurdle rates, priorities, incentives, risk avoidance, sunk costs, monitoring costs.

Suppliers who make the major choices are affected by factors much like consumers. They are risk averse and exhibit a first cost bias that reflects constrained resources. Efficient products may not be stocked by dealers because of lack of demand[13] or lack of capital. A bias for short-term profits may inhibit innovation. "Firm size may also significantly influence innovation... uncertainty of markets and the drive for short tem gains means that these advantages generally translate into higher profits for lower selling costs, rather than innovations in quality or efficiency.[14] The organizations can become obstacles to change.

> No only do market often fail to deliver efficiency, but sometimes they introduce uncertainties that make innovation risky... Activity in the industry is highly cyclical... the structure of the industry represents, in part, an adaptation t market cycling.[15]
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> Large-scale manufacturing and distribution systems can also act as inertial brakes on change... Ironically, complacency resulting from market dominance may also reduce the perceived benefits of innovation...

At the individual level on the supply-side, there is an agency problem – a separation between the builder and purchaser of buildings and appliances and the user.[16] Suppliers may not install energy efficiency technologies properly, as it requires different skills or considerations.[17]

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[11] DeCanio (p. 63). First, it is necessary to discard the baggage carried by most economists that immersion in a market environment guarantees efficiency behaviour by the market participants.... In actuality, companies rise and fall; variations in performance are huge, both across and within sectors

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At a more general level, producers are people, just as consumers and they are influenced and affected by the same behavioral factors as consumers. Their profit motivation may mitigate some aspects of the behavioral economic factors that result in less than optimal behavior, but it does not cure all of the problems, with respect to efficient outcomes. Indeed, as suggested above, their profit motive may exacerbate the problem because the tendency to opportunistically exploit information asymmetries or to under invest in research to maximize short term profits. The supply-side also suffers from problems of motivation, perception, calculation and operation with respect to efficiency.

> Firms are faced with myriad concerns other than economic optimization or technical innovation, including internal competition for resources and control, goal conflicts, information relations and institutional inertia. Changing organizational environments offer opportunities for innovation, but stabilizing network connections can inhibit technical change and slow its transfer. Large-scale systems exhibit considerable momentum, but evolve at uneven rates under the influence of contending interests and ways of thinking...
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> Perceived costs and risks include question of reliability of alternatives, maintenance problems, call back complaints and risk of damage to reputation, uncertainties regarding requirements and costs of gearing up; uncertain source of supply and technical support; and exclusive distribution agreements. Consumer acceptance.[18]

Policy Implications

With the overwhelming evidence of a large and persistent efficiency gap, some have tried to "resolve" the market failure problem by relabeling it. Instead of a market failure, it is seen as a "normal" market that is sluggish in the face of uncertainty surrounding investments that are irreversible and immobile resulting in sunk costs. Faced with the risk of loss in an uncertain environment, consumers and producers wait. It has been pointed out that this does not resolve the policy debate, since policies to reduce risk and uncertainty can speed the market toward "objectively" efficient outcomes, particularly where the individual perception of risk is different from the actual societal level of risk. The entire analysis is reframed as an externality problem, centered not on the true cost to society, but on the true risk to society.

In fact, some analysts envision this broader role for the setting of standards.

> The uncertainty/loss aversion model of consumers' fuel economy decision making implies that consumers will undervalue expected future fuel savings to roughly the same degree as manufacturers' perception that consumers demand short payback periods. This suggests that

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[16] McKinsey, Reducing, p. 41, "The owner, operator, occupant and bill-payer (benefit capturer) associated with a building may be separate entities or may not be involved for the full relevant time period; a result, their interests in supporting energy efficiency and GHG abatement are not aligned."

[17] Large annual increases in fuel economy require aggressive changes to every aspect of the vehicle. The industry does not have the resources to handle this level of change all at once. Even if it did, it would be too risky to implement the changes all at once....There are also many examples of poor quality vehicles and inadequate technologies rushed to market. The Chevy Chevette, Ford Pinto and Chrysler K cares all offered good fuel economy and sole well at the time, but developed reputations as relatively unreliable vehicles, damaging the reputations of the companies. (Greene, pp. 95-96).

[18] (lutzenhiser, p. 871-872).

increasing fuel prices may not be the most effective policy for increasing the application of technologies to increase passenger and light truck fuel economy. This view is supported by the similar levels of technology applied to U.S. and European passenger cars in the 1990s, despite fuel prices roughly three times higher in Europe. It is also circumstantially supported by the adoption by governments around the world of regulatory standard for light-duty vehicle fuel economy and carbon dioxide emissions.[19]

This view moves standards into the transaction costs arena as a solution to the market failure problem. But the ability of standards to address the market failure problems goes beyond its ability to address the barriers to investment in efficiency enhancing technologies grounded in the view that focuses on consumer behavioral and transaction cost economics. Standard can address the behavioral and transaction cost problems that afflict the supply-side of the market, as well as some of the structural problems, as shown in Exhibit III-8.

But the ability of standards to address the market failure problems goes beyond its ability to address the barriers to investment in efficiency enhancing technologies grounded in the view that focuses on consumer behavioral and transaction cost economics. Standard can address the behavioral and transaction cost problems that afflict the supply-side of the market, as well as some of the structural problems, as shown in Exhibit III-8.

A principle finding is that frictionless models of competitive equilibrium are incomplete and potentially misleading guide to energy policy. Good policy arguably involves more than simply "getting prices right." A potential role exists for governments to intercede when the vagaries of market institutions lead to lags in the development and adoption of energy-efficient technologies (Howarth and Anderson, p. 264).

Subjective uncertainty, however, may stem form the fact that precise estimated of energy prices and equipment performance are costly to obtain from the perspective of individual consumers. If the costs of gathering information were pooled across individuals, substantial economies of scale should b achieved which could reduce the uncertainties associated with certain technologies. (Howarth and Anderson, p. 265)

The informational requirements that must be met to identify an efficient tax regime, however, are particularly onerous. The government must know not only the level of consumer expectations but also the specific way in which they are formed, and this information must be effectively conveyed to manufacturers through the structure of the tax. In practice, such information may be very difficult to obtain reducing the efficacy of tax instruments.

Such limitations suggest a potential role for the direct regulation of equipment performance. Energy efficiency standards led to demonstrable improvement in the fuel economy of automobiles in the 1970s and early 1980s. State and local governments set requirements concerning the thermal performance of building elements. (Howarth and Anderson, p. 265)

In some cases the direct regulation of equipment performance might side-step problems of asymmetric information, transaction costs and bounded rationality, obviating the need for

[19] Green, David L., Jonh German and Mark A. Delucchi, "Fuel Economy: The Case for Market Failure," Daniel Sperling and James S. Cannon (Eds.), *Reducing Climate Impacts in the Transportation Sector* (Fringer,2009), p. 203; "Discount rates used by consumers in these purchases can be expected to include potentially substantial permia for risk, liquidity, and uncertainty" (Harmon, p. 140). .

individual consumers to make unguided choices between alternative technologies. (Howarth and Sanstad, p. 108).

EXHIBIT III-8:
CAUSES OF MARKET FAILURE ADDRESSED BY STANDARDS

ENDEMIC FLAWS
- Agency
- Asymmetric Information
- Moral Hazard

STRUCTURAL PROBLEMS
- Scale
- Bundling
- Cost Structure
- Product Cycle
- Availability

SOCIETAL FAILURES
- Externalities
- Information

TRANSACTION COSTS
- Sunk Costs, Risk
- Risk & Uncertainty
- Imperfect Information

BEHAVIORAL FACTORS
- Motivation
- Calculation/Discounting

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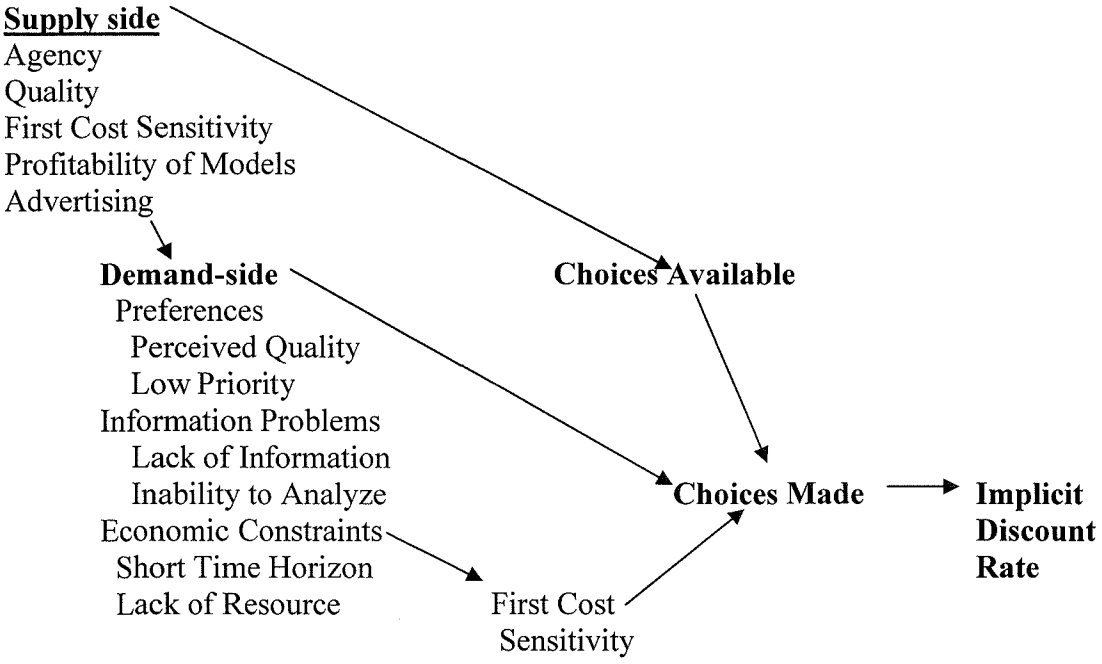

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Policy Implications

With the overwhelming evidence of a large and persistent efficiency gap, some have tried to "resolve" the market failure problem by relabeling it. Instead of a market failure, it is seen as a "normal" market that is sluggish in the face of uncertainty surrounding investments that are irreversible and immobile resulting in sunk costs. Faced with the risk of loss in an uncertain environment, consumers and producers wait. It has been pointed out that this does not resolve the policy debate, since policies to reduce risk and uncertainty can speed the market toward "objectively" efficient outcomes, particularly where the individual perception of risk is different from the actual societal level of risk. The entire analysis is reframed as an externality problem, centered not on the true cost to society, but on the true risk to society.

In fact, some analysts envision this broader role for the setting of standards.

> The uncertainty/loss aversion model of consumers' fuel economy decision making implies that consumers will undervalue expected future fuel savings to roughly the same degree as manufacturers' perception that consumers demand short payback periods. This suggests that

---

[16] McKinsey, Reducing, p. 41, "The owner, operator, occupant and bill-payer (benefit capturer) associated with a building may be separate entities or may not be involved for the full relevant time period; a result, their interests in supporting energy efficiency and GHG abatement are not aligned."

[17] Large annual increases in fuel economy require aggressive changes to every aspect of the vehicle. The industry does not have the resources to handle this level of change all at once. Even if it did, it would be too risky to implement the changes all at once....There are also many examples of poor quality vehicles and inadequate technologies rushed to market. The Chevy Chevette, Ford Pinto and Chrysler K cares all offered good fuel economy and sole well at the time, but developed reputations as relatively unreliable vehicles, damaging the reputations of the companies. (Greene, pp. 95-96).

[18] (lutzenhiser, p. 871-872).

increasing fuel prices may not be the most effective policy for increasing the application of technologies to increase passenger and light truck fuel economy. This view is supported by the similar levels of technology applied to U.S. and European passenger cars in the 1990s, despite fuel prices roughly three times higher in Europe. It is also circumstantially supported by the adoption by governments around the world of regulatory standard for light-duty vehicle fuel economy and carbon dioxide emissions.[19]

This view moves standards into the transaction costs arena as a solution to the market failure problem. But the ability of standards to address the market failure problems goes beyond its ability to address the barriers to investment in efficiency enhancing technologies grounded in the view that focuses on consumer behavioral and transaction cost economics. Standard can address the behavioral and transaction cost problems that afflict the supply-side of the market, as well as some of the structural problems, as shown in Exhibit III-8.

