

**ENHANCED ENERGY SECURITY ACT  
OF 2006**

---

---

**HEARING**  
BEFORE THE  
**COMMITTEE ON**  
**ENERGY AND NATURAL RESOURCES**  
**UNITED STATES SENATE**  
ONE HUNDRED NINTH CONGRESS

SECOND SESSION

ON

**S. 2747**

TO ENHANCE ENERGY EFFICIENCY AND CONSERVE OIL AND NATURAL  
GAS, AND FOR OTHER PURPOSES

---

JUNE 22, 2006



Printed for the use of the  
Committee on Energy and Natural Resources

---

U.S. GOVERNMENT PRINTING OFFICE

30-716 PDF

WASHINGTON : 2006

---

For sale by the Superintendent of Documents, U.S. Government Printing Office  
Internet: bookstore.gpo.gov Phone: toll free (866) 512-1800; DC area (202) 512-1800  
Fax: (202) 512-2250 Mail: Stop SSOP, Washington, DC 20402-0001

COMMITTEE ON ENERGY AND NATURAL RESOURCES

PETE V. DOMENICI, *New Mexico, Chairman*

LARRY E. CRAIG, Idaho	JEFF BINGAMAN, New Mexico
CRAIG THOMAS, Wyoming	DANIEL K. AKAKA, Hawaii
LAMAR ALEXANDER, Tennessee	BYRON L. DORGAN, North Dakota
LISA MURKOWSKI, Alaska	RON WYDEN, Oregon
RICHARD M. BURR, North Carolina,	TIM JOHNSON, South Dakota
MEL MARTINEZ, Florida	MARY L. LANDRIEU, Louisiana
JAMES M. TALENT, Missouri	DIANNE FEINSTEIN, California
CONRAD BURNS, Montana	MARIA CANTWELL, Washington
GEORGE ALLEN, Virginia	KEN SALAZAR, Colorado
GORDON SMITH, Oregon	ROBERT MENENDEZ, New Jersey
JIM BUNNING, Kentucky	

BRUCE M. EVANS, *Staff Director*  
JUDITH K. PENSABENE, *Chief Counsel*  
BOB SIMON, *Democratic Staff Director*  
SAM FOWLER, *Democratic Chief Counsel*  
JOHN PESCHKE, *Professional Staff Member*  
DEBORAH ESTES, *Democratic Counsel*

# CONTENTS

## STATEMENTS

	Page
American Institute of Architects .....	60
Bayh, Hon. Evan, U.S. Senator from Indiana .....	2
Bingaman, Hon. Jeff, U.S. Senator from New Mexico .....	7
Callahn, Kateri, President, Alliance to Save Energy .....	39
Coleman, Hon. Norm, U.S. Senator from Minnesota .....	4
Domenici, Hon. Pete V., U.S. Senator from New Mexico .....	1
Dorgan, Hon. Byron L., U.S. Senator from North Dakota .....	9
Karsner, Alexander, Assistant Secretary, Office of Energy Efficiency and Renewable Energy, Department of Energy .....	10
Lashof, Daniel A., Science Director, Climate Center, Natural Resources Defense Council .....	29
Lieberman, Hon. Joseph I., U.S. Senator from Connecticut .....	1
Nadel, Steven, Executive Director, American Council for an Energy-Efficient Economy .....	46
Salazar, Hon. Ken, U.S. Senator from Colorado .....	24
Thomas, Hon. Craig, U.S. Senator from Wyoming .....	9

## APPENDIX

Responses to additional questions .....	63
---	----



# ENHANCED ENERGY SECURITY ACT OF 2006

THURSDAY, JUNE 22, 2006

U.S. SENATE,  
COMMITTEE ON ENERGY AND NATURAL RESOURCES,  
*Washington, DC.*

The committee met, pursuant to notice, at 10:05 a.m., in room SD-366, Dirksen Senate Office Building, Hon. Pete V. Domenici, chairman, presiding.

## OPENING STATEMENT OF HON. PETE V. DOMENICI, U.S. SENATOR FROM NEW MEXICO

The CHAIRMAN. I have an opening statement and I'm sure you do, but in deference to other Senators' time, why don't we proceed to have our two Senators comment first, Senator Bayh and then Senator Coleman. We are glad that you are here and we understand that you are co-sponsors of this legislation and would like to be heard this morning. So we welcome you. Your statements will be made a part of the record as if read. We would welcome whatever you would care to say. Please proceed, Senator Bayh first and Senator Coleman second.

[The prepared statement of Senator Lieberman follows:]

PREPARED STATEMENT OF HON. JOSEPH I. LIEBERMAN,  
U.S. SENATOR FROM CONNECTICUT

Thank you, Mr. Chairman. I am grateful to the members of the Energy and Natural Resources Committee for allowing me to testify in support of the Enhanced Energy Security Act. I was proud to cosponsor this bill with Senator Bingaman last month.

As you know, the Enhanced Energy Security Act is based on the Vehicle and Fuel Choices for American Security Act, a bill that Senators Bayh, Brownback, Coleman, and I introduced with six other colleagues last November. Twenty-six Senators, including Senator Bingaman, have now cosponsored that bill, which I like to call the Set America Free Act. Seventy-nine Congressmen and Congresswomen have cosponsored its companion bill in the House of Representatives.

The Set America Free Act's core provisions fall within the jurisdiction of this committee. Senator Bingaman has taken that core, has slightly amended and supplemented it, and has reintroduced it as the Enhanced Energy Security Act. He also has taken those of the Set America Free Act's provisions that fall within the Finance Committee's jurisdiction and has introduced them as the Enhanced Energy Security Tax Incentives Act, of which I am also an original cosponsor.

As the Ranking Minority Member of this Committee, and as someone who has earned the respect of Senator Domenici, the committee's esteemed Chairman, Senator Bingaman has had the wherewithal to bring about today's hearing. I commend him and Chairman Domenici for doing so. It is an unmistakable sign of the momentum that continues to gather behind the Set America Free Act.

Like that bill, the Enhanced Energy Security Act requires the Executive Branch to use means readily at its disposal to save, by 2016, 2.5 million barrels per day from projected oil consumption in that year. It goes on to require 7 million barrels per day in savings by 2026 and 10 million barrels per day in savings by 2031. Cur-

rently, we import just over 10 million barrels per day of crude oil and consume just over twice that amount.

Americans are alarmed both by the steady rise in gas prices and by the increasing volatility in those prices. The main reason fuel prices are high and volatile is that the price of oil is high and volatile. The fundamental reason for that, in turn, is the narrowness of the margin between global oil demand and global oil production. We might never again see a comfortable margin, because while we have not yet drained all the oil deposits in the world, the demand of countries such as the U.S., China, and India is growing just as quickly as production.

Many Americans are also concerned that the U.S. is being thrust into increasing competition over oil with nations such as China, and they do not like seeing our economy held hostage to the caprice of those unstable and even hostile countries that supply much of the world's oil.

The U.S. can not drill its way out of this bind. Oil is a commodity that trades in a global market. Any modest amount of oil produced by new wells in the U.S. would be merely a trickle in the stream of global production, and thus would not have any appreciable effect on the price we pay for oil.

The only permanent solution to high fuel prices is to end our oil addiction. The Set America Free Act would do just that. What is more, in the process of making our cars, trucks, and busses more efficient and increasing the use of fuels derived from crops, the act would reduce greatly the amount of global warming pollution that our vehicles add to the atmosphere.

Energy independence, economic security, and curbing global warming—the Set America Free Act advances us toward each of those vital goals. So I am honored to testify today in favor of Senator Bingaman's Enhanced Energy Security Act. I respectfully ask this committee to schedule a vote on the bill and to report it favorably to the Senate floor.

Thank you, Mr. Chairman.

#### **STATEMENT OF HON. EVAN BAYH, U.S. SENATOR FROM INDIANA**

Senator BAYH. Thank you very much, Mr. Chairman, for convening these hearings and for your leadership on this important issue. It is good to be with you again this morning. And to Senator Bingaman, thank you for your leadership. We wouldn't be here if it hadn't been for your very good work on this issue. I also should thank members of the committee who could not be present today, who have endorsed this legislation, as well as our colleague, Senator Lieberman, who has done great work in this area and has helped to bring us to this point today, as well as to our friend and colleague, Norm Coleman, who I've had the pleasure of collaborating with on several other issues.

Mr. Chairman, I hope this can be an example of bipartisan cooperation that can characterize more of our work here in the U.S. Capitol.

In fact, Mr. Chairman, this is an all too infrequent occurrence, working across the aisle to advance our Nation's interests, making common cause on our common challenges. The energy challenge that faces our country, as you know well, Mr. Chairman, is not a democratic issue or a republican issue, it is an American issue and it is appropriate that we work on it together and I'm hopeful that perhaps this can serve as a template for solving the other challenges that face us, finding the common ground that we need to build upon to create America's future.

This is the right issue on which to start, Mr. Chairman, because our energy dependency and our future independence will be one of the defining challenges of our generation. It affects so much that is important to this country. It affects our economy, our national security, our finances, our environment and we need to make

progress on this issue, Mr. Chairman, if we are going to set our children free. We need to bring the same level of urgency and focus to this issue that we did to the question of putting a man on the moon. It will take that kind of effort to make the progress that America deserves. I hope we can begin to make that progress starting today.

The approach that Senator Coleman and I and Senator Bingaman and others adopt makes real progress, Mr. Chairman. We empower American workers to produce the next generation of high-mileage vehicles for use by American consumers. We rely increasingly on America's farmers and their crops to produce America's energy sources. If the Nation of Brazil can derive almost 37 percent of its fuel from bio-based fuels, certainly we can do better here in this country. Mr. Chairman, I would simply note that in next year's Indianapolis 500, those motor vehicles, some of the most powerful on earth, they go 230 miles an hour, they will be powered 100 percent by ethanol in next year's 500. If we can do that with those race cars, we can do a better job with America's family vehicles.

Our approach involves having American scientists and engineers make the discoveries that will truly make us independent in terms of our energy needs in the long run. And the progress, Mr. Chairman, will be substantial. The experts estimate that over the next 10 years, we will reduce America's petroleum consumption from what it would otherwise be by about 2.5 million barrels per day, 100 percent of what we are currently importing from the Middle East. That doesn't solve all of our problem but it is a material step in the right direction. And over the next 20 years, we would reduce our anticipated consumption by 7 million barrels per day—again, a major step in the right direction.

The time has come to act, Mr. Chairman. We need a greater sense of urgency, more than ever. We import more petroleum today than we did on 9/11. Almost 5 years after that attack, we have made virtually no progress. We must do better than that. We find ourselves in the unacceptable position of too often funding both sides of the War on Terror. That must stop and it can stop by increasing our energy independence and reducing our need for imported petroleum.

Finally, Mr. Chairman, we are exporting way too many American jobs today and importing way too much oil. The time has come to reverse that process. Our proposal would accomplish that.

So, let me just conclude by recalling the spirit that prevailed across our country, certainly in my State and I know in yours as well, following the 9/11 attacks. I literally had people stopping me on the street, asking, what can I do? What can I do to help my country? There was a palpable desire on the part of the American people to help us meet the challenges that we face.

Mr. Chairman, we gathered here today to give them that answer, to support this set of initiatives. And if we do, I think the chances are good that some day we might look back at this as the beginning of solving this problem. Much as Winston Churchill said at the end of the Battle of Britain, an important turning point in another great struggle for mankind, when he said that this was certainly not the end. Perhaps it was not the beginning of the end, but it was definitely the end of the beginning. So let us bring that same

focus, that same sense of urgency and commitment to the beginning of meeting America's energy challenges. That is why we are here today. Mr. Chairman, I thank you for your courtesy and for your leadership.

The CHAIRMAN. Thank you very much, Senator. Now, Senator Coleman, we welcome your remarks.

**STATEMENT OF HON. NORM COLEMAN, U.S. SENATOR  
FROM MINNESOTA**

Senator COLEMAN. Thank you very much, Mr. Chairman. I want to thank you first personally. I was listening to Senator Bayh's remarks and the Americans say, what can we do? Mr. Chairman, I've had a number of conversations with you where you've asked the question, what can we do? What do we do? What should we be doing that we're not doing? And I think through the leadership—bipartisan leadership of Senator Bingaman, the ranking members, Senator Bayh and others, I think we've laid on the table, through the Vehicle Fuel Choices for American Security Act, from which this legislative effort stems, 26 co-sponsors, a bipartisan approach and some very specific things that we can do.

First, let me second the comments of my colleague from Indiana. I think there are few topics Congress can address right now that are more important to the future of this Nation than energy security. We talk about whether it is freeing our Nation from dependence on foreign oil or limiting. There is a lot of discussion about it, but clearly, this is a matter of national defense. This is a matter of economic security. This is a matter of defense of our way of life. I think what some folks see as a challenge, I see, and I think my colleagues see, as an opportunity for economic stimulus and growth.

We set an ambitious plan in this Enhanced Energy Security Act, saving 2.5 million barrels of oil per day in 10 years, roughly the amount of oil that we import today from the Middle East. I think many would dismiss this as too ambitious a goal, but as Senator Bayh talked about, and I believe, at one point in time we told Americans that we were going to walk on the moon. At the time, we didn't have the capacity to get to the moon, not to mention get back. I think because we had a singular focus and a commitment and we stayed the course of that commitment, it happened. The innovative spirit of America, the relentless drive to get something done, that's the key. Lay out the objective, and this bill lays out a very clear objective and then challenges—let us kind of marshal our energies to make it happen. I think that the failure to act—clearly, the threat is real. It doesn't take much imagination to consider the foreign policy implications of having to worry about what Hugo Chavez is thinking this morning about selling oil to America. Right now, I don't think he has a choice, but at some point he will, with the political stability in Nigeria.

Mr. Chairman, countries that aren't free produce two-thirds of the world's oil and have nearly 80 percent of the world's proven oil reserves. Looking to our economy, Chairman Greenspan was recently before the Foreign Relations Committee and we held a hearing on this subject. He pointed out that world oil markets are now subject to a degree of strain not experienced in a generation and



that the lack of excess capacity means there isn't enough of a buffer between supply and demand to absorb shut-downs of even a small part of the world's production. If terrorists attack just one major oil supply that exceeds our economy, we will pay a heavy price.

So the imperative is clear. America must unleash itself from its foreign oil dependency. I think the solution is clear: Technology, renewable energy, and energy conservation. This bill provides some important initiatives, that will promote, by the way, E-85 fueling infrastructures, speed the development of cellulosic ethanol, while investing in the development of efficient vehicle technologies and assisting auto manufacturers to transition to fuel-efficient vehicle production.

I believe that much of the ability to reduce petroleum demand will rest with our ability to accelerate technology for electric hybrids and infrastructure for renewable fuels. This year, Brazil will have the liberty of not having to import. The liberty—not to say that it won't, but it will have the liberty of not importing foreign oil. I've been to Brazil. I've talked to their leaders. I've witnessed what they have done first-hand. And what they did was simply had a focused, concentrated effort over 30 years. It took a long time but they started in the 1970's and they are there today. In the 1970's, their leadership realized 85 percent dependence on foreign oil was unacceptable. They did something about it. They made a commitment to investing in ethanol production, mandated an aggressive percentage of gasoline be blended with ethanol, and ultimately ensured that flex fuel vehicles were widely available. A similar commitment by the United States could also reap significant rewards.

In fact, in a recent study—and I'm going to have it submitted, if I can, into the record—by AllianceBernstein of Wall Street, they've laid out kind of an interesting view of research on strategic change. They noted—they talked about how cellulosic ethanol could be a game changer, a game changer resulting in, perhaps, a reduction of 40 percent of the demand for petroleum.

Mr. Chairman, renewables are a real option. One of the problems we have is half the E-85 pumps—it's one thing to have renewables, but half the pumps in the Nation are in one State, my State. I think 246 out of 600 E-85 pumps. But we can change that. Notably, the alternative fueling infrastructure incentives in this bill would make an estimated \$20 million available per year for these pumps. I think it is obvious that our current foreign oil dependence is untenable, that our economy and national security is in peril if we don't do something about it. But hopefully, that's not the end of the story.

I truly believe we can gain a great deal of energy independence through existing and emerging energy saving and renewable energy technology that will protect and grow American jobs. Mr. Chairman, hybrids are a few years away. Again, I cite the AllianceBernstein study: Hybridization—Toyota is coming out with a lithium battery, I'm told, in a couple years. It could get 70 miles, stay charged and that will drive down, that will drive down. But what we've got to do is we've got to support those technologies. We have to be there to move the ball forward. Cellulosic isn't here today but we have a stake in it being here in the near-term future.

The Enhanced Energy Security Act moves us toward independence and continued prosperity and I commend the committee for considering this proposal. Thank you, Mr. Chairman.

[The prepared statement of Senator Coleman follows:]

PREPARED STATEMENT OF HON. NORM COLEMAN, U.S. SENATOR FROM MINNESOTA

First of all, I want to thank you, Chairman Domenici, for holding this hearing, and I want to recognize Senator Bingaman's efforts on this bipartisan legislation. The Vehicle and Fuel Choices for American Security from which this legislative effort stems has 26 cosponsors and speaks to bipartisan interest in taking an aggressive approach to energy independence.

There are few topics Congress could address right now more important to the future well-being of the nation than our energy security. Freeing our nation from dependence on foreign energy is truly a matter of national defense—defense of our national security, defense of our economy, defense of our way of life. But, what some folks forget is that this challenge presents a powerful opportunity for economic stimulus and growth.

The Enhanced Energy Security Act sets an ambitious plan for saving 2.5 million barrels of oil per day in 10 years, roughly the amount of oil we currently import from the Middle East. Many would dismiss such an ambitious goal, but the moon was also once out of reach—we all know the power of America's innovative, relentless spirit when called to an objective, no matter how formative.

Quickly, the threat to national and economic security is real and growing. It does not take much imagination to consider the foreign policy implications of having oil imports rest on the whims of Hugo Chavez in Venezuela or the political stability of Nigeria. Countries that aren't free produce more than two-thirds of the world's oil and have nearly 80 percent of the proven reserves.

Looking to our economy, just consider the recent comments of Alan Greenspan who has pointed out that world oil markets are now subject to a degree of strain not experienced in a generation and that the lack of excess capacity means there isn't enough of a buffer between supply and demand to absorb shutdowns of even a small part of the world's production. If a terrorist attack on one of our major oil suppliers succeeds, our economy will pay a heavy price.

The imperative is clear: America must free itself from its oil dependence, and I believe the solution is also clear: renewable energy and energy conservation. The Enhanced Energy Security Act and its parent bill, the Vehicle Fuel Choices for American Security Act, include important initiatives that will promote E85 fueling infrastructure and speed the development of cellulosic ethanol, while investing in the development of efficient vehicle technologies and assisting auto manufacturers' transition to fuel-efficient vehicle production. These initiatives will help make America a leader in renewable fuel and energy conservation technology that U.S. businesses can then export to countries like China and India where there is a projected 125% increase in the demand for oil from 2003 to 2025.

I believe much of the reduction in petroleum demand will rest with our ability to produce renewable fuels. This year, Brazil will have the liberty of not having to import a drop of foreign oil. I been to Brazil, witnessed their success firsthand, I've sat down with their leaders and talked renewables, and what I've learned is that Brazil's success was the result of a determined, concerted effort over 30 years to reach oil independence.

In the 70s, the Brazilian leadership realized its 85 percent dependence on foreign oil was unacceptable and they did something about it. Investing billions of dollars, Brazil directed provided heavy government support for ethanol production, mandated an aggressive percentage of gasoline be blended with ethanol, and ultimately ensured flex fuel vehicles were widely available. A similar commitment by the United States could also reap significant rewards. In fact, a recent AllianceBernstein study found that ethanol could eventually replace a large fraction, around 40 percent, of gasoline demand.

Of course, mandating that every gallon of gasoline contain ethanol in this country would be difficult, which is why it's so important to have heavy federal in E85 pumps so that ethanol can be made widely available. Notably, the alternative fueling infrastructure incentives in this bill would make an estimated \$20 million a year available for these pumps.

I think it's obvious our current foreign oil dependence is untenable, that our economy and very national security is in peril if we don't do something about it, but thankfully, that's not the end of the story. I truly believe we can gain a great deal of energy independence through existing and emerging energy saving and renewable

energy technologies that will protect and grow American jobs. The Enhanced Energy Security Act moves us towards independence and continued prosperity, and I commend the Committee for considering this proposal.

The CHAIRMAN. Thank you very much, Senator. Before you leave, and we're going to proceed, we have a lot of witnesses, but I just want to lay before the two of you and the two of us, a simple proposition that it becomes more and more obvious to this Senator with the passage of each day that while we are all complaining about the high price of crude oil, one thing that it is bringing to the American economy is an opportunity for innovative technology because the price is justifying investment. And I lay before you now, and it is being addressed by some very intelligent people, it is a very simple proposition, and that is, why is that high price not bringing more investment? And it seems that question is being answered in the following manner.

One of the reasons is, there is no assurance that the price is going to stay that high. Now, that is bringing some very imaginative thinking to the proposition of how one might resolve that issue. Such things as a floor and where would a floor be? Is \$38 or \$40 a sufficient floor to assure that there will be investments of all types, in terms of things like coal gasification. Now, you must have heard these propositions from Jet Blue and others, where they are talking about that kind of thing. Very, very interesting propositions. They find their ways through your different proposals, at least the basic notion that it is time to invest because the price is awful. What you are competing with is very, very high, finally. So you don't want to let that get away from you. You want to get the alternatives on while that is true.

I want to thank you for your testimony and for your proposals. I don't know where this is going for the remainder of this a short year, but there are many good ideas there and I thank you for them.

Senator Bingaman, would you like to make your opening remarks? I'll follow with mine and then we'll proceed with the witnesses.

Senator BINGAMAN. I'm glad, too. Let me also just thank both Senator Bayh and Senator Coleman for their leadership on this. The legislation that we are considering this morning in the committee, of course, is built on—is essentially the parts of the legislation that they introduced, which this committee has jurisdiction of and which, I think, have a great deal of merit and we appreciate your leadership.

The CHAIRMAN. Thank you.

Senator BINGAMAN. Did you want me to give an opening statement?

The CHAIRMAN. Yes, please.

**STATEMENT OF HON. JEFF BINGAMAN, U.S. SENATOR  
FROM NEW MEXICO**

Senator BINGAMAN. Let me go ahead and begin, Mr. Chairman, on a subject that is a little different than the subject of this hearing, and acknowledge that today is the 1-year anniversary of a sense of the Senate resolution that we passed related to greenhouse gas emissions and global warming. I wanted to thank you for the

continued effort that we are making to move ahead on that issue and the workshop that we had earlier and the white paper we've issued. I think all of that has been positive.

The topic of today's hearing is S. 2747, and as I indicated, it is a piece of legislation that essentially takes provisions that were earlier introduced, that should be in the jurisdiction of this committee. The earlier legislation contained tax provisions as well and went to the Finance Committee.

So what we've done is to get the provisions that relate to this committee and put them together in legislation, S. 2747, dealing primarily with the issue of energy efficiency. I think energy efficiency, along with the use of alternative fuels and alternative energy sources, provide us with the best near-term options to begin balancing energy demand and supply and reducing the cost of energy. Clearly, this needs to be part of what we do, in a very conscious way, by changing our policies and beginning to move toward reducing our addition to foreign oil, which the President spoke about in his State of the Union speech. I hope we get some good testimony on the provisions in this legislation. I believe we may also get some additional ideas for legislation from some of the testimony from the second panel, which I think would be good.

Let me thank Secretary Karsner for his appearance today. I believe this is his first appearance since his confirmation and I look forward to hearing his comments. I am somewhat disappointed that the written testimony the Department has submitted is not more detailed in response to the specific provisions in this legislation. I thought, frankly, we would get more direct interaction with the administration on what steps they propose will help us to end this addiction to oil, which the President spoke of. Clearly, the proposals in this legislation, I think, move in that direction. I hope we can get into those questions in the question and answer period. Thank you very much.

The CHAIRMAN. Thank you. Again, good morning. And this morning we have a hearing on my colleague, Mr. Bingaman's bill, S. 2747, which essentially is enhanced energy efficiency as a means of reducing our consumption of gas and oil. I'm pleased that we are having the hearing and look forward to the testimony. There is no doubt much can be done to improve the ways in which we use energy. We can do many things as private citizens that make economic sense. We can reduce the amount of gasoline we consume by driving less. We can reduce the amount of natural gas and electricity we consume by producing more efficient appliances and exercising more care in how cool or warm we keep our homes, depending upon the season. We can build more efficient residences and commercial buildings. We can use more energy produced from renewable energy, solar, wind and biomass and we can reduce our use of water, which requires enormous amounts of energy to store and then move to consumers.

These are just a few of the steps that most consumers are faced with, that the higher prices of last year look them in the eye and cause them to make some changes. The question we as legislators now face is, what can we do to help consumers understand how to reduce their energy consumption and the cost that they must endure?

We did a great deal in the energy bill of 2005 that addresses energy conservation and improved energy efficiency. But that was before increased global demand for oil and natural gas and Hurricanes Katrina and Rita drastically changed our lives, and how dependent we are on imported petroleum and how even the slightest interruption of domestic supplies can affect our daily lives.

Our hearing today marks, I think, the beginning of a search for additional ideas that we might undertake to address our energy needs and I welcome my friend's contribution to the start of this effort to find new ideas and, I hope, some new solutions.

Before we hear our witnesses, I want to take a moment to recall that on this date, a year ago, we passed, as you indicated, a sense of the Senate resolution regarding the need to establish a system of reducing greenhouse gas emissions in the U.S. economy. We have not made great progress, but that is looked upon by many as a significant achievement, the mere fact that we made the finding and then the Senate adopted it. Since then, our committee has had several hearings and a very successful conference, as you've indicated, and I look forward to seeing where this all ends up.

Now, having made your statement, I look now to Senator Thomas to see if he has any opening remarks and then to the distinguished Senator Dorgan, if he has any.

**STATEMENT OF HON. CRAIG THOMAS, U.S. SENATOR  
FROM WYOMING**

Senator THOMAS. Thank you, Mr. Chairman. I am pleased that you are having this hearing. I think one of the great things to look forward to is some alternatives that we can have for energy and the demands of energy that we have and to look at the ways we can do that and to the incentives we can put in place to cause it to happen.

I just want to make one point that I think we also need to remember, that we have two challenges, at least, before us. One is the long-term challenge of finding some alternatives and some new ways to produce. We also have the challenge of our needs in the short-term. So, we can't get so consumed with our long-term energy that we don't take a look at doing what we can with the things that we do know how to do and to exploit those things we already have. So, I hope we can find this balance and I think this hearing will be part of doing that. Thank you, sir.

The CHAIRMAN. Thank you very much.

**STATEMENT OF HON. BYRON L. DORGAN, U.S. SENATOR  
FROM NORTH DAKOTA**

Senator DORGAN. Mr. Chairman, thank you very much. I am the ranking member of a committee that is meeting two floors above us, the Commerce subcommittee, so I will have to be in and out. But I want to thank you. You know, as the old saying goes, talk is cheap and energy prices are high, but I've been very proud to be a part of this committee working on the previous energy bill and now working on things that really will matter. I think the proposals by you and the proposals by Senator Bingaman recognize that the least expensive and most readily available forms of energy are achieved through efficiency and conservation in the short-term,

because we use a prodigious amount of energy and waste a great deal of it as well. As Senator Thomas said, we've got to do a lot of things and a lot of things right, in the short, intermediate and long terms to address these issues. I think that the hearing you are holding today is exactly the right thing at the right time and I appreciate your leadership and the leadership of Senator Bingaman.

The CHAIRMAN. Thank you, Senator. Now, this is your first opportunity to appear before us. I remember the day we had you before us, how excited you were to take this job on. And now I understand you have been over there for a while. You still have a smile on your face and you look just as rosy as you did when you were willing to accept the job. I know this bill has presented a very difficult challenge, an analytical challenge for you and a policy analysis challenge, but we look forward to your testimony. Your remarks will be made part of the record. We urge that you make them brief for oral presentation, considering that they are already in the record as presented.

With that, would you please proceed and then we'll ask questions, if we have any.

**STATEMENT OF ALEXANDER KARSNER, ASSISTANT SECRETARY, OFFICE OF ENERGY EFFICIENCY AND RENEWABLE ENERGY, DEPARTMENT OF ENERGY**

Mr. KARSNER. Thank you, sir. Chairman Domenici, ranking member Bingaman and members of the committee, I am pleased to offer preliminary comments on some of the provisions of S. 2747, the Enhanced Energy Security Act of 2006, and I will also report on the status of the Office of Energy Efficiency and Renewable Energy's work to implement the energy efficiency provisions of the Energy Policy Act of 2005.

I will begin with the comments on S. 2747. When EAct 2005 was signed last August, it addressed many energy issues that had sought attention for many years. It was only a month later when Hurricane Katrina hit and slammed—

The CHAIRMAN. We can't hear you very well, sir.

Mr. KARSNER. Oh, forgive me, sir. It was only a month later when Hurricane Katrina hit, forcing home new energy realities and forcing our country to take an even closer look at our energy vulnerabilities. We, as a Nation, needed to take more comprehensive action. And I would like to express my gratitude to this committee for your diligence in pursuing new legislative paths and initiatives to advance our national energy efficiency goals at this very critical time.

Unfortunately, the administration has not had sufficient time to review or coordinate its interagency review of S. 2747 and, therefore, does not, at this time, have a formal position on the legislation. I would note, however, that some portions of S. 2747 overlap with current EAct provisions and that it would be productive to resolve any issues of redundancy or duplication that are inherent in the legislation. Many sections of S. 2747 contribute effective energy-efficiency ideas to the mix of proposals our Nation needs to reduce oil consumption.

For example, I am generally supportive of the School Bus Idling Program to save fuel and reduce pollution and believe the pro-

posals for near-term vehicle technology to promote electric propulsion appear to be sufficiently flexible and aligned with the President's Advanced Energy Initiative.

The "Golden Carrot" style incentive program, in section 402, for high-efficiency consumer products, could definitely prove effective, especially if it were to be enhanced to ensure that winning companies make a sufficient commitment to bring those products to market.

