

THE FISCAL YEAR 2014 U.S. DEPARTMENT OF
ENERGY BUDGET

HEARING
BEFORE THE
SUBCOMMITTEE ON ENERGY AND POWER
OF THE
COMMITTEE ON ENERGY AND
COMMERCE
HOUSE OF REPRESENTATIVES
ONE HUNDRED THIRTEENTH CONGRESS

FIRST SESSION

JUNE 13, 2013

Serial No. 113-53



Printed for the use of the Committee on Energy and Commerce
energycommerce.house.gov

U.S. GOVERNMENT PRINTING OFFICE

85-443

WASHINGTON : 2013

For sale by the Superintendent of Documents, U.S. Government Printing Office
Internet: bookstore.gpo.gov Phone: toll free (866) 512-1800; DC area (202) 512-1800
Fax: (202) 512-2104 Mail: Stop IDCC, Washington, DC 20402-0001

COMMITTEE ON ENERGY AND COMMERCE

FRED UPTON, Michigan
Chairman

RALPH M. HALL, Texas
JOE BARTON, Texas
Chairman Emeritus
ED WHITFIELD, Kentucky
JOHN SHIMKUS, Illinois
JOSEPH R. PITTS, Pennsylvania
GREG WALDEN, Oregon
LEE TERRY, Nebraska
MIKE ROGERS, Michigan
TIM MURPHY, Pennsylvania
MICHAEL C. BURGESS, Texas
MARSHA BLACKBURN, Tennessee
Vice Chairman
PHIL GINGREY, Georgia
STEVE SCALISE, Louisiana
ROBERT E. LATTA, Ohio
CATHY McMORRIS RODGERS, Washington
GREGG HARPER, Mississippi
LEONARD LANCE, New Jersey
BILL CASSIDY, Louisiana
BRETT GUTHRIE, Kentucky
PETE OLSON, Texas
DAVID B. MCKINLEY, West Virginia
CORY GARDNER, Colorado
MIKE POMPEO, Kansas
ADAM KINZINGER, Illinois
H. MORGAN GRIFFITH, Virginia
GUS M. BILIRAKIS, Florida
BILL JOHNSON, Missouri
BILLY LONG, Missouri
RENEE L. ELLMERS, North Carolina

HENRY A. WAXMAN, California
Ranking Member
JOHN D. DINGELL, Michigan
Chairman Emeritus
EDWARD J. MARKEY, Massachusetts
FRANK PALLONE, JR., New Jersey
BOBBY L. RUSH, Illinois
ANNA G. ESHOO, California
ELIOT L. ENGEL, New York
GENE GREEN, Texas
DIANA DEGETTE, Colorado
LOIS CAPPS, California
MICHAEL F. DOYLE, Pennsylvania
JANICE D. SCHAKOWSKY, Illinois
JIM MATHESON, Utah
G.K. BUTTERFIELD, North Carolina
JOHN BARROW, Georgia
DORIS O. MATSUI, California
DONNA M. CHRISTENSEN, Virgin Islands
KATHY CASTOR, Florida
JOHN P. SARBANES, Maryland
JERRY MCNERNEY, California
BRUCE L. BRALEY, Iowa
PETER WELCH, Vermont
BEN RAY LUJAN, New Mexico
PAUL TONKO, New York

SUBCOMMITTEE ON ENERGY AND POWER

ED WHITFIELD, Kentucky

Chairman

STEVE SCALISE, Louisiana

Vice Chairman

RALPH M. HALL, Texas

JOHN SHIMKUS, Illinois

JOSEPH R. PITTS, Pennsylvania

LEE TERRY, Nebraska

MICHAEL C. BURGESS, Texas

ROBERT E. LATTA, Ohio

BILL CASSIDY, Louisiana

PETE OLSON, Texas

DAVID B. MCKINLEY, West Virginia

CORY GARDNER, Colorado

MIKE POMPEO, Kansas

ADAM KINZINGER, Illinois

H. MORGAN GRIFFITH, Virginia

JOE BARTON, Texas

FRED UPTON, Michigan (ex officio)

BOBBY L. RUSH, Illinois

Ranking Member

JERRY McNERNEY, California

PAUL TONKO, New York

EDWARD J. MARKEY, Massachusetts

ELIOT L. ENGEL, New York

GENE GREEN, Texas

LOIS CAPP, California

MICHAEL F. DOYLE, Pennsylvania

JOHN BARROW, Georgia

DORIS O. MATSUI, California

DONNA M. CHRISTENSEN, Virgin Islands

KATHY CASTOR, Florida

JOHN D. DINGELL, Michigan

HENRY A. WAXMAN, California (ex officio)

