

**ENERGY SECURITY AND OIL DEPENDENCE—REC-
COMMENDATIONS ON POLICIES AND FUNDING
TO REDUCE U.S. OIL DEPENDENCE**

HEARING

BEFORE A

SUBCOMMITTEE OF THE
COMMITTEE ON APPROPRIATIONS
UNITED STATES SENATE
ONE HUNDRED TENTH CONGRESS

FIRST SESSION

SPECIAL HEARING

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TUESDAY, MAY 8, 2007

U.S. SENATE,
SUBCOMMITTEE ON ENERGY AND WATER DEVELOPMENT,
COMMITTEE ON APPROPRIATIONS,
Washington, DC.

The subcommittee met at 2:30 p.m., in room SD-192, Dirksen Senate Office Building, Hon. Byron L. Dorgan (chairman) presiding.

Present: Senators Dorgan, Domenici, Cochran, and Craig.

OPENING STATEMENT OF SENATOR BYRON L. DORGAN

Senator DORGAN. We'll call the subcommittee to order today. This is the Senate Appropriations subcommittee hearing on energy and water development. I want to say good afternoon to all of you.

We're here to take testimony and better understand the key steps and funding mechanisms that are necessary for reducing U.S. oil dependence and for future U.S. energy security.

We'll also discuss the results of an analysis conducted to assess the economic impact of implementing the recommendations to the Nation on reducing U.S. oil dependence, a report that has been put together by the Energy Security Leadership Council. That's a group of distinguished business and military leaders who, like me, view U.S. oil dependence as detrimental to our long-term security interests as well as our economic health.

I think it's safe to say that the goal for all of us is to improve the national economic and energy security of the United States. I'm a little tired, especially today, when I put gasoline in my vehicle, of thinking about how that price may or may not be computed.

The oil cartel, the OPEC ministers, will sit around a table, presumably in a closed room, and make their production decisions. Then the major oil companies, always with two names now because of the mergers, larger and stronger with more muscle in the marketplace, exert that strength in the marketplace. I think of the spot market which has become an orgy of speculation rather than simply a market of liquidity.

The majority of the oil that is sold and traded around the world is done so through corporations that are owned by nation states. So, whenever I hear people talk about the free market in oil, I have to suppress a grin because, of course, there is no free market in oil.

There are a lot of influences that decide the price, most of which we don't know very much about, but it certainly is not what is called a classical free market.

We are, this country, the top oil consumer in the world. I have a chart that shows oil consumption. Most of us know that we suck about 84 million barrels of oil a day out of this planet of ours. We stick little straws in the Earth and suck oil out, about 84 million barrels a day and we in the United States use fully one-fourth of it every single day. We are prodigious consumers of oil.

Much of our oil comes from where it is most vulnerable in the world. Some very vulnerable regions of the country have a substantial amount of the resources. We are about 60 plus percent dependent on foreign sources of oil. That clearly, it seems to me, is not in our best interest.

About 70 percent—just shy of 70 percent of the oil that comes into this country is used for transportation. We are unbelievably dependent, and growing in that dependence, on oil that comes from very troubled parts of the world. A substantial part, of which, after we import it, is used for transportation.

And so God forbid there should be some terrorist attack some day that would shut off the pipeline of oil coming into this country. We would not only see dramatic increases in the price of that which we could import, but we would also see substantial disruption and substantial problems, and I think our economy would suffer a very serious long-term problem.

Let me say that I also, coming from a State like North Dakota, have a pretty acute awareness of the energy issue, particularly with respect to oil. We drive exactly twice as much per person in North Dakota as New Yorkers do. That's just because we're a big, old State.

It's not unusual for somebody to jump in a pickup truck and drive 200 miles, one way, to get some parts for the combine and drive 200 miles back and then go to work after that. We drive twice as much, per person, as a New Yorker does. That means, whether it's the price of oil or the tax imposed on a barrel of oil, it has twice the impact on a consumer in North Dakota. So, we're well aware of all of these issues and the issue of security, and the issue of availability of oil at a reasonable price—gasoline at a reasonable price.

It seems to me that there are no silver bullets to address these issues, but there are plenty of good ideas that we need to embrace. We need to find ways to conserve. We need to find ways to produce more, domestically. And we need to encourage, especially, our home grown biofuels industry in this economy. With input from the Energy Security Leadership Council, Senator Craig and I have introduced something called, the SAFE Energy Act of 2007 that has four cornerstone principles, to reduce oil dependency.

These include, first, increasing auto efficiency through a class based approach. I might say that as a member of the Commerce Committee this morning we actually marked up a bill and passed it out of the Commerce Committee, which is a striking thing for our subcommittee to have done today. That includes a portion of what we have included in the SAFE Energy Act. So, we're moving on that front.

Second, expanded production and the use of biofuels like ethanol and biodiesel. We included that in our bill, but it's also the case that Senator Bingaman and Senator Domenici's leadership in the Energy Committee has been invaluable. As members of that committee, Senator Craig and I played a role in that, and we're moving on that front as well.

We are working on producing more of our own oil and gas resources by allowing access to domestic reserves, particularly in the eastern Gulf of Mexico, while at the same time strengthening our environmental protections. And managing energy risks by enhancing diplomatic alliances and partnerships, including establishing a Bureau of International Energy Policy with the National Security Council, is something that we are concerned with. We have been making progress, working hard on these issues, and we look forward to hearing from our witnesses today on a number of them.

This particular subcommittee, of course, has an integral interest, especially in the renewable fuels portion, in this issue. That is something that we've asked Secretary Karsner to discuss here today and we appreciate his presence. The area of the Energy Department in which he toils and works is the area concerned with issues of renewable fuels and biofuels.

Let me wait on a description of the rest of our witnesses for a moment while I ask the ranking member to provide a statement and then I'll call on Senator Craig. Senator Domenici.

OPENING STATEMENT OF SENATOR PETE V. DOMENICI

Senator DOMENICI. Thank you very much, Mr. Chairman.

I know you—Senator Craig and you have put together a proposal or a bill and obviously, Senator Craig, you would like to speak to it to the extent that it might not have been completely talked about by the chairman.

But I would like to have a few words before I yield to you on the subject because—it is quite obvious to me that the three committees in the United States Senate that had something to do with the subject matter are busy at work. If we can just find a way, not to get into each other's way, but rather to produce something.

We have the Energy and Natural Resources Committee, which is an authorizing committee. Senator Bingaman heads that. We are busy doing two of the things you spoke of today that are very important for the future of our country in terms of gasoline, gasoline prices, and the ability to have fuel for cars and to have new kinds of cars on our roads. We're busy at trying to do that.

And so, what you've got here in this subcommittee, an Appropriations subcommittee, which I chaired last year. And I'm very pleased to be a member now and have you chairman of it.

You have produced another approach which concentrates very heavily, as I see it, on production, which is interesting. This Subcommittee is trying to produce more fuel. Others around the Senate are trying to hold back and produce less fuel, but your bill is a fuel producing bill. And that makes me look with a little bit more optimism about the future because we need to be able to get together and get something very important done.

Obviously, the witnesses that we have before us—already know what we have done. But I want to repeat, just for a moment, that—

last year we produced a break through on offshore, natural gas and crude oil. For the first time in 25 years we've broken through, on the off shore of Florida, with a very meaningful bill.

While the United States Government agency, which handles the same, was busy trying to get theirs done, under your leadership, Madam Director—we have a very important offshore drilling proposal started. This bill moves ahead more dramatically in that area. I question whether all of it could be developed, but clearly, the members of the subcommittee are taking a strong position that we've got to produce off shore resources.

And I commend you for putting that together. I join you in that regard and hope that we will be able to work together.

My closing remarks that are directed at Director Johnnie Burton. Just yesterday you announced retirement at the Minerals Management Service (MMS). Johnnie has served in that position for the last 5 years, done an outstanding job in managing the MMS. I commend you for it. I'm very sorry that you're leaving.

I asked you a moment ago, where are you going? In agreement with your terrific performance, you would be going perhaps even as far as New York to advise people back there, but you said, in your modest way, "No, no, I'm going back to Wyoming." In any event, you will be helping somebody, I'm sure, on the subject matter you are so good at.

With that—I want to make one last remark. Clearly the United States, this year, must get on with the proposition that is before this subcommittee and the one that is before Senators Bingaman and Domenici on the other committee. We just, must, do something about reducing gasoline use, where the gasoline is coming from overseas. No doubt about it, that's got to be done.

Secondly, we must produce, wherever we can produce—in the correct way. That means much of the offshore that is not being used, that can be used, must be used. That's our natural gas and our oil and we must use it.

We have leaders. Private sector leaders like you, Mr. Smith, who have many, many trucks, you need to help us with practical advice—that I hope you're going to give us today. As to how we go about changing the use and changing the kind of vehicle engines that we use over the next decade. We must do that or all would seem to be lost, in my opinion.

Thank you, Mr. Chairman. I yield.

[The statement follows:]

PREPARED STATEMENT OF SENATOR PETE V. DOMENICI

Thank you, Senator Dorgan. On Sunday, the national average price of retail gasoline rose for the 14th consecutive day, staying above \$3.00 per gallon. Mr. Chairman, average prices around the country have risen 91 of the last 98 days.

I am certain that there is no magic bullet or immediate panacea to remedy this global problem of supply and demand economics. But this much I know—in order to strengthen our energy and economic security we must do more to reduce our dependence on foreign oil.

That requires a common sense, balanced approach. It means that policies of drill-only or conserve-only are not enough. Instead, we must support policies that advance conservation and efficiency at home, additional domestic production in an environmentally sound manner, and diversification of the kind of fuels that power our lives. This complete approach to energy policy stressing efficiency, conservation, production, and diversification is something I have been promoting for many years.

When I was chairman of the Energy Committee in 2005, we passed the most wide-ranging comprehensive energy policy in decades. This bill includes long-term innovative policies on efficiency, renewable energy, nuclear energy, electricity. It also established the first-ever renewable fuel standard which brought renewable biofuels into our mix to displace foreign oil and created literally thousands of jobs and millions of dollars in a revitalized rural economy in America.

Last year, we passed the Gulf of Mexico Energy Security Act which opens up the 181 Area and 181-South Area in the Gulf of Mexico. In total, these 8.3 million acres are estimated to contain 1.26 billion barrels of crude oil and 5.83 trillion cubic feet of natural gas—enough natural gas to heat and cool 6 million homes for about 15 years. This will provide much needed natural gas relief for our industrial and home consumers, and will bolster our energy security by increasing our domestic oil and gas production.

Finally, this year, we have passed a biofuels and energy efficiency bill out of the Energy and Natural Resources Committee by a strong, bipartisan vote of 20–3. We have more work to be done, but I hope we can keep doing it in a balanced and measured way.

I applaud Senator Dorgan and Senator Craig for their hard work in the area of energy policy. On the Energy and Natural Resources Committee they have been thoughtful legislators who know and appreciate the value of a balanced energy approach. This understanding led them to embrace the findings of the Energy Security Leadership Council. I hope by the end of today's testimony that we make believers of everyone at this hearing. I thank the witnesses for taking the time to be with us today, and look forward to their testimony on this important topic.

Mr. Chairman, I would like to take a moment and recognize the service of Director Johnnie Burton. Just yesterday, Director Burton announced her retirement from the MMS. Johnnie has served in that position for the past 5 years and done an outstanding job in managing the MMS.

Johnnie, I have enjoyed working with you during the passage of the Energy Policy Act and the Gulf of Mexico Security Act and I wish you all the best.

Senator DORGAN. Senator Domenici, thank you very much. Senator Craig.

STATEMENT OF SENATOR LARRY CRAIG

Senator CRAIG. Well, Mr. Chairman, thank you for holding the hearing today and focusing on—clearly, an extremely important issue to this country.

Last night I intentionally drove out into Virginia, while I live here in the District. The reason I did was because I could buy gas for 5 cents a gallon cheaper, than I can buy it here on Capitol Hill. Even with that, I paid \$3.05 a gallon. That's the bad news.

Along with that bad news though, is some good news. That is that because of the \$3.05 gas we're having this hearing today. And you all are in front of us and the room is full, and the television cameras are on. And the reporters are present. Laptops ablaze because Americans are growing increasingly concerned that we are phenomenally dependent on unstable foreign sources of oil.

In Nigeria today, three pipelines blew up. Six Chevron employees held hostage. It is a very unfriendly world out there. And that unfriendly world in the name of Petro-Nationalism has learned how to jerk the tail of the giant, us. And that's a tragedy for us, potentially, if we don't do something about it.

And I must tell you, Mr. Chairman, that's what brought you and me together in a—what I think, is likely coalition, not an unlikely coalition at all because while I'm suggesting that North Dakota was never to be inhabited by European Americans like Idaho should be.

The distances are very similar and those farmers and ranchers that drive back and forth many, many miles when we—tell them

that 60 percent of what's in their gas tank, and that chart is somewhere behind me, came from somewhere off shore. They grow very frustrated in not understanding why, we, as a country, have allowed that to happen. But we have. And we've done it for a lot of false and in some cases, real reasons.

And that's what brought both Senator Dorgan and I together to introduce the SAFE Act. Dealing with a combination of things that are both in the area of efficiencies: the CAFE language that was marked up today in Commerce, the innovations, the biofuels that Senator Domenici and Senator Bingaman marked up last week in the Energy Committee and the production side of it that I want to concentrate on for a few moments today. Because we still have those, probably some in the audience today, who want to be "political correct".

And being politically correct means somehow you don't produce as much as you should produce. You conserve your way or you efficiency your way through all of this. I am of the conclusion and I think the bill reflects it, that we need it all.

It will be cleaner, progressively cleaner. It is safer, progressively safer. It is more environmentally sound than ever in our history, but to deny ourselves all of it makes us as a country, increasingly vulnerable. So, I bring up the chart that was requested by audience demand today, the No Zone chart.

And I bring that up for you, Johnnie, because I know you're headed for retirement. And I don't blame this on you, not at all. Because you've been most successful in being the administer of a very critical and necessary resource. I bring it up today because it echoes back to a ghost of my childhood, the ghost of Santa Barbara, which one-third of the audience today doesn't know what in the heck I'm talking about because it was old news then and it is old news now, but it shaped American's policy off shore for decades.

This country ought to know where every drop of oil is within our reach. Whether we go for it or not. And we ought to know how reasonable it is to get there and we ought to try to get there if we can.

And Senator Domenici wove a very intricate web last year that got us to lease sale 181, that Johnnie is now administering over. That opens up another very large resource. But for this great Nation not to know what's in the No Zone of the east coast, not to know what's in the No Zone of the west coast, not to be optimizing that which is in the gulf, is a shame on us.

And as a result of that, this legislation, I would hope moves us somewhat in that direction because it is not a matter of being selective anymore, Mr. Chairman. It is a matter of needing it all and that doesn't sense the greed at all that we're talking about. We're talking about a gross domestic product (GDP) that is 25 to 26 percent of the world GDP and therefore requirement of energy to feed it and to do so in an appropriate and responsible way.

So, I think, that clearly, as we push forward in these areas and nudge all of these issues. The coalition that is embodied, in part, by those who are with us today, who sat down as an industry and as sensitive, knowledgeable people to the world around us, looked at realities and said, here's where we need to go. And here's the wise public policy that takes us there and the SAFE Act that we

introduced is reflective of that. It is a substantial contribution to our effort here on this issue.

So, thank you for the hearing. Thank all of you for being here. Johnnie, thank you for your tremendous service to our country, your responsible administering of the Outer Continental Shelf (OCS). As a westerner, I know why you want to go home to Wyoming. Thank you.

Senator DORGAN. Senator Craig, thank you. I will refrain from responding to the insensitive remark about the habitation of the Northern Great Plains.

But I'm tempted.
Senator Cochran.

STATEMENT OF SENATOR THAD COCHRAN

Senator COCHRAN. Mr. Chairman, thank you very much for holding this hearing to review the recommendations of the Energy Security Leadership Council for reducing our dependence on foreign oil. It's a very timely hearing; a very important subject. I ask unanimous consent that the balance of my remarks be printed in the record and we can go forward with hearing the testimony of our witnesses.

Senator DORGAN. Without objection.
[The statement follows:]

PREPARED STATEMENT OF SENATOR THAD COCHRAN

Mr. Chairman, Thank you for holding this hearing to review the recommendations of the Energy Security Leadership Council on reducing the United States' dependence on foreign oil. I'd like to also thank the witnesses for being here to provide testimony and answer questions. Ms. Burton, I especially thank you for all your hard work as Director of the Minerals Management Service, to expand domestic energy sources such as the Outer Continental Shelf oil and gas leasing plan. I wish you well in your pursuit of new and workable initiatives to achieve energy independence.