But the ability of standards to address the market failure problems goes beyond its ability to address the barriers to investment in efficiency enhancing technologies grounded in the view that focuses on consumer behavioral and transaction cost economics. Standard can address the behavioral and transaction cost problems that afflict the supply-side of the market, as well as some of the structural problems, as shown in Exhibit III-8.

A principle finding is that frictionless models of competitive equilibrium are incomplete and potentially misleading guide to energy policy. Good policy arguably involves more than simply "getting prices right." A potential role exists for governments to intercede when the vagaries of market institutions lead to lags in the development and adoption of energy-efficient technologies (Howarth and Anderson, p. 264).

Subjective uncertainty, however, may stem form the fact that precise estimated of energy prices and equipment performance are costly to obtain from the perspective of individual consumers. If the costs of gathering information were pooled across individuals, substantial economies of scale should b achieved which could reduce the uncertainties associated with certain technologies. (Howarth and Anderson, p. 265)

The informational requirements that must be met to identify an efficient tax regime, however, are particularly onerous. The government must know not only the level of consumer expectations but also the specific way in which they are formed, and this information must be effectively conveyed to manufacturers through the structure of the tax. In practice, such information may be very difficult to obtain reducing the efficacy of tax instruments.

Such limitations suggest a potential role for the direct regulation of equipment performance. Energy efficiency standards led to demonstrable improvement in the fuel economy of automobiles in the 1970s and early 1980s. State and local governments set requirements concerning the thermal performance of building elements. (Howarth and Anderson, p. 265)

In some cases the direct regulation of equipment performance might side-step problems of asymmetric information, transaction costs and bounded rationality, obviating the need for

[19] Green, David L., Jonh German and Mark A. Delucchi, "Fuel Economy: The Case for Market Failure," Daniel Sperling and James S. Cannon (Eds.), *Reducing Climate Impacts in the Transportation Sector* (Fringer,2009), p. 203; "Discount rates used by consumers in these purchases can be expected to include potentially substantial permia for risk, liquidity, and uncertainty" (Harmon, p. 140). .

individual consumers to make unguided choices between alternative technologies. (Howarth and Sanstad, p. 108).

EXHIBIT III-8:
CAUSES OF MARKET FAILURE ADDRESSED BY STANDARDS

ENDEMIC FLAWS
- Agency
- Asymmetric Information
- Moral Hazard

STRUCTURAL PROBLEMS
- Scale
- Bundling
- Cost Structure
- Product Cycle
- Availability

SOCIETAL FAILURES
- Externalities
- Information

TRANSACTION COSTS
- Sunk Costs, Risk
- Risk & Uncertainty
- Imperfect Information

BEHAVIORAL FACTORS
- Motivation
- Calculation/Discounting

Ceres

Higher MPG = More Jobs and a Stronger US Economy

Higher gas mileage standards are good business for the US auto industry and investors

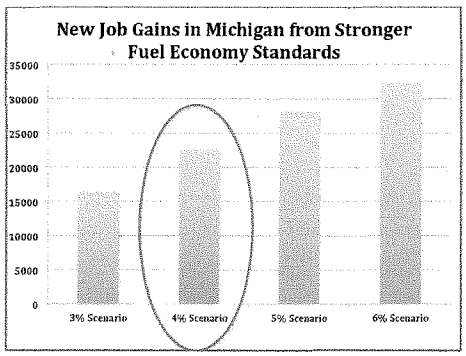
A recent Ceres/Citi Investment Research report, using analysis by the University of Michigan Transportation Research Institute, showed higher fuel economy standards would benefit the auto industry, especially the Detroit 3.

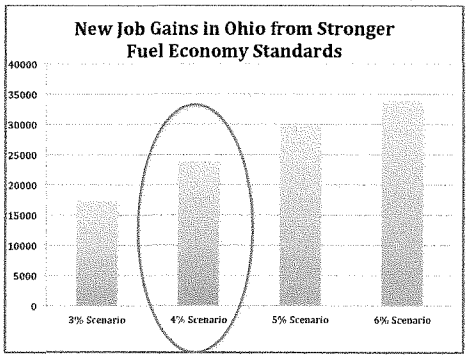
> Increasing industry average fuel economy to 42 miles per gallon by 2020 could raise industry variable profit by $9.1 billion, or 8 percent. Most of the added profit, $5.1 billion, could go to the Detroit 3. Key suppliers stand to benefit as well.
>
> The 42 mpg would be cost effective for consumers when gas prices reach $2.00 a gallon in 2020. It will not only reduce petroleum imports but also save consumers money.

Voters overwhelmingly support stronger mileage standards

Even in the historic heart of America's auto industry--Michigan and Ohio-- voters believe increased efficiency will spur innovation and create jobs. They don't believe the rhetoric that higher mileage standards would cost jobs or hurt US automakers. An April poll by The Mellman Group for Ceres found:

> 76% of likely Michigan voters and 80% of likely Ohio voters believe a national 60 mpg standard would encourage American car makers to innovate, boosting sales and protecting American auto jobs
>
> Every group of likely voters overwhelmingly supports 60 mpg, including 65% of Michigan Republicans, and 67% of Michigan conservatives, 68% of Ohio Republicans, and 69% of Ohio conservatives





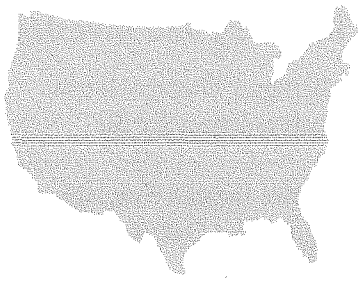
President Obama's announcement of 54.5 mpg by 2025 means cars would be required to average a 5 percent improvement in fuel economy each year from 2017 through 2025, while trucks would only need to rise 3.5 percent a year through 2021. This most closely aligns with the 4 percent per year improvement for CAFE mileage and GHG emission reduction in the Ceres report 'More Jobs Per Gallon." www.ceres.org/more-jobs-per-gallon

Ceres leads a national coalition of investors, environmental organizations and other public interest groups working with companies to address sustainability challenges. www.ceres.org

Ceres

Higher MPG = More Jobs and a Stronger US Economy

Voters, investors, and economists across the country support higher gas mileage standards



The Obama Administration and automakers reached an unprecedented agreement in July 2011 by proposing an average fuel economy standard of 54.5 miles per gallon by 2025 for passenger vehicles. Ceres—a national coalition of investors, business leaders, and public interest groups—has sifted the data and finds that 54.5 mpg will propel the nation toward a stronger domestic automobile industry, new jobs, fresh investment opportunities and enjoys overwhelming voter support.

A closer look at the economic benefits of President Obama's 54.5 mpg agreement finds:

Higher gas mileage is good for the US economy

An economic analysis commissioned by Ceres and conducted by the independent firm Management Information Services, Inc., found stronger mileage standards will boost the US economy.

> *"It's time to put our economy into high gear - strong standards will unleash American innovation, boost sales and protect American auto jobs.*
>
> *Mindy Lubber*
> *Ceres President"*

The 54.5 mpg standard will create approximately 484,000 new jobs economy wide

In percentage terms, the 12 states that would see the biggest increases are Indiana, Michigan, Alabama, Kentucky, Tennessee, Ohio, North Carolina, New Hampshire, Vermont, Oregon, New York and Missouri

The states that would gain the most jobs in absolute terms are California, New York, Florida, Ohio, Michigan, Illinois, Pennsylvania, Texas, North Carolina, Indiana, Georgia and New Jersey

49 states would see net job gains

43,000 of those jobs would be in the auto industry

National gross economic output (sales) would be approximately $21.3 billion higher

State economies benefit, too:

The projected impact on individual state GDP is overwhelmingly positive:

States benefitting most from the 54.5 mileage standard in relative terms include Michigan and Indiana, followed by Kentucky, South Carolina, Tennessee, Wisconsin, Iowa, Ohio, Alabama, Oregon, Missouri and Nebraska

The 12 states with the highest increase in total economic output as a result of these standards are Michigan, New York, California, Ohio, Indiana, Florida, Illinois, North Carolina, Pennsylvania, Georgia, Tennessee and Wisconsin

Revenue to cash strapped local, state and federal governments would be about $12.7 billion higher

American families will have more money in their pockets to spend on non-energy goods and services

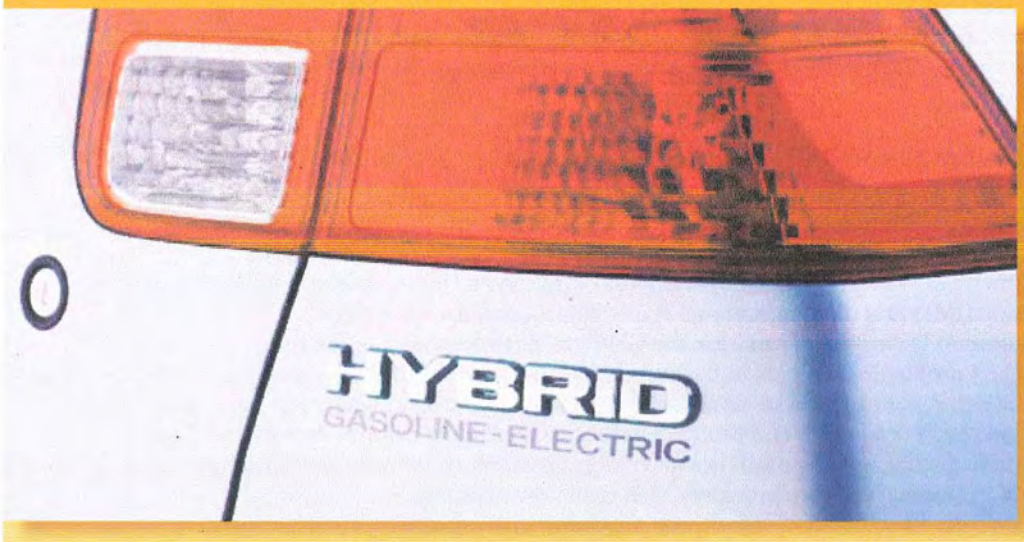
An improved vehicle standards of 54.5 mpg means consumers will save $107 billion at the pump

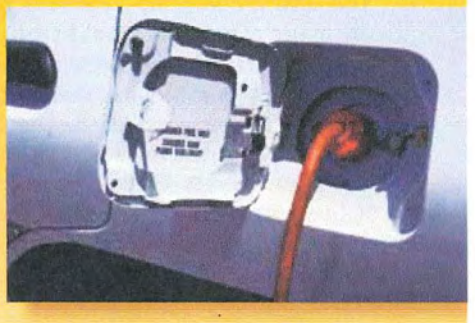
Personal income would be approximately $14.2 billion higher

Supplying Ingenuity

U.S. Suppliers of Clean, Fuel-Efficient Vehicle Technologies

August 2011





NRDC
THE EARTH'S BEST DEFENSE

NATIONAL WILDLIFE FEDERATION

UAW
www.uaw.org

About the Natural Resources Defense Council

The Natural Resources Defense Council is an international, nonprofit environmental organization with more than 1.3 million members and online activists. Since 1970, our lawyers, scientists, and other environmental specialists have worked to protect the world's natural resources, public health, and the environment. NRDC has offices in New York City, Washington, D.C., Los Angeles, San Francisco, Chicago, Montana, and Beijing. Visit us at www.nrdc.org.

About the National Wildlife Federation

The National Wildlife Federation is America's largest conservation organization. We work with more than 4 million members, partners and supporters in communities across the country to protect and restore wildlife habitat, confront global warming, and connect with nature.

About the International Union, United Automobile, Aerospace and Agricultural Implement Workers of America (UAW)

The UAW is one of the nation's largest unions with more than 390,000 active members and 600,000 retirees. Members are in over 750 local unions in the United States, Puerto Rico and Canada. Headquartered at Solidarity House in Detroit, the UAW is affiliated with the American Federation of Labor-Congress of Industrial Organizations (AFLCIO), the International Metalworkers Federation (IMF) and the International Trade Union Confederation (ITUC). Chartered 75 years ago as the United Automobile Workers of America, the UAW has since become a union for all workers. While still representing skilled and production workers in the automotive and parts suppliers sectors, the UAW also represents workers in aerospace and defense, heavy trucks, farm and construction equipment, and other heavy and light manufacturing industries. The union's technical, office and professional sector represents workers in state and local government, universities, hospitals, casinos, media, technical and design centers, libraries, museums, zoos and legal services, as well as free-lance writers and in-home child-care providers. Visit us at www.uaw.org.