CONTENTS

	Page
Hon. Ed Whitfield, a Representative in Congress from the Commonwealth of Kentucky, opening statement	1
Prepared statement	3
Hon. Bobby L. Rush, a Representative in Congress from the State of Illinois, opening statement	4
Hon. Fred Upton, a Representative in Congress from the State of Michigan, opening statement	5
Prepared statement	7
Hon. Henry A. Waxman, a Representative in Congress from the State of California, opening statement	8
Prepared statement	9
Hon. Eliot L. Engel, a Representative in Congress from the State of New York, prepared statement	62
WITNESSES	
Ernest J. Moniz, Secretary, U.S. Department of Energy	10
Prepared statement	13
Answers to submitted questions	73
SUBMITTED MATERIAL	
Report entitled, "Proposed FY 14 Administration Cuts to Dept. of Energy Coal and Fossil Energy Research and Development Program," the University of Illinois, submitted by Mr. Shimkus	63
Letter of March 26, 2013, from the Committee to the U.S. Department of Energy, submitted by Mr. Burgess	65
D.O.E. response	68
Letter of April 25, 2013, from the Center for Strategic & International Studies to President Barack Obama, submitted by Mr. Kinzinger	70
Chart entitled, "Fossil Energy R&D," submitted by Mr. McKinley	72

THE FISCAL YEAR 2014 U.S. DEPARTMENT OF ENERGY BUDGET

THURSDAY, JUNE 13, 2013

HOUSE OF REPRESENTATIVES,
SUBCOMMITTEE ON ENERGY AND POWER,
COMMITTEE ON ENERGY AND COMMERCE,
Washington, DC.

The subcommittee met, pursuant to call, at 10:09 a.m., in room 2123 of the Rayburn House Office Building, Hon. Ed Whitfield (chairman of the subcommittee) presiding.

Members present: Representatives Whitfield, Scalise, Hall, Shimkus, Terry, Burgess, Latta, Olson, McKinley, Gardner, Kinzinger, Griffith, Barton, Upton (ex officio), Rush, McNerney, Tonko, Engel, Green, Capps, Doyle, Barrow, Matsui, Christensen, Castor, and Waxman (ex officio).

Also present: Representative Johnson.

Staff present: Nick Abraham, Legislative Clerk; Gary Andres, Staff Director; Charlotte Baker, Press Secretary; Mike Bloomquist, General Counsel; Sean Bonyun, Communications Director; Matt Bravo, Professional Staff Member; Alison Busbee, Policy Coordinator, Energy & Power; Annie Caputo, Professional Staff Member; Patrick Currier, Counsel, Energy & Power; Andy Duberstein, Deputy Press Secretary; Vincent Esposito, Fellow, Nuclear Programs; Tom Hassenboehler, Chief Counsel, Energy & Power; Ben Lieberman, Counsel, Energy & Power; Nick Magallanes, Policy Coordinator, CMT; David McCarthy, Chief Counsel, Environment/Economy; Brandon Mooney, Professional Staff Member; Mary Neumayr, Senior Energy Counsel; Andrew Powaleny, Deputy Press Secretary; Peter Spencer, Professional Staff Member, Oversight; Tom Wilbur, Digital Media Advisor; Jeff Baran, Democratic Senior Counsel; Phil Barnett, Democratic Staff Director; Greg Dotson, Democratic Staff Director, Energy and Environment; Kristina Friedman, Democratic EPA Detailee; and Caitlin Haberman, Democratic Policy Analyst.

OPENING STATEMENT OF HON. ED WHITFIELD, A REPRESENTATIVE IN CONGRESS FROM THE COMMONWEALTH OF KENTUCKY

Mr. WHITFIELD. I would like to call the hearing to order this morning. And today's topic and hearing will be on the Department of Energy's fiscal year 2014 budget. And, of course, this is the first opportunity that we have had to have our new Energy Secretary Ernest Moniz with us.

And, Mr. Secretary, we are delighted you are here. We know that you have a lot of experience at the Department of Energy having served there in the Clinton Administration. And I think all of us were quite impressed with the way you sailed through confirmation. I think the vote was 97 to 0. And that is quite a tribute to you, I would say. So congratulations on that confirmation.

And I will recognize myself now for a 5-minute opening statement.