The section on energy-saving performance contracts could potentially provide increased flexibility for the Federal Government to use energy service companies. Inside the Department of Energy, we are inclined to support the energy efficiency resource programs proposed in section 404, a measure that was not included in the final version of the EAct but supported by the administration at that time.

Other measures, such as the Efficient and Safe Equipment and Replacement Program, would at this time require further review. Looking at title I, the national oil savings plan to reduce oil use on a fixed schedule, we believe that the targets might not be able to be met, even with the most aggressive technology push. While the advanced energy initiative is expected to help achieve these long-term goals, there remain national uncertainties in technology development and commercial uptake that make it imprudent to legislate an arbitrary end result.

In addition, the President has asked Congress for the authority to reform and increase passenger car CAFE standards but has indicated that highway safety, technology, and economics need to be considered in the balance when determining the maximum feasible fuel economy standard.

In title II, we have additional concerns. For example, while the President and Secretary Bodman are both committed to Federal leadership in using the Federal fleet of vehicles to advance fuel efficiency and flexible fuels, we believe there are aspects of the technical language in S. 2747 regarding Federal fleet requirements that need further review and discussion. We look forward to working collaboratively with you and the members of the committee to resolve these issues.

Similarly, we are not yet convinced of the effectiveness of vehicle retirement programs with respect to the cost and life cycle energy savings under the present economic analysis. With regard to section 206, EAct already authorizes grants to support activities for auto companies producing fuel-efficient vehicles. We believe a series of new loan guarantees legislation would largely be unnecessary.

EAct also provides tax credits to reduce the cost of alternative fuel distribution addressed in section 207 of S. 2747. In title IV, the national media campaign language is virtually identical to that enacted in EAct.

I would also like to comment on the proposed renewable portfolio standards. The administration continues to believe that RPS standards are best left to the States. Under Secretary Garman provided congressional testimony before this committee on March 8, 2005, explaining this position.

I would now like to briefly address EERE's implementation of EPAct 2005, with more complete comments in my written testimony that have been submitted for the record.

Targeting our national imperative to reduce energy consumption, EPAct introduced a broad range of energy efficiency initiatives, programs, standards and studies, many of which built upon the work that was already in progress at the Department of Energy. For example, section 105 provides long-term authority to extend Federal energy savings performance contracting—ESPCs—until September 30, 2016. This extension has renewed interest in Federal energy savings projects after the 1-month hiatus in Federal ESPC authority. EERE has reinvigorated its super ESPC program to increase the potential for cost-effective energy savings through private investment in Federal energy efficiency projects.

Appliance and equipment standards are cost-effective energy saving tools, based on published benefit/cost analysis of past rules. The Department is committed to addressing the backlog of mandated rulemakings and meeting all of its statutory requirements. By this August, we will be sending you another status report on our progress on appliance standards. We expect to report that we will be on schedule for all items and, to the extent possible, I am hopeful that we will find ourselves slightly ahead of schedule.

Section 110 directed DOE to explore the impact of extending daylight savings time. That study is presently underway and in concurrence. Another study on the energy conservation implications of the widespread adoption of telecommuting by Federal employees is also in the concurrence process.

Section 134 authorized the Energy Efficiency Public Information Initiative, a comprehensive national plan to inform consumers that builds upon the outreach efforts ongoing within DOE. Consistent with this authorization, a number of consumer awareness programs are underway. For example, last October, Secretary Bodman launched the “Easy Ways to Save Energy” campaign, which includes an education and awareness effort with the Alliance to Save Energy and private industry to disseminate energy savings information through radio and television public service announcements, websites, newspaper advertising, and media campaigns.

In conclusion, I hope this gives you some understanding of the administration's perspective on S. 2747 and a fair overview of the energy efficiency responsibilities that our office assumed with the enactment of the EPAct. In many important ways, EPAct has served to buttress our efforts and help emphasize the necessity of energy efficiency onto the national stage. We look forward to working with you as we dedicate ourselves to developing energy efficient and renewable energy technologies and promoting significant improvements in the energy efficiency of our country.

Thank you very much.

[The prepared statement of Mr. Karsner follows:]

PREPARED STATEMENT OF ALEXANDER KARSNER, ASSISTANT SECRETARY, OFFICE OF ENERGY EFFICIENCY AND RENEWABLE ENERGY, DEPARTMENT OF ENERGY

Chairman Domenici, Ranking Member Bingaman, and Members of the Committee, I am pleased today to offer preliminary comments on some of the provisions in S. 2747, the “Enhanced Energy Security Act of 2006”. I will also report on the status of the Office of Energy Efficiency and Renewable Energy's (EERE) work to



implement the energy efficiency provisions of the Energy Policy Act (EPACT) of 2005.

COMMENTS ON S. 2747

When EPACT 2005 was signed last August, it addressed many energy issues that had sought attention for years. However, only a month later, Hurricane Katrina hit, slamming home new energy realities and forcing our country to take an even closer look at our energy vulnerabilities. We, as a Nation, needed to take more comprehensive action, and I would like to thank this Committee for your diligence in pursuing new legislative paths and initiatives to advance our national energy efficiency goals at this critical time.

The Administration has not had sufficient time to review or coordinate its inter-agency review of S. 2747 and therefore does not have a formal position on this legislation. I would note, however, that some portions of S. 2747 overlap with current EPACT provisions and that it would be productive to resolve any issues of duplication that are inherent in the legislation.

Looking at the Title I national oil savings plan to reduce oil use on a fixed schedule, we believe that the targets might not be able to be met, even with aggressive, technology-forcing increases in CAFE standards that may not fully account for highway safety. While the Advanced Energy Initiative is expected to help achieve these long-term goals, there remain natural uncertainties in technology development and commercial uptake that make it imprudent to legislate an arbitrary end-result. In addition, the President has asked Congress for authority to reform and increase passenger car CAFE standards but has indicated that highway safety, technology, and economics need to be considered when determining the maximum feasible fuel economy standard.

In Title II, we have additional concerns. For example, while the President and Secretary Bodman are both committed to Federal leadership in using the Federal fleet of vehicles to advance fuel efficiency and flexible fuels, we believe there are aspects of the technical language in S. 2747 regarding Federal fleet requirements that need further review and discussion. We look forward to working with the committee to resolve these issues.

Similarly, we are not convinced of the effectiveness of vehicle retirement programs with respect to cost and life-cycle energy savings under economic analysis. With regard to Section 206, EPACT already authorizes grants to support activities for auto companies producing fuel efficient vehicles, and we believe new loan guarantees would be largely unnecessary. EPACT also provides tax credits to reduce the cost of alternative fuel distribution addressed in Section 207 of S. 2747. In Title IV, the "National Media Campaign" is virtually identical to that enacted in EPACT.

I would also like to comment on the proposed Renewable Portfolio Standard (RPS). The Administration continues to believe that RPS standards are best left to the States. Under Secretary Garman provided Congressional testimony before this Committee on March 8, 2005, explaining this position.

EPACT 2005 IMPLEMENTATION

I would now like to address EERE's implementation of EPACT 2005. Targeting our national imperative to reduce energy consumption, EPACT introduced a broad range of energy efficiency initiatives, programs, standards, and studies, many of which built upon work that was already in progress at the Department of Energy (DOE).

*EERE's Federal Energy Management Program Provisions*

While EPACT's first section in Title I appropriately addresses energy savings in facilities administered by Congress, the next set of sections broadens Federal programs for energy efficiency that are conducted by EERE's Federal Energy Management Program, or FEMP.

Section 102, Energy Management Goals, re-establishes the statutory energy reduction goals for Federal buildings. Updating the 1985 energy consumption figures, the new goal uses a base year of Fiscal Year (FY) 2003 and requires reductions of two percent per year in energy use per square foot, leading to a 20 percent reduction by FY 2015.

The law allows agencies to exclude certain buildings from this goal under stringent criteria and gave the Department of Energy 180 days to provide guidelines for these exclusions. The guidelines have been finalized and issued to the Federal agencies. Formally titled the *Guidelines Establishing Criteria for Excluding Buildings from the Energy Performance Requirements of Section 543 of the National Energy Conservation Policy Act as Amended by the Energy Policy Act of 2005*, they are avail-

able on FEMP's web site at: [http://www1.eere.energy.gov/femp/pdfs/exclusion\\_criteria.pdf](http://www1.eere.energy.gov/femp/pdfs/exclusion_criteria.pdf).

To further assist agencies in adjusting to the new goals, EERE is drafting a memorandum to Federal agencies to clarify how the differing reporting requirements of EPACT and Executive Order 13123 (still in effect) will be addressed and to provide guidance to agencies in establishing their 2003 baseline. EERE plans to provide each agency with its FY 2003 energy consumption, costs, and square footage data formatted in ways that allow agencies to easily assess their baseline data according to default and new building inventory categories. We are also convening working group meetings with agencies to revise the Annual Reporting Guidance to reflect the EPACT 2005 requirements.

To promote operations and maintenance (O&M) best practices in the Federal sector, EERE is developing an O&M Best Practices Guide and training materials including a comprehensive on-line training program for Federal energy managers and building operators. EERE will continue conducting its Energy Savings Expert Team (ESET) facility assessments, launched last fall in response to the President's call for agency action to conserve energy. The teams initially conducted site assessments at 28 large Federal installations and identified potential natural gas savings of 970 billion Btu. DOE is following up with all sites to assess whether the ESET recommendations are implemented, to provide technical assistance to agencies should they choose to use energy savings performance contracts instead of direct appropriations to implement projects, and to help with project planning for more capital-intensive projects.

Additional efforts include promoting the Resource Efficiency Manager (REM) concept in the Federal sector. REM salaries are paid for by the savings they help generate. EERE will also demonstrate advanced energy efficient technologies in Federal buildings, with a goal to test or demonstrate one new advanced energy efficient technology each year. One of the steps toward this goal is working with industry to develop deployment opportunities for advanced energy efficient technologies.

Section 103, Energy Use Measurement and Accounting, requires all Federal agencies to install metering and advanced metering where cost-effective, according to guidelines developed by the Department of Energy in consultation with a number of interest groups. After meeting with representatives from industry, energy efficiency advocacy organizations, national laboratories, universities, and Federal facility managers, EERE has issued the *Guidance for Electric Metering in Federal Buildings*, located on the web at: [http://www1.eere.energy.gov/femp/pdfs/adv\\_metering.pdf](http://www1.eere.energy.gov/femp/pdfs/adv_metering.pdf). Agencies must submit their implementation plans by August 3, 2006, and progress reporting under the advanced metering requirement will begin in FY 2007.

Section 104, Procurement of Energy Efficient Products, seeks to harness the energy savings that can be achieved economically through the purchase of energy-efficient products and equipment. DOE has drafted the regulations necessary to carry out Section 104; the regulations are being reviewed internally. We have also drafted the premium efficiency standard for electric motors of 1 to 500 horsepower as required under Section 104(d).

The Department will continue to develop and revise its widely-used energy efficient product procurement recommendations and will seek to expand its bulk purchasing program to encompass additional technologies, agencies, and building types each year. Over the longer term, we will work with EPA, State, and local government organizations and non-government organizations (NGOs) to establish and participate in a broad-based network of public agencies, institutions, and leading corporations committed to using ENERGY STAR and FEMP criteria in their purchasing, with affiliated suppliers who agree to provide compliant energy-efficient products.

Section 105 provides long-term authority to extend Federal Energy Savings Performance Contracting (ESPC) until September 30, 2016. This extension has renewed interest in Federal energy savings projects, after the 13-month hiatus in Federal ESPC authority.

EERE has reinvigorated its Super ESPC program to increase the potential for cost effective energy savings through private investment in Federal energy efficiency projects.

EERE continues to increase outreach and education of ESPC to the Federal agencies that actually implement the energy efficiency projects. Our ESPC education campaign includes new informational and promotional materials in the most current media formats and direct communications with Senior Energy Officials of every major Federal agency. We plan to increase by 50 percent the number of ESPC training workshops conducted during the next two fiscal years.

EERE will continue to conduct detailed data analysis of ESFC metrics including cost effectiveness, financing costs, and project cycle times to help improve ESFC results. Specific improvements include reducing project cycle time from the current 12 to 18 months to 9 to 12 months and modifying contracts to obtain the best possible financing rates.

Under Section 109, DOE is required to issue a new Federal building energy efficiency standard, through the rulemaking process, within one year of the passage of EPACT 2005. The provisions of this section require that buildings be designed to 30 percent below the American Society of Heating, Refrigerating, and Air-Conditioning Engineers (ASHRAE) standard or the International Energy Conservation Code (depending on building type) if life-cycle cost effective. We are working on a rulemaking to implement Section 109.

*EERE's Building Technologies Program Provisions*

Turning now to the building sector, EPACT 2005 could not have arrived at a more propitious time. Drivers in the marketplace, such as high electricity and natural gas prices, along with excellent progress in R&D on building technologies are bringing energy efficiency and renewable energy into mainstream markets, and significantly improving the business case for energy efficiency and renewable energy.

But when it comes to energy efficiency, the case for the Nation is even more compelling than the business case. That is something that President Bush recognized when he outlined the Advanced Energy Initiative during his State of the Union address, with a proposal to increase clean-energy research and break America's dependence on foreign sources of energy and to promote clean energy by changing the way we power our homes, businesses, and automobiles.

DOE has an aggressive goal for the future of buildings. By 2020, DOE aims to have cost-competitive net-zero-energy homes in this country. Such buildings would be 60 to 70 percent more efficient than conventional practice in their energy use, and would use renewable energy such as solar photovoltaics to meet their remaining energy requirements. A related goal is to have zero-energy commercial buildings as well by 2025. We have set interim targets to develop residential and commercial building design packages that incrementally improve energy efficiency and incorporate renewables in a cost effective manner.

I'd like to review our progress across the 12 EPACT sections for which the Building Technologies Program is responsible, ranging from expanded authorizations for appliance standards to assisting the Department of Treasury develop the technical requirements for tax incentives. This extensive focus on energy efficiency in the building sector reflects the significant opportunities for energy efficiency improvements in residential and commercial buildings, appliances and equipment. In particular, I'd like to highlight our appliance standards work, progress on solid state lighting R&D, and our Energy Star activities.

Appliance and equipment standards are cost effective energy-saving tools, based on published benefit-cost analyses of past rules. The Department is committed to addressing the backlog of mandated rulemakings and meeting all of its statutory requirements. In our report to Congress, submitted on January 31, 2006, pursuant to Section 141, we presented a multi-year schedule that is ambitious and achievable and will enable the Department to produce at least one new or amended standard for all products in the backlog no later than June 2011, five years from the issuance of this plan. By June 2011, the Department will issue standards for the following 18 products in the backlog:

- Residential furnaces and boilers
- Mobile home furnaces
- Small furnaces
- Residential water heaters
- Direct heating equipment
- Pool heaters
- Distribution transformers, MV dry-type and liquid-immersed
- Electric motors (1-200 hp)
- Incandescent reflector lamps
- Fluorescent lamps
- Incandescent general service lamps
- Fluorescent lamp ballasts
- Residential dishwashers
- Ranges and ovens (gas and electric) and microwave ovens
- Residential clothes dryers
- Room air conditioners
- Packaged terminal air conditioners and heat pumps
- Residential central air conditioners and heat pumps

Since the passage of EPACT, and consistent with the schedule delivered to Congress, we are making great progress. I would like to summarize what we have done in the past year.

By this August, we will be sending you another status report on our progress on appliance standards. We expect to report that we will be on schedule for all items, and perhaps slightly ahead of schedule on selected items. For example, EPACT 2005 included 15 prescribed standards, which DOE promptly codified en masse in its October 18, 2005 technical amendment.

In regard to test procedures, EPACT 2005 prescribed 11 test procedures. Adopting these is a more technical exercise, so it takes a little longer. The proposed rule to codify the prescribed test procedures will be issued this June, with a final rule expected by November 2006.

On the standards side, I am happy to report that DOE is on schedule in getting the EPACT 2005-required rulemakings up and running. For residential dehumidifiers and commercial clothes washers, DOE held a “framework workshop” in April 2006 to kick off the rulemaking. Comments have been received and the analysis is underway. I note that Congress has required a second rulemaking for commercial clothes washers—this will begin after the first rule is issued.

The commercial refrigeration standards rulemaking is in a similar state—the “framework workshop” was held in May 2006. In July, we’ll be having a “framework workshop” to kick off the standards rulemaking for beverage vending machines.

There are three other activities related to EPACT 2005 and Appliance Standards that I’d like to close with:

First, there are two future revisions for the commercial refrigeration products’ standards and two revisions to the statutorily prescribed standard for automatic commercial ice makers—we have planned for these future activities required by EPACT 2005.

Second, EPACT 2005 requires a rulemaking for a niche part of the ceiling fan light kit market. This final rule is due January 1, 2007. EPACT 2005 did not allow DOE enough time to complete a full rulemaking for this niche set of products, but it did offer “default” standards in case DOE misses its deadline—DOE plans to codify the “default” standards on January 2, 2007 through a technical amendment in the Federal Register.

Third, we are working on the determination analysis for battery chargers and external power supplies. DOE plans to make the determination by August 2008. As indicated in the April 24th Unified Agenda, if this determination is positive, the DOE will issue a final rule for these products by August 2011.

While the appliance standards authorizations in Title I are the most significant for our work in the building sector, there are several additional sections that offer new authority that we are taking advantage of immediately.

Section 131 of EPACT 2005 provided additional authorization for the ENERGY STAR program. Our analysis suggests that this joint effort between the Department of Energy and the Environmental Protection Agency has been successful in promoting the adoption of energy efficient technologies by consumers and businesses. EPACT 2005 recognized that success, and provided for acceleration of new ENERGY STAR criteria for clothes washers and dishwashers.

I’m pleased to report that we published the new specifications for these appliances on December 20, 2005, and March 8, 2006, respectively. These criteria go into effect on January 1, 2007. Taken together, we estimate purchase of these ENERGY STAR appliances will save \$89 million in energy bills and 10.4 billion gallons of water per year. We are also on track to update the specifications again over the next three years, effective January 1, 2010.

Section 912, the Next Generation Lighting Initiative, directs the Secretary to carry out a program of research, development, demonstration, and commercial application activities to advance solid-state lighting (SSL) technologies for application in general illumination. Relative to today’s options, the SSL technologies will be longer lasting, more energy efficient, cost competitive, and have less environmental impact.

Prior to the passage of EPACT, the Department’s SSL program had competitively selected an industry partner, the Next Generation Lighting Industry Alliance (administered by the National Electrical Manufacturers Association), and signed a Memorandum of Agreement (MOA) in February 2005. A Determination of Exceptional Circumstances which provides special guidance on the intellectual property for inventions developed under the SSL program was signed in June 2005.

EERE’s existing lighting R&D program produced numerous advancements in SSL. For example, 15 solid-state lighting patents were submitted in FY 2005 as a result of DOE-funded research projects. These patents demonstrate the value of DOE’s SSL projects to private companies and notable progress toward commercialization.

One company, Cree Lighting, demonstrated a white light emitting diode (LED) device with a record-setting efficacy of 65 lumens per watt. The improvement in brightness was enabled by balancing multiple interrelated design parameters, including novel chip design. The results are particularly significant because they were achieved in a pre-production prototype using Cree's standard XLamp™ package, rather than a laboratory device.

With the additional impetus provided by the passage of EPACT, the program continues to produce technical achievements. For example, researchers from the University of Southern California, University of Michigan, and Universal Display Corporation have achieved a record efficiency of 24 lumens per watt in a white organic light-emitting diode (OLED) device. The new OLED device is 50 percent more efficient than a standard incandescent light bulb and 20 percent more efficient than the team's previous record OLED.

Relative to the commercialization of future products, EERE hosted an LED Industry Standards Workshop in March 2006 to provide a forum for greater cooperation and coordination among standards organizations. DOE presented details of the proposed DOE ENERGY STAR criteria for LED products, which will be made public later this year. With DOE leadership, the group will continue to coordinate, provide updates, and accelerate process in solid-state lighting.

I would also like to say a word about the Tax Credit section in Title XIII, Energy Policy Tax Incentives Subtitle C-Conservation and Energy Efficiency Provisions. The Department has been working with representatives from State energy offices, industry and other organizations to develop an understanding of the technical requirements for implementation of the tax credits. The Department is also working closely with the U.S. Department of the Treasury to ensure that the regulations address all the technical issues related to the tax credits. The Department of the Treasury has the primary responsibility for developing the specific regulations, establishing definitions and procedures, to implement these measures.

#### *Other Energy Efficiency Provisions*

EERE is also responsible for a variety of additional studies, outreach initiatives, and programs. Many are underway.

For example, Section 110 directed DOE to explore the impact of extending daylight savings time. That study is underway. Another study on the energy-conservation implications of the widespread adoption of telecommuting by Federal employees is in the concurrence process.

Section 134 authorized the "Energy Efficiency Public Information Initiative," a comprehensive national plan to inform consumers that builds upon the outreach efforts ongoing at DOE. Consistent with this authorization, a number of consumer awareness programs have already begun. For example, last October Secretary Bodman launched the "Easy Ways to Save Energy Campaign" which includes an education and awareness effort with the Alliance to Save Energy and private industry to disseminate energy saving information through radio and television public service-announcements, websites, newspaper advertising, and media campaigns. Other collaborative efforts such as "Powerful Savings," "EnergyHog," and "The Power is in Your Hands" combined the best skills of government, the private sector, and non-governmental institutions to provide the public with tools to conserve energy and save money.

Several EPACT sections engage our Weatherization and Intergovernmental Activities Program (OWIP). EPACT Section 123 provided aggressive new goals and planning requirements for the State Energy Program (SEP). We have invited States to review, and, if necessary, revise State Energy Conservation Plans and are encouraging regional collaboration, where appropriate. EERE notified the States of these requirements in January through the SEP annual program guidance and will send formal invitation letters to governors by June 30.

#### CONCLUSION

I hope this gives you some understanding of the Administration's perspective on S. 2747, and a fair overview of the energy efficiency responsibilities that our office assumed with the enactment of EPACT. In many important ways, EPACT has served to buttress our efforts and help launch the necessity of energy efficiency onto the national stage. We look forward to working with you as we dedicate our efforts to developing energy efficient and renewable energy technologies and promoting improvements in the energy efficiency of our country.

The CHAIRMAN. Thank you very much.  
Senator Bingaman.

Senator BINGAMAN. Thank you very much. Mr. Karsner, one of the key provisions in this legislation tries to set a target for the amount of oil that could be saved and, I think, for 10 years from now I think it begins. Your testimony, as I understand it, and I think this is an exact quote, would be, “imprudent to legislate an arbitrary end result.” The confusion I’ve got on this is that the President, in his State of the Union speech, and this is another quote, he said that he was committing the country to “replace more than 75 percent of our oil imports from the Middle East by 2025.” Now, that’s a pretty specific target, as I understood it.

We wrote a letter—when I say “we,” I mean about 20 of us here in the Senate. We wrote a letter to Secretary Bodman, after the President’s State of the Union speech, asking him to please tell us how you’re going to do this, how you are going to reduce imports from the Middle East by 75 percent by the year 2025. We wrote that letter on the 21st of February. We haven’t received an answer yet.

We’re trying, in this legislation, to establish a much more modest goal than what the President called for but what we thought was a somewhat realistic goal and do it in a responsible way by saying 10 years from now, we should have some goal that we’re working at, it should be some quantitative goal that seemed to be consistent with the view the President was taking in setting his quantitative goal. I’m just wondering how you reconcile the position that you are taking here in opposition to any arbitrary end result with the position the President took in his speech.

Mr. KARSNER. Yes, sir. I think it is not a question of the goal or the aspiration of the goal or the objective. Indeed, as you point out, we are at least as—or more—aggressive in our objectives and in our targets than the legislation indicates. The question is actually opposition to legislating a mandate, fixing a law, as to what the end result might be. In industry, we would call these objectives ‘stretch targets,’ putting something very ambitious before us and then designating a plan to reach those stretch targets. So at the Department of Energy, beginning with the release of the Advanced Energy Initiative, we began putting together coherent plans that would meet the stretch targets.

By way of example, the President’s objective that cellulosic ethanol become commercial by 2012, cellulosic ethanol being a very, very important part of the formula to displace petroleum, then going further and saying that we could displace up to 30 percent of gasoline consumption, at the present measures, by 2030. Those are stretch targets. Other people in the private sector have come out with similar stretch targets—25 percent by 2025, by way of example. They are far enough out that our own stretch targets shouldn’t be viewed as exclusive, even though they are ambitious. We are looking to collaborate both with the committee and really, all people of goodwill who were interested in resolving this problem, to make those targets more acute and more poignant.

Senator BINGAMAN. Well, perhaps you could give us what those stretch targets are that you have embraced and the extent to which they are consistent with what the President talked about in his State of the Union speech and then what the plans are to reach those stretch targets. Because I think that is what we were asking

for in our letter to Secretary Bodman is to tell us what the plan is to reach this stretch target, which I think is a very major stretch. Quite frankly, to say that we are going reduce imports from the Middle East by 75 percent by the year 2025, that's a real stretch. But I have yet to see any plan that would get us there, and if you have such a plan that you've developed, I'd be anxious to have it. If you could maybe respond to us or see if Secretary Bodman could put that together and respond to the letter we sent, that would be helpful.

Mr. KARSNER. Yes, sir. We will.

[The information follows:]

With respect to the President's goal of reducing oil imports, programs under the Advanced Energy Initiative, if successful in achieving major breakthroughs in all vehicles and fuels initiatives, such as expanding the use of ethanol, specifically cellulosic ethanol, could displace the need for up to 5 million barrels of oil per day by 2025. Through investments in transportation technology, the AEI will allow the greater use of "homegrown" ethanol made from cellulosic biomass, which is now discarded as waste. The funding will make ethanol feedstocks such as wood chips, corn stover (stalks) or switch grass cost-competitive. Also the AEI will accelerate research in the next generation of battery technology for hybrid vehicles and "plug-in hybrids."

Senator BINGAMAN. On page 2 of your testimony, you note that EPA act authorizes grants to support activities for auto companies producing fuel-efficient vehicles. Could you tell us what progress has been made to date to implement those provisions, when you think that program will be up and running, when you expect the first loan guarantee to be entered into, whatever you could tell us about that.

Mr. KARSNER. What I can tell you is that we have had a significant dialog with the auto companies, particularly those that are partnered with the program, and asked them to cull their own portfolios in technology to propose ways that the loan guarantees might enhance their ambitions to get to manufacturing and production of more fuel efficient vehicles. Thus far, there has been limited interest by only one or two of the automobile companies in pursuing those loan guarantees. With regard to standing up the loan guarantee program, as Under Secretary Garman has testified, there is a process at DOE presently for creating an Office of Loan Guarantees and they anticipate taking applications before the end of the year.

Senator BINGAMAN. OK. My time is up. Go right ahead, Mr. Chairman.

Thank you.

Mr. KARSNER. Thank you, sir.

The CHAIRMAN. The note I just passed out here indicated we have three stacked votes at 11:10 a.m. Now, I don't think, Senator, that we could possibly be finished by then. I merely indicate we'll leave and—

Senator BINGAMAN. Come back for it.

The CHAIRMAN [continuing.] Come back, just so that everybody understands.

Mr. Karsner, let me indicate that in reading your testimony, I want to tell you that I was very impressed and appreciative of your stating with specificity all of the efficiency measures that are being implemented pursuant to the law that we passed. Senator Binga-

man had been pushing goals for years and there are still many of them that you acknowledge have not been implemented; right?

Mr. KARSNER. Correct.

The CHAIRMAN. But you are pushing hard, are you not, in terms of, across the board, the appliance standards and all the others? Are we making some headway? Could you just articulate for a minute or two for the public what is going on in that area?

Mr. KARSNER. Yes, sir. As you know, I've been on the job for a very short time, but in that short time, the two things you just mentioned have been amongst my highest priorities, as I committed during my confirmation hearings. That is to say, the appliance standards and implementation of the EPCRA provisions are things that I insist on a weekly briefing on, in terms of both issues and, as I had committed to you, Senator Bingaman, at that time, we would analyze the critical path and see where we might be able to accelerate or, if you want, lubricate the machinery of decision-making so that we could look at ways to get to the fastest pace of implementation possible. I am comfortable that the team is very, very committed, that they are on schedule, that they are working hard to see where gains could be made and that we are also reaching out to all of the stakeholders, very assertively, to work collaboratively where we can to see where consensus might be drawn in future discussions.

The Energy Policy Act itself provides a very prescriptive path for my job for the duration. There are very many helpful provisions that, if implemented and executed, will lead to these savings that are desired at a very fast pace. I think it goes without saying that it remains the highest priority in terms of the tools we have at the Department of Energy to throttle the current energy balance and to affect the situation now. So therefore, it remains my highest priority.

The CHAIRMAN. You mentioned in your remarks, when you were addressing the mandated target for savings on crude oil, you alluded to the President seeking additional authority with reference to auto emissions standards. And not having received that, could you discuss that whole proposition with us a bit and the relationship of that target to the fuel efficiency standards for automobiles and what you talked about in giving the President more authority and economic considerations?

Mr. KARSNER. Well, the President has already used his authority on CAFE for light-duty vehicles and trucks and he would like the comparable authority for the other classes of vehicles so that the administration might have the capacity to review and raise, as may be necessary, combined with the other considerations that are economic and highway safety. I believe that the administration has put that forward to Congress already and I believe the administration has demonstrated that it is willing and able and assertive about reviewing CAFE standards and making gains where it can.

The CHAIRMAN. Do you have any way of telling us what the CAFE standards would have to be to achieve the target that this legislation mandates for the saving of crude oil, of imported crude oil?

Mr. KARSNER. I do not have that information. I would be pleased to bring back our technical experts to talk about it in more detail.



Obviously, there is a sensitivity there with respect to how much technology can be deployed over the same timeframe versus how much increased efficiency is necessary out of the vehicle. So there are really several moving pieces and it is a moving target and that is part of the difficulty in legislating an absolute end result. If one assumes that the technology doesn't get to the market fast enough, then of course, that number would shoot very, very high, which may not even be possible under current manufacturing standards.

