Consumer Federation of America

NO TIME TO WASTE

AMERICA'S ENERGY SITUATION IS DANGEROUS BUT CONGRESS CAN ADOPT NEW POLICIES TO SECURE OUR FUTURE

October 2007

THE URGENT NEED FOR ACTION

A Dramatic Change in the Direction of Energy Policy

America's energy situation has deteriorated dramatically over the past two decades.

- In 20 years, oil imports have tripled and we now import almost two thirds of the oil we consume.[1]
- Emissions of greenhouse gases have increased by 20 percent in the past 15 years [2] and concerns about global warming have become a reality.
- In the past five years, household budgets have been hard hit by rising energy prices.[3]

In spite of these rising prices, increasing imports, and greenhouse gas emissions, U.S. energy policy has been stagnant, failing to address any of these problems. Today, however, Congress is on the verge of adopting a major shift in energy policy that will tackle the hard reality of our energy situation head on.

There are three provisions in energy legislation recently passed by the House of Representatives and Senate that address consumer needs, national security, and the environment using today's technology. **Congress must pass a bill that contains the following:**

1. **Increase the Corporate Average Fuel Economy (CAFE) standard to 35 miles per gallon (mpg) by 2020, using the Senate language;[4]**
2. **Expand the production of cleaner, more advanced cellulosic ethanol and other biofuels to 36 billion gallons, with protections to ensure sustainable and energy efficient production, using the Senate language; and[5]**
3. **Institute a Renewable Electricity Standard (RES) that requires utilities to use renewable energy as the source of 15 percent of their electricity, using the House provisions.[6]**

The Senate and House have identified the solutions. Now they must simply be implemented by passing sound, achievable energy policy. Time is critical. To delay passage of

these simple requirements would only sink America deeper into the energy morass and fail to address critical consumer, security, and environmental problems. Adoption of this energy policy is imperative. To do anything less would be an egregious mistake for consumers, national security, and the environment.

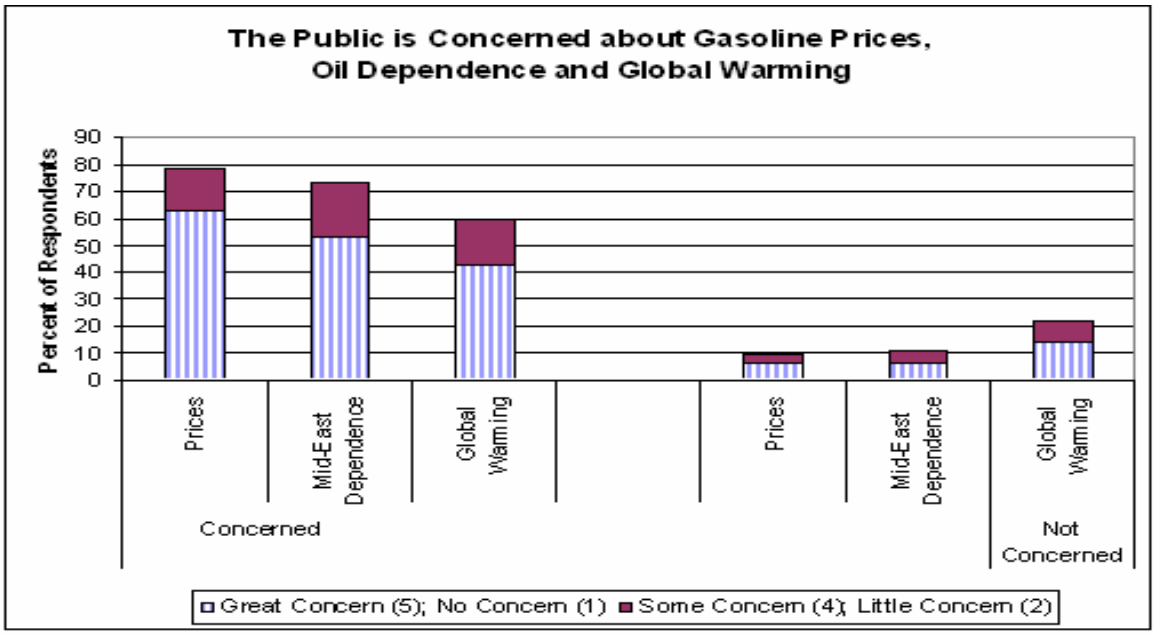
Time Is Not On Our Side

Efforts to weaken or block these policies waste the most critical asset we have to solve our complex energy problem – time. The U.S. consumes one-quarter of the world's oil, yet has less than 3 percent of the world's oil reserves.[7] Growing demand for oil increases the power of energy producers hostile to our national interests who help fund terrorist activities. Of equal concern, the world's leading scientists have issued stark warnings that the window of opportunity to avert the worst impacts of the global warming problem is closing.[8] We cannot afford the "go low and slow" approach being pushed by the auto manufacturers[9] and electric utilities.[10] The auto industry proposal, for example, would achieve only one-quarter of the oil savings that the Senate CAFE language would achieve, which translates into a delay of two vital decades. Time is of the essence if we are to relieve the pressure on consumer pocketbooks, national security, and global warming.[11]

THE PUBLIC SUPPORTS AGGRESSIVE ENERGY POLICY

The public understands the dire circumstances in which we find ourselves and supports aggressive action to address the energy problem. Respondents to an October 2007 opinion poll commissioned by the Consumer Federation of America (CFA) express great concern over our national oil problem and overwhelmingly support changes in policy. CFA has been polling on the energy issue for two years now, and the results are clear.[12] In the most recent survey, gasoline prices are the largest concern, with 78 percent expressing concern (63 percent expressing great concern) (See Exhibit 1). However, concern over U.S. dependence on Middle

Exhibit 1:



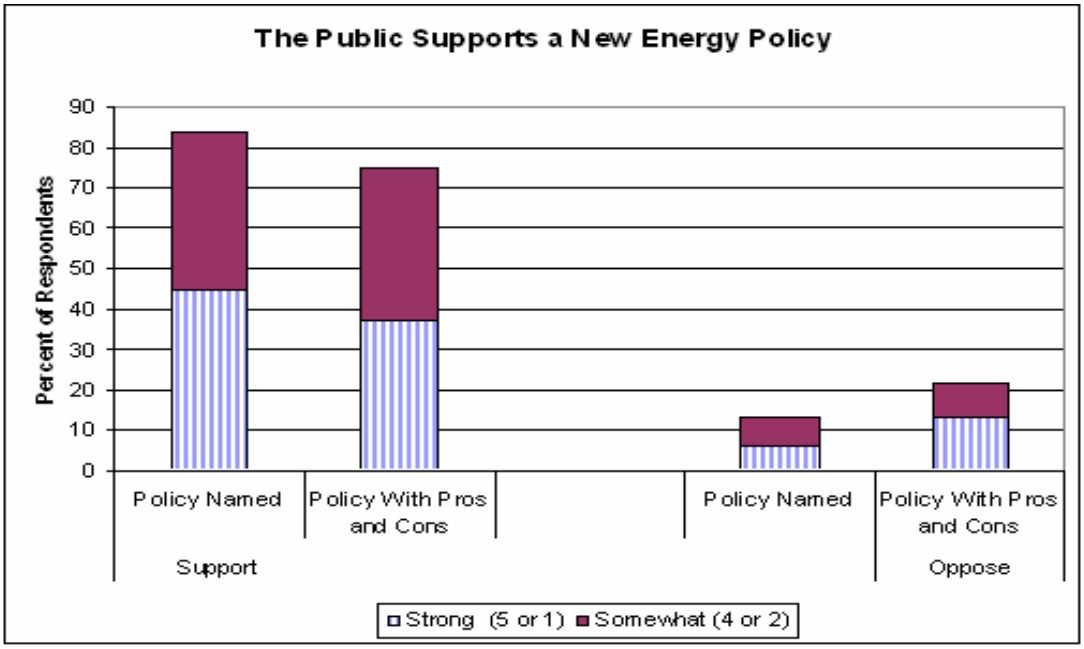
Source: CFA poll conducted by Opinion Research Corporation, September 27 – October 1, 2007; 2021 total respondents.

Eastern oil has been growing and almost equals concern over prices in our most recent poll (76 percent; 56 percent great concern). Concern about global warming stands at 60 percent (43 percent great concern).

Reflecting this high level of concern, the public is supportive of the three policies Congress is considering (see Exhibit 2). Overwhelming majorities (84 percent and 75 percent) support the policies. The policy question was asked of two separate samples of over 1,000 respondents nationwide. The higher level of support (84 percent; 45 percent strongly support) comes with a simple statement of the policies being considered as follows.

> *The U.S. Congress is considering legislation that would significantly increase energy efficiency and the use of renewable energy. The most important provisions of this legislation would require increases in the gas mileage of cars, SUVs, and pickup trucks; require greater use by electric utilities of renewable fuels such as wind and solar power; and create programs to expand the use of ethanol and other biofuels. Do you personally support or oppose this legislation?*

Exhibit 2:



Source: CFA poll conducted by Opinion Research Corporation, September 27 – October 1, 2007; 2021 total respondents.

There is only a small drop-off when arguments on both sides are presented (75 percent support, 38 percent strongly support) as follows:

> *The U.S. Congress is considering legislation that would significantly increase energy efficiency and the use of renewable energy. The most important provisions of this legislation would require increases in the gas mileage of cars, SUVs, and pickup trucks; require greater use by electric utilities of renewable*

fuels such as wind and solar power; and create programs to expand the use of ethanol and other biofuels. Supporters of these policies say they will lower consumer spending on energy, lower U.S. dependence on foreign oil, and lower global warming emissions. Opponents say that prices will rise and jobs will be lost. Do you personally support or oppose this legislation?

Opposition to the policies is extremely low with only 13 percent opposed (6 percent strongly opposed) when the policies are only named, and 22 percent opposed (13 percent strongly opposed) when the pros and cons are presented.

THE NEW ENERGY POLICY: DIRECT BENEFITS AND EXTERNALITIES

Our economic analysis shows that the public is correct in its concerns about our energy situation and support for these policies. We view energy policy from two perspectives – a consumer pocketbook perspective and a societal cost-benefit perspective.[13] Conducting two separate analyses can result in a quandary if the results point in opposite directions. If the result of the consumer pocketbook analysis is negative, but the result of the societal cost benefit test is positive, the relative size of the effects and the difference between direct and indirect effect can make for a complex decision. That is not the case with the policy decision before the Congress. We find that the adoption of the energy policies pending in Congress will have a positive net benefit under *both* the consumer pocketbook test and the societal cost-benefit test.

Direct Benefits

The consumer pocketbook analysis examines the direct impact of the program on household expenditures. For fuel economy, it asks how much more it would cost consumers to own the vehicles that would be brought into the market compared to how much less they would spend on gasoline as the result of driving more fuel efficient vehicles. For the Renewable Electricity Standard (RES), it asks whether total consumer bills for home energy will increase or decrease.

Our economic analysis concludes that the public has good reason to support these policies. Combined, these provisions will save consumers hundreds of billions of dollars. Estimated impacts cumulative to 2020 are as follows:

Gasoline consumption would be dramatically reduced.

- Increases in fuel economy standards in the Senate bill will result in lower gasoline consumption of over 60 billion gallons between now and 2020.[14] At $3 per gallon, the savings to consumers will be over $180 billion cumulative to 2020.
- Biofuels will lower gasoline consumption by approximately the same amount.[15]

The growth of imports would be stopped for the first time in two decades.