Under the Obama Administration, the Department of Energy in my view has often taken a backseat to the Environmental Protection Agency and was all too willing to acquiesce to EPA's agenda rather than affirmatively assert its own pro-energy agenda. Particularly, DOE allowed itself to become a part of the Administration's—for lack of a better word—attack on fossil fuels when it should have been defending them as a core component of our energy future and a critical contributor to job creation, global competitiveness, and affordable energy prices.

When I think about an anti-fossil fuel movement, frequently, I think about Europe and what has happened. Europe has placed so much emphasis on renewables and wind energy and solar, and when the natural gas prices started escalating in Europe, all of a sudden in Europe they are burning more and more coal now. And on the books they have plans to build 69 new coal-powered plants, 60 gigawatts of new power. And so I think that it is important that we think about this instead of this Administration has moved—the budget reflects most of the money is being spent on renewable rather than the baseload energy needs.

I will never forget then-Secretary of Energy Chu made the statement that coal is his worst nightmare. And I don't think that we need a Department of Energy that sees this Nation's growing abundance of natural gas and oil as a problem to be solved rather than an opportunity to be embraced.

The Department of Energy in my view should not treat conventional energy and renewable energy as an either/or proposition where the Federal Government actively discourages conventional energy in order to create an artificial market for renewable energy. The President says himself that he is for “all of the above” and yet, frequently, in his Administration, that absolutely is not the case.

We need a Department of Energy in my view open to all domestic energy sources that are economically competitive, be they conventional or renewable. “All of the above,” as I said, has supposedly been the President's motto, but his policies have suggested otherwise.

In fact, yesterday, I introduced legislation along with a Democratic Member that would repeal a provision in the Energy Independence and Security Act of 2007 that would require that the Federal Government not use any fossil fuel for heating new or modified federal buildings by the year 2030. So our bill is in keeping with the President's stated goal of using all of the above. And yet, that 2007 Energy Independence and Security Act would phase out the use of fossil fuel in its entirety for any federal new building or modified building by the year 2030.

I look forward to working with Secretary Moniz, and I believe that the proposed fiscal year 2014 DOE budget we will review

today, as I said, still reflects the mistakes of the recent past and is not a forward-looking proposal.

For example, we see in this budget an outsized—and I know that the Secretary certainly was not there at the time—but we see an outsized request for the Department of Energy’s Office of Energy Efficiency and Renewable Energy, which we all support, a nearly \$1 billion increase. And when you look at these numbers, you have got batteries in electric vehicles receiving more money than any other entity, solar energy next, building technologies next, biomass next, and the conventional fuels are way down the list. And I don’t think there is anything that reflects an Administration’s overall goals better than its budget request.

So I think the shale gas and oil revolution in America holds tremendous potential for energy affordability and security, for job creation, for export opportunities, and for strengthening America’s standing in the world, but it also poses implementation and innovation challenges for which DOE, in my view, can play an important role. DOE should be out in front of this revolution taking steps to facilitate its development and not creating obstacles to it.

So I look forward to working with you, Mr. Secretary. We certainly look forward to your testimony and your answers to our questions today.

[The prepared statement of Mr. Whitfield follows:]

PREPARED STATEMENT OF HON. ED WHITFIELD

This morning’s hearing will focus on the proposed Fiscal Year 2014 budget for the Department of Energy. But it is also this subcommittee’s introduction to the nation’s new Secretary of Energy, Dr. Ernest Moniz. Congratulations Dr. Moniz on your overwhelming victory in the Senate. Hopefully some of the legislation we will be considering this year will get that kind of vote. I am genuinely looking forward to working with you to help fashion an energy policy that benefits the American people.

It is no secret that I have had my share of disagreements with the Obama administration and DOE over the past few years. Under this administration, DOE has often taken a back seat to the Environmental Protection Agency, and was all-too-willing to acquiesce to EPA’s anti-energy agenda rather than affirmatively assert its own pro-energy agenda. In particular, DOE allowed itself to become a part of the administration’s attack on fossil fuels when it should have been defending them as a core component of our energy future and a critical contributor to job creation, global competitiveness, and affordable energy prices.

In my view, the last thing we need is a Secretary of Energy who says things like “coal is my worst nightmare.” Nor do we need a secretary who sees this nation’s growing abundance of natural gas and oil as a problem to be solved rather than an opportunity to be embraced. And we certainly don’t need a secretary who treats conventional energy and renewable energy as an either/or proposition where the federal government actively discourages conventional energy in order to create an artificial market for renewable energy. We need a secretary open to all domestic energy sources that are economically competitive, be they conventional or renewable. All of the above has supposedly been the president’s motto, but his policies have suggested otherwise.