I am pleased that Chairman Dorgan and Ranking Member Domenici are bringing to light workable solutions to the unfortunate dependence the United States has endured upon foreign oil, which is located in some of the most unstable regions of the world. Investment in alternatives will not only strengthen the energy security of America, but will likely lead to innovative renewable and clean energy developments. It is imperative that we accelerate our initiatives to increase domestic supplies of energy. Thank you all for being here to discuss this important and timely issue.

Senator DORGAN. I'm going to introduce all five, and then we will just have sequential testimony. I mentioned that Andy Karsner is with us today. He is the Assistant Secretary for Energy Efficiency and Renewable Energy and he has testified before the subcommittee previously. We welcome you, Andy.

Also with us today are: Johnnie Burton, the Director of the Minerals Management Service, U.S. Department of the Interior. We welcome you and we thank you for your service as you announce your retirement.

Frederick Smith, Chairman, President and CEO of FedEx Corporation. Mr. Smith, thank you for being here.

Admiral Gregory Johnson, U.S. Navy, retired, former Commander of the United States Naval Forces in Europe.

And, Dr. Robert Wescott, the President of Keybridge Research LLC.

I do want to mention that Mr. Smith and Admiral Johnson were leaders in the Energy Security Leadership Council which produced the Securing America's Energy Future document. We welcome you to testify here on their behalf.

So, Secretary Karsner, why don't you proceed? The entire statement submitted by each of you will be made a part of the permanent record and we would ask that you summarize.

STATEMENT OF HON. ALEXANDER KARSNER, ASSISTANT SECRETARY FOR ENERGY EFFICIENCY AND RENEWABLE ENERGY, DEPARTMENT OF ENERGY

Mr. KARSNER. Mr. Chairman, Senator Domenici, members of the subcommittee, thank you for the opportunity to testify before you today on Senate bill 875, the Security and Fuel Efficiency Energy Act of 2007 and on the policies and funding necessary for reducing U.S. oil dependence.

In his 2007 State of the Union Address, President Bush challenged our country to reduce gasoline consumption by 20 percent within the decade, the "Twenty in Ten" plan. The President called for a robust alternative fuel standard requiring the equivalent of 35 billion gallons of renewable and alternative fuels by 2017. Expanding the mandate established by the Energy Policy Act of 2005 is expected to decrease projected gasoline usage by 15 percent.

Another 5 percent reduction in gasoline consumption can be achieved through the administration's proposal to reform CAFE standards. The "Twenty in Ten" plan holds the promise of diversifying the sources, types and volumes of fuels we use, while reducing our vulnerabilities and dependence on oil.

S. 875, the SAFE Energy Act, shares the President's goal of significantly altering our Nation's energy portfolio. The administration has not had sufficient time to coordinate interagency views of S. 875, but I would like to offer some preliminary comments on the legislation.

While the Department of Transportation has primary authority for addressing the President's call to reform and elevate CAFE standards, the Department of Energy invests in the vehicle technologies and attests to their availability to increase fleet efficiency. Those provisions of the bill that broadly support the President's vision of increasing efficiency alongside technologies to displace fuel consumption are integral to a comprehensive national strategy.

Title II of S. 875 supports the President's goal of deploying increased volumes of renewable fuels. The administration believes, however, that we must have a manageable time frame for fuels and infrastructure deployment and that a 10-year goal is an ambitious and appropriate metric.

Title II also contains provisions that focus on infrastructure development, which is a vital component of achieving energy security. The primary focus of S. 875 is on adoption of E85 infrastructure, an important end goal of ethanol deployment. Including provisions that also accelerate early adoption of intermediate fuel blends that range in intervals between E10 and E85 could serve as a useful bridge towards this ultimate goal.

Finally, although S. 875 takes important steps toward energy security, the United States and all major oil-consuming countries currently rely on imported petroleum as our major fuel source. Devel-

opment of alternative fuels reduces our vulnerability to a major disruption in worldwide oil supplies and assists in transforming our energy economy. Over the last 30 years, we have invested in the Strategic Petroleum Reserve to provide us protection against these types of disruptions.

While the Reserve is robust with an inventory of 690 million barrels, and has provided relief to U.S. consumers after several shortages, our growth rates indicate that the reserve should in fact be much larger. The administration is taking steps to increase the inventory of the Reserve to 727 million barrels, the current capacity. The administration believes that our energy security requires us to go further and authorize an increase in the size of the Reserve from 1 billion to 1.5 billion barrels.

We also urge Congress to support the President's request for \$168 million in fiscal year 2008 to fund its expansion.

Today's hearing also addresses a recently released assessment of the economic impacts of implementing the Energy Security Leadership Council's recommendations to the Nation on reducing U.S. oil dependence. The analysis demonstrates the countless benefits that can be achieved, if we as a country commit to altering our energy portfolio. The Department is making progress toward that goal.

The President's Advanced Energy Initiative and "Twenty in Ten" goal, along with the Energy Policy Act of 2005, contribute a substantial road map for energy security. The Department is implementing EPACT 2005, and we are already beginning to see its results.

For example, the Council's recommendations include providing financial assistance for six or more biorefineries employing a variety of feedstocks located in various regions of the country. In fact, Secretary Bodman recently announced that the Department of Energy (DOE), under the authority provided in EPACT section 932 will invest up to 385 million for six commercial scale biorefinery projects over the next 4 years. In addition, just last week, Secretary Bodman announced the availability of up to \$200 million for cellulosic biorefineries at 10 percent of commercial scale, also in accordance with EPACT section 932.

Mr. Chairman, the question that is most urgently before this subcommittee, I believe, is how many Federal dollars will it take to satisfactorily address our addiction to oil. I suggest to you that there is no amount of Federal spending that can achieve this goal alone, without catalyzing private investment. If we are serious about changing our Nation's energy portfolio, we must unleash the vast potential and transformative power of our capital markets.

The Federal Government's greatest contribution to energy security is the enactment of durable policy that signals to private investors our long-term commitment to alternative sources of energy and addresses market imperfections. Government funding alone will not be enough to bring about the magnitude of change at the rate required to address our critical security, economic, and environmental concerns.

The challenge for large-scale, up-front investments and clean energy is that the potential for outstanding returns must be realized over an extended period of time or the life cycle of the technologies use. This is true whether dealing with the solar roof top, cellulosic

biorefineries, large wind farms, nuclear powerplants, energy efficient products like the ubiquitous compact fluorescent light bulb, or even transmission linking our clean energy resources with our national urban load centers.

Though the energy source is domestically available and generates little to no greenhouse gases, uncertainty over a technology's life cycle risk and cost severely retards the amounts and types of private capital available being deployed. Effective capital formation requires the Federal Government to provide the necessary policy predictability and economic climate that enables massive investments at an accelerated pace. Responsible leveraging of Federal tax dollars to catalyze and accelerate private infrastructure financing and capital flows is essential to enable our national strategy of a new clean energy economy.

Mr. Chairman, this concludes my prepared statement and I'd be happy to answer any questions the subcommittee members may have.

Senator DORGAN. Secretary Karsner, thank you very much.
[The statement follows:]

PREPARED STATEMENT OF HON. ALEXANDER KARSNER

Mr. Chairman, Senator Domenici, members of the committee, thank you for the opportunity to testify before you today on S. 875, the Security and Fuel Efficiency Energy Act of 2007, and on the policies and funding necessary for reducing U.S. oil dependence.

In his 2007 State of the Union address, President Bush challenged our country to reduce gasoline consumption by 20 percent in the next 10 years, the "Twenty in Ten" plan. The President called for a robust Alternative Fuel Standard (AFS), requiring the equivalent of 35 billion gallons of renewable and alternative fuel in 2017. This goal is a significant expansion of the 7.5 billion gallon renewable fuel target now in law for 2012, under the Renewable Fuels Standard. Expanding the mandate established by the Energy Policy Act of 2005 (EPACT 2005) is expected to decrease projected gasoline use by 15 percent. Another 5 percent reduction in gasoline consumption can be achieved through the administration's proposal to reform CAFE standards. The "Twenty in Ten" plan holds the promise of diversifying the sources, types, and volumes of fuels we use, while reducing our vulnerabilities and dependence on oil. Only through transformational technological change can these goals be achieved, and we believe that the administration's proposals provide the tools to achieve them.

S. 875, THE SAFE ENERGY ACT

While the administration has not had sufficient time to coordinate interagency views of S. 875, the SAFE Energy Act of 2007, I am pleased to offer some preliminary comments on the legislation. While the Department of Transportation (DOT) has primary authority for addressing the President's call to reform and elevate CAFE standards, the Department of Energy (DOE) invests in the vehicle technologies and attests to their availability to increase fleet efficiency. Those provisions of the bill that broadly support the President's vision of increasing efficiency along side technologies to displace fuel consumption are integral to a comprehensive national strategy.

Title II of S. 875 supports the President's goal of deploying increased volumes of renewable fuels. The administration believes, however, that we must have a manageable timeframe for fuels and infrastructure deployment, and that a 10-year goal is an ambitious and appropriate metric. However, the administration also believes that once a standard is set, the market should be allowed to determine which options succeed, and therefore, the President's proposal broadens the market by expanding the alternative fuel options that can meet the standard. In addition, the President's proposal also provides for a flexible means for industry to comply with the alternative fuel standard requirements. First, it includes a banking and trading system that allows participants to meet their obligations by purchasing credits from other complying parties. Credits could also be purchased from the Federal Government, thereby providing an automatic economic "safety valve."

In effect, credits would be offered for sale to entities subject to the AFS mandate—those who refine, blend and import gasoline—and they would have the ability to comply: (1) by using a sufficient amount of alternative fuel in motor vehicle and non road fuels they produce or import; (2) by buying credits that may be available in the private marketplace; or (3) by purchasing credits directly from the Government. This is intended to guard against “price spikes” where an insufficient supply of alternative fuel or alternative fuel credits drives up the prices.

The credits available under the automatic economic “safety valve” in the President’s proposal are for sale by the Government set at the price of \$1.00 per gallon of ethanol equivalent. This feature provides some market certainty—businesses can calculate their maximum cost of compliance. They then can use their ingenuity to deliver value and minimize their compliance costs. The \$1.00 safety valve does not protect against other factors that may cause increases in gasoline prices (e.g., geopolitical tensions or weather-related disruptions), but those can be addressed through administrative waivers if necessary.

Title II also contains provisions that focus on infrastructure development, which is a vital component of achieving energy security. The primary focus of S. 875 is on adoption of E85 infrastructure, an important end goal for ethanol deployment. However, the administration also believes that government policy should not be dictating the fuel that the market adopts, but should allow diverse fuels to compete. Provisions that also accelerate early adoption of intermediate fuel blends could serve as a useful bridge toward the ultimate goal of energy security. We support those provisions of the bill that are consistent with the President’s goals, particularly the areas of emerging biofuels and assessments of renewable fuels incentives.

Finally, although S. 875 takes important steps toward energy security, the United States and all major oil-consuming countries currently rely on petroleum as a major fuel source. Development of alternative fuels reduces the vulnerability of this economy to the severe consequences of a major disruption in world wide oil supplies and assists in our long-term goal of transforming our energy economy.

Over the last 30 years, we have invested in the Strategic Petroleum Reserve to provide us protection against these types of disruptions. While the Reserve is robust, with an inventory of 690 million barrels, and has provided relief to oil consumers after supply shortages, our projected growth rates indicate that the Reserve needs to be much larger. Even allowing for successful implementation of the legislation before the Congress, we must deal with the vulnerabilities associated with concentration of the world’s petroleum reserves in unstable regions.

The administration is taking steps to increase the inventory of the Reserve to 727 million barrels, the current capacity, and to make the necessary expansions to reach 1 billion barrels as authorized under EPACT 2005. The administration believes that our energy security requires we go even further and authorize an increase in the size of the Reserve to 1.5 billion barrels. We urge Congress to support the President’s request for \$168 million in fiscal year 2008 to fund expansion. That funding will allow us to buy land and rights of way, and to do all of the detailed design and engineering work necessary to expand the existing Reserve sites at Bayou Choctaw, Louisiana, and Big Hill, Texas, as well as a new site near Richton, Mississippi, and NEPA work for expansion to 1.5 billion barrels.

ENERGY SECURITY LEADERSHIP COUNCIL REPORT

Today’s hearing also addresses a recently released assessment of the economic impacts of implementing the Energy Security Leadership Council’s Recommendations to the Nation on Reducing U.S. Oil Dependence. The analysis demonstrates the countless benefits that can be achieved if we as a country commit to altering our energy portfolio. We are committed to making progress toward that goal. The President’s Advanced Energy Initiative (AEI) and “Twenty in Ten” goal, along with EPACT 2005, contribute to a roadmap for energy security. The Department is implementing EPACT 2005, and we are already beginning to see the results.

For example, the Council’s recommendations include providing financial assistance for six or more biorefineries employing a variety of feedstocks, located in various regions of the country. In fact, Secretary Bodman recently announced that DOE, under the authority provided in EPACT section 932, will invest up to \$385 million for as many as 6 commercial-scale biorefinery projects over the next 4 years, subject to appropriations. These funds, combined with industry’s cost share, could lead to more than \$1.2 billion in public and private sector investment in these biorefineries. In addition, just last week Secretary Bodman announced the availability of up to \$200 million, subject to appropriations, for cellulosic biorefineries at 10 percent of commercial scale, also in accordance with EPACT section 932. This effort will enable industry to resolve remaining technical and process integration uncer-

tainties and allow for more predictable, less costly scale up of “next generation” biorefinery process technologies. The 10-percent scale demonstrations have the potential to reduce the overall cost and risk to industry and contribute to the quicker commercialization of larger-scale facilities.

EERE’s Biomass Program is focused on making cellulosic ethanol cost-competitive by 2012, a target put forth in the AEI. In fiscal year 2007, including funds appropriated under the Continuing Resolution, the Department has allocated approximately \$200 million for EERE’s Biomass and Biorefinery Systems R&D program to implement key activities necessary to achieve the 2012 goal for cost-competitive cellulosic ethanol.

The Department is also working with public and private sector partners to encourage development and deployment of a biofuels distribution infrastructure in the United States. The Department is pursuing a number of infrastructure activities, including analyses of pipelines, water issues, and advanced vehicle technologies. The biofuels infrastructure team is also assessing the impacts of higher-level intermediate blends of ethanol (e.g., E15 and E20), renewable fuels pipeline feasibility and materials research, and optimization of E85 alternative fuel vehicles. This work is being coordinated with the Department of Transportation, which sets and enforces standards for the safe transportation of petroleum products and hazardous liquids by all modes of transportation, including pipelines.

ACHIEVING ENERGY SECURITY

The question that is most urgently before this subcommittee, I believe, is how many Federal dollars will it take to end our dependence on oil. I suggest to you, Mr. Chairman, that there is no amount of Federal spending that can achieve this goal. If we are serious about changing our Nation’s energy portfolio, we must unleash the vast potential of capital markets. The Federal Government’s greatest contribution to energy security is the enactment of durable policy that signals to private investors our long-term commitment to alternative sources of energy. Government funding alone will not be enough to bring about the magnitude of change at the rate required to address our critical security, economic, and environmental concerns.

We have made great progress in the development of clean energy and energy efficiency technologies. Renewable sources of electric generation, like wind across the Great Plains and solar in the Southwest, are already cost competitive in many locations. Highly efficient buildings that generate as much energy as they consume are a reality and proceeding down the cost curve. Emission-free nuclear energy is poised to substantially contribute to both energy security and environmental stewardship. Carbon capture and storage will enable coal to retain its important contribution to the energy mix.

The challenge for large scale, up front investments in clean energy is that the potential for outstanding returns must be realized over an extended period of time, or the “lifecycle” of the technology’s use. This is true whether dealing with a solar rooftop, cellulosic biorefineries, large wind farms, nuclear power plants, energy efficient products like the ubiquitous compact fluorescent lamp, or transmission linking our clean energy sources with urban loads. Though clean energy sources are domestically available and generate little to no greenhouse gases, uncertainty over the necessary technologies’ “lifecycle” risks and costs severely retards the amount and types of private capital being deployed. Rapid commercialization of clean energy technologies requires sophisticated capital risk management to facilitate complex financial transactions. That risk assessment is what the private sector does best. Effective capital formation requires the Federal Government to provide the necessary policy predictability and economic climate that enables massive investments at an accelerated pace. Responsible use of Federal tax policy to catalyze and accelerate private infrastructure financing and capitol flows is essential to enable our vision of a new clean energy future.

