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ENERGY SECURITY: HISTORICAL PERSPECTIVES AND MODERN CHALLENGES

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CONTENTS

ENERGY SECURITY: HISTORICAL PERSPECTIVES AND MODERN CHALLENGES

TUESDAY, MAY 12, 2009

U.S. SENATE,
COMMITTEE ON FOREIGN RELATIONS,
Washington, DC.

The committee met, pursuant to notice, at 2:03 p.m., in room SD–419, Dirksen Senate Office Building, Hon. John F. Kerry (chairman of the committee) presiding.

Present: Senators Kerry, Cardin, Shaheen, Kaufman, Lugar, Isakson, Risch, and Barrasso.

OPENING STATEMENT OF HON. JOHN F. KERRY, U.S. SENATOR FROM MASSACHUSETTS

The CHAIRMAN. This hearing will come to order. And the record will reflect that this is the first time before a hearing that any witness that I can remember has been applauded, Mr. President.

We are obviously very, very pleased to have with us today President Jimmy Carter.

"Why have we not been able to get together as a nation and resolve our serious energy problem?" These were the words of President Jimmy Carter in 1979. And regrettably, despite the strong efforts of President Carter and others, here we are, in 2009, still struggling to meet the same challenge today.

It's a rare honor to welcome a former President of the United States to testify before this committee, and I'm very, very pleased to share this honor with my colleague, Senator Lugar, who will be here momentarily, and with other colleagues.

Senator Lugar was sworn in 3 weeks before the Carter administration began, and he's been a leading voice on the issue of energy security ever since, and he is now the senior Republican in the U.S. Senate.

This is the first in a series of hearings that will build on the important work that was done by Senator Lugar and then-Senator Biden on the issue of energy security over the last several Congresses. From securing our natural gas pipelines globally to creating clean development pathways, this is obviously not just an important issue, but it's a broad issue that has implications well beyond just energy; it cuts across disciplines and across regions. We hope to use these hearings to gain insight and perspective on the current state of our challenge, and particularly to help understand this in the context of the global economy, global security threats, and the national security needs of our Nation.

The downside of our continued dependence on oil is compelling, it is well known; and the downside is only growing. Economically, it results in a massive continuous transfer of American wealth to oil-exporting nations, and it leaves us vulnerable to price and supply shocks. But, the true cost of our addiction extends far beyond what we pay at the pump; its revenues and power and sustained despots and dictators, and it obliges our military to defend our energy supply in volatile regions of the world at very great expense.

These were some of the problems that then-President Carter saw, understood, and defined, back in the latter part of the 1970s. They remain problems today. And to this long list of problems, we now add two very urgent, and relatively new, threats: Global terror, funded indirectly by our expenditures on oil, and global climate change driven by the burning of fossil fuels.

To make matters worse, we are adding billions of new drivers on the roads and consumers across the developing world, as India and China's population and other populations move to automobiles, as lots of other folks did, all of that will ensure that the supplies of existing energy sources will grow even tighter. All the trends are pointing in that wrong direction.

According to the International Energy Agency, global energy demand is expected to increase approximately 45 percent between 2006 and 2030, fueled largely by growth in the developing world. So, we're here today to discuss both the geostrategic challenges posed by our current energy supply and the need to find new and more secure sources of energy in the future.

From development to diplomacy to security, no part of our foreign policy is untouched by this issue. Region by region, our energy security challenge is varied and enormous. In Europe, for example, the potential for monopolistic Russian control over energy supplies is a source of profound concern for our allies, with serious implications for the daily lives of their citizens. Too often, the presence of oil multiples threats, exacerbates conflicts, stifles democracy and development, and blocks accountability.

In Nigeria, massive oil revenues have fueled corruption and conflict. In Venezuela, President Chavez has used oil subsidies to great effect to buy influence with neighbors. Sudan uses its energy supply to buy impunity from the global community for abuses. Iran uses petro dollars to fund Hamas and Hezbollah, and to insulate its nuclear activities from international pressure.

We know that, at least in the past, oil money sent to Saudi Arabia has eventually found its way into the hands of jihadists. And, of course, oil remains a major bone of contention and a driver of violence in Kirkuk and elsewhere among Iraq's religious and ethnic groups.

And alongside these security concerns, we must also recognize that access to energy is fundamental to economic development. Billions of people who lack access to fuel and electricity will not only be denied the benefits of economic development, their energy poverty leaves them vulnerable to greater political instability and more likely to take advantage of dirty or local fuel sources that then damage the local environment and threaten the global climate.

Taken together, these challenges dramatically underscore a simple truth: Scarce energy supplies represent a major force for instability in the 21st century. That is why, even though the price of a barrel of oil is, today, $90 below its record high from last summer, we cannot afford to repeat the failures of the past. Ever since President Nixon set a goal of energy independence by 1980, price spikes and moments of crisis have inspired grand plans and Manhattan projects for energy independence, but the political will to take decisive action has dissipated as each crisis has passed. That is how steps forward have been reversed and efforts have stood still even as the problem has gotten worse.

In 1981, our car and light-truck fleet had a fuel efficiency rate of 20.5 miles per gallon. Today, that number is essentially the same. The only difference? Back then we imported about a third of our oil; today we import 70 percent.

The good news is that we are finally moving beyond the old paradigm in which crisis gives way to complacency. In recent years, Congress and the administration have made some progress, some real progress. In 2007, I was proud to be part of the effort that raised fleetwide fuel efficiency standards for the first time since the Carter administration. Then, in February we passed an economic recovery package which was America's largest single investment in clean energy that we have ever made. Though our progress has been impressive, the fact is—and President Carter will talk about this today—the lion's share of the hard work still lies in front of us. I'm hopeful that these hearings on energy security will illuminate the way forward, both in securing our existing resources and encouraging the growth of secure, affordable, and sustainable alternatives.

It's a particular pleasure to have President Carter here, because President Carter had the courage, as President of the United States, to tell the truth to Americans about energy and about these choices, and he actually set America on the right path in the 1970s. He created what then was the first major effort for research and development into the energy future, with the creation of the Energy Laboratory, out in Colorado, and tenured professors left their positions to go out there and go to work for America's future. Regrettably, the ensuing years saw those efforts unfunded, stripped away, and we saw America's lead in alternative and renewable energy technologies, that we had developed in our universities and laboratories, transferred to Japan and Germany and other places, where they developed them. In the loss of that technology, we lost hundreds of thousands of jobs and part of America's energy future.

President Carter saw that, knew and understood that future. He dealt with these choices every day in the Oval Office, and he exerted genuine leadership. He's been a student of these issues and a powerful advocate for change in the decades since, and we're very grateful that he's taken time today to share insights with us about this important challenge that the country faces.

Senator Lugar.

STATEMENT OF HON. RICHARD G. LUGAR, U.S. SENATOR FROM INDIANA

Senator LUGAR. Well, thank you very much, Mr. Chairman. I join you, welcoming President Carter, and, likewise, your very thoughtful comments about his leadership in the Oval Office, and we look forward to his perspectives today to be helpful to all of us.

And I welcome, also, our second panel, Gen. Chuck Wald, former Deputy Commander of European Command, and Mr. Fred Smith, the chief executive officer of FedEx. In addition to their own substantial expertise on energy policy, General Wald and Mr. Smith are leaders in a coalition called Securing America's Future Energy, which advocates for energy policy reform that's broad in scope and aggressive in action.

We're cognizant that, despite past campaigns for energy independence and the steady improvement in energy intensity per dollar of GDP, we are more dependent on oil imports today than we were during the oil shocks of the 1970s. And yet, I believe that the American public and elected officials are becoming much more aware of the severe problems associated with oil dependence, and are more willing to take aggressive action. Similarly, Americans are recognizing that we have the capacity to change how we generate electricity and how we heat and cool our buildings.

This past weekend, I was thrilled to be a part of a participation in the groundbreaking for a unique and ambitious geothermal energy project at Ball State University, in Muncie, IN. Through this project, the biggest of its type in the country, the entire campus, more than 40 buildings, will be heated and cooled using geothermal energy. The project will allow the university to retire its coal-fired boilers, and it will save more than $2 million a year in doing so. The Ball State geothermal project provides a practical, real-world example of how large-scale alternative-energy projects are now economically viable today. I'm confident that when other universities, businesses, and institutions see what's happening in Muncie with American-built equipment, they'll be asking how can they put that technology to work for themselves.

And even as I was encouraged by the geothermal project, another development last week pushed the United States further from energy independence. Proposed regulations offered by the Environmental Protection Agency could halt expansion of ethanol produced from cornstarch by imposing prejudicial greenhouse gas standards on ethanol qualifying under the renewable fuels mandate. By attempting to regulate ethanol through incomplete modeling of so-called life-cycle greenhouse gas emissions, the EPA seeks to blame corn farmers for shifting land-use patterns around the world. Accurately measuring such a complex phenomenon would also require accounting for varying trade barriers, distortional subsidy regimes, the decline of foreign-assistance-targeted rural development, and many other factors.

In 2006, I joined with President Obama and Senator Harkin to propose an expansive increase in the renewable fuels mandate. And the reason for doing so was clear; foreign oil dependency is a security threat to our Nation. Each of us working in this area recognizes the ultimate goal is for the United States to produce much larger quantities of advanced biofuels made from any plant mate-

rial. Important advances have been made in cellulosic technology, and more will be achieved. But, the development of this technology will be much slower if we stifle existing corn-based ethanol production.

The physical and financial infrastructure used to deploy today's ethanol are essential building blocks of the infrastructure necessary to deploy advanced biofuels on a mass scale. And moreover, reversing clear government policy that promotes corn ethanol may undermine the confidence of potential investors in advanced biofuels and perhaps other energy technologies. Our Nation cannot afford to turn its back on the primary oil substitute available today, and production of 9.2 billion gallons of ethanol erased the need last year for 325 million barrels of crude oil. In effect, ethanol production allowed the United States oil import free for an entire month last year. In this case, an EPA regulation carrying the force of law threatens to further entrench U.S. oil dependence.

The President and Congress must make specific commitments to an array of technologies and ensure that our rhetoric is matched by our policies and our regulations. For example, in the summer of 2005, Congress passed a loan guarantee program aimed at speeding commercialization of emerging energy technologies, including and underlining cellulosic ethanol. Yet, due to bureaucratic inertia and disagreements over implementation, no loan guarantees were granted for more than 3½ years, and only one has been granted to date. The United States needs a broad range of technology development, domestic energy production, and efficiency gains to make substantial progress toward energy independence.

Having worked with President Obama and Vice President Biden on these issues during their tenure in the Senate, I believe they understand that urgency. Energy security is a national security priority. It must be given constant attention and support at all levels of government.

I thank the chairman for calling this hearing and look forward to our distinguished witnesses.

The CHAIRMAN. Thank you very much, Senator Lugar.

Mr. President, again—I'd say to my colleagues, I had a chance to visit with the President briefly before we came here, and I will tell you that the work of the Carter Center, globally, is really quite extraordinary. This committee would do well to have some of our staff go down there and spend some time understanding how the Carter Center has been able to get services and efforts into a lot of countries. These services do enormous good for considerably less dollars than some of the USAID and other efforts, and we need to look hard at how that happens.

Mr. President, thank you very, very much for being here with us today, and we look forward to your testimony, sir.

STATEMENT OF HON. JIMMY CARTER, FORMER PRESIDENT OF THE UNITED STATES, PLAINS, GA

President CARTER. Thank you, Mr. Chairman. I have already learned a lot from the two opening statements, and I'm very pleased to be here to accept Senator Kerry's request to relate my personal experiences, as President, in meeting the multiple challenges of a comprehensive energy policy and the interrelated stra-

tegic issues. They've changed very little during the last three decades.

Fourteen years ago I responded to a similar invitation from Senator Sam Nunn to report on one of the peace missions I had made in 1994 to North Korea, Haiti, and Bosnia. At that time, I was the fifth President ever to testify before a Senate committee, and the first one since Harry Truman.

Long before my inauguration as President, I was vividly aware of the interrelationship between energy and foreign policy. U.S. oil prices had quadrupled in 1973, when Mr. Nixon was President and I was Governor, with our citizens subjected to severe oil shortages and long gas lines brought about by a boycott of Arab OPEC countries. Even more embarrassing to a proud and sovereign nation was a secondary boycott that I inherited in 1977 against American corporations doing business with Israel. We overcame both challenges, but these were vivid demonstrations of the vulnerability that comes with excessive dependence on foreign oil.