Yesterday I introduced legislation to repeal a provision in the Energy Independence and Security Act of 2007 requiring a 100 percent reduction of domestic energy sources such as coal and natural gas to be used in new and modified federal buildings by 2030. This bill would allow the government more access to diverse energy sources and more cost effective measures for building structures. It is a simple and sensible measure that reaffirms the administration’s so called “all of the above” energy policy.

Fortunately, I see a positive future ahead in working with Secretary Moniz, and not a moment too soon. But I also believe that the proposed FY 2014 DOE budget that we will review today still reflects the mistakes of the recent past and is not a forward-looking proposal.

For example, we see in this budget an outsized request for the Office of Energy Efficiency and Renewable Energy, a nearly \$1 billion increase. The Obama DOE has wasted too much money on green energy pet projects that have failed, and we owe it to the taxpayers not to repeat those mistakes. In sharp contrast, conventional energy sources receive funding far below their actual contribution to the energy mix. It makes no sense to me that DOE's applied energy budget devotes more to renewables than all other energy sources combined.

And while the budget continues to throw money at things like electric car batteries and wind energy, it provides little for emerging issues like electric reliability and cybersecurity. It's time to get serious about the energy challenges we face, and this misallocation of resources needs to be corrected.

For example, the shale gas and oil revolution holds tremendous potential for energy affordability and security, for job creation, for export opportunities, and for strengthening America's standing in the world. But it also poses implementation and innovation challenges for which DOE can play a role. DOE should be out in front of this revolution taking steps to facilitate it, but the proposed budget does not reflect this need.

Overall, while we do not have an energy budget that reflects energy reality, we look forward to working with the new Energy Secretary who understands current energy realities and management priorities.

#

Mr. WHITFIELD. And, with that, at this time I like to recognize the distinguished gentleman from Chicago, Mr. Rush, for a 5-minute opening statement.

OPENING STATEMENT OF HON. BOBBY L. RUSH, A REPRESENTATIVE IN CONGRESS FROM THE STATE OF ILLINOIS

Mr. RUSH. I want to thank you, Mr. Chairman.

I want to thank you, Secretary Moniz, for being here today to discuss DOE's fiscal year 2014 budget, as well as the Agency's overall energy agenda.

Mr. Secretary, I believe you are heading one of the most important agencies in the Nation, as the field of energy will hold the keys to unlocking America's creativity and innovative spirit while also taking our economy to another level and providing an abundance of rewarding jobs and rewarding careers.

In fact, as I have stated many times before this subcommittee, the country that leads the world in advanced energy technology, energy production, and clean and renewable energy breakthroughs will also lead the global race for economic superiority, and it is imperative that our Nation remains in the forefront in each of these areas.

I believe in an all-of-the-above agenda that encapsulates my five core principles: 1) safe and reliable and affordable energy for all Americans; 2) focus on STEM education and training; 3) jobs and economic opportunities for all segments of the American population; and 4) policies to address climate change; lastly, North American energy independence over the next few decades.

With the emergence of the shale and natural gas finds, as well as the Obama Administration's commitment to investing in new advancements in clean and renewable energy technology, I believe that it is possible to find the right balance between protecting the Nation's earth, land, and water supply through sensible environmental regulations while at the same time ensuring that all Americans have the chance to share in the employment, the business,

and the economic opportunities that the energy industry will provide.

Since my ascension as ranking member on the Energy and Power Subcommittee in 2011, I have held a series of discussions with top energy leaders in the oil, gas, and renewable energy and pipeline industry, and we finally began to make some headway in our efforts to ensure that minorities, that women, and that historically underrepresented groups are given a chance to fully participate in the lucrative and vastly expanding energy sector.

Just 2 years ago when asking energy leaders about the levels of participation of these underrepresented groups, the most common response that I would receive undoubtedly would be sorry, Mr. Rush, we don't have that information. We will get back to you. Today, I am holding serious discussions with top industry leaders on what they can do proactively to ensure that minorities and other groups are aggressively being recruited, aggressively being trained, and aggressively given the opportunities to participate in the energy field. Mr. Secretary, over the past year, my office has worked extensively with your agency, including your Office of Economic Impact and Diversity, and together, we are making great strides in our combined efforts to increase minority participation in all sectors of the energy field from increasing STEM education and training opportunities to assessing employment and business opportunities.

Mr. Secretary, I look forward to working with you. I look forward to working with your department in close collaboration to make sure that all Americans are afforded the opportunity to benefit wholly in the energy area.