The CHAIRMAN. One of the problems with the Bingaman legislation you have alluded to, is the mandated target of savings with no policy leeway, just telling you, here is a target, do it. And I understand the frustration of the Senator. He has expressed it in his questions. He'd like to know how you are going to get there.

On the other hand, you have also expressed the administration's position that that target seems a bit too difficult. You have been caught in a box because maybe the President has alluded to a higher target in general terms, but I think there is a difference. One is legislated and mandated by law and one is not, which I think is going to be difficult for this legislation. But I merely comment on that.

Let's see if these Senators on this side have any questions of this witness before we proceed.

I will submit some questions in writing, Mr. Secretary.

Mr. KARSNER. Thank you.

Senator THOMAS. Thank you, Mr. Chairman. I have one. We have a number of things out there playing now about some conversion from coal, for instance, to fuel and this and that. It seems like the implementation of the current regulations is very slow. Some of these things are designed to provide incentives and we have companies waiting to go but the Department hasn't yet set forth the regulations that allow them to apply for the incentives to go ahead with their plants. Do you have any comment on that?

Mr. KARSNER. My only comment is that the pace of government is also new to me and I'm trying to, at least within the domain that I work in, accelerate things where possible. I know that my colleague, Jeff Jarett, is working very aggressively and ambitiously in terms of the coal-to-liquids projects.

Senator THOMAS. It just seems as if this is a pretty regulatory thing that has already been authorized, and yet the years have gone by and people are standing around waiting to make investments to do the things that we're talking about here and they seem to be slow. You talked about efficiency requirements by the States, urging the States to do that; was that correct?

Mr. KARSNER. I'm sorry, sir. Specifically what?

Senator THOMAS. I think you said in your statement that you wanted the States to do the efficiency standards.

Mr. KARSNER. That was with regard to the renewable portfolio standards and a national mandate versus a State-by-State mandate policy.

Senator THOMAS. But when we have the movement of vehicles and so on, is that a reasonable thing to do?

Mr. KARSNER. I think that the vehicle efficiency standards, the CAFE standards, are not part and parcel of the renewable portfolio standards that I mentioned in my statement.

Senator THOMAS. OK. The bill that we're talking about directs the Secretary to conduct R&D for electric-driven transportation technology and research and those kinds of things and provide— isn't it more appropriate to allow the companies to do this with private dollars?

Mr. KARSNER. There are some things that the private sector would not otherwise take on because it is too far off of their planning horizons, so the type of research and development that is needed at this early stage for moving on to lithium ion batteries, for example, is something that we are doing collaboratively with the private sector.

Senator THOMAS. Well, I hope so, because if we don't do it with our own private sector then foreign companies will do it and we'll be looking for somewhere else to do those things. So I think sometimes I get the feeling that the bureaucracy is a little academic oriented, looking way off into the future and not paying much attention to what we are, where we are currently, in terms of these kinds of things, like the coal-to-liquid structure and designated streams and those kind of things. I know there are other questions and we're pressed on time, but we will continue to work with you because we need to move forward, both on the shorter term and on the very long term and make those things—get them into place.

Mr. KARSNER. I agree, sir.

The CHAIRMAN. Let's see. Senator Alexander.

Senator ALEXANDER. Thanks, Mr. Chairman. Mr. Secretary, thank you for coming. I'd like to pursue your comments about the renewable portfolio standard. Now, the renewable portfolio standard would be a requirement that we use renewable materials to produce electricity; correct?

Mr. KARSNER. That's correct, sir.

Senator ALEXANDER. And what percent of our electricity in the United States today is produced by renewable materials or processes?

Mr. KARSNER. I believe it is under 2 percent, excluding hydro-power.

Senator ALEXANDER. How much?

Mr. KARSNER. Under 2 percent.

Senator ALEXANDER. Under 2 percent. And your testimony is that—well, how many States have renewable portfolio standards today?

Mr. KARSNER. I believe it is approximately 25, but I could report on that for the record.

[The information follows:]

Lawrence Berkeley National Laboratory staff report that twenty states plus the District of Columbia have renewable energy portfolio standards in place, as of May 2006. Three more states, Minnesota, Illinois and Vermont, have established renewable energy goals.

Senator ALEXANDER. So a couple of dozen have it. And how high are—what are their goals? They are well above 2 percent, are they not?

Mr. KARSNER. Many different States have many different goals, based on what their renewable resource is in that State, generally speaking. So there is really a patchwork of different renewable portfolios.

Senator ALEXANDER. But the range might be what?

Mr. KARSNER. On the top end of it, you might find 20 percent. Others do it in terms of quantitatively assessing the amount of megawatts that ought to be delivered by renewable energy.

Senator ALEXANDER. And these include some major States—for example, California and Pennsylvania. So even though, nationally, it is only 2 percent in terms of renewables producing electricity, some two dozen States, including many large States, have their own standards. And they define renewables differently in those States; is that correct?

Mr. KARSNER. I believe that's right.

Senator ALEXANDER. Well, for example, in Pennsylvania, I believe, a renewable might be coal waste to turn into electricity. And in Tennessee, we might want to use incremental hydro. And in Connecticut, I believe, they even define renewables as fuel cells. Do you think that is appropriate for different States to have different definitions of what they mean by renewable?

Mr. KARSNER. I do. I think it should be substantially driven by the available renewable resources in that State, in terms of how much penetration they might expect for that State's development.

Senator ALEXANDER. If there were a national renewable portfolio standard, would the primary beneficiary of that be wind power?

Mr. KARSNER. I think wind power is a substantial beneficiary on the State-by-State RPS, so I'm not sure that there would be any great gain for wind power with a national RPS.

Senator ALEXANDER. Well, for example, if there were a requirement that a State like Tennessee have a 10 percent or 20 percent renewable standard and wind were one of the only ways it could get there and it couldn't get there, then it would end up, in effect, paying a tax on its electric bills to cause some other State to do that; is that not right?

Mr. KARSNER. That is one of the reservations I have about a national renewable portfolio standard. It could be seen as punitive to those States that lack the renewable energy resource so that people in Tennessee or Florida might pay substantially more.

Senator ALEXANDER. It might transfer well from one part of—from the southeast to another part of the State. Maybe it's an unintended consequence because of the different sorts of renewable resources.

Mr. KARSNER. That is the general position.

Senator ALEXANDER. And that would be on top of whatever—if wind were the example, then that subsidy would then be on top of whatever the renewable production credit is for wind power in the Federal tax code today?

Mr. KARSNER. Right. I don't think that a renewable portfolio standard concept, in general, always implies that there need be a subsidy. For example, the State renewable portfolio standard in Texas has driven down wind prices to make them much, much lower than they were.

Senator ALEXANDER. But that's a State renewable. See, I'm talking about a Federal renewable standard.

Mr. KARSNER. Right.

Senator ALEXANDER. If you required a State, in effect, to use a renewable resource that it could not use, then that would transfer wealth from that State to another part of the country.

Mr. KARSNER. It would certainly impose higher costs.

Senator ALEXANDER. Would you anticipate that over the next 5 years, that more States would have renewable portfolio standards?

Mr. KARSNER. I would anticipate that, and in fact, I would encourage that. We're hopeful that all States would develop for themselves, as appropriate, a renewable portfolio standard that takes into account the available resource they have in that State.

Senator ALEXANDER. Thank you, Mr. Chairman.

The CHAIRMAN. Thank you.

Senator Salazar.

Senator SALAZAR. Mr. Chairman and Senator Bingaman, thank you for holding this hearing. It is a very important hearing and I have a statement for the record that I will submit for the record.

[The prepared statement of Senator Salazar follows:]

PREPARED STATEMENT OF HON. KEN SALAZAR, U.S. SENATOR FROM COLORADO

Good morning Mr. Chairman; Ranking Member Bingaman, and members of the committee. I would like to thank you, Mr. Chairman, for agreeing to hold this hearing. And I welcome our colleagues, Senator Bayh and Senator Coleman, who are here today because of our shared commitment to securing America's energy independence by promoting the manufacture and use of advanced technology vehicles, including flex-fuel vehicles able to run on either petroleum or renewable fuels.

My own state of Colorado contributes substantially to the energy resources of our country. We are blessed with an abundance of natural energy resources, and the coal, oil and gas industries play a significant part in our state's economy. In that regard, I very much appreciate your willingness, Mr. Chairman, to travel to Colorado to consider the possible development of Colorado's vast oil shale resources. And I look forward to the hearing you have scheduled next week on oil & gas development in the Rocky Mountains. But as long as the United States is dependent on foreign oil for a significant part of our energy needs, particularly our transportation fuels, our economy and our national security are at risk. We need to move rapidly toward energy independence and energy security.

I am therefore proud to be an original co-sponsor of S. 2747, Senator Bingaman's bill under consideration today, and of S. 2025—the Vehicle and Fuel Choices for American Security Act of 2005—which is the basis for the oil savings and vehicle titles of Senator Bingaman's bill. These broadly supported, bipartisan provisions will change how we power our vehicles.

Mr. Chairman, right now, the United States consumes around 20 million barrels of oil every day. Fully two-thirds of the oil we consume in this country is for transportation. The massive amount of oil that we are importing is barely enough to cover the needs of the transportation sector alone. S. 2747 tackles this problem head on. It would bring more gallons of biofuels, such as cellulosic ethanol and biodiesel, to market. It would give consumers more choices and greater access to alternative fuels and advanced technology vehicles. It would lower and stabilize the cost of transportation fuels, and it would retool America's vehicle fleet to run more efficiently and on alternative fuels.

At the same time, S. 2747 would significantly reduce our dependence on the Middle East for supplies of oil and natural gas. We can achieve these results through policies that encourage more efficient use of energy in vehicles, electric appliances, lighting and industry, as well as a greater emphasis on the use of renewable sources of energy.

In that regard, I am anxious to hear from Mr. Karsner what energy efficiency standards and goals the Department of Energy will adopt in 2007 and 2008 to implement the energy efficiency programs authorized in EAct 2005 as well as the funding priorities reflected in the President's Advanced Energy Initiative.

Mr. Chairman, the bipartisan energy bill we passed last year was an important first step along a path toward greater energy security. But it was only a first step. I believe there is an urgent national security imperative to embrace advanced flex-fuel vehicles and the renewable fuels and infrastructure to support them, as well as a renewable energy initiative like the one contained in this bill, to put us firmly

on the pathway toward energy independence. A bold but achievable renewable energy initiative will strengthen our national security by reducing our dependence on foreign oil.

I look forward to hearing today's testimony and to further Committee action on S. 2747, the Enhanced Energy Security Act of 2006.

Mr. CHAIRMAN. It will be made part of the record.

Senator SALAZAR. Let me, Mr. Karsner, just ask a question. I know that in your comments, you were critical of the oil savings targets that we have in S. 2747 and I think your term was that you thought it was imprudent to legislate, in your words, in this regard, that it was imprudent to legislate an arbitrary end result. In the President's State of the Union, he obviously called for a goal of getting us to reduce our consumption of oil imports by 75 percent. That's a relatively objective number with a goal that's out there. Tell me how it is that what the President is trying to get to here, in terms of an oil savings goal where we will reduce our imports from the Middle East, differs from what we are proposing here in S. 2747?

The CHAIRMAN. Senator Salazar, I might indicate to you that while I'm not going to object to your question, it is redundant in that Senator Bingaman asked the exact same question. But we can have it answered again. Maybe we can say you asked it more eloquently.

[Laughter.]

Senator SALAZAR. Well, maybe what you can do is to just as succinctly respond to that question.

Mr. KARSNER. Right. I appreciate that. It is not so much at all that we are critical of the target. We are critical of putting a target into law when the target itself is dependent upon the pace and the pricing and the market realities and realization of the progress of the technology.

Senator SALAZAR. OK. I appreciate that. Let me ask you, in terms of some of the other aspects of S. 2747, one of the things that we have included in S. 2747 is to improve efficiency of our vehicle fleet, for getting more advanced vehicles on the road. It sets these goals and helps manufacturers retool their vehicle fleets to meet them.

Mr. KARSNER. Oh, absolutely.

Senator SALAZAR. What steps has the Department taken, under your leadership, to try to achieve these goals since we passed EPO Act last year?

Mr. KARSNER. If I understand the question, you're asking about the Vehicle Technologies Program and the implementation of using the tools of EPO Act to enhance the vehicle technologies available for efficiency?

Senator SALAZAR. Yes.

Mr. KARSNER. Well, I can report more intelligently with our technical experts for the record and work for a briefing in your office about that. We have a very robust and well-funded vehicle technologies program and through the Fuel and Freedom Car Partnership, we are working on several aspects of that, including enhanced work on plug-in hybrid vehicles and battery technologies, lightweighting of the vehicle materials for use in the manufacturing assembly, and of course, the other technologies related to the uptake of flexible fuel and hydrogen fuel cells. But I think it would be use-

ful to give you a more exhaustive answer and briefing on that from our technical experts in the vehicles program.

Senator SALAZAR. Let me ask a question on cellulosic ethanol. I know that in last year's legislation, we created loan guarantees for projects such as cellulosic ethanol demonstration plants, and I know that Senator Craig, for example, has been working with the White House and the Department of Energy to try and get a company to establish a commercial facility in Idaho. And there have been, as I understand it, some problems in terms of getting to the point where we have a functioning set of rules that are pushing forward with those loan guarantees that would make that kind of a project feasible. Can you comment on whether or not, within the legislation that we have here, there are additional incentives that would help us move forward, and make those kind of incentives for cellulosic ethanol a greater possibility?

Mr. KARSNER. Yes, sir. I think that the title XVII, and to a lesser extent, the title XV program, are both sufficient to stand up a loan guarantee program. Under Secretary Garman has testified on this and he has really led this effort within the Department of Energy to stand up a program. And I believe that they announced that they are hopeful that they will begin taking applications on that prior to the year end. For our own part, within the Energy Efficiency and Renewable Energy Office, we are seeking to exhaustively vet those technologies that might be available and applicable to a loan guarantee program at the point that it stood up. In other words, we are seeking to parallel process so that applicants are ready and able at the point that the Government is ready and able to take those applications.

Senator SALAZAR. OK. I will only make one closing comment here and that is that during Monday's hearing of the Energy Committee on the implementation of the 2005 legislation, which this committee authored, the Director of NREL and one of his subordinates said that they were confident that we would be at a point within 6 years where we could commercially move forward with cellulosic ethanol. He also said very clearly that he thought that we had the technology to be able to get to the point where 70 percent of our oil was being replaced by biomass fuels by the year 2030. And I continue to believe that that is a huge opportunity for us, along with all the other items that we have on our menu, including oil shale in my State and a whole host of other things that the chairman is very interested in. Our hope in drafting the provisions of this bill is that we would help move the realization of that vision and that agenda forward, which the President started out with in referring to it in his State of the Union message. So, I thank you for your testimony, Mr. Karsner.

Mr. KARSNER. Thank you, sir.

The CHAIRMAN. All right. Thank you very much, Senator.

While we are moving toward the next set of witnesses, I would like to state for the record to clarify some of the questions that have been put forward with reference to a status of loan guarantees, which were prescribed in the statute that we adopted as part of our 1985 overall law. And let me state for the record that I guess it would be fair to say that I am embarrassed to state for the record and it's not to ask this witness, it's merely to make a state-

ment, that the Department is not ready to issue any loan guarantees, as prescribed in the law, as the major method of funding innovative technology because there has been a major battle between the OMB and the Department that has not been resolved to this point.

Now, it is on the way to resolution. I can say that to my fellow Senators. It is close. I will tell you that it will be resolved soon or something will be resolved, I will assure you of that.

I haven't figured out what that resolution will be yet, but there are a lot of ways to skin a cat around here and this cat will be skinned. There will be loan guarantees and a loan guarantee office in the Department of Energy under the law or something will happen, because it was prescribed to be one of the major ways to take advantage of the high price of crude oil. I mean, anybody understands the high price of crude oil is an invitation to investment, but the investment is negated by the fear that the price will fall again and you need the incentive to help precipitate and pursue that investment more vigorously.

One way being discussed is some kind of a modulation of it by floor. That's going to hit us pretty soon. There is a very big discussion of establishing a floor on crude oil for certain industries to go with coal, the coal to liquid to diesel.

The other way is a large use of loan guarantees, and they aren't ready. So it is embarrassing that that was how we intended to avail ourselves of this opportunity. And anybody sitting out there saying, "Oh, it will happen, of course it will happen," it will happen because the price is so high, but it will happen much more vigorously if we put the incentives in place contemplated by Congress. And I am very, very embarrassed that the administration is in this hiatus. And it just cannot stay there very much longer. It's got to be resolved. Now, that's not your fault, sir. And we could have certainly given you hell about the fact that you have no loan guarantees available. I already knew that, but there is no use beating up on you. You know it better than I. You said Secretary Bodman wants to have it a stand-up agency by the end of the year; right? You made that statement?

Mr. KARSNER. Right.

The CHAIRMAN. That may never happen if the OMB does not shape up. I think they may be on the way now. They have a deputy around here that's got to be confirmed. That fellow has no chance. He won't even appear before us here. He won't even see this table, the way things are going right now. He already knows that. Having said that, I think we're going to move on.

Senator CRAIG. Mr. Chairman?

The CHAIRMAN. Yes, sir?

Senator CRAIG. I'm coming late to the theatre, and I apologize, but I do want to tell you and the committee—I was visiting with Senator Salazar earlier in the morning—I met with Director Portman and OMB staff this week. It was a closed meeting for the very purpose of allowing me to express my full emotion as it relates to the conflict—I'm using that word—of differences going on between DOE and OMB as to how to do loan guarantees.

The CHAIRMAN. Good.

Senator CRAIG. And I've suggested that if they can't do it, we'll hire an outside firm to come in and do it for you, because there is a substantial amount of finger-pointing at this moment. It's coming from both sides. Here is what the Director told me. He was going to put a stop to that. He is working directly with DOE as we speak. He is fully engaged in this and he is going to complete it as rapidly as he can. It is on the top of his priority list. So I would suggest that between you and probably the ranking member and—I know that all of us have been involved in it. We got involved in this discussion this morning before the Foreign Affairs Committee, with Senator Lugar. He has dug into it. Why? For all the reasons you just gave. When we promise new energy policy, of the value and the kind that we're talking about, to get out on the edge of these new technologies, and our Government wants a promise, but can't deliver, then we have to figure out why it can't.

Thank you for being as persistent as you are. We will work with you on it, and maybe collectively we can get it done, and at the same time, in talking with Secretary Bodman, if he gets it right in the sense that he says, "I don't want a program out there that just starts putting money at every technology." Some work, some won't work. Money spent, money wasted, projects gained, new technologies brought online—all of those are factors in a good vetting process that allows us to make sure the money that we put out there or assist in putting out there gets to the right project.

The CHAIRMAN. Right. That's right. We're glad you arrived. You surely added the right conclusion to these remarks. I can tell you that everything you just said does not lead to the conclusion that the only institution that knows how to decide how to let this happen properly is the OMB.

Senator CRAIG. Oh, I agree.

The CHAIRMAN. That's impossible. I mean, if there is no other way to do it, then we are in deep you-know-what, because they don't want them. There are many of them over there that don't even want to do them, so when you write them up and say, "Do it," and then they don't want to do it, it's pretty messy.

Senator CRAIG. Yes.

The CHAIRMAN. I sure thank you and I'm sorry we had to do this in front of you. I hope you have a very good day.

Mr. KARSNER. Oh, no. It has helped with my assignment, sir.

Senator BINGAMAN. Mr. Chairman, maybe I should speak up for the administration here.

[Laughter.]

Senator BINGAMAN. But I'll withhold, since I don't really have any defense to give.

The CHAIRMAN. I bet. You better not. You certainly have had—by having this hearing, I've looked with great favor upon you. And that you dare to defend them today, that would be the end.

[Laughter.]

The CHAIRMAN. On this issue—

Senator BINGAMAN. I certainly wouldn't want to defend them on this or any other issue.

The CHAIRMAN. Thank you, sir.

Mr. KARSNER. Thank you, sir.



The CHAIRMAN. All right, let's get the next witnesses. I didn't know you were on it, too.

Mr. CALLAHAN. Oh! The vote has started. Do you want to start that panel or do you want to—

The CHAIRMAN. Yes, let's get—we're sorry. Right now, with you in your places, we have the clock saying that we have to vote. So we're going to acknowledge your presence and make sure everybody knows who you are.

Dan Lashof, senior scientist with the Natural Resource Defense Council here in DC, thank you for coming. We look forward to hearing from you.

Kateri Callahan; is that correct? Boy, I'm better today than usual. President of the Alliance to Save Energy, Washington, DC, thank you.

And we have Steve Nadel, executive director of the American Council for Energy-Efficient Economy.

Senator Bingaman, what do you think we ought to do at this point?

Senator BINGAMAN. Mr. Chairman, I think we ought to get as much testimony as we can before that second bell rings.

The CHAIRMAN. Right. Let's start, we're going to start now with you, Mr. Lashof. We have your written testimony. You proceed as you would like.

**STATEMENT OF DANIEL A. LASHOF, SCIENCE DIRECTOR,  
CLIMATE CENTER, NATURAL RESOURCES DEFENSE COUNCIL**

Mr. LASHOF. Thank you, Mr. Chairman and Senator Bingaman, for holding this hearing. Normally, I would, of course, begin by thanking you for having this important hearing at this time, but I would note that had you perhaps scheduled it this afternoon, we could be cheering the U.S. World Cup team now with some of our renewable energy. And I would just note quickly, Senator Bayh and Senator Coleman noted that we could learn some things from Brazil about their ethanol program. I've been told that their stock market closes when Brazil is playing in the World Cup, so maybe we want to follow that practice as well. But I am delighted to be here to discuss the Enhanced Energy Security Act, which NRDC strongly supports.

Let me try to make five points this morning, quickly, with the help of three charts.

First, President Bush was right when he said that we're addicted to oil and that is a serious problem. We are currently spending about \$1.5 billion per day on oil, as has been noted earlier. Some of that money ends up in the hands of extremist groups that wish to do us harm. And as our colleagues in the Set America Free Coalition have said, America is, in effect, funding both sides of the war on terror and we need to stop doing that.

Second, the United States can't drill its way to energy security and that is what this first chart shows. It shows world oil reserves. The United States is there on the right with just 2 percent of the world's oil reserves, compared with about 70 percent in OPEC countries.

In contrast, we are responsible for about 25 percent of world oil demand and so that shows that our leverage in affecting the world

oil market and becoming more secure is primarily through the demand side.

Third, the Enhanced Energy Security Act, I believe, offers a critical opportunity to break the gridlock that is currently blocking meaningful reductions in oil dependence. Title I, in particular, would establish a firm oil savings target and hold government agencies responsible for achieving that target. But it provides unlimited flexibility about how that target is to be achieved. I think that is an innovation in the approach that is very commendable and I think that is the reason we've seen broad bipartisan support, 26 co-sponsors. That is S. 2025, which shares that same approach.

Now, we've had testimony earlier from Mr. Karsner about whether or not it is sensible for the Government to legislate a target of that kind. I believe that it is critical. This is a national priority to reduce our oil dependence. I believe we have to have firm targets to require a detailed plan about how they will be achieved and then review that plan to see whether we are on track. Without that—I remember even back to the 1992 Energy Policy Act. We passed some lovely aspirational targets. I believe the numbers were something like 30 percent of our petroleum was supposed to be replaced with alternative. I don't remember the number because they were not, in fact, taken seriously, because they were just aspirational. So we have not—without a rigorous plan to hold agencies accountable for actually hitting these targets, we simply will not make the progress we need to make.

Now, in this second chart, I show that—and this is my fourth point—the oil saving targets in the bill are achievable. Again, Mr. Karsner raised some questions about that. This shows just one way we could achieve the targets, from a variety of technologies and vehicle fuel-efficiency levels, but also looking at replacement tires, heavy-duty trucks and medium-duty trucks, as well as certainly ethanol and other alternative fuels. Those add up to, by 2015, 3.2 million barrels a day. The target in the bill is 2.5 million barrels a day, so the potential exceeds that. And I would again emphasize this is just one way to get there that we looked at. Many people believe we could do much more with ethanol by 2015 or 2017 than is shown here. That would be great. Then we could reduce the pressure to make as large of gains in other areas.

I also note that there is technology coming along every day and when we make a national commitment, we'll see more. Just yesterday, UPS—with EPA—announced a new hydraulic hybrid delivery truck that gets a 70 percent improvement in fuel economy. That kind of technology, which I heard about for the first time—

The CHAIRMAN. Who did that?

Mr. LASHOF [continuing]. Last night, is a dramatic innovation that could make a big difference.

So let me just finish with my fifth point and that is, it is essential to reduce oil dependence and global warming emissions simultaneously. Mr. Chairman and Senator Bingaman, you both noted that today is the 1-year anniversary of the Senate resolution that you led us to adopting, calling for a program to reduce our global warming pollution that would be effective, and I think that is essential. Happily, S. 2747 emphasizes approaches that do just that: simultaneously reduce both oil dependence and global warming

and, certainly in this regard, the energy efficiency and renewable energy provisions of the bill are extremely important and we strongly support those. It would also reduce demand for natural gas and make a big difference there. But we do need to choose wisely.

And my last point, which is shown in this chart. There are options that some people have advocated that could as much as double the global warming emissions per gallon of gasoline equivalent. I think we need to avoid those. We could do that by including in government incentive programs, whatever their nature, a performance standard that says that at least in looking at alternative fuels, it has to at least do better than the conventional gasoline that it would be intended to replace. Thank you very much.

[The prepared statement of Mr. Lashof follows:]

PREPARED STATEMENT OF DANIEL A. LASHOF, SCIENCE DIRECTOR, CLIMATE CENTER,  
NATURAL RESOURCES DEFENSE COUNCIL

#### INTRODUCTION

Thank you for the opportunity to testify today on the subject of enhanced energy security. My name is Daniel A. Lashof. I am the Science Director of the Climate Center at the Natural Resources Defense Council (NRDC). NRDC is a national, non-profit organization of scientists, lawyers and environmental specialists dedicated to protecting public health and the environment. Founded in 1970, NRDC has more than 1.2 million members and online activists nationwide, served from offices in New York, Washington, Los Angeles and San Francisco.

#### SUMMARY

Today's energy use patterns are responsible for two growing problems that require urgent action to keep them from spiraling out of control—oil dependence and global warming. Both are serious; both warrant a much more proactive policy action than has occurred to date. Fortunately, we have in our tool box energy resource options that can dramatically reduce both oil dependence and global warming emissions, and policy options, such as the Enhanced Energy Security Act (S. 2747) and the Enhanced Energy Security Tax Incentives Act (S. 2748), to mobilize these solutions into action.

The unsettling events of the past year—devastating hurricanes, accelerated melting of glaciers and ice sheets, steep price spikes at the gas pump, and rising tensions with oil-rich regimes—serve as a painful reminder that we are vulnerable and that security is now defined by factors much broader than simply our military defenses. Oil dependence poses a direct threat to our national security, our economy and our environment, and makes a substantial contribution to the urgent problem of global warming. As Secretary of State Condoleezza Rice noted in the recent Senate Foreign Relations hearing:

“We do have to do something about the energy problem. I can tell you that nothing has really taken me aback more as secretary of State than the way that the politics of energy is—I will use the word warping—diplomacy around the world . . . It is, of course, an energy supply that is still heavily dependent on hydrocarbons, which makes more difficult our desire to have growth, environmental protection and reliable energy supply all in a package”.<sup>1</sup>

The twin crises of oil dependence and global warming require an immediate and thoughtful response that will enable us to tackle both challenges together.

There is strong bipartisan consensus around many of the solutions, most notably the Vehicle and Fuel Choices for American Security Act (S. 2025). Diverse coalitions that cross the political spectrum have come together in asking for aggressive action to break our oil addiction.<sup>2</sup> A majority of the Senate has also endorsed the need to address global warming with a comprehensive and effective national program of mandatory market-based standards and incentives on emissions of greenhouse gases. In red and blue states alike we hear deep concern about oil and a call to ac-

<sup>1</sup> U.S. Senate Committee on Foreign Relations Hearing, April 4, 2006.

<sup>2</sup> Set America Free Coalition, [www.setamericafree.org](http://www.setamericafree.org).

tion for Washington to seriously address the energy challenge ahead. Most importantly, Americans overwhelmingly support strong action to address the core of the problem—our demand for oil—and federal standards to enable consumers to use less oil.

The Enhanced Energy Security Act stands out by focusing on the efficient use of energy and clean, renewable alternatives, rather than measures that would prolong our addiction. While measures outside this committee’s jurisdiction, such as improving vehicle fuel economy performance and transit, are essential to successfully addressing our dependence on oil, this bill provides the right foundation for energy security legislation to move America toward a less risky and more reliable energy future. NRDC also strongly supports the renewable portfolio standard provision in the bill, which passed the Senate last year, and the energy efficiency provisions.

#### *America’s Addiction to Oil Threatens our Security*

The central challenge to America’s energy security is our dependence on oil and the web of geopolitical and economic forces that now govern access to and control of this increasingly costly and strategic global commodity. As we describe in our 2005 report “Securing America: Solving Oil Dependence through Innovation” (attached for the record),<sup>3</sup> our intense rate of oil consumption already poses a clear and direct threat to America’s national and economic security, as well as our environment. With only 3 percent of global oil reserves, America’s greatest leverage is reducing our demand for oil through innovation, efficiency gains and clean, renewable alternatives. To enhance our energy security we must stop enabling the addiction and begin to move America beyond oil.

“America is addicted to oil” the President said in his State of the Union. He was right. We consume nearly 21 million barrels of oil per day—a quarter of the world’s oil production and more than China, India, Japan and all of South and Central America use combined—and rely on foreign suppliers for 60 percent of our daily oil needs. The U.S. also has by far the highest per capita oil consumption of all major countries.<sup>4</sup> If we continue with business as usual, by 2025 we will import over 70 percent of the oil we need to power our economy.<sup>5</sup> With limited domestic supply, the country that leaves itself most vulnerable is the one that is most dependent on the volatile global market for its basic energy needs—and that country is the U.S.