At that time, we were importing 50 percent of consumed oil, almost 9 million barrels per day, and were the only industrialized nation that did not have a comprehensive energy policy. Senators Dodd and Lugar will remember those days.

It was clear that we were subjected to deliberately imposed economic distress and even political blackmail. A few weeks after I became President, I elevated this issue to my top domestic priority. In an address to the Nation, I said: "Our decision about energy will test the character of the American people and the ability of the President and Congress to govern this Nation. This difficult effort will be the "moral equivalent of war," except it will be uniting our efforts to build and not to destroy."

First, let me review our work with the U.S. Congress, which will demonstrate obvious parallels with the challenges that lie ahead and may be informative to the Foreign Relations Committee, and also to those of you who serve on other committees.

Our efforts to conserve energy and to develop our own supplies of oil, natural gas, coal, and renewable sources were intertwined domestically with protecting the environment, equalizing supplies to different regions of the country, and balancing the growing struggle and animosity between consumers and producers. Oil prices then were controlled at very low, artificial levels, through an almost incomprehensible formula based on the place and time of the discovery of a particular oil well, and the price of natural gas was tightly controlled—but only if it crossed a State line. Scarce supplies naturally went where prices were the highest, depriving some regions of needed fuel; like New England, for instance.

Energy policy was set by more than 50 different Federal agencies, and I was determined to consolidate them into a new department. In April 1977, after just 90 days in office, we introduced a cohesive and comprehensive energy proposal, with 113 individual components. We were shocked to learn that it was to be considered by 17 committees and subcommittees in the House and would have to be divided into five separate bills in the Senate.

Speaker Tip O'Neill was able to create a dominant ad hoc House committee under Chairman Lud Ashley, but the Senate remained

divided under two strong-willed, powerful, and competitive men: "Scoop" Jackson and Russell Long.

In July, we pumped the first light crude oil into our strategic petroleum reserve in Louisiana, the initial stage in building up to my target of 115 days of imports. A historical note—we reached that goal in 1985. Less than a month after this, I signed a new Energy Department into law, with James Schlesinger as Secretary, and the House approved, that quickly, my omnibus proposal. In the Senate, however, the oil and automobile industries prevailed in Senator Long's committee, which produced unacceptable bills dealing with price controls and the use of coal. There was strong bipartisan support throughout the Congress, but many liberals then preferred no legislation to the high prices that were in prospect. Three other Senate bills encompassed my basic proposals on conservation, coal conversion, and electricity rates. They were under Senator Jackson's control.

I insisted, however, on the maintenance of a comprehensive or omnibus bill, crucial—then and now—to hold this together to prevent fragmentation and control by oil company lobbyists, and the year ended in an impasse. As is now the case, enormous sums of money were involved, and the life of every single American was being touched. The House/Senate conference committee was exactly divided and stalemated. I could only go directly to the American people. I made three prime-time TV speeches, in addition to addressing a joint session of Congress, on this single issue: Energy. Also, we brought a stream of interest groups into the White House, several times a week, for direct briefings.

The conferees finally reached agreement, but, under pressure, many of the conference committee members refused to sign their own report, and both Senators Long and Jackson threatened filibusters on natural gas and an oil windfall profits tax.

In the meantime, as President I was negotiating to normalize diplomatic relations with China. I was bringing Israel and Egypt together in a peace agreement. I was sparring with the Soviets on a Strategic Arms Limitation Treaty. I was allocating, with Congress, vast areas of land in Alaska and I was trying to induce 67 Members of a reluctant Senate to ratify the Panama Canal treaties. Our closest allies were vocally critical of our profligate waste of energy, and OPEC members were exacerbating our problems every time they had a chance.

Finally clearing the conference committee and a last-minute filibuster in the Senate, the omnibus bill returned to the House for a final vote just before the 1978 elections and, following an enormous White House campaign—I think I called every single Member of the House—it passed, 207 to 206.

The legislation put heavy penalties on gas-guzzling automobiles; forced electric utility companies to encourage reduced consumption; mandated insulated buildings and efficient electric motors and heavy appliances; promoted "gasohol," as it was known then; production and carpooling; decontrolled natural gas prices at a rate of 10 percent per year; promoted solar, wind, geothermal, and water power; permitted the feeding of locally generated electricity, even from small dams, into utility grids; and regulated strip mining and leasing of offshore drilling sites. We were also able to improve effi-

ciency by deregulating our entire air, rail, and trucking transportation systems.

What remained was decontrolling oil prices and the imposition of a windfall profits tax. This was a complex and extremely important issue, with hundreds of billions of dollars involved. The big question was how much of the profits would go to the oil companies and how much would be used for public benefit?

This issue took on even more significance as the price of imported oil more than doubled after the outbreak of the Iranian Revolution. With deregulated prices, the oil companies would see more profit in their pockets with every price increase.

We reached a compromise in the spring of 1980, with a variable tax rate of 30 percent to 70 percent on the oil companies' profits; the proceeds to go into the general treasury and be allocated by the Congress in each year's budget. The tax was scheduled to expire after 13 years or when $227 billion had been collected.

Our strong actions regarding conservation and alternative energy sources resulted in a reduction of net oil imports by 50 percent, from 8.6 to 4.3 million barrels per day by 1982, just 28 percent of consumption then. Increased efficiency meant that, during the next 20 years, our gross national product increased four times as much as energy consumption increased. This shows what can be done.

Unfortunately, there has been a long period of energy complacency, and our imports are now almost 13 million barrels a day. I dedicated solar collectors on the White House roof in 1979 and set a reasonable national goal: 20 percent of energy from renewable sources by 2020. But, the 32 panels were removed, after my successor moved to the White House, with assurances to the American people that such drastic action would no longer be necessary.

The United States now uses 2½ times more oil than China, and 7½ times more than India, or, on a per capita consumption basis, 12 times China's and 28 times India's.

Although our rich Nation can afford these daily purchases, there's little doubt that, in general terms, we are constrained not to alienate our major oil suppliers, which puts a restraint on our Nation's foreign policy. And some of these countries are publicly antagonistic; they are known to harbor terrorist organizations or to obstruct America's strategic interest. When we are inclined to use restrictive incentives, as on Iran, we find other oil consumers reluctant to endanger their supplies. On the other hand, the blatant interruption of Russia's natural gas supplies to Ukraine has sent a warning signal to its European customers that they can be blackmailed in the future.

Excessive oil purchases are the solid foundation of our net trade deficit, which creates a disturbing dependence on foreign nations that finance our debt. We still face criticism from some of our own allies, who are far ahead of us in energy efficiency and commitments to environmental quality, and we must also remember that the poorest people also pay the higher oil prices that result from our enormous per capita consumption.

A major new problem was first detected while I was President. My science adviser, Dr. Frank Press, informed me of evidence found by scientists at Woods Hole that the Earth was slowly warming and that human activity was at least partially responsible. Now

my wife, Rosalynn, and I have personally observed the shrinking of glaciers, the melting of Arctic ice, and the inundation of villages along the Alaska shorelines. The last time Rosalynn and I went to Anchorage, AK, the lead newspaper headline read "Polar Bears To Be Extinct in 25 Years."

There's no doubt that rejecting the Kyoto Accords incurred severe condemnation to our country, and damaged our overall status as a world leader.

To address this challenge forthrightly should not create fear among us. A source of income for our Government that parallels the windfall profits tax back in 1980 is some means of auctioning carbon credits, and it is likely that many more jobs will be created than lost with new technologies derived from a comprehensive energy plan, if it's ever forthcoming.

My wife and I have visited more than 125 nations since leaving the White House, and the Carter Center now has programs in about 70 of them. We know that the people in abject poverty are suffering most from expensive and uncertain energy supplies, and are destined for much greater despair with rising sea levels, increased pollution, and desertification. It's difficult for us to defend ourselves against accusations that our waste of energy contributes to their plight.

Everywhere, we see the intense competition by China for present and future oil supplies and other commodities—we just were in South America last week and saw this. Chinese financial aid is going to other key governments, including Argentina, Venezuela, Ecuador, and others—three countries we visited—and their financial aid is very helpful and appreciated.

Recently, I've found the Chinese to be very proud of their more efficient, less polluting coal powerplants. They're building about one of these each month, in addition to some nonefficient plants, while we delay our first full-scale model. You might want to read an article that was in the New York Times yesterday that describes this disparity between the Chinese coal-building plants and ours. We also lag far behind many other nations in the production and use of windmills, solar power, nuclear energy, and the efficiency of energy consumption.

Last week, we found especially confident—almost exuberant—the business and political leaders in Brazil. Their banking and financial system is relatively stable. Worldwide popularity and influence is very high. Enormous new oil deposits have been discovered off their coast, and Brazil is now the world leader in producing cellulose, wood products, cotton, orange juice, soybeans, corn, and sugarcane. Brazil is poised to export products and technology from its remarkable biofuels industry using nonfood sources.

In closing, let me emphasize that our inseparable energy and environmental decisions will determine how well we can maintain a vibrant economy, society, protect our strategic interests, regain world political and economic leadership, meet relatively new competitive challenges, and deal with the less fortunate nations. Collectively, nothing could be more important than this question of energy and strategic interests.

Thank you, Mr. Chairman.

[The prepared statement of President Carter follows:]

PREPARED STATEMENT OF HON. JIMMY CARTER, FORMER PRESIDENT OF THE UNITED STATES, PLAINS, GA

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What remained was decontrolling oil prices and the imposition of a windfall profits tax. This was a complex and extremely important issue, with hundreds of billions of dollars involved. The big question was how much of the profits would be used for public benefit.

By this time, the Iranian revolution and the impending Iran-Iraq war caused oil prices to skyrocket from $15 to $40 a barrel ($107 in today's prices), as did the prospective deregulated price. We reached a compromise in the spring of 1980, with a variable tax rate of 30 percent to 70 percent, the proceeds to go into the general treasury and be allocated by the Congress in each year's budget. The tax would expire after 13 years or when $227 billion had been collected.

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A major new problem was first detected while I was President, when science adviser Frank Press informed me of evidence by scientists at Woods Hole that the earth was slowly warming and that human activity was at least partially responsible. Now, my wife and I have personally observed the shrinking of glaciers, melting of Arctic ice, and inundation of villages along the Alaska shoreline. Top newspaper headlines greeted us on a recent visit to Anchorage: "Polar Bears to be Extinct in 25 Years."

There is no doubt that rejecting the Kyoto Accords incurred severe condemnation of our country, and damaged our overall status as a world leader.

To address this challenge forthrightly should not create fear among us. A source of income for our Government that parallels the windfall profit tax is some means of auctioning carbon credits, and it is likely that many more jobs will be created than lost with new technologies derived from a comprehensive energy plan.

We have visited more than 125 nations since leaving the White House, and The Carter Center has programs in about 70 of them. We know that the people in abject poverty are suffering most from expensive and uncertain energy supplies, and are destined for much greater despair with rising sea levels, increased pollution, and desertification. It is difficult for us to defend ourselves against accusations that our waste of energy contributes to their plight.

Everywhere, we see the intense competition by China for present and future oil supplies (and other commodities), and their financial aid going to other key governments. Recently I found the Chinese to be very proud of their more efficient, less polluting coal powerplants. They are building about one each month, while we delay our first full-scale model.

We also lag far behind many other nations in the production and use of windmills, solar power, nuclear energy, and the efficiency of energy consumption. Last week, we found especially confident—almost exuberant—business and political leaders in Brazil. Their banking and financial system is relatively stable, worldwide popularity and influence is very high, enormous new oil deposits have been discovered, and Brazil is now the world leader in producing cellulose, wood products, cotton, orange juice, soybeans, corn, sugarcane, and are poised to export products and technology from their remarkable biofuels industry using nonfood resources.

In closing, let me emphasize that our inseparable energy and environmental decisions will determine how well we can maintain a vibrant society, protect our strategic interests, regain worldwide political and economic leadership, meet relatively new competitive challenges, and deal with less fortunate nations. Collectively, nothing could be more important.

The CHAIRMAN. Well, thank you very much, Mr. President. We greatly appreciate those insights on the journey traveled and also on the challenge ahead. If you would be kind enough, I think we'd probably like to be able to ask a few questions, if we can.

Mr. President, in the context of today's energy challenge, which is not all that dissimilar, what would your advice be to the Congress as it grapples with the global climate change and energy bills that we're about to undertake? Is there an order of priorities, in your judgment? Is there a way we should approach this, based on the lessons that you've learned and have observed over these years?