- Combining improved fuel economy and biofuels output will cut imports by almost 2.4 million barrels per day, equal to about 20 percent of imports. [16]

Greenhouse gas emissions would be dramatically reduced.

- Fuel economy improvements would result in reduced cumulative greenhouse gas emissions of over 750 million metric tons per year.[17]
- The extent to which biofuels would reduce greenhouse gas emissions depends on the raw material inputs and the technology used to produce the fuels.[18] The reduction in greenhouse gas emission would be between 130 million and 660 million tons cumulative to 2020.
- While the renewable electricity standard would not cut oil imports, it would lower natural gas consumption, lowering prices and reducing greenhouse gas emissions. The primary impact would be a cumulative reduction of approximately 250 million tons of greenhouse gas emissions by 2020.[19]
- Combining the three programs would reduce greenhouse gases by 1.1 billion to 1.7 billion tons.

Externalities

The national cost-benefit test examines the indirect effects of adopting the new standard on the U.S. It quantifies the value of externalities that would be internalized as a result of the policy. The concept of external costs and benefits is widely recognized in the social sciences.[20] These costs and benefits are indirect. We take the concept of externalities seriously; they are real and people feel the effects.

Many of the social costs of burning fossil fuels result in social expenditures which are paid for in taxes. For example, many analysts believe that excessive oil dependence increases the military expenditure to protect American interests in the region.[21] The drag on the economy created by the drain of local resources out of the national economy and the vulnerability to economic disruptions as a result of huge imports of crude oil is felt across many sectors.[22] Many of the health effects of auto pollution emissions are felt locally. Ultimately, the effects of global warming will be felt locally, with different impacts on different areas.

Thus, we believe it is a mistake not to quantify and personalize these external costs and benefits. The key is to use a method that is reasonable.

Valuing externalities is difficult, but even conservative estimates of $1 per gallon for reductions in gasoline consumption and $100 per ton of carbon dioxide emissions (equivalent to $1 per gallon) yield large monetary values for indirect savings.[23] The total societal value of these three policies exceeds $400 billion, cumulative to 2020.

Consumer Expenditure Savings	$180 billion
Reduced Consumption/Imports	$120 billion
Greenhouse gas reductions	$110-180 billion

The incremental costs incurred to produce these benefits are in the range of $100 billion.

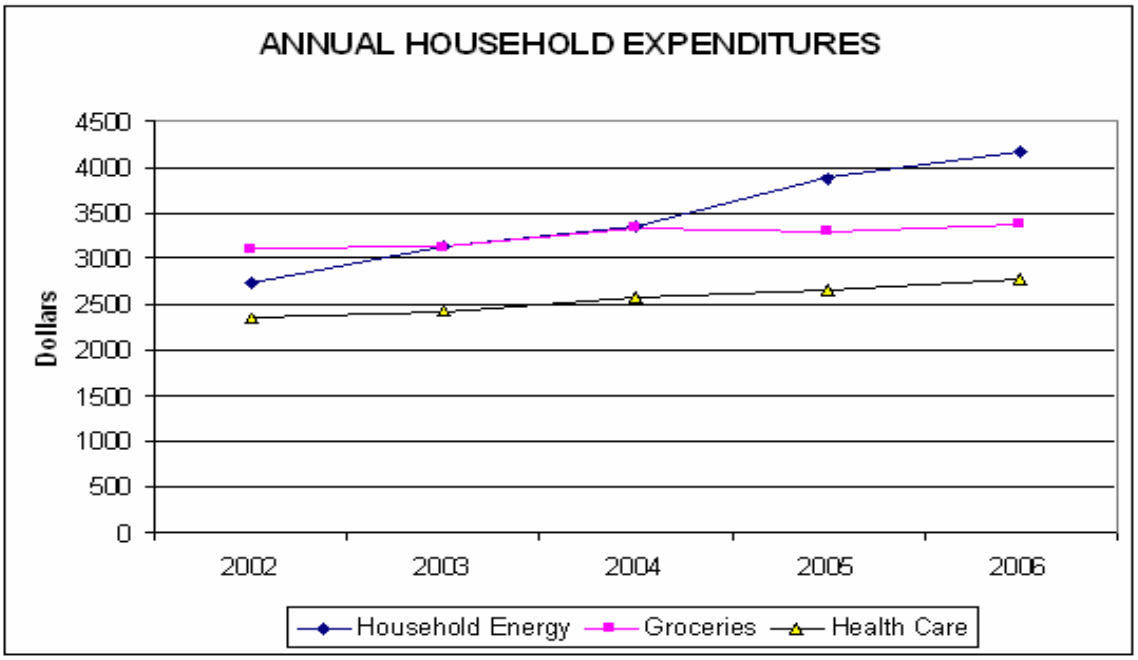
The direct consumer benefits are the largest single component of the total cost-benefit analysis, but each of the components is substantial. For every dollar of consumer pocketbook benefit, there is at least one dollar of indirect societal benefit.

FACING THE FACTS OF OUR CURRENT ENERGY CHALLENGE

Consumer Impacts

From the consumer point of view, spending on energy (gasoline, electricity, and natural gas) is a large and growing household expenditure. Our reliance on fossil fuels – oil for gasoline, and natural gas consumed for heating and cooking, but also increasingly used to generate electricity – has led to huge increases in consumer costs in recent years (see Exhibit 3). Over the past five years, annual household expenditures on gasoline have increased from $1,000 to almost $2,300 per year. Annual expenditures on electricity and natural gas have increased by $400 per household to almost $1,900 per year. In short, in 2006, consumers spent well over $4,000 on household energy, compared to less than $2,500 just five years earlier.