Mr. Secretary, I am delighted to have you before this subcommittee. I believe that your department will play a vital role in pushing America towards greater innovation, greater prosperity, and greater energy independence.

Thank you, and I yield back.

Mr. WHITFIELD. Thank you, Mr. Rush.

At this time I would like to recognize the gentleman from Michigan, the chairman of the full committee, Mr. Upton, for 5 minutes.

OPENING STATEMENT OF HON. FRED UPTON, A REPRESENTATIVE IN CONGRESS FROM THE STATE OF MICHIGAN

Mr. UPTON. Well, thank you, Mr. Chairman. And today, we do welcome the new Secretary, Secretary Moniz, to the Committee to receive his testimony on the Department of Energy's fiscal year 2014 budget.

You know, it has been over 30 years since Congress enacted the Department of Energy Organization Act of 1977. That was a different time, a time of dwindling oil and gas supplies, rising energy prices—we remember those gas lines—and overreliance on energy imports from unfriendly nations. In short, it was a time of energy scarcity and uncertainty.

Fast-forward 3 decades and our energy landscape is dramatically different. We have entered a new era of energy abundance, providing a level of energy security and certainty that was simply unimaginable just a few years ago.

American ingenuity and innovative technologies have powered an incredible energy transition, turning the trends in domestic oil and natural gas production upside down. And according to the International Energy Agency, the U.S. is now the world's leading producer of natural gas, and we have a chance—and I think we will—surpass Saudi Arabia as the world's largest oil producer by 2020.

And while we should all support a diverse and balanced energy strategy, including renewables and energy efficiency, unfortunately, the President's fiscal year 2014 budget for the Department of Energy ignores a number of new energy plans in the landscape. The President's energy budget doubles-down on some failed policies of the last 4 years, continuing to risk taxpayer dollars on "green energy" programs that have proven costly, ineffective, and failed to deliver on the jobs that were promised.

Notably, the President calls for \$2.8 billion for the DOE's Office of Energy Efficiency and Renewable Energy, a 56 percent increase over prior years. The amount is nearly double the budgets of the Offices of Nuclear Energy, Fossil Energy, and Electricity combined. Such a disparity in funding levels directly conflicts with the President's stated commitment to an "all-of-the-above" energy strategy.

The President's energy budget isn't just about dollars and cents; it is about priorities for the country, and the priorities set forth in his budget are a little bit out of touch with today's energy reality and present a stark contrast from the energy priorities being pursued by this committee.

Our vision for the Nation's energy future is a true, open, "all-of-the-above" strategy that would promote greater production and use of our new energy abundance, facilitate private sector innovation to develop advanced energy technologies and manufacturing, and ensure that U.S. consumers indeed have a long-term supply of reliable and affordable energy. It should also include a global perspective on how North America's abundant resources can be used to launch strategic international diplomacy and geopolitical stability around the world.

To achieve those objectives, I believe that it is time to repurpose the Department of Energy to reflect the opportunities of today and meet the challenges of tomorrow, and I am very happy to see the Secretary's testimony reflect these new ideas in both organizational changes, as well as the overall mission.

Our transforming energy landscape requires a DOE for the 21st century. We need an agency that is ready to shed its culture of scarcity and instead embrace a mindset of abundance and opportunity. We need a department that will take full advantage of our newly discovered energy resources and capitalize on private sector expertise to modernize our energy systems, and that includes continued oversight regarding U.S. export policies that impede U.S. participation in international energy projects and commerce, not true just for LNG and coal but for nuclear suppliers, equipment, and renewables as well.

Such a transition, if done properly, will spur dramatic economic growth, create thousands of good American jobs, make us significantly more energy secure, and in fact set the U.S. down a path of becoming a global energy superpower.

So, Mr. Secretary, congratulations on your appointment. We certainly look forward to working with you over the next couple of years to achieve our common objective.

And I would yield the balance of my time to nobody. I yield back.
[The prepared statement of Mr. Upton follows:]

PREPARED STATEMENT OF HON. FRED UPTON

Today we welcome Secretary Moniz to the committee to receive his testimony on the Department of Energy's FY 2014 budget.

It has been over 30 years since Congress enacted the Department of Energy Organization Act of 1977. That was a different time—a time of dwindling oil and gas supplies, rising energy prices, and overreliance on energy imports from unfriendly nations. In short, it was a time of energy scarcity and uncertainty. Fastforward three decades and our energy landscape is dramatically different. We have entered a new era of energy abundance, providing a level of energy security and certainty that was simply unimaginable just a few years ago.