The President’s Advanced Energy Initiative and “Twenty in Ten” goal, along with full implementation of EPACT 2005, hold the promise of accelerating deployment of clean, renewable energy and energy efficiency technologies. To meet these challenges, cutting edge research and development must be supported by consistent, long-range policy actions, such as the proposal that the President articulated in the State of the Union.

Mr. Chairman, this concludes my prepared statement, and I would be happy to answer any questions the subcommittee members may have.

Senator DORGAN. Director Burton, you may proceed.

STATEMENT OF R.M. "JOHNNIE" BURTON, DIRECTOR, MINERALS MANAGEMENT SERVICE, DEPARTMENT OF THE INTERIOR

Ms. BURTON. Mr. Chairman and members of the subcommittee, I appreciate the opportunity to testify today on actions the Department of the Interior Minerals Management Service has taken to reduce U.S. oil dependence.

Production from the Federal Outer Continental Shelf accounts for 25 percent of domestic oil production and near 20 percent of domestic gas production—natural gas production. As energy demand continues, to increase these resources—is all the more important, to our national security and to our economy.

The Energy Information Administration estimates that despite increased efficiencies and conservation over the next 20 years, consumption is expected to grow more than 25 percent. Even with more renewable energy production expected, oil and natural gas will continue to account for the majority of energy used through 2030. Interior's domestic energy programs, particularly offshore oil and gas production, will remain vital to our national energy portfolio—for some time to come.

Mr. Chairman, the administration is in the process of reviewing your proposed legislation which addresses access to oil and gas resources on the Federal Outer Continental Shelf in the Gulf of Mexico and authorizes an inventory of oil and gas resources in a portion of the Atlantic OCS. The administration recognizes there are many complicated issues associated with the development of these resources and is working hard to accommodate the needs of all stakeholders.

On April 30, the Department of the Interior transmitted to Congress the 5-year Outer Continental Shelf Oil and Gas Leasing Program to guide domestic energy production—leasing and production, from 2007 to 2012. The program proposes 21 sales in eight planning areas. Twelve sales are slated for the Gulf of Mexico, eight for Alaska and potentially, one off the coast of Virginia. The Virginia coast would have a 50-mile buffer zone, as requested by the Governor.

The program proposes annual lease sales in the central and western Gulf of Mexico. The Gulf of Mexico Energy Security Act signed by the President on December 20, 2006 requires oil and gas leasing in portion of Sale 181 area in the central gulf. That accounts for over 2 million acres. Another portion of Sale 181 is in the eastern gulf. It accounts for about 550,000 acres. And finally, there is an area south of 181, which accounts for 5.7 million acres. The total new areas in the gulf that will be offered in the next 5 years amount to about 8.3 million acres.

Under the 5-year program the portion of Sale 181 area in the central gulf will be included in the October 2007 lease sale and the portion of the eastern gulf would be offered for the first time in March 2008. The 181 south area is scheduled for 2009. All of these new areas require additional environmental work, which is what we're doing right now.

The leasing program scheduled eight sales in Alaska, two in the Beaufort Sea, three in the Chukchi Sea, up to two in the Cook Inlet, and one in the North Aleutian Basin in an area that's about 5.6 million acres which were previously offered during Sale 92 in

1985. This is requested by the State of Alaska. This area would be subject to environmental reviews including public comment, extensive consultation with the State, local governments, and tribal organizations before any lease sale can proceed.

The program also includes a proposed sale in the mid-Atlantic planning area, out beyond 50 miles of the coastline of Virginia in late 2011. This area was included in the 5-year program at the request of the Commonwealth of Virginia. All of the Atlantic planning areas, including Virginia are presently under congressional moratorium and under Presidential withdrawal. No sale can occur unless these two edicts are lifted. The proposed sale excludes a 50-mile deep coastal buffer from leasing consideration, as well as a triangular piece of the entrance of the Chesapeake to protect that particular bay.

Our analyses indicate that implementing the new 5 year oil and gas leasing program would result in a mean estimate of an additional 10 billion barrels of oil and 45 trillion cubic feet of gas over a 40 year timespan. And that would translate to about \$170 billion in today's dollars in net benefits to the Nation.

Through all of our programs, MMS works to ensure that the public receives the maximum benefit from America's OCS resources and Federal mineral revenues. As MMS moves forward in the new century, the importance of facilitating the Nation's management of the OCS lands and collecting and dispersing mineral revenues will remain our top priority.

Mr. Chairman, this concludes my statement and I'm ready to answer questions at your pleasure.

Senator DORGAN. Director Burton, thank you very much.

[The statement follows:]

PREPARED STATEMENT OF R.M. "JOHNNIE" BURTON

Chairman Dorgan, thank you for the opportunity to appear here today to discuss with you the actions the Department of the Interior's Minerals Management Service has taken to reduce U.S. oil dependence and to protect the Nation against supply disruptions. This committee has played an important role in shaping our domestic energy program, particularly with regard to encouraging environmentally sound development of our domestic oil and gas resources on the Outer Continental Shelf.

The Department and its agencies, including the Minerals Management Service (MMS), serve the public through careful stewardship of our Nation's natural resources. The Department also plays an important role in domestic energy development. One third of all energy produced in the United States comes from resources managed by the Interior Department.

As energy demand continues to increase, these resources are all the more important to our national security and to our economy. The Energy Information Administration estimates that, despite increased efficiencies and conservation, over the next 20 years energy consumption is expected to grow more than 25 percent. Even with more renewable energy production expected, oil and natural gas will continue to account for a majority of energy use through 2030. Interior's domestic energy programs, particularly offshore oil and gas production, will remain vital to our national energy portfolio for some time to come.

The Federal Outer Continental Shelf (OCS) covers 1.76 billion acres and is a major source of crude oil and natural gas for the domestic market. In fact, according to the Energy Information Administration, if the Federal OCS were treated as a separate country, it would rank among the top five nations in the world in terms of the amount of crude oil and second in natural gas it supplies for annual U.S. consumption.¹

Mr. Chairman, the administration is in the process of reviewing your proposed legislation, S. 875, Title III of which addresses access to oil and gas resources on

¹EIA U.S. Imports by Country of Origin, 12-21-2006.

the Federal Outer Continental Shelf in the Gulf of Mexico and authorizes an inventory of resources in a portion of the Atlantic OCS.

The administration recognizes there are many complicated issues associated with the development of these resources and is working hard to accommodate the needs of all stakeholders.

On April 30th the Department of the Interior transmitted to Congress the 5-Year Outer Continental Shelf Oil and Gas Leasing Program (5-year program), to guide domestic energy leasing on the OCS from 2007 to 2012. The program proposes 21 lease sales in 8 planning areas. Twelve sales are slated for the Gulf of Mexico, 8 off of Alaska and one in the Mid-Atlantic Planning Area.

The Program continues to schedule annual lease sales in the Central and Western Gulf of Mexico. The Gulf of Mexico Energy Security Act (the Act), signed by President George W. Bush on December 20, 2006, requires oil and gas leasing in portions of the "Sale 181 Area" in the Central Gulf (2,028,730 acres) and in the Eastern Gulf (about 546,000 acres) Planning Areas as well as the "181 South Area" (5,762,620 acres). The total acreage of new areas in the Gulf offered under the proposed program is 8,337,443 acres. Under the 5-year program, the portion of the "Sale 181" area in the Central Gulf would be included in the October 2007 lease sale, and the portion in the Eastern Gulf would be offered for the first time in March 2008. The 181 South area is scheduled for lease in 2009 following additional environmental studies and requirements under the National Environmental Policy Act (NEPA).

The leasing program schedules 8 sales in Alaska: 2 in the Beaufort Sea; 3 in the Chukchi Sea; up to 2 in Cook Inlet; and 1 in the North Aleutian Basin—in an area of about 5.6 million acres that was previously offered during Lease Sale 92 in 1985. These areas would be subject to environmental reviews, including public comment, and extensive consultation with state and local governments and tribal organizations before any lease sale proceeds.

The program also includes a proposed sale in the Mid-Atlantic Planning Area, beyond 50 miles of the coastline of Virginia, in late 2011. This area was included in the 5-year program at the request of the Commonwealth of Virginia. This sale would only take place if the congressional moratorium is discontinued and the presidential withdrawal is modified for this area. This proposed sale area excludes a 50-mile coastal buffer from leasing consideration as requested by the Commonwealth of Virginia, as well as a No-Obstruction Zone at the entrance to the Chesapeake Bay where no leasing would take place. No lease sale would proceed without additional consultation and more site-specific analysis of its environmental effects under the NEPA.

Our analysis indicates that implementing the new 5-Year OCS Oil and Gas Leasing Program would result in a mean estimate of an additional 10 billion barrels of oil, 45 trillion cubic feet of gas over a 40-year time span, and \$170 billion, in today's dollars, in net benefits for the Nation.

Mr. Chairman, this concludes my remarks. I would be happy to answer any questions you have at this time.

Senator DORGAN. Next we will hear from Fred Smith, Chairman, CEO, of FedEx. Mr. Smith, thank you for being with us.

STATEMENT OF FREDRICK W. SMITH, CHAIRMAN, PRESIDENT AND CEO, FEDEX CORPORATION

Mr. SMITH. Mr. Chairman, thank you very much. Admiral Johnson and I are here today to represent the Energy Security Leadership Council. I've submitted my testimony for the record. I'll just summarize it, if that's ok with you.

As you mentioned, the Energy Security Leadership Council is a group of 20 business CEOs and retired military officers, who've been moved to action out of the conviction that oil dependence severely threatens the economic and national security of the United States. We would argue, in fact, that oil dependence is the most important security issue facing the Nation, with the possible exception of weapons of mass destruction.

In December the council unveiled a set of recommendations to the Nation on reducing U.S. oil dependence. The report outlines a comprehensive energy security strategy based on four measures: One, new strength in vehicle fuel efficiency standards; two, in-

creased domestic oil production in conjunction with expanded environmental protections; three, greater availability of alternative fuels; and four, improved international arrangements to secure global oil supplies.

The recommendations replace the false hope of domestic energy independence with realistic policies for better managing the reality of global energy interdependence. We commend very much, you and Senator Craig and the other members of the subcommittee here, for facing up to the hard facts about energy security.

We believe the time has come for Americans to unite behind an aggressive campaign to reduce our dependence on oil and increase domestic and global energy security. The recommendations we've made are balanced policies. As you noted, Mr. Chairman, we consume now, more than 20 million barrels of oil a day, one-quarter of the world's total.

More than 60 percent of the oil we use is imported; 70 percent of that oil goes toward transportation, which relies on oil for 97 percent of delivered energy with almost no substitutes available. As the CEO of an organization of 280,000 people operating 677 aircrafts around the world and over 70,000 vehicles, I can assure you this issue commands our daily attention.

In the event of an oil crisis, transportation would break down and paralysis would spread into all economic sectors. A brief look at the history of Japan and Germany during World War II will illustrate the importance of energy vulnerability.

The American people must recognize that the 21st century global oil market is well removed from the free market ideal, as you mentioned. By some estimates, over 90 percent of all oil and gas reserves are now held by national oil companies that are partially or fully controlled by governments, many of whom do not have America's best interest at heart.

I'm certainly not one to—encourage regulation where market solutions are available, but the supply of oil is determined by a cartel, a group of people who gather together, including ways that would be illegal in the United States. Therefore Government intervention is not merely desirable; it is essential.

The council's approach tackles oil dependence through many policies but basically those measured balanced approaches I mentioned. Key among them are new vehicle efficiency standards which require 4 percent more miles per gallon than the fleet of cars and light trucks sold a year before. These new standards are very different from the old CAFE standards. Vehicle classes should be determined by key attributes—the government will have the discretion to require different percentage increases for different classes of vehicles in pursuit of this 4 percent improvement.

They—we recommend a variety of consumer and manufacturing tax credits that will help car makers and car buyers adjust to greater fuel economy. I should note that we recommend medium and heavy duty vehicles, along with light trucks and passenger vehicles be included in these new efficiency standards. It's very important given the growth of vehicle—oil consumptions and light truck and medium and heavy truck consumption.

We believe that the development of alternative fuels is very important, but there is no way that we can grow ourselves out of this

problem. And we believe that increased supplies of domestic oil are an equal part of this equation. The safety record of the U.S. offshore operators is truly dramatic—having produced 7 billion barrels of oil with a spill rate of .001 from 1985.

So, we believe Mr. Chairman, that we've made some very good recommendations. We've tried to quantify the security benefits of these policies. The council has worked with distinguished economists from the University of Maryland. And Dr. Robert Wescott, here, will summarize the results of these studies.

With that, I'll conclude and be happy to answer any questions.

Senator DORGAN. Mr. Smith, thank you very much.

[The statement follows:]

PREPARED STATEMENT OF FREDERICK W. SMITH

I thank the subcommittee for this opportunity to testify about the dangers of oil dependence and about the policies this Nation can adopt to protect itself. I speak to you today on behalf of the Energy Security Leadership Council, a non-partisan group that I co-chair along with General P.X. Kelley (Ret.), the 28th Commandant of the United States Marine Corps. All totaled, the Council unites 20 business leaders and retired senior military officers who have been moved to action out of the conviction that oil dependence severely threatens the economic and national security of the United States. Indeed, we would argue that oil dependence is the most important security issue facing the Nation with the possible exception of weapons of mass destruction.

In December, the Council unveiled a set of Recommendations to the Nation on Reducing U.S. Oil Dependence. This report outlines a comprehensive energy security strategy, which calls for strengthened vehicle fuel efficiency standards, increased domestic oil production in conjunction with expanded environmental protections, greater availability of alternative fuels, and improved international arrangements to secure the global oil supply. Crucially, it replaces the false hope of domestic energy independence with policies for better managing the reality of global energy interdependence. The suggested initiatives are aggressive while being balanced and credible. Where the market cannot be expected to provide solutions, government has been asked to apply workable standards capable of spurring the needed private-sector responses. The members of the Council have pledged to continue working until these policy recommendations are enacted into law.

During the last few months, the Council has collaborated with Senator Byron Dorgan and Senator Larry Craig to design legislation based on the Recommendations. This collaboration has given rise to the "Security and Fuel Efficiency Energy Act of 2007 (the SAFE Energy Act)." The fuel economy sections of this bill were subsequently introduced as the "Fuel Efficiency Energy Act of 2007." I am grateful to Senators Dorgan and Craig for their leadership on this issue.

But this entire subcommittee deserves to be commended for framing the oil dependence debate as an economic and national security issue of fundamental importance. The American people must be told the hard facts about energy security. Acknowledging the risks that lie ahead is just good sense, and I hope my contribution today can play a part in this "truth-telling", so to speak. The time has come for Americans to unite behind an aggressive campaign to reduce our dependence on oil and increase domestic and global energy security. To succeed, we must move beyond the narrow interests, political polarization, and short-term thinking that have prevented meaningful national progress for the last 20 years. Real progress is possible if we can come together around balanced policies that address both the supply and demand sides of the oil equation. The Council fully expects that all participants in this deeply entrenched debate will take issue with some of our solutions. We hope to secure the support of a bipartisan coalition that has the clarity of vision and courage of conviction needed to make hard choices.

Unless we tackle these hard choices, I have no doubt that oil dependence will result in major economic disaster for this country. Oil is the life-blood of our economy. We consume more than 20 million barrels of oil per day, a quarter of the world total. More than 60 percent of the oil we do use is imported. The numbers are even more disturbing when one considers how oil use is concentrated in vital economic sectors. Nearly 70 percent of our oil consumption goes toward transportation, which relies on oil for 97 percent of delivered energy with almost no substitutes available. As the leader of a global transportation and logistics company with 677 airplanes

and 70,000 vehicles, I know the transportation sector well. FedEx has grown because quick and efficient transportation creates value throughout the entire economy. In the event of an oil crisis, transportation would break down and paralysis would spread into all economic sectors. Just look at the histories of Japan and Germany during WWII. Transportation and oil were the Achilles's heels of those country's war efforts. The Allies recognized this weakness and waged war against the Axis's transport and oil capabilities. It stands to reason that America's enemies can recognize that oil dependence is America's Achilles's heel.