#### PROVEN OIL RESERVES THROUGH 2025

	Billions of Barrels
U.S. ....	23
Non-OPEC ....	396
Middle East ....	727
OPEC ....	870
Total .....	1,266

Source: Energy Information Administration, *Annual Energy Outlook 2004*

First, our appetite for oil is unsustainable and it is shifting the balance of power toward oil rich suppliers (see figure above). The U.S. has just 3 percent of the global oil reserves, while the Middle East is home to two thirds of the world’s oil.<sup>6</sup> Today we have the luxury of importing large amounts of oil from friendlier nations such as Mexico and Canada but this luxury is fleeting. At current consumption rates, non-Organization of the Petroleum-Exporting Countries (non-OPEC) production is expected to peak and begin declining as early as 2015,<sup>7</sup> which means that oil rich nations, especially those in the Middle East, will take even tighter control of the reins of the global oil market.

Second, there is growing evidence that higher oil prices are here to stay. Most analysts agree that market fundamentals of high demand and limited supply, and not speculation or market hysteria, are the primary reason for today’s high oil prices. These prices can be explained, in part, by continued growth in oil demand in the United States and explosive growth in Asia, especially China. Oil demand has grown a robust 5 percent since 2003, despite a doubling of oil prices during that

<sup>3</sup>Natural Resources Defense Council, “Securing America” report, 2005.

<sup>4</sup>B.P. Statistical Review of World Energy, June 2006, page 13.

<sup>5</sup>Energy Information Administration, *Annual Energy Outlook 2006*.

<sup>6</sup>B.P. Statistical Review of World Energy, June 2006, page 6.

<sup>7</sup>PFC Energy, *Global Crude Oil and Natural Gas Liquids Supply Forecast*, September 2004.

period. It appears likely that global oil demand and tight global oil supplies will keep fuel prices high for the foreseeable future.

There is also little spare oil production capacity to cushion a sudden loss in supply and the mix of easily extractable crude oil is moving away from “light, sweet” toward more “sour” grades that fewer refineries can handle. Considering these factors, oil prices may abruptly jump even higher, as happened during the first two oil crises of 1973-75 and 1979-81. Oil prices could also decline for short periods, but unlike during the last two oil crises, important oil market fundamentals now favor higher prices lasting for much longer—and perhaps becoming a permanent feature of the market.

Moreover, oil suppliers are also less able to adequately cushion the market in the face of rising demand. Historically, producers were accused of holding back supplies when prices rose. But most industry experts agree that OPEC and other suppliers are now pumping at or near the upper limits of their capability. Indeed, there are concerns that rapid exploitation degrades the long term viability of some oil fields.<sup>8</sup> Spare capacity, often used to cushion oil price spikes, is essentially gone.

Another reason to worry is that America’s economy is already feeling the pinch of persistently higher oil prices. The run-up in oil prices, including the cost of the new “fear premium”, exerts an inflationary impact on everyday goods and services, consumers are left with less disposable income after their trips to the pump, and businesses of all sizes (except the oil companies) are seeing shrinking profits in the face of pricier fuel. Oil imports now account for a quarter of the ballooning trade deficit.<sup>9</sup> At an average cost of \$70 per barrel, we spend nearly \$1.5 billion every day on oil and over \$300 billion annually just for oil imports. Former Federal Reserve Chairman Alan Greenspan has called the cost of oil a “hidden tax” on consumers and despite the economy’s resilience to rising energy costs, the economy remains extremely vulnerable to supply disruptions and oil prices shocks in the global market, as we experienced in the aftermath of Hurricane Katrina.<sup>10</sup>

Finally, above and beyond the direct cost of oil dependence, we invest billions of dollars annually to acquire and protect access to oil resources. According to recent estimates by the National Defense Council Foundation, the hidden military and economic cost of oil dependence is in the range of \$800 billion annually and oil supply disruptions like those we experienced in the 1970’s could cost the economy as much as \$8 trillion.<sup>11</sup> Moreover, our oil dependence has enormous environmental costs, including emissions of the greenhouse gases that cause global warming, air and water pollution, and the despoiling of pristine public lands.

On a global stage of energy winners and losers, America’s over-dependence on oil is now a liability that comes with costly consequences. One that is particularly dangerous is the connection between oil and terror. As we describe in the joint report with the Institute for the Analysis of Global Security (see attached), terror networks have clearly identified oil as the Achilles’ heel of our economy and continue to carry out numerous attacks on oil infrastructure around the globe.<sup>12</sup> The billions of dollars we export every year facilitates a massive transfer of wealth to oil suppliers that help finance terrorism and support the spread of hostile ideology.<sup>13</sup> According to defense and national security experts, because of our oil dollars, America helps “fund both sides of the war on terror”. Oil has become a strategic commodity that can easily be used against us.

To answer this multifaceted challenge of energy security we must pursue solutions that will tackle the core of the problem—our demand for oil—and make new policy commitments, such as the Enhanced Energy Security Act (S. 2747), that will offer lasting relief to consumers and clean, renewable energy alternatives. Scaling back our appetite for oil is essential to safeguarding our national security, economy and environment.

#### TRANSPORTATION DRIVES OUR OIL ADDICTION

We are singularly dependent on oil to fuel our economy and the transportation sector drives our addiction. Today transportation is responsible for more than two-

<sup>8</sup> Simmons, Matt. *Twilight in the Desert: The Coming Saudi Oil Shock and the World Economy*, John Wiley & Sons (2005).

<sup>9</sup> Bureau of Economic Analysis, U.S. International Transactions, 2006.

<sup>10</sup> U.S. Senate Committee on Foreign Relations Hearing, April 4, 2006.

<sup>11</sup> National Defense Council Foundation, Senate Foreign Relations Committee Testimony, March 30, 2006.

<sup>12</sup> Institute for the Analysis of Global Security, [www.iags.org](http://www.iags.org).

<sup>13</sup> *The Paradox of Plenty: Oil Booms and Petro-States*, Studies in International Political Economy, No. 26, University of California, 1997; Zakaria, Fareed, *The Future of Freedom: Illiberal Democracy at Home and Abroad*, Norton, 2004.

thirds of total U.S. oil demand; our passenger vehicles account for forty percent of total demand.<sup>14</sup>

Moreover, our transportation system is 97 percent reliant on oil and will account for 80 percent of our projected oil demand growth over the next two decades. There are several reasons:

- First, we are taking more trips. More Americans rode trains and buses 80 years ago, and transit use spiked during World War II. Then it plummeted, leveling off at less than half of its peak level. Meanwhile vehicle miles traveled (VMT) climbed steadily and is now three trillion miles per year.<sup>15</sup> Increasing travel by private vehicles is exacerbated by sprawl and poorly designed communities that makes commutes longer and traffic worse.
- Second, the fuel economy of our light duty vehicle fleet is stagnant. Thanks largely to the proliferation of inefficient SUVs, improvements in fuel economy stalled in 1988 (see figure below<sup>15a</sup>). The largest recent jump in performance happened in the late 1970's, driven by policy and consumer choices in reaction to embargoes and price run ups.<sup>16</sup> Despite significant technology innovation over the last two decades, in the absence of higher standards fuel economy performance has not advanced.
- Third, petroleum continues to dominate the transportation fuel market. The popularity of biofuels is an extremely recent phenomenon and despite booming growth in the industry, biofuels account for just a few percent of the nation's total fuel use. Of the 170,000 gas stations around the country, only 700 dispense E85 fuel, and consumer awareness about alternative fuels is still low, even among owners of flexible fuel vehicles (FFVs).<sup>17</sup> Today there are 5.7 million FFVs on the road, less than 2.6 percent of total vehicles, but even this small number run on alternative fuels just 1 percent of the time. In fact, FFVs currently increase our oil use, since automakers receive excessive credits against their fuel economy standards for producing these vehicles, regardless of how much alternative fuel they actually use.<sup>18</sup>

The non-passenger vehicle fleet also contributes to the problem. Heavier vehicles ranging from 8,500 pounds to more than 33,000 pounds consume more than 2.8 million barrels of oil each day—more than we import from the Persian Gulf.<sup>19</sup> The heaviest trucks, such as tractor-trailers weighing more than 33,000 pounds, consume two-thirds of this energy, while lighter, shorter-range trucks use the remaining third. These vehicles could be 70 percent more efficient.<sup>20</sup>

#### OIL DEMAND AND GLOBAL WARMING POLLUTION MUST BE REDUCED SIMULTANEOUSLY

Oil dependence is a critical link between national security and global warming. The oil we burn in our cars and trucks is responsible for a third of U.S. global warming pollution. Passenger vehicles alone contribute 1.6 billion tons of carbon dioxide and 13 million tons of smog-forming emissions from tailpipes every year. The recent alarming trends of arctic melting, extended drought, and severe storms suggest that the effects of global warming are being felt more rapidly than expected.<sup>21</sup> Global warming itself threatens the security of the United States not only by supercharging hurricanes, but also because it has the potential to destabilize regimes by creating millions of environmental refugees and intensifying conflicts over water resources in semi-arid regions.

To avoid catastrophic global climate change the U.S. and other nations will need to deploy energy resources that result in much lower releases of CO<sub>2</sub> than today's use of oil, gas and coal. To keep global temperatures from rising to levels not seen since before the dawn of human civilization, the best expert opinion is that we need to get on a pathway now to allow us to cut global warming emissions by 60-80% from today's levels over the decades ahead. The technologies we choose to meet our

<sup>14</sup>Energy Information Administration, Annual Energy Outlook 2006.

<sup>15</sup>Based on Federal Highway Administration and American Public Transportation Association figures.

<sup>15a</sup>IAAll graphs have been retained in committee files.

<sup>16</sup>U.S. EPA, "Light-Duty Automobile Technology and Fuel Economy Trends: 1975 Through 2003".

<sup>17</sup>Energy Information Administration, National Petroleum News, May 2005.

<sup>18</sup>*Report to Congress: Effects of the Alternative Motor Fuels Act CAFE Incentives Policy*, Department of Transportation, Environmental Protection Agency, and Department of Energy, March 2002.

<sup>19</sup>Calculation based on projections in EIA's Annual Energy Outlook 2003 for energy consumption by commercial light, medium and heavy trucks.

<sup>20</sup>Natural Resources Defense Council, "Securing America" report, 2005.

<sup>21</sup>Natural Resources Defense Council, "Global Warming Science Update YTD", 2005.

future energy needs must have the potential to perform at these improved emissions levels.

Most serious climate scientists now warn that there is a very short window of time for beginning serious emission reductions if we are to avoid truly dangerous global warming without severe economic impact. Delay makes the job harder. The National Academy of Sciences recently stated: "Failure to implement significant reductions in net greenhouse gases will make the job much harder in the future—both in terms of stabilizing their atmospheric abundances and in terms of experiencing more significant impacts."<sup>22</sup> In short, a slow start means a crash finish—the longer emissions growth continues, the steeper and more disruptive the cuts required later.

The Enhanced Energy Security Act focuses appropriately on measures that would simultaneously reduce oil dependence and global warming pollution. The National Coal Council and others, by contrast, have proposed launching a massive program to replace oil with a synthetic liquid fuel produced from coal using a process known as Fischer-Tropsch. Such a step would have devastating environmental consequences: potentially doubling carbon dioxide emissions per gallon of gasoline replaced, and increasing the devastating effects of coal mining felt by communities and ecosystems stretching from Appalachia to the Rocky Mountains.<sup>23</sup> Fortunately, we have better, less controversial options that can reduce our oil dependence more quickly, more cheaply, and more cleanly than coal-to-liquids.

To assess the global warming implications of alternative fuels we need to examine the total life-cycle or "well-to-wheel" emissions. Coal is a carbon-intensive fuel, containing almost double the amount of carbon per unit of energy compared to natural gas and about 20 percent more than petroleum. When coal is converted to liquid fuels, two streams of CO<sub>2</sub> are produced: one at the coal-to-liquids production plant and the second from the exhausts of the vehicles that burn the fuel. With the technology in hand today and on the horizon it is difficult to see how a large coal-to-liquids program can be compatible with the low-CO<sub>2</sub>-emitting transportation system we need to design to prevent global warming.

Today, our system of refining crude oil to produce gasoline, diesel, jet fuel and other transportation fuels, results in a total well-to-wheels emissions rate of about 27.5 pounds of CO<sub>2</sub> per gallon of fuel. Based on available information about coal-to-liquids plants being proposed, the total well-to-wheels CO<sub>2</sub> emissions from such plants would be about 49.5 pounds of CO<sub>2</sub> per gallon—twice as high as conventional petroleum based fuels.<sup>24</sup>

Even if the CO<sub>2</sub> from coal-to-liquids plants is captured, well-to-wheels CO<sub>2</sub> emissions would still be higher than emissions from today's crude oil system. Capturing 90 percent of the emissions from coal-to-liquid plants would lower plant emissions to levels close to petroleum production and refining, while vehicle emissions would be equivalent to those from gasoline. However, even with CO<sub>2</sub> capture, the well-to-wheels emissions would be 8 percent *higher* than from petroleum.

This comparison indicates that using coal to produce a significant amount of liquids for transportation fuel would not be compatible with the need to develop a low-CO<sub>2</sub> emitting transportation sector. Liquid fuel from coal contains the same amount of carbon as gasoline or diesel made from crude, so the potential for achieving significant CO<sub>2</sub> emission reductions compared to crude is inherently limited. Biofuels, especially cellulosic ethanol, offer much greater potential to reduce oil dependence and cut CO<sub>2</sub> emissions. We already use ethanol in our fuel supply and significant investments are pouring into the biofuels industry to help it grow. Renewable biofuels are a cheaper, cleaner and more readily available alternative that could displace imported oil, help revitalize the rural economy, and lower CO<sub>2</sub> emissions.

Transforming our transportation sector by mobilizing the use of efficient technologies, diversifying fuel choices at the pump to include clean, renewable fuels, and offering mass transit options for commuters, such as light rail, is essential to ensuring that our pursuit of energy security also enables us to tackle the urgent challenge of global warming.

Fortunately, technology is available today that can give us a robust and effective program to reduce oil dependence. To cut our dependence on oil we should follow a simple rule: start with the measures that will produce the quickest, cleanest and

<sup>22</sup>National Academy of Sciences, *Understanding and Responding to Climate Change: Highlights of National Academies Reports*, p.16 (October 2005), [http://dels.nas.edu/dels/rpt\\_briefs/climate-change-final.pdf](http://dels.nas.edu/dels/rpt_briefs/climate-change-final.pdf).

<sup>23</sup>NRDC Senate Energy Committee testimony on coal liquefaction, April 14, 2006.

<sup>24</sup>Calculated well to wheel CO<sub>2</sub> emissions for coal-based "Fischer-Tropsch" are about 1.8 greater than producing and consuming gasoline or diesel fuel from crude oil. If the coal-to-liquids plant makes electricity as well, the relative emissions from the liquid fuels depends on the amount of electricity produced and what is assumed about the emissions of from an alternative source of electricity.

least expensive reductions in oil use; measures that will put us on track to achieve the reductions in global warming emissions we need to protect the climate. As we describe in the attached report, a combination of more efficient transportation, biofuels, “smart growth” policies and oil savings measures in other sectors, could reduce our oil demand by as much as 40 percent by 2025 (see “oil savings toolbox” below).

### TECHNOLOGICALLY ACHIEVABLE OIL SAVINGS

[million barrels per day]

Oil Savings Measures	2015	2025
Raise fuel efficiency in new passenger vehicles through tax credits and standards .....	1.6	4.9
Accelerate oil savings in motor vehicles through fuel efficient replacement tires and motor oil .....	0.5	0.6
efficiency improvements in heavy-duty trucks .....	0.5	1.1
Accelerate oil savings in industrial, aviation, and residential sectors	0.3	0.7
Encourage growth of biofuels industry through demonstration and standards .....	0.3	3.9
<b>Total Oil Saved .....</b>	<b>3.2</b>	<b>11.2</b>

See Appendix for complete analyses.

The Enhanced Energy Security Act (S. 2747) creates a solid foundation for tackling the core challenge of growing oil demand, and the companion tax bill provides needed incentives to help consumers and industry play an active role in bringing innovative, efficient technologies and renewable energies to market sooner. Given the breadth of the legislation, the following discussion focuses largely on provisions of the bill related to oil dependence. NRDC looks forward to working with the committee to perfect and help enact the legislation.

#### CONGRESS SHOULD SET CLEAR TARGETS AND DEMAND ACCOUNTABILITY

Breaking our oil addiction requires mobilizing American ingenuity, factories and farms around a clear goal. The first step Congress must take is to make a binding national commitment to oil savings. If the past is any indicator of success for such a commitment, this savings goal is achievable. During world war II, American factories converted in just months from building cars to building tankers and bombers that became the arsenal of democracy. And after the first oil crisis in the early 1970s, America slashed its oil imports and saved billion of dollars in fuel costs to keep our economy strong. From biofuels to hybrid vehicles, we have the technology today to make significant reductions in our oil demand.

S. 2747 would establish the critical foundation of oil savings, starting with a commitment to reduce oil consumption by 2.5 million barrels of oil per day in ten years, and provide a set of tools and incentives to help achieve these goals. Crucially, the bill also ensures that the oil savings target is not merely aspiration by establishing a rigorous process for ensuring that the nation gets on track—and stays on track—to meeting the requirement.

We recommend the following policy measures to achieve the oil savings commitments that would be established by S. 2747. Although we recognize that not all of these measures are within the jurisdiction of the Energy Committee, we recommend that final oil savings legislation incorporate this complete toolbox in order to provide the greatest possible flexibility in the means for achieving the targets.

#### *Accelerate Oil Savings in Transportation*

- Raise fuel economy performance standards for passenger cars and light trucks;
- Provide domestic automakers and suppliers with incentives to retool factories and produce more efficient, advanced technology vehicles, such as hybrids and advanced clean diesel, to regain competitiveness with foreign rivals and keep jobs and profits in the U.S.;
- Establish minimum efficiency standards for heavy trucks and replacement tires;
- Reduce vehicle miles traveled (VMT) through increased funding for transit and transit-oriented development; and
- Enable private fleet owners and consumers to use less fuel by offering incentives for fleet turnover and extending EPACT consumer tax incentives for hybrid vehicles.



*Expand Fuel Choices through Clean, Renewable Biofuels*

- Increase EPACT production goals for cellulosic biofuels to 1 billion gallons by 2016;
- Require that areas with access to biofuels and registered flexible fuel vehicles (FFVs) require fuel stations to install E85 pumps and provide incentives to offset capital costs of new pumps;
- Make every new vehicle flexible fuel capable and phase out the federal fuel economy loophole for dual-fuel cars and trucks;
- Implement and fully fund cellulosic biofuels production incentives authorized by EPACT; and
- Ensure that alternative transportation fuels perform better than gasoline in reducing “well-to-wheels” emissions of carbon dioxide.

*Increase Energy Savings in Industry, Aviation and the Residential Building Sector*

- Expand industrial efficiency programs to focus on oil use reduction and adopt standards for petroleum heating;
- Replace chemical feedstocks with bioproducts through research and development and government procurement of bioproducts;
- Upgrade air traffic management systems so aircraft follow the most-efficient routes; and
- Promote residential energy savings with a focus on oil-heat.

Many of the necessary reforms are already included in the broadly supported Vehicle and Fuel Choices for American Security Act (S. 2025), as well as the bill before this committee.

Most importantly, the Enhanced Energy Security Act includes a meaningful framework for oil savings. The bill provides helpful new programs to develop new vehicle technology, such as plug-in hybrids and lightweight materials, and accelerate the turnover of inefficient cars and trucks. The bill provides needed incentives for oil saving technologies, as well, such as cellulosic biofuels and advanced technology vehicles, and increased funding authorization for cellulosic biofuels. The companion tax legislation would help domestic automakers retool and produce more fuel efficient vehicles, assist private fleet owners in purchasing these cars and trucks, and help truckers install idling reduction equipment to reduce fuel use.

However, the Enhanced Energy Security Act and the companion tax legislation contain several omissions that should be addressed. Specifically, the retooling incentives for auto manufacturers and suppliers should be consistent between the authorizing and tax legislation (Section 208 of S. 2747 and Section 202 of S. 2748) in requiring sustained improvements in fleetwide fuel economy for automakers that take advantage of the production incentives, and Tier II, Bin 5 emissions compliance for all qualifying vehicles. This would help ensure adequate air quality protection and actual fuel savings in return for public dollars.

The bill could also better address the problem of oil dependence by incorporating additional measures for transportation efficiency and biofuels infrastructure, which are essential to reducing oil dependence. Unlike S. 2025, the oil savings toolbox in this bill is not complete, and although some of these provisions fall outside this committee’s jurisdiction, the following measures should be included to provide the tools necessary to achieve oil savings. We look forward to working with the committees to adopt these and other improvements to the bill.

*Increased Fuel Economy Performance for Light Duty Vehicles*

A key solution to oil dependence is raising the efficiency of cars and trucks. When Congress first enacted fuel economy standards in 1975 in response to rising gas prices and the OPEC oil embargo, Corporate Average Fuel Economy standards (CAFE) succeeded in doubling the fuel economy of American vehicles in just ten years. This helped drive the oil intensity of our economy down by about one-third, providing better insulation from today’s high prices.

The program also resulted in a substantial reduction in the nation’s oil dependence. According to the National Research Council, had we continued to use oil at the same rate, today we would be consuming 40 percent more gasoline and 3.8 million barrels or nearly 20 percent more oil.<sup>25</sup>

In the context of higher prices, fuel savings technologies are vital to the future of domestic automakers and suppliers. As we noted in our “In the Tank” report in

<sup>25</sup>National Research Council, Effectiveness and Impact of Corporate Average Fuel Economy (CAFE) standards, Washington, D.C. 2002.

2005, automakers stand to lose substantial market share, profit and jobs if they do not make fuel economy a top priority.<sup>26</sup>

NRDC strongly supports the recently introduced “Ten-in-Ten Fuel Economy Act” as a critical part of our nation’s strategy for addressing the urgent challenges of oil dependence and global warming. The bill would guarantee that we save 2.5 million barrels of oil per day by 2025 and reduce tailpipe emission of carbon dioxide by 420 million metric tons.

#### *Efficiency Standards for Tires and Heavy Trucks*

Tires may look similar, but some models are more fuel-efficient than others, while having comparable or superior braking, tread life (longevity), and other important performance attributes. The small incremental cost of fuel-efficient replacement tires compared with average tires sold in the replacement market quickly pay for themselves, and could easily save consumers at least \$36 a year by boosting the fuel economy performance of their vehicle by 2 to 4%—a potential annual savings of \$6 billion nationally. Despite the clear benefits, only new cars are routinely equipped with these tires and they are not widely available in the replacement market. Congress should grant authority to set minimum tire efficiency standards. Replacement tires should not only be labeled, but also optimized for fuel efficiency so consumers can take advantage of an easy way to save fuel.

Improving the fuel economy of heavy-duty trucks offers a major opportunity for oil savings. All truck classes can benefit from fuel-efficiency gains from current and emerging technology. Technology assessments by the American Council for an Energy-Efficient Economy (ACEEE) found that truck fuel-efficiency advances up to 70 percent are cost-effective. In addition to tax incentives for purchases of idling reduction equipment, Congress should grant authority to set minimum efficiency standards for medium and heavy duty trucks.<sup>27</sup>

#### *Transit*

Oil dependence is one more reason to pursue smart-growth as an alternative to suburban sprawl and to expand Americans’ transportation options. The potential for smart growth oil savings is immense. If all new construction were built in a similar fashion to existing smart growth developments, the nation would save over half a million barrels of oil per day after 10 years of construction. The attached report identifies ways for Congress to support local smart growth policies to reduce VMT and achieve oil savings.

#### *Renewable Energy and Energy Efficiency is Essential to Overall Energy Security*

NRDC strongly supports the renewable portfolio standard provision of the Enhanced Energy Security Act. This provision, which passed in the Senate’s version of the Energy Policy Act of 2005, would be a major step forward in promoting clean renewable energy in the United States.

NRDC also supports the energy efficiency provisions. The financial incentives program for high-efficiency products is an excellent idea, which is similar to the Golden Carrot program NRDC developed in collaboration with utilities, state energy offices and EPA to promote the design and manufacture of a high-efficiency refrigerator. We recommend that the high-efficiency products provision be strengthened by 1) giving EPA the authority to make the awards, since EPA has more experience than DOE in this area, 2) authorizing a specific dollar amount for the program, 3) requiring that the products actually be in production before giving the money to the manufacturers, and 4) requiring that the award be for products that achieve a certain minimum percentage of energy savings. This last requirement is necessary to exclude bids for very modest, but cheap, energy savings, which can be acquired more easily through other programs. This program should be limited to technologies that advance the state of the art.

NRDC also supports a federal energy efficiency resource program, which would require that electric utilities save a certain percentage of their consumption through energy efficiency programs. The energy efficiency resource program provisions in the Enhanced Energy Security Act should be strengthened by placing the requirement on the utilities instead of leaving the decision of whether to establish such a requirement to state public utility commissions.

<sup>26</sup> University of Michigan and Natural Resources Defense Council, “In the Tank” report, 2005.

<sup>27</sup> Langer, Therese, Report to the National Commission on Energy Policy “Energy Savings Through Increased Fuel Economy for Heavy-Duty Trucks,” 2004.

*Energy Efficiency Provisions of the Enhanced Energy Security Tax Incentives Act*

Some 1.5 million barrels of oil per day are consumed in buildings where savings of 30%-50% and more are cost-effective and can be facilitated by tax incentives. NRDC strongly supports extending energy efficiency tax incentives extensions, as is done in the Enhanced Energy Security Tax Incentives Act. However, there are now better alternatives for some of these incentives that are more meaningful and more cost effective. The original EAct incentives for retrofitting homes and for solar energy are based on the cost of the measures rather than their performance. This structure was tried in the 1970's for both efficiency and solar, and it was an expensive failure. NRDC has concerns about adding the tax credit for 30% energy savings in new homes. Almost all of the 200,000 homes constructed in California annually already save about 28% on average, so this provision could be costly. NRDC supports the existing homes and solar energy incentives language that will soon be introduced by Senators Snowe and Feinstein. The Snowe-Feinstein bill would create new performance-based incentives for retrofit of both owner-occupied homes and rentals, while also extending the EAct incentives for 2 years.

## CONCLUSION

NRDC is pleased to endorse S. 2747 and S. 2748, which provide an excellent foundation for breaking America's addiction to oil, reducing natural gas demand, and curbing global warming. By establishing an enforceable national commitment to oil savings and providing flexible tools for achieving it, these proposals point the way to breaking the energy policy gridlock that we are stuck in today. Congress should seize this opportunity to increase our security, strengthen our economy, and protect our environment.

The CHAIRMAN. Thank you very much. We've got just minutes left on this vote. We are going to vote now and return and it will be your turn then. We stand in recess.

[Recess.]

Senator BINGAMAN [presiding]. Why don't we go ahead again. We apologize for the interruption. Senator Domenici still has to stay on the Senate floor to speak on one of the amendments that is pending on this defense bill, so he asked me to come back and proceed with the rest of the testimony here.

Kateri, why don't you go right ahead. Your full statement will be included in the record and we are glad to hear your summary or whatever you would like to say.

**STATEMENT OF KATERI CALLAHAN, PRESIDENT,  
ALLIANCE TO SAVE ENERGY**

Ms. CALLAHAN. Great. Thank you, Senator Bingaman. I am Kateri Callahan and I serve as the president of the Alliance to Save Energy, which, as you know, is a bipartisan, non-profit coalition of more than 100 businesses, governments, environmental and consumer groups who promote energy efficiency around the world.

I would like to start, Senator, by thanking you for the leadership that you provide and Senator Dorgan, who is on our Board of Directors, also to express our appreciation for the leadership of this committee in beginning to make energy efficiency a true cornerstone of energy policy. In the Energy Policy Act of last year, just one of the provisions, the appliance standards, will result in energy savings and dollar savings for consumers of \$63 billion by 2020. So it has been very good working with you in advancing energy efficiency.

Notwithstanding, however, all of this good progress that has been made, we believe there is a need for additional government policies to advance energy efficiency, particularly in the transportation sector. So we are very delighted about the innovative meas-

ure that you have introduced as S. 2747 and we are pleased to support and endorse that legislation.

The question facing our country is twofold—and Senator Domenici alluded to this earlier in the day. First, and urgently, we need to address today's high energy prices, which are causing plant closings and the loss of jobs, and contributing to a general malaise in consumers, coast-to-coast. But the second, and I would argue equally important, question is what Federal policies can be put in place today to insulate us against all of the future threats we have to our economy, our environment and our energy security because of our enormous and growing thirst for energy.

We think the first and central answer to both of those questions is energy efficiency as our Nation's greatest energy resource. It has a proven track record. We now save more energy every year than is provided to us by any other single resource. And if the Congress and the States hadn't taken the actions that they had since 1973, we would need 43 percent more energy today to fuel our economy. The good news, though, is that we haven't wrung out of energy efficiency everything that we can. Our national labs did a study a couple of years ago and they believe that we could essentially halt the growth in our energy consumption in 20 years just by putting in place energy efficiency programs. So it is doable and it is doable with technologies and practices available to us today.

The first place to start, as I mentioned, is transportation because, in our view, that was the largest gap in EPOA 2005. We've done a study of it, Senator, and we believe that, on balance, that bill will save no oil whatsoever. S. 2747 puts in place aggressive targets for national oil savings. We very much support those. However, I know the numbers that Dan doesn't, because I was around for EPOA 1992. There were goals in that bill, very important goals, of saving 10 percent of the use of transportation fuel by the year 2000 and 30 percent by 2010. Well, we are still today, in 2006, at 97 percent dependency in the transportation sector. So we think the surest way to oil savings would be through increases, reforms and CAFE standards, but we understand that is problematic in the Congress, even though the majority of Americans support it. It is also outside of the jurisdiction of this committee. So the novel approach that we would like the committee to look at is a vehicle feebate program.