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EXECUTIVE SUMMARY

Emerging from recent economic turmoil, the United States automotive industry is again profitable. Consumers are demanding cars and light trucks that go farther on a gallon of fuel, and the industry is meeting those demands by adding technologies that improve fuel economy and cut carbon pollution.

Vehicle efficiency and emissions reductions are being further encouraged by the first significant improvements in fuel economy standards for both cars and light trucks in more than two decades, and the first-ever carbon pollution standards, covering model years 2012 to 2016. Additional improvements in the standards currently being developed by the Obama Administration will have a dramatic impact on the future direction and competitiveness of the U.S. automotive industry and the economic growth of the United States as a whole. Moreover, strong standards can save consumers money at the pump.

U.S. suppliers of clean, fuel-efficient vehicle technologies can play a key role in the expansion of U.S.-based vehicle manufacturing that can lead to job gains.

THE AUTOMOTIVE INDUSTRY IS KEY TO ECONOMIC GROWTH

A successful domestic automotive industry is critical for preserving and growing U.S. jobs. Today, the automotive industry directly employs nearly 700,000 U.S. workers. More than 427,000 of those jobs are at automotive suppliers—companies that design, engineer, and manufacture the parts that are eventually assembled into cars and light trucks.

This study assesses the supply chain for clean and efficient vehicle technologies and identifies more than 300 companies that are located in 43 states and the District of Columbia. These clean and efficient vehicle component suppliers are responsible for employing 150,000 workers directly and for employing hundreds of thousands of others indirectly (see Table 1). These companies develop and supply the critical components for advanced internal combustion engines and vehicles, hybrid powertrains, plug-in electric vehicles, and create the electric vehicle charging infrastructure (see Figures 1 and 2).

Table 1: Top 15 States Currently Employing the Highest Number of Autoworkers in Clean, Efficient Technologies

State	Facilities	Employment
Michigan	97	38,067
Ohio	28	13,753
Indiana	30	11,819
Kentucky	6	9,775
Pennsylvania	13	8,662
Texas	22	8,558
Alabama	13	8,285
California	79	7,422
South Carolina	16	6,934
North Carolina	19	5,928
Tennessee	11	5,393
New York	16	5,339
Illinois	23	4,715
Virginia	11	2,373
Arizona	4	1,765
Other States	116	12,380
Total	**504**	**151,168**

Figure 1: United States Suppliers of Low-Emission, Fuel-Efficient Vehicle Technologies (Number of Supplier Facilities by State)

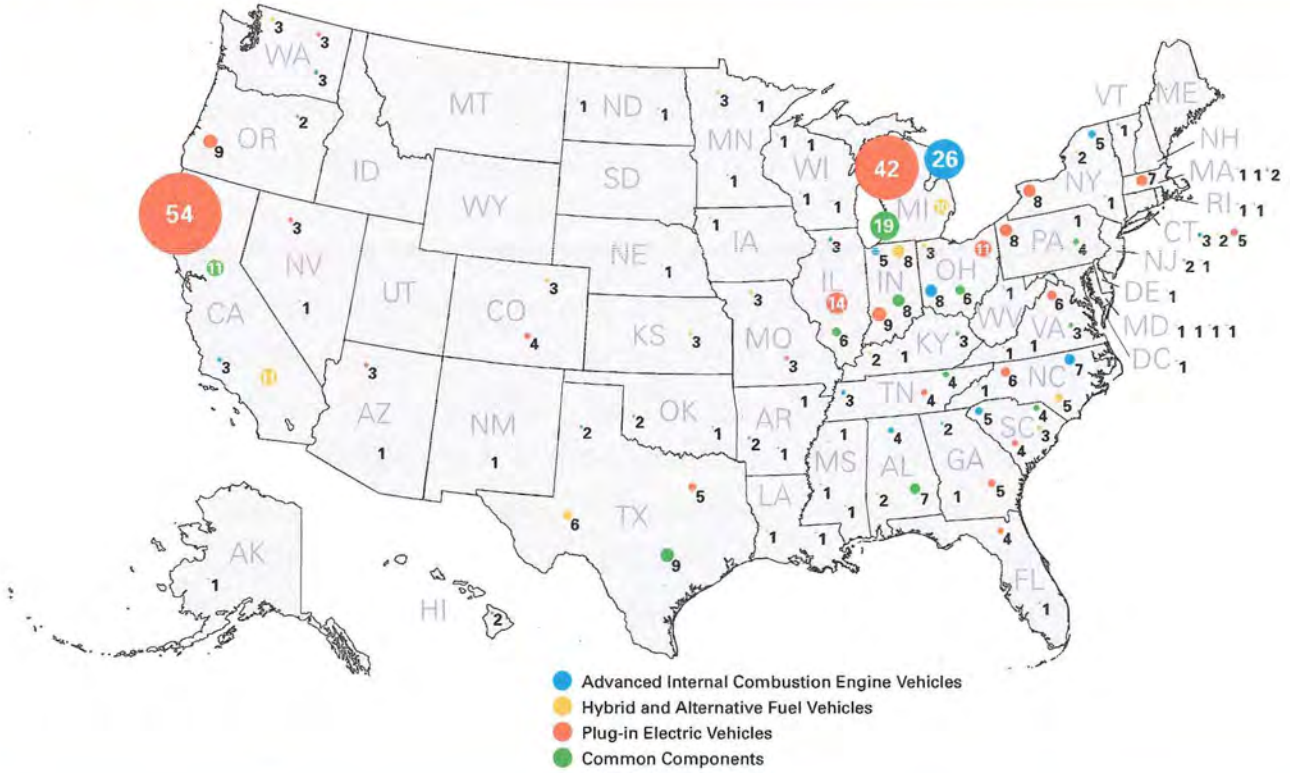
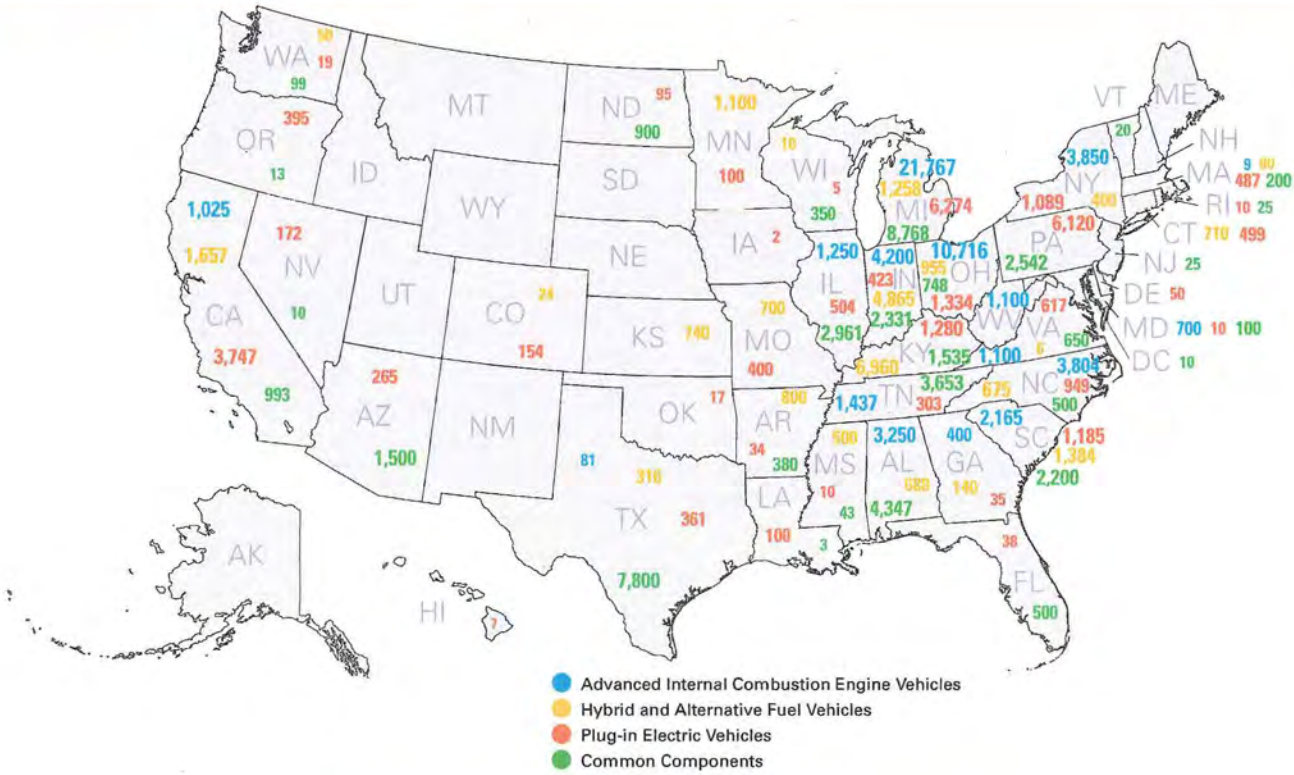


Figure 2: Employment by U.S. Fuel-Efficient Vehicle Technology Suppliers (Number of Supplier Employment by State)



Suppliers and automaker component operations are on the front lines of innovation, producing new fuel-saving and low-emission technologies that add new content to vehicles on the assembly line. By growing the production of these new technologies—including advanced internal combustion engine components, turbochargers, improved transmissions, lightweight structures, electric traction motors, electronic controllers, advanced battery materials, traction batteries, and smart charging systems—suppliers can maintain existing jobs and create new ones.

Improved vehicle fuel economy and pollution performance standards provide the certainty necessary to foster automotive supplier and automaker investment in fuel-saving technologies. Standards that are more similar to those in Europe and Asia will allow automakers and their suppliers to leverage the efficiency of global platforms and powertrains that add scale and reduce costs, leading to lower prices and higher profits.

Further, with ongoing innovation and higher volumes of fuel-saving components that are required to meet U.S. standards, domestic manufacture of these fuel-saving technologies becomes more likely. The recently adopted standards requiring that vehicle model years 2012 to 2016 reach 34.1 miles per gallon provide near-term direction.

The Obama Administration is now developing standards for model years 2017 to 2025 that will have a major impact on long-term investment decisions and, therefore, on innovation and jobs. The 2010 report, "Driving Growth: How Clean Cars and Climate Policy Can Create Jobs," published jointly by the UAW, the Center for American Progress, and the Natural Resources Defense Council[1] showed that up to 150,000 new domestic jobs could be created in the automotive sector if the industry followed a sustained path of improving new vehicle fuel economy and continuing support through complementary polices such as the EISA Section 136 retooling loans.

Strong standards will do the most to cut our nation's oil dependence and carbon pollution, improve our security, and keep billions of dollars in our economy annually instead of sending it overseas for oil. Strong standards will put automotive engineers and production workers on the job, supplying ingenuity for cleaner, more fuel-efficient vehicles.

Union of Concerned Scientists
Citizens and Scientists for Environmental Solutions

NRDC
The Earth's Best Defense

GO60 mpg
60 MPG BY 2025

SAVING MONEY AT THE GAS PUMP

State-by-State Consumer Savings from Stronger Fuel Efficiency and Carbon Pollution Standards

Making our cars and trucks go farther on a gallon of gasoline is a powerful way to save Americans more than $44 billion annually at the gas pump, reduce carbon pollution, and cut oil dependence. Fuel-saving technology, such as more efficient engines, smarter transmissions, better aerodynamics, and high-strength lightweight materials can make all vehicles get better fuel efficiency and emit less tailpipe carbon pollution.

Upcoming Standards Will Improve Fuel Economy and Cut Carbon Pollution

Right now, the Obama Administration is taking action to strengthen fuel efficiency and carbon pollution standards for new vehicles sold in the United States. In July, President Obama directed the U.S. Department of Transportation (DOT) and Environmental Protection Agency (EPA) to establish joint fuel efficiency and pollution standards for new cars and trucks that will reach the equivalent of 54.5 miles per gallon (mpg) and emit 163 grams of carbon dioxide per mile (g/mi) in 2025. The new standards are fleet average requirements, which mean that some vehicles would have higher fuel efficiency and some would be lower.