President CARTER. Senator, I think there would be two basic elements of it. One is an omnibus proposal that could be addressed collectively by the Congress. I don't know how many different committees would be involved now, but they need to be brought together in a common approach to the complex problem, because no single element of it can be separated from the others. I think it would also minimize the adverse influence of special interest groups who don't want to see the present circumstances changed or a new policy put into effect to deal with either energy or with the environment. So, that's an important thing.

Another advantage in having an omnibus bill is it gives the President and other spokespersons for our Government, including all of you, an opportunity to address this so the American people can understand it. You know already, it's extremely complex. I think that it is almost necessary to see a single proposal come forward combining energy and environment, as was the case in 1977 to 1980, so that it can be addressed comprehensively.

This is not an easy thing, because now, with inflation, I guess several trillion dollars are involved; back in those days, hundreds of billions of dollars. And the interest groups are extremely powerful.

I had the biggest problem, at the time, with consumer groups who didn't want to see the price of oil and natural gas deregulated.

It was only by passing the windfall profits tax that we could induce some of them to support the legislation, because they saw that the money would be used for helping poor families pay high prices on natural gas for heating their homes and for alternative energy sources.

The CHAIRMAN. Mr. President, I know you don't have eyes in back of your head, but we've been joined by your wife, Rosalynn Carter.

President CARTER. Oh, good.

The CHAIRMAN. We're delighted that she is here with us today. Thank you so much.

Right in back of you, sir.

President CARTER. I understand.

The CHAIRMAN. And your daughter, Amy. We're delighted to welcome——

President CARTER. I felt an aura of authority enter the room——

The CHAIRMAN. You did? [Laughter.]

President CARTER [continuing]. A few minutes ago. I didn't know where—what it came from. [Laughter.]

The CHAIRMAN. Well, I know that they're fresh from a luncheon with our current First Lady, and we're delighted to welcome them here.

President CARTER. Amy was a 9-year-old when she moved into the White House—an age right between those of the two Obama children.

The CHAIRMAN. Well, I'm sure they shared stories. I hope they did. [Laughter.]

The CHAIRMAN. Mr. President, is there any doubt in your mind about the urgency of the United States leading on the issue of climate change, particularly with respect to the Copenhagen negotiations that will occur in December?

President CARTER. No, there's no doubt in my mind about that. In fact, all the way through at least the George H.W. Bush administration, we were in the forefront of evolving the Kyoto Accords. In fact, George Bush, Sr., was one of the main spokespersons in Rio de Janeiro. When the followup meeting was held it was a surprise, I think, even to our country and to the rest of the world, when we abandoned the leadership toward taking action on environment and global warming.

Global warming is a new issue that didn't exist when I was in office, although it was first detected then. I would hope that we would take the leadership role in accurately describing the problem, not exaggerating it, and tying it in with the conservation of energy. And the clean burning of coal, I think, is a very important issue, as well, for which we could take leadership.

I was really surprised, when I was in China recently with Rosalynn, and we met with the Chinese leaders and engineers, who were very proud of their progress in burning coal cleanly. They haven't learned yet, and don't really want to the spend the extra price of burying the CO_2 deep within the earth, maybe 6 or 7 miles down, but I think they've made some tremendous strides. We ought not to abandon great improvements in order to seek for perfection, which might cost five or six times as much to build a plant.

So, I would like for our country to be in the forefront, not only by saying we've got to do something, but by determining precisely, in an engineering and scientific way, the way we should move most effectively. I think we also could learn from the different countries that are ahead of us on solar panels, on wind production, and other means, and get them to cooperate in a generous way.

The most important single issue for the future, Mr. Chairman, might be how the United States takes a leadership role to encourage, under tremendous international and domestic pressure, India and China to join with us in becoming much more efficient.

The Carter Center plays a deep and penetrating and constant role in China. I normalized diplomatic relations with China almost exactly 30 years ago, and have been deeply involved in that country since then. We have seen there the pressure from China's own farmers and other citizens to correct environmental problems, because all their streams are polluted, basically. The Chinese Government is under great pressure, domestically. I would like to see the United States say, "Follow us in making sure that you do something about global warming, as well as energy efficiency in the future." I think the Chinese and Indians would follow us, but they won't act unilaterally if we are the laggard country in the world.

The CHAIRMAN. And finally, Mr. President, General Powell, and then-Secretary Powell, warned, in both roles, about the national security implications of this issue.

President CARTER. Yes.

The CHAIRMAN. The former CIA chiefs, President Obama and other leaders have each similarly warned about the national security implications of climate change. Some people have talked about a twentyfold increase in refugees; struggles over water, drought; increases in poverty; and the spread of disease more easily. I wonder if you would share with us, from the perspective that you bring based on your years of work and your global travels to 120 countries plus the 70 countries the Center is in, and from the view of a former President making these choices about our security, how do you see this issue as we head into Copenhagen? Also what do the American people need to think about in terms of the consequences of this issue on our national security choices.

President CARTER. I mentioned very briefly, I think in one short paragraph, the constraints that are already on us. Whether we admit it or not, we are very careful not to aggravate our main oil suppliers. We don't admit it. But, we have to be cautious. And I'm not criticizing that decision. But, some of these people from whom we buy oil and enrich are harboring terrorists; we know it. Some of them are probably condemning America as a nation. They have become our most vocal public critics. We still buy their oil, and we don't want to alienate them so badly that we can't buy it. We also see our allies refraining from putting, I'd say, appropriate influence—I won't say "pressure"—on Iran to change their policy concerning nuclear weapons because they don't want to interrupt the flow from one of their most important suppliers of oil.

We have seen, also, as I mentioned earlier, the threat to Western Europe by their increasing dependence on fuel from Russia. We saw what they did when they interrupted, for weeks at a time, natural gas supplies to Ukraine, which also cut off supplies to

other parts of Europe. That can happen in the future in a time of crisis. And I would guess that is one of the reasons that Europe has been in the forefront of accommodating Russia on their move into Georgia.

So, I think, to the extent that the Western world and the oil-consuming world can reduce our demands, the less we will be constrained in our foreign policy to promote democracy and freedom and international progress.

One of the things that surprised me, back in the 1970s, was that we even lost a good bit of our supplies from Canada. Because when we had the OPEC oil embargo, Canada sent their supplies to other countries, as well. So, we can't expect to depend just on oil supplies from Mexico and Canada.

I would guess that our entire status as a leading nation in the world will depend on the role that we play in energy and environment in the future, not only removing our vulnerability to possible pressures and blackmail.

The CHAIRMAN. Thank you very much, Mr. President.

Senator Lugar.

Senator LUGAR. Well, thank you very much, Mr. Chairman.

President Carter, in your State of the Union Address, January 23, 1980, which you have mentioned, you articulated what became known to many as the Carter Doctrine. That has several interpretations, but one of them was that the United States would use its military to protect, or to protect our access to Middle Eastern oil.

President CARTER. Exactly.

Senator LUGAR. At the same time, in the same speech, you went on to say, "We must take whatever actions are necessary to reduce our dependence on foreign oil." You have illustrated in your testimony today all the actions you took, as a matter of fact, in the White House and in other rhetoric.

It seems to me to be a part of our predicament, historically, at least often in testimony before this committee, the thought is that our relationship with Saudi Arabia has, implicitly or explicitly for 60 years, said, "We want to be friends; furthermore, we want to make certain that you remain in charge of all of your oil fields, because we may need to take use of them. We would like to have those supplies, and in a fairly regular way."

Now, on the other hand, we have been saying, as you stated, and other Presidents, that we have an abnormal dependence on foreign oil. I suppose one could rationalize this relationship by saying that Saudi Arabia is reasonably friendly in comparison, now, to, say, Venezuela or Iran or Russia or various others. And so, we might be able to pick and choose among them.

Perhaps regardless of Presidential leadership, throughout all this period of time, the American public has decided that it wants to buy oil or it wants to buy products, whether it be cars, trucks, and so forth that use a lot of oil. As our domestic supplies have declined, that has meant, almost necessarily, that the amount imported from other places has gone up. And so, despite the Carter Doctrine, say, back in 1980s, we have a huge import bill. Increasingly, our balance-of-payment structure has been influenced very adversely by these payments. And so, many of us try to think through this predicament, and each administration has its own

iteration. President Bush, most recently, in one of his State of the Union messages, said we are "addicted to oil." At the same time, I remember a meeting at the White House in which he said, "A lot of my oil friends are very angry with me for making such a statement, said, 'What's happened to you, George?'" You know, there's this ambivalence in the American public about the whole situation.

Now, what I want to ask, From your experience, how could we have handled the foreign policy aspect and/or the rhetoric or the developments, say, from 1980 onward, in different ways, as instructive of how we ought to be trying to handle it now? I'm conscious of the fact that many of us are talking about dependence upon foreign oil. We can even say, as we have in this committee, that you can see a string of expenditures, averaging about $500 million a year, even when we were at peace, on our military to really keep the flow going, or to offer assurance. Secretary Jim Baker once, when pushed on why we were worried about Iraq invading Kuwait, said of course it was the upset of aggression, but it's oil. And many people believe that was the real answer, that essentially we were prepared to go to war to risk American lives, and were doing so, all over oil so we could continue to run whatever SUVs or whatever else we had here with all the pleasures to which we've become accustomed.

Why hasn't this dependence, the foreign policy dilemmas or the economic situation ever gripped the American public so there was a clear constituency that said, "We've had enough, and our dependence upon foreign oil has really got to stop, and we are not inclined to use our military trying to protect people who are trying to hurt us"? Can you give us any instruction, from your experience?

President CARTER. In the first place, no one can do this except the President—to bring this issue to the American public, to explain to them their own personal and national interest in controlling the excessive influx of oil and our dependence on uncertain sources. And it requires some sacrifice on the part of Americans—lower your thermostat. We actually had a pretty good compliance with the 55-miles-per-hour speed limit for a while, and people were very proud of the fact that they were saving energy by insulating their homes and doing things of that kind. And we had remarkable success. I just gave you the——

Senator LUGAR. Yes.

President CARTER [continuing]. Results of that 4-year effort. I made three major televised prime-time addresses, and also spoke to a special session of Congress, just on energy; nothing else. That was just the first year. I had to keep it up.

By the time 1980 came around, we had basically what I proposed at the beginning, with reconciliation between Senators Long and Jackson, which was another major achievement. The public joined in and gave us support. The oil companies still were trying to get as much as possible from the rapidly increasing prices. They were not able to do so because of the legislation passed.

In 1979, at Christmastime, though, is when the Soviet Union invaded Afghanistan, and I looked upon that, as you pointed out, as a direct threat to the security of my country. I pointed out to the Soviet Union, in a speech, that we would use every resource at our command, not excluding nuclear weapons, to protect America's

security, and if they moved out of Afghanistan to try to take over the oil fields in the Middle East, this would be a direct threat to our existence, economically, and we would not abide by it. And, secretly, we were helping the freedom fighters—some of whom are no longer our friends—in Afghanistan overcome the Soviet invasion. And it never went further down into Iran and Iraq.

Unfortunately, though, that same area was then taken over by the war between Iran and Iraq, and all the oil out of those two countries stopped coming forward in those few months. That's when prices escalated greatly.

It is surprising how much we were able to do, building on what President Ford and others had done. And I know that Senators Kerry and McCain recently have sponsored the increased mandatory efficiency of automobiles. When I became President, the average gas mileage on a car was 12 miles per gallon, and we mandated, by the time I went out of office, 27½ miles per gallon within 8 years. But, President Reagan and others didn't think that was important, and so, it was frittered away. We have gone back to the gas guzzlers, in effect, which I think has been one of the main reasons that Ford and Chrysler and General Motors are in so much trouble now. Instead of being constrained to make efficient automobiles, they made the ones upon which they made more profit.

Of course, you have to remember, too, that the oil companies and the automobile companies have always been in partnership, because the oil companies want to sell as much oil as possible, even the imported oil—the profit goes to Chevron and others. I'm not knocking profit, but that's a fact. And the automobile companies knew they made more profit on gas guzzlers. So, there was kind of a subterranean agreement there.

I would say that, in the future, we have to look forward to increasing pressures from all these factors. There's no doubt that, as China and India, just for instance, approach anywhere near the per capita consumption of oil that America is using now, the pressure on the international oil market is going to be tremendous, and we're going to, soon in the future, pass the $110-per-barrel figure again. And when that comes, we're going to be in intense competition with other countries that are emerging.