The idea is simple. You would provide a rebate for fuel-efficient vehicles that is paid for by a fee on gas guzzling vehicles. A feebate would encourage manufacturers to put more fuel-efficient technologies in their vehicles and it would encourage consumers to buy those vehicles. There are three important benefits that I want to mention to the approach. It is revenue neutral; the fees would pay the rebates, so no cost to the government; and it is market-based, you can align consumer preferences with manufacturers' technology capability and with national policies. The nice thing about it, too, I think, is it would provide continual improvement. One act by Congress would result in putting in place a program that would continually increase the fuel economy of vehicles as the mid-point rose higher and higher into the future.

I'm going to run out of time here in a minute, so let me just say that we also appreciate and support that S. 2747 is focused on sav-

ing natural gas. I think Steve Nadel is going to talk here about the renewable portfolio standard and things we would like to see done to expand so that energy efficiency resources can be used effectively to help take us off of conventional fuels in the electricity sector. And while it is out of the jurisdiction of this committee, I wanted to mention that, because I can't let this opportunity pass, we think it is critically important to extend the energy tax incentives that you made available in EPAct 2005. We applaud your support and introduction of legislation, Senator Bingaman, to do just that and we will work with you on it.

Consumers and businesses in this country have been hit by the worst energy price shocks in years and, according to the polls, we see half the people in the country are spending less on other household needs and goods because they are having to spend more on energy. So the polls are telling us something needs to be done now, but fortunately, the polls are also saying that people want the Congress to focus more on long-term solutions than just dealing with today's energy crisis. So we think we have an opportunity now to enact significant energy efficiency provisions that do both. They tackle today's energy prices but they put us on a path for a sustainable energy future. Thank you.

[The prepared statement of Ms. Callahan follows:]

PREPARED STATEMENT OF KATERI CALLAHAN, PRESIDENT, ALLIANCE TO SAVE ENERGY

My name is Kateri Callahan and I serve as President of the Alliance to Save Energy, a bipartisan, nonprofit coalition of more than 100 business, government, environmental and consumer leaders who promote energy efficiency worldwide to achieve a healthier economy, a cleaner environment, and greater energy security.

The Alliance appreciates the leadership Senators Bingaman and Dorgan are providing as two of our Congressional Vice-Chairs, and we are grateful for the important work that this Committee has done, through design and enactment of last year's energy bill which included critical energy saving provisions, to begin to make efficiency a cornerstone of this nation's energy policy. The energy efficiency appliance standards alone in EPACT will result in more than \$63 billion dollars in consumer savings on energy bills by 2020.

Notwithstanding, however, these positive steps, the need for additional government policies to advance energy efficiency—particularly in the transportation sector—have never been greater so we are pleased that the Committee is considering new, important measures like Senator Bingaman's Enhanced Energy Security Act of 2006, S. 2747, which the Alliance supports.

The question facing our country is two-fold. First, and urgently, how can we best and most expeditiously tackle today's high energy prices which are causing plant closings and loss of manufacturing jobs, and contributing to the general malaise of consumers coast-to-coast. But the second, and more important question, I believe, is what federal policies can be put in place today to insulate our country against the looming economic, environmental and energy security threats arising from our enormous national thirst for energy.

A first and central answer to both questions is to more fully use our nation's greatest energy resource—energy efficiency. Efficiency has a proven track record; we now save more energy each year through energy efficiency than we get from any single energy source, including oil. If we tried to run today's economy without the energy-efficiency improvements that have taken place since 1973, we would need 43 percent more energy than we use now. The very good news is that efficiency is the gift that keeps on giving. The National Laboratories have found that we could essentially halt the growth in energy consumption in this country within 20 years through aggressive policy support of energy efficiency.

In our view the largest gap in the Energy Policy Act of 2005 was on oil savings and efficiency in the transportation sector. We estimate that last year's final energy bill—on balance—will save no oil at all.

S. 2747 includes aggressive targets for national oil savings. While the Alliance supports these targets, we do not believe that enacting goals is enough. The Energy Policy Act of 1992, for example, included goals to displace 10 percent of light duty

vehicle fuel by 2000, and 30 percent by 2010 with alternative fuel; yet today, petroleum still accounts for 97 percent of transportation fuel. The Alliance believes administration action is needed, but Congress should not wait.

Perhaps the surest route to oil savings would be through increases or reforms in CAFE standards, as in the bill introduced earlier this week by Senator Feinstein and others. Although there is near-universal support for boosting the standards among the public, the Alliance recognizes that CAFE standards are much more controversial in the halls of Congress, and are outside the jurisdiction of this committee.

One novel approach to oil savings that could be within this committee's purview is a vehicle "feebate." The idea is simple: provide a rebate for fuel-efficient vehicles that is paid for by a fee on gas guzzlers.

A feebate would encourage manufacturers to use more fuel-efficient technologies in their vehicles, and encourage consumers to purchase more efficient vehicles. It would save consumers money in the long run, as the savings in gasoline should be greater than any added vehicle cost.

There are three important benefits of this approach. It is *revenue-neutral*, with the fees collected paying for the rebates provided. It is *market-based*, aligning consumer preferences with manufacturer abilities and national policy. And, it can yield *continual improvement without further action by Congress or the Administration* because as fuel economies increase, the dividing line between fees and rebates is automatically adjusted higher.

S. 2747 also properly focuses on saving natural gas. Because supplies of natural gas are so tight in the United States, reducing demand for natural gas by just a few percent could yield significant price reductions over the next several years. S. 2747 includes a renewable portfolio standard, but many utilities have found that helping their customers to save a kilowatt hour of electricity is cheaper than producing that kilowatt hour from renewable sources or even from traditional sources. S. 2747 recognizes the potential of these programs with a provision from last year's Senate energy bill requiring state public utility commissions to consider policies to promote utility energy-efficiency programs. The Alliance strongly supports this provision, but would urge the committee to consider further federal action.

And, while outside the jurisdiction of this committee, I cannot let an opportunity go by to emphasize the importance of extending and building on the tax incentives for energy-efficient buildings, equipment, and vehicles that were in EPAct 2005. These incentives have great potential to transform markets for energy-efficient technologies, but they are in effect for too short a time.

Consumers and businesses in this country have been hit by the worst energy price shocks in many years. According to polls, about half of American households have cut back on other household spending because of energy costs. But polls also show that a large majority of Americans are rightly more concerned that Congress find long-term energy solutions than that Congress quickly address current prices. There is an opportunity now to enact significant energy-efficiency measures that can provide quick relief, but more importantly, will benefit the economy, the environment, and energy security for years and years to come.

---

#### INTRODUCTION

The Alliance to Save Energy is a bipartisan, nonprofit coalition of more than 100 business, government, environmental and consumer leaders. The Alliance's mission is to promote energy efficiency worldwide to achieve a healthier economy, a cleaner environment, and greater energy security. The Alliance, founded in 1977 by Senators Charles Percy and Hubert Humphrey, currently enjoys the leadership of Senator Mark Pryor as Chairman; Washington Gas Chairman and CEO James DeGraffenreidt, Jr. as Co-Chairman; and Senators Jeff Bingaman, Byron Dorgan, Susan Collins and Jim Jeffords along with Representatives' Ralph Hall, Zach Wamp and Ed Markey, as its Vice-Chairs. Attached to this testimony are lists of the Alliance's Board of Directors and its Associate members.

The Alliance is pleased to testify at a hearing on legislation to promote energy efficiency. Despite some positive steps in the Energy Policy Act of 2005, the need for energy efficiency and the potential contribution of new energy-efficiency policies have never been greater.

#### THE NEED FOR ENERGY-EFFICIENCY POLICIES

Gasoline and natural gas prices have doubled in the last few years, and electricity prices also reached all-time highs. All told, recent energy price increases cost American families and businesses over \$300 billion last year. These high prices have

caused plant closings and loss of manufacturing jobs, and have made many low-income homeowners unable to pay their heating bills. President Bush recognized that our long-term energy security and environmental issues due to our wasteful use of fossil fuels are equally serious when he called for ending our “addiction” to oil.

The problems are likely to get worse. The Energy Information Administration projects that oil use in the United States will grow by another 7.5 million barrels a day by 2030, about one-third of current consumption. While there has been a great deal of attention recently to growing oil demand in China and India, it is worth noting that projected *growth* in oil demand in the United States is nearly as great as in China, and three times that of India. Natural gas use in the United States is projected to grow by a fifth by 2030, and electricity use by half. Such growth will lead to higher prices, greater volatility, and increasing dependence on foreign natural gas as well as foreign oil.

Energy efficiency has the potential to slow the growth in demand significantly, and thus moderate the associated price volatility, energy security concerns, and environmental impacts. Energy efficiency is the nation’s greatest energy resource—we now save more energy each year from energy efficiency than we get from any single energy source, including oil, natural gas, coal, and nuclear power. The Alliance to Save Energy estimates that if we tried to run today’s economy without the energy-efficiency improvements that have taken place since 1973, we would need 43 percent more energy supplies than we use now. Much of these savings result from federal energy policies and programs like appliance and motor vehicle standards, research and development, and the Energy Star program. The existing car and light truck CAFE standards alone saved an estimated 2.8 million barrels of oil a day in 2000.

And tremendous, cost-effective, potential energy savings remain. Vehicle efficiency has continued to improve even after CAFE standards were largely fixed in the mid-1980’s, but, paradoxically, vehicle fuel economy has actually gone down—the efficiency gains have been eaten up by increased weight and power. The EPA estimates that if automakers had applied the technology gains since 1987 to improving fuel economy, average fuel economy would be 20 percent higher. The National Research Council found that much greater vehicle efficiency gains are possible with existing, cost-effective technologies that have not been widely applied yet, not even including hybrid-electric engines. A 2000 study by several of the national labs found that overall the United States could save 19 percent of anticipated energy use by 2020, essentially halting growth in consumption. This includes 12 percent savings for natural gas, 21 percent savings for petroleum, and 24 percent savings for electricity.

#### OIL SAVINGS MEASURES

Perhaps the largest gap in the Energy Policy Act of 2005 was on oil savings and efficiency in the transportation sector. The Alliance estimates that last year’s energy bill, as it emerged from the conference committee, likely will save no oil at all, as the small savings from the hybrid-electric vehicle tax incentive and other provisions will be canceled out by increased gasoline use due to extension of the CAFE loophole for dual-fueled vehicles. Our dependence on foreign oil has steadily increased under the policies and programs in place today. If we truly wish to end our “addiction” to oil, Congress and the President must take further action.

S. 2747, the Enhanced Energy Security Act of 2006, includes aggressive targets for national oil savings, enough to make a real difference in oil markets and on our oil dependence. The Alliance supports these targets, but does not believe that passing fine goals is enough. Although the Energy Policy Act of 1992 included goals that alternative fuels would replace 10 percent of light duty vehicle fuel by 2000, and 30 percent by 2010, petroleum still accounts for 97 percent of transportation fuel. While S. 2747 details procedures by which the administration is to achieve the goal, the Alliance believes greater support and likely additional legislation will be needed from Congress. Administration action is needed, but Congress should not wait.

Perhaps the surest route to oil savings would be through increases or reforms in CAFE standards. Standards increases could be relatively quick, cost-effective, and could have a major impact on energy use. Although there is near-universal support for boosting the standards among the public, the Alliance recognizes that CAFE standards are much more controversial in the halls of Congress, and are outside the jurisdiction of this committee. Other smaller, but positive, measures in S. 2025 and tax provisions in S. 2748 also are outside this Committee’s jurisdiction.

#### Vehicle “Feebate”

One new approach to oil savings that could be within the committee’s purview is a vehicle “feebate.” The idea is simple: provide an incentive (rebate) to make and buy fuel-efficient vehicles; a premium (fee) on gas guzzlers will discourage that choice and pay for the incentives.

In one approach the Department of Energy would apply a fee or rebate to the manufacturer of each new car and light truck. For each vehicle the amount would be based on the gallons of gasoline estimated to be used over the lifetime of the vehicle; the less gasoline a vehicle uses, the larger the rebate (or smaller the fee).

The fee or rebate would then be determined relative to a dividing line, the midpoint mpg. The dividing line between fees and rebates would be set each year such that the total fees would just pay for all the rebates, so *there would be no net revenue or cost to the government*. Consequently, about half the vehicles would receive a rebate, and about half the vehicles would be assessed a fee. If you do not wish to influence the kind of vehicles customers buy, cars and trucks could be divided into several categories based on size, with a separate midpoint mpg for each category.

A feebate would improve fuel efficiency because it would encourage manufacturers to use more fuel-efficient technologies in their vehicles, and encourage consumers to purchase more efficient vehicles. One study finds that a feebate slightly different from that described above would save 1.2 million barrels a day of oil by 2020; a larger feebate could save considerably more. Although improved technologies may increase the average price of cars and light trucks, the savings in gasoline should be greater than the added cost.

There are several benefits to the feebate approach:

#### EXAMPLES OF POSSIBLE FEES AND REBATES

Vehicle	Fuel Economy (mpg)	Feebate
Toyota Prius .....	55	\$1177 rebate
Ford Escape Hybrid .....	33	\$693 rebate
Honda Accord .....	27	\$423 rebate
Midpoint mpg .....	21	—
Lincoln Town Car .....	20	\$95 fee
Chevrolet Trailblazer .....	18	\$317 fee
Ford F-150 .....	16	\$595 fee

For example, this rebate for a Prius is calculated: 25 cents per gallon \* 160,000 miles \* (1/21 mpg - 1/55 mpg) = \$1177

- *Revenue neutral*: The program can be designed to cost the government NO money, and it would not be a tax increase.
- *Market-driven policy*: The financial incentives will help push the market to more efficient vehicles, to align consumer demand, manufacturer requirements, and national policy.
- *Continual improvement*: As fuel economies increase, the midpoint mpg is ratcheted up, encouraging continual improvement, but never out of line with the existing market.
- *Not tied to CAFE standards*: If the feebate is large enough, market forces will drive up fuel economies beyond the current fuel economy standard.
- *Reduces oil consumption and greenhouse gas emissions*.

#### NATURAL GAS SAVINGS MEASURES

S. 2747 also properly focuses on saving natural gas. Because supplies of natural gas are so tight in the United States, reducing demand for natural gas by just a few percent points could yield significant price reductions over the next several years. S. 2747 includes several provisions for natural gas efficiency and electricity efficiency (which can yield significant savings of natural gas as an energy source), notably a renewable portfolio standard.

But many utilities have found that helping their customers to save a kilowatt-hour of electricity is cheaper than producing that kilowatt-hour from renewable sources or even from traditional sources. While estimates vary widely, utility end-use energy-efficiency programs often cost around 3-4 cents per kilowatt-hour. S. 2747 recognizes the potential of these programs by requiring state public utility commissions to consider policies to promote utility energy-efficiency programs, taken from last year's Senate energy bill. The Alliance strongly supports this provision, but would urge the committee to consider further federal action as noted below.



### *Energy Efficiency Resource Standard*

Several states are already developing innovative policies to set performance standards for utility energy-efficiency programs alongside standards for generation from renewable sources. Renewable and efficiency requirements can reinforce each other in several ways.

- Texas has separate renewable and efficiency requirements,
- Connecticut and Pennsylvania have alternative energy portfolio standards with separate tiers for renewables and efficiency and other sources,
- Hawaii and Nevada have combined standards for renewable and efficiency resources (Nevada caps the amount efficiency contributes),
- California has a “loading order” that sets efficiency as the preferred resource; once cost-effective efficiency measures have been exhausted, utilities are to use renewable sources, and only then traditional sources.

Like a renewable portfolio standard, an energy efficiency resource standard is a performance-based approach that gives utilities broad flexibility about how and where to achieve the energy savings. Utilities are required to implement energy-efficiency programs sufficient to save a specified amount of energy, such as one percent of the previous year’s sales. They can implement their own programs, hire energy service companies or other contractors, or sometimes pay other utilities to achieve the savings by buying credits. Usually, the costs of the energy-efficiency programs must be recovered from energy customers through utility rates, but the savings from avoided energy supply are greater than the efficiency cost. Note that an energy efficiency resource standard is not a requirement that the utility’s sales decrease in absolute terms or a limit on their sales at all; it is a requirement that utilities implement programs that are estimated to save a specified amount of energy.

As a focus for federal policy, the energy efficiency resource standard has several advantages:

- It is readily available in all parts of the nation,
- It is available for direct natural gas use as well as for electricity,
- It is cost-effective today, and
- The potential savings are enormous—if 0.75 percent savings were achieved annually nationwide, by 2020 electricity and natural gas use would be reduced by 8 percent, with an estimated net cumulative savings to consumers of \$64 billion.

### *Appliance Standards*

Perhaps the only other federal policy to achieve that level of electricity and natural gas savings is appliance standards. While EAct 2005 included a set of important new standards, additional action by Congress is needed. First, the greatest potential natural gas savings are from a standard requiring efficient residential furnaces in the Northern states, but these furnaces may not be cost-effective in all of the warmer states. Legislation would be useful to clarify that the Department of Energy, if warranted, could set separate levels for heating and cooling equipment in two climate regions. Second, the Alliance is working with manufacturers and other stakeholders to reach agreement on proposed federal standards for additional categories of equipment, and hopes these standards will be legislated as agreement is reached. Finally, the Alliance urges you to maintain vigilant oversight as DOE attempts to meet the requirements for rulemakings in EAct 2005 while issuing long-delayed standards required in earlier bills.

### *Energy-Efficiency Tax Incentives*

Other important measures to save electricity and natural gas are outside the jurisdiction of this committee. But the Alliance will not let an opportunity go by to emphasize the importance of extending and building on the tax incentives for energy-efficient buildings, equipment, and vehicles that were in EAct 2005. These incentives have great potential to transform markets for energy-efficient technologies, but they are in effect for too short a time. “A large commercial building initiated when the bill” was signed last August will not be finished before the commercial buildings deduction expires in December, 2007. For Toyota hybrid vehicles, the tax credit will expire even earlier, phasing out between October 2006 and March 2007. The Alliance strongly supports the extensions that are in S. 2748, with some modifications that have been worked out with other stakeholders—notably a performance-based incentive for whole-home energy-efficiency retrofits that picks up where the current home improvements credit leaves off. The Alliance also supports updates to federal standards for certain buildings, particularly manufactured housing and homes with federally subsidized mortgages.

## CONCLUSION

Consumers and businesses in this country have been hit by the worst energy price shocks in many years for gasoline, natural gas, and (in some areas) electricity. These price increases hit the rest of the economy, as chemical plants move overseas and, according to polls, about half of American households cut back on other household spending. There are measures we could take, such as consumer education, which would have an immediate impact. But polls also show that a large majority of Americans are rightly more concerned that Congress find long-term energy solutions than that Congress quickly address current prices. There is an opportunity now, due to the high prices, to enact significant energy-efficiency measures that will benefit the economy, the environment, and energy security for years to come. If Congress does not act, the price volatility and supply shortages will continue to plague us. The Alliance urges you to seize the opportunity to take really significant measures to reduce energy waste in this nation.

Senator BINGAMAN. Thank you very much.

Mr. Nadel—is that the right pronunciation? Why don't you go right ahead. Thank you.

**STATEMENT OF STEVE NADEL, EXECUTIVE DIRECTOR,  
AMERICAN COUNCIL FOR AN ENERGY-EFFICIENT ECONOMY**

Mr. NADEL. Thank you, Senator. I appreciate the opportunity to be here. I am the executive director of the American Council for an Energy-Efficient Economy, a non-profit research organization here in Washington. As Kateri Callahan said, energy efficiency is our Nation's No. 1 energy resource, but there is much more opportunity. Since the Energy Policy Act was passed last year, our energy problems have only gotten worse and we are very heartened to see that this committee is again considering energy legislation, including major energy efficiency provisions. I particularly wanted to thank you, Senator Bingaman, for taking a lead on this.

As we look at the Energy Policy Act of 2005, and the Energy Policy Act of 1992, what we see is there are many, many provisions of which a few have had some significant impacts and many of them, unfortunately, have not had the impacts we all would have hoped for. They have not been followed with Appropriations, States haven't followed through, et cetera. We therefore recommend that the committee focus on just a few major energy-saving provisions that will have a really big impact. Fortunately, S. 2747, I think, has three of the four things that we think are very important, and I am going to suggest a few tweaks and one significant addition.

First, we need to do something about saving oil. That's the biggest problem with the 2005 law and, actually, the 1992 law as well. We really need to take some leadership. We need some creative approaches and I think the approach in S. 2747 is a good, creative approach to make some significant progress. So I strongly urge this committee to include that in any bill that reports out.

In addition, we are going to need some supporting policies so that the future administrations have many choices to choose from to meet those targets. Title II has some good provisions. In our written comments, we provide a couple of additional suggestions of things that—arrows that can be in the quiver, that future administrations can use to meet those targets. We think the targets are very achievable. We have done some analyses as well, looking just at the opportunities for energy efficiency savings. We can save more than 5 million barrels per day just from efficiency by 2020. And I point out that about 2 million of that comes from the indus-

trial sector, the residential sector, airplanes, and heavy vehicles. It is not just CAFE, it is not just passenger vehicles, there are lots of opportunities throughout the economy to save oil. So we urge this committee to take that path.

Second, there is a provision in S. 2747 calling on States to consider setting energy efficiency performance standards. These are targets that utilities would need to meet that would gradually escalate over time to help lock in some electricity and, potentially, natural gas savings.

We would recommend strengthening that provision and making it a national energy efficiency performance standard. We think there are many benefits to going national: You get much more savings, savings that all states take advantage of; it will help reduce energy prices nationwide; and because there are more savings, it will help reduce pollution nationwide. We urge that there be an energy efficiency performance standard actually included in the legislation, somewhat modeled after the renewable portfolio standard that is already in there.

Third, we recommend that a provision be added on appliance and equipment efficiency standards. The Energy Policy Act last year included quite a few standards. We are in the process of negotiating with manufacturers on additional standards and we hope the committee will include whatever consensus standards we can reach agreement on by the time the bill moves. We have one agreement now. We are working on several others.

Also, we recommend that the bill clarify current law and authorize the Department of Energy, when it sets efficiency standards on heating and cooling equipment, to set two standards for the United States instead of one. Alaska and Florida have very different climates and a one-size-fits-all approach is creating some problems. Either you set a very weak standard and don't save any energy or set a stronger standard but it disadvantages those folks, say, in a warm climate. By dividing the country into two standards, we can save a lot of energy while reducing the burdens in those climates that won't benefit.

Finally, we recommend that the energy efficiency tax incentives get included.

We thank you, Senator Bingaman and your co-sponsors, for including many of this as S. 2748.

Overall, we estimate that the Energy Policy Act of 2005, the energy efficiency provisions, would reduce U.S. energies by about 1½ percent in 2020. This is a significant savings. But those four measures I just recommended, those could save an additional 12 percent. We are talking seven times the energy savings from the Energy Policy Act of 2005 from just four provisions. So we urge you to consider these four provisions as you move forward with legislation. Thank you.

[The prepared statement of Mr. Nadel follows:]

PREPARED STATEMENT OF STEVEN NADEL, EXECUTIVE DIRECTOR, AMERICAN COUNCIL  
FOR AN ENERGY-EFFICIENT ECONOMY (ACEEE)

SUMMARY

*Introduction*

Energy efficiency is an important cornerstone for America's energy policy. Energy efficiency has saved consumers and businesses trillions of dollars in the past three decades, including about a trillion dollars in 2005 alone. These efforts should now be accelerated in order to:

- Save American consumers and businesses even more money;
- Change the energy supply and demand balance to put downward pressure on energy prices;
- Decrease America's addiction to oil, particularly oil imports;
- Strengthen our economy (since energy savings generate American jobs and capital investment);
- Buy us time to implement a comprehensive long-term energy strategy, and
- Reduce the risks of global warming by moderating carbon dioxide emissions growth.

*Key Drivers*

Prices of heating oil, gasoline, natural gas, and coal have risen 60-100% in the past three years (varying by fuel), driven by rising demand, tight supplies, and limited transportation and processing infrastructure. While prices are unlikely to return to the levels of three years ago, prices can be reduced through a combination of reduced demand and increased supplies. However, new supplies take time to develop, so energy efficiency is the only near-term option. A 2005 ACEEE analysis found that reducing natural gas use by about 4% over five years could reduce natural gas prices by over 20%. Reducing demand for oil and for refined petroleum products is also likely to reduce prices.

U.S. reliance on oil imports continues to rise and is projected to be near 70% of total U.S. oil demand by 2020. A substantial portion of this oil comes from unstable regions of the world. While moderate amounts of new oil are available in hard-to-reach areas of the U.S., they are not enough to offset continuing rapid depletion of North American fields. Moreover, much greater amounts of oil are available by increasing the efficiency with which we use oil. A January 2006 ACEEE study finds that we can reduce U.S. oil use by more than 5 million barrels per day by 2020. That's equivalent to almost doubling current U.S. oil production—which no serious petroleum expert views as possible. Improvements to passenger vehicles account for more than 3 million barrels per day of savings, but more than 2 million barrels per day of savings are available in the residential, commercial, and industrial sectors, and in heavy vehicles and airplanes. This suggests that oil-savings efforts should focus on all sectors, not just passenger vehicles.

Greenhouse gas emissions, especially carbon dioxide, continue to increase. Early signs of the impact of global warming are becoming apparent in Alaska and other parts of the Arctic, and several recent papers have identified a link between warmer ocean temperatures and increased hurricane intensity. Energy efficiency is the most cost-effective way to reduce these emissions, as efficiency investments generally pay for themselves with energy savings alone, providing no-cost emissions reductions. For example, a May 2006 ACEEE study found that the planned cap and trade system for power-sector carbon dioxide emissions in the northeastern U.S. can have a positive impact on the regional economy provided increased energy efficiency programs are a key part of implementation efforts.

*Energy Policy Acts of 2005 and 1992*

The Energy Policy Act of 2005 contained some useful energy efficiency provisions, particularly the new equipment efficiency standards and energy efficiency tax incentives. Other EPA 2005 provisions may also help as well, but virtually all of these lack funding or other critical follow-up actions. Overall, ACEEE now estimates that the efficiency provisions in this law will reduce energy use in 2020 by 1.8 quadrillion Btu, which is 1.5% of projected national energy use. More than 75% of the savings are from equipment efficiency standards and efficiency tax incentives. Experience with the Energy Policy Act of 1992 showed a similar pattern—most of the savings came from a few provisions, and the majority of provisions proved to be more show than substance.

### Key Priorities for New Legislation

Based on this past experience, we recommend that future legislative efforts focus on a few provisions that will result in substantial energy savings. We recommend four such provisions as follows:

1. *Oil savings targets*—S. 2747 sets oil savings targets that OMB and other agencies are tasked with meeting. This is a promising provision but needs to be backed by complementary actions that will make the targets enforceable, as well as authorize a variety of policies that OMB can choose among in order to meet the targets.

2. *A national energy efficiency resource standard*—An energy efficiency resource standard (HERS) consists of electric and/or gas energy savings targets for utilities, with flexibility to achieve the target through a market-based trading system. An EERS is similar to a renewable portfolio standard, but for energy efficiency savings instead of renewable energy generation. Policies along these lines have been adopted by eight states and several European countries. S. 2747 encourages states to consider EERSs but we recommend that this section be strengthened to establish a national EERS, with a national market-based trading system.

3. *Equipment and appliance efficiency standards*—Consensus efficiency standards were key successes in the last two Energy Policy Acts, and ACEEE is now working with industry and other stakeholders to negotiate additional consensus standards. We recommend that any consensus agreements that emerge be incorporated into legislation. In addition, new legislation should authorize DOE to consider separate standards for the North and South for heating and cooling equipment. The current one standard for all approach means that there will be clear winners and losers that can be avoided by customizing standards for each climate zone.

4. *Efficiency tax incentives*—Provisions in EAct 2005 generally expire at the end of 2007, largely because the 2005 conferees were under pressure to reduce the amounts spent on tax incentives. These should be extended, to at least the original expiration dates, and a few refinements should also be considered.

### Energy Savings

ACEEE estimates that together these four items can reduce U.S. energy use by more than 14 quads in 2020, reducing energy use by about 12%. *These savings would be more than seven times the efficiency savings of EAct 2005.*

### Conclusion

We urge the Committee to concentrate on the largest opportunities for improving energy efficiency and take concrete action on legislation in these four key priority areas. Failure to take these steps now will make it much more likely that our nation's energy problems will continue or even worsen, and that Congress and the nation will have to continue facing energy "crises" for many years to come.

---

### INTRODUCTION

ACEEE is a nonprofit organization dedicated to increasing energy efficiency as a means of promoting both economic prosperity and environmental protection. We were founded in 1980 and have contributed in key ways to energy legislation adopted during the past 25 years, including the Energy Policy Acts of 2005 and 1992 and the National Appliance Energy Conservation Act of 1987. I have testified before the Committee several times and appreciate the opportunity to do so again.

Energy efficiency improvements have contributed a great deal to our nation's economic growth and increased standard of living over the past 30 years. Energy efficiency improvements since 1973 accounted for approximately 55 quadrillion Btus in 2005, which is *more than half of U.S. energy use and nearly as much energy as we now get annually from domestic coal, natural gas, and oil resources combined.*<sup>1</sup>

<sup>1</sup>Specifically, national energy intensity (energy use per unit of GDP) fell 46 percent between 1973 and 2003. About 60% of this decline is attributable to real energy efficiency improvements and about 40% is due to structural changes in the economy and fuel switching. Energy and GDP figures from Energy Information Administration, 2006, *Monthly Energy Review May 2006*. Washington, DC: U.S. Dept. of Energy. Proportion of gains due to efficiency from Murtishaw and Schipper, 2001, *Untangling Recent Trends in U.S. Energy Use*. Washington, D.C.: U.S. Environmental Protection Agency.

Thus, energy efficiency can rightfully be called our country's largest energy source. If the United States had not dramatically reduced its energy intensity over the past 30 years, consumers and businesses would have spent roughly \$1 trillion more on energy purchases in 2005.