Exhibit 3:



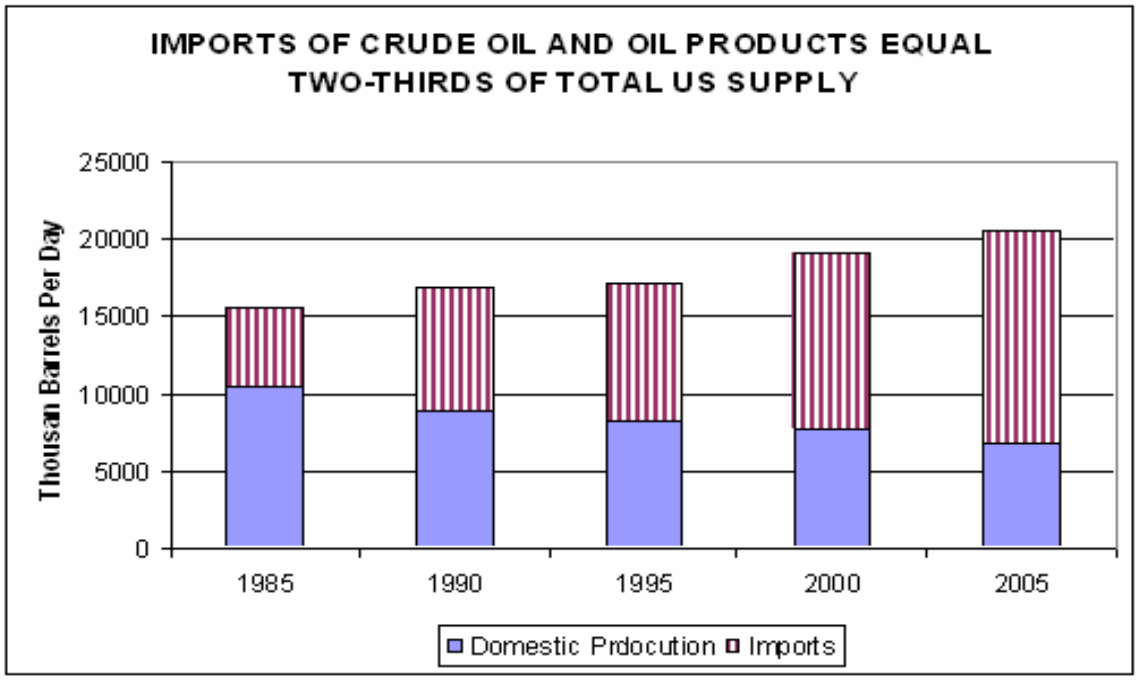
Bureau of Labor Statistics, Consumer Expenditure Survey, various years. 2006 estimated by inflating 2005 expenditures according to the Bureau of Labor Statistics, *Consumer Price Index* **for groceries and health care and** *Energy Information Administration*, **Monthly Energy Review, August 2007, for energy prices.**

To put these price increases into perspective, Exhibit 1 compares expenditures on household energy to expenditures on groceries (food at home) and health care. In 2002, household energy expenditures were a little higher than health care (by about 16 percent), but a little less than expenditures on groceries (by about 12 percent). By 2006, expenditures on household energy had shot up and were 23 percent more than expenditures on groceries and 50 percent more than expenditures on health care. These energy price increases are crimping household budgets.

National Security & Economic Impact

U.S. crude oil imports have tripled over the past two decades while imports of finished petroleum products have more than doubled. As a result, we now import almost two-thirds of our total consumption of petroleum products (see Exhibit 4).

Exhibit 4:



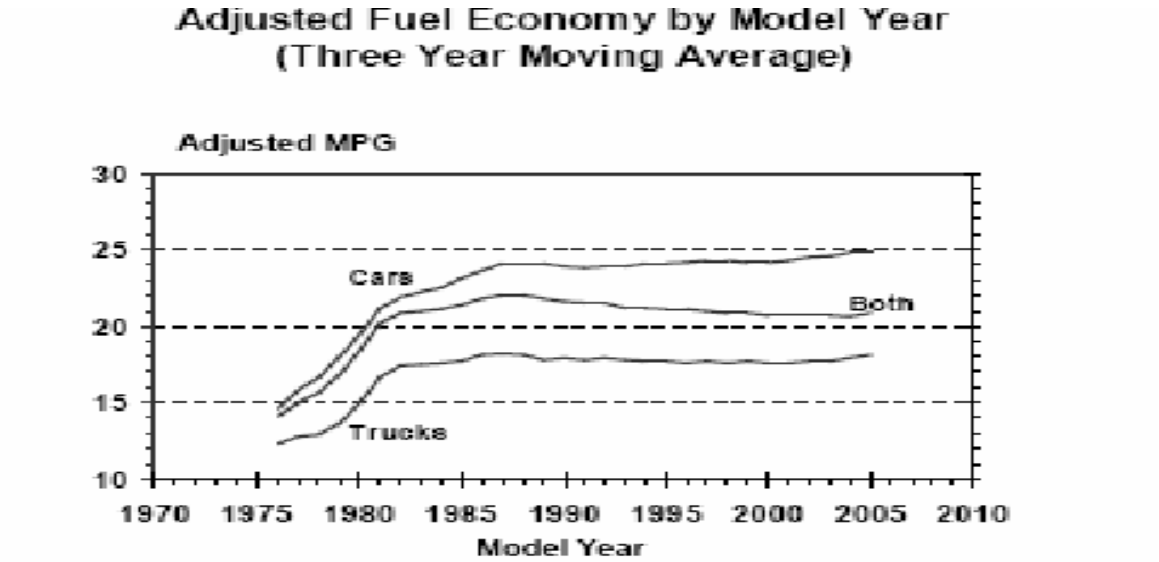
Source: Energy Information Administration: *Monthly Energy Review*, August 2007, p. 38.