I've just mentioned two of the so-called BRIC countries. I've mentioned Brazil and China. But, we know that India is also in there, and Russia is, too. I used the example of the increasing influence of Brazil in a benevolent way. That's going to continue. We're going to be competitive with Brazil, and we're also going to be competitive, increasingly, with China. Everywhere we go in Africa, you see the Chinese presence, a very benevolent presence and perfectly legitimate. But, anywhere that has coal or oil or copper or iron or so forth, the Chinese are there, very quietly buying the companies themselves if they're under stress, as they are in Australia right now, or they're buying the ability to get those raw materials in a very inexpensive way in the future. We're going to be competing with them. They have an enormous buildup now of capital because of our adverse trade balance and buying our bonds, and they're able to give benevolent assistance now, wisely invested in some of the countries that I mentioned earlier.

So, I think the whole strategic element of our dealing with the poorest countries in the world, of our dealing with friendly competitors, like Brazil, of our dealing with potential competitors in the future, like China, our dependence on unsavory suppliers of oil, all of those things depend on whether or not we have a comprehensive energy policy that saves energy and cuts down on the consumption and also whether we deal with environment.

Senator LUGAR. Well, thank you so much. What a wonderful recitation of history, and it's from a perspective of somebody who has seen it.

President CARTER. Well, when you get my age, and almost your age, you have to look back on history more than the future.

Thank you. [Laughter.]

Senator ISAKSON. Mr. Chairman.

The CHAIRMAN. Senator Isakson.

Senator ISAKSON. With your permission and that of Senator Cardin, I have a very important place to go. But I also have a very important Georgian here whom I would like the chance to acknowledge for just 1 minute, with your permission.

The CHAIRMAN. Absolutely.

Senator ISAKSON. Mr. President, thanks to you and Rosalynn for your service to the State and to the country.

President CARTER. Thank you, Johnny.

Senator ISAKSON. It is good to have you in Washington and good to see you again. I particularly want to acknowledge your remarks with regard to renewable energy and your notable focus on nuclear. I know you are a nuclear engineer by——

President CARTER. Right.

Senator ISAKSON [continuing]. Profession in the service, and I think you are exactly right in that nuclear energy must be a part of the mix. Since our State, as you know, depends heavily on coal for electric generation, I, further, appreciate your acknowledgment that Georgia should be a national leader in clean coal technology. So, thank you for your service, thank you for being here, and thank you for both of those acknowledgments.

President CARTER. Thank you. It's a pleasure to be with you again.

Senator ISAKSON. Thank you, sir.

The CHAIRMAN. And, Senator Isakson, I can tell you with assurance that nuclear will be part of the mix, and therefore, you're going to say, in front of President Carter, that you're going to support this bill, right? [Laughter.]

Senator ISAKSON. Nuclear in the mix, I'll guarantee you that.

President CARTER. Yes, we already use a lot of nuclear energy, and we're building a new plant now in Georgia, a very large nuclear plant.

The CHAIRMAN. Thank you, Senator Isakson.

Senator Cardin.

Senator CARDIN. Well, Mr. Chairman and Mr. President, thank you very much for——

President CARTER. Thank you, Senator.

Senator CARDIN [continuing]. Sharing your knowledge with this committee.

We have really hard work to be done. I'm trying to get the benefit of what you went through in the late 1970s, to see how we can use that today and learn from what you did in the 1970s. You made an interesting observation that the interest groups will make it difficult for us to get the type of legislation passed that we need to get passed. I agree with your observation that the legislation needs to be a bill that deals with energy and the environment, that if we separate it, we're likely to get lost on both.

What I find somewhat disappointing is our failure to get the interest groups that benefit from significant legislation active—as active as the opponents. It seems to me that if we do this right, we're going to create a lot of jobs, because if you're going to——

President CARTER. Sure.

Senator CARDIN [continuing]. Deal with alternative energy sources and increased efficiency in the way we use energy, it's going to create jobs. We can get the solar fields out in the rural areas as well as the wind farms and get them functioning. That's going to create a lot of new jobs; good jobs. And if we retrofit our buildings, and do it in the right way, it's going to create construction jobs. Building the transit systems—it's going to create job growth for America. If we do this in the right environmental way, as you have pointed out, it's going to be good for my State of Maryland. The Chesapeake Bay is critically important; we're seeing what global climate change is already meaning for the watermen in our State. So, it's going to help in that regard.

You and Senator Lugar already had an excellent exchange on the security front. There's a lot of interest groups that want to make sure that we take care of our national security and we use our military only when we have to. And, as you pointed out, we've done that because of oil in too many cases.

So, it seems to me that what we need to do is energize the interest groups that have so much to benefit.

You talked about balance of payment. Senator Lugar talked about that. It's a huge issue. A lot of groups are very interested in what's happening with trade.

So, is there any experience that you can share with us as to how we could do a better job in mobilizing these interest groups? I know there's a patriotism, everybody wants to do the right thing, but, when it gets down to it, they're also interested in what they think is in their best immediate interest. And it seems to me this is in their best immediate interest.

President CARTER. Well, I deliberately mentioned three different interest groups—one was oil, one was automobiles, and one was consumers—just to show that there's a disparity among them in their opposition to some elements of the comprehensive energy policy that I put forward.

The oil companies didn't want to have any of their profits go to the general treasury and for renewable energy and that sort of thing. The consumers didn't want to see the price of natural gas and oil deregulated, because they wanted the cheapest possible supplies. The energy companies wanted to sell their natural gas, for instance, just in their own States where they were discovered, because the only price control on natural gas was if it crossed a State line. There was no restriction if they sold it in Texas or if

they sold it in Oklahoma, where the gas was discovered. Those interest groups were varied, and they still are.

You will find some interest groups that will oppose any single aspect of the multiple issues that comprise an omnibus package, and they'll single-shot it enough to kill it, and just the lowest common denominator is likely to pass if it's treated in that way.

The only way you can get it passed is to have it all together in one bill so that the consumers will say, "Well, I don't like to see the increase in price, but the overall bill is better for me" and for the oil companies to say, "Well, we don't like to see the government take some of our profits, but the overall bill is good for me." That's the only way you can hope to get it. It was what I had to deal with for 4 solid years under very difficult circumstances in the Congress and so forth.

And I think that's a very important issue to make. And, to be repetitive, the only person that can do this is the President. The President has got to say, "This is important to our Nation, for our own self-respect, for our own pride in being a patriot, for saving our own domestic economy—for creating new jobs and new technology, very exciting new jobs, and also for removing ourselves from the constraint of foreigners, who now control a major portion of the decisions made in foreign policy and who endanger our security."

So, the totality is the answer to your question. You've got to do it all together in order to meet these individual special interest groups' pressure that will try to preserve a tiny portion of it that's better from them and, one by one, they'll nibble the whole thing away.

Senator CARDIN. Well, I think that's good advice. President Obama has been very clear about this, and I think he will continue to focus on this. He clearly has a way of communicating with the American public that——

President CARTER. Much better than I did——

Senator CARDIN. Well, I don't know about that, but in today's market, he is, of course, inspirational ——

President CARTER. But, it's got to be a high priority for him. I'm not preaching to him, because he knows what he's doing.

Senator CARDIN. Well, I can tell you that he's expressed it to us, that this is of the highest priority. So I think we'll see that from the President.

I congratulate you on getting the bill passed. I hope we have more than a one-vote margin in the House. That's cutting it a little close, Mr. President. But, we'll do our best to build the type of coalition here that we can get that type of bill passed, and I think your testimony has been very——

President CARTER. Thank you.

Senator CARDIN [continuing]. Helpful to us. And, by the way, I think you communicated very well today, so we might need to have your help also——

President CARTER. Always glad——

Senator CARDIN [continuing]. As we go forward.

President CARTER [continuing]. To help.

Senator CARDIN. Thank you very much.

President CARTER. Senator Cardin, all, let me say that I think that the fact that this Foreign Relations Committee is addressing

this is extremely important, not just the Environmental Committee or the Energy Committee, but Foreign Relations, because it has so much to do with our interrelationship with almost every other country on Earth.

Senator CARDIN. And we're raising it with all of the parliamentarians in other countries. It's top on our list. So, I appreciate you saying that. Our chairman and ranking member make sure that this is brought up at every one of our meetings.

President CARTER. Well, they know what the other leaders think.

Senator CARDIN. Thank you.

Thank you, Mr. Chairman.

Senator SHAHEEN. Welcome, Mr. President, Rosalynn, and Amy. Thank you very much for being here.

President CARTER. Thank you. Thank you for helping me be President.

Senator SHAHEEN. Well, I was going to say, I also need to thank you for my being here, because it was my involvement in your campaign in 1975 that got me into politics. So, thank you very much for that.

And I can also speak as a consumer about the difference that that omnibus energy bill made for average people like me, because my husband and I built our home in Madbury in 1979, and we benefited from a lot of what was in that omnibus bill, because we built a passive solar-design house, and we put solar panels on the roof to heat our hot water, and we put in a furnace that burned wood and oil and garbage, and it's still there saving us money.

President CARTER. Right.

Senator SHAHEEN. But, you talked about—from a very unique perspective, about the confluence of energy and security in foreign policy. Can you elaborate a little more on what you were just talking about with Senator Cardin, about what a difference it would make to our foreign policy if we are successful again in aggressively moving toward energy independence and continuing this kind of commitment that we're talking about needing to do now? What will that mean for this country in the future?

President CARTER. I'd say it would have two major effects. One, look at our allies and friends—all the European countries, Japan, and so forth. They would breath a sigh of relief if they knew, once again, that the United States was in the forefront of the whole world in dealing with energy efficiency, comprehensive use of energy, the advancement of technologies to create new jobs based on new discoveries and new ideas, and also reducing the restraints on themselves for moving toward global warming. They need some leadership on that.

I would say that the independence that our own country would have in its foreign policy would be also greatly beneficial. Now the countries that supply us with oil are pretty certain that we're not going to do anything drastic that would alienate them. Even when you have some leaders—I'd say one of them south of here with whom I'm very well acquainted, who has made a profession the last number of years, of publicly attacking and derogating our country, and others that I need not name, that I mentioned just in passing in my talk—that are harboring terrorists. We can't really put tremendous pressure on them to change their policies on human

rights, on the rights of women, and so forth, as long as they are the major suppliers of energy. When we meet in human rights forums in which the Carter Center quite often is involved, we have to be very careful not to aggravate our major suppliers of oil, even though they are some of the worst violators of human rights and are the most abusive, say, to Christians and others who want to worship differently or dress differently in their countries.

We know, as well, that I'm being repetitive now—that the countries in Europe, they won't do anything, even in the U.N. Security Council, that would put a little bit of extra pressure on Iran. I really think that the United States ought to start dealing directly with Iran at as high a level as is possible with them because I think that they are fearful, in some ways, within Iran, that they're going to be attacked by outsiders.

I think that, in many ways, the freedom of our country, our independence of action in foreign policy, the leadership that we can provide, and the support we get from our allies, would all be confluent in a bold new step to bring about a correlation between energy efficiency and reduction of excessive dependence on foreign oil and also to promote the beneficial effects of environmental quality.

Senator SHAHEEN. Thank you.

President CARTER. Sure.

The CHAIRMAN. Thank you, Senator Shaheen.

Senator Kaufman.

Senator KAUFMAN. Thank you, Mr. Chairman. Thank you for holding this meeting. Again, I think this is extremely important.

And it's great to see you, Mr. President. How are you——

President CARTER. Good to see you, thank you.

Senator KAUFMAN [continuing]. Doing? I think that we're about to have a peanut-brigade alumni association breakout right here. [Laughter.]

I think one of the great things was working in your campaigns, both your campaigns, and clearly you've done a great job, not only as President, but as a post-President.

I was listening to your testimony, and also answering Senator Cardin's question. I don't know whether it's my faulty memory at this age, but I seem to remember, on a talk show, a question somebody asked you, What was the single thing you learned from being President? And you said, "Never offer comprehensive legislation." [Laughter.]

President CARTER. I don't remember saying that, but I don't deny it. [Laughter.]

I might have said it. [Laughter.]

Senator KAUFMAN. But, I did—you know, it just—and I thought about that, in terms of your two comments; one that, you know, how difficult it is to get comprehensive legislation through. If there was just——

President CARTER. But, I would say this is about the only issue that I thought had to be treated comprehensively. It took me an entire 4 years. And I made so many speeches to the American people—fireside chats, and so forth—that the American people finally got sick of it, of my talking. [Laughter.]

And the Congress was—the Senate and the House were very reluctant to take this up the second year, but I kept on the pres-

sure, and I would say that it was costly, politically, just to harp on this issue repetitively.