Even though the United States is much more energy efficient today than it was 30 years ago, there is still enormous potential for additional cost-effective energy savings. Some newer energy efficiency technologies have barely begun to be adopted. Other efficiency measures could be developed and commercialized rapidly in coming years, with policy and program support. For example, in a study from 2000, the Department of Energy's national laboratories estimated that increasing energy efficiency throughout the economy could cut national energy use by 10 percent or more in 2010 and about 20 percent in 2020, with net economic benefits for consumers and businesses.<sup>2</sup> Studies for many regions of the country have found similar if not even greater opportunities for cost-effective energy savings.<sup>3</sup>

Unfortunately, a variety of market barriers keep these savings from being implemented. These barriers are many-fold and include such factors as "split incentives" (landlords and builders often do not make efficiency investments because the benefits of lower energy bills are received by tenants and homebuyers); panic purchases (when a product such as a refrigerator needs replacement, there often isn't time to research energy-saving options); and bundling of energy-saving features with high-cost extra "bells and whistles."

Recent developments in energy markets indicate that the U.S. needs to *accelerate* efforts to implement energy efficiency improvements:

- Oil, gasoline, natural gas, and coal prices have risen substantially in recent years. For example, residential natural gas prices in 2005 averaged \$13.83 per thousand cubic feet, up 61% from the average price three years earlier (prices averaged \$8.57 per thousand cubic feet in 2002).<sup>4</sup> Likewise, retail gasoline prices are up 87% relative to three years ago (\$2.917 per gallon 6/19/06 versus \$1.558 per gallon 6/16/03).<sup>5</sup> Even more dramatically, Powder River Basin coal has more than doubled in price since three years ago (spot prices of \$13.80 per short ton in May 2006, up from about \$6 per short ton in May 2003).<sup>6</sup> Energy efficiency can reduce demand for these fuels, reducing upward price pressure and also reducing fuel-price volatility, making it easier for businesses to plan their investments. Prices are determined by the interaction-of supply and demand—if we seek to address supply and not demand, it's like entering a boxing match with one hand tied behind our back.
- A recent ACEEE analysis found that gas markets are so tight that if we could reduce gas demand by as little as 4% over the next five years, we could reduce wholesale natural gas prices by more than 20%.<sup>7</sup> This analysis was conducted by Energy and Environmental Analysis, Inc. using its North American Gas Market Model, the same analysis firm and computer model that was employed by DOE and the National Petroleum Council for their 2003 study on U.S. natural gas markets.<sup>8</sup> These savings would put over \$100 billion back into the U.S. economy. Moreover, this investment would help bring back U.S. manufacturing jobs that have been lost to high gas prices while also helping to relieve the crushing burden of natural gas costs experienced by many households, including low-income households. Importantly, much of the gas savings in this analysis

<sup>2</sup>Interlaboratory Working Group, 2000, *Scenarios for a Clean Energy Future*. Washington, D.C.: Interlaboratory Working Group on Energy-Efficient and Clean-Energy Technologies, U.S. Department of Energy, Office of Energy Efficiency and Renewable Energy.

<sup>3</sup>For a summary of many of these studies, see Nadel, Shipley and Elliott, 2004, *The Technical, Economic and Achievable Potential for Energy Efficiency in the U.S.: A Meta-Analysis of Recent Studies*. Washington, D.C.: American Council for an Energy-Efficient Economy.

<sup>4</sup>Energy Information Administration, 2006, *Natural Gas Navigator: U.S. Natural Gas Residential Price*. [http://tonto.eia.doe.gov/dnav/ng/ng\\_pri\\_sum\\_dcunus\\_m.htm](http://tonto.eia.doe.gov/dnav/ng/ng_pri_sum_dcunus_m.htm). Visited June 20, Washington, D.C.: U.S. Dept. of Energy.

<sup>5</sup>Energy Information Administration, 2006, *Petroleum Navigator: U.S. All Grades All Formulations Retail Gasoline Prices*. [http://tonto.eia.doe.gov/dnav/pet/hist/mg\\_tt\\_usw.htm](http://tonto.eia.doe.gov/dnav/pet/hist/mg_tt_usw.htm). Visited June 20, Washington, D.C.: U.S. Dept. of Energy.

<sup>6</sup>Energy Information Administration, 2006, *Coal News and Markets, Week of May 5, 2006*. <http://www.eia.doe.gov/eneaf/coal/page/coalnews/coalmar.html#spot>. Washington, D.C.: U.S. Dept. of Energy.

<sup>7</sup>Elliott and Shipley, 2005, *Impacts of Energy Efficiency and Renewable Energy on Natural Gas Markets: Updated and Expanded Analysis*. <http://www.aceee.org/pubs/e052/full.pdf>. Washington, D.C.: American Council for an Energy-Efficient Economy.

<sup>8</sup>National Petroleum Commission, 2003, *Balancing Natural Gas Policy—Fueling the Demands of a Growing Economy: Volume I, Summary of Findings and Recommendations*. Washington, D.C.: U.S. Department of Energy.

comes from electricity efficiency measures, because much of the marginal electric load is met by natural-gas fired power plants.

- The U.S. is growing increasingly dependent on imported oil, with imports accounting for more than 60% of U.S. oil consumption in 2005, of which more than 40% came from OPEC countries.<sup>9</sup> The U.S. Energy Information Administration estimates that imports will account for 68% of U.S. oil use in 2020.<sup>10</sup> While moderate amounts of new oil resources are available in hard-to-reach areas of the U.S., much greater energy resources are available by increasing the efficiency with which we use oil. A January 2006 report by ACEEE found that the U.S. can reduce oil use by as much as 5.3 million barrels per day in 2020 through improved efficiency, including more than 2 million barrels per day in industry, buildings, heavy duty vehicles, and airplanes.<sup>11</sup> In other words, *there are substantial energy savings outside of the highly contentious area of light-duty vehicle fuel economy*. These 5.3 million barrels per day of oil savings are nearly as much as we presently import from OPEC (OPEC imports were 5.5 million barrels per day in 2005).<sup>12</sup> Energy efficiency can slow the growth in oil use, allowing a larger portion of our needs to be met from sources in the U.S. and friendly countries, as well as domestically produced alternative fuel sources.
- Economists have increasingly raised concerns that the U.S. economy is slowing and that robust growth rates we have had in recent years will not be sustained. Energy efficiency investments can spur economic growth; they often have financial returns of 30% or more, helping to reduce operating costs and improve productivity and profitability. In addition, by reducing operating costs, efficiency investments free up funds to spend on other goods and services, creating what economists call the “multiplier effect,” and helping the economy broadly. This stimulates new economic activity and job growth in the U.S., whereas most of every dollar we spend on oil flows overseas. A 1997 study found that due to this effect, an aggressive set of efficiency policies could add about 770,000 jobs to the U.S. economy by 2010.<sup>13</sup>
- While the U.S. overall has ample supplies of electricity at present, demand is rapidly growing and several regions (such as southwest Connecticut, Texas, New York, and California) are projecting a need for substantial new capacity in the next few years in order to keep reserve margins adequate.<sup>14,15</sup> Energy efficiency resource policies can slow growth rates, postponing the date that additional capacity will be needed.
- Greenhouse gas emissions continue to increase. Early signs of the impact of these changes are becoming apparent in Alaska and other Arctic regions.<sup>16</sup> And several recent papers have identified a link between warmer ocean temperatures and increased hurricane intensity.<sup>17,18</sup> Energy efficiency is the most cost-effective way to reduce these emissions, as efficiency investments generally pay for themselves with energy savings alone, providing no or negative-cost emissions reductions. The term “negative-cost” means that, because such efficiency investments produce net economic benefits, they achieve emission reductions at a net savings for the economy. This important point has been missed in much of the climate policy analysis modeling performed to date. Too many economic models are incapable of characterizing the real economic effects of efficiency investments, and so forecast inaccurate economic costs from climate policies. Fortunately, this kind of flawed policy analysis is beginning to be corrected. For example, a May 2006 study just released by ACEEE found that the Regional

<sup>9</sup>Energy Information Administration, 2006, *Monthly Energy Review May 2006*. Washington, DC: U.S. Department of Energy.

<sup>10</sup>Energy Information Administration, 2006, *Annual Energy Outlook*. Washington, D.C.: U.S. Department of Energy.

<sup>11</sup>Elliott, Langer and Nadel, 2006, *Reducing Oil Use Through Energy Efficiency: Opportunities Beyond Cars and Light Trucks*. Washington, DC: American Council for an Energy-Efficient Economy.

<sup>12</sup>See note #9.

<sup>13</sup>Alliance to Save Energy et al., 1997, *Energy Innovations: A Prosperous Path to a Clean Environment*. Washington, DC: American Council for an Energy-Efficient Economy.

<sup>14</sup>North American Electric Reliability Council, 2005, *2005 Long-Term Reliability Assessment: The Reliability of Bulk Electric Systems in North America*. Princeton, N.J.: North American Electric Reliability Council.

<sup>15</sup>New York Independent System Operator, 2005, “The NYISO Issues Reliability Needs Assessment.” Press release of December 21. Schenectady, N.Y.: New York Independent System Operator.

<sup>16</sup>Hassel, 2004, *Impacts of a Warming Arctic: Arctic Climate Impact Assessment*. <http://www.acia.uaf.edu>. Cambridge University Press.

<sup>17</sup>Webster, Holland, Curry and Chang, 2005, “Changes in Tropical Cyclone Number, Duration, and Intensity in a Warming Environment.” *Science*, 309, 16 September, 1844-1846.

Greenhouse Gas Initiative (RGGI—the planned cap and trade system for greenhouse gases in the northeastern U.S.) can have a small but positive impact on the regional economy provided increased energy efficiency programs are a key part of implementation efforts.<sup>19</sup>

Energy efficiency also draws broad popular support. For example, in a March 2005 Gallup Poll, 61% of respondents said the U.S. should emphasize “more conservation,” versus only 28% who said we should emphasize “production” (an additional 6.5% volunteered “both”).<sup>20</sup> In an earlier May 2001 Gallup poll, when read a list of 11 actions to deal with the energy situation, the top four actions (supported by 85-91% of respondents) were “invest in new sources of energy,” “mandate more energy-efficient appliances,” “mandate more energy-efficient new buildings,” and “mandate more energy-efficient cars.” Options for increasing conventional energy supply and delivery generally received significantly less support.<sup>21</sup>

However, energy efficiency alone will not solve our energy problems. Even with aggressive actions to promote energy efficiency, U.S. energy consumption is likely to continue to rise for more than a decade, and this growth, combined with retirements of some aging resources and production facilities, will mean that some new energy supplies and energy infrastructure will be needed. But aggressive steps to promote energy efficiency will substantially cut our energy supply and energy infrastructure problems, reducing the economic cost, political controversy, and environmental impact of energy supply enhancements, while buying us time to implement a comprehensive, long-term energy strategy.

#### THE ENERGY POLICY ACTS OF 2005 AND 1992

The Energy Policy Act of 2005 (EPAct 2005) made some useful progress on energy efficiency. Particularly notable were sections that established new consensus, federal efficiency standards on 16 products and that created energy efficiency tax incentives. Other useful provisions included the extension of authority for Energy Saving Performance Contracts (ESPC) in federal facilities, and a variety of mandated reports that hopefully will help spur future policy action. For example, the EPAct 2005 provision requiring DOE to submit a plan to Congress on steps it will take to catch up on overdue efficiency standard rulemakings was timed just right, and DOE has now prepared and begun to implement this plan. In addition, a variety of promising initiatives were authorized in EPAct 2005, but to have an impact, need to be followed by appropriations.

Unfortunately, most of the new provisions requiring funding were not included in either the President’s budget request or in the House appropriations bills (the Senate has yet to act). Given recent developments, such as the lack of funding for many of the EPAct 2005 provisions, ACEEE now estimates that the energy efficiency sections of EPAct 2005 will reduce U.S. energy use by about 1.8 quadrillion Btu (“quads”) in 2020, reducing projected U.S. energy use in 2020 by 1.5%. Of these savings, more than 75% will come from two key provisions—equipment efficiency standards and energy efficiency tax incentives.<sup>22</sup>

A similar pattern applies to the Energy Policy Act of 1992 (EPAct 1992). This law also attempted to comprehensively address U.S. energy needs, including an energy efficiency title. ACEEE and the Alliance to Save Energy conducted a review of this law five years after passage and found that many of the provisions were not fully implemented due to limited funding, the fact that many provisions were voluntary and were largely ignored, and limited follow-through. For example, provisions calling for state action were ignored by many states, and only resulted in policy changes in a few states. Ultimately, most of the energy efficiency savings that actually occurred came from just a few provisions including a series of new equipment effi-

<sup>18</sup> Emanuel, 2005, “Increasing Destructiveness of Tropical Cyclones over the Past 30 Years.” *Nature*, 436, 4 August, 686-688.

<sup>19</sup> Prindle, Shipley and Elliott, 2006, *Energy Efficiency’s Role in a Carbon Cap-and-Trade System: Modeling Results from the Regional Greenhouse Gas Initiative*. Washington, DC: American Council for an Energy-Efficient Economy.

<sup>20</sup> Gallop, 2005, “Gallop Poll Social Series—The Environment.” Princeton, N.J.: The Gallop Organization.

<sup>21</sup> Moore, David, 2001, “Energy Crisis: Americans Lean toward Conservation over Production.” Princeton, N.J.: The Gallup Organization.

<sup>22</sup> Nadel, Prindle and Brooks, 2006, “The Energy Policy Act of 2005: Energy Efficiency Provisions and Implications for Future Policy Efforts” in *Proceedings of the 2006 ACEEE Summer Study on Energy Efficiency in Buildings*. Washington, D.C.: American Council for an Energy-Efficient Economy.



ciency standards (which accounted for more than half the savings), equipment efficiency ratings, improvements to building codes, and some R&D efforts.<sup>23</sup>

#### KEY PRIORITIES FOR NEW LEGISLATION

Based on the experience with EAct 1992 and initial actions on EAct 2005 implementation, we recommend that as the Energy Committee considers new energy efficiency legislation, it concentrate on a few provisions with significant energy savings, and that the Committee not spend a lot of time on provisions that may sound good on paper, but are unlikely to actually save much energy in practice. Based on our review of a variety of bills introduced in Congress and our read of the political situation, we recommend that a new energy efficiency bill emphasize four areas as follows:

1. Oil savings targets and associated policies;
2. Energy efficiency resource standards (energy-saving targets for utilities);
3. Equipment efficiency standards; and
4. Extensions and refinements of efficiency tax incentives in EAct 2005.

Fortunately, S. 2747 (the subject of this hearing) and its companion S. 2748 address most of these items in some fashion, although in each case some further strengthening would be very helpful. In the remainder of my testimony I discuss these four priority areas, summarize the energy savings available from addressing these four key priorities, make some further comments on S. 2747, and then draw a few final conclusions.

#### *Oil Savings Targets*

The biggest shortfall in EAct 2005 (and in EAct 1992 as well) was the failure to address opportunities to use oil more efficiently. As I noted previously, U.S. dependence on oil imports is increasing and energy efficiency represents a key strategy for reducing this dependency. There are many strategies that can be employed to reduce oil use, of which improving passenger vehicle fuel economy is just one. Other strategies include:

- Improving the efficiency of buildings with oil and propane space heating and water heating. These systems are particularly common in the Northeast, and Midwest; and in rural areas, that lack natural gas distribution systems.
- Reducing oil use in industry through such measures as improved boilers and process heating; increased recycling of waste materials; improved paving materials that reduce petroleum feedstock requirements; and energy efficiency improvements in off-highway equipment and operating practices.
- Improving the fuel economy of heavy vehicles, such as delivery trucks and tractor trailers.
- Promoting “smart growth” strategies so public transit is more assessable and driving distances are reduced.
- Improving the fuel efficiency of airplanes.

S. 2747 includes a provision directing the Office of Management and budget and other agencies to develop and implement a plan to reach specified oil savings targets, including 2.5 million barrels per day in 2016 and 10 million barrels per day in 2031. These targets represent approximately 10% of projected 2016 U.S. petroleum product use and approximately 35% of projected 2031 use. We strongly support this section and urge the Committee to incorporate it into the next major piece of energy legislation it reports out.

However, this provision is only useful if future administrations faithfully implement it. To increase the chances that this provision is fully implemented, we recommend that the following steps be taken:

1. The Committee should have legal counsel carefully review the language to make sure it is enforceable in a court of law. While we hope that legal action will never be needed, if legal action is clearly provided for, this will provide a significant incentive to future administrations to keep on track in implementing this provision.
2. The Committee should work closely with the Commerce Committee to make sure that a variety of strategies for meeting the targets are authorized, including heavy vehicle testing and fuel economy policies and replacement tire efficiency standards. The Committee should also encourage the

<sup>23</sup> ACEEE and ASE, 1997, *Missing the Mark: Five-Year Report Card on the Energy Efficiency Provisions of the Energy Policy Act*. Washington, D.C.: American Council for an Energy-Efficient Economy and Alliance to Save Energy.

Commerce Committee to develop initial near-term fuel economy targets (such as ones based on the 2002 National Academy study),<sup>24</sup> so that some savings will start to accrue even while the OMB-led process is put in place.

3. The Committee should work to authorize or put in place additional policies for achieving fuel savings such as: (a) revenue-neutral fees and rebates (“feebates”) to encourage purchase of vehicles with above-average fuel economy and discourage purchase of below-average vehicles; and (b) a small fee on heating oil and propane purchases to fund programs to help homeowners and businesses reduce use of these fuels.<sup>25</sup>

#### *Energy Efficiency Resource Standard*

An energy efficiency resource standard (EERS) is a simple, market-based mechanism to encourage more efficient use of electricity and natural gas. An EERS consists of electric and/or gas energy savings targets for utilities, often with flexibility to achieve the target through a market-based trading system. An EERS is similar to a renewable portfolio standard, but for energy efficiency savings instead of renewable energy generation. Programs along these lines have been adopted by eight states and several European countries. All EERSs currently in place include end-user energy saving improvements that are aided and documented by utilities or other program operators.<sup>26</sup> Sometimes distribution system efficiency improvements, along with combined heat and power (CHP) systems and other high-efficiency distributed generation systems, are included as well. With trading, a utility that saves more than its target can sell savings credits to utilities that fall short of their savings targets. Trading would also permit the market to find the lowest-cost savings. However, unlike other resources such as renewable energy and coal, energy-saving opportunities are distributed throughout the 50 states.

Among the EERS-like laws now in operation, Texas’s electricity restructuring law created a requirement for electric utilities to offset 10% of their demand growth through end-use energy efficiency. Utilities in Texas have had no difficulty meeting their targets and there is discussion about increasing the targets. Hawaii and Nevada recently expanded their renewable portfolio standards to include energy efficiency. Connecticut and California have both established energy savings targets for utility energy efficiency programs (Connecticut by law and California by regulation) while Vermont has specific savings goals in the performance contract with the non-profit organization that runs statewide programs under a contract with the Public Service Board. Pennsylvania’s new Advanced Energy Portfolio Standard includes end-use efficiency among other clean energy resources. Colorado’s largest utility has energy savings goals as part of a settlement agreement approved by the Public Service Commission. And Illinois and New Jersey are planning to begin programs soon. EERS-like programs have been working well in the United Kingdom and the Flemish region of Belgium. Italy has recently started a program, and another is about to start in France. Details on each of these programs are provided in a March 2006 ACEEE report.<sup>27</sup>

S. 2747 includes a provision directing states to consider adoption of EERSs. However, experience under EPAct 1992 and 2005 is that few states follow up on these directives. Instead, we recommend that S. 2747 be amended to establish a national EERS, but allowing for state-based administration provided states meet certain basic criteria.

We recommend that EERS targets generally start at modest levels (e.g., savings of 0.25% of sales annually) and ramp-up over several years to savings levels currently achieved by states with substantial experience (e.g., 0.50% of gas sales, 0.75% of electric sales, and 1.0% of peak electric demand annually). To ensure that costs will be moderate, we recommend that a market for trading of savings credits be established and that a “safety valve” be created under which electric and gas utilities could buy credits from the implementing agency for about half of the current

<sup>24</sup> See National Research Council, 2002, *Effectiveness and Impact of Corporate Average Fuel Economy (CAFE) Standards*. Washington, D.C.: National Academy Press.

<sup>25</sup> Specifically, we recommend a fee of 1-2 cents per gallon, with funds to be administered by the states. State allocations should be based on use of heating oil and propane by state, and a competitive RFP, in which states with the best program proposals receive extra funds. While many gas and electric utilities operate energy-saving programs, homeowners and businesses using heating oil and propane are generally left out. This proposed program would address this gap.

<sup>26</sup> Savings are documented in program evaluations, following evaluation guidelines specified by state utility commissions. State commissions have many resources to draw on to develop these guidelines, including guidelines from other states.

<sup>27</sup> Nadel, 2006, *Energy Efficiency Resource Standards: Experience and Recommendations*. Washington, D.C.: American Council for an Energy-Efficient Economy.

retail costs of each energy source (monies so collected should be used to fund public-benefit, government-operated energy efficiency programs).

While many EERSs are separate from a renewable portfolio standard, an option would be to combine renewable energy and energy efficiency in a single, combined portfolio standard. However, if this is done, the portfolio target should be significantly higher than if only renewable energy or if only energy efficiency were included. For example, a combined efficiency/renewables target might be 20% of 2020 sales, and not the 10% of 2020 sales that the Senate has previously passed as a renewable portfolio standard. Another option will be to add additional “advanced energy resources” to a portfolio standard such as “advanced coal” that includes carbon sequestration or new advanced nuclear reactors. Each of these resources has supporters and detractors, so a careful political calculus is needed to see which resources add versus subtract votes. To the extent additional resources are added to a portfolio standard, the targets should be increased commensurately. In no case should utilities be allowed to reduce their renewables purchases below levels previously voted by the Senate.

#### *Equipment Efficiency Standards*

ACEEE, affected industries, and other stakeholders have a long history of negotiating consensus agreements on new efficiency standards. Many of these agreements were incorporated into the Energy Policy Acts of 1992 and 2005. ACEEE is now talking with industry about standards on additional products, and we expect to have agreements on several new standards by the end of the year. If we are successful, we urge the Committee to include these new consensus standards in legislation it works on next year. Products that may lend themselves to consensus standards include the following:

- Reflector lamps
- Pool heaters
- Metal halide luminaries
- Bottle-type drinking water dispensers
- Portable electric spas (hot tubs)
- Single-voltage external AC to DC and AC to AC power supplies
- Commercial hot-food holding cabinets
- Walk-in refrigerators and freezers

In addition, we recommend that current standards law be amended to permit DOE to divide the country into two climate zones when setting new standards for heating and cooling equipment. DOE’s Office of General Counsel says they lack authority to set separate standards for different regions, and therefore must use a one size fits all approach. However, climate in the U.S. varies enormously from Alaska to Florida, and a one size fits all approach for the entire country does not make sense for some climate-sensitive products. For example, DOE is currently conducting a rulemaking on new standards for residential furnaces, a major consumer of natural gas. Condensing furnaces (e.g., those meeting the ENERGY STAR specification) are very cost-effective in Northern states, but may not be cost-effective in many Southern states. But a single climate zone approach would either mean setting a weak standard based on Southern needs and achieving little energy savings, or setting a stronger standard based on national average heating loads and imposing significant costs on warm states. Dividing the country into two climate regions would save substantial energy without imposing extra costs on warm states. An ACEEE analysis estimated that a condensing furnace standard in cold states would reduce national natural gas use by more than 150 billion cubic feet and will save consumers \$3.2 billion (discounted net present value) for equipment sold by 2030.

Manufacturers claim that imposing separate standards for the North and South would create difficulties for them. However, manufacturers often have separate models for Northern and Southern climates (e.g., furnaces in the South often have larger fans in order to handle larger cooling loads) and thus we think manufacturers are overstating the difficulties. To address this problem and the large energy and economic savings that are possible with regional standards, we recommend that current law be amended to grant DOE authority to consider separate standards for the North and South for residential heating and cooling systems. This amendment should require DOE to consider the advantages and disadvantages of regional differentiation based on criteria in the underlying law and decide whether regionally differentiated standards make sense for a particular product. To limit the impact on manufacturers, we recommend that the amendment permit only two zones and require zones to follow state boundaries and be fully contiguous (except Alaska and Hawaii).

### *Efficiency Tax Incentives*

EPAct 2005 included a variety of very useful energy efficiency tax incentives including incentives for efficient commercial buildings, homes, appliances, heating and cooling equipment, and vehicles. However, pressure on conferees caused most of these incentives to be cut to only two years, which is too short a period to transform markets. S. 2748 extends most of these incentives for an additional three years and adds several new incentives that previously passed the Senate but were not included in the final EPAct 2005 conference agreement. In general we support the provisions of S. 2748, but recommend a few refinements as follows:

*Commercial buildings:* EPAct 2005 included an “interim” provision for lighting energy retrofits. We recommend that this provision be specifically included in any extension as this is the only provision that truly applies to existing commercial buildings. If cost becomes an issue, this lighting retrofit provision could expire earlier than the 2010 date for the other commercial building incentives.

*New homes:* EPAct 2005 includes incentives for new homes reducing energy use by 50% relative to a model energy code, and includes additional incentives for manufactured homes that either save 30% or that meet ENERGY STAR criteria. S. 2748 provides a 30% savings threshold for all new homes and continues the special ENERGY STAR provision for manufactured homes. We think the 30% credit for all homes will prove very expensive and recommend that it be dropped if cost becomes an issue. Also, for manufactured homes, the current ENERGY STAR specification is fairly weak and saves less than 30% in nearly all cases. We recommend that the manufactured home credit clearly call for 30% savings and not include an ENERGY STAR path unless the Secretary of the Treasury determines that meeting the ENERGY STAR specification will on average save 30% (this latter option will permit an updated ENERGY STAR spec to be included).

*Heating and cooling equipment:* We recommend that eligibility levels for a few products be modified in cases where very few products are on the market that qualify for the tax credits. Specifically, we recommend a 90% AFUE requirement for boilers and oil-fired furnaces, and that the heat pump credit specifically reference the highest Consortium for Energy Efficiency tier in place on Dec. 31, 2006. The credit for boilers and oil furnaces should also be increased to \$300 to provide more incentive to manufacturers and consumers to develop and buy these products.

*Existing homes:* From reports we have heard from program operators, the current incentives are not encouraging much new investment. We recommend that future extensions include a performance-based component that provides incentives of \$800-2,000 for reducing home energy use by 20-50%. Such a provision will offer a larger and more enticing incentive to consumers and will save a substantial amount of energy as contractors seek to reach and exceed the 20% savings threshold. A bill along these lines with broad support is now being crafted by Senators Snowe and Feinstein. Once ready, we recommend it be incorporated into future legislation.

*Appliances:* S. 2748 does not extend the tax credit for efficient appliances. We recommend that this credit also be extended, but that eligibility levels be increased so that only the most efficient products on the market are eligible for incentives.

*Vehicles:* Toyota has already hit the 60,000 vehicle cap set by EPAct 2005 for advanced vehicles. We support the provision in S. 2748 to lift this cap. However, if the costs of this provision prove too high, a compromise would be to set a vehicle cap per manufacturer per vehicle class (e.g., compact, intermediate, full size car, etc.) in order to encourage all manufacturers to sell full product lines of advanced vehicles.

*Combined heat and power plants:* This provision was passed by the Senate but dropped by conferees. Due to volatility of energy prices and onerous interconnection requirements and rates imposed by some utilities, the pace of CHP installations has slowed. These proposed tax incentives should help reverse this trend.

*Microturbines and advanced meters:* If funds are tight, we recommend that these provisions be dropped. Energy savings from both of these provisions are pretty small and not as cost-effective as the other efficiency incentive provisions.

### ENERGY SAVINGS

ACEEE has conducted a variety of analyses on savings from various energy efficiency provisions. Based on this work, we can approximate the savings from each of the four key priority areas discussed above. These estimates are preliminary and will be refined as the legislative process proceeds.

Oil savings target .....	7.4
Energy efficiency resource standard .....	5.6
Equipment efficiency standards .....	0.4
Tax incentive extensions and refinements .....	0.7
<b>Total .....</b>	<b>14.1</b>

These savings total more than 14 quads and represent about 12% of projected 2020 U.S. energy use. *These savings are more than seven times greater than the efficiency savings in EPAAct 2005.*

#### ADDITIONAL COMMENTS ON S. 2747

S. 2747 contains additional provisions not discussed above as key priorities. In general we believe these provisions are worthwhile, although many of them are likely to have modest impacts. Below we provide brief comments on a few of these provisions.

*Deployment of advanced vehicle technologies* (Section 208): This provision requires that manufacturers not decrease fuel economy below 2002 levels in order to be eligible for incentives. We support the intent of providing grants only to manufacturers who do not reduce fuel economy, but recommend that this provision be refined to not take effect for two years and then to require that to be eligible, manufacturers must exceed their 2002 fuel economy by 6%, with this eligibility floor increasing 3-4% each year thereafter. Grants should go to companies that achieve at least minimal fuel economy improvements, but the two-year delay gives manufacturers time to hit initial targets. Some of these improvements are already required under recent actions raising fuel economy standards for light trucks.

*Renewable portfolio standard* (Section 301): We support this provision. We have not dwelled upon it as ACEEE concentrates on energy efficiency and not renewable energy. However, as I noted earlier, a renewable portfolio standard and energy efficiency resource standard nicely complement each other.

*National media campaign* (Section 403): A national media campaign is one of the few things that can be done to reduce energy use in 2006 and 2007. Such a campaign was authorized by Section 135 of EPAAct 2005 but has not been funded. Section 403 of S. 2747 is a useful complement to the EPAAct provision and hopefully has a better chance of receiving funding.

#### CONCLUSION

Energy efficiency is an important cornerstone for America's energy policy. Energy efficiency has saved consumers and businesses' billions of dollars in the past two decades, but these efforts should be accelerated in order to:

- Save American consumers and businesses even more money;
- Change the energy supply and demand balance to put downward pressure on energy prices;
- Decrease America's addiction to oil, particularly oil imports;
- Strengthen our economy (since energy savings generate American jobs and capital investment); and
- Reduce the risks of global warming by moderating carbon dioxide emissions growth.