American ingenuity and innovative technologies have powered an incredible energy transition, turning the trends in domestic oil and natural gas production upside down. According to the International Energy Agency, the U.S. is now the world's leading producer of natural gas, and has a chance to surpass Saudi Arabia as the world's largest oil producer by 2020.

While we should all support a diverse and balanced energy strategy, including renewables and energy efficiency, unfortunately, the president's FY 2014 budget for the Department of Energy ignores our new energy landscape. The president's energy budget doubles-down on the failed policies of the last four years, continuing to risk taxpayer dollars on "green energy" programs that have proven costly, ineffective, and failed to deliver the jobs as promised. Notably, the president calls for \$2.8 billion for DOE's Office of Energy Efficiency and Renewable Energy—a 56 percent increase over prior years. This amount is nearly double the budgets of the Offices of Nuclear Energy, Fossil Energy, and Electricity combined. Such a disparity in funding levels directly conflicts with the president's stated commitment to an "all-of-the-above" energy strategy.

The president's energy budget isn't just about dollars and cents; it's about priorities for the country. And the priorities set forth in his budget are out of touch with today's energy reality and present a stark contrast from the energy priorities being pursued by this committee. Our vision for the nation's energy future is a true, open "all-of-the-above" strategy that would promote greater production and use of our new energy abundance, facilitate private sector innovation to develop advanced energy technologies and manufacturing, and ensure U.S. consumers have a long-term supply of reliable and affordable energy. It should also include a global perspective on how North America's abundant resources can be used to launch strategic international diplomacy and geopolitical stability around the world.

To achieve these objectives, I believe it is time to repurpose the Department of Energy to reflect the opportunities of today and meet the challenges of tomorrow, and I am happy to see the secretary's testimony reflect new ideas in both organizational changes and overall DOE mission.

Our transforming energy landscape requires a Department of Energy for the 21st Century. We need an agency that is ready to shed its culture of scarcity and instead embrace a mindset of abundance and opportunity. We need a Department of Energy that will take full advantage of our newly discovered energy resources and capitalize on private sector expertise to modernize our energy systems. This includes continued oversight regarding U.S. export policies that impede U.S. participation in international energy projects and commerce. This is true not just for LNG and coal, but for nuclear suppliers, equipment, and renewables as well. Such a transition, if done properly, will spur dramatic economic growth, create thousands of good American jobs, make us significantly more energy secure, and set the United States down a path of becoming a global energy superpower.

Secretary Moniz, once again, congratulations on your appointment and, on behalf of the entire Committee on Energy and Commerce, we look forward to working with you over the next several years to achieve our common objectives.

#

Mr. WHITFIELD. Thank you, Mr. Chairman.

At this time, I recognize the gentleman from California, Mr. Waxman, the ranking member of the full committee, for a 5-minute opening statement.

OPENING STATEMENT OF HON. HENRY A. WAXMAN, A REPRESENTATIVE IN CONGRESS FROM THE STATE OF CALIFORNIA

Mr. WAXMAN. Thank you, Mr. Chairman. Mr. Secretary, I want to thank you for being here today. The Department of Energy will benefit from your expertise and leadership and we look forward to working with you as the Nation continues its transition to a clean energy economy.

The Department has a host of challenging responsibilities—from cleaning up Cold War-era nuclear sites and maintaining our nuclear weapons stockpile, to managing 17 national labs and operating the Strategic Petroleum Reserve. Running the Department of Energy is a big job and you have the experience to do it. But I want to tell you how I view your role. I look at your responsibilities through the lens of climate change. Climate change is the biggest energy challenge we face. There is no debate about the science. Climate change is happening now, it is caused by humans, and the impacts are real.

The paramount responsibility of the Secretary of Energy is advancing the Nation's response to this existential threat.

For decades, experts have talked about the potential future impacts from climate change. They have warned that in the future we will face extreme heat waves, floods, droughts, wildfires, ocean acidification, and dramatic sea level rise.

These are no longer future threats; they are happening today. Climate change is spawning extreme weather across the country from the Texas droughts to the Colorado wildfires to Superstorm Sandy.

And as the impacts mount, the window for effective action to address climate change is closing. And just this week, the International Energy Agency warned that, unless the world acts to reduce carbon pollution before 2020, global temperatures could rise by more than 9 degrees Fahrenheit, which would “be a disaster for all countries.” IEA found that taking key actions now to reduce emissions could be done at no net economic cost, while delay would impose trillions of dollars in costs on society.