The standards are also pegged to specific laboratory tests instead of real-world driving conditions. In 2025, cars and trucks will average closer to 40 miles per gallon in actual driving, which is nearly double today's on-road average of 22 mpg.

Raising fuel efficiency standards to 54.5 mpg and setting a 163 g/mi standard will deliver significant economic, environmental, and national security benefits. It will save 23 billion gallons of oil in 2030 and reduce heat-trapping carbon pollution by 280 million metric tons – the equivalent of having 40 million fewer vehicles on the road in that year.

Consumers in All States Save Money

In addition to the oil savings and clean air benefits, increasing the fuel efficiency of new vehicles will mean American consumers will spend less at the gas pump. Over the life of a new vehicle, consumers could keep thousands of additional dollars in their pocketbooks instead of spending them on gas—and that's even after accounting for the cost of the fuel-saving technology. In fact, for most consumers who finance the purchase of a new vehicle, the fuel savings will be greater than the additional cost of the loan from the moment they drive off the lot. The *net* consumer savings by both state and household are show in the following table:

Table 1: Annual Consumer Savings of Proposed 2017-2025 Standards on Transportation Fuel Bills in 2030, by State and Household

State	Fuel Savings (million gallons)	Total State Fuel Bill Net Savings ($ millions)	Fuel Bill Net Savings per Household	Carbon Pollution Reductions (Thousands of metric tons CO_2-e)
Alabama	366	$737	$387	4,335
Alaska	52	$96	$312	610
Arizona	733	$1,536	$387	8,675
Arkansas	258	$535	$423	3,050
California	2,668	$4,954	$314	31,585
Colorado	412	$825	$370	4,880
Connecticut	239	$457	$324	2,825
Delaware	71	$139	$360	840
District of Columbia	35	$70	$374	410
Florida	2,098	$4,223	$371	24,835
Georgia	814	$1,607	$364	9,635
Hawaii	83	$153	$313	975
Idaho	132	$270	$378	1,560
Illinois	759	$1,190	$240	8,985
Indiana	400	$631	$241	4,730
Iowa	199	$351	$302	2,360
Kansas	195	$356	$314	2,305
Kentucky	345	$705	$393	4,080
Louisiana	363	$739	$415	4,300
Maine	97	$189	$329	1,145
Maryland	484	$960	$365	5,730
Massachusetts	457	$881	$327	5,405
Michigan	622	$976	$240	7,365
Minnesota	417	$767	$316	4,940
Mississippi	219	$451	$396	2,590
Missouri	433	$793	$314	5,130
Montana	77	$153	$368	905
Nebraska	122	$219	$309	1,440
Nevada	297	$629	$391	3,515
New Hampshire	107	$210	$332	1,265
New Jersey	504	$727	$204	5,960
New Mexico	145	$293	$374	1,710
New York	1,022	$1,485	$205	12,095
North Carolina	877	$1,768	$372	10,385
North Dakota	42	$74	$303	490
Ohio	691	$1,058	$234	8,180

Oklahoma	311	$635	$417	3,675
Oregon	319	$605	$321	3,770
Pennsylvania	701	$991	$200	8,290
Rhode Island	76	$148	$330	900
South Carolina	363	$718	$365	4,295
South Dakota	53	$94	$307	625
Tennessee	557	$1,148	$396	6,595
Texas	2,411	$5,024	$425	28,550
Utah	202	$408	$373	2,390
Vermont	48	$92	$326	560
Virginia	691	$1,366	$365	8,180
Washington	562	$1,060	$319	6,655
West Virginia	129	$253	$361	1,525
Wisconsin	365	$571	$239	4,320
Wyoming	38	$73	$358	445
U.S. Aggregate	23,660	$44,394	$330	280,000

Methodology: Calculating Consumer Fuel Savings

Consumers save money by driving vehicles that go farther on a gallon of gas. Lower fuel consumption results in lower fuel expenditures and less pollution. Cleaner, more efficient vehicles require new fuel-saving technologies and we account for the additional costs of these technologies in our savings calculations. The incremental costs are modest, however, when compared to the fuel savings so consumers end up with the large net savings shown in Table 1 above.

We calculate the savings to households in 2030 by taking the difference in the cost of driving a fleet made up primarily of vehicles that meet fuel efficiency and carbon pollution standards established through model year 2016[1] of 35.5 mpg and 250 g/mi (base case) and the cost of purchasing and driving more efficient vehicles that reach a fleet average of 54.5 mpg and 163 g/mi (higher efficiency case).

The assumption about the fuel efficiency and emissions of the fleet in 2030 presumes the standards remain in place and unchanged from 2025 to 2030. Our calculations of fleet fuel efficiency account for the fact that the real-world on-road mileage is about 27 percent lower than the standards.

The cost of driving is simply the product of fuel consumption and fuel prices. For both the base and higher efficiency vehicle cases, we start with gasoline prices as projected by the Energy Information Administration (EIA). When calculating the transportation cost of the more efficient fleet, however, we adjust the cost to include a modest fuel price decrease because a reduction in U.S. oil demand puts downward pressure on world oil prices, and therefore state gas prices. It should be noted that, even without the cost-reduction effect, all states have substantial net savings.

Fuel consumption for the base and higher efficiency cases is determined by dividing EIA mileage projections by projections of on-road vehicle efficiency (in miles per gallon), which come out of a

[1] EPA/NHTSA Light-Duty Vehicle Greenhouse Gas Emission Standards and Corporate Average Fuel Economy Standards for MY2012-MY2016 finalized on April 1, 2010.

national vehicle stock turnover model. For this analysis, the 2030 national consumption is then allocated to states in proportion to state-level household projections. State-level fuel costs are calculated by multiplying a state's consumption by the gasoline prices for that state's region. Finally, average state household costs are determined by dividing state costs by 2030 household projections from Census data.

Reductions in carbon pollution in 2030 are determined with a national stock model and are allocated to states in accordance to the fuel consumption in the region and the state-level household projections.

Detailed Assumptions

Fuel Prices

State gasoline prices for the base case are assumed to equal the prices for the region in which the state is located, as reported by the regional data of EIA's *Annual Energy Outlook 2011*.[2] In the higher efficiency case, those base case gasoline prices are adjusted downward to reflect the fact that changes in U.S. oil demand can affect world oil prices and therefore U.S. gasoline prices. Today, the U.S. consumes nearly a quarter of world daily production and a reduction in demand from driving more efficient vehicles will lower worldwide demand and therefore oil prices. We adopt the EPA/NHTSA estimates that the drop in fuel prices due to the new standards is equivalent to $0.28 per gallon.[3] However, as mentioned above, even with this price reduction excluded from the analysis, households in all states still save money on their monthly fuel bills in 2030.

Vehicle Costs

The technology to make more efficient vehicles increases the price of the vehicles. For the higher efficiency case, we assume that MY 2025 – MY 2030 vehicles reaching a fleet average of 54.5 mpg-equivalent will cost $2030 more than vehicles that reach the MY 2016 35.5 mpg-equivalent standard in the base case. To the incremental technology cost, we add sales tax and insurance using EPA estimates for a total incremental cost of about $2178.[4]

We also assume that the incremental cost is not paid for entirely upfront but is included in a 5-year loan with a 7 percent interest rate. We allocate the more efficient vehicle incremental costs to individual states according to an estimate of new vehicles sales in each state in 2030. We use the EIA *Annual Energy Outlook 2011* projection of national sales and assign each state a share of the sales according its projected fraction of national households in 2030.

For Further Information:

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[2] Available at http://www.eia.doe.gov/oiaf/aeo/index.html. Using motor gasoline retail prices.
[3] EPA/NHTSA MY2012-2016 Final Rule, Table III.H.8-1. Assumes 42 gallons per barrel.
[4] EPA/NHTSA MY2012-2016 Final Rule, Tables I.C.2-6 and III.H.5-3.

Final Report

Consumer Reports Fuel Economy Poll

November 2011

CU Project #2012. 51

Methodology

- Telephone surveys utilizing a random probability sample of telephone households were conducted among 1,008 adults to assess their behaviors and attitudes regarding fuel economy.

- Interviewing took place over October 28- October 31, 2011.

- The questionnaire was fielded via Opinion Research Corporation's Caravan twice-weekly national telephone omnibus survey.
  - ✓ ORC used a probability sample of telephone households to achieve a nationally representative probability sample and weighted completed interviews by age, sex, geographic region and race.

- The results of this study are intended for external communications. Methodology statement for public release:
  - ✓ The Consumer Reports National Research Center conducted a telephone survey of a nationally representative probability sample of telephone households. 1,008 interviews were completed among adults aged 18+. Interviewing took place over October 28- October 31, 2011.
    - ⇨ The margin of error is +/- 3.1% points at a 95% confidence level.

Household Car Ownership

- Consistent with our findings in April 2011, most (84%) consumers indicate that they currently live in households with at least one vehicle.
  - ✓ As would be expected those with higher income levels are more likely to live in a household with at least one vehicle.
  - ✓ Those who live in the West region are significantly more likely to live in a household with at least one vehicle.

K1 - Does your household own one or more cars?

	Total	GENDER		AGE			INCOME			REGION			
	Sample	Male	Female	18-34	35-54	55+	< $40k	$40 -$74k	$75k+	NEast	NCentral	South	West
Unweighted Base-->	(1,008)	(513)	(495)	(95)	(326)	(574)	(401)	(277)	(160)	(183)	(225)	(372)	(228)
	%	%	%	%	%	%	%	%	%	%	%	%	%
Yes	84	85	83	81	86	84	74	91	95	80	84	82	90
No	16	15	17	19	14	16	26	9	5	20	16	18	10

Type of Vehicle Driven Most Often

- Sedans (24%) and small cars (19%) are the most popular types of cars driven. Small cars are especially prominent among:
  - ✓ Age 18-34 and Age 55+
  - ✓ HH income < $40k

- Over one quarter (26%) of consumers drive an SUV most often, particularly:
  - ✓ Women
  - ✓ Age 35-54
  - ✓ HH income >$75k

K2 - What type is the car that you drive most often?

Base: Consumers who live in households with at least one car

	Total	GENDER		AGE			INCOME			REGION				MILES DRIVEN PER DAY		
	Sample	Male	Female	18-34	35-54	55+	< $40k	$40 -$74k	$75k+	NEast	NCentral	South	West	< 20	20-49	50+
Unweighted Base-->	(867)	(448)	(419)	(78)	(286)	(493)	(314)	(252)	(153)	(146)	(194)	(320)	(207)	(384)	(298)	(155)
	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%
Sedan	24	25	23	23	22	27	25	24	25	24	27	22	26	26	24	25
Small car	19	15	23	29	12	19	25	15	11	16	17	23	16	22	15	16
Pickup	13	17	9	5	14	18	14	16	8	7	15	14	14	11	14	11
Small SUV	9	6	13	10	10	8	6	7	14	11	10	11	6	9	10	10
Midsize SUV	9	7	11	5	13	8	6	10	17	10	8	8	12	8	9	15
Minivan	9	11	8	6	12	8	11	9	7	13	8	7	11	9	10	8
Large SUV	7	7	7	9	7	6	5	7	8	8	5	8	5	5	9	7
Sporty car	4	5	3	10	2	3	3	7	2	7	5	1	5	2	6	5
Wagon	2	2	1	2	2	1	2	1	3	2	2	3	1	1	3	3
Convertible	1	2	1	1	3	1	1	1	3	1	1	1	2	2	1	1
Don't drive	2	2	1	1	2	2	1	2	2	3	1	1	3	4		

Average Number of Miles Driven Per Day

- On average car owners drive 31.7 miles per day with 21% who indicate they drive 50 or more miles per day.

- Those who drive the most miles per day are:
  - ✓ Males – 25% drive 50+ miles per day
  - ✓ Age 18-34 – 29% drive 50+ miles per day
  - ✓ Age 35-54 – 24% drive 50+ miles per day
  - ✓ HH Income $75k+ – 33% drive 50+ miles per day

K3 - How many miles do you drive in a typical day?