The American people must also recognize that the 21st century global oil market is well removed from the free-market ideal. By some estimates as much as 90 percent of all oil and gas reserves are held by national oil companies (NOCs) that are either partially or fully controlled by governments. Oil markets are not only politicized, they are also distorted by the presence of large economic externalities such as military expenditures that are not factored into the retail price of consumer fuels.

Given these hard realities, we must accept that market forces alone will not solve our oil problems. Instead, government must step in to spur and, in some cases, require private-sector responses. This is not a decision I came to easily, and I am certainly not one to encourage regulation where other effective solutions are available. But the fact is the supply of oil—the most valuable commodity in the world—is determined by a group of men who gather together and collude in ways that would be considered illegal in the United States. To combat such anti-competitive practices, government intervention is not merely desirable—it is essential.

The Council's approach tackles oil dependence through many policies, but none is more crucial than reformed and strengthened vehicle fuel-economy standards. Under the Council's proposal, the fleet of new passenger cars and light trucks sold in the United States each year will have to get 4 percent more miles per gallon than the fleet of cars and light trucks sold the year before. The same improvement will be required for commercial trucks, which have never previously been subject to fuel-economy standards.

Four percent is not an arbitrarily chosen number. It reflects the historical annual gains that were achieved when the Nation last committed itself to fuel economy. It is also perfectly consistent with expert forecasts of potential future fuel economy improvements.

These new standards are very different from the CAFE standards of the past. They require continual improvement but they are also designed to be flexible when necessary. For instance, pickup trucks may not be able to obtain the same fuel-economy levels as SUVs or minivans, but the Council's proposal does not require them to do so. NHTSA will have the discretion to require different percentage increases for different classes of vehicles in pursuit of 4-percent annual fuel-economy improvement for the entire new vehicle fleet. Vehicle classes will be determined by key attributes, and under this approach freight-hauling vehicles could justifiably be held to a lower fuel-economy standard than would be applied to vehicles designed first and foremost for transporting passengers.

Flexibility is further ensured by "off-ramps" that may be employed if NHTSA finds that 4-percent improvement in a given year is technically infeasible, unsafe, or not cost-effective. These are not loopholes, since it will require expert opinion and data to invoke them. But, together, the 4-percent annual improvement standard and the off-ramps give credit to American ingenuity and technological prowess while protecting business from unachievable or value-destroying mandates.

Finally, the proposed legislation contains a variety of consumer and manufacturing tax credits that will help car-makers and car-buyers adjust to greater fuel economy.

These measures will help us once again significantly reduce the oil intensity of this country. Oil intensity—the amount of oil needed to generate a dollar of GDP—has been cut in half since the oil shocks of the 1970s. The result is a U.S. economy that still sees steady growth despite high oil prices such as those experienced over the last few years. Unfortunately, progress in further lowering oil intensity has slowed noticeably in the last decade. We must do better.

Overall, this approach aims for two highly desirable outcomes: improved energy security and a competitive domestic automotive industry. To improve energy security, America needs to get millions of fuel efficient cars on the road. But we must also have a secure source of these vehicles, and that's why we advocate incentives that expedite the needed transition of U.S.-based manufacturing capacity.

I mentioned above that the Council wants to apply fuel economy standards to medium and heavy trucks for the first time in our Nation's history. Let me tell you why this is so important. Medium- and heavy-duty vehicles account for over 10 percent of U.S. petroleum consumption, roughly a quarter of the amount used by passenger cars and light trucks. Moreover, the fuel consumption of these vehicles is ex-

pected to grow at a rate nearly 50 percent higher than what is expected for light-duty vehicles. Clearly, oil use by trucks is not a marginal consideration.

The fuel economy of medium and heavy trucks is well below what it could be. A 2002 study conducted by the U.S. Department of Energy (DOE) found that currently available technologies could raise tractor-trailer mileage from 6 mpg to 10 mpg. A more recent analysis performed by DOE in 2005 suggests that an even higher level is feasible. Potential improvements for medium trucks run as high as 90 percent. For trucks driven in cities, hybrid power-trains offer the greatest opportunity. And, perhaps most importantly, these gains are not projected to have any negative impact on performance.

So, you may be asking, why don't we have these trucks? Don't truck operators look to minimize costs by adopting cost-effective fuel-saving technologies? The answer, of course, is that some do and some don't. As with purchasers of passenger cars, it is often difficult for truck buyers to correctly value the financial benefit of fuel-efficiency investments that require large up-front investments and produce savings over an extended time. Lack of information about available technologies and their fuel saving potential may also slow adoption of fuel-saving technologies, especially since fuel efficiency depends on a combination of elements (e.g., engine, chassis, aerodynamics) that are often marketed by separate manufacturers. But if you ask me, the key reason for lagging truck fuel economy is that manufacturers have not made such vehicles available. The market failures that have worked against passenger fuel economy are also evident in the truck sector. Indeed, since the manufacture of commercial vehicles is even more concentrated than is the case for passenger vehicles, the effects of the market failure may be even more pronounced in this sector.

To improve energy security, we must use oil more efficiently, but we must not stop there. Diversifying our transportation fuel supply should also be a key part of our national strategy to reduce oil dependence. Without an expanded supply of alternatives, conventional petroleum will continue to power nearly all of our motor transport. Such reliance on a single non-substitutable input creates profound economic dangers.

Corn-based ethanol is by far the most successful domestic alternative transportation fuel. At a maximum, however, corn-based ethanol may be able to displace 10 percent of our gasoline use before corn demand outstrips supply. Corn ethanol will undoubtedly remain an important alternative fuel, but we must also develop newer technologies that have the potential to loosen the constraint posed by limited corn supplies. Cellulosic ethanol is one of the most promising emerging biofuels, and the Council has put forth policies for fostering the growth of this industry. In addition, we have proposed plans for growing the demand-side of the biofuels market, in particular through incentives for developing the critical delivery infrastructure. Finally, we propose a system of variable subsidies that will husband taxpayer dollars by reducing government payments to the ethanol industry when oil prices are high and ethanol production is correspondingly profitable. If oil prices were to fall, perhaps through cartel actions, the subsidies would rise again to protect the biofuels industry as a strategic bastion of supply diversification. Our plan will also offer additional protections to biofuels production facilities that have not paid off their capital costs, especially if they employ emerging technologies.

Biofuels are part of the solution, but we should not fool ourselves into thinking that America can "grow" its way out of this problem. America's fuel needs cannot be met with biofuels alone. Even Brazil, which has roughly the same land mass as the continental United States, but whose fuel requirements are only a small fraction of ours, still relies on oil for most of its transportation energy.

The United States will continue to require oil for the foreseeable future, and, as such, I want to address the need for increasing the supply of secure domestic oil. Political forces have often portrayed increased supply and decreased demand as mutually exclusive ambitions. In fact, both goals are indispensable components of any comprehensive policy for obtaining genuine energy security.

The United States plays a critical role in global petroleum production. Currently the third largest oil producer in the world after Saudi Arabia and Russia, America has produced more total oil than any other nation. Nevertheless, the United States is the world's largest consumer by far, accounting for 25 percent of the world's daily oil consumption while providing only around 10 percent of supply.

Much of America's untapped resources are legally off limits to production. These production "moratoria" are often justified on environmental grounds, even though the oil production industry has amassed an excellent environmental record. From 1985 to 2001, U.S. offshore operators produced 7 billion barrels of oil with a spill rate of only .001 percent. More recently, 3,050 of the Gulf's 4,000 platforms and 22,000 miles of Gulf pipelines were in the direct path of either Hurricane Katrina

or Hurricane Rita. Despite the destruction of 115 platforms, damage to 52 other platforms and 535 pipeline segments, and the near total shut-down of the Gulf's offshore oil and gas production, there were no major oil spills attributed to either storm.

The Council believes it is sensible to increase access to exploration and production on the Outer Continental Shelf (OCS) as long as government and the oil and gas industry are willing to reasonably strengthen the legal and financial penalties that can be imposed in the event of any damage to the environment. To be sure, increased U.S. production on the OCS will not fundamentally shift the global distribution of oil resources, the majority of which will remain in the Middle East and under OPEC control. But by boosting production domestically, the U.S. can improve the flexibility and resiliency of the global oil market, especially in an increasingly tight market where spare production capacity is concentrated in a handful of countries.

Let me restate the key component's of the Council's plan:

- Reform and strengthen CAFE standards to require 4 percent annual increases in fuel economy of the new vehicle fleet. These standards should be applied to all on-road vehicles, including medium and heavy trucks. While the standards must be strict, they should contain "off-ramps" that will protect consumers and manufacturers by relaxing the 4 percent annual increases if they prove to be too costly, unsafe, or technically infeasible;
- Build the market for alternative fuels, paying attention to feedstock and infrastructure concerns;
- Explore and develop this country's own oil and natural gas fields in a rigorous but environmentally responsible and sensitive manner; and
- Where possible, design a more effective and efficient foreign policy for securing the overseas oil that we still need.

In order to quantify the economic security benefits of these policies, the Council worked with economists from the University of Maryland and Dr. Robert Wescott, former Chief Economist at the U.S. President's Council of Economic Advisors. The research team employed LIFT, a detailed general equilibrium simulation model that captures the effects of purchases and sales among nearly 100 industry groups. The point of departure for the study was a baseline scenario for the 2007–2030 period that was generally consistent with the forecast contained in the U.S. Department of Energy's Annual Energy Outlook for 2006. A second scenario for the same period was then developed incorporating the Council's proposals for fuel conservation, expanded alternative fuel production, and increased domestic oil and natural gas supply.

The results are being released today in a published report, but the key findings are easily summarized. If we can find the courage to act on this plan, the direct economic benefits will include higher energy productivity, reduced petroleum imports, and slightly lower global oil prices. These changes will translate into additional macroeconomic benefits that include higher real income and employment, a lower current account deficit, and a reduced federal government deficit. Last but not least, the program will buffer the economy against oil price shocks: that is, as the measures reduce the petroleum dependence of the economy, any given sudden spike in global oil prices will be less harmful to the economy than would have been the case without the policies.

The Council is committed to working with the members of the committee and the entire Congress in bipartisan fashion to achieve these goals. Our Nation deserves no less.

Senator DORGAN. Now we'll hear from Admiral Johnson. Admiral Johnson, you may proceed.

STATEMENT OF ADMIRAL GREGORY G. JOHNSON, UNITED STATES NAVY (RET.), FORMER COMMANDER, UNITED STATES NAVAL FORCES, EUROPE

Admiral JOHNSON. Chairman Dorgan, Ranking Member Domenici, and members of the subcommittee, good afternoon. I thank you for the opportunity to testify along with Mr. Smith and I certainly endorse his assessment that oil dependence is one of the most serious economic and national security challenges facing our Nation. So, I want to use my time to talk to you about the threats to the global oil supply and argue that there is a compelling case to be

made for increasing U.S. oil and natural gas production in conjunction with strengthened environmental protections.

Ever since launching his war against the United States, Osama bin Laden has threatened attacks on oil installations in the Arabian Gulf region. Just last year massive oil supply shock was only narrowly averted when the al-Qaeda attack on the Abqaiq facility was barely foiled. Sixty percent of Saudi Arabia's oil goes through this facility. Two weeks ago the Saudi authorities again uncovered an al-Qaeda plot that threatened oil infrastructure targets.

Iraq is also the scene of persistent insurgent and terrorist attacks on pipelines and pumping stations especially in the north of Iraq and in the offshore loading platforms in the northern Arabian Gulf. These attacks have curtailed Iraqi oil exports and cost the Iraqi government billions of dollars in revenue at a time when American taxpayers are spending billions on reconstruction.

The danger of attacks in shipping is also quite real. In October 2002, the French supertanker, *Limburg*, was rammed by a small boat packed with explosives off the coast of Yemen. Most of all shipments from the Persian Gulf have to pass through a handful of maritime chokepoints. Fully one-half, 40 million barrels a day of oil, transiting our world's oceans go through restricted waterways: the Strait of Hormuz, the Strait of Mirlocca, the Strait of Babel Mandeb, the Turkish Straits, and the Suez Canal.

All of our regional combatant commands handle all security tasks. For instance, the European command, where I commanded naval forces at the close of my career is involved in oil security tasks and missions from the Caspian Sea Transcaucasus region to the Gulf of Guinea in West Africa. And you just heard what happened there today in Nigeria.

The armed forces of the United States have been extraordinarily successful in fulfilling their energy security mission but this very success may have weakened the Nation's strategic posture by allowing America's political leaders and the American public to believe that energy security can be achieved by military means alone. We need to change that paradigm. The U.S. military is certainly not the only instrument, in many cases not the best instrument, for confronting the strategic dangers that emanate from oil dependence.

This is particularly true when oil is used as a political weapon and we certainly all remember the 1973 oil embargo and the consequences of that. And that—we all know that Russia is beginning to exercise its commodity muscle as evidenced by the stop of natural gas exports to Ukraine, which, in turn, withheld natural gas destined for western Europe.

Energy exporting governments don't need to resort to full fledged embargoes to hurt U.S. and other importers. They can manipulate prices through less drastic production—cuts and by foregoing improvements in their infrastructure. Witness what is happening in Venezuela. Currently an estimated 90 percent of global oil reserves are controlled by national oil companies, NOX, which are highly susceptible to being influenced by political objectives.

European Union's reliance on Middle Eastern oil and Russian gas continues to complicate U.S. foreign policy efforts, especially with regard to stopping Iran from developing nuclear weapons.

China, of course, exercises its interest in Sudanese oil by stymieing diplomatic efforts in Darfur.

The U.S. Government must make comprehensive energy security a top strategic priority. And I am heartened to see that a broad wave of support is rapidly advancing the legislative process to substantially strengthen fuel economy standards. Unfortunately the same bipartisan realism is not fully coalesced around the issue of increased domestic supply.

A congressional and Presidential moratoria to prevent oil exploration and production on most of the Outer Continental Shelf are usually justified by the need to protect military training areas, tourism, and the environment. While prohibiting oil and natural gas leases inside the military mission line in the Gulf of Mexico essentially blocks all production in the eastern Gulf of Mexico, an area that is estimated to contain 4 billion barrels of oil and 37 trillion cubic feet of natural gas.

Based on my 36 years of naval service, I think I'm in a position to say that the military can successfully train for and complete its mission without this sweeping prohibition. After all we routinely operate in the Arabian Gulf which has intense oil and gas infrastructure, as well as the North Sea and the littoral waters of the United Kingdom and Norway.

As for tourism, let me present to you this telling fact: Adam Goldstein, the President of Royal Caribbean International Cruise Lines, certainly cares about maritime tourism, especially in Florida, where his company is headquartered. Yet, he has joined the Energy Security Leadership Council and supports the call for increased domestic production in the Outer Continental Shelf.

Finally, let's talk about environment. As Mr. Smith mentioned in his remarks, oil exploration and production in this country have a remarkable safety record. The same is true for Canada, Norway, and the United Kingdom. All countries with strong environmental records, which do not limit offshore production to anywhere near the extent that the United States does. If you take a global perspective, oil production close to the U.S. market is arguably far safer to the environment than shipping equivalent quantities over thousands of sea miles in vulnerable tankers in an environment in which there have been notable mishaps at great—expense to our Earth's environment.

The council is confident that well regulated U.S. oil industry can increase domestic production in an environmentally responsible fashion. And we have several suggestions in my prepared remarks.

Mr. Chairman, I thank you for the opportunity to make comments and I'm willing to take your questions at any time.

Senator DORGAN. Thank you very much, Admiral Johnson.

[The statement follows:]

PREPARED STATEMENT OF ADMIRAL GREGORY G. JOHNSON

Chairman Dorgan, Ranking Member Cochran, Senator Domenici and members of the subcommittee, I thank you for inviting me to talk to you about how we can reduce U.S. oil dependence and consequently improve economic and national security. Mr. Smith, who co-Chairs the Energy Security Leadership Council on which I serve, has forcefully described the goals of the Council and the pressing need for tougher vehicle fuel-economy standards. I won't recover this ground other than to express my complete agreement with his assessment that oil dependence is one of the most serious economic and national security challenges facing this Nation.

I want to use my time to talk about the threats to the global oil supply. In turn, I will argue that there is a compelling case to be made for increasing U.S. oil and natural gas production in conjunction with strengthened environmental protections.