Gasoline accounts for almost half of the oil consumed in the U.S. and, consequently, half of our oil imports, yet the fuel economy of our vehicle fleet has not improved at all over the past two decades (see Exhibit 5).

Dependence on imports from unstable areas of the world and the increasing power and wealth that rising oil prices give to nations that are hostile to our national interests undermines our national security, funds terrorism, and hinders our ability to conduct foreign policy.[24]

Economically, the U.S. is exposed on a daily basis to oil price shocks and supply disruptions.[25] Regardless of the cause – whether by global market dynamics, natural disasters, terrorist attacks, or politically motivated oil embargoes – if we continue business as usual, allowing our demand for oil to grow unchecked, those price shocks will become much more frequent, deeply felt, and longer lasting. Economists across our country strongly support government intervention in the

Exhibit 5:



Source: Environmental Protection Agency, *Light-Duty Automotive Technology and Fuel Economy Trends: 1975 through 2006*, **p. 3.**

transition away from fossil fuels, according to a survey by the Wall Street Journal. When asked to pick the greater geopolitical threat to the economy, by nearly a 3-to-1 margin, the economists chose a disruption in crude oil supplies caused by tensions in the Mid-East over the impact on spending and confidence that could follow a major terrorist attack. [26]

Global Warming Impacts

The United Nations' Intergovernmental Panel on Climate Change (IPCC) composed of the world's leading scientists has warned that to avert the worst consequences of global warming, we need to reduce global warming emissions to 80 percent below 1990 levels by 2050.[27] Without action, the United States will emit about 20 percent more greenhouse gases by 2020 than it did in 2000, according to a draft report that the Bush Administration was scheduled to submit to the United Nations a year ago.[28]

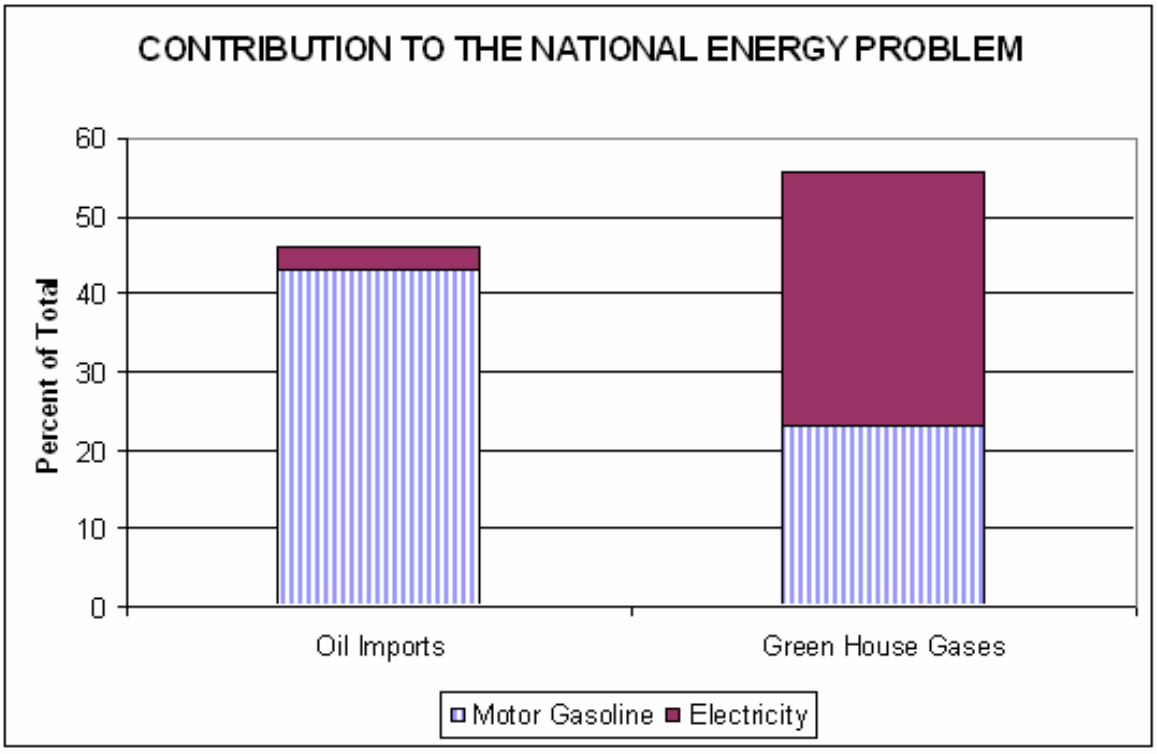
Beyond the environmental damage of global warming, some analysts believe the impact of global warming also poses "a serious threat to America's national security."[29] Senior retired military officials from the Center for Naval Analysis warned in a report that global warming acts as a "threat multiplier for instability" in some of the world's most volatile regions, adding tension to stable regions, worsening terrorism and likely dragging the U.S. into fights over water and other resource shortages. On the simplest level, it has the potential to create sustained natural

and humanitarian disasters on a scale far beyond those we see today. The consequences will likely foster political instability where societal demands exceed the capacity of governments to cope.[30]

Electric utilities are the single largest source of carbon dioxide emissions, the most important global warming greenhouse gas emitted in the U.S., accounting for one third of the nation's total emissions.[31] Automobile tailpipe emissions are the second largest source of greenhouse gas emissions, accounting for one-sixth of the total. When the emissions associated with the production of gasoline are included, motor vehicle gasoline accounts for almost one-quarter of our national emissions.

Thus, as Exhibit 6 shows, consumption of these two products – motor vehicle gasoline and electricity – account for about one half of the national energy problem, whether the problem is measured by oil imports or greenhouse gas emissions. That is why these are the central challenges of a national energy policy and addressing them is so urgent.