Base: Consumers who live in households with at least one car

	Total	GENDER		AGE			INCOME			REGION				MILES DRIVEN PER DAY		
	Sample	Male	Female	18-34	35-54	55+	< $40k	$40 -$74k	$75k+	NEast	NCentral	South	West	< 20	20-49	50+
Unweighted Base-->	(867)	(448)	(419)	(78)	(286)	(493)	(314)	(252)	(153)	(146)	(194)	(320)	(207)	(384)	(298)	(155)
	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%
Average # of miles	*31.7*	*32.8*	*30.6*	*41.6*	*33.1*	*22.8*	*28.1*	*34.6*	*38.5*	*28.8*	*32.4*	*31.5*	*33.5*	*7.9*	*28.7*	*84.2*
None	5	4	6	5	5	6	7	5	3	8	4	5	5	13		
1-9	14	11	16	7	14	18	17	11	5	13	18	11	13	33		
10-19	22	22	22	22	15	29	21	20	25	20	22	21	25	54		
20-29	16	14	17	7	20	18	15	17	16	19	15	15	15		46	
30-49	18	20	17	27	19	11	19	21	18	12	18	22	18		54	
50-99	15	17	12	19	17	9	11	16	23	17	13	15	13			69
100+	6	8	5	10	7	3	4	6	10	4	8	6	7			31
Don't know	4	3	4	4	3	6	5	3	1	6	2	4	4			

Amount of Driving Compared to Last Year

- Consumers are cutting down on the amount of driving they are doing with nearly one quarter (24%) who indicate they are driving less, compared with only 14% who report driving more than one year ago.
  - ✓ Those who are most likely to have cut back are:
    - ⇨ Age 35-54 (26%)
    - ⇨ Age 55+ (33%)

K4 - Compared to a year ago, are you driving more, less or the same amount in a typical day?
Base: Consumers who live in households with at least one car

	Total	GENDER		AGE			INCOME			REGION				MILES DRIVEN PER DAY		
	Sample	Male	Female	18-34	35-54	55+	< $40k	$40 -$74k	$75k+	NEast	NCentral	South	West	< 20	20-49	50+
Unweighted Base-->	(867)	(448)	(419)	(78)	(286)	(493)	(314)	(252)	(153)	(146)	(194)	(320)	(207)	(384)	(298)	(155)
	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%
Driving more	14	16	13	34	12	3	16	13	14	14	17	12	16	8	19	18
Driving less	24	25	24	13	26	33	28	21	21	27	23	25	23	27	24	20
Driving the same amount	59	58	61	53	60	62	55	64	64	56	59	62	59	60	57	62
Don't drive	2	2	1	1	2	2	1	2	2	3	1	1	3	4		
Don't know	0	0	0			0					0	0				

Next Vehicle Purchase

- Small cars (21%) and Sedans (18%) continue to lead the list in terms of the next car purchase. Small cars are a particularly popular consideration among:
  - ✓ Females (26%)
  - ✓ Households with income <$40k (29%)
- Males are equally considering Sedans (21%) and Pick-ups (20%).

K5 - Thinking about your NEXT vehicle purchase, what type are you most likely to buy?

Base: Consumers who live in households with at least one car

	Total	GENDER		AGE			INCOME			REGION				MILES DRIVEN PER DAY		
	Sample	Male	Female	18-34	35-54	55+	< $40k	$40 -$74k	$75k+	NEast	NCentral	South	West	< 20	20-49	50+
Unweighted Base-->	(867)	(448)	(419)	(78)	(286)	(493)	(314)	(252)	(153)	(146)	(194)	(320)	(207)	(384)	(298)	(155)
	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%
Small car	21	17	26	28	18	20	29	23	6	23	26	21	16	24	18	18
Sedan	18	21	16	19	16	19	18	18	22	21	23	14	19	19	21	15
Pickup	13	20	7	7	14	18	16	12	12	9	13	14	15	15	13	11
Midsize SUV	12	9	14	12	12	10	8	14	18	9	8	16	10	7	15	15
Small SUV	10	7	13	7	13	9	7	10	15	11	6	11	11	11	8	11
Minivan	8	8	8	7	9	7	10	9	2	12	6	7	7	9	7	9
Don't know	8	8	7	1	8	10	7	3	6	5	8	7	10	8	6	7
Large SUV	5	5	5	11	5	2	2	7	10	6	5	6	4	3	6	9
Sporty car	3	4	2	5	2	3	3	3	3	3	3	2	5	3	3	5
Convertible	1	1	1	2	1	0		2	2	0	1	1	2	1	2	1
Wagon	1	1	1		1	0	1		3		0	1	1	1	0	
Don't know	8	8	7	1	8	10	7	3	6	5	8	7	10	8	6	7

Better Fuel Economy in Future

- Nearly two-thirds of consumers who have at least one car expect their next vehicle purchase to have better fuel economy.
  - ✓ Few consumers expect to have worse fuel economy on their next vehicle.

K6 - Relative to your current vehicle, for this next car do you expect to choose a model with...
Base: Consumers who live in households with at least one car

	Total	GENDER		AGE			INCOME			REGION				MILES DRIVEN PER DAY		
	Sample	Male	Female	18-34	35-54	55+	< $40k	$40 -$74k	$75k+	NEast	NCentral	South	West	< 20	20-49	50+
Unweighted Base-->	(867)	(448)	(419)	(78)	(286)	(493)	(314)	(252)	(153)	(146)	(194)	(320)	(207)	(384)	(298)	(155)
	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%
BETTER FUEL ECONOMY (NET)	64	67	61	70	64	62	71	60	56	67	63	59	70	61	68	68
Much better fuel economy	40	40	39	43	42	35	52	33	26	45	34	39	42	42	38	42
Somewhat better fuel economy	24	27	22	26	21	27	19	28	29	22	29	20	28	19	30	25
About the same fuel economy	29	26	32	21	31	32	24	34	35	27	30	33	23	36	24	23
WORSE FUEL ECONOMY (NET)	4	4	4	7	4	2	2	5	7	3	4	4	4	1	5	6
Somewhat worse fuel economy	3	2	4	7	1	1	1	4	4	3	2	3	4	0	4	4
Much worse fuel economy	1	2	0		2	0	1	1	3		3	1	0	0	2	2
Don't know	3	3	3	2	1	5	3	1	3	3	2	3	2	3	2	3

Motivations for a More Fuel Efficient Vehicle

- Lower fuel cost (89%) is the primary motivation among those who plan to purchase a more fuel efficient vehicle.
  - ✓ Environmentally friendly or green (72%) is also a strong motivator.

K7_01 - Which of the following are your motivations for choosing a more fuel efficient vehicle? -
Base: Consumers who expect their vehicle to have better fuel economy then current vehicle

	Total	GENDER		AGE			INCOME			REGION				MILES DRIVEN PER DAY		
	Sample	Male	Female	18-34	35-54	55+	< $40k	$40 -$74k	$75k+	NEast	NCentral	South	West	< 20	20-49	50+
Unweighted Base-->	(556)	(289)	(267)	(53)	(187)	(311)	(220)	(156)	(85)	(100)	(118)	(190)	(148)	(246)	(198)	(98)
	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%
Lower fuel costs	89	89	89	84	92	90	88	90	88	94	92	94	78	90	89	88
Environmentally friendly or green	72	70	75	71	74	71	75	68	73	65	68	76	75	79	70	62
Newer technology	65	69	60	57	66	69	60	70	75	75	58	66	61	68	64	61
Concern about dependence on foreign oil	55	51	60	43	58	61	55	59	51	47	61	58	52	60	61	42
Higher resale value	49	52	45	46	47	52	48	50	44	51	52	48	45	50	47	45
Other	3	1	4		1	5	3	1	3	3	1	4	2	4	2	
Don't know/none of these	1	1	0		1	1	0		3		1	1	1	1	0	2

Willing to Do to Save Amount Spent on Fuel

- Reducing the amount spent of fuel is on the minds of most car owners as 87% are willing to do something in order to decrease their consumption.
  - ✓ Nearly three quarters (74%) would be willing to change their car purchasing behavior including 54% who are willing to pay more for a more fuel-efficient vehicle.
  - ✓ Two-thirds are willing to change their driving behavior with over half (52%) who are willing to drive less.
    - ⇨ Those most likely to change their driving behavior are those Age 18-34 (79%) and those in households with income < $40k (76%).

K8_01 - When choosing your next car, what would you be willing to do in order to reduce the amount you spend on fuel?
Base: Consumers who live in households with at least one car

	Total	GENDER		AGE			INCOME			REGION				MILES DRIVEN PER DAY		
	Sample	Male	Female	18-34	35-54	55+	< $40k	$40 -$74k	$75k+	NEast	NCentral	South	West	< 20	20-49	50+
Unweighted Base-->	(867)	(448)	(419)	(78)	(286)	(493)	(314)	(252)	(153)	(146)	(194)	(320)	(207)	(384)	(298)	(155)
	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%
Purchasing Behavior (NET)	74	70	78	77	80	67	78	73	77	80	69	74	74	73	75	77
Pay extra to purchase a more fuel-efficent vehicle	54	52	56	58	58	46	52	55	62	58	49	53	58	49	60	58
Purchase a smaller car	46	41	51	50	48	43	54	44	38	48	41	49	45	47	45	42
Purchase a vehicle that doesn't require gasoline	39	42	35	45	44	28	39	40	44	47	31	34	46	38	40	42
Change Driving Behavior (NET)	66	62	71	79	63	62	76	62	54	68	67	65	67	70	65	61
Drive less	52	48	55	65	46	49	63	48	35	52	50	55	48	56	49	43
Carpool	36	34	37	54	37	19	41	29	34	40	36	32	37	36	35	35
Walk or bike more often	35	33	38	51	35	25	40	34	26	40	37	29	39	40	33	27
Take public transit	25	29	21	38	24	16	29	20	25	29	17	25	28	25	23	24
Other	1	2	1	2	1	2	1	2		1	4	0	1	3	1	
Don't know/None of these	13	16	10	11	12	16	10	16	14	12	13	15	12	12	14	14

Power Types Considered for Next Vehicle

- Over half of car owners indicate they would consider alternative power types including hybrid or electric for their next vehicle.
  - ✓ Those who are most likely to consider these types are:
    - ⇨ Younger: Age 18-34 (64%) and Age 35-54 (60%)
    - ⇨ West Region (64%)
    - ⇨ Northeast Region (63%)

K9_01 - What power types are you considering for your next vehicle?

Base: Consumers who live in households with at least one car

	Total	GENDER		AGE			INCOME			REGION				MILES DRIVEN PER DAY		
	Sample	Male	Female	18-34	35-54	55+	< $40k	$40 -$74k	$75k+	NEast	NCentral	South	West	< 20	20-49	50+
Unweighted Base-->	(867)	(448)	(419)	(78)	(286)	(493)	(314)	(252)	(153)	(146)	(194)	(320)	(207)	(384)	(298)	(155)
	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%
Conventional gasoline	76	74	77	76	77	75	76	79	77	72	82	77	71	78	75	79
Hybrid/Electric/Hydrogen Fuel (NET)	56	59	52	64	60	45	57	58	60	63	48	51	64	55	61	53
Hybrid	46	46	46	48	53	37	43	50	53	53	36	42	54	43	51	47
Electric	32	37	26	41	34	21	34	31	37	31	31	30	35	32	35	28
Hydrogen fuel cell	24	31	16	35	24	15	25	26	22	24	19	22	31	23	24	26
Flex-fuel, runs on gasoline or ethanol fuel	46	49	43	51	48	40	53	45	40	46	41	52	42	46	48	48
Natural gas or propane	25	29	21	26	25	26	26	29	21	19	21	27	30	24	27	23
Diesel	16	25	7	23	17	11	15	15	24	14	11	18	20	14	17	19
Don't know	4	3	5	3	3	6	4	2	2	4	3	3	7	4	3	5

Type of Hybrid or Electric Vehicle Being Considered

- A Traditional hybrid (41%) is the most common hybrid being considered, particularly among females (53%).
  - ✓ One quarter of males indicate that they would most likely consider purchasing a hydrogen fuel cell vehicle.