Ever since he launched his war against the United States, Osama bin Ladin has threatened attacks on oil installations in the Persian Gulf. Last year, a massive oil supply shock was only narrowly averted when an al-Qaeda attack on the Abqaiq facility was barely foiled. Two weeks ago, the Saudis again uncovered an al-Qaeda plot that threatened oil infrastructure targets. This time, the operatives were in the final stages of preparing an attack, with little or no planning left to do. In addition to arresting over 170 individuals, advanced explosives and significant weapons caches were seized by Saudi officials.

Clearly, we face committed enemies with the intent and capability to cause major disruptions. Some of their attacks on the Saudi oil economy have already succeeded, for instance their attacks on expatriate residential compounds in Riyadh in 2002 and in al-Khobar in 2004.

Iraq is the scene of persistent insurgent and terrorist attacks on pipelines and pumping stations, especially in the North of the country. These attacks have curtailed Iraqi oil exports and cost the Iraqi government billions of dollars in revenue at a time when American taxpayers are spending billions on reconstruction. If violence continues, and especially if it spreads to the south, where most export facilities are located, then all of Iraq's oil production could be at risk.

The danger of attacks on shipping is also quite real. In October 2002, the French supertanker Limburg was rammed by a small boat packed with explosives off the coast of Yemen. Most oil shipments from the Persian Gulf have to pass through a handful of maritime chokepoints. Even unsuccessful attacks on tankers are likely to raise insurance rates and thus oil prices.

Nearly all of our U.S. military commands handle oil security tasks. Central Command guards access to oil supplies in the Middle East. Southern Command defends Columbia's Cano Limon pipeline. Pacific Command patrols tanker routes in the Indian Ocean, the South China Sea, and the Western Pacific. European Command, where I was in charge of all naval forces at the close of my career, is involved in oil security all the way from the Caspian Sea to West Africa.

The armed forces of the United States have been extraordinarily successful in fulfilling their energy security missions, but this very success may have weakened the Nation's strategic posture by allowing America's political leaders and the American public to believe that energy security can be achieved by military means alone. We need to change the paradigm, because the U.S. military is not the best instrument for confronting all of the strategic dangers that emanate from oil dependence. This is particularly true when oil is used a political weapon.

The 1973 Arab embargo is still the most famous example of the use of energy as a strategic political weapon. But in recent years, Russia has shown the most willingness to play this dangerous game, just as at the beginning of 2006 when it stopped natural gas exports to the Ukraine, which in turn withheld natural gas destined for Western Europe. The danger of conflict with a nuclear power like Russia should make it abundantly clear that there are limits on how we can use military power to guarantee energy flows.

Of course, energy exporting governments don't need to resort to full-fledged embargoes to hurt the United States and other importers. Exporters can manipulate price through less drastic production cuts. After oil prices dropped from their 2006 peak of \$78 to about \$60 in the U.S. market, OPEC members began to cut back on production. Governments in oil-producing countries can also constrain future supply through investment decisions that lead to long-term stagnant or slowing growth in production and exports, or even decline. Often enough, future supply destruction is the unintended or accepted consequence of an insistence on government control of natural resources. Currently, an estimated 80–90 percent of global oil reserves are controlled by national oil companies (NOCs), which are highly susceptible to being constrained by political objectives, even if these undermine long-term supply growth. With this level of state-control, it's impossible to speak of a free market for oil.

State-controlled production is frequently inefficient, relying on outdated technology and reserve management techniques. Russia's oil industry stands as a testament to the dangers of political meddling in oil production. After the collapse of the Soviet Union, Russian production plummeted to only 6 million barrels per day in the mid-1990s, but then the efforts of private companies helped push production back to over 9 million barrels per day, achieving 10 percent annual growth rates

in 2003 and 2004.¹ However, with the subsequent expropriation of private enterprises such as Yukos, the production growth curve has flattened. Government control over production in Russia will also adversely impact new natural gas field and oil projects. President Putin has determined that tight government control of resources is more important than the greater revenue that would accrue from increased production achieved through cooperation with Western oil companies.

In an oil-dependent world facing increasingly tight supplies, the growing power of the oil-exporting countries and the shifting strategic calculations of other importing countries have lessened U.S. diplomatic leverage. Iran, which exports to the U.S.'s European and Asian allies, has threatened to use the "oil weapon" to retaliate against efforts to constrain its nuclear program. Venezuela's Hugo Chavez incessantly brandishes the threat to cut off oil to the U.S. And Russia's growing self-assurance and assertiveness cannot be divorced from the leverage it enjoys because of its oil and gas resources.

European Union reliance on Middle Eastern oil and Russian gas continues to complicate U.S. foreign policy efforts, especially with regard to stopping Iran from developing nuclear weapons. China, with its rapidly growing dependence on foreign oil, also blocks U.S. diplomatic initiatives in order to strengthen its own ties with oil exporters. Chinese opposition has helped thwart U.N. Security Council sanctions against Iran and prevented significant intervention in the Darfur region of Sudan.

The U.S. Government must make comprehensive energy security a top strategic priority. Toward that end, we should mobilize a full range of national security resources, including our economic power, our investment markets, our technology prowess, and our unsurpassed military strength. To borrow a metaphor from the energy sector, this broad approach will result in some dry-holes, but it should pay solid dividends over time.

As with national security as a whole, energy security requires a strong measure of domestic commitment and discipline. I am heartened to see that a broad wave of support is rapidly advancing the legislative process to strengthen fuel-economy standards. Unfortunately, the same bipartisan realism has not coalesced around the issue of increased domestic supply. But in my opinion, an opinion shared by the entire Energy Security Leadership Council, America must make greater use of its domestic oil and natural gas reserves in conjunction with expanded environmental protections.

The congressional and presidential moratoria that prevent oil exploration and production on most of the Outer Continental Shelf are usually justified by the need to protect military training areas, tourism, and the environment. Let's run through these objections in order.

Prohibiting oil and natural gas leases inside the Military Mission Line in the Gulf of Mexico essentially blocks all production in the Eastern Gulf of Mexico, an area that is estimated to contain 4 billion barrels of oil and 37 trillion cubic feet of natural gas. With my 35 years of service as a naval aviator, I think I am in a position to say with conviction that the military can successfully train for and complete its mission without the sweeping prohibition. The navy and air force can work around platforms that have fairly small footprints, and with this cooperation we can advance two national security imperatives: the need for a highly trained military and the need for secure domestic energy supplies.

As for tourism, let me present you with this telling fact: Adam Goldstein, the President of Royal Caribbean International cruise line, certainly cares about maritime tourism, especially in Florida, where his company is headquartered. Yet, Mr. Goldstein joined the Energy Security Leadership Council and supports the call for increased domestic production on the Outer Continental Shelf. He is confident that oil platforms will not harm his business. After all, his ships currently use sea lanes that are shared with oil tankers and that hasn't stopped people from booking cruises. If Adam Goldstein believes we can come to a workable compromise that increases energy security and does not harm tourism, that's good enough for me.

Finally, let's talk about the environment. As Mr. Smith mentioned in his remarks, oil exploration and production in this country have a remarkable safety record. The same is true in Canada, Norway, and Great Britain, all countries with strong environmental records and which do not limit offshore production to anywhere near the extent the United States does. If you take a global perspective, oil production close to the U.S. market is arguably far safer to the environment than shipping equivalent quantities over thousands of sea miles in vulnerable tankers. And if you're interested in environmental stewardship, as I think all of us in this room are, ask

¹EIA, "Country Analysis Brief: Russia," (January 2006), available online at www.eia.doe.gov/cabs/Russia/Full.html.

yourself whether it's right to relegate oil production to less developed areas of the world where environmental protections are often sorely lacking.

The Council is confident that a well-regulated U.S. oil industry can increase domestic production in an environmentally-responsible fashion. We call for lifting the moratoria blocking OCS oil and gas development, but we are also entirely supportive of more stringent environmental standards to protect OCS waters and adjacent state lands. We take issue with the moratoria because we consider them to be a needlessly one-sided answer to a complex problem that requires balanced solutions based on compromise. As all purchasers of insurance know, total coverage tends to be exceedingly expensive. As a result, most policy holders, even extremely risk averse ones, choose to accept some risk, for instance in the form of a deductible. In most cases, government also chooses to manage, rather than to eliminate, risk. The Council believes that it is sensible to increase access to exploration and production on the OCS as long as government and the oil and gas industry are willing to strengthen the legal and financial penalties that can be imposed on those who damage the environment. In terms of specific suggestions for improvements, the Council recommends:

- increasing the size of surety bond requirements;
- creating a new Federal entity (modeled on the Office of Federal Inspector for the Alaska Gas Pipeline) to be responsible for overseeing environmental laws with respect to drilling, production, and transportation;
- establishing/strengthening Citizens' Advisory Groups, equipped with financial autonomy, to advise the oversight entity;
- specifying stricter liability provisions to reduce the likelihood of protracted litigation;
- expanding environmental safeguards to protect against harmful environmental damages associated with initial exploration and drilling, recognizing that current regulations, such as those enacted in the Oil Pollution Act of 1990 and EPA's Spill Prevention, Control, and Countermeasure regulation, focus principally on providing safeguards during development and production phases;
- strengthening the administration of the leasing program through the Department of the Interior, employing an ecosystem focus sensitive to cumulative impacts, to result in no significant adverse effect on fish and wildlife, their habitats, subsistence resources, or the environment, with seasonal limits to protect breeding, spawning, and wildlife migration patterns and, where appropriate, requiring the approval of plans by the U.S. Army Corps of Engineers, EPA, and the U.S. Fish and Wildlife Service; and
- protecting coastal vistas using provable line-of-sight calculations to measure the actual impact of offshore production facilities.

The enhanced safeguards proposed by the Council should not be viewed as unconquerable obstacles to expanded production. To the contrary, we are convinced that such measures are essential to making additional domestic supply a far more practical and likely proposition, precisely because they address the legitimate needs of preserving the natural environment and building public confidence. This compromise, like the many others proposed by the Council, offers an achievable path toward improving the Nation's energy security.

I thank you again for your consideration.

Senator DORGAN. Finally, we will hear from Dr. Robert Wescott, who is President of Keybridge Research. Dr. Wescott, welcome and you may proceed.

STATEMENT OF DR. ROBERT F. WESCOTT, PRESIDENT, KEYBRIDGE RESEARCH LLC

Dr. WESCOTT. Mr. Chairman and members of the subcommittee, thank you for inviting me to testify today about the economic effects of U.S. energy policy options.

Today I want to discuss an analysis that I helped undertake of the Security and Fuel Efficiency Act of 2007, which would reduce America's oil dependency. As someone who spent a number of years as an economic policymaker, including stints as Chief Economist at the Council of Economic Advisors and as Special Assistant to the President for Economic Policy, I appreciate that you need to evaluate many dimensions of a potential new energy policy package: its

effects on national security, its effect on the budget, its effects on various industrial sectors and on the whole U.S. economy.

Would a new energy policy be affordable? What would it mean for jobs and income? Could the economy keep growing while it was being implemented? And how might the vulnerability of our economy to an oil shock be reduced over time if we undertook good policies? These are the questions that I will focus on today.

I want to describe for you an economic-model-based simulation analysis of the SAFE Energy Act that was performed by the Inter-industry Forecasting Project or Inforum Project, in the Economics Department at the University of Maryland, and by my firm, Keybridge Research. We relied on Inforum's highly respected LIFT model, an inter-industry macro-economic model of the U.S. economy. This statistical model is especially well suited for a long-run energy policy study.

And our University of Maryland, Keybridge modeling team, including Dr. Jeffrey Werling and Dr. Douglas Meade and myself, we have many decades of experience performing policy simulation studies with large scale economic models. The study was commissioned by the Energy Security Leadership Council, which I'll refer to as the Council. A project of securing America's future energy and it reflects the policy proposals that the Council published in December 2006.

These policies have three—target three main changes, as Mr. Smith said: Reduced energy—petroleum demand, the transportation sector, expanded supply of renewable fuels and enhanced domestic production of petroleum and gas. These policies are broadly mirrored in the SAFE Energy Act of 2007.

Let me highlight the key findings right up front. Our policy finds that with the council's policy package the U.S. economy will experience a number of beneficial impacts between now and 2030. With reduced oil dependency, household incomes and American employment will be higher and the U.S. trade deficit will be smaller. Typical U.S. households, for example, would enjoy about \$1,100 more of real income in 2030 with the new energy policies. Employment in the manufacturing sector would be about 140,000 jobs higher by 2030.

And even after paying for the subsidies and other measures to implement these policies, U.S. Government budget is expected to come out ahead in net terms because economic activity and the level of GDP will be higher. We estimate that the Federal Government's benefit cost ratio at about three. Probably the single most important conclusion of the study is that by substantially reducing America's oil dependency, the economy will be much better prepared to withstand a future oil shock, such as those that hit the U.S. economy in 1973–74, 1980–81 and 1991, all of which caused recessions.

That it is the council's energy package can be thought of as a self-financing insurance policy that will help make the economy more robust in good times and more resilient in the face of possible future energy shocks. Just a few more details on the key findings, we find that the policy package would make the U.S. economy substantially less oil intensive. By 2030, oil demand is projected to be 5.9 million barrels a day lower than if we didn't have the energy

package. In cumulative terms between 2007 and 2030, the package would reduce overall U.S. consumption by about 22 billion barrels of oil. That's roughly three times our annual energy use—oil use today.

One other thing the—with the conservation measures and the planned enhancements, we think that we would reduce crude oil imports by about 8.2 million barrels a day. That's about a 50-percent reduction. Cumulatively over this 24 year period, that would mean about 32 billion barrels less of U.S. oil imports. And just for a comparison, the total proved U.S. reserves today, in the entire United States; there are about 30 billion barrels. So, it's about the same order of magnitude.

I just—finally, just to talk about the transmission mechanisms. If we would put this package in place, first of all, we would be enhancing American productive capacity, especially the transportation sector. In simple terms we would be more efficient and our exports would be more competitive in world markets and imports would be lower. So, this would allow U.S. industry to take—grow faster.

Second, Americans would transfer less income abroad that is, the OPEC tax would be lower. This would allow more income to stay at home and to be saved or to be used to purchase American goods.

And third, we would have improved American productivity. We would be having more labor and capital available to increase production in the United States.

Finally, let me just come back to this—idea that we could make the economy less susceptible to a problem in the future. We did simulation studies where we assumed that we had an oil shock in 2026 after these policies were put in place. And what we found is that the insulation properties of these policies could reduce the damage done by an oil shock, a doubling of oil prices, by 30 to 40 percent. Yes, the U.S. economy would still be hurt, but it would be hurt no where near as much if we put these policies in place.

Thank you very much.

[The statement follows:]

PREPARED STATEMENT OF ROBERT F. WESCOTT

Chairman Dorgan and members of the subcommittee: I would like to thank you for inviting me to testify about the economic effects of U.S. energy policy options. My name is Robert Wescott and I am President of Keybridge Research LLC, a Washington DC-based economic research firm. Today I want to discuss an analysis that I have helped to undertake of the Security and Fuel Efficiency Energy Act of 2007 (the SAFE Energy Act), which would reduce America's dependence on oil. As someone who has spent a number of years as an economic policymaker, including stints as Chief Economist at the Council of Economic Advisers and as Special Assistant to the President for Economic Policy, I appreciate that you need to evaluate many dimensions of a potential new energy policy package—its effects on national security, on the U.S. budget, on various industrial sectors, and also on the whole U.S. economy. Would a new energy policy be affordable? What would it mean for jobs and income? Could the economy keep growing while it was being implemented? And how might the vulnerability of our economy to an oil shock be reduced over time if we undertook good energy policies? These are the questions I will focus on today.

The study that I want to describe for you is an economic model-based simulation analysis of the SAFE Energy Act of 2007 that was performed by the Interindustry Forecasting (Inforum) Project in the Economics Department at the University of Maryland and by my firm, Keybridge Research. We relied upon Inforum's highly respected LIFT model, an inter-industry macroeconomic model of the U.S. economy.

This statistical model is especially well suited for a long-run energy policy study, because it captures the interactions among 97 different industrial sectors of the economy and shows their combined effects on GDP, consumption, employment, and energy use. Collectively the University of Maryland/Keybridge modeling team, including Dr. Jeffrey Werling, Dr. Douglas Meade, and myself, has many decades of experience performing policy simulation studies with large-scale econometric models of the U.S. economy.