Anyway, I think, in general, comprehensive legislation may not be good, but, in this case, I think it's absolutely necessary.

Senator KAUFMAN. Well, faced with the problem we have right now, just to kind of clarify this a little bit——

President CARTER. All right

Senator KAUFMAN [continuing]. If there was one thing you could do—in other words, if we—if there was one thing that we could do in order to deal with this problem—because you're right about how important energy is to our foreign policy—so that we didn't have to go to 173 committees, whatever—what would be the one thing you can think of that we could do that would most advance our effect to kind of control this energy thing?

President CARTER. That's a difficult one. I would guess, if you look at energy and environment together, I would say take the leadership role in Copenhagen and let the rest of the world know that the United States was, once more, going to be responsible, as the most powerful nation on Earth, for the future environmental quality of the Earth.

Senator KAUFMAN. And on the same kind of idea, what is the one piece of alternative technology that you think, if you just could pick one, would be the one thing that we should emphasize?

President CARTER. That's a hard—I don't know quite whether you mean a brand new discovery of——

Senator KAUFMAN. No, like solar energy, nuclear, wind——

President CARTER. I'd like—I like wind very much. We took our vacation this year in Spain, and you drive through Spain and all the way through you see, on top of the hills, these windmills. And they're going to soon be producing 15 percent of all their energy with windmills. And I think they're beautiful, because they kind of remind you of Don Quixote, the windmills. [Laughter.]

But, that would be one thing. And the technology is available, and I think that's one thing that can be done.

And I think that the subject that Senator Kerry and I discussed briefly at lunch, about the clean burning of coal—I would say the most important single long-term benefit to our country would be to learn how to burn coal cleanly. And I don't think it's beyond the possibility of engineering and science. The Chinese have made a major step forward, they've made—their coal-burning plants much more efficient and much cleaner burning than ours are.

The ultimate is to get rid of all the sulfur dioxides and so forth and also the carbon dioxide, but the only way to get rid of all the carbon dioxide, that we know yet, is to pipe it 5 to 6 miles deep in the earth and store it down there, under high pressure. That can be very expensive. In the meantime, I think that's the No. 1 technological advance that would help our country, because we have 300 or 400 years of coal-burning.

When I was President, by the way, there was a difference in Western coal and Eastern coal. The Eastern coal, supported by Senator Byrd, held its own, just because of him. But, back in those days, we were worried about sulfur content. And the Western coal was much superior. But, nowadays, the Eastern coal has a lot higher energy quotient, and might be more attractive for carbon di-

oxide reductions. So, there's kind of a balance there. But, Western coal is still the No. 1 producer of electricity now, and to find a technology where they're burning it more cleanly and efficiently, and environmentally better, is the No. 1 technological breakthrough that I would like to see.

Senator KAUFMAN. And, you know, you've watched this for so many years. What—and it's happening again. You know, the price of oil went up, everybody wanted a hybrid. Already——

President CARTER. It's going to go up again.

Senator KAUFMAN. Yes. But, I'm just saying, right now it's back down——

President CARTER. Yes.

Senator KAUFMAN [continuing]. It's down, and hybrid sales are going down.

President CARTER. I know.

Senator KAUFMAN. Do you have any thoughts—I mean, I'm—on how we should deal with that, or just wait for it to go back up again?

President CARTER. I think, just take the best advantage of whatever market presents itself now. We're enjoying $50 oil now. It has been up to $130. When I was in the White House, it was up to $112, I think——

Senator KAUFMAN. Right

President CARTER [continuing]. Based on present prices.

You know, one thing, too, that that's been mentioned several times, is nuclear power. I was in favor of the Nevada storage facility—the majority leader is not, now. But, we—somehow or other we've got to be able to go toward nuclear fuel. And we can continue burying nuclear waste material for a long time, just on local sites. It doesn't take much. But, there are new technologies that are available—and I'm not revealing any secrets when I say that. When I was a young naval officer I was in charge of building the second atomic submarine in Schenectady, NY, the powerplant. And at that time, and still in domestic powerplants, you have to refuel about every 3 years. The finest warship on Earth now is named the USS *Jimmy Carter*, and——

[Laughter.]

President CARTER [continuing]. And it has a nuclear powerplant that will never have to be refueled. It will—the nuclear powerplant fuel cells will last longer than the hull will last, longer than 45 years. So, you see, the point I'm making is that technological advances in coal-burning and in nuclear power, are there, provided our Nation's great scientific and engineering capability are marshaled and focused on those key opportunities.

Senator KAUFMAN. Thank you, Mr. President.

President CARTER. Sure.

Senator KAUFMAN. Thank you, Mr. Chairman.

The CHAIRMAN. Mr. President, thank you——

President CARTER. Thank you.

The CHAIRMAN [continuing]. Very, very much. We are enormously grateful to you. We just had a call from President George Herbert Walker Bush contesting—he wants to debate you on which is the finest aircraft carrier, his or yours. [Laughter.]

President CARTER. Well, I didn't say aircraft carrier. I didn't say aircraft carrier. I said warship. [Laughter.]

The CHAIRMAN. Warship.

President CARTER. He'll still want to debate.

The CHAIRMAN. Covered yourself like a good navy man. [Laughter.]

President CARTER. Thank you.

The CHAIRMAN. Mr. President, we have a terrific second panel. The chairman, president, and CEO of FedEx, Fred Smith, and Gen. Chuck Wald, former Deputy Commander of European Command are going to come to the table. And we'll recess, just for 60 seconds, so that you can come out back here.

President CARTER. Thank you.

I wish I could stay and hear the second panel, but we've got to get back.

The CHAIRMAN. But, if we could just say, Mr. President, we're very grateful to you for coming today, and I want to express, on behalf of the whole committee, the admiration of all of us for your leadership around the world and for the courage with which you've given definition to the words "public citizen" and "public servant." And we're very, very grateful to you. Thank you, sir.

Thank you.

[Recess.]

The CHAIRMAN. The hearing will come back to order.

It's a great pleasure to welcome both of our witnesses. General Wald, as I mentioned, was the Deputy Commander of the European Command. He's now a senior fellow at the Bipartisan Policy Center and a pilot of great distinction. He flew over Bosnia and was a forward air controller in Vietnam. And we're very, very pleased to welcome you here today, General. Thank you for your work on this.

It is also a great pleasure to welcome a personal friend, Fred Smith, who is the chief executive officer of one of America's remarkable companies, operating in some 220 or so countries, with an enormous aircraft fleet and tens of thousands of workers. He founded the FedEx company in 1971, and I might remark is currently embarking on a new program to significantly switch to 30 percent biofuels by 2030 in order to both deal with efficiency issues as well as reduce the carbon footprint. And I might comment, obviously I won't go into any details, but delighted to welcome a college classmate and personal friend of all these years. So, we're delighted to have you here.

General, would you lead off, please. And we'll put the full statement in the record. If you want could you please just summarize and we'll put in as if read in full, and then we'll have a chance to have a little discussion.

STATEMENT OF GEN. CHARLES F. WALD, USAF (RET.), SENIOR FELLOW, BIPARTISAN POLICY CENTER, WASHINGTON, DC

General WALD. I'd be glad to. Thank you, Mr. Chairman and Senator Lugar, for all the support you give the U.S. military today and while I was in the military, to start off with. But—I will provide the testimony for the record.

And I'd just like to say that it's a true honor to be sandwiched between two great Americans this afternoon, President Carter and Fred Smith, and—I never had the privilege to know President Carter, but I do know Fred Smith, and he's an outstanding American. What he's doing for our security is—should not go without notice. So—he'd be a lot more humble about that, but I've seen him in action for the last couple of years, so I just wanted to get that on the record, as well.

Energy security, to me, has been an important issue for the last at least two decades in my career; and, ironically, the first time it really became apparent to me, I think, in a big way, was when I was in War College in 1990, here in Washington, DC. And at that time, we were talking about strategy, which plenty of us thought we knew what it was, but we were learning. And the Carter Doctrine came up. And, at that time, I think, even then, 10 years after President Carter declared his doctrine, it was, I think, a surprise to many people that President Carter had been the first one to say that we would use military force to ensure the free flow of oil in the Middle East. That's 38 years ago.

Since then, I personally have spent years in the Persian Gulf, for example, and at least 16 years of my career overseas, much of it defending resources that are important to, not only us, but the rest of the global economy. And energy is, I think, paramount in that effort today and will continue to be.

Our national security is definitely threatened by the fact that we are dependent upon oil and energy from places that don't like who we are and what we do. Independence is not in the cards, necessarily, but becoming less dependent on places that don't like us are certainly in the cards.

No. 2, I think I learned over the years in my career that subtle things are very important in our part of the world, and our reputation in the world today is hugely important, and our actions on both energy security, but climate, as well, and how we react to the global economy is not trivial.

Our leadership today is more important than ever on assuring the world finds alternative energy sources to assure the fact that we cannot be cut from that source and our economy affected, but also our reputation as a leader in the world on climate. And I think the SAFE—Securing America's Future Energy—plan for legislation to electrify the grid or robust the grid, turn to an alternate electric car as the main source of transportation in the United States, look to alternative energy sources and then work in our foreign policy, will bring us to a place in the world that will bring us back to predominance.

So, I thank you for the time, and I'd be glad to take questions when the time's right.

[The prepared statement of General Wald follows:]

PREPARED STATEMENT OF GEN. CHARLES F. WALD, U.S. AIR FORCE (RET.), MEMBER, ENERGY SECURITY LEADERSHIP COUNCIL, WASHINGTON, DC

Mr. Chairman, members of the committee, thank you for inviting me to be here today.

As you are all acutely aware, our country is now confronting a range of pressing challenges, both at home and abroad. The financial crisis, health care reform, and climate change are all serious issues that demand leadership and careful attention.

But based on my career and professional experience, I can think of no more pressing threat, no greater vulnerability, than America's heavy dependence on a global petroleum market that is unpredictable, to say the least.

In 2006, I retired from the United States Air Force after 35 years of service. In my final assignment, I served as the Deputy Commander of United States European Command. Currently, EUCOM's jurisdiction covers more than 50 countries and over 20 million square miles spanning the region north of the Middle East and subcontinent from the North Sea all the way to the Bering Strait. Though EUCOM is no longer responsible for Africa, it included that continent during my tenure.

During my tenure at EUCOM, I saw firsthand the dangers posed by our Nation's dependence on oil. And those dangers have only become more acute in the time since.

The implicit strategic and tactical demands of protecting the global oil trade have been recognized by national security officials for decades, but it took the Carter Doctrine of 1980, proclaimed in response to the Soviet Union's invasion of Afghanistan, to formalize this critical military commitment.

President Carter—whom I am honored to speak after—can, of course, explain the Carter Doctrine better than anyone in this room. In short, it committed the United States to defending the Persian Gulf against aggression by any "outside force." President Reagan built on this foundation by creating a military command in the gulf and ordering the U.S. Navy to protect Kuwaiti oil tankers during the Iran-Iraq war. The gulf war of 1991, which saw the United States lead a coalition of nations in ousting Iraq from Kuwait, was an expression of an implicit corollary of the Carter Doctrine: the United States would not allow Persian Gulf oil to be dominated by a radical regime—even an "inside force"—that posed a dangerous threat to the international order.

The United States military has been extraordinarily successful in fulfilling its energy security missions, and it continues to carry out those duties with great professionalism and courage. But, ironically, 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. In the case of our oil dependence problem, however, military responses are by no means the only effective security measures, and in some case are no help at all.

The United States now consumes nearly 20 million barrels of petroleum a day. About 11 million barrels—or 60 percent of the total—are imported. In 2008, we sent $386 billion overseas to pay for oil. Our oil and refined product, in fact, accounted for 57 percent of the entire U.S. trade deficit. This is an unprecedented and unsustainable transfer of wealth to other nations.

Our transportation system accounts for 70 percent of the petroleum we consume, and 97 percent of all fuel used for transport is derived from oil. In other words, we have built a transportation system that is nearly 100 percent reliant on a fuel that we are forced to import and whose highly volatile price is subject to geopolitical events far beyond our control.

In my time as a military leader, I labored to develop a proactive risk-mitigation strategy for just those kinds of geopolitical events. It was an unwieldy challenge. Petroleum facilities in the Niger Delta were subject to terrorist attacks, kidnappings and sabotage on a routine basis—just as they are today. Export routes in the Gulf of Guinea were plagued by piracy, just as routes in the Gulf of Aden have been more recently. We can share intelligence and train security forces, but our military reach is limited by cost, logistics, and national sovereignty.