K11 - What type of hybrid or electric vehicle are you MOST LIKELY to consider purchasing?
Base: Consumers who would be interested in purcahsing a hybrid or electric vehicle

	Total	GENDER		AGE			INCOME			REGION			
	Sample	Male	Female	18-34	35-54	55+	< $40k	$40 -$74k	$75k+	NEast	NCentral	South	West
Unweighted Base-->	(463)	(246)	(217)	(51)	(178)	(231)	(162)	(139)	(91)	(82)	(93)	(157)	(131)
	%	%	%	%	%	%	%	%	%	%	%	%	%
Traditional hybrid (such as a Toyota Prius)	41	32	53	36	47	38	42	36	42	40	47	36	45
Plug-in hybrid (such as a Chevrolet Volt)	22	24	20	23	19	27	26	24	16	19	22	28	18
Hydrogen fuel cell, an electric car that is fueled with hydrogen	17	25	7	19	17	14	9	17	27	17	18	18	13
Pure electric, all electric without a gasoline engine (such as a Nissan Leaf)	12	11	13	17	10	10	16	11	10	13	8	10	16
Don't know	8	8	8	5	8	11	8	11	5	11	4	7	9

Motivations for Choosing Alternative Fuel Vehicle

- The most popular motivations among those who are considering an alternative fuel vehicle are:
  - ✓ Lower fuel costs
  - ✓ Lower emissions/pollutants
  - ✓ Environmentally friendly or green

K12_01 - Which of the following are your motivations for choosing an alternative fuel vehicle?

Base: Consumers who indicated they are considering hybrid, electric or hydrogen fuel cell for their next vehicle

	Total	GENDER		AGE			INCOME			REGION				MILES DRIVEN PER DAY		
	Sample	Male	Female	18-34	35-54	55+	< $40k	$40 -$74k	$75k+	NEast	NCentral	South	West	< 20	20-49	50+
Unweighted Base-->	(463)	(246)	(217)	(51)	(178)	(231)	(162)	(139)	(91)	(82)	(93)	(157)	(131)	(204)	(173)	(77)
	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%
Lower fuel costs	89	87	93	81	95	90	90	89	87	87	94	93	84	87	91	93
Lower emissions/pollutants	86	88	84	83	87	86	85	84	85	84	85	89	84	86	86	86
Environmentally friendly or green	85	83	87	88	86	83	85	87	84	85	85	87	82	84	84	88
Investing in clean energy	84	82	86	82	86	84	89	82	82	77	86	87	84	83	85	83
Stable fuel costs	83	84	82	75	87	84	83	80	84	85	84	87	76	81	82	87
Ability to refuel at home	76	77	75	71	80	76	81	79	67	68	78	83	72	77	73	81
New technology	75	78	73	70	79	76	76	78	68	72	77	80	71	69	79	79
Concern about dependence on foreign oil	71	68	73	57	80	70	66	72	72	64	75	75	67	68	76	66
Smooth acceleration and quiet operation	69	66	73	62	74	72	74	68	63	62	68	79	64	67	69	74
Higher resale value	59	59	59	58	61	59	66	57	51	64	67	58	52	58	57	63
Other	0	0	0			1		0	1	1	0	0			0	1
Don't know	1	0	2	3		0	2					3		0	2	

Power Types Considered if Availability Improves

- If availability improves over the next 15 years, consumers are even more likely (72%) to consider a hybrid, electric or hydrogen fuel vehicle.

K10_01 - If the availability of various power types improves over the next 15 years, which power train would you be interested in purchasing?

Base: Consumers who live in households with at least one car

	Total	GENDER		AGE			INCOME			REGION				MILES DRIVEN PER DAY		
	Sample	Male	Female	18-34	35-54	55+	< $40k	$40 -$74k	$75k+	NEast	NCentral	South	West	< 20	20-49	50+
Unweighted Base-->	(867)	(448)	(419)	(78)	(286)	(493)	(314)	(252)	(153)	(146)	(194)	(320)	(207)	(384)	(298)	(155)
	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%
Hybrid/Electric/Hydrogen Fuel (NET)	72	78	67	76	80	63	68	77	84	81	71	66	76	68	77	75
Hybrid	58	58	58	57	67	49	52	65	67	64	56	54	61	54	65	58
Electric	51	55	46	57	57	40	50	51	60	54	54	47	51	50	53	53
Hydrogen fuel cell	43	54	32	55	46	32	39	45	55	40	43	40	50	40	44	50
Conventional gasoline	65	63	68	65	69	63	69	67	67	66	66	69	59	64	68	69
Flex-fuel, runs on gasoline or ethanol fuel	54	55	53	62	59	44	57	53	55	56	57	54	50	53	59	55
Natural gas or propane	40	47	33	40	42	40	37	42	49	35	37	46	38	40	38	44
Diesel	25	33	17	34	26	17	21	28	35	20	24	28	24	20	28	31
Don't know	4	4	5	4	3	6	3	2	5	6	5	4	4	5	3	3

Level of Concern
Top 2 Box – 5 Point Scale

- Consumers who have at least one car indicate that the Price of Gasoline (79%) is their number one concern followed closely by America's Reliance on Foreign Oil (72%).
  - ✓ Consumers Age 55+ and those living in the North Central region are equally concerned with the Price of Gasoline and America's Reliance on Foreign Oil.

K13 - On a scale of 1 to 5, please rate your level of concern for each of the following *Base: Consumers who live in households with at least one car*																
TOP 2 BOX CONCERNED																
	Total	GENDER		AGE			INCOME			REGION				MILES DRIVEN PER DAY		
	Sample	Male	Female	18-34	35-54	55+	< $40k	$40 -$74k	$75k+	NEast	NCentral	South	West	< 20	20-49	50+
Unweighted Base-->	(867)	(448)	(419)	(78)	(286)	(493)	(314)	(252)	(153)	(146)	(194)	(320)	(207)	(384)	(298)	(155)
	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%
Price of Gasoline	79	75	83	80	79	78	84	77	68	81	78	80	76	78	79	80
American Reliance on Foreign Oil	72	67	77	64	72	77	70	72	72	76	77	74	62	70	72	74
Air Pollution	66	60	72	65	67	66	71	67	55	59	65	68	70	67	67	61
Amount of Oil Consumption in the U.S.	62	58	67	53	67	65	63	71	49	63	64	66	55	61	66	58
Lack of Public Transportation Options	41	40	43	42	43	40	44	38	39	36	36	46	43	45	43	34

Boxes indicates parity with top scoring at 95% confidence level.

Agreement with Policies

Top 2 Box – 4 Point Scale

K14 - Level of agreement with each of the following statements

Base: Consumers who live in households with at least one car

TOP 2 BOX AGREEMENT	Total	GENDER		AGE			INCOME			REGION				MILES DRIVEN PER DAY		
	Sample	Male	Female	18-34	35-54	55+	< $40k	$40 -$74k	$75k+	NEast	NCentral	South	West	< 20	20-49	50+
Unweighted Base-->	(867)	(448)	(419)	(78)	(286)	(493)	(314)	(252)	(153)	(146)	(194)	(320)	(207)	(384)	(298)	(155)
	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%
Fuel efficiency standards for all vehicles should be improved	93	90	95	90	95	93	95	92	92	96	91	92	93	93	95	87
Auto manufacturers should offer a greater variety of cleaner, more fuel efficient vehicles in the near future	91	89	93	94	93	87	93	88	89	90	92	92	90	92	93	88
Fuel economy standards should require auto manufacturers to increase the overall fleet average to at least 35 miles	86	82	90	87	86	86	90	89	80	86	85	85	89	88	89	78
I am willing to pay extra for a more fuel efficient vehicle if I can recover the additional cost through lower fuel costs	83	81	85	85	83	82	79	86	86	90	82	81	82	84	85	77
The U.S. should adopt a national goal of dramatically reducing oil consumption	81	79	83	80	84	78	83	82	75	87	78	78	83	80	82	80
I am willing to pay extra for a more fuel efficient vehicle if it will lower my	81	78	83	76	85	78	78	83	80	83	79	77	86	77	82	85
Fuel economy standards should require auto manufacturers to increase the overall fleet average to at least 55 miles	80	75	85	83	81	76	85	83	67	80	80	77	83	84	82	72
Consumers should receive incentives like rebates or tax credits to buy more fuel efficient or alternative fuel vehicles	80	75	85	87	80	75	85	82	72	82	78	80	79	80	80	77
Car manufacturers should produce more fuel efficient vehicles, and the government should increase standards	77	71	83	82	79	72	81	79	70	77	78	74	81	80	78	70

Boxes indicates parity with top scoring at 95% confidence level.

Full Data Tables
K13-K14

K13 A-C: On a scale of 1 to 5, please rate your level of concern for each of the following issues

	Total	GENDER		AGE			INCOME			REGION				MILES DRIVEN PER DAY		
	Sample	Male	Female	18-34	35-54	55+	< $40k	$40 -$74k	$75k+	NEast	NCentral	South	West	< 20	20-49	50+
Unweighted Base-->	(867)	(448)	(419)	(78)	(286)	(493)	(314)	(252)	(153)	(146)	(194)	(320)	(207)	(384)	(298)	(155)
AIR POLLUTION	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%
Top 2 Box	66	60	72	65	67	66	71	67	55	59	65	68	70	67	67	61
Extremely concerned	47	42	51	43	45	52	59	40	31	49	41	49	47	51	44	42
4	19	18	20	23	23	14	13	27	24	10	24	19	23	16	23	19
3	18	19	17	16	20	17	15	17	23	24	18	19	12	17	20	20
2	6	8	5	7	7	5	7	4	9	10	6	4	7	7	5	6
Not at all concerned	9	13	6	12	6	11	7	12	14	7	10	10	10	9	7	13
Don't know	0	0	0			1	0	0		1	1		0	0	0	
AMERICAN RELIANCE ON FOREIGN OIL	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%
Top 2 Box	72	67	77	64	72	77	70	72	72	76	77	74	62	70	72	74
Extremely concerned	57	51	63	39	58	68	61	57	50	57	56	65	45	53	59	56
4	15	16	15	24	14	9	10	16	22	19	20	9	17	16	14	18
3	16	18	15	18	20	12	17	15	20	8	17	15	23	16	17	17
2	5	7	3	10	4	3	6	5	4	9	2	3	9	7	5	1
Not at all concerned	6	8	4	8	4	7	8	7	4	6	4	8	6	6	5	8
Don't know	0		1		0	1		1			1		1	1		
LACK OF PUBLIC TRANSPORTATION	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%
Top 2 Box	41	40	43	42	43	40	44	38	39	36	36	46	43	45	43	34
Extremely concerned	28	27	28	25	28	29	32	26	19	30	23	35	20	33	28	20
4	14	12	15	17	15	11	12	12	19	7	13	11	23	12	15	14
3	22	19	26	25	22	20	24	22	24	27	21	24	18	19	24	24
2	13	15	10	15	13	10	11	12	16	14	15	11	11	11	12	16
Not at all concerned	23	26	20	18	21	28	21	26	21	22	27	19	26	24	20	25
Don't know	1	0	1		0	2	0	1	0		1	0	2	1	1	0

K13 D-E: On a scale of 1 to 5, please rate your level of concern for each of the following issues

	Total	GENDER		AGE			INCOME			REGION				MILES DRIVEN PER DAY		
	Sample	Male	Female	18-34	35-54	55+	< $40k	$40 -$74k	$75k+	NEast	NCentral	South	West	< 20	20-49	50+
Unweighted Base-->	(867)	(448)	(419)	(78)	(286)	(493)	(314)	(252)	(153)	(146)	(194)	(320)	(207)	(384)	(298)	(155)
PRICE OF GASOLINE	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%
Top 2 Box	79	75	83	80	79	78	84	77	68	81	78	80	76	78	79	80
Extremely concerned	62	57	67	58	62	64	71	60	44	67	62	65	54	61	61	63
4	17	18	16	23	17	14	13	18	23	14	16	15	23	17	18	18
3	14	16	12	10	16	14	8	16	25	10	16	11	18	13	15	14
2	3	4	3	6	2	3	3	3	5	1	3	5	3	4	4	2
Not at all concerned	3	5	2	3	2	5	5	4	2	7	3	3	2	5	2	4
Don't know	0	0	0		0	1	0		1	0	0	0		0	0	
AMOUNT OF OIL CONSUMPTION IN US	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%
Top 2 Box	62	58	67	53	67	65	63	71	49	63	64	66	55	61	66	58
Extremely concerned	46	41	50	38	48	49	53	49	27	46	38	53	42	44	48	41
4	17	17	17	15	19	16	9	22	22	18	26	13	13	17	18	17
3	23	24	23	29	23	19	23	21	29	22	23	18	33	22	22	29
2	5	6	4	7	5	5	5	2	13	6	5	5	5	6	4	5
Not at all concerned	8	12	5	11	5	10	9	5	9	7	7	11	7	10	7	7
Don't know	1	0	1		1	2	0	1	1	2	1	0	0	1	0	1