Mr. Secretary, your job would be a lot easier with support from Congress, but don't count on it. This committee, and the Republican-controlled House, has become one of the last remaining refuges of the flat-Earth society. We have the jurisdiction to do so much to protect future generations, yet we won't even hold a hearing to learn from the scientists about their concerns about climate change.

So you will have to act without us. President Obama got it exactly right in his State of the Union address when he said that if Congress did not act, he would.

Some of the most important authorities are those in the Department of Energy. You need to act aggressively to strengthen energy efficiency standards for appliances and equipment. That will save consumers money while reducing energy use and carbon pollution.

You should implement the President's proposal for a "Race to the Top" on energy efficiency and grid modernization to encourage States to voluntarily adopt forward-leaning policies.

And you can invest in research and development and provide other support for promising clean energy and energy storage technologies.

Mr. Secretary, you also can play an important role in educating Congress and the public about the threat of climate change and the urgent need for action.

We are at a critical crossroads. We face great peril if we ignore the science and cling to the fuels of the past. Or we can listen to the scientists, invest in the clean energy technologies of the future, and lead the world in energy innovations.

Mr. Secretary, I am confident you will help us choose the right path and I look forward to your testimony and to working with you on all the issues that you confront where we can be of help. I yield back my time.

[The prepared statement of Mr. Waxman follows:]

PREPARED STATEMENT OF HON. HENRY A. WAXMAN

Mr. Secretary, thank you for being here today. The Department of Energy will benefit from your expertise and leadership, and we look forward to working with you as the nation continues its transition to a clean energy economy.

The Department has a host of challenging responsibilities—from cleaning up Cold War era nuclear sites and maintaining our nuclear weapons stockpile to managing 17 national labs and operating the strategic petroleum reserve. Running the Department of Energy is a big job, and you have the experience to do it.

But I want to tell you how I view your role. I look at your responsibilities through the lens of climate change. Climate change is the biggest energy challenge we face. There is no debate about the science. Climate change is happening now, it is caused by humans, and the impacts are real.

The paramount responsibility of the Secretary of Energy is advancing the nation's response to this existential threat.

For decades, experts have talked about the potential future impacts from climate change. They've warned that in the future we'll face extreme heat waves, floods, droughts, wildfires, ocean acidification, and dramatic sea level rise.

These are no longer future threats; they are happening today. Climate change is spawning extreme weather across the country, from the Texas droughts to the Colorado wildfires, to Superstorm Sandy.

And as the impacts mount, the window for effective action to address climate change is closing. Just this week, the International Energy Agency warned that unless the world acts to reduce carbon pollution before 2020, global temperatures could rise by more than 9 degrees Fahrenheit, which would "be a disaster for all countries." IEA found that taking key actions now to reduce emissions could be done at no net economic cost, while delay would impose trillions of dollars in costs on society.

Mr. Secretary, your job would be a lot easier with support from Congress, but don't count on it. This Committee—and the Republican-controlled House—has become one of the last remaining refuges of the flat earth society. We have the jurisdiction to do so much to protect future generations, yet we won't even hold hearings to hear from the scientists.

So you will have to act without us. President Obama got it exactly right in his State of the Union address when he said that if Congress did not act, he would.

Some of the most important authorities are those in the Department of Energy. You need to act aggressively to strengthen energy efficiency standards for appliances and equipment. That will save consumers money while reducing energy use and carbon pollution.

You should implement the President's proposal for a Race to the Top on energy efficiency and grid modernization to encourage states to voluntarily adopt forward-leaning policies.

And you can invest in research and development and provide other support for promising clean energy and energy storage technologies.

Mr. Secretary, you also can play an important role in educating Congress and the public about the threat of climate change and the urgent need for action.

We are at a critical crossroads. We face great peril if we ignore the science and cling to the fuels of the past. Or we can listen to the scientists, invest in the clean energy technologies of the future, and lead the world in energy innovation.

Mr. Secretary, I am confident you will help us choose the right path and look forward to your testimony.

Mr. WHITFIELD. Thank you, Mr. Waxman.

That concludes the opening statements, so, Secretary Moniz, we will recognize you for 5 minutes for your opening statement and look forward to your testimony. And be sure and put the microphone on. Thank you.