In 2008, the 1-million-barrel-per-day BTC pipeline—which runs from the Caspian Sea in Azerbaijan to the Turkish port of Ceyhan—was knocked offline for 3 weeks after Turkish separatists detonated explosives near a pumping station, despite the best efforts of local security forces. The pipeline spewed fire and oil for days. The following week, Russian forces launched a month-long incursion into the Republic of Georgia during which the pipeline was reportedly targeted a number of times.

And sitting in the heart of the Middle East is the greatest strategic challenge facing the United States at the dawn of a new century: The regime in Tehran. We cannot talk about energy security, national security, or economic security without discussing Iran. From nuclear proliferation to support for Hezbollah, oil revenue has essentially created today's Iranian problem. I recently participated in a study group sponsored by the Bipartisan Policy Center that produced a report titled, "Meeting the Challenge: U.S Policy Toward Iranian Nuclear Development." I encourage you and your staff to review the report in its entirety. It is entirely possible that events related to Iran could produce an unprecedented oil price spike in the future, a spike that—given the fragility of the domestic and global economy—could very well be catastrophic.

With 90 percent of global oil and gas reserves held by state-run oil companies, the marketplace alone will not act preemptively to mitigate the enormous damage that would be inflicted by a serious and sudden increase in the price of oil. What is required is a more fundamental, long-term change in the way we use oil to drive our economy.

The Energy Security Leadership Council has advocated for a transformation of our transportation sector from one almost entirely dependent on oil to one powered by the domestic sources of energy that fuel our electric system.

Some may be surprised to hear a former general talk about electric cars, but they shouldn't be. In the military, you learn that force protection isn't just about protecting weak spots; it's about reducing vulnerabilities before you get into harm's way. That's why reducing America's oil dependence is so important. If we can lessen the oil intensity of our economy, making each dollar of GDP less dependent on petroleum, we would be less vulnerable if and when our enemies do manage to successfully attack elements of the global oil infrastructure. The best ways to reduce oil intensity are to bring to bear a diversity of fuels in the transportation sector, and this is best achieved by the electrification of transportation.

That's not all. The United States needs a comprehensive policy for achieving genuine energy security. This policy should include (1) increases in oil and natural gas production in places like the Outer Continental Shelf along with strict new environmental protections; (2) implementing fuel efficiency standards for all on-road transport that were signed into law last year; and (3) electricity infrastructure upgrades, particularly to our transmission grid, that will be required for a new energy future.

Oil dependence is a very real threat. But it is a threat we can confront. It will take a great effort, and most of all, it will take leadership on the part of the people in this room and all of your colleagues. I thank you for allowing me to address this committee, and more importantly, I thank you for your attention and action on this crucial issue.

The CHAIRMAN. Well, we do look forward to asking you some, for sure.

Fred.

STATEMENT OF FREDERICK W. SMITH, CHAIRMAN, PRESIDENT, AND CHIEF EXECUTIVE OFFICER, FEDEX CORP., MEMPHIS, TN

Mr. SMITH. Mr. Chairman, good to see you. Senator Lugar, always good to see you, as well.

I think it's important to recap, just briefly, what brought the military officers and the CEOs of the Energy Security Leadership Council together. As General Wald said, and as he so ably represents, our military members spent a big part of their careers protecting the oil lanes that allow America's industrial economy to exist. On the commercial side, companies like FedEx, UPS, Southwest Airlines, Royal Caribbean, Waste Management, companies that had a big dependence on petroleum, recognized that our continuing importation of over 60 percent of our daily oil needs represents, after nuclear proliferation and weapons of mass destruction and terrorism, the largest security and economic threat that this country deals with.

I'm fond of pointing out to all my friends who are in the financial services business that the logs of the bonfire may have been laid with the credit derivatives and the speculation and the subprime mortgages, but the match that lit off our current economic travails was the runup in oil prices last July to $147 per barrel. And I personally have been through five of these things now, and every major recession that the United States has had since 1973 has been precipitated by a significant runup in oil prices, including the ones that President Carter mentioned. In fact, FedEx, which is now

almost a $40-billion company that employs 300,000 folks, was almost killed in its cradle by the original oil embargo.

But, there is a very significant difference in where we are today than where we have been in the previous episodes, and that is because, on the price-runup side, on the demand side, it has not been in the main runup because of producers withholding supply, it has been because of the increase in demand from the so-called brick countries. And on the other side of the house, on the supply side, for the first time that I've been involved with this, it seems to us that there is a very real prospect of coming up with a national policy that makes sense, and that's where the Energy Security Leadership Council's recommendations come in. And they are fourfold.

First is, on the foreign policy area, it's important to recognize that about half of our substantial military budget goes, one way or another, to protecting our oil trade, and there's just no doubt about the fact that we're in two shooting wars in the Middle East, in large measure, because of our dependence on imported petroleum.

The second recommendation that we have is to maximize U.S. production, to the extent that it can be done in an environmentally appropriate way. The reason for that is, quite simply, that oil is a fungible product, and it's a lot better for our balance of payments and for our national security to have it produced in North America than it is to have it imported from half a world away, where it may not be produced in an environmentally efficient way, and while we all want to reduce our dependence on imported petroleum, the facts of the matter are we're going to be using a fair amount of it for many decades to come.

The third recommendation is to develop new generations of advanced biofuels. And you mentioned, Mr. Chairman, our own goal inside FedEx, and we are a significant user of petroleum. In the last year before the recession, to put that into perspective, we used about 1.6 billion gallons of jet fuel and diesel fuel for about 700 aircraft and 85,000 vehicles. U.S. Air Force is the largest single user, at about 2.4 billion gallons per year.

And it's very exciting for those of us who are in aviation today that in the recent past have been for demonstrations of advanced biofuels based on algae, Jatropha, and Camelina, which, unlike the alcohol-based fuels of ethanol, actually have the same molecular structure as oil itself. And in these demonstration flights with commercial aircraft, where the advanced biofuel has been mixed with Jet-A, you actually have an improvement in efficiency between a 50- and 60-percent reduction in CO_2 emissions over the cycle of production. So, it's not as if this is pie-in-the-sky, no pun intended; it's simply a matter of, How do you take these biofuels to scale-production?

And then, last and probably the most important of the recommendations, which is quite different, again, than the preceding periods of time, is that there is a feasible solution for a great deal of our oil dependency in the transportation sector. And bear in mind, transportation burns 70 percent of our petroleum and it—98 percent of all transportation is produced with petroleum.

And the breakthrough, of course, is the development of the lithium-ion-type batteries in our laptops and our cell phones. And so, for the first time it is feasible to develop plug-in hybrid electric

vehicles, either all electric or with a small reciprocating engine that acts as a generator, on a single electric charge to get a range of between 40 and 100 miles between charges. And about 80 percent of all personal automotive travel in this country takes place with a range of less than 40 miles per day.

So, the Energy Security Leadership Council has as its centerpiece the electrification of short-haul transportation with the concomitant construction of a smart grid, where the electrical power can be made from many different sources—from nuclear, from hydroelectric, from coal—clean coal, from gas, from geothermal, from wind, and from solar. And this type of power production is domestic in its origin. There is, with the appropriate government incentives and policies, the prospect, in our opinion, to put 150 million of these vehicles on the road by 2030. And it would have a dramatic effect on our daily oil consumption and our dependency on these foreign powers that President Carter mentioned a moment ago.

And I'd just close with this. You know, the issue of our dependency on imported petroleum being an enormous national security and national economic threat precedes President Carter's tenure in the White House. And, in fact, in 1956 President Eisenhower, who knew a thing or two, I would say, about national security, issued a statement after a Cabinet meeting, that, in the opinion of his administration, that if the United States imported more than 16 percent of its oil, it would be a grave national security threat. So, here we are, you know, a half a century later, with 60 percent of our oil being imported, 90 percent of the world's oil reserves owned, not by our own integrated oil companies, but by the nationalized oil companies of countries around the world, often in inhospitable locations and certainly within inhospitable intentions toward the United States.

So, we think that the recommendations we've made, which are thoughtful, which have been done with the best possible scholarship, and which have been verified by some outstanding work by econometric folks at the University of Maryland, form a very good set of recommendations for the Congress to move forward on this issue.

[The prepared statement of Mr. Smith follows:]

PREPARED STATEMENT OF FREDERICK W. SMITH, CHAIRMAN, PRESIDENT AND CEO, FEDEX CORP., COCHAIRMAN, ENERGY SECURITY LEADERSHIP COUNCIL, WASHINGTON, DC

Good afternoon, Chairman Kerry, Senator Lugar, and members of the committee. I would like to thank you for giving me this opportunity to speak to you regarding one of the great challenges facing our country today: Providing secure, sustainable and affordable energy to power the American economy.

I am proud to serve as chairman of the Energy Security Leadership Council, alongside many distinguished business and military leaders, including my good friend, Gen. Chuck Wald.

I am also honored to appear here after former President Carter. Very few understand the history of our Nation's energy challenges—and the urgency with which we must face them—better than he.

I can speak to this issue personally. FedEx delivers more than 6 million packages and shipments per day to over 220 countries and territories. In a 24-hour period, our fleet of aircraft flies the equivalent of 500,000 miles, and our couriers travel 2.5 million miles. We accomplish this with more than 275,000 dedicated employees, 670 aircraft, and some 70,000 motorized vehicles worldwide.

FedEx's reliance on oil reflects the reliance of the wider transportation sector, and indeed the entire U.S. economy. Oil is the lifeblood of a mobile, global economy. We are all dependent upon it, and that dependence brings with it inherent and serious risks.

The danger is clear, and our sense of urgency must match it. This threat, however, comes coupled with a truly unique opportunity. Energy is in the headlines. It is being discussed both here in the Congress as well as down the street at the White House. Today, perhaps for the first time, there is a strong bipartisan understanding that something must be done.

That is my message to you today: This Senate can pass comprehensive, bipartisan legislation this year that will set the Nation on a course to effectively eliminating our dependence on oil.

We can do this.

The lynchpin of any bill that is serious about confronting oil dependence must be a transportation system that today is almost entirely dependent on petroleum. The solution can be found in something that nearly every single one of you has either on your belt or on the table in front of you. The lithium ion batteries that power our cell phones and laptop computers can one day form the nucleus of an electrified transportation sector that is powered by a wide variety of domestic sources: Natural gas, nuclear, coal, hydroelectric, wind, solar, and geothermal. No one fuel source—or producer—would be able to hold our transportation system and our economy hostage the way a single nation can disrupt the flow of petroleum today.

And if our cars are to run on electricity, any bill we pass must guarantee it can get to them. We must improve the planning, siting, and cost-allocation process for a nation that has built only 14 interstate transmission lines subject to FERC's jurisdiction between 2000 and 2007. We must implement time-of-day pricing and build a smart grid. We must encourage companies to build those electric cars and consumers to buy them.

Each of these elements make up a highly integrated system, in which every part depends on the other. We would see few results if we improved transmission in the Northeast, created a smart grid in the Northwest, and introduced more electric cars in the Deep South. Indeed, it would be preferable to develop all of these elements simultaneously even in a limited geographic area, creating electric transportation "ecosystems" where the concept can take root and grow.

Finally, it would be impossible to pursue those goals, and irresponsible to try, without safeguarding our economy and our Nation in the short and medium term. We will still be using oil and other liquid fuels for many years even as we make this transformation. Increasing the domestic production of oil and natural gas, as well as advanced biofuels, is among the most effective near-term steps for improving American energy security.

I understand that this may seem contradictory. We talk about ending our dependence on oil, and in the next sentence about drilling for more oil. But the reason for this is simple: Our safety and our security must be protected throughout the entire process. It would be ideal if we could simply snap our fingers and stop using petroleum today. But that is a pipe dream, not a policy. There are no silver bullets, and we cannot allow the perfect to be the enemy of the good—especially when faced with very real dangers to our economic and national security.

I realize, of course, that there are many other legitimate concerns relating to energy right now. Climate change, for example, is a high priority for many in this room and across the country.

Energy and climate change are, as you all know, related issues. That said, it is important to emphasize that the fundamental goal of reducing oil intensity is a distinct one that needs to be considered based on its own merits and the very real dangers of inaction. Put simply, pricing carbon as a stand-alone policy, whether through a tax or a cap-and-trade system, will not allow us to reach that goal. Carbon pricing will almost automatically target the power industry in general and coal in particular. The power industry, however, is responsible for a fairly small percentage of the petroleum we consume as a nation. So pricing carbon will not meaningfully affect the price of oil, the demand for oil, and therefore oil dependence.