K14 A-C: Level of agreement with each of the following statements

	Total	GENDER		AGE			INCOME			REGION				MILES DRIVEN PER DAY		
	Sample	Male	Female	18-34	35-54	55+	< $40k	$40 -$74k	$75k+	NEast	NCentral	South	West	< 20	20-49	50+
Unweighted Base-->	(867)	(448)	(419)	(78)	(286)	(493)	(314)	(252)	(153)	(146)	(194)	(320)	(207)	(384)	(298)	(155)
The U.S. should adopt a national goal of dramatically reducing oil consumption																
AGREE	81	79	83	80	84	78	83	82	75	87	78	78	83	80	82	80
Strongly agree	55	57	53	51	55	56	54	58	56	60	46	55	59	56	52	55
Somewhat agree	26	22	30	29	28	22	29	25	19	27	32	23	24	24	30	26
DISAGREE	18	20	16	18	16	20	15	17	25	12	21	20	16	18	17	20
Somewhat disagree	8	8	9	8	10	8	9	7	13	6	6	11	9	7	10	9
Strongly disagree	9	12	6	11	6	12	6	10	11	6	15	9	7	10	7	10
Don't know	1	1	1	2	1	2	2	0		1	1	2	1	2	1	
Fuel efficiency standards for all vehicles should be improved																
AGREE	93	90	95	90	95	93	95	92	92	96	91	92	93	93	95	87
Strongly agree	70	63	76	69	70	68	76	69	65	64	67	72	72	72	70	63
Somewhat agree	23	27	20	20	24	24	19	23	27	32	23	20	21	21	25	24
DISAGREE	7	9	5	8	5	7	4	8	8	3	9	7	7	5	5	13
Somewhat disagree	3	2	4	4	2	3	2	3	3	1	3	4	4	2	3	6
Strongly disagree	4	6	1	5	3	4	1	5	5	2	7	2	4	3	3	7
Don't know	1	1	0	2		0	1			1	0	1		1	0	
Car manufacturers should produce more fuel efficient vehicles, and the government should increase standards and enforce them																
AGREE	77	71	83	82	79	72	81	79	70	77	78	74	81	80	78	70
Strongly agree	51	52	50	53	51	49	52	56	45	58	46	48	53	52	52	47
Somewhat agree	26	20	33	29	28	23	28	22	26	19	32	26	28	28	26	24
DISAGREE	22	27	16	15	21	27	18	21	29	23	21	23	19	18	21	28
Somewhat disagree	7	9	6	3	8	10	6	9	12	9	6	6	9	8	6	9
Strongly disagree	14	18	11	13	14	16	13	12	18	14	15	17	10	10	15	20
Don't know	1	2	1	3	0	1	1	0	0		1	3	1	1	1	2

K14 D-F: Level of agreement with each of the following statements

	Total	GENDER		AGE			INCOME			REGION				MILES DRIVEN PER DAY		
	Sample	Male	Female	18-34	35-54	55+	< $40k	$40 -$74k	$75k+	NEast	NCentral	South	West	< 20	20-49	50+
Unweighted Base-->	(867)	(448)	(419)	(78)	(286)	(493)	(314)	(252)	(153)	(146)	(194)	(320)	(207)	(384)	(298)	(155)
Consumers should receive incentives like rebates or tax credits to buy more fuel efficient or alternative fuel vehicles																
AGREE	80	75	85	87	80	75	85	82	72	82	78	80	79	80	80	77
Strongly agree	50	46	54	51	53	45	57	52	44	50	47	51	51	48	53	46
Somewhat agree	30	29	31	36	26	30	28	30	28	32	31	29	28	32	27	30
DISAGREE	19	23	14	12	19	23	13	17	28	17	20	18	19	18	19	22
Somewhat disagree	6	7	6	3	6	10	5	8	8	4	5	5	10	6	6	8
Strongly disagree	12	16	8	9	13	14	8	9	19	13	14	13	9	11	13	14
Don't know	1	2	1	1	2	2	2	1	1	1	2	1	1	2	1	1
I am willing to pay extra for a more fuel efficient vehicle if it will lower my operating costs																
AGREE	81	78	83	76	85	78	78	83	80	83	79	77	86	77	82	85
Strongly agree	47	46	48	46	49	43	49	49	37	52	36	44	57	44	53	46
Somewhat agree	34	32	35	30	36	35	29	34	43	31	42	33	29	34	30	39
DISAGREE	18	21	16	21	15	21	19	17	20	16	21	22	12	22	17	12
Somewhat disagree	8	9	7	10	5	11	8	8	6	6	10	12	3	10	8	7
Strongly disagree	10	12	8	11	10	10	11	8	13	11	10	11	8	12	9	6
Don't know	1	1	1	2	0	1	2	0	0	1	1	0	2	1	0	2
I am willing to pay extra for a more fuel efficient vehicle if I can recover the additional cost through lower fuel costs within 5 years																
AGREE	83	81	85	85	83	82	79	86	86	90	82	81	82	84	85	77
Strongly agree	48	50	45	51	46	47	47	56	42	56	41	44	53	49	50	42
Somewhat agree	35	31	40	33	37	35	32	30	44	33	41	37	29	35	34	35
DISAGREE	15	17	13	12	16	18	17	13	14	9	17	17	15	14	14	21
Somewhat disagree	6	8	5	4	6	8	9	4	5	3	8	7	5	4	7	10
Strongly disagree	9	9	8	8	9	9	8	10	9	6	9	9	10	10	7	11
Don't know	2	2	2	4	2	1	3	1	0	1	1	2	3	2	1	2

K14 G-I: Level of agreement with each of the following statements

	Total	GENDER		AGE			INCOME			REGION				MILES DRIVEN PER DAY		
	Sample	Male	Female	18-34	35-54	55+	< $40k	$40 -$74k	$75k+	NEast	NCentral	South	West	< 20	20-49	50+
Unweighted Base-->	(867)	(448)	(419)	(78)	(286)	(493)	(314)	(252)	(153)	(146)	(194)	(320)	(207)	(384)	(298)	(155)
Level of agreement - Auto manufacturers should offer a greater variety of cleaner, more fuel efficient vehicles in the near future																
AGREE	91	89	93	94	93	87	93	88	89	90	92	92	90	92	93	88
Strongly agree	64	62	65	73	61	59	70	63	54	57	59	65	70	65	66	56
Somewhat agree	28	27	28	20	32	28	24	25	35	32	34	27	20	27	27	32
DISAGREE	8	9	6	4	7	11	5	11	11	9	6	7	10	7	6	11
Somewhat disagree	4	5	3	1	5	6	2	7	7	5	4	4	4	3	4	7
Strongly disagree	3	3	3	3	2	5	3	5	4	3	2	3	5	4	2	5
Don't know	1	2	1	2		2	2	0	0	1	1	1	1	2	1	0
Fuel economy standards should require auto manufacturers to increase the overall fleet average to at least 35 miles per gallon by 2016																
AGREE	86	82	90	87	86	86	90	89	80	86	85	85	89	88	89	78
Strongly agree	59	55	62	61	54	61	65	58	51	56	60	57	63	63	57	54
Somewhat agree	27	27	28	25	32	25	25	31	28	30	26	28	26	25	32	25
DISAGREE	12	16	8	11	13	12	8	11	19	13	14	13	9	11	10	19
Somewhat disagree	5	6	4	4	6	4	2	5	9	9	6	2	4	3	5	8
Strongly disagree	7	10	4	7	7	8	6	7	10	4	8	10	6	7	6	11
Don't know	2	2	1	2	1	2	2	0	1	1	1	2	2	1	1	2
Fuel economy standards should require auto manufacturers to increase the overall fleet average to at least 55 miles per gallon by 2025																
AGREE	80	75	85	83	81	76	85	83	67	80	80	77	83	84	82	72
Strongly agree	51	48	54	59	48	49	56	51	41	54	46	52	54	55	48	49
Somewhat agree	29	26	31	25	34	26	28	32	26	26	34	26	30	29	34	23
DISAGREE	19	24	13	17	18	23	14	16	33	19	18	21	16	15	17	28
Somewhat disagree	8	9	7	10	7	10	6	7	19	11	5	9	8	6	9	9
Strongly disagree	10	15	6	7	11	13	8	9	15	8	13	12	7	8	7	18
Don't know	1	1	1		1	2	1	1		1	1	1	1	1	2	0

On another subject…

K1 Does your household own one or more cars?

01 YES
02 NO
99 REFUSED

IF HOUSEHOLD OWNS ONE OR MORE CARS, K1 (01), CONTINUE.
ALL OTHERS SKIP TO NEXT SECTION

K2 What type is the car that you drive most often?
(READ ENTIRE LIST BEFORE RECORDING ONE ANSWER)
[RANDOMIZE]

01 Convertible
02 Minivan
03 Pickup
04 Sedan
05 Small car
06 Sporty car
07 Small SUV
08 Midsize SUV
09 Large SUV
10 Wagon
99 DON'T DRIVE

IF DRIVE, K2 (01-10), CONTINUE.
IF DON'T DRIVE, K2 (99), SKIP TO K5

K3 How many miles do you drive in a typical day?
(RECORD NUMBER. RANGE IS 0-999, DON'T KNOW)

K4 Compared to a year ago, are you driving more, less or the same amount in a typical day?

01 DRIVING MORE
02 DRIVING LESS
03 DRIVING THE SAME AMOUNT
99 DON'T KNOW

K5 Thinking about your NEXT vehicle purchase, what type are you most likely to buy? (READ ENTIRE LIST BEFORE RECORDING ONE ANSWER) [RANDOMIZE]

01 Convertible
02 Minivan
03 Pickup
04 Sedan
05 Small car
06 Sporty car
07 Small SUV
08 Midsize SUV
09 Large SUV
10 Wagon
99 DON'T KNOW

K6 Relative to your current vehicle, for this next car do you expect to choose a model with . . . (READ ENTIRE LIST BEFORE RECORDING ONE ANSWER)

01 Much better fuel economy
02 Somewhat better fuel economy
03 About the same fuel economy
04 Somewhat worse fuel economy
05 Much worse fuel economy
99 DON'T KNOW

[ASK IF K6 (01-02)]
K7 Which of the following are your motivations for choosing a more fuel efficient vehicle? (READ LIST. RECORD AS MANY AS APPLY. WAIT FOR YES OR NO FOR EACH) [RANDOMIZE]

01 Concern about dependence on foreign oil
02 Environmentally friendly or green
03 Higher resale value
04 Lower fuel costs
05 Newer technology
95 OTHER (SPECIFY)
99 DON'T KNOW/NONE OF THESE

K8 When choosing your next car, what would you be willing to do in order to reduce the amount you spend on fuel? Would you . . .
(READ LIST. RECORD AS MANY AS APPLY. WAIT FOR YES OR NO FOR EACH)
[RANDOMIZE]

01 Purchase a smaller car
02 Drive less
03 Carpool
04 Take public transit
05 Walk or bike more often
06 Purchase a vehicle that doesn't require gasoline
07 Pay extra to purchase a more fuel-efficient vehicle
95 OTHER (SPECIFY)
99 DON'T KNOW/NONE OF THESE

K9 What power types are you considering for your next vehicle?
(READ LIST. RECORD AS MANY AS APPLY. WAIT FOR YES OR NO FOR EACH)
[RANDOMIZE]

01 Conventional gasoline
02 Diesel
03 Flex-fuel, runs on gasoline or ethanol fuel
04 Hybrid
05 Electric
06 Hydrogen fuel cell
07 Natural gas or propane
99 DON'T KNOW

K10 If the availability of various power types improves over the next 15 years, which power train would you be interested in purchasing?
(READ LIST. RECORD AS MANY AS APPLY. WAIT FOR YES OR NO FOR EACH)
[RANDOMIZE]

01 Conventional gasoline
02 Diesel
03 Flex-fuel, runs on gasoline or ethanol fuel
04 Hybrid
05 Electric
06 Hydrogen fuel cell
07 Natural gas or propane
99 DON'T KNOW

[ASK IF K9 (04-06)]

K11 What type of hybrid or electric vehicle are you MOST LIKELY to consider purchasing?
(READ ENTIRE LIST BEFORE RECORDING ONE ANSWER)
(READ EXAMPLES ONLY IF NECESSARY)
[RANDOMIZE]

01 Plug-in hybrid (such as a Chevrolet Volt)
02 Pure electric, all electric without a gasoline engine (such as a Nissan Leaf)
03 Traditional hybrid (such as a Toyota Prius)
04 Hydrogen fuel cell, an electric car that is fueled with hydrogen
99 DON'T KNOW

K12 Which of the following are your motivations for choosing an alternative fuel vehicle?
(READ LIST. RECORD AS MANY AS APPLY. WAIT FOR YES OR NO FOR EACH)
[RANDOMIZE]

01 Concern about dependence on foreign oil
02 Environmentally friendly or green
03 Higher resale value
04 Lower fuel costs
05 New technology
06 Lower emissions/pollutants
07 Investing in clean energy
08 Stable fuel costs
09 Ability to refuel at home
10 Smooth acceleration and quiet operation
95 OTHER (SPECIFY)
99 DON'T KNOW

K13 On a scale of 1 to 5, where 5 is EXTREMELY CONCERNED and 1 is NOT AT ALL CONCERNED, please rate your level of concern with each of the following.
[RANDOMIZE ITEMS]

01 Not at all concerned (1)
02 (2)
03 (3)
04 (4)
05 Extremely concerned (5)
99 DON'T KNOW

A. Air pollution
B. American reliance on foreign oil
C. Lack of public transportation options
D. Price of gasoline
E. Amount of oil consumption in the U.S.