The Energy Policy Act of 2005 took modest steps in this direction, particularly the sections establishing new appliance and equipment efficiency standards and tax incentives for advanced energy-saving equipment, vehicles, and buildings. Overall, we estimate that EPAAct 2005 will reduce U.S. energy use by about 1.5% by 2020.

But much more can and should be done. We recommend that Congress include the following provisions in new legislation:

1. Oil savings targets and associated policies;
2. Energy efficiency resource standards (energy-saving targets for utilities);
3. New consensus equipment efficiency standards and enhancements to DOE's rulemaking authority;
4. Buy us time to implement a comprehensive long-term energy strategy, and
5. Extensions and refinements of efficiency tax incentives in EPAAct 2005.

These provisions will increase energy savings relative to EPAAct 2005 by more than a factor of seven, reducing U.S. energy use by about 12% in 2020. Failure to

take these steps now will make it more likely that Congress and the nation will continue to face energy "crises" for many years to come.

This concludes my testimony. Thank you for the opportunity to present these views.

Senator BINGAMAN. Thank you much. Let me just ask a question of each of you. Mr. Lashof, your testimony and your written statement also talk about the value of this renewable portfolio standard nationally. I think you heard some of the criticism that was stated by, I think, both Senator Alexander and Mr. Karsner about the whole idea of having a national standard rather than a State-by-State standard. I thought I would give you a chance to respond to that, if you would like to.

Mr. LASHOF. I'm very happy to. Thank you, Senator. I certainly believe that a national standard would be desirable. I believe that we have national interests in increasing our use of renewable energy, both to reduce the price of national gas and to reduce global warming pollution. And that requirement—a national standard makes sense for those grounds. I think, in the absence of a national standard, in fact, the States that do move forward to the extent that they impose higher costs on their customers, in part to relieve pressure, for example, of natural gas prices, are providing benefits to the entire Nation, and States that don't have standards are free riders because they benefit from the reduced natural gas prices that result from increased use of renewables but might not be contributing to paying any early incremental costs for achieving that. So I think that is one reason for a national standard.

I would also note two other things. One is, Congress seems to believe that national standards make sense in related areas. For example, the renewable fuel standard that was included in EPAct on the transportation fuel side is a national approach, again recognizing that there are national benefits. That, like the renewable portfolio standard, provides a trading program that gives you a great deal of flexibility for each State to make whatever contribution makes the most economic sense, whether it is by building those resources within their State or by getting them through the trading mechanism.

The last point I would make is that unlike some of the discussion we heard which seemed to suggest that wind was really the only option and that maybe the Southeast doesn't have renewable potential, there is enormous renewable energy potential in all parts of the country, using different resources. So while wind resources may be largest in the Midwest and the Great Plains and in the Dakotas, there are enormous biomass resources in the Southeast. And in the Department of Energy study of how a renewable portfolio standard would be achieved, it showed, in fact, that there were net benefits nationally. They actually found that biomass resources would be the largest contributor. So I believe that there are big opportunities in Tennessee and Florida and other States to contribute in that way to meeting a national standard. Thank you.

Senator BINGAMAN. Thank you very much.

Ms. Callahan, let me ask you about this feebate proposal. Most of the proposals that relate to vehicle fuel efficiency have been opposed by the automobile manufacturers. What is your understanding of their reaction to this proposal?

Ms. CALLAHAN. Well, Senator, we have been talking to some of the manufacturers and are continuing a dialog with them. As you might suspect, their attraction to the program or not depends on their vehicle stock and what they are producing. The ones that have the more fuel-efficient vehicles tend to be more in favor of this kind of proposal than those who produce less fuel-efficient vehicles, just as an early read on it.

One thing that I think makes this more attractive to the autos, and we are talking to them about, is that you could set this program up so that you had mid-points for every class of vehicle, all eleven different classes of vehicles. So you could offer consumers full choice and you would be comparing big, heavy SUVs to other big, heavy SUVs and setting your mid-point there. So I think there are ways that can have greater appeal to the auto manufacturers with this program than they perhaps realize at this point. And we are talking to them and would enjoy having support from you and your staff and you having some dialog with them as well.

To answer specifically, I think Honda is leaning toward this kind of a program as a solution. I think that they may be the most out-front in terms of being open, with being attracted to this, in lieu of, at some point, a CAFE program. Because if you put this in place and made it work right, it would, in effect, make CAFE moot over the course of time.

Senator BINGAMAN. OK. Thank you very much.

Mr. NADEL, let me ask you about some of these tax incentives that you have here. You list a whole series of them that need to be enacted or extended. I certainly favor that and, of course, we have the legislation that does that. Have you looked at costing these out and trying to determine what kind of revenue we are talking about, this costing the Federal treasury, and each specific tax provision?

Mr. NADEL. We had done a detailed analysis of many of these provisions when they were originally 5-year proposals. I don't have the exact numbers with me, but based on that, with some updates, it should be relatively easy to come up with some cost estimates and I would be happy to provide those for the record.

Senator BINGAMAN. That would be useful. If you have those, I think that would be helpful. Let me ask, on your energy efficiency resource standard, could you elaborate a little bit as to how you see that working as a national standard? I mean, what would it apply to and how would you administer it?

Mr. NADEL. OK. It would apply to electricity and natural gas sales that effectively cost from the utility into the transmission and distribution system, same as the RPS now applies. We would recommend that the Department of Energy develop some implementing regulations, such as exactly what would the criteria be to evaluate the energy savings so that we knew we had reasonable evaluations of how much had actually been saved. But we would recommend that, in general, States be allowed, and we would expect most of them to actually then work with their local utilities, within the framework of these general regulations, to help make sure that each of their utilities has met the standard, with DOE only filling in if a State didn't want to take that lead. But that is how we would see it working in broad outline.

Senator BINGAMAN. OK. Do you know of any reaction from the utility industry to this kind of proposal? I know we've had various people in the utility industry on both sides of the question of whether a renewable portfolio standard made sense. How about with regard to the energy efficiency standard?

Mr. NADEL. Right. We've been talking to a number of utilities about this. I think the Edison Electric Institute, who represents all the utilities, is a little skeptical of any mandate since they have been skeptical about the renewable portfolio standard, but a number of utilities have indicated interest. There is—we are working with one major utility now, and a Senator on this committee, to actually get a bill introduced shortly.

Senator BINGAMAN. OK.

Mr. NADEL. So we think there would be some utilities' support. Certainly not the whole industry, but some.

Senator BINGAMAN. OK. Well, thank you all very much for testifying. I think it has been a useful hearing and we've gotten a lot of issues out for discussion. We will try to follow up and move something forward legislatively. Thank you all for coming.

Ms. CALLAHAN. Thank you, Senator.

Mr. NADEL. Thank you.

[Whereupon, at 12:39 p.m., the hearing was adjourned.]

[The following statement was received for the record:]

#### STATEMENT OF THE AMERICAN INSTITUTE OF ARCHITECTS

The American Institute of Architects (AIA) welcomes the opportunity to provide written testimony to the Senate Committee on Energy and Natural Resources for its hearing on energy efficiency and S. 2747.

The AIA represents the professional interests of than 75,000 licensed architects and allied design professionals who every day express their commitment to excellence in design and livability in our nation's buildings and cities. The AIA strongly supports S. 2747, which we believe will enhance energy efficiency and lead to a substantial conservation of oil and natural gas. We commend Senator Bingaman for his leadership on this issue.

We believe that governmental policies, programs, and incentives should encourage energy conservation, especially as it relates to the built environment. We also support the aggressive development of renewable energy sources. As architects, our members have strongly enunciated their commitment to promoting energy efficiency and waste reduction in the built environment, encouraging energy-conscious design and technology, and supporting national programs for more efficient use of non-renewable resources and the development of renewable energy sources.

The AIA recognizes that a growing body of evidence demonstrates that current building planning, design, construction, and real estate practices contribute to patterns of resource consumption that seriously jeopardize the Nation's environment. Architects accept responsibility for their role in creating the built environment. Consequently, they believe that they must alter their profession's actions to encourage clients and the entire design and construction industry to work collaboratively to change the course of this country's energy future.

We believe that Congress should give a high priority to creating federal incentives that reduce the energy consumption footprint of the built environment. We believe that Senator Bingaman's bill is a great first step. But much more needs to be done.

First, the AIA believes that the General Services Administration (GSA) should be tasked with developing a baseline for the average energy consumption of each representative type of building (office building, hospital, barracks, post office, ranger station, etc.) operated by the federal government.

Within one year of developing a baseline, the GSA and all federal agencies that construct and renovate buildings should be directed to develop requirements that all federal buildings constructed or renovated after January 1, 2010, shall consume no more than one-half the energy consumption specified by GSA's energy consumption baseline. The regulations also should set a declining cap on energy consumption for



newly constructed buildings and major renovations such that they meet the following minimum delivered energy performance compared to the baseline:

2015 .....	60%
2020 .....	70%

(This is modeled after New Mexico Executive Order 2006-0001 signed by New Mexico Governor Bill Richardson on January 16, 2006.)

Second, the AIA proposes that the National Institute for Standards and Technology (NIST) develop a standard for measuring sustainability in buildings using transparent, consensus-based procedures consistent with the Technology Transfer Act of 1995 and OMB Advisory Circular 119. We recommend that the standard:

- a. Is developed and renewed on a regular basis through a consensus based process, in which all interested parties can participate;
- b. Requires clearly defined design documentation to demonstrate compliance;
- c. Requires compliance to be validated by an independent third party;
- d. Requires the development of sustainable sites avoiding the conversion of prime agricultural lands or wetlands, regenerating brownfield sites or those that result in regenerative benefits to the natural environment;
- e. Requires specific goals in the efficient use of water resources that promote application of new wastewater technologies;
- f. Requires specific goals for significant reductions in energy use, especially non-renewable energy sources, with enhanced performance assured through commissioning of building systems;
- g. Promotes the use of renewable energy sources;
- h. Requires reduced use of non-renewable natural resources through the reuse of existing structures and materials, reductions in construction waste, promotion of recycled content materials, and use of materials independently certified as from sustainable sources;
- i. Requires specific goals for improved indoor environmental quality through enhanced indoor air quality, thermal comfort, acoustics, daylighting, pollutant source control and use low emission materials and building system controls;
- j. Promotes the development and application of innovative designs and collaborative processes intended to improve environmental performance;
- k. Recognizes the life cycle value of a community or project in addition to construction first costs, including assessment of impact on climate change, acid rain, water pollution, resource depletion, and toxicity factors;
- l. Utilizes life cycle assessment data as the basis for design and construction decision making;
- m. Acknowledges national, regional and bio-climatic differences;
- n. Reduces (and eventually eliminates) on site and off site toxic elements in the built environment;
- o. Requires specific measurable reductions in CO<sub>2</sub> production in the built environment; and
- p. Requires documentation of actual building energy and operational performance.

Third, the AIA believes that the commercial building tax deduction authorized by Section 1331 of the Energy Policy Act of 2005 (that provides for a deduction of up to \$1.80 per square foot for commercial and public buildings placed in service in 2006 and 2007 that meet an energy reduction target equivalent to 50% of ASHRAE Standard 90.1-2001), though well-intentioned, is not sufficient to offset the costs of meeting as rigorous an energy reduction target as 50% of ASRAE 90.1-2001. We believe that the deduction amount should be increased to \$2.70 per square foot.

In addition, we believe that the deduction expires far too quickly to spur the design and construction of any new energy efficient buildings; buildings to be "placed in service" during 2006 and 2007 are already designed, and construction may have already started. Therefore, we believe that the deduction should be made permanent.

Finally, the AIA strongly believes that a new generation of sustainable buildings will require a workforce of architects and engineers sufficiently educated in the principles of sustainability. We believe that the National Science Foundation (NSF) should be authorized to establish a Sustainability Grants Program that will make federal monies available for:

- The development of a model curriculum in sustainable design for buildings that would be adopted and enlarged upon by schools of architecture and engineering;
- Scholarships to architectural and engineering students who commit to completing a course of study that includes all of the elements of sustainability in the built environment; and
- Competitive grants to faculty members at schools of architecture and engineering for research projects that fill critical knowledge gaps in the study of sustainability in architecture (e.g., life cycle analysis).

The American Institute of Architects commends Senator Bingaman and the members of the Senate Energy and Natural Resources Committee for recognizing the need for energy efficiency. The AIA fully supports the use of incentive-based programs that encourage energy efficiency throughout all sectors of the American economy. We look forward to working with the Committee and the Senate on initiatives that will lead to greater conservation and energy efficiency.

APPENDIX  
RESPONSES TO ADDITIONAL QUESTIONS

---

RESPONSES OF ALEXANDER KARSNER TO QUESTIONS FROM SENATOR BINGAMAN  
FEDERAL FLEET

*Question 1.* On page two of your testimony in regard to the language in Title II of S. 2747 regarding petroleum savings requirements for the Federal fleet you note that “we believe there are aspects of the technical language . . . that need further review and discussion.” Please provide the committee with the specific language you are referring to and the necessary technical corrections. The provision begins on page 8 and continues through page 11.

Answer. The Administration is currently reviewing this legislation. DOE might suggest establishing Fiscal Year 2005 as a baseline and extending the 20 percent petroleum consumption goal to Fiscal Year 2016 with a 2 percent reduction each year.

VEHICLE RETIREMENT PROGRAMS

*Question 2.* On page two of your testimony you note that you are not convinced of the effectiveness of vehicle retirement programs. I wonder if you might explain to us why that is? Do you have any internal policy analysis that you could share with us on this? I would ask that you provide an additional explanation for the record as to specifically why you find them not to be effective.

Answer. We have not conducted an internal policy analysis but there have been a number of studies analyzing the cost and life-cycle energy savings of vehicle retirement programs. Section 202(c) would benefit from the inclusion of a requirement that payments are only made with proof that a new efficient vehicle is being purchased. Otherwise payments could be made to owners of little used “extra” vehicles, which will not materially affect the consumption of petroleum.

OIL SAVINGS

*Question 3.* The Secretary has noted that “. . . the programs under the President’s Advanced Energy Initiative, if successful in achieving major breakthroughs in all vehicles and fuels initiatives, would alone displace the need to up to 5 million barrels per day of 2025.” Please provide a detailed explanation for the record of how the 5 million barrels is calculated and how it breaks down along the various programs and new technologies

Answer. The statement is based on the commercial uptake for these technologies and based on analysis of potential R&D breakthroughs which was similar to a National Academy of Science’s scenario looking at petroleum displacement potential from hybrids and fuel cell vehicles developed for an Academy report on hydrogen.

The FY 2007 budget request seeks a 65 percent increase in funding for biomass research with the goal of making cellulosic ethanol cost competitive by 2012. This aggressive target will be accomplished through the ability to convert a wider variety of regionally available biomass feedstocks and agricultural wastes and the validation of those technologies and their related economics. Through partnerships with the private sector, the Hydrogen Fuel Initiative and related FreedomCAR activities seek to make it practical and cost effective for large numbers of Americans to use clean, hydrogen fuel-cell vehicles by 2020. The Vehicle Technologies program places an emphasis on the development of lithium ion batteries and other technologies for plug-in hybrid technologies that offer the potential to make significant reductions in petroleum use.

In short, biofuels, greater efficiency through market penetration of hybrids and plug-in hybrids, and hydrogen fuel cell vehicles all would contribute to the oil displacement goal.

## ALTERNATIVE FUELING INFRASTRUCTURE

*Question 4.* Your testimony (page 2) states that Sec. 207 is not necessary because EPAct 2005 provides tax credits for E85 and other alternative fueling infrastructure. In the past, policies to encourage the use of alternative fuels have foundered due to the lack of refueling infrastructure or the lack of vehicles designed to use the alternative fuels, or both. We now have over 6 million flexible fuel vehicles that can run on alternative fuels and only about 600 fueling stations. Not all of the entities interested in developing alternative fueling infrastructure can take advantage of a tax credit. Why shouldn't the federal government support a revenue neutral grant program that would help expand the fueling infrastructure?

Answer. The scope of the tax credits provided for in EPACT 2005 is substantial incentive for businesses to spur new development of alternative fueling infrastructure. We believe the participation of private enterprise is essential for a sustainable infrastructure over the long term. Moreover, Section 207(4)(f) includes alternative fuels price controls that we feel would actually discourage investment in alternative fuels.

## EFFICIENCY PROGRAMS

*Question 5.* In your oral statement, you indicated that the Department would support several of the provisions in S. 2747. These included: Section 203—Assistance to States to reduce school bus idling; Section 204—Near term vehicle technology program; Section 401—Energy Savings Performance Contracts; Section 402—Deployment of new technologies for high efficiency consumer products; section 404—Energy efficiency resource programs. Please provide the Committee with any technical comments the Department may that would improve these sections. In addition, please indicate any other provisions in S. 2747 that the Department could support if technical changes were made to the language.

Answer. We do not have technical comments to offer at this time. The Department could support Section 201 with language stipulating a 2016 goal for each Federal agency reduce its covered petroleum consumption by 2 percent each year, to achieve at least a 20 percent reduction in petroleum consumption, as calculated from the baseline established by the Secretary for Fiscal Year 2005.

## RESPONSES OF ALEXANDER KARSNER TO QUESTIONS FROM SENATOR SMITH

## OIL SAVINGS

*Question 1a.* In his State of the Union address, the President announced a goal of reducing by our oil imports from the Middle East by 75% by 2025. The bill under discussion, S. 2747 calls for formulation of an action plan to achieve specific oil savings in the future. In your testimony, you stated that these targets might not have been achievable. Given the broadly recognized importance of reducing our dependence on oil, it is critical that we have a clear understanding of what is achievable. Specific question are:

What oil savings targets does DOE recommend as being both achievable and consistent with meeting the President's goal?

Answer. The Advanced Energy Initiative, proposed by President Bush in his recent State of the Union Address, proposes a 22 percent increase in clean-energy research at the Department of Energy (DOE) that will accelerate breakthroughs in developing and using alternative sources of energy—which will ultimately help diversify our energy mix. Funding will help develop clean, affordable sources of energy that will reduce the use of fossil fuels and lead to changes in the way we power our homes, businesses and cars. With respect to the President's goal of reducing oil imports, programs under the AEI, if successful in achieving major breakthroughs in all vehicles and fuels initiatives, would alone displace the need for up to 5 million barrels of oil per day by 2025.

*Question 1b.* What are the several key measures that DOE recommends as most important to achieving those targets?

Answer. Specific goals include developing advanced battery technologies that allow a plug-in hybrid-electric vehicle to have a 40-mile range operating solely on battery charge, reducing the cost of cellulosic ethanol to \$1.07/gallon by 2012, and making progress towards the President's goal of enabling large numbers of Americans to choose hydrogen fuel cell vehicles by 2020. The aggressive oil reduction target will be accomplished through the ability to convert a wider variety of regionally available biomass feedstocks and agricultural wastes and the validation of those technologies and their related economics and the development of lithium ion batteries and other technologies for plug-in hybrids technologies that offer the potential

to make significant reductions in petroleum use. If research is successful, hydrogen fuel cell vehicles could also contribute to reducing oil demand, though not till about 2020.

*Question 1c.* In particular, given the importance of vehicle efficiency, what oil savings contributions does DOE recommend from increases in efficiency, and how should those efficiency gains be implemented?

Answer. The FY 2007 Presidential budget request reallocated vehicle funding program resources to increase focus on plug-in hybrid electric vehicle (HEV) research. Our technological goals are ambitious, and progress to date is good. We have seen pre-competitive advances in the reduction in the cost of the next generation of batteries, as well as improvements in the cost and performance of other essential components of HEVs. Other indicators of progress include advances in the nickel metal hydride battery developed through DOE-sponsored R&D. Work is underway to develop the high energy batteries for plug-in HEVs.

*Question 1d.* A second key factor to oil usage in transportation is total vehicle miles traveled. What contribution toward oil savings does DOE recommend from this factor, and how should that be achieved?

Answer. The focus of the Advanced Energy Initiative is to change the way we power our homes, businesses, and vehicles by employing new technologies to improve the efficiency of our oil use and develop alternative fuels to displace oil rather than the promotion of policies to reduce the number of miles traveled.

#### FEDERAL FLEETS

*Question 2.* In your testimony, you indicate that the Administration is committed to federal leadership in advancing vehicle efficiency and alternative fuels in federal fleets, yet you have reservations about the specific federal fleet measures contained in S. 2747.

Please outline the key features of a federal fleet program that both would achieve the significant oil savings as envisioned in S. 2747 and would have high likelihood of success.

Answer. DOE believes that establishing Fiscal Year 2005 as a baseline and extending the 20 percent petroleum consumption goal to Fiscal Year 2016 with a 2 percent reduction each year would be a more effective target.

#### RENEWABLE PORTFOLIO STANDARDS

In your verbal testimony, you indicated that leaving RPS policies in the hands of the states allows states to adopt policies that are best suited to their renewable resource availabilities. However, this approach doesn't seem to recognize that wholesale electricity markets are regional in nature.

*Question 3a.* Under a federal RPS, wouldn't power suppliers in each state be likely to use the most cost-effective resources anyway?

Answer. The Administration opposes a national RPS because power generation options and renewable resources vary widely from state to state, because states hold different views of the types of resources that they would like to support, and because retail electricity sales are regulated largely at the state level. A national RPS could create "winners" and "losers" among regions of the country the winners being the regions with ample renewable resources, and the losers being the regions without. A national RPS could lead to higher energy bills and opposition to renewable energy moving into the mainstream of the Nation's energy supply mix.

*Question 3b.* Has there been any analysis of the economic differences between implementation of state-by-state versus national RPS policies?

Answer. The Department bases its opposition to a national RPS on past Federal interventions in the marketplace such as the Fuel Use Act of 1978 which effectively curtailed the use of natural gas for electricity generation. The EIA has analyzed RPS provisions in various studies including Impacts of a 10-Percent Renewable Portfolio Standards in 2002, and Analysis of a 10-Percent Renewable Portfolio Standard in 2003, outlining, in part, the costs to industry of implementing a national RPS.

*Question 3c.* What approach would renewable power systems developers prefer?

Answer. A third of the states representing 35 percent of the total electricity load for the U.S., have adopted RPS standards. These policies are beginning to drive the development of the renewable energy marketplace at a healthy rate. For example, the RPS policies in Texas, New York, Minnesota, California, Colorado, Pennsylvania, and New Mexico are expected to deliver significant new wind capacity additions in the coming years.

*Question 3d.* What about utilities and power suppliers?

Answer. We believe that regional stakeholders, including utilities and power suppliers, working with governors, state legislatures, and energy companies are in the best position to develop a portfolio standard that will suit their states' energy, environmental, and economic needs. If RPS standards are too aggressive, supply constraints and high costs may result, causing adverse effects in the promotion of market adoption of renewable technologies.

RESPONSES OF ALEXANDER KARSNER TO QUESTIONS FROM SENATOR WYDEN

*Question 1.* Near-term Vehicle Technology Program: could the goals of this section be accomplished by expanding DOE authorities under the Cooperative Research and Development Act? Government research alone in these areas won't bring cleaner, safer, more fuel-efficient cars and trucks to market.

Answer. No, the goals of Section 204 could not be accomplished by expanding DOE authorities under the Cooperative Research and Development Act (CRADA).

The CRADA is one of several research tools that DOE uses extensively to engage industry in our programs for specific purposes. Although it is an effective tool, expanding the CRADA authority is not a substitute and would not be sufficient for carrying out the total core research, development, and technology validation that the Department performs.

*Question 2.* Light-weight materials research and development: DOE, DOD and NASA are already funding R&D in super light-weight carbon materials and nanotechnologies. Is another government-wide research plan going to make a difference in the time it will take to bring new materials to market? What can be done to accelerate the production of lightweight materials? Would DOE support a production tax credit for light-weight materials manufacturing?

Answer. The DOE Automotive Light-weight Materials development effort differs from the DOD and NASA efforts in that they have very different cost, performance, and operational characteristics. The DOE program has already helped bring new aluminum, magnesium, and polymer composites processing technologies to market sooner. (There is very little nanomaterials research in the DOE Materials program.) The production of light-weight materials for cars and trucks might be accelerated by tax incentives for more fuel efficient vehicles (non technology-specific). Production tax credits specifically for light-weight materials manufacturing might be too technology specific and could distort rational engineering and design choices.

*Question 3.* Federal Renewable Portfolio Standards . . . your testimony notes that the Bush Administration opposes a Federal renewable portfolio standard (RPS) and instead prefers to rely on state RPS programs to encourage investment in renewable energy. Approximately 20 states have adopted RPS programs. These programs differ in how they treat various renewable energy technologies. In addition, some states only reward renewable energy generated in a particular state. The states that have acted also differ in means of enforcement. This hodgepodge of state RPS programs could very well stunt the development of renewable energy projects which rely on well-functioning regional markets that allow developers to trade renewable energy and credits across state lines pursuant to consistent rules. How can the Bush Administration rely solely a state-by-state approach to RPS programs when it supports the development of regional electricity markets?

Answer. We believe that regional stakeholders, including utilities and power suppliers, working with governors, state legislatures, and energy companies are in the best position to develop a portfolio standard that will suit their states' energy, environmental, and economic needs. If RPS standards are too aggressive, supply constraints and high costs may result, causing adverse effects in the promotion of market adoption of renewable technologies. A third of the states, representing 35 percent of the total electricity load for the U.S., have adopted RPS standards. These policies are beginning to drive the development of the renewable energy marketplace at a healthy rate. For example, the RPS policies in Texas, New York, Minnesota, California, Colorado, Pennsylvania, and New Mexico are expected to deliver significant new wind capacity additions in the coming years.

*Question 4.* In reply to a question on RPS from Senator Alexander you stated that a national RPS would drive up energy prices in the states without a RPS or renewable energy resources of their own. Yet according to Cliff Chen, who authored a recent study of state RPS with DOE Lawrence Berkeley National Lab energy researchers Ryan Wisner and Mark Bolinger, mandatory renewable energy programs now used in more than half the United States have little effect on the rates consumers pay for electricity or the national economy. Why then does DOE continue to oppose adoption of a national RPS?

Answer. The Administration opposes a national RPS because power generation options and renewable resources vary widely from state to state, because states hold

different views of the types of resources that they would like to support, and because retail electricity sales are regulated largely at the state level. A national RPS could create “winners” and “losers” among regions of the country, the winners being the regions with ample renewable resources, and the losers being the regions without. A national RPS could lead to higher energy bills and opposition to renewable energy moving into the mainstream of the Nation’s energy supply mix.

*Question 5.* Does DOE support the inclusion of wave/ocean power and incremental hydro in the definitions of renewable energy sources provided in S. 2747?

Answer. Yes, DOE supports wave/ocean power and incremental hydro technologies as renewable energy sources.

*Question 6.* Sec. 207 . . . Funding for Alt Fuels Infrastructure: have any of the panelists examined which is the quickest and most cost-effective way to build out the infrastructure needed to deliver ethanol to U.S. consumers?

Answer. No, a study of the quickest and most cost effective way to build out the ethanol infrastructure has not been undertaken. However, the Vehicle Technologies Program is currently developing a comprehensive ethanol strategy covering R&D and deployment.

#### RESPONSES OF ALEXANDER KARSNER TO QUESTIONS FROM SENATOR SALAZAR

*Question 1.* The Enhanced Energy Security Act (S. 2747) and S. 2025, the Vehicle and Fuel Choices for American Security Act of 2005, on which it is based, is strong bipartisan legislation that will help us accomplish the President’s goal of reducing our dependence on foreign oil.

Please provide me and the members of this Committee with the Department of Energy’s formal position on the oil savings targets set out in Title I of the bill.

Answer. The goals established in Title I of the Enhanced Energy Security Act might not be able to be met even with aggressive technology-forcing increases in CAFE standards that disregard highway safety. While the Advanced Energy Initiative is expected to help achieve these long-term goals, there remain uncertainties in technology development and commercial uptake that make it imprudent to legislate an arbitrary end-result. In addition, the President has asked Congress for authority to reform and increase passenger car CAFE standards but has indicated that highway safety, technology and economics need to be considered when determining the maximum feasible fuel economy standard. As before, an arbitrary savings goal should not be used to set the standard.

*Question 2.* During his State of the Union speech, the President of the United States announced a national goal to reduce 75% of our oil imports from the Middle East by 2025. Out of the 12 million barrels (mbd) the U.S. imports daily, only 2 mbd actually come from the Middle East. According to the Energy Information Administration, by 2025 the United States is projected to import close to 20mbd, of which 5mbd will come from the Persian Gulf. The President’s oil savings target is therefore 3.75mbd by 2025.

Is that goal achievable? Is it achievable using the tools contained in S. 2747 (or S. 2025) and without any increases in CAFE standards?

Answer. The Advanced Energy Initiative, proposed by President Bush in his recent State of the Union address, proposes a 22 percent increase in clean-energy research at the Department of Energy (DOE) that will accelerate breakthroughs in developing and using alternative sources of energy—which will ultimately help diversify our energy mix. With respect to the President’s goal of reducing oil imports, programs under the AEI, if successful in achieving major breakthroughs in all vehicles and fuels initiatives, would alone displace the need for up to 5 million barrels of oil per day by 2025.

*Question 3.* S. 2747 (and S. 2025 on which it is based) is aggressive in encouraging increased production of biofuels and investment in renewable fuels systems and infrastructure. In that respect, it would advance one of the goals of the President’s Advanced Energy Initiative. Do you agree?

Answer. The Department of Energy and the Administration have not had sufficient time to review or coordinate its interagency review of S. 2747 and therefore does not have a formal position on this legislation.

*Question 4.* S. 2747 sets goals for improving the efficiency of our vehicle fleet and for getting more advanced vehicles on the road. It sets these goals and then helps manufacturers retool their vehicle fleets to meet them.

What steps has the Department taken under your leadership to encourage American Automobile manufacturers to embrace these goals and to increase market penetration of advanced vehicle technologies?