This study was commissioned by the Energy Security Leadership Council (ESLC), a project of Securing America's Future Energy (SAFE), and reflects the policy proposals detailed in the ESLC's Recommendations to the Nation on Reducing U.S. Oil Dependence, published in December 2006. These policies target three main changes: reduced petroleum demand in the transportation sector through more aggressive vehicle fuel economy standards, expanded supply of renewable alternative fuels, and enhanced domestic production of petroleum in conjunction with stricter environmental protections. These policy proposals are closely mirrored by the provisions of the SAFE Energy Act of 2007.

Let me highlight our main findings right up front. The study finds that with the ESLC policy package, the U.S. economy will experience a number of beneficial impacts between now and 2030. With reduced oil dependency, household incomes and American employment will be higher, and the U.S. trade deficit will be smaller. The typical U.S. household, for example, would enjoy about \$1,100 more in real income per year by 2030 (2006 dollars) with the new energy policies, and employment in the manufacturing sector would be about 140,000 jobs higher. And even after paying for subsidies and other measures to implement these policies, the U.S. Government budget is expected to come out ahead in net terms, because economic activity and income levels will be higher. The Federal Government's benefit-cost ratio would be about three.

Probably the single most important conclusion of the study is that by substantially reducing America's oil dependency, the economy will be much better prepared to withstand a future oil shock, such as those that hit the U.S. economy and contributed to recessions in 1973–74, 1980–81, and 1991. That is, the ESLC energy package can be thought of as a self-financing insurance policy that will make the economy more robust in good times and more resilient in the face of potential future energy shocks.

ENERGY POLICY ASSUMPTIONS

The first step in the study was to develop a baseline scenario for the period 2007 to 2030 that was consistent with the forecast contained in the U.S. Department of Energy's Annual Energy Outlook 2006 (AEO). A second "energy policy package" scenario was then developed for the same period that incorporated the fuel conservation, alternative fuel production, and domestic oil and natural gas supply assumptions of the ESLC proposals.

- The fuel economy measures included mandated 4 percent annual increases in fuel efficiency standards for passenger cars and light-duty trucks, strengthened fuel efficiency standards for medium-duty and heavy-duty trucks, and improved Federal Aviation Administration traffic routing for airplanes. Altogether it was assumed that primary oil demand could be reduced by 5.8 million barrels per day (mbd) by 2030 with these steps.
- The study also assumed that expanded ethanol production could contribute 0.7 mbd for transportation by 2030 and that biodiesel could add 0.2 mbd to production, for a total of 0.9 mbd from biofuels.
- Finally the study assumed that through a relaxation of moratoria on oil and gas drilling in the outer continental shelf (OCS) and through more rapid implementation of enhanced oil recovery methods, domestic oil and gas production could be boosted by 2.5 mbd by 2030.

This second "energy policy package" scenario required estimates to be made for the cost of policy compliance, the pace of technological innovation in energy use, the cost of alternative fuel production, as well as for other key inputs. The estimates were drawn from or corroborated by well respected sources, such as reports by the U.S. Department of Energy's Energy Information Agency and the National Academy of Sciences. We tried to make this energy policy scenario as realistic as possible. We assumed, for example, that in order to achieve higher fuel efficiency, new automobiles would require new engines/motors, advanced controls, electronics, new materials, and batteries and would cost about 10 percent more each year than they did in the baseline scenario. We also took into account the fact that higher ethanol production would require a growing share of U.S. corn production, and that the price of agricultural products would rise as a result, and that ethanol production itself

would require inputs of fossil fuels. And we took into account the fact that higher fuel efficiency and growing household income levels would generate an additional demand for transportation that would eat away some of the initial reductions in primary oil demand. The two scenarios—the baseline scenario and the “energy policy package” scenario—were then compared to quantify the changes in energy and oil intensity, oil imports, production, employment, and income that result from the ESLC policy package.

A second phase of analysis looked at what would happen if a large-scale oil shock—featuring a doubling of oil prices—hit the U.S. economy starting in 2026, after the ELSC policy package was nearly fully implemented. While such a massive shock would be a negative development for the U.S. economy, we wanted to see if the ELSC policy package could help insulate the economy from the worst damage—that is, if it could have insurance benefits.

KEY FINDINGS

Under the ESLC energy policy package, the study found that the U.S. economy will become significantly less oil intensive. By 2030 U.S. oil demand is projected to be 5.9 million barrels per day (mbd) less than in the baseline case, a reduction of 23 percent. In cumulative terms during the 2007 to 2030 period, the ESLC policy package reduces U.S. consumption by 22 billion barrels of crude oil equivalent through conservation and the use of alternative fuels. This aggregate figure is about 3 times the 7.4 billion barrels of crude oil consumed by the United States in 2006.

—Oil intensity is the amount of oil used to generate a unit of GDP. In 2006 the United States used 0.56 barrels of oil to produce \$1,000 of GDP, down from about one barrel of oil in the early 1970s.

—In the baseline case, the AEO projects that the United States will use 0.36 barrels of oil per \$1,000 of GDP by 2030 (all figures in 2006 dollars).

—Our study calculates that with the ESLC policy package the United States will need only 0.27 barrels of oil per \$1,000 of GDP by 2030—about one quarter less than in the baseline case.

Compared to the baseline case, the supply enhancements and conservation measures combine to reduce imports of crude oil by 8.2 mbd by 2030, a 47.3 percent decrease. Cumulatively during the 24-year period under consideration, the United States would import 32.2 billion fewer barrels of foreign oil. This figure compares to estimated remaining proved reserves of 4.3 billion barrels for Prudhoe Bay in Alaska and less than 30 billion barrels for the entire United States.

Reduced U.S. demand on the global oil supply should lead to modestly lower world oil prices throughout the projection period. The baseline case assumes a nominal price of oil of \$107 by 2030. This study estimates that the price of oil would be \$95 per barrel, or about 13 percent lower, with the ESLC policy package. Lower oil imports and lower world oil prices would mean that by 2030, oil imports will be lower by \$278 billion per year. During the 2007 to 2030 period, the Nation’s economy will avoid the expenditure of \$2.5 trillion for imported crude oil. These savings can be spent on other imports, or they can stay at home—to be spent on domestic output or invested in domestic capital. This study estimates that, through 2030, the policy package will improve the United States current account deficit by about \$175 billion dollars, or about 0.4 percent of GDP. (This figure assumes that approximately \$103 billion of the savings from avoided oil imports will be spent on other imports.)

Enhanced energy efficiency also provides a significant boost to real income. The rise in real disposable income is multi-causal and dynamic. First, productive processes, especially those involving transportation, become more competitive relative to the global marketplace. In essence, lower energy costs enhance exports and lower imports, thereby allowing U.S.-based industry and employment to grow faster. Second, Americans transfer less money abroad to petroleum exporters. The lowering of the “OPEC tax” comes about through both a lower volume of petroleum imports and lower global petroleum prices. As a result, more income stays at home to be consumed on domestically made items or saved and invested in U.S. productive resources. Finally, higher energy productivity and lower income transfers abroad help stimulate greater capital investment and labor participation within the U.S. economy. The availability of greater capital and labor resources means that the economy can reach a higher level of overall production without generating inflationary pressures.

For all these reasons both U.S. real GDP and U.S. real income are higher with the energy policy package. U.S. real GDP is increased by 0.2 percent by 2030 and the level of real personal disposable income is enhanced by 0.8 percent.

—With the energy policy package, the typical U.S. household in 2030 should receive \$1,103 (2006 dollars) more income than it would without the energy policy

package. Cumulatively during the 2007 to 2030 period, American households would experience an increase in income of almost \$1.7 trillion (2006 dollars)—money that could be spent on goods and services, or saved for a more comfortable retirement.

—By 2030 the typical U.S. household would be spending fewer dollars directly on energy for transportation. The combination of higher income and less spending on energy means that the average household would be able to enjoy about \$1,835 (2006 dollars) in incremental discretionary purchasing power. That is, the typical household would have \$1,835 more income to use for savings or for the purchase of consumer goods and services other than energy. The 24-year cumulative enhancement in this “non-energy purchasing power” is nearly \$2.9 trillion.

Because of the higher levels of income and GDP that result from the energy policy package, the U.S. Federal budget balance would improve by a cumulative \$578 billion (2007 to 2030) when compared against the baseline case. The ELSC group estimated that its energy policy package would represent a cumulative (2007 to 2030) nominal cost to the U.S. Treasury of \$180 billion. That is, in Federal budget terms, the energy policy package would pay for itself 3 times over (i.e., have a benefit-cost ratio of 3) during the course of the next 24 years if the ELSC cost estimates prove to be roughly correct.

A stronger economy with lower energy dependency and higher levels of income will create more jobs. In the energy policy package scenario there would be an increase of 1.2 million jobs by 2030, or about a 0.7 percent increase. Among the employment effects expected for 2030, the model projects 139,000 more manufacturing jobs, 91,000 more jobs in professional services, and 199,000 more jobs in travel and tourism. As mentioned, the study assumes that the cost of domestic motor vehicle manufacturing relative to the baseline increases steadily, reflecting higher costs for motors/engines, lightweight materials, advanced electronics, and other new technologies that help achieve higher fuel efficiency. This altered production pattern will cause these industries to see greater demand for their products and therefore higher employment levels.

SUPPLY SHOCK INSURANCE

The adoption of the ESLC policy package can significantly reduce the economy’s vulnerability to an oil supply shock. Simulations were conducted in which the price of oil was doubled in 2026, with the price remaining 66 percent higher in 2027 and 25 percent higher from 2028 through 2030. Such a shock would harm the economy regardless of the energy policies in place, but the ESLC policy measures reduce the damage to income and employment by 30 to 40 percent.

—Taking the AEO baseline as a point of departure, the oil price shock produces a real disposable income loss of almost \$600 billion in 2006 dollars by 2027. In contrast, the maximum income loss under the ESLC policies is only \$366 million, only 63 percent of the damage without reduced oil dependence. Under the baseline, a doubling of oil prices results in the loss of more than 4 million jobs by the second year of the shock, while the loss under ESLC policies is just 2.5 million jobs.

—The cumulative shock-induced negative impact on GDP over the period 2026–2030 is estimated at \$1.3 trillion under the AEO baseline but only \$0.9 trillion in the ELSC case (all in 2006 dollars). The cumulative negative impact on real disposable income over the same period is estimated at \$1.6 trillion in the AEO baseline and \$1.0 trillion in the ELSC case (2006 dollars).

CONCLUSIONS

Econometric models are useful tools for studying long-run economic effects of energy policies. Simulation analysis with the University of Maryland’s respected Inforum LIFT model shows that policies to reduce America’s dependence on oil through fuel efficiency gains, further diversification into biofuels, and increased domestic production of conventional oil and natural gas can give a modest boost to household incomes and make the U.S. economy healthier in good times.

From an energy security point of view, however, the biggest advantage of implementing policies to reduce America’s dependence on oil is that they could make the United States less vulnerable during an oil price shock. If the United States were less dependent on oil, there would be fewer layoffs if oil prices doubled in a crisis period, fewer industries would close down operations, the Strategic Petroleum Reserve could backstop production for a longer period of time, and the negative consequences of an economic downturn could be significantly softened.

I would like to thank you for your consideration of this analysis.

BIOFUELS

Senator DORGAN. Thank you very much for being here. Let me begin asking a couple of questions, then my colleagues will certainly wish to ask questions as well.

Secretary Karsner, you and I have discussed this issue at some length, particularly the biofuels issue. We have about 16,000 flex fuel vehicles in North Dakota, my State. And we have, I think, 23 or 24 gasoline pumps, in a State 10 times the size of Massachusetts where you can get E85 and 16,000 flex fuel vehicles, so there's a dysfunction here. All of us want to have more flex fuel vehicles. We want to be able to drive up to pumps and draw a blend, perhaps of 20, 30, 40, or 50 percent biofuel, and especially of E85 fuel and yet we cannot as we have infrastructure problems. How do we solve those?

Mr. KARSNER. That's a great question, sir. In fact, the question focusing on E85 pumps and flex fuel vehicles is emblematic of the problem as a whole. The problem as a whole is that we have a sufficiently mature technology and availability of resources that can help us mitigate and hedge the security risk; but we haven't devised sufficient policy with a scale and a rate that would be commensurate with the magnitude of the challenge.

So, with regard to E85 and flex fuel, last year we had a banner year—450 new stations added—equaling a total national capacity of 1,200 stations. So, even with 60, 70 percent growth year on year, 750 had been the total we had ever put out of flex fuel pumps. Even if we maintained that rate of 450 per annum—that record rate—of new E85 pumps across the Nation, it would still take us up to 100 years to get to a scale that would matter, 50,000 pumps available for the country.

So, the truth is our current programming of voluntary stimulus falls short of the problem. Every little bit matters.

Senator DORGAN. Secretary Karsner, is it the case that the so-called market system probably won't get us there because the major oil companies have very little interest in putting any E85 pump out on their island?

Mr. KARSNER. We have seen very little uptake by the majors in terms of E85 interest.

Senator DORGAN. And so that is why there's an issue of public policy here and that's what I would like you to think about. I'm going to ask you again about the public policy menus that are available to us to marry up the dramatic increase production of renewable fuels which we're embarked upon. And, at the same time, what infrastructure is needed to pump that biofuel into a flex fuel vehicle?

FUEL EFFICIENCY

I will come back to you in just a minute.

Mr. Smith, tell me what prevents you—how many trucks do you have?

Mr. SMITH. We have about 77,000, a little more.

Senator DORGAN. And what prevents you—you're a big purchaser of trucks, one of the Nation's largest, I assume—from saying, "You

know what? I want more efficient trucks and so I'm going to make an informed choice as a purchaser and buy only this kind of truck."

Is it not available on the market at this point? Do we need public policy that moves on CAFE standards because the marketplace is not addressing it, or not providing it?

Mr. SMITH. Well, the short answer to that is, yes. The ability to improve fuel efficiency for trucks is very well proven, in a lot of studies and in the practical realm. We, along with Eaton Corporation and the Environmental Defense Fund, pioneered a new electric hybrid pick-up and delivery (PUD) vehicle. It produces about 50 percent greater fuel efficiency, about 90 percent greater emissions efficiency or emissions reduction over our traditional diesel powered PUD vehicles.

Those vehicles are about 75 percent more expensive from a capital acquisition cost. So, obviously, being in a competitive business, we can't buy one set of vehicles if there is no economic return and someone that we may be competing with is not. So, it does require Government programs to get from here to there. In the case of the over the road vehicles, the fuel standards, as we've recommended them and by the Energy Security Leadership Council, in the case of hybrid vehicles for pick-up and delivery, tax credit expansion would also get the job done.

Senator DORGAN. Have you had other business executives look at you cross eyed and say, "What on earth are you thinking going to Washington asking for more regulation?"

Mr. SMITH. Well the short answer to that is, yes.

As you may know, Senator, I've spent a lot of time up here over the last 30 years basically arguing against Government regulation. It took a considerable intellectual journey for me to come to the point of concluding that absent Government action, regulation, if you will, the problem can't be solved.

Because as you said in your opening statement, the oil market is not a free market. It is governed by a cartel which controls price. And it is increasingly governed by supply demands—dynamics where proven oil reserves that are owned by state oil companies, over 90 percent.

As the Admiral pointed out, many of these state actors understand the vulnerability of our economy. Some of them are not state actors too, like the terrorists. So, there really is no way to solve the problem unless you, in the Congress and the Government, move forward on some of these. And the record is pretty clear. In 1975, when the original CAFE standards were enacted under a Republican administration, they had dramatic effects on the fuel efficiency standards of the country. I mean, even Henry Ford, who at the time was the CEO of Ford Motor Company, in retrospect, acknowledged the country would never have become as fuel efficient as it did, absent those CAFE standards.

ENERGY SECURITY

Senator DORGAN. I think, you know,—first of all let me say that the work that has been done by the Energy Security Leadership Council was work that I was unaware of until I, much earlier this year, had a whole series of meetings and was acquainted then with the SAFE Act. When Dr. Wescott talks about the reduction in oil

intensity of our country, if we adopt a series of these recommendations, I think that this is really important work.

The substantial relationship between the vehicle fleet, the transportation side in our country and imported oil had not occurred to me before. But nearly 70 percent of that which we are using goes for the transportation fleet and over 60 percent of our oil is now coming from other, often very vulnerable, places in the world. It's important to pull this piece out and take a look at it and begin to address it with a series of policies.