K14 For each of the following statements please indicate whether you strongly agree, somewhat agree, somewhat disagree or strongly disagree.
[RANDOMIZE STATEMENTS]

01 Strongly agree
02 Somewhat agree
03 Somewhat disagree
04 Strongly disagree
99 DON'T KNOW

A. The U.S. should adopt a national goal of dramatically reducing oil consumption
B. Fuel efficiency standards for all vehicles should be improved
C. Car manufacturers should produce more fuel efficient vehicles, and the government should increase standards and enforce them
D. Consumers should receive incentives like rebates or tax credits to buy more fuel efficient or alternative fuel vehicles
E. I am willing to pay extra for a more fuel efficient vehicle if it will lower my operating costs
F. I am willing to pay extra for a more fuel efficient vehicle if I can recover the additional cost through lower fuel costs within 5 years
G. Auto manufacturers should offer a greater variety of cleaner, more fuel efficient vehicles in the near future
H. Fuel economy standards should require auto manufacturers to increase the overall fleet average to at least 35 miles per gallon by 2016.
I. Fuel economy standards should require auto manufacturers to increase the overall fleet average to at least 55 miles per gallon by 2025

Union of Concerned Scientists

New Agreement on Fuel Efficiency & Auto Pollution Standards (MY2017-2025)

IMPORTANT STEP TOWARDS CLEANER, MORE FUEL EFFICIENT CARS & TRUCKS

The Obama administration has announced an agreement with the State of California and major automakers to strengthen fuel efficiency and greenhouse gas standards for light-duty vehicles sold in model years 2017-2025.[1] Once finalized, these standards will save consumers money at the gas pump, protect public health by curbing global warming pollution, and cut America's oil dependence. They will also help spur investments in new automotive technology, which will create jobs and sustain the recovery of the American auto industry.

While many important details must still be finalized, some of which risk eroding the benefits of the program, the agreement lays out a path to reduce the average global warming emissions of new passenger cars and light trucks to 163 grams per mile (g/mi) in model year 2025 – a level equivalent to 54.5 miles per gallon (mpg) if met exclusively with fuel efficiency improvements, or a Corporate Average Fuel Economy (CAFE) standard of 48-49 mpg assuming full use of air conditioning improvements. That would translate to a 2025 window sticker of about 36 mpg - up from 21 mpg today.

The new agreement also extends the successful National Program, which allows automakers to build a single national fleet that complies with federal and state global warming pollution requirements under the Clean Air Act and fuel economy standards administered by the Department of Transportation.

Savings at the Gas Pump, Cleaner Air, and Energy Security

If the agencies finalize standards based on the framework announced by President Obama, UCS analysis shows the following consumer savings, pollution reductions, and oil savings in 2030.

- **Cut oil consumption by as much as 1.5 million barrels per day** -- 23 billion gallons of gasoline annually -- by 2030. That is equivalent to U.S. imports from Saudi Arabia and Iraq in 2010.
- **Cut global warming pollution by as much as 280 million metric tons (MMT) in 2030**, which is equivalent to shutting down 72 coal-fired power plants for one year.
- **Lower fuel expenditures at the pump by over $80 billion in 2030**. Even after paying for the cost of the necessary technology, consumers will still clear $50 billion in savings in that year alone.

Standards Must Still Be Finalized through a Formal Rulemaking

When President Obama announced this effort in May 2010, he signed a memorandum[2] directing the Environmental Protection Agency (EPA) and Department of Transportation (DOT) to finalize standards by July 2012. Following the recent agreement, the agencies are on track to meet that target. They are expected to release a Notice of Proposed Rulemaking (NPRM) in the fall of 2011, solicit public comment, and then publish final standards by July 2012. The California Air Resources Board (CARB) will also finalize its standards under the Clean Air Act by the end of 2011. California is then expected to request a waiver consistent with the implementation of the National Program.

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[1] http://www.epa.gov/otaq/climate/regulations.htm#1-1
[2] http://www.whitehouse.gov/the-press-office/presidential-memorandum-regarding-fuel-efficiency-standards

Key Issues that Could Erode the Benefits of the Program

Important decisions must still be made on key issues during the rulemaking. Depending on how the standards are structured, these issues could create incentives for automakers to pursue compliance strategies that would result in lower consumer savings, pollution reductions, and oil savings. The final standards must ensure that the overall program has integrity and that loopholes are not created that would allow automakers to comply with standards by using accounting mechanisms instead of clean, fuel-efficient technology.

- **Electric Vehicle Accounting**: The current proposal allows automakers to treat electric vehicles as having zero grams of pollution per mile (0 g/mi). This accounting treatment ignores global warming pollution generated by producing the electricity used to power the vehicle. On top of the 0 g/mi accounting, the proposed agreement provides credit multipliers for electric vehicles between MY2017-2021. There are better ways to accelerate the production of electric-drive technology and these measures risk eroding the pollution reductions from the standards. For instance, if electric drive vehicles account for just 5 percent of new vehicles sold in MY2025 and are treated as zero emissions, it would reduce the pollution reductions of the program 8.5 percent in 2030. The final standards should include a reasonable cap on the number of vehicles that can qualify for the 0 g/mi credit and the credit multipliers should be eliminated after MY2021, as currently outlined in the agreement.

- **Light Truck Reclassification**: In the first five years of the standards, MY2017-2021, the annual improvements required for light trucks, especially the larger ones, are weaker than those required for passenger cars. In addition, the slope of the light truck curve has become steeper since the MY2012-2016 standards. These factors could encourage automakers to reclassify passenger cars as light trucks or add size to existing light trucks to qualify for weaker standards. Automakers have pursued similar gaming strategies in the past. The agencies should make certain that the final standards guard against this loophole by ensuring that light truck definitions limit the ability to reclassify cars as trucks - as well as holding firm to strong standards across the light truck fleet from 2022-2025.

- **Mid-Term Review:** The three agencies setting standards – EPA, NHTSA, and CARB – will conduct a technical assessment of technology needed to achieve the last four years of standards (MY2022-2025). NHTSA will then conduct a rulemaking to finalize standards for those years. EPA will make a determination on whether it needs to revise its standards – either by increasing or decreasing the stringency. It is important that the mid-term review remains a technical assessment and not be used as an off-ramp to end the standards halfway through the program. Further, it is critical that all three agencies are free to make determinations at the mid-term review point and implement standards consistent with their statutory obligations.

- **Off-Cycle & Air-Conditioning Credits:** Automakers are able to achieve global warming pollution reductions by improving the efficiency of air-conditioning systems and switching to less-harmful refrigerants. The agencies estimate that manufacturers will be able to achieve approximately 20 g/mi of pollution reduction through these strategies. In addition, automakers will be able to gain credits for 'off-cycle' technologies that are not captured by the existing fuel economy test procedure. Both of these credits must be based on real and verifiable emissions reductions, and must be limited to avoid delays in basic fuel efficiency improvements and pollution reductions.

A fully referenced version of this fact sheet is available online at *www.ucsusa.org*.

The Union of Concerned Scientists is the leading science-based nonprofit working for a healthy environment and a safer world.

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Union of Concerned Scientists

New Agreement on Fuel Efficiency & Auto Pollution Standards (MY2017-2025)

IMPORTANT STEP TOWARDS CLEANER, MORE FUEL EFFICIENT CARS & TRUCKS

The Obama administration has announced an agreement with the State of California and major automakers to strengthen fuel efficiency and greenhouse gas standards for light-duty vehicles sold in model years 2017-2025.[1] Once finalized, these standards will save consumers money at the gas pump, protect public health by curbing global warming pollution, and cut America's oil dependence. They will also help spur investments in new automotive technology, which will create jobs and sustain the recovery of the American auto industry.

While many important details must still be finalized, some of which risk eroding the benefits of the program, the agreement lays out a path to reduce the average global warming emissions of new passenger cars and light trucks to 163 grams per mile (g/mi) in model year 2025 – a level equivalent to 54.5 miles per gallon (mpg) if met exclusively with fuel efficiency improvements, or a Corporate Average Fuel Economy (CAFE) standard of 48-49 mpg assuming full use of air conditioning improvements. That would translate to a 2025 window sticker of about 36 mpg - up from 21 mpg today.

The new agreement also extends the successful National Program, which allows automakers to build a single national fleet that complies with federal and state global warming pollution requirements under the Clean Air Act and fuel economy standards administered by the Department of Transportation.

Savings at the Gas Pump, Cleaner Air, and Energy Security

If the agencies finalize standards based on the framework announced by President Obama, UCS analysis shows the following consumer savings, pollution reductions, and oil savings in 2030.

- **Cut oil consumption by as much as 1.5 million barrels per day** -- 23 billion gallons of gasoline annually -- by 2030. That is equivalent to U.S. imports from Saudi Arabia and Iraq in 2010.
- **Cut global warming pollution by as much as 280 million metric tons (MMT) in 2030**, which is equivalent to shutting down 72 coal-fired power plants for one year.
- **Lower fuel expenditures at the pump by over $80 billion in 2030**. Even after paying for the cost of the necessary technology, consumers will still clear $50 billion in savings in that year alone.

Standards Must Still Be Finalized through a Formal Rulemaking

When President Obama announced this effort in May 2010, he signed a memorandum[2] directing the Environmental Protection Agency (EPA) and Department of Transportation (DOT) to finalize standards by July 2012. Following the recent agreement, the agencies are on track to meet that target. They are expected to release a Notice of Proposed Rulemaking (NPRM) in the fall of 2011, solicit public comment, and then publish final standards by July 2012. The California Air Resources Board (CARB) will also finalize its standards under the Clean Air Act by the end of 2011. California is then expected to request a waiver consistent with the implementation of the National Program.

[1] http://www.epa.gov/otaq/climate/regulations.htm#1-1
[2] http://www.whitehouse.gov/the-press-office/presidential-memorandum-regarding-fuel-efficiency-standards

Key Issues that Could Erode the Benefits of the Program

Important decisions must still be made on key issues during the rulemaking. Depending on how the standards are structured, these issues could create incentives for automakers to pursue compliance strategies that would result in lower consumer savings, pollution reductions, and oil savings. The final standards must ensure that the overall program has integrity and that loopholes are not created that would allow automakers to comply with standards by using accounting mechanisms instead of clean, fuel-efficient technology.

- **Electric Vehicle Accounting**: The current proposal allows automakers to treat electric vehicles as having zero grams of pollution per mile (0 g/mi). This accounting treatment ignores global warming pollution generated by producing the electricity used to power the vehicle. On top of the 0 g/mi accounting, the proposed agreement provides credit multipliers for electric vehicles between MY2017-2021. There are better ways to accelerate the production of electric-drive technology and these measures risk eroding the pollution reductions from the standards. For instance, if electric drive vehicles account for just 5 percent of new vehicles sold in MY2025 and are treated as zero emissions, it would reduce the pollution reductions of the program 8.5 percent in 2030. The final standards should include a reasonable cap on the number of vehicles that can qualify for the 0 g/mi credit and the credit multipliers should be eliminated after MY2021, as currently outlined in the agreement.

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