Exhibit 6:



Source: Energy Information Administration, *Emissions of Greenhouse Gases in the United States,* **November 2006;** *Monthly Energy Review,* **August 2007**

LONG-TERM ENERGY SOLUTIONS REQUIRE AN IMMEDIATE START

There are no quick fixes to the national energy problem. We can only address our dire situation with long-term sustained commitments to reducing our consumption of oil and other fossil fuels. The key to this long-term policy is to start now, choose aggressive goals, and stay on course.[32]

A marriage of the Senate and House provisions is the perfect starting point to initiate a new energy policy that can provide long-term relief for energy consumers and take major steps to address national energy problems.

Consumer Benefits from Senate CAFE Increase & House RES Policy

Increased Fuel Economy: The most obvious and direct benefit to consumers will come in lower total costs for road transportation. Our analysis shows that the higher fuel economy mandated by the Senate bill pays for itself on a monthly basis. The increase in the cost of vehicles to achieve higher fuel economy is more than offset by the reduction in expenditures on gasoline. In the case of the least efficient models -- pick-up trucks and SUVs -- the savings would be quite large (see Exhibit 7). We have tested this proposition for "average" vehicles in rural households who tend to drive more than urban households and for owners of pickup trucks,[33] who tend to experience much lower gasoline mileage today. We have examined the consumer impact of a 35 mpg standard as well as a longer-term 50 mpg standard.[34]

Exhibit 7:

Consumer Analysis of Reformed Café (35 MPG all Vehicles, 30 mpg Pickups)

	ALL Households		Rural Households		Pickup Trucks	
	Gasoline Price		Gasoline Price		Gasoline Price	
	$2.50	$3.00	$2.50	$3.00	$2.50	$3.00
Loan Payment increase	$1909	$1909	$1909	$1909	$3565	$3565
Life of Loan						
Fuel Cost Savings	$2073	$2487	$2488	$2984	$4740	$5688
Net savings	$ 164	$578	$ 579	$ 1075	1175	2123
Life of vehicle						
Fuel Cost Savings	$2900	$3480	$$3480	$4176	9552	$11463
Net Savings	$991	$1571	$1175	$2123	$5957	$7898

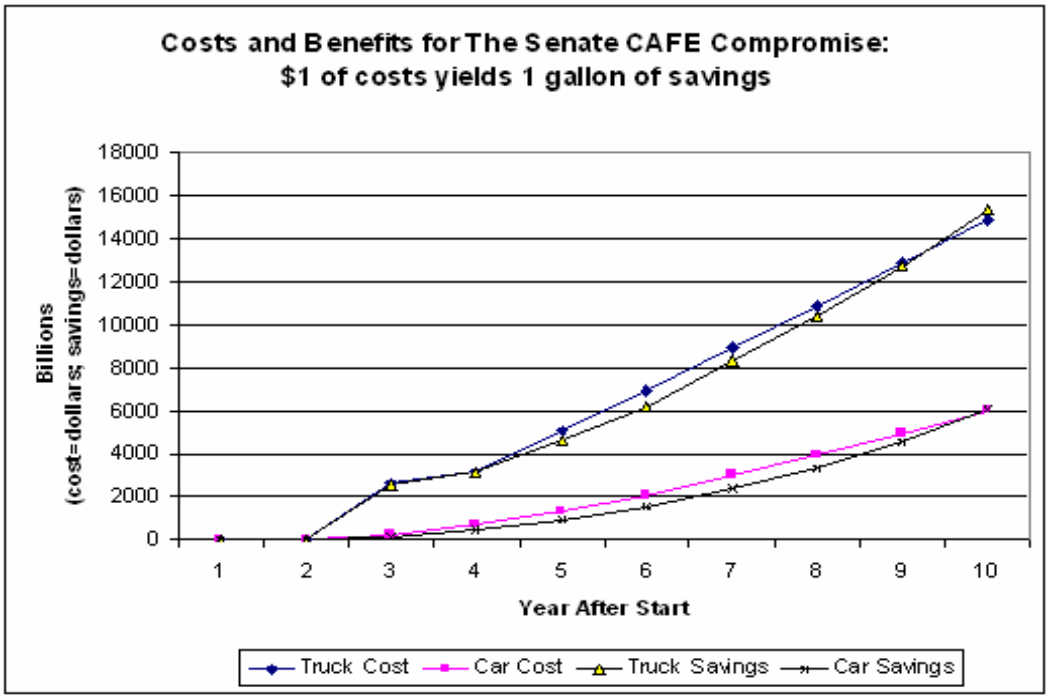
Source *Too Little, Too Late: **Why The Auto Industry Proposal To Go Low And Slow On Fuel Economy Improvements Is Not In The Consumer Or National Interest*** (Consumer Federation of America, July 2007)

Using estimates of the cost of increasing fuel economy from the National Academy of Sciences (NAS) and estimates of the fuel savings from the National Highway Traffic Safety

Administration (NHTSA), we estimate that consumer savings from the purchase of more fuel efficient vehicles are at least $1,000 over the lifetime of a car (about 10 years) and from $6,000 to $8,000 for pick-up trucks.

Alternatively, we note that in order to save a gallon of gasoline, auto manufacturers would have to invest one dollar to improve the technology in vehicles (see Exhibit 8). With the total social value of gasoline well in excess of $3 per gallon, it is apparent that this is a very good investment for consumers and the nation. Because trucks are so much less efficient, their potential savings are much higher.

Exhibit 8



Source: Based on National Highway Traffic Safety Administration, *CAFÉ Compliance and Effects Modeling System, Documentation* (Draft, 5/26/06), 3% scenario, which is equivalent to the Senate compromise legislation.