On the other hand, the comprehensive plan to reduce oil dependence that I have described today will have a positive impact on our environment. Because electrification of transportation plugs energy demand from cars and trucks into the electric power system, it also consolidates emissions from millions of dispersed tailpipes into a finite number of large-point power stations. We do not pretend that this can or will solve the climate change problem alone, but it can act as an important table-setter to put us on the right path.

The opportunity before all of you, and before our Nation, is enormous. The investors and innovators who power the energy world, and those businesses like FedEx

that are dependent on it, are waiting for an enduring, bipartisan plan. They crave a stable regulatory environment. They know that any policies forced into place by one party may very well be overturned in 5 or 10 years by the other. A comprehensive solution passed by a bipartisan majority, however, will create the confidence to move forward.

We cannot afford to develop sudden amnesia about what happened only a year ago. Indeed, we may not have to worry. Oil prices are up by 70 percent since February. Can we continue tempting fate?

The policies I have laid out today have the potential to undo our oil policy gridlock by offering a bipartisan, achievable, comprehensive solution. That is not just an opportunity. It is a necessity. We have before us a responsibility, a mandate to put our Nation on a pathway toward once and for all ending our dangerous dependence on petroleum and leaving a stronger, safer America in its place.

Our challenges are great, but so are our opportunities. It is time for America to act.

The CHAIRMAN. Well, we appreciate those thoughts and effort very much. It is a little startling, so many years later, that we're still struggling with the same issues that President Carter faced and reminded to us in his stark testimony today.

Fred, share with us, if you would—some more details about how FedEx plans to achieve the 30-percent biofuels target by 2030. As much as we'd like to transition rapidly, we're just not going to see that immediately, we're going to do this in a process, I guess. The question I would ask you is, What step or what incentive or measure could we put in place that would have the greatest impact in terms of taking us the farthest and the fastest, in your judgment?

Mr. SMITH. I think the biggest single elements are the appropriate incentives for the purchase and operation of plug-in hybrids and plug-in hybrid electrics, and appropriate legislation to build a smart grid with Federal authorities to require time-of-day pricing and the various support accoutrements, if you will, to a highly electrified short-haul transportation system. Those would be the two things that would have the biggest effect, in terms of reducing our use of petroleum, in general.

And, of course, we did not come together to address climate change in the environment, per se, although all of us are concerned about it as citizens and the science that's out there. But, you get that as a byproduct of the recommendations that we have. In fact, I would say that there are few recommendations that I've seen that would have a more dramatic effect, short of the power-generation issues that you're dealing with, with clean coal and things like that, to reduce carbon emissions in the air, to move to a short-haul electrified transportation system and to begin using advanced biofuels in long-haul transportation, where the battery technology doesn't offer the same advantages.

The CHAIRMAN. Well, I don't disagree with you. I think, in terms of impact, it would be very dramatic. But, it's striking that Roger Smith, the former CEO of General Motors, built a terrific electric car. I drove in one in California a few years ago and was not aware at that time, that they just completely discontinued this car. Frankly, I am told this was because of pressure from other interests that saw their profits and stream of revenue threatened as a consequence.

So, here was this shortsighted impact. But I'm currently driving a Prius that has one of these lithium batteries in it that you can get through the dealer, it's not a retrofit anymore. You actually get upward of 170 miles to the gallon if you drive thoughtfully, with

a combination of the plugging in and so forth. So, these are things that are available. If more of America was suddenly grabbing onto that, you'd have a huge reduction, obviously, in the import piece.

But, speak, if you would for a moment, about the global climate change piece. Do you both share—and does the coalition share—a sense of urgency with respect to the global climate change component of this?

General.

General WALD. As Fred said, SAFE didn't come together for that purpose; it was basically national security. But, from a personal perspective, speaking from my own self now, I was on a study last year with the Center for Naval Analysis, National Security and Climate Change, with 14 retired four-star and three-star generals, and—I mean, I care about the environment, I always have, but I wasn't a climate-concerned person at that time, although I thought it was a real issue. After a year of study with top scientists in the United States, and some deniers, as well, the panel came to the conclusion that it is a problem. Now, how much it's being exacerbated, I'm not a scientist, but I think we exacerbate it through man-made emissions.

At that time—and I've seen things around the world—Mozambique, in 1996, two typhoons flooded the entire country; the only people that could respond to that type of disaster were military, because the size of—the number of equipment that—what we had for equipment. I think we'll see more of that. And Bangladesh comes to mind, one of the areas that we are concerned with, 17 million people displaced; I think you mentioned that in your opening statement, Senator, about displaced personnel.

The CHAIRMAN. Right.

General WALD. Huge issues that will continue to grow over time. The Navy will have a big problem with the littoral, with their bases potentially being inaccessible if the water rises even a couple 2 or 3 feet.

So, yes, I think that's an issue. And if there's—like General Sullivan, the leader of the Center for Naval Analysis study that we did, said, in the military we work on risk, risk mitigation, and a 50-percent risk of something happening is something we'd probably address in the military.

So, I guess my point would be—I'm not a scientist, but my visceral is there's an issue there. And I think the SAFE recommendations, as Fred mentioned, will elegantly address, not only our national security issue, but the climate, as well. So, I consider it the way to go.

The CHAIRMAN. I would assume that given your experience, you worked on considerably less than 50 percent. I mean, if you were told by your flight line mechanic or whoever, that there's a 5-percent or 10-percent chance that the fighter you're getting into is going to crash, you'd probably want to have a revision on that maintenance system or on those evaluations.

General WALD. Yes, I mean, you're right, it's—you know, we were talking about it earlier today with some other folks, and the issue about the spectrum of threat in the United States today from low end to high end, low end being the peace or peacekeeping and potentially—in the old days, potentially talking about terrorism

was toward the low end, because it was a one-off occurrence usually. Today, that low end of the spectrum, like Fred said, WMD in the hands of a terrorist, is a high-risk issue, the highest there is. That may be a 1-percent issue, but you've got to address it. So, anything that's catastrophic, yes, you have to address, and I think if there's a catastrophic chance of climate change doing something to our grandchildren, we need to address it today.

The CHAIRMAN. I think that's a very important statement, and I appreciate your saying that, or acknowledging it.

Fred, share with us, from a company perspective, competitiveness perspective—we're going to hear a lot from different companies who are going to say, "It's all well and good that this is a security challenge, but I've got a survival challenge. I've got to compete in the marketplace. You know, I've got X amount of capital costs to try to make this transition." Are there steps we should also take that are particularly capable of addressing those concerns from fellow CEOs and others who looked at this transformation, but they're just holding back because right now it's easier to compete with the status quo?

Mr. SMITH. Well, I think that's a big part of it. I'll give you some examples inside FedEx that will make this, I think, demonstrably clear.

We, along with the Eaton Corporation and the Environmental Defense Fund, which some people might say we're strange bedfellows, but we came together because of our mutual interest in the subject—developed the first walk-in pickup-and-delivery vans, a walk-in Prius, if you will. And those vehicles have about 43 percent more fuel efficiency, versus the conventional diesel-powered unit, and they're over 90 percent more emission efficient and have less emissions to address the climate change that you mentioned.

The problem with the vehicles is, because they're not produced at scale, the capital cost of one of those vehicles is about $90,000 versus about $60,000 for the conventional vehicle.

Now, in California, within the next 2 or 3 years, our fleet of several thousand vehicles in California will be comprised largely of hybrids, because California regulations will require you to meet certain standards.

So, the point you're getting at is, while we can do this on a demonstration basis and buy a few hundred of them and demonstrate the efficacy—and, by the way, our couriers and our mechanisms and all love this equipment, so it's not as if there's any stepdown in terms of utility—but, you can't unilaterally disarm, so to speak. So, the government, as a matter of policy, needs to set goals.

And we strongly believe, I might mention, Senator, that the issues about climate change, which are very important, as you've mentioned here, and the issues about dependence on petroleum, are related, but they are separate issues. I mean, you're going to have to have goals and policies that achieve what you want to do on both sides. And they'll clearly connect, but I think if you try to put something together in too broad a spectrum here, you have the real risk that meaningful reduction in the national security risk and in the national economic risk of reducing our use of imported petroleum, or petroleum in general, will be traded off, or whatever the case may be. So, that's why I applaud you in the Foreign

Affairs Committee looking at this issue for what it really is; it's a major national security and foreign affairs risk, as well as being a climate change risk and a balance-of-payments issue, and so forth.

The CHAIRMAN. This next question is for both of you—besides the somewhat obvious dilemma of being hamstrung a little bit in what you can do because somebody's your supplier and you can't necessarily leverage your supplier if you're completely dependent on it and your economy is dependent on it; you're in trouble. But, besides that, which is sort of up front and obvious, what other national security implications do you see in this question of our current use and dependency on energy?

General WALD. Well, I mean, it's kind of related to that, but—I mean, this idea—if you look at Afghanistan today, for example, there are lots of issues there, as you're both well aware, but one of the major issues is resupplying the troops with fuel, for example. And it's ironic that in Iraq we have ready access to readily available fuel out of Saudi Arabia, for example; even Iraq, for that matter. Today, there is no fuel whatsoever made in Afghanistan, there's no pipelines that go in there. So, our troops have to be resupplied by convoy, which is problematic. You've seen what's happened there. And then we fly in with airplanes that aren't able to refuel; they can fly it back to Baku, so now we're dependent on Azerbaijan, for example, or other places. So, that, in itself, is a huge strategic issue for us.

And as the military goes down the road of—we have a report coming out next week from the Center for Naval Analysis again, on DOD energy use, that I'd commend you read if you have a chance sometime. But, the issue there is, What is the Department of Defense going to do to move to an alternative fuel of some sort? And as you do that, I think, as Fred's articulated very clearly, there are some alternatives you can go to. It takes time. But, whatever that alternative is, I personally believe, is going to have to be similar to what the commercial world uses, because of the availability of the fuels.

And what we shouldn't do is go from one dilemma to another. So, whenever we go to an alternative, we need to have readily available someplace, preferably in our own country.

So, I think the issue—and Fred mentioned it a minute ago—is very complex. And if I were—if I were able to sit here today and say, "I'm going to make a law that would move America toward the next step," the first thing I would do is solve our energy-use problem first, because we can do something about that.

Again, I mean, I personally believe the second step will be taken care of, and that's the climate. But, I think a comprehensive energy bill, based on what SAFE has said today, is the best thing we can do; it's in our own hands, and we can make a difference.

The CHAIRMAN. Well, let me just say to you that there is no solution to climate change without energy policy. I mean, it is the fundamental solution. You can decide what your source is going to be, but if your emissions are coming out of transportation or out of buildings, the energy used and the way you build, et cetera, or your transportation or utilities, those are the keys. And I personally think that the technologies are moving fast enough behind the scenes with various university efforts—such as MIT, Carnegie Mel-

lon, Caltech, that different people who are deeply involved in this, together with venture capitalists, who are beginning to see the potential, such as the future Googles out there, or future FedExes, they're going to be racing to this technology. And I think once we've sent a signal to the marketplace, I'm not sure that the amount is as critical as sending the signal. I think you're going to see a whole series of changes in behavior that are going to stun people because of the rate at which they're going to take over.

And you can see this in the 1990 Clean Air Act experience on sulfur, SO_X which we did for acid rain, where we created a trading scheme, and we, in fact, have traded very effectively now approximately 19 years. And incidentally, we did this much more efficiently than anybody ever imagined and at a much lower price. Plus the whole transition took place with less competitive drag and at a lower price than people thought.

So, I'm very optimistic about it, as I really think there's a brilliant future out there in solar, in wind and various alternatives, and even in nuclear, conceivably, in certain places, depending on what the market sends as a signal to those costs.

General WALD. Could I just add one——

The CHAIRMAN. Yes, please.

General WALD. I couldn't agree more on the—from the standpoint of—the United States is the most entrepreneurial place in the world. I was lucky enough, in my years in the service, to travel to 135 countries; in the last assignment, to 90. And last week we went to California—Robbie Diamond, who is sitting behind me, who is the head of SAFE—and we visited a place called Applied Materials, a company called Solazone, and another one called Bloom Energy. And I will guarantee you I've never seen anything like that in any other country around the world, where people, based on the creative thought, can do some things—the algae—one was solar and one was a special kind of a generator that—by the way, Google uses now at their headquarters in California.