Answer. The FreedomCAR partnership was established in 2002 to provide a mechanism for U.S. automobile manufacturers to work cooperatively with the Fed-

eral Government in pre-competitive research areas that show the promise of significantly reducing the use of petroleum. To this end the Department of Energy provides financial assistance and technical expertise to support research activities that cover a broad spectrum of technologies that will have significant impact in near term, mid term, and long term. Near term activities are focused on increasing the efficiency of internal combustion engines to reduce consumption and utilizing alternative fuels, such as ethanol, to directly displace petroleum use. Mid term activities are focused on developing advanced hybrid vehicle technologies, such as cost effective long range batteries for plug-in hybrids that can significantly reduce petroleum consumption. In the long term the partnership is pursuing a new paradigm in transportation: the complete replacement of petroleum use in automobiles through the use of hydrogen.

*Question 5.* Your prepared testimony expresses “concerns” with the federal fleet requirements in S. 2747 and questions “the effectiveness” of the vehicle retirement program “with respect to cost and life-cycle energy savings under economic analysis.” You also state with reference to Section 206 of the bill that new loan guarantees for the manufacture of fuel efficient vehicles “would be largely unnecessary.”

Please explain the Department’s “concerns” and share with me and the members of this Committee the economic analysis on which the Department bases its criticism of the bill. Please also explain why additional incentives for automobile manufacturers to develop new fuel efficient vehicles are unnecessary.

Answer. Section 202(c) would benefit from the inclusion of a requirement that payments are only made with proof that a new efficient vehicle is being purchased. Otherwise payments could be made to owners of little used “extra” vehicles, which will not materially affect the consumption of petroleum.

EPA 2005 already authorizes grants to support the production of fuel efficient vehicles. There is little reason to provide loan guarantees to automobile manufacturers that typically have access to capital. These loan guarantees would be difficult to administer compared to loan guarantees for discreet facilities such as renewable energy plants, nuclear power plants, or gasification plants.

#### RENEWABLE ENERGY STANDARD

*Question 6.* Wild swings in the price of natural gas are dramatically increasing costs of production for sectors of the economy ranging from farmers to the petrochemical industry. Studies by the Energy Information Administration indicate that increasing the use of renewable energy sources would result in reduced demand and lower prices for consumers and large industrial users.

Does the Administration support measures that would ensure an increase in the deployment of renewable energy sources, which would in turn reduce the price of natural gas?

Answer. Our main priorities are reducing America’s growing dependence on foreign oil and generating clean electricity. We have directed our resources to those programs with the greatest potential to contribute to those priorities. One of the goals is to reduce the cost of solar photovoltaic technologies so that they become cost-competitive by 2015, and expand access to wind energy through technology. The Administration is also supportive of EPA 2005 provisions which contained \$3.4 billion over ten years in tax incentives to encourage the production of electricity using renewable wind, solar, biomass, and geothermal energy sources, including the first-ever tax credit for residential solar energy systems. Diversification of our electric power sector will ensure the availability of affordable electricity and ample natural gas supplies.

*Question 7.* Several studies indicate that two of the principle barriers to increasing the use of renewables are a lack of long term markets and a lack of effective financing mechanisms.

I know you have a particular interest in private-public partnerships for new alternative energy technologies. Please describe for me and the members of this Committee the steps that the Department will take under your leadership to address these dual barriers.

Answer. The Office of Energy Efficiency and Renewable Energy continues to support the development of long-term energy markets that provides a diverse supply of reliable, affordable, and environmentally sound energy through investment, development, and public-private partnerships. EERE provides cost shared funding so these collaborative partnerships can research and develop transformational technologies which can then be commercialized by the private sector. Examples of formal partnerships include the FreedomCAR Partnership and the 21st Century Truck Partnership.



*Question 8.* As you point out in your prepared testimony, the Administration has opposed a federal renewable energy standard, arguing that “RPS standards are best left to the States.” At least 22 states and the District of Columbia now have in place some sort of requirement to increase the use of renewable energy. These programs differ in how they treat various renewable energy technologies. In addition, some states only reward renewable energy generated in a particular state. The states that have acted also differ in means of enforcement. This hodgepodge of state RPS programs could very well stunt the development of renewable energy projects which rely on well-functioning regional markets that allow developers to trade renewable energy and credits across state lines pursuant to consistent rules.

What is the rationale for the Administration’s stated preference for a state-by-state approach to renewable energy programs when it supports the development of regional electricity markets?

Answer. The Administration opposes a national RPS because power generation options and renewable resources vary widely from state to state, because states hold different views of the types of resources that they would like to support, and because retail electricity sales are regulated largely at the state level. A national RPS could create “winners” and “losers” among regions of the country, the winners being the regions with ample renewable resources, and the losers being the regions without. A national RPS could lead to higher energy bills and opposition to renewable energy moving into the mainstream of the Nation’s energy supply mix.

*Question 9.* Several trade organizations have charged that the lack of a single federal standard for connecting to the electric grid allows individual utilities to devise Byzantine procedures that hamper the ability of renewable energy companies to connect to the electrical grid.

Would the Administration support a national “net-metering” standard that would reduce these regulatory barriers?

Answer. The Administration supports the provisions in EPC Act Sections 1252-1254, which require states and non-regulated utilities to analyze demand response/advance metering, net metering, and interconnection issues but allows states to make their own determination on standards based on that assessment.

#### RENEWABLE ENERGY (PRODUCTION TAX CREDITS)

*Question 10.* Many in the renewable trade associations have charged that an “on-again-off-again” production tax credit is crippling our deployment of renewables, because reliable financial predictions are difficult to make with such short term tax credits. Businesses order renewable energy technologies, such as wind turbines, in time to qualify for tax credits, leading to significant backlogs and increased prices, but orders drop off again when it appears that the production tax credits may expire. As a result of these peaks and valleys in demand, the manufacturers of the equipment cannot expand their production capacity.

Will the Administration support a long term extension of the production tax credits and clean energy bonds for renewables, so that consumers and producers can make plans to buy or to produce renewable energy technology more than one year at a time?

Answer. The Administration has not developed a formal position on long-term extension of production tax credits.

#### NATIONAL RENEWABLE ENERGY LABORATORY (NREL)

*Question 11.* In 2005, drastic personnel reductions were threatened at the National Renewable Energy Laboratory in Colorado. Shortly before the President visited NREL, the Department of Energy announced that it was allocating an additional \$5 million to NREL to re-hire the researchers and staff. These budget shortfalls also required NREL to reduce or postpone research contracts with key technical partners outside of NREL and DOE. Unfortunately, sufficient funding was not available to restore the research contracts. Such budget uncertainties make it very difficult for NREL to attract and retain high quality staff members and research partners in today’s competitive environment.

What steps has the Department taken or will the Department take to ensure that NREL will have sufficient and reliable funding in FY07, so that the laboratory can continue to lead the nation’s efforts to develop renewable energy sources and to offer new advances in energy efficiency?

Answer. In his State of the Union address, the President announced new solar and biofuels initiatives designed to accelerate the contribution of these transformational technologies to the Nation’s energy portfolio. The President has requested commensurate funding increases for the Department’s Solar Technology and Biomass programs, through which these initiatives will be managed, as well as

funding increases in its Wind and Hydrogen, Fuel Cells & Infrastructure Technologies research and development programs. Together, the Solar, Biomass, Wind, and Hydrogen programs form the core of NREL's research and development capabilities, collectively accounting for 60 percent of all NREL funding. Depending on appropriations, NREL will likely receive increased funding in FY 2007 to support these initiatives. (The Department's Preliminary Lab Tables released with the FY 2007 Budget are estimates and may need revision.)

It is important to note each DOE program allocates funding to various national labs or to competitive solicitations for industry or university researchers in ways to best accomplish program goals. Increased funding for a program does not necessarily translate to increased funding for each national lab currently receiving funding from that program.

FEDERAL RENEWABLE ENERGY AND ENERGY EFFICIENCY PROGRAMS

*Question 12.* What is the total amount of money that the federal government will spend on renewable energy and energy efficiency research and development for FY06? What percentage is that of the U.S. GDP?

What are the corresponding amounts of money and the relative share of GDP for our major international economic competitors, including Brazil, Canada, China, Germany, Great Britain, India and Japan?

Answer. According to the 2006 edition of Energy Policies of IEA Countries (forthcoming), in 2005, the U.S. spent 366.09 million dollars on energy efficiency RD&D and 242.81 million dollars on renewable energy sources RD&D. This represented approximately 0.005% of U.S. GDP in 2005. These figures represent funding reported by the Energy Information Agency to the IEA, and likely exclude significant amounts of RD&D conducted at agencies other than DOE.

	Energy efficiency RD&D (\$ in millions)	Renewable energy sources RD&D (\$ in millions)	% of GDP in national currency
U.S. ....	366.09	242.71	0.005
Canada .....	46.67	33.79	0.007
Germany .....	24.33	123.51	0.005
UK .....	0.00	66.49	0.003
Japan .....	464.73	285.41	0.016

No RD&D information on Brazil, China and India is available as they are not TEA countries and do not report their data to that organization.

*Question 13.* Your prepared testimony highlights certain federal energy-efficiency programs, such as Energy Star and Building Codes Assistance, the Federal Energy Management Program, and the Weatherization Program. But the President's budget request for fiscal year 2007 proposes significant cuts to each of these vital programs designed to cut pollution and save energy.

Do you agree with me that, at a time of record high natural gas and oil prices, we must invest more, not less, in technologies and practices that promise the quickest, cleanest and cheapest means of addressing tight energy supplies and extraordinarily high prices?

Answer. In this year's Department of Energy FY 2007 budget request we realigned some priorities. The Advanced Energy Initiative, proposed by President Bush in his recent State of the Union Address, proposes a 22 percent increase in clean-energy research at the Department of Energy (DOE) that will accelerate breakthroughs in developing and using alternative sources of energy—which, will ultimately, help diversify our energy mix. With respect to the President's goal of reducing oil imports, programs under the AEI, if successful in achieving major breakthroughs in all vehicles and fuels initiatives, could alone displace the need for up to 5 million barrels of oil per day by 2025.

As part of the Advanced Energy Initiative, \$150 million has been requested for biomass; \$30 million to develop better battery technology for hybrid cars; and \$148 million for the Solar America Initiative; and \$44 million for wind energy research.

Within the Building Technologies program, there are funding increases for building integration, technology validation, and market introduction as well as support for equipment standards and analysis. The request continues strong support for the development of solid state lighting technologies that can significantly reduce lighting electricity consumption in commercial buildings. Funding for energy efficient vehicle technologies, exclusive of Congressionally directed activities (i.e. earmarks) and transfers, is level with the FY 2006 appropriation. The FY 2007 request places an

emphasis on the development of lithium ion batteries and other technologies for plug-in hybrids technologies that offer the potential to make significant reductions in petroleum use.

The Administration also is requesting over \$3 million for public energy education and outreach to continue our energy efficiency campaigns of the last few months. DOE will continue to build strategic partnerships with public and private groups to promote energy efficiency practices and technologies.

*Question 14.* Before you came on board, Energy Department officials said the energy bill was passed too late to have significant impact on the 2007 budget. In fact, none of the new programs authorized in the bill were funded.

As you prepare the FY08 budget, do you plan to fund the new program to assist states with building codes compliance, the pilot program for state policies to promote utility energy efficiency programs, the consumer education campaign, or other new energy efficiency programs in the bill? Will you continue to increase the funding for appliance standards to implement the new required rulemakings while working through the backlog of long-delayed standards?

Answer. It would be premature to discuss the Fiscal Year 2008 budget formulation process. However, the plan that the Department has submitted to Congress considers both the backlog and the new requirements detailed in EPACT 2005. The backlog in rulemakings was not a funding issue, but a management issue that the Department is committed to addressing. New management processes, including review and reporting requirements, have been instituted. Productivity improvements in the rulemaking program are taking effect and will significantly increase the rate at which new standards are issued.

In Fiscal Year 2007 the program will complete action on rulemakings started in Fiscal Year 2005 and prior years, and will continue work on the 13 product standards and test procedures initiated in Fiscal Year 2006.

---

RESPONSE OF DANIEL LASHOF TO QUESTION FROM SENATOR BINGAMAN

NEW HYDRAULIC HYBRID TRUCKS

*Question 1.* In this morning's Washington Post there is an article about new hydraulic hybrid trucks. It notes that these new UPS trucks that will be tested in Detroit have the potential to yield a 60-70 percent saving on fuel use. The trucks were built for EPA. Have you performed any analysis on the potential for such hybrid hydraulic systems? What barriers (if any) exist to the wider deployment of this technology?

Answer. Our analysis of oil savings from heavy duty trucks includes the hybridization of local trucks greater than 10,000 pounds gross vehicle weight. Fuel economy gains of 70 percent are technically feasible with hybridization through hydraulic or electric systems. Our analysis was not specific to hydraulic hybrids.

NRDC worked with the American Council for an Energy Efficient Economy (ACEEE) to evaluate the fuel savings from heavy duty vehicles. ACEEE compiled a list of barriers to improving heavy truck efficiency, including the greater adoption of hydraulic and other hybrid systems, in their January 2006 report "Reducing Oil Use through Efficiency: Opportunities beyond Cars and Light Trucks". The barriers to and policies for improved heavy truck efficiency from the report (pages 18-20) are excerpted below:

BARRIERS

- *Lack of fuel economy information:* The absence of a fuel economy testing and labeling requirement for heavy trucks creates a failure in the current market, in that truck buyers lack the information to choose the most efficient truck. In addition, the variety in tractor-trailer duty-cycles makes trucking companies reluctant to accept claims of efficiency improvements without extended testing of products on their own fleets.
- *High initial cost:* Efficiency technologies typically increase the purchase price of a truck. Many truck purchasers are unable to pay this price increment, even if the technologies have short payback times. For example, APUs can cost up to \$7,000, or about three years' worth of fuel savings. Three years is said to be the payback time required by truckers for efficiency technologies (Stodolsky et al. 2000), so some APUs would be marginal in this regard.<sup>1</sup>

<sup>1</sup>Less expensive idle reduction technologies with much shorter payback periods may be available in the near future (Neff 2005).

- *Driver preferences*: Trucking companies have for some years experienced a severe shortage of qualified drivers and are therefore eager to retain the drivers they have. In some cases, fuel efficiency improvements may conflict with driver preferences with regard to driving practices, aerodynamic treatments, and engine settings.
- *Industry structure*: Truck manufacturing is not a vertically integrated industry for the most part. This makes marketing of efficient components directly to the users more difficult, especially because component manufacturers do not have an avenue for demonstrating their efficiency benefits within complete trucks.
- *Resale market*: Limited value is assigned to efficiency in the used truck market.
- *Manufacturer risk*: The manufacturers' risks in investing in new technology, and the fact that competing manufacturers can often take advantage of the leader's technology, serve as a barrier, particularly in light of fuel price volatility.

## POLICIES

- *Fuel economy standards for tractor-trailers*: There are at present no fuel economy standards for vehicles over 8,500 lbs. in the United States (or elsewhere, for that matter). Tractor-trailers are relatively homogeneous, making this a good class of vehicles for fuel economy standards from the standpoint of feasibility. In particular, because the vast majority of tractor-trailer miles are driven on the highway, the problem of choosing an appropriate test cycle is much simplified.
- *Funding for idle reduction technologies*: Partial government subsidies for idle reduction technologies for a limited period of time would result in a decline in cost. The Energy Policy Act of 2005 authorizes \$95 million in spending on anti-idling; if appropriated, this would be sufficient to have a major impact. The funds should be applied to develop a range of technologies, however, and not limited to a single approach such as truck stop electrification that applies to a limited truck population.
- *Extended tax incentives for hybrids*: The Energy Policy Act of 2005 includes tax credits for heavy-duty (as well as light-duty) hybrids. The amount of credit depends on size, fuel economy benefit, and incremental cost (see Table A-2). The credits will offset some of the high purchase costs of these vehicles and bring down the incremental costs by raising production levels. At a fuel price of \$2.05 per gallon, the credits together with three years' fuel savings would more than offset incremental costs for Class 6-8 hybrids and would be almost sufficient for Classes 3-5 as well. The credits are only available through 2009, however, which is not sufficient time to allow for new product development. A five-year extension of the credits could greatly enhance the success of the program.
- *Hybrid R&D funding*: Funding for hybrid research and development is also a determinant of the rate at which hybrids enter the market. DOE should renew its commitment to the ambitious fuel economy targets laid out in its "Technology Roadmap for the 21st Century Truck Program" (DOE 2000) and maintain funding levels for development of hybrids and other technologies needed to achieve those targets.
- *Fuel economy standards for Class 2b trucks*: Fuel economy standards, feebates, and incentives to promote hybridization all warrant consideration for Class 2b. This class includes a wide range of vehicle types, but 80% are pickups (Davis and Truett 2002), which together with vans, panel trucks, and sport utility vehicles make up over 96% of the total. These vehicles have under-8500-lb. counterparts and bringing them under CAFE or a feebate scheme would pose no serious technical obstacles.

## RESPONSES OF DANIEL LASHOF TO QUESTIONS FROM SENATOR SMITH

## OIL SAVINGS

*Question 1.* In your testimony, you include an "oil savings toolbox" that lists oil savings that can be achieved by several individual actions.

Do the listed savings represent the results of an integrated analysis? In other words, can these savings be added, or are the savings from some factors likely to overlap with savings from others?

Answer. The savings are the result of an integrated analysis. For example, the oil savings from fuel efficient motor oil used in on-road vehicles are calculated assuming that the savings from fuel-efficient tires are already achieved. This methodology eliminates the 'double-counting' of fuel savings and allows the measures represented in the toolbox to be added as shown.

*Question 2.* Does the analysis include the effects of “take back,” which represents an inclination of drivers to increase vehicle miles traveled if vehicle efficiency is increased?

Answer. The oil savings analysis does consider the effects of “take back”, also known as the “rebound effect.” When considering improvements in light-duty vehicle efficiency, it is assumed that there is rebound effect of 10%, meaning a 10% increase in fuel economy results in a 1% increase in vehicle miles traveled. This is a conservative assumption considering recent analysis by economists Kenneth Small and Kurt Van Dender demonstrating that the rebound effect ranges between 2.6 percent and 12.1 percent<sup>2</sup> and the average long-range value is 6.8 percent.<sup>3</sup>

#### RESPONSES OF DANIEL LASHOF TO QUESTIONS FROM SENATOR WYDEN

*Question 1.* Sec. 207 . . . Funding for Alt Fuels Infrastructure: have any of the panelists examined which is the quickest and most cost-effective way to build out the infrastructure needed to deliver ethanol to U.S. consumers?

Answer. A sustained and balanced set of policies that includes infrastructure requirements, tax incentives and federal funding are necessary to scale up the biofuels market and the availability of ethanol at the pump. Enacting these measures would also assure investors that there will be a growing long term market for sustainably made biofuels and attract the venture capital needed to quickly commercialize new cellulosic biofuels technologies.

The quickest and most effective way to deliver biofuels to consumers over the next ten years would be to establish standards and incentives to increase the availability of E85 (85 percent ethanol and 15 percent gasoline) and flexible fuel vehicles. NRDC recommends the following measures:

- (1) Require a growing percentage of all new light-duty vehicles to be flexible-fuel capable. At least fifty percent of all new vehicles should be flexible-fuel by model year 2012. Getting flexible fuel vehicles into the hands of consumers will help grow the market for biofuels and expedite consumer acceptance and demand for E85 fuel.
- (2) Eliminate CAFE (Corporate Average Fuel Economy) credits for flexible fuel vehicles to ensure that use of flexible fuel vehicles actually results in fuel savings.
- (3) Require a growing percentage of retail gas stations to install E85 pumps, starting with areas that have a significant percentage of registered flexible fuel vehicles and local ethanol production.

To ensure that biofuels are produced from diverse sources and perform better than gasoline, the following policies should be adopted along with the above infrastructure requirements.

- (1) Ramp up the cellulosic ethanol production required by the Renewable Fuel Standard (RFS) from 250 million gallons in 2013 to 1 billion gallons by 2016, and set interim production requirements for 2009 through 2012.
- (2) Require a growing percentage of ethanol be sold as E85 fuel over the next decade, reaching at least 40 percent of ethanol production by 2015.
- (3) Establish lifecycle greenhouse gas performance standards for renewable fuels that ensure growing emission reductions compared with conventional gasoline.

#### RESPONSES OF KATERI CALLAHAN TO QUESTIONS FROM SENATOR BINGAMAN

##### FEEBATES

*Question 1.* Please provide for the record a more detailed explanation of how the concept of feebates work and how a potential program could be implemented here in the United States.

Answer. The basic concept of a feebate program is to provide an incentive for efficient vehicles that is paid for by a fee on inefficient vehicles. It will work best if the incentives and fees are large enough to affect manufacturer and consumer choices, and if they are applied broadly enough to shift the full automotive market. But there are many ways a feebate could be implemented, with options on who ad-

<sup>2</sup>Small, Kenneth and Kurt Van Dender, “The Effect of Improved Fuel Economy on Vehicle Miles Traveled: Estimating the Rebound Effect Using U.S. State Data, 1966-2001,” University of California Energy Institute, Berkeley, California, September 2005

<sup>3</sup>Van Dender, Kurt, “Recent Estimates of the Rebound Effect and Their Relevance to Proposed CAFE Reforms for Light Trucks”, a presentation provided to at a workshop sponsored by Resources for the Future, October 20, 2005.

ministers it, on what vehicles are included, and on the amount of the fees and rebates applied.

Who administers to whom: The fees and rebates could be applied to the manufacturers, retailers, or purchasers of new vehicles. Administration of the program would be easiest if it is applied to manufacturers since there are so few. Additionally, feebate analysts conclude that the greatest efficiency gains will come from manufacturers as they improve the technology in their vehicles, rather than from consumer purchasing decisions. The amount of the fee or rebate could be reported on the vehicle fuel economy label to increase consumer awareness and help drive appropriate purchasing decisions.

The feebate system could be administered by the Department of Energy or another agency. (The National Highway Traffic Safety Administration at the Department of Transportation already administers CAFE fines to vehicle manufacturers.) Finally, the fees and rebates could be applied as a refundable excise tax by the Internal Revenue Service, similar to the current gas guzzler tax.

What vehicles are covered, in what categories: In order to maximize the impact and prevent gaming, the fees and rebates should be applied to all light duty vehicles (cars, SUVs, minivans, and pickup trucks). And, it should include vehicles currently heavier than CAFE limits, up to at least 10,000 pounds.

The simplest approach would be to put all vehicles in one category. However, as smaller vehicles would generally receive rebates, and larger vehicles be assessed fees, manufacturers of larger vehicles would inherently be at a disadvantage under such a system.

If Congress wishes to encourage fuel-efficient technologies, without influencing the kind of vehicles people buy, the vehicles could be divided into several categories, with fees balanced against rebates for vehicles in each category. For example, vehicles could be divided based on vehicle footprint (length multiplied by width) as in the new light truck CAFE standards. The categories should be broad enough to ensure competition in each category and to discourage manipulating vehicles to shift between categories. Because most of the impact of feebates is likely to be on manufacturer technology, not customer choice, well-designed categories should only slightly reduce the savings from a feebate. Multiple categories will, however, lead to some vehicles receiving a rebate even though they have worse fuel economy than other vehicles that must pay a fee (i.e., an "efficient" SUV could receive a rebate in that category while an "inefficient" compact car would be assessed a fee). With multiple categories, manufacturers and consumers are not penalized or rewarded because of the kind of vehicles they make or buy. The Alliance to Save Energy recommends this approach to application of fees and rebates on vehicles.

How much is the rebate or fee: If the purpose is to maximize oil savings, the fees and rebates should be proportional to the gallons of gasoline that the vehicle can be expected to use over its lifetime, or to gallons per mile ("gpm"—the inverse of mpg) assuming the number of miles is fixed. This is the same metric that is averaged in calculating fleet fuel economies for CAFE.

A range of amounts have been proposed, from 25 cents per gallon to \$3.00 per gallon, or less than \$500 per .01 gpm to more than \$2000 per .01 gpm. The amount can be set to incorporate fuel usage externality costs in vehicle choices, or to incorporate the actual cost of gasoline that consumers may not think about when buying a vehicle. Costs will be minimized if the feebate is phased in over a period of years in order to allow manufacturers time to respond with new technologies. Greene and coauthors estimated a \$1000 per .01 gpm feebate would increase average fuel economy to 32 mpg (compared to about 24 mpg today—using the inaccurate mpg values employed in the CAFE program).

The fee or rebate for each vehicle is set based on the gpm compared to a midpoint gpm. The midpoint gpm (or mpg) that divides between fees and rebates in a vehicle category can be set so that the total value of the fees is roughly the same as the total value of the rebates, so the program is revenue-neutral. The midpoint mpg should be reset periodically to maintain revenue neutrality. Assuming that average fuel economy improves due to the incentives from this program, the dividing line will be "ratcheted up" (e.g., the mpg value for the midpoint will increase) in response to changing markets. Unlike a static standard, a feebate creates an incentive for continual improvement.

*Question 2.* If a feebate system were implemented what would its relationship with the CAFE system potentially be?

Answer. A well-designed feebate system should increase overall fuel economy significantly. If CAFE standards remained nearly static, as they have for the past couple decades, they would effectively become irrelevant, as the average fuel economy for each manufacturer fleet exceeded the standards because of the feebate impacts (certain luxury car manufacturers might be an exception, but as they routinely vio-

late CAFE standards today, it is not clear that CAFE is having much impact on them anyway other than requiring them to pay fines for their violations).

Congress might choose to retain the CAFE system as a backstop, in case the feebate is poorly designed or fuel economy decreases despite the pressure of the feebate. If Congress or the administration does choose to raise CAFE standards significantly, a feebate could serve as an incentive to exceed those standards, and could help move the market to make it easier to meet the increased standards.

If both CAFE standards and a feebate system are in place, automakers may find it easier to respond if the policy details, such as the categories of vehicles, are coordinated.

*Question 3.* Section 208, “Deployment of new technologies to reduce oil use in transportation “direct the Secretary of Energy to provide deployment incentives for a variety of projects to reduce oil used in transportation. One measure allowed is a “reverse auction.” Are you familiar with this concept and its benefits?

Answer. A reverse auction is an auction with one buyer and many sellers, rather than a “conventional” auction with many buyers and one seller. In a reverse auction, one seller seeks the highest price from bids by multiple buyers. Sec. 108 proposes a reverse auction for incentives for cellulosic ethanol; this issue is outside the scope and mission of the Alliance to Save Energy.

#### RESPONSE OF KATERI CALLAHAN TO QUESTION FROM SENATOR SMITH

*Question 1.* Your testimony supports the adoption of feebates as a means of increasing vehicle efficiencies. However, at least initially such a program would tend to favor foreign auto companies over domestic companies because of the types of vehicles comprising their current product lines. Please comment on the possibility of establishing a feebate program that works on a company-by-company basis, without moving funds from one manufacturer to another. Could this increase overall fleet efficiency just as effectively, without penalizing the U.S. auto industry?

Answer. A feebate rewards automakers, or their customers, whose vehicles use less gasoline. These companies are not necessarily headquartered in other countries. In fact General Motors frequently points out that it makes more models that get at least 30 mpg than any other manufacturer.

David Greene at Oak Ridge National Laboratories and others modeled the impact of a feebate on manufacturers based on their product mixes of a few years ago. They found that a feebate with all cars and light trucks mixed in a single category will likely yield net savings for some “foreign” manufacturers and a net cost to “domestic” manufacturers. However, if vehicles are divided into categories, with fees and rebates balanced within each category, then the distributional impacts are different. Some “domestic” manufacturers—those with relatively fuel-efficient options in a given category—are likely to benefit from such a feebate.

A feebate, as usually envisioned, does not directly transfer money between manufacturers; the transfer is between the government and individual manufacturers or customers. A system that had no net financial impact on any manufacturer or customer would be meaningless, with no impact at all. However, a feebate could in principle be based on each manufacturer’s current fleet, with incentives for improvement and penalties for backsliding. Such a system should have a similar impact in improving overall fuel economy, though some might consider it manifestly unfair.

#### RESPONSE OF KATERI CALLAHAN TO QUESTION FROM SENATOR WYDEN

*Question 1.* Sec. 207 . . . Funding for Alt Fuels Infrastructure: have any of the panelists examined which is the quickest and most cost-effective way to build out the infrastructure needed to deliver ethanol to U.S. consumers?

Answer. The mission of the Alliance to Save Energy is limited to reducing energy use. As we do not address such supply-side questions, I would only comment that production of ethanol, as of all fuels, is limited, and expansion of ethanol will only partially compensate for growing fuel use unless paired with greater efficiency.

[Responses to the following questions were not received at the time the hearing went to press:]

U.S. SENATE,  
COMMITTEE ON ENERGY AND NATURAL RESOURCES,  
*Washington, DC, June 26, 2006.*

Mr. STEVEN NADEL,  
*Executive Director, American Council for an Energy-Efficient Economy, Washington, DC.*

DEAR MR. NADEL: I would like to take this opportunity to thank you for appearing before the Senate Committee on Energy and Natural Resources on Thursday, June 22, 2006 to give testimony regarding S. 2747, to enhance energy efficiency and conserve oil and natural gas, and for other purposes.

Enclosed herewith please find a list of questions which have been submitted for the record. If possible, I would like to have your response to these questions by Monday, July 10, 2006.

Thank you in advance for your prompt consideration.

Sincerely,

PETE V. DOMENICI,  
*Chairman.*

[Enclosure.]

QUESTION FROM SENATOR BINGAMAN

NEW HYDRAULIC HYBRID TRUCKS

*Question 1.* In this morning's Washington Post there is an article about new hydraulic hybrid trucks. It notes that these new UPS trucks that will be tested in Detroit have the potential to yield a 60-70 percent saving on fuel use. The trucks were built for EPA. Have you performed any analysis on the potential for such hybrid hydraulic systems? What barriers (if any) exist to the wider deployment of this technology?

QUESTION FROM SENATOR WYDEN

*Question 1.* Sec. 207 . . . Funding for Alt Fuels Infrastructure: have any of the panelists examined which is the quickest and most cost-effective way to build out the infrastructure needed to deliver ethanol to U.S. consumers?