Renewable Electricity Standard (RES): According to numerous analyses, the House RES standard could lower the consumption of fossil fuels by electric utilities by as much as 10 percent and thereby lower consumer energy costs indirectly by alleviating the upward pressure on energy prices.[35] In 2005, 12 of the 15 studies on the impact of a federal renewable standard presented to the Senate Energy and Natural Resources Committee found a federal standard would result in a net reduction in overall energy bills for American consumers.[36] More recent studies have reached similar findings.[37]

The economic process by which consumer savings are created in the utility sector are similar to those in the vehicle sector, except they occur at the utility level and are then passed

through to consumers in their bills. Utilities invest in renewables to meet the new standard. As a result, they consume less coal and natural gas. "The higher capital expenditures are offset by lower natural gas and coal prices."[38] The latter is particularly important for several reasons. Natural gas has been the overwhelming fuel of choice for utilities in recent years and the "[n]atural gas price is the primary determinant of power prices and spark spread as natural gas accounts for 68 percent of the nation's price-setting fuel."[39] Thus, rising natural gas prices have been driving up electricity prices. Natural gas is also used as an energy source for residential heating and cooling. One recent model of a 15 percent federal renewable standard, similar to the House provision, estimates the downward pressure on natural gas prices at almost 15 percent and the downward pressure on coal prices at 5 percent.[40]

National Benefits of Aggressive Policies to Reduce Fossil Fuel Consumption

The consumer pocketbook test applied above is conservative as it does not take into account the national economic and security benefits of reduced fossil fuel consumption nor do they factor in the environmental benefits. The value of national security and environmental benefits is substantial, and it makes the case for immediate, aggressive policy action even more compelling.

Retired Air Force General Charles Wald estimates that if the true cost of military security were incorporated into the price of gasoline, we would be paying between $6.50 and $7 a gallon. The IPCC put the global warming cost of carbon dioxide emissions at the equivalent of $1 per gallon. Our review of the literature shows that these social costs have a value of between $1 and $2 per gallon.[41] Given recent developments, we believe the higher figure is more appropriate.

The Senate policies on fuel economy and expansion of biofuel production could lower the national energy consumption of oil by as much as 2.4 million barrels a day by 2025 – or 10 percent of our national use, reducing oil imports by 20 percent compared to "do nothing" policies. The cumulative total to 2020 would be over 120 billion gallons of gasoline.

Although the potential greenhouse gas reductions associated with increases in biofuel production varies widely, it should be noted that the Senate bill focuses future increases in biofuels by developing processes that utilize cellulosic raw materials, which would result in greenhouse gas reduction in the upper end of the range of possibilities (130 million tons to 660 million tons) cumulative to 2020. The House RES does not impact oil consumption and imports, but it significantly reduces other fossil fuel consumption and related greenhouse gas emissions. It could lower emissions in the utility sector by as much as 10 percent. The cumulative total to 2020 would be over 250 million tons. Combining the three components – fuel economy, biofuels, and renewable generation – the cumulative reduction in greenhouse gas emissions to 2020 would be in the range of 1.1 billion to 1.8 billion tons, with a value of $110 to $180 billion.

The total direct and indirect benefits would be $400 billion. The incremental costs incurred to produce these benefits are in the range of $100 billion.[42]

CONCLUSION

The urgent need for a new direction in energy policy was underscored recently when the National Petroleum Council (NPC) called for a doubling of the fuel economy of vehicles in a study entitled *Facing the Hard Truth About Energy.*[43] The NPC agreed with a 2002 study by the National Academy of Sciences[44] and an earlier analysis by the Consumer Federation of America[45] that called for the maximum feasible improvement in fuel economy and expressed the belief that a doubling of the fuel economy of cars and trucks is technologically feasible and economically beneficial to consumers. While we rarely agree with the NPC, which tends to stress traditional supply-side options, we think their change of heart represents the recognition of the hard reality that U. S. energy policy requires a change in policy direction.

The dangers of the deteriorating American energy position have become clear to policymakers and the public. Economic analysis and public opinion support a bold change in policy direction to lower pressures on prices, reduce our dependence on imported oil, and cut global warming greenhouse gas emissions. The key building blocks of a new energy policy: 1) higher fuel economy standards for vehicles as approved by the Senate, 2) increased production of ethanol from cellulosic sources also in the Senate package, and 3) greater reliance on renewable sources of energy in the electricity sector as passed by the House of Representatives need only to be welded together for final passage and signature by the President. Efforts by the automobile and electric utility industry to derail this legislation put their narrow special interests ahead of the national interest and waste our most valuable asset in the effort to respond the national energy challenge – time. The U.S. simply cannot afford to wait any longer to address the national energy crisis.

Endnotes

[1] Energy Information Administration, *Monthly energy Review,* various issues, available at http://www.eia.doe.gov/emeu/mer/

[2] Energy Information Administration, *Emissions of Greenhouse Gases in the United States, 2005,* (Washington, D.C., November 2005), p. ix.

[3] Bureau of Labor Statistics, *Consumer Expenditure Survey,* various issues.

[4] H,R. 6

[5] Id.

[6] H.R. 3221

[7] Energy Information Administration, *World Oil Balances,* available at http://www.eia.doe.gov/emeu/ipsr/t21.xls; *World Proved Reserves of Oil and Natural Gas, Most Recent Estimates*, available at http://www.eia.doe.gov/emeu/international/reserves.html

[8] The awar of the 2007 Nobel Peace Prize to researchers and advocates in the area of global warming serves to underscore the growing urgency.