This doesn't address electricity generation or transmission of power and so on. We have a lot of things to do on energy. We're working on all of those, but in this piece specifically with efficiency, CAFE standards, greater auto efficiency, renewables, through biofuels, increased domestic production and the issue of security through diplomacy. This, I think, is a significant contribution.

And I think in many ways, Senator Craig and I are odd fellows here. He probably would shade more on the production side. I'd shade more on the efficiency side. But I think both of us recognize that we need some of each. We need the best of both and I think this plan gives us an opportunity to look at that in a very different and a very significant way.

Dr. Wescott, can you tell me again your analysis of the reduction in oil intensity in this economy if we proceed on all four of these areas?

OIL INTENSITY

Dr. WESCOTT. One of the ways to look at oil intensity is just raw oil intensity. How many barrels does it take to make \$1,000 of GDP? In the early 1970s it took us a little over one barrel of oil to make \$1,000 of GDP. In 2006, it took us about 0.56 barrels of oil to make \$1,000 of GDP. So, it's just a little over one-half a barrel to make \$1,000 of GDP.

The U.S. Department of Energy's, Energy Information Agency projects that in our business as usual case between now and 2030, that by 2030 it would be taking about 0.36 barrels of oil to make \$1,000 of GDP. When we did the simulation study here, we estimated that with the SAFE package, it would take about 0.27 barrels of oil to make \$1,000 of GDP. So, that's about a 25-percent reduction, about a one-quarter reduction from the business as usual case.

Senator DORGAN. Very significant. I'm going to call on my ranking member in a moment.

I was sitting here thinking. My father ran a gas station while I was growing up. And so, as a young boy, as would be the case when your father runs a gas station, I pumped a lot of gas on weekends and nights. I did this all of my early life and some say my occupation hasn't actually changed very much.

So, I recognize, having been out at the gas pump a lot as a kid, that service stations will do what is in their best interest.

Secretary Karsner, let me come back to where I started to ask you: How did we get to the point where we are producing all of this biofuel quantity and have so few pumps to pump that into these vehicles?

One of my great concerns is this, we're going to produce and produce more ethanol, and probably cellulosic ethanol, and so on, right up here. Then all of a sudden, people are going to understand that we have all of these flex vehicles on the road, but we don't have a market to get this from the pipeline into the gas tank. And all of sudden it's going to drop off the front edge about 5 years from now.

So, tell me again your notion of how we deal with the infrastructure issues so we don't have a State like mine, with 15,000 vehicles and 23 pumps pumping E85?

BIOFUELS INFRASTRUCTURE

Mr. KARSNER. I think you've characterized the most important aspect exactly correct. We may be facing a cliff when this country arrives at E10 or ends our splash blend penetration, which we're on a current trajectory to do in the next 5 years.

What happens then? How do we move up the ladder? Is it to E12, E15, E20, E85 with one big massive jump, and are we doing the right things now to prepare for that?

In many ways when you look through the entire supply chain of the problem for alternative fuels penetration, it's the easiest part of the puzzle, but it is the most intransigent. Also because, as you're indicating, you're fundamentally asking leaders of industry to voluntarily erode their profit margins, whether you're talking about adding extra equipment, \$45 to \$200 for flex fuel vehicles, or whether you're talking about adding extra pumps or pump modifications.

And so the real question is how do we get industry to arrive at a profitable paradigm for which they would make those decisions? And we, in DOE's Vehicles Technologies Program, haven't focused sufficiently on this over the last decade because there was really no technological breakthrough necessary. But we need a far greater level of fleet penetration of all manufacturers that serve the market for flexible fuel, so that we have a more predictable, uniform, geographically distributed market. And the gas station owner can know what the traffic and numbers would be, so that they would welcome E85 or other intermediate blends.

Senator DORGAN. Just one final point. We use, I believe, about 145 billion gallons of fuel a year. If every single gallon were blended with 10 percent biofuel or 10 percent ethanol, that's a total market of 14.5 billion gallons. The President wants to get to 35 billion. The Energy Committee wants to get to 36 billion. So, with the use of 14.5 billion at 10 percent, you've got to blend.

For that you've got to have blend pumps with 20, 30 and 40 percent biofuel. You have to have E85 pumps. You've got to be using much, much more than we would use in a 10-percent blend. Otherwise you're going to build up then you're going to have the cliff and the market for ethanol is going to drop precipitately. And I want ethanol and the biofuels to be able to be used to extend our supply and to reduce dependence on foreign oil which is exactly what the SAFE plan is about.

Well, I've used my time. Let me call on Senator Domenici.

Senator DOMENICI. Well, Mr. Chairman, first of all let me say I think that whether you used your time or not, that this is kind of

the way we ought to do business here. Is to just get involved and talking with each other, especially when you have a panel like this one. I consider your questions and their answers to be just as much in response to my concerns as his because it's pretty obvious that for the first time we're addressing about three issues that we just have to decide whether we're going to address them or not.

And frankly, I was already convinced, but today puts the final frosting on it, that we have not been addressing the CAFE standards to the extent that they are a problem. We haven't been extending or addressing them in the various committees that have jurisdiction.

Although, I understand that this very day, the Commerce Committee, may be, by a historic coincidence, has passed CAFE standards. They may have addressed the CAFE standards in much the same way that you did in your report. Is that correct?

Senator DORGAN. Senator, we actually reported out a bill, favorably.

Senator DOMENICI. Right.

Senator DORGAN. Out of the Commerce Committee today, which is a real significant achievement in my judgment.

Senator DOMENICI. So that's there while the Energy and Natural Resources Committee reported out a bill that on the biofuel side, is the maximum amount we can do and leaves hanging one big issue that we're talking about here today. We have to decide what must we do, in the bill that we carry forward.

What are we going to do about infrastructure credits or the like for the new gasoline pumps that we're going to have to have by the thousands? What are we going to do about it? Are we going to sit by and watch while it does not happen or is there something significant we must do. And obviously, if there is, it ought to be in that same bill that produces the new mandate with reference to the CAFE standards.

So, that's two of them, obviously there. We must do something about it. There is no question that we did not discuss here, but we must discuss sooner or later, the need for more refineries in our country capable of producing refined products. I don't know whether we'd do anything about it in a bill or whether the companies talk with us about what we must do to change the regulatory schemes that make it almost impossible for it to move in that area.

And then the last, obviously, but not least, we have to decide exactly what the mix is going to be for biofuels. Although, I think the Energy Committee may have done that. We may have the right mix. It may be there.

That's the end of my questions, merely my observations of what we ought to do. We'll decide. We'll get together with Senator Bingaman, chairman of the other committee that has jurisdiction over most of this.

And I hope, Mr. Chairman, and Senator Craig, that we can all get together and decide what we want to do. Do it together and we have one bill, put yours in with it. It will be just as much yours as anybody else's, perhaps, more so. And let's decide if we're going to do something about CAFE.

Senator Craig, I commend you. Heretofore, you have obviously not gone as far with CAFE standard modification as you have since

this committee did their work. And I understand why you did. You told me why. And obviously, in the next 15 minutes we'll hear from you, why, because I'll yield to you. But we keep hearing that from the automobile manufacturer and those—

I'm from New Mexico so obviously we don't produce cars, yet. We have broad open countryside, just like you. Perhaps a little more growth in industry in our State than in yours, but we still have to—

People like me are elected to address the Nation's problems, so clearly, we're going have to make—I'm going to have to join with people like you; and like you, Senator Dorgan and see what we can do about this particular area of concerns. And I just want to tell you and whoever is listening, I will.

We're going to do something and then we'll see what the House decides to do. That will be another interesting stop over point at some point.

Mr. Smith, I want to say to you, thank you for all the work you did in putting together your committee, time, effort and money you spent. I think you produced something rather extra special because it's brief. It's not 50,000 pages, so somebody might read it. That has to make decisions or might ask somebody to extrapolate from it what the five or six things we ought to be doing and we'll do them.

And Mr. Secretary Karsner, thank you for your work. It seems like every time we turn around, you're up here testifying. I understand you do have people in your department that when you delegate, they do the work, even while you're up here. Is that correct?

Mr. KARSNER. That is correct, sir.

Senator DOMENICI. Alright, I hope so. I would yield back, Mr. Chairman, thank you.

Senator DORGAN. Senator Domenici, thank you very much and Senator Craig and I will then begin talking to you about co-sponsoring our bill and we'll move it along.

Senator DOMENICI. That's right.

Senator DORGAN. We appreciate your work. Let me make one point before I call on Senator Craig. This is not the authorizing committee. We will appropriate money for renewable energy accounts and so on. So, that's an obvious interest of this subcommittee, but the authorizing committee has made great strides with the leadership of Senator Bingaman and Senator Domenici, just in the last 1½ weeks.

So, that's good news for all of the things that we're talking about today. I appreciate Senator Domenici's work on that.

Senator CRAIG.

Well, Mr. Chairman, thank you very much. All that we've heard today is projected outward, 10 years, 20 years, 25 and 30 years and that's a reality of what it takes to retrofit to this phenomenal country of ours.

One of the vice presidents for Chevron was in to visit with me today about the difficulties they're having in Nigeria. He said his president likes to say, and I think I'm quoting it accurately, "We've invested \$11 million a year for 100 years and it still isn't enough," speaking of his company. One hundred years of magnitude of in-

vestment to put that service station on every corner of America. And now we want to fix them, re-fix them, overnight.

I don't disagree with you, Fred. I've been around here, some would say too long already, 27 years. And yes, my time here has been a bit of a journey, and I've changed, a bit as I've looked at where we need to get and the vulnerability of where we are. That's why Byron and I joined hands this year in a combination of things that you all brought to us that we thought was a very dynamic approach for dealing with a phenomenally important problem.

CURRENT RESOURCES

But in that journey to where we want to get, we have to move along a pathway. We, in part, know how to deal with. That's increased production of current resources as we refine and improve and modify and change or we will become increasingly vulnerable if we fail to do that in this interim period.

So, I want to turn to you, Johnnie, and visit for a few moments about a resource that we know is there, but politically we have been denied access to for a long period of time. And that's the Outer Continental Shelf. You added an area off the coast of Virginia to your most recent 5 year plan. You mentioned that. It looks like a little piece of pie.—Where's my chart? —I track you closely.

If all goes well, you estimate it will take 20 years before we begin production. Something like that, I think. Question, how soon can production begin in the new lease 181 gulf area and why is that so much sooner than what we know could be done as it relates to the natural gas find 50 miles offshore Virginia.

Ms. BURTON. Well, one thing.

Senator CRAIG. Your mike, please.

Ms. BURTON. Yes. Virginia is not ready to be leased. It has a congressional moratorium.

Senator CRAIG. Explain the ready—not ready, I mean.

Ms. BURTON. We plan in October to have a sale in Sale 181 areas in the central gulf. A company can bid for leases. They can lease areas in the central gulf and potentially could start exploratory drilling next year.

Now it will take them several years to explore and to set their development plan and to produce. But let's say it will take 8 or 9 years at the most.

Virginia, on the other hand, is not ready to be leased because there is a moratorium on those lands and there's a Presidential withdrawal on those lands. And until both of those things are changed, we can't even plan a sale. We can't even do presale work to get ready for a sale.

So, we have tentatively scheduled a sale in 2011, assuming Congress would lift the moratorium. Assuming the President would modify his withdrawal—then we can start doing all of the environmental work. Then we can have a sale. So, the sale could not happen before 2011 and that is at the earliest.

There is no infrastructure off Virginia's Coast. So, assuming they find something of interest, it will take a while for them to devise a production plan, a development plan and finally to bring the resource onshore. So, maybe 15 and upwards years before that can be feasible.

This industry takes time to develop resources. Folks think that when we're going to have a sale next year; we're going to have production. That isn't the case. It may be the case onshore. It is easier, but not offshore.

Senator CRAIG. Well, I thank you for expressing and explaining the lead time necessary in a frontier environment. The lead time necessary in a known environment and the light green is representative of 181 is still a time factor of substantial proportion.

As you can see by the chart behind me, there's a line drawn in the ocean, beginning at Florida where no drilling is currently taking place. This—compromise No Zone is roughly one-third of the gulf. I know we haven't allowed—been allowed to survey in the Florida waters, but is there any reason why this area might not contain roughly the same amount of resource as the rest of the gulf. Are the patterns, the geologic patterns still there?

Ms. BURTON. So far as we know, sir, the geologic patterns do not respect political boundaries and therefore if there is deep water in the deep gulf discoveries and if a trend is shown, it is not going to stop where the line stops. So there is logically a great probability that the eastern gulf also carries a lot of resources.

We do not know it because there has been no exploration. No work has been done in the eastern gulf for over 20 years. And so what we know of the eastern gulf is very, very sparse.

ENVIRONMENTAL CONSEQUENCES

Senator CRAIG. Does exploration for the purpose of finding and developing knowledge of a resource not exploiting it but developing knowledge of a resource have any environmental consequence?

Ms. BURTON. It depends on what we call exploration. Seismic surveys, the main tool industry uses to learn more of what's under the surface of the Earth, does not carry very onerous types of environmental risk, but it carries enough that we would not give a permit without doing environmental studies.

So, everything is protected as much as we can protect it. We do have the ability to give permits for seismic surveys, however seismic surveys are extremely expensive and industry is not willing to spend that kind of money unless they know they can then act on what they learn.

OIL PRICE SHOCK

Senator CRAIG. Dr. Wescott, in Idaho, we already feel like we're in an oil price shock with all time high gas prices. There isn't a business out there or a family at this moment that isn't scratching their head because they didn't budget \$3 gas into their business plan or their family budget. However, this is occurring during—due to refinery shortages, oil prices and supplies are not even a part of that today.

Question, can you please describe the effect of an oil shock, by that term. I think all of us are in a bit of shock today, but the shock in your study. What might cause this and how this might be mitigated with more U.S. production as well as more production in our own hemisphere, that is Cuba or somewhere like that beyond our known reserves?

What's the cushion to a shock of the kind that you see in your study?

Dr. WESCOTT. First of all I would just mention, you mentioned \$3 a gallon. The "Today Show" this morning had signs that showed \$4.33 in San Francisco this morning. So, prices are very high.

When—if we just think about an oil shock hitting the U.S. economy as in 1973–74, as in the early 1980s, as in 1991, economists think about channels of influence or lines of impact on the economy. The first one, of course, is on the pocketbook of the average household.

And energy, historically, has been somewhere between 3 and 8 to 9 percent of the family budget. So, in the low oil price days of the early 1990s for example, when it was just 3 percent of the family budget, obviously that was a small piece of the budget. Now as we get up to 8 and 9 and 10 percent of the family budget it gets a more substantial piece. And if it doubles, then you're basically constraining the purchases that people can make of other things.

And so, approximately one-half of all U.S. households are basically cash constrained, they don't have surplus funds. They don't have thousands of dollars in the bank. And so, right off the bat if you jump the price of oil and double it, as we did in this oil shock, you're forcing about one-half of American households to almost immediately cut back on their movies that they go to and their purchases of other items. So, that's one of the key channels of influence.

Another key channel of influence is through the financial markets. And especially if it's caused by a terrorist attack or something a 9/11 or one of these sorts of events, it can have psychological effects. And so, we know that after 9/11, for example, the U.S. stock market fell by almost one-quarter. The Dow Jones average fell. So, that has wealth effects on people.

People tend to consume about 3 to 4 percent of their wealth every year. And if suddenly their household wealth is sharply reduced because of a bad psychology or fear of terrorism or whatever that could also have a negative effect on the economy.

The third way that it can affect the economy is direct industry effects. There is going to be some industrial activities that are just plain shut down immediately if prices double.

And I don't know, Mr. Smith's exact business in details, but there are some activities when if the price absolutely doubles there are some flights that would not take place. Some airlines would cancel flights. Some chemical factories would shut down. They just couldn't—they couldn't physically run their business. They're tied into contracts or whatever and they would get less for selling their goods then it would cost them to make it. These would be some of the very disruptive effects of an oil shock.

Now the second half of your question; what could be done to make a better outcome? The price of oil itself—is a world price. If we had a shock and the United States produced more of its oil, we would still have many of the same price effects, okay. So, it is not a magic here that would—but there's one big difference. If right now we're importing about 60 percent of our oil. If we were importing only 30 percent of our oil some of that—when we have a price shock domestic producers in Texas, off shore, whoever; some Ameri-

cans are paying more for oil, but people—Americans are gaining about one-half of that. Let's say they would be getting 70 percent of it if we were only importing 30 percent. So, that actually flows into the American system and that doesn't—the American economy. It doesn't hurt it as much, but when we're heavily dependent on foreign oil, there's more leakage in the system. So, if the lower we could have the import component, the more insulated we would be even at a price shock.