Mr. SMITH. And FedEx——

General WALD. And FedEx, too. Yes, exactly. And so, I think incentives for that type of activity is where I think we're really going to make a lot of headway.

The CHAIRMAN. Great.

Senator Lugar.

Senator LUGAR. Thank you, Mr. Chairman.

With the nostalgia today about Presidential campaigns of the past, I noted our distinguished Senators from Delaware, New Hampshire, identified with the Carter campaign; I want to identify with the Howard Baker campaign. [Laughter.]

I was honored to be his national chairman, Fred Smith was his national treasurer, back 30 some years ago. And, although that campaign was not successful, per se, it at least has led to survival for both of us, in the meanwhile, attempting to do meaningful things, on most days.

My imagination is triggered by your testimony, Fred, to think through two things that you pointed out, one of which is that the current economic dilemma in our country and the world may not have been entirely triggered by the $147 price of oil. But, as you say, you've been through five of these situations in the past, sur-

vived them; barely, on one occasion. It was not only oil—clearly many analysts believe it was overreaching in the housing market, the subprime loans, and then all of the slicing-and-dicing derivatives and other strange financial instruments. But, this is a fascinating thing, all by itself, which really hasn't been studied, how oil got to $147; and, for that matter, how corn in Indiana got to $9 a bushel; soybeans to $15. Within 6 months, the oil was down to one-third of that, and so was the corn, slightly above $3; the soybeans, slightly above $8. These were huge changes in a remarkably short period of time. And it's not at all clear to any of us exactly how the world works that way. One can say, "Well, this is supply and demand, these are markets," and so forth.

What also happened during this same period of time was the wars in Afghanistan and Pakistan not going particularly well. We've had testimony today from Richard Holbrooke. We get back, once again, to this thought that you made as point one of your four points. For the better part of 50 or 60 years, our foreign policy had been deeply entwined with oil, in one form or another. In fact, some would say—this is, once again, sort of speculative theory, almost like why oil went to $147—that essentially the al-Qaeda group was disturbed, likewise people in Saudi Arabia, by the fact that, after the war in Kuwait, we continued to leave troops in Saudi Arabia. They were a source of disturbance for many persons who did not want us there. And, as a matter of fact, a number of people in the Middle East have not wanted our troops in any of the places that they have been recently.

Now, we could have made a case for bringing democracy and human rights and education for children, and so forth, to a number of countries, but some would say, "This is, at best, sort of a second or third order of rationalization as to why you were there to begin with and what sort of wars you engendered by your physical presence." And why were we there? Well, in large part because we were attempting, as President Carter expressed in the Carter Doctrine, to make certain we cannot be displaced from oil sources that were vital to our economy throughout that period of time.

So, we put people in harm's way to make sure that all of those vital things occurred, did the best we could to rationalize that we were doing a lot of other good things while we were in the area. And that still is the case. As we heard today in testimony, with all the complexities of how in the world the Government of Pakistan is to come to some cohesion, quite apart from Afghanistan after a long history, we get back once again to the oil problem.

I suppose that this is a part of leadership, whether it's business or political, for some of us to try to do a better explanation to our constituents of what the stakes are of all of this, because I'm not sure any of us have ever gotten it. We have sort of trundled on in life as usual. But, the points you've made today are very stark.

You've also made an interesting point about California and your own equipment. That California has some rules with regard to this, and so, as a result, you're going to have to conform to that. They're not national rules now, but they do make a difference in energy for those vehicles that you have to run in California.

Just thinking hypothetically, as we're in now what seems to be an unfortunate revolution in our whole transportation predicament,

whether it's General Motors or Chrysler or whatever may occur to Ford or others, here we're at a point in our history in which we're not selling very many vehicles. One can say, "Well, the market finally will work. Somebody will find something out there and begin to buy cars again, because some will wear out." But, at the same time you're pointing out, as is Chairman Kerry, that we have all sorts of what really are revolutionary ways of powering vehicles now, and they bring about huge changes, in terms of energy efficiency, enough that we finally really might make an impact upon imported oil, for example, a big impact, if we were serious about it. And we have to be serious about resurrecting our transportation business and getting our goods and services around the country, quite apart from transporting ourselves.

What we're inclined to do is to say, "This is a different problem altogether." And we sort of work through the bankruptcy court, and we work through supply and demand, for whatever it may be, all sort of oblivious, on the other hand, of the energy thing, national security, troops abroad, and all the rest. We talk about it in a different forum.

I suppose, you know, what I'm grasping for is people like yourselves who are visionary and say, "Now, here is a prescription as to how you try to solve at least two or three things at the same time." And you've tried to solve several, in the testimony you've had today.

The leadership that the two of you have given has been exemplary, But the fact is that still a lot of people in the industries that you're involved in don't get it, they're not moving in the same direction that I can see you are. Maybe California or others demand certain things happen. Yet as a country, we're not even picking up, say, on the example of Brazil, where the ordinary motorist can drive into a filling station, and 75 percent of them offer ethanol from sugar, as opposed to petroleum, and consumer's make a choice. And Brazil is energy independent. They are, of course, producing oil offshore, which you suggested as one of your points, that you at least take advantage of the resources you still have in your country. But, that example is out there now. It's a whole country. It took 20 years to get there.

But, why, for instance, in your own leadership in the group that you head now, has there not been more acceptance? Or, maybe we haven't seen the acceptance—maybe you've actually had a rush of people to follow your lead. And if so, give us the good news. How do you discern your own influence and who you're influencing?

Mr. SMITH. Well, Senator, I think there's reason to be optimistic. And I say that for several reasons. The initial report that the Energy Security Leadership Council put out, based on excellent scholarship and demonstrated in a number of simulations, where a number of very noted people, including Secretary Gates, played one of the roles, Secretary Rubin, I think even Richard Holbrooke may have been in one; I can't remember, but—that demonstrated the national security and economic risk of relatively small withdrawals of supply. Well, then, obviously, we saw it last summer, which was far beyond what was in the simulation.

But, because of that excellent scholarship and the work of ESLC, I think we played a very important role, in 2007, when the Con-

gress passed the energy legislation late that year, that reinstituted, for the first time, new fuel efficiency standards. And, of course, I have many very free-market friends that accuse me of being an apostate. But, if you look at it just from the market standpoint, you miss the issue that General Wald and his colleagues bring to the table, that this isn't a free market, it's not just an economic issue; it's a national security issue.

So, you had increased regulation. Then, at the same time, you had technology coming along. And I would submit to my friend Senator Kerry, the big difference between the electric car, that Chairman Roger Smith of General Motors pioneered several years ago, and the new generation of electric and plug-in electric cars that have been introduced just since the 2007 legislation—the Chevy Volt, the new Honda hybrid, which I just saw, today in the Financial Times, is the No. 1 selling hybrid in Japan, and which is now available in this country; Nissan, in 2010, will be offering a new plug-in hybrid; MIT scientists have announced that they think they can take the recharge cycle of these plug-ins down from hours to minutes—you can clearly do it if you have high-power plugs, you know, 440 or 220. So, I think you had a convergence of the regulations inherent in the 2007 bill, which required new fuel efficiency standards, different than the old types; you know, they were category-specific, not averages. And, at the same time, you had technology coming together that said there really is a way to get to these points.

Senator Kerry mentioned that if you drive your hybrid properly and all, you can get upward of 150, 170 miles per gallon equivalent. That's what you're looking at, not 35 gallons per hour.

Now, aviation, for years, has made huge progress. We're re-equipping our narrow-body airplanes with equipment that'll have a 47-percent unit improvement, in terms of fuel per ton carried. We're beginning the process of refleeting our long-distance airplanes with the new triple-7 200 long-range freighter, which has these fantastic General Electric engines, some of the components of which are built in Lynn, MA, and they have about a 20-percent improvement and about a 30-percent improvement in range.

So, technology is coming along, and regulation, because of the environmental, national security, economic risk, have been put in place, and there's, of course, excellent bills out there now, with Senator Dorgan and Senator Voinovich's bill—there's another one over on the House—that I think recognizes that it's a combination of regulation—the stick, if you will—and the carrot of incentives and credits and so forth, that will get us to where we need.

But, as I said in my opening remarks, for the first time since I've watched this, this is a different situation, because 20 years ago there really wasn't any alternative to the internal combustion engine. And the internal combustion engine will be around a long time, and it, too, will become more efficient, the same way diesels will become more efficient. But, I think the plug-in hybrid electrics and the all-electrics for the short-haul transportation that makes up the vast majority of our daily utilization of our automobiles has the real chance to change this equation, for the first time. But, to get from here to there, it's got to be in light regulation and appro-

priate incentives to get people to produce and buy this equipment and get it into scale production.

Senator LUGAR. Just one further question. Why, if this is the case, would you approach this as incrementally, say, as the legislation you've suggested or that we've passed? In other words, why wouldn't you go to, say, 50 miles a gallon in 3 years or something of this sort? Now, everybody will say, "Well, by golly, we don't have the technology to do that," or, "We can't produce that many efficient cars. We're just getting there." But, isn't the urgency of this such that a more dramatic push is really in the national interest?

Mr. SMITH. Well, I think that you have to be mindful just of the scope of the problem too, Senator. I think I'm correct, it takes about 15 years to turn over the automotive fleet. But, in the report which we produced, the recommendations we have, which, again, are largely incorporated in the legislation here, including the smart grid and so forth, it begins to have very dramatic effects, on a cumulative basis. And the reason for that is that oil markets, like any commodity markets, as you demonstrated in your remarks about the huge runup in fuel prices of soybeans and corn, it's always on the margin; that last 1 or 2 percent of demand can make the price go up by two or three times. So, as you begin to take demand down by improving the efficiency as these new quantumly more efficient vehicles come into the fleet, and the lesser efficient vehicles go out, you begin to have a real effect on the total amount of petroleum consumed, a very big part of the petroleum imported, particularly if you develop advanced biofuels and maximize domestic production. And now you've changed the national security equation, the balance of payments equation, and you have a very different situation than we find ourselves in today, or have been for the last 45 or 50 years.

Senator LUGAR. Thank you.

The CHAIRMAN. Thank you, Senator Lugar.

General, if you had 30 seconds to convince a fellow American of why energy is such a critical national security issue, what would you say to them?

General WALD. First of all, I'd say that if we don't do—we have a window, here, of vulnerability in America, and I don't know if it's 10 years or 15. If we had an epiphany today and have the leadership, which I think we potentially do, to decide that we're going to go where we think we should go, it will take us probably a decade.

And I think the biggest threat we face today, personally, in America is the Iranian situation, and I think that's a difficult wild card. And if that situation goes in a direction that we don't want it to be, we are going to be in a significant problem here in America, from an economic standpoint, as well as a security standpoint.

So, I think there is a way for people to articulate this problem, and I think every time we seem to go someplace and talk about this, it resonates. So, I—frankly, I believe it starts right here in Washington. And I don't think we should overly frighten people, but they need to be aware of the fact that we are severely threatened today and vulnerable.

The CHAIRMAN. Fred Smith. Thirty seconds, 1 minute, whatever——

Mr. SMITH. Well, I—as I said a moment ago, I'm optimistic. I mean, we participated in the debates. In fact, I think I testified before you in 2007——

The CHAIRMAN. But, if somebody doesn't understand it or didn't yet believe it, what would you say to them to convince them?

Mr. SMITH. Well, I think what I would say is—all you have to do is to watch the nightly news and look at the enormous human cost and the cost in national wealth of prosecuting these wars in the Middle East. And any way you slice it, in large measures they are related to our dependence on foreign petroleum. There are other issues, to be sure; but, just as Alan Greenspan said in his book, "neat," you know, the situation was about oil. And if we continue along the road we've been on these last 40 years, we're going to get into a major national security confrontation that makes these things that we've been in, here the last few years, pale in comparison.

So, I think every American can understand that issue by just simply relating to what we've been involved in, the last few years, and watching the enormous human cost of these involvements that we have in areas of the world which we wouldn't necessarily be involved in if we weren't as dependent on foreign petroleum. We have other issues and other interests, but I think they would not require the level of boots on the ground that we've been forced to get into there in these last two wars.

The CHAIRMAN. Well, that's a good way to bring this to a close. We're really appreciative to both of you. First of all thank you both for your service to our country in uniform, and thank you for what you're doing now. We're very appreciative and glad you could be with us today.

Senator Lugar, do you have any——

Take care. Thank you very much.

We stand adjourned.

[Whereupon, at 4:10 p.m., the hearing was adjourned.]

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