[9] H.R. 2927. See Mark Cooper, *Too Little, Too Late. Why The Auto Industry Proposal To Go Low And Slow On Fuel Economy Improvements Is Not In The Consumer Or National Interest* (Washington, D.C., Consumer Federation of America, July 2007), available at http://www.consumerfed.org/pdfs/Auto_Industry_Proposal.pdf

[10] Edison Electric Institute, Congress Should Oppose a Mandatory Federal Renewable Portfolio Standard, available at

http://www.eei.org/newsroom/energy_news/federal_rps.htm

[11] Mark Cooper, *Technology, Cost and Timing: An Analysis of Competing Congressional Proposals to Raise Fuel Economy Standards) Washington, D.C.: Consumer Federation of America, July 2007) available at* http://www.consumerfed.org/pdfs/Technology_Cost_Timing.pdf

[12] Consumer Federation of America, New Report Shows Nearly Three-Quarters of Americans Concerned About Future Gas Prices, September 1, 2005 available at http://www.consumerfed.org/pdfs/GasPricesRelease090105.pdf; Consumer Federation of America, Consumers Still Greatly Concerned About Better Gas Mileage and Oil Imports Despite Falling Gas Prices, November 13, 2006 available at http://www.consumerfed.org/pdfs/Gas_Mileage_Consumer_Attitudes_Manu_Performance_Press_Release111306.pdf; Consumer Federation of America, Americans Alarmed About Dependence on Oil Imports and Resulting High Gas Prices and Funding Terrorism, May 1, 2007 available at http://www.consumerfed.org/pdfs/CFA_For_Immediate_Release052107.pdf.

[13] See Mark Cooper, 50 by 2030: Why $3.00 Gasoline Makes the 50 Mile per Gallon Car Feasible, Affordable and Economic (Washington, D.C.: Consumer Federation of America, May 8, 2006) for a detailed discussion of the two types of analyses.

[14] The Senate Compromise is close to the 3% scenario modeled by NHTSA in xx, which produces savings of approximately 63 billion barrels when the fleet reaches 35 mpg. Based on greenhouse gas emission, recent estimates by the Natural Resources Defense Council (Senate-Approved Fuel Economy Bill Trumps Industry-Backed House Proposal, Saving More Oil and Cutting More Pollution) also puts the cumulative gasoline savings at 63 billion gallons.

[15] Based on the incremental increase in biofuel user above current goals of 24 billion gallons in 2022, prorated over 10 years. The target for 2020 is 19.2 billion gallons in 2020. At 35 miles per gallon, the savings in 2020 estimated by NHTSA would be 21.3 billion gallons, while the NRDC savings in 2020 would be 18.4 billion gallons. The average of these two is 19l9 billion gallons. Thus, the savings from biofuels would likely exceed the savings from fuel economy slightly. We cautiously say it would at least equal the amount from fuel economy.

[16] Energy Information Administration, *Annual Energy Outlook: 2007, With Projections to 2030* (February 2007), p. 135, indicates a growth of imports in the base case of just over one million barrels per day.

[17] NRDC puts the figure at 759 million metric tons and the NHTSA calculation would be higher.

[18] EIA, Emissions of Greenhouse Gases, p. 20, presents a range of reduction in greenhouse gases emissions based on feed stock and production processes ranging from an estimated industry average for 2010 or 18 percent to 91 for the most beneficial technology. National Resources Defense Council, *Getting Biofuels Right: Eight Steps for Reaping Real Environmental Benefits from Biofuels* (May 2007), presents similar estimates.

[19] Interpolating the results in Energy Information Administration, *Impact of 1 15-Percent Renewable Portfolio Standard* (June 2007), we estimate cumulative reductions in carbon dioxide emissions of 258 million metric tons. Wood Mackenzie, *The Impact of a Federal Renewable Portfolio Standard* (February 2007), estimates almost 50 percent higher reductions.

[20] The concepts are well established even in introductory economic texts such as John B. Taylor, *Economics* (New York, Hougton Mifflin, 1998) 2nd Ed., pp. 412-425, and more advanced texts such as W. Kp Viscusi, John M. Vernon and Joseph E. Harrington, *Economics of Regulation and AntiTrust* (Cambridge,: MIT Press, 2001), pp. 688-697, 712-715;.

[21] Lovins, Amory, et al., *Winning the Oil Endgame* (Rocky Mountain Institute, 2004); Greene, David L., and Sanjana Ahmad, *Costs of U.S. Oil Dependence: 2005 Update* (Oak Ridge National Laboratory: Tennessee, February 2005; Securing America's Future Energy, *Oil Dependence: A Threat to U.S. Economic and National Security.*

[22] International Center for Technology Assessment, *The Real Price of Gasoline,* 1997, *Gasoline Cost Externalities Associated with Global Climate Change,* September 29, 2004; *Gasoline Cost Externalities: Security and Protection Services,* January 25, 2005; Lovins, Amory, et al., *Winning the Oil Endgame* (Rocky Mountain Institute, 2004); Greene, David L., and Sanjana Ahmad, *Costs of U.S. Oil Dependence: 2005 Update* (Oak Ridge National Laboratory: Tennessee, February 2005).

[23] The IPCC, recent winner of the Noble Peace Prize, estimated that a cost of $100 per ton.

[24] Securing America's Future Energy, *Oil Dependence: A Threat to U.S. Economic and National Security*

[25] David L. Greene and Sanjana Ahmad, *Cost of U.S. Oil Dependence: 2005 Update, 2005* (2005).

[26] IZZO, PHIL. "Is It Time for a New Tax on Energy? /Economists Say Government Should Foster/Alternatives – But Not How Bush Proposes." *Wall Street Journal* (Feb. 9, 2007); May, Clifford D. "Diversity Can Pave the Road Toward Energy Security." *Scripps Howard News Service* (Jan. 25, 2007).

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[34] Mark Cooper, *Rural Households Benefit More From Increases in Fuel Economy* (Washington, D.C., June 2007); Cooper, Technology, 50 by 2030.

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