Now there's one other part of this story. That gets to just this raw constraint on supply. In 1973 we had an oil embargo and we just, plain, had the oil cut off from being shipped to the United States. That is why we had gas lines, as you well remember. So if we had more domestic production, we would presumably—would be at less risk of this sort of oil cutoff or shut off kind of risk.

FUEL EFFICIENCY

Senator CRAIG. Thank you, Doctor.

Mr. Smith, a couple of weeks ago, the Idaho State Snowmobile Association was in my office visiting with me. I say this, I think, in consort with Byron, as to a concern we hear about out in the rural States, like Idaho and North Dakota. One of the questions asked of me at that time by a member of the association was, well, Senator, we see you're supporting this legislation for CAFE standards. Don't you understand we need big trucks? I mean, we've got to pull our snowmobiles and our campers and put our family in them. We've got to go over the mountain and we need power.

Your company that talks about efficiencies; drives toward efficiencies and yet, you need power. Is it possible to get higher efficiency trucks that still have the power, if you will, to pack the load that you need for long distance, that you need for recreation?

You know, when I drive into a parking lot anywhere in Boise, Idaho, you would think I was in a SUV lot. That's Idaho today—or a truck lot.

Mr. SMITH. Well, Senator, we operate thousands of big trucks that are comparable to anything that anyone in recreational sector would need to move snowmobiles or boats or anything else. And there is a lot of research which is referenced in my full testimony that shows that there is the capability to significantly improve the efficiency of large trucks.

And we do, in our recommendations to the Nation, therefore strongly suggest that the new fuel efficiency standards apply to this category of equipment as well as light trucks and cars.

Senator CRAIG. Thank you. Mr. Chairman, thank you.

OIL AND GAS DEVELOPMENT

Senator DORGAN. Senator Craig, thank you very much. Let me ask just a couple of additional questions.

Admiral Johnson, you're probably familiar with the agreement we've described, lease 181 in the Gulf of Mexico, that was reached last year. Some had raised concerns we couldn't go further into the eastern gulf because of the military mission line. Is that line an impediment to further oil and gas development in your judgment in the Gulf of Mexico?

Admiral JOHNSON. No, I don't think so. It's certainly a concern and something that would require close dialogue between the interested parties and the Department of Defense and our ability to conduct training there. It's become more important to us as a result of the closing of the training areas off the Vieques in Puerto Rico.

And so, our training in some ways has intensified in this area, but I think that there with prudence, with careful dialogue, there's an ability to be able to do both. And again, because we operate in the Arabian Gulf; we operate in the North Sea and areas that are quite intense, and it creates a few restrictions. You have to do a little bit more prior planning to work around it, but I think in the long run, that they would be compatible.

TECHNOLOGY DEVELOPMENT

Senator DORGAN. Mr. Smith, when I was a teenager I bought a 1924 Model T Ford for \$25 that was all rust and no wires and I restored it all over in about 2 years. And I was thinking you put gasoline in that exactly the same way you put gasoline in a 2007 Ford. Nothing has changed.

When we talk about CAFE standards and the greater efficiency of the system that powers our vehicles, I'm in support of that greater efficiency. But I guess my preference would be that this be a bridge to get to the next technology, hydrogen fuel cells, for example. What's your assessment of whether that's 20 years or 40 years from now?

Mr. SMITH. Well, Senator, I'm not qualified to assess the ability to get to some new technology like you mentioned. I am a believer that there will be technological breakthroughs. But, I think in our particular case what we have tried to do is to have very practical recommendations on what today's technology is rather than, to use an old aviation term, you know, have a wish and a prayer that these technologies will be produced in the future.

I hope you kept that car. It would be worth a lot of money right now too, I bet.

Senator DORGAN. I did not. I discovered as a junior in high school you couldn't date much in a 1924 Model T.

So I sold it, regrettably.

Let me also ask about the light, medium and heavy trucks. I share Senator Craig's issue here in the sense that North Dakotans don't want to go buy a Geo to go check the calves at 30 below zero with a 40 mile an hour wind, you know. They want a durable heavy-duty vehicle out on the ranches and so on.

But, as I mentioned earlier, we use twice as much gas per person as New Yorkers do. It seems to me that would make it very important that we have more efficient vehicles including more efficient large vehicles. But the industry would say to us: "You know what? It's not possible. If it were possible to make more efficient vehicles, we'd be making them. We'd make them because Mr. Smith would love to buy them." Your assessment of that?

Mr. SMITH. Well, Senator, one of the members of the—council, the CEO of Auto Nation, came by to see me long ago and he gave me a chart. He sells more automobiles than anybody in America. Overall fuel economy, now this is a little dated given the price of fuel at \$4 a gallon in San Francisco, but let's see it was consider-

ation number 12. After sound systems, interior conveniences, seating capacity, ergonomics, in fact, it was even after cup holders, so the same thing actually applies in the industrial truck sector because the market responds to what's here and now.

And the important thing about the recommendations we made on these fuel efficiency standards, they're very different than the old CAFE standards. They are by category. So you can't make small Geos and average them out to have fuel thirsty SUVs in the category that constitutes the type of vehicles that your constituents need.

You have to achieve fuel efficiency standards so your constituents are going to spend less money on the fuel for those vehicles and still be able to pull their agricultural equipment or whatever they need. Just like FedEx pulls these heavy loads of packages in freight.

Senator DORGAN. Let me make one final point and then one question finally to Secretary Karsner.

I did not respond as I should have. I view this as a bridge. I, and several others, have been pushing very hard to move more aggressively toward a different technology future using hydrogen and fuel cells, where you get water vapor coming out the tail pipe. You get twice the efficiency of power to the wheel and hydrogen is everywhere.

And so, ultimately I want to disconnect from our need and demand for oil. Now that's not going to happen quickly but we need to make that happen at some point. And there is, as I've said from time to time, this notion in our country that only real men dig and drill. The only real energy future is a dig and drill.

Boy, there's a lot to be gained by efficiency, by conservation and other things. I agree we need production in certain cases, but we need a balanced plan. And I especially want to find a way to pole vault to a different kind of energy future. More specifically from my standpoint, it ought to be a hydrogen fuel cell future.

Now, Secretary Karsner, I like your work. I think you're well qualified for your job. You and I have had a chance to visit some. I hate to always ask you the tough question as the last question. But you probably know what I am going to ask.

CAFE STANDARDS

The Commerce Committee today passed new CAFE standards. These are auto efficiency standards and I was a part of it. CAFE is a significant part of the SAFE Act, which I'm pleased about, but I know the administration will probably view this as a mandate, which in fact it is. What will be the administration's position?

I know the President has indicated he would not support a mandate. He thinks it should be voluntary and so on. Are we going to be facing a veto threat? What are we facing from the administration as we try to push through automobile efficiency standards that are mandatory?

Mr. KARSNER. Well, I haven't seen this morning's legislation, but if it is in the spirit of what these gentlemen and what your legislation proposes in the SAFE Act, I don't think it would be the case that the administration would be hostile to those things that would

modernize and elevate CAFE standards. In fact that is part of what the President's plan called for.

I'm not sure what the antecedent was historically for that, but I think as your partnership with Senator Craig illustrates, we're long past old partisan divides on this issue. We need both increased alternative sources of supply and increases in efficiency.

And so, from my perspective the administration looks forward to working with you all to integrate those.

Senator DORGAN. But this will be regulatory and a mandate, although to be sure it has off ramps.

Senator CRAIG. He said yes.

Senator DORGAN. You know, I think, regrettably, that I know what will be said later, but I would like, Secretary Karsner to really urge the administration to take a new look. The last time they testified before the Commerce Committee on this subject not many weeks ago, the refrain was, "Yes voluntary standards. Yes, improve it, but voluntarily. No mandates. No regulation."

It seems to me all of us have to give a little here. And the only way to make progress on efficiency is not by saying to the auto industry, please help us. I mean we've seen for 25 years very, very little progress in this area. I think that this panel says it right and I think the Commerce Committee said it right this morning.

It is time for us to take some aggressive and some bold action. And I hope you will pass that word back to the administration. We all ought to be working on the same sheet here and that is regulation. It should be mandatory with some off ramps and I worry very much that we will hear—not good things in the coming days about it.

But I encourage you. You're a very accomplished person as I said to you before. I think you do a good job. You come to this with great skill and good knowledge in these areas. So help us, would you, with the President and the White House on these issues and the Office of Management and Budget (OMB)?

Mr. KARSNER. I think the President and certainly Secretary Bodman share your sense of urgency about getting some legislation passed that includes efficiency as well as the alternative supply.

ADDITIONAL COMMITTEE QUESTIONS

Senator DORGAN. I want to thank all of the witnesses. Some of you have come a long distance today.

Director Burton, I saw the announcement of your decision to leave public service, congratulations for your public service and we wish you well.

Secretary Karsner, we look forward to continuing to work with you and Mr. Smith, and Admiral Johnson, thanks for your work.

[The following questions were not asked at the hearing, but were submitted to the Department for response subsequent to the hearing:]

QUESTIONS SUBMITTED TO HON. ALEXANDER KARSNER

QUESTIONS SUBMITTED BY SENATOR PETE V. DOMENICI

LOAN GUARANTEE PROGRAM

Question. I understand that the inter-agency review of the draft regulations for the loan guarantee program is nearing completion and the regulations will be published for comment. When do you predict the draft regulations to be released, and when do you believe the final regulations will be implemented in order to make the first loan guarantee?

Answer. On May 16, 2007, a Notice of Proposed Rulemaking (NPR) was published in the Federal Register V. 72 Fed. Reg. 27471, for DOE's "Loan Guarantees for Projects that Employ Innovative Technologies." The NPR provides for a 45-day public comment period which ends on July 2, 2007. The final regulations will be promulgated as soon as practicable after the close of the comment period.

Question. While DOE and OMB are working to develop the draft regulations, DOE is supposed to review the existing applications. Is the Department staff working on these applications, and have you been in contact with the applicants?

Answer. The Department has begun both a technical and financial review of the pre-applications received in response to the initial Title XVII loan guarantee program August 2006 Solicitation (Solicitation No. DE-PS01-06LG00001). The Department will contact applicants when the Credit Review Board makes a decision on whether to invite the applicant to submit a full application or to inform the applicant that they will not be invited to submit a full application.

DEPLOYMENT OF TECHNOLOGY

Question. What is the Department doing to encourage the deployment of innovative alternative fueled cars and trucks?

Answer. The Department's approach to promoting new technologies couples technology push with market demand pull, and works to address barriers to the market adoption of advanced technologies through various program initiatives. One example is the Clean Cities activity within EERE's Vehicle Technologies Program. Clean Cities identifies fleets and other end users to demonstrate and deploy advanced vehicle technologies in the final research stages. This demonstration and deployment effort provides researchers and stakeholders with vital "real world" performance data necessary to prove new technologies prior to a full commercial launch to the mass market. We also coordinate closely with States, universities, and industry partners to conduct validation and learning demonstrations of new vehicles, such as plug-in hybrids. In addition we are developing several projects to promote and recognize innovative vehicle and fuel technologies under EPACT section 1008 authority.

In addition, the President recently signed Executive Order 13423 in January 2007. Among the requirements in the Executive Order is one requiring Federal agencies to reduce vehicle fleet consumption of petroleum products by 2 percent annually through 2015 and to increase non-petroleum based consumption by 10 percent annually. The Department is already required by EPACT 2005 to assure that 75 percent of all Federal Government vehicle acquisitions must be alternatively fueled vehicles. The Executive Order requires that there be 100 percent use of alternative fuels in those vehicles whenever those fuels are available and cost effective. The Department is currently working on a plan to accelerate the purchase and use of innovative alternative fuels at all DOE facilities and working to overcome barriers to alternative fuel use. The Department will communicate its experiences in implementing this plan to serve as an example to other Federal agencies with the same goals.

Question. What is the Department doing to make sure the necessary infrastructure is in place to support biofuels or hybrid electric vehicles?

Answer. The Department of Energy, with the help of many Federal agencies, is taking a leadership role in commercializing cellulosic biofuels that includes fuel production technologies, transportation and delivery infrastructure issues, and vehicle testing and optimization. The Department recently selected six advanced technology biorefinery demonstrations to validate cost competitive biofuels. These investments, including private capital, could infuse up to \$1.2 billion towards commercialization of biofuels. Additionally, the Department just released a solicitation for up to \$400 million, including private funding, to support the development of small-scale biorefineries that can quickly be moved to commercial scale.

The Department is also formulating a biofuels infrastructure strategy that brings together our biofuels and vehicle technologies programs to examine vehicle performance impacts from operation on various biofuels blends. The Department is working

with other Federal agencies, to identify and promote infrastructure needs that will be necessary to handle the rapid increase of ethanol through expansion of E85 or other blends necessary to meet the President's goal of displacing 20 percent of America's gasoline use in 10 years. To further support this goal, the Secretaries of Energy and Agriculture are co-chairing a board of 10 Federal agencies to look at all aspects of a bio-fueled economy and publish a National Biofuels Action Plan that communicates the government's strategies for production, delivery and end-use necessary for widespread deployment and commercialization.

No new infrastructure is necessary for conventional hybrid electric vehicles. As the Department performs the research necessary to enable plug-in hybrid electric vehicles, we are examining various issues related to the integration of vehicles into the electric grid. For example, many households do not have access to household electric connections (they park their vehicles on the street). Also, an initial study by DOE's Pacific Northwest National Laboratory has identified regional variations in the availability of off-peak electricity. We will conduct the necessary research and analysis to help identify and resolve such issues.

The Department has developed a comprehensive Plug-In Hybrid Electric Vehicle (PHEV) Research and Development Plan to guide its efforts. The plan describes the activities that will be performed to develop the appropriate PHEV technologies, identifies analysis that is needed, and summarizes eventual deployment actions. The plan describes the studies that will be performed to determine if there will be any major impacts on our electricity infrastructure. Much of this work is already underway.

VOLUNTARY ADOPTION OF ALTERNATIVE ENERGY TECHNOLOGY

Question. Mr. Smith, with FedEx, in his testimony suggested that market forces weren't enough to encourage the adoption of alternative energy technologies and that Federal mandates would be a necessary tool to increase efficiency. Do you agree with this statement?

Answer. Effective capital formation, at the rate and scale necessary to achieve our national objectives, will require durable policy signals from Congress. Private investors can and will deploy emerging energy technologies if the Federal Government makes clear its long-term commitment to a new energy economy. For life cycle returns to be recognized as secure, term project financing, which can be facilitated through loan guarantees under Title XVII, is indispensable.

Question. What is the Department doing to help encourage the commercial deployment of new alternative energy technologies?

Answer. The Department's approach to promoting new technologies couples technology push with market demand pull, and works to address barriers to the market adoption of advanced technologies through various program initiatives. By identifying markets where the life-cycle costs of advanced energy technologies currently form a compelling economic argument, the Federal Government will create demand pull, which will increase the economies of scale and drive the technologies down the cost curve. The Department also stimulates the commercialization of advanced technologies by bridging the gap between R&D and the market place. To this end, the Office of Energy Efficiency and Renewable Energy has designated a Director of Commercialization and Deployment, located within the Energy Efficiency and Renewable Energy Program, to oversee and guide our commercialization and deployment efforts.

On May 14, 2007, the President signed an executive order that will result in reducing carbon dioxide emissions. This will be accomplished by increasing the use of lower carbon fuels and increasing vehicle efficiencies, both leading to the reduction of petroleum consumption. In addition, the President's 20 in 10 policy initiative aims to reduce gasoline consumption by 20 percent over the next 10 years through a combination of increased alternative fuel use and improvements in vehicle fuel efficiencies.

CONCLUSION OF HEARING

Senator DORGAN. I've read the report by the Energy Security Leadership Council a couple of times, most recently on an airplane, cover to cover. It's really well done. It's a good plan. And Dr. Wescott, thank you for evaluating it and giving us your analysis of what that evaluation shows in terms of the opportunity to contribute to this country. We appreciate your being here. This hearing is recessed.

[Whereupon, at 4:10 p.m., Tuesday, May 8, the hearing was concluded, and the subcommittee was recessed, to reconvene subject to the call of the Chair.]

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