**STATEMENT OF HON. ERNEST J. MONIZ, SECRETARY, U.S.
DEPARTMENT OF ENERGY**

Secretary MONIZ. Great. So, Chairman Upton and Whitfield, Ranking Members Waxman and Rush, members of the committee, I thank you for this chance to appear before you today to lay out some of my priorities and vision for the next few years of the Department of Energy. It is my first opportunity to appear in the House as Secretary of Energy, and I look forward and hope to use these brief remarks to at least partially introduce myself to the committee as a basis for our work going forward.

I have been working on energy science and security issues for most of my professional career, and I think it is known I served as DOE Under Secretary during the Clinton Administration after serving as associate director in the Office of Science and Technology Policy.

Most of my professional career has been at MIT where I have been on the faculty since 1973, including serving as head of the Department of Physics and founding director of the MIT Energy Initiative in 2006.

So today, I will lay out some of my vision for how the Department can be best positioned to address the pressing challenges before us and touch on some of the initiatives in the President's fiscal year 2014 budget request for the Department of Energy. And I will organize some brief remarks around the DOE mission areas, starting with energy technology and policy.

Since the President took office, it has been already said, in fact, by Chairman Upton, the global energy landscape has undergone a profound change. In the United States, oil and gas production has increased each year, while oil imports have fallen to a 20-year low. At the same time, renewable electricity generation has doubled and carbon emissions have fallen to the lowest level in United States in nearly 2 decades. But even with this increase in domestic oil and gas production, high gasoline prices impact American families and businesses every day and remind us that we are still too reliant on oil, and the risks of global climate change, as Mr. Waxman said, threaten the health, security, and prosperity of future generations.

The President's fiscal year 2014 budget request will help us double American energy productivity by 2030, save consumers and businesses money by saving energy, and support groundbreaking research innovation to leverage every domestic source of energy from hydrocarbons to nuclear to solar and wind, and other renewables as well like hydro and geothermal.

The President's budget increases investments in DOE's applied energy programs. Among these are the Energy Innovation Hubs which bring together top scientists and engineers pursuing game-changing energy goals and also the Advanced Research Projects Agency for Energy, ARPA-E, supporting high-impact, early-stage technologies on the way to the marketplace. And I very strongly support both of those programs.

I also served on the President's Council of Advisors on Science and Technology, and 2½ years ago, that group recommended a new approach to try and integrate various threads of energy policy, environment, security, economy specifically by launching an Administration-wide process termed the Quadrennial Energy Review, and I plan to work on that across the Administration but clearly also with input from the Congress, from the industry, from NGOs and others. This will build on the Quadrennial Technology Review carried out in the Department in 2011. And to do this work, I feel it is very important that we beef up our analytical capabilities as the underpinnings of a fruitful discussion with all of the stakeholders.

In science, DOE science programs really are a key part of the backbone of basic research in the physical sciences in the United States. Earlier this month, I took my first trip as Secretary. I went to Oak Ridge, Tennessee. Among other things, I saw Titan, the world's fastest supercomputer. By pursuing the research that is necessary to enable and build the next generation of supercomputers, we can help ensure continued U.S. leadership in this area. But we certainly cannot be laid back about it. International competition, especially from China, is closing in quite rapidly.

While I was at Oak Ridge, I also visited the first hub called Castle applying these large-scale computational tools to nuclear power reactors. It is producing product already, a virtual environment for reactors.

The President's budget also continues support for the Energy Frontier Research Centers, which have been, in my view, a great success at many universities and laboratories across the country.

On nuclear security and environmental radiation I will be brief, although these are clearly pretty important missions for the Department. The President's budget proposes, I think, a strong basis for transitioning to a smaller but always safe, secure, and reliable nuclear stockpile. It also strengthens the science, technology, and engineering base to maintain the safety and reliability over the long-term.

Environmental remediation at the many sites involved in decades of nuclear weapons production during the Cold War remains a major mission for the Department. This is a legal and moral imperative, and the President's budget proposal provides resources to clean up this legacy and continue the world's largest environmental remediation effort in the Department. Next week, I will visit the Hanford site where we have some of our most difficult challenges in trying to reach eventual closure of all of these sites.

Finally, improving the management and performance of the Department really is one of my top priorities as Secretary. I believe we need to do this to enable our pursuit of mission effectively. And I will just say I have identified now particularly four areas where

I would like to focus attention on improved management performance. One is better integration of our science and energy functions; second, elevating the focus through organizational change unimagined in performance as an enterprise-wide requirement; third, security. We need clear alliance of authority and responsibility and we will pursue that organizationally. And finally, I have already mentioned beefing up the analytical capacity in the Department and our laboratories as part of our analyzing policy.

So in summary, the Department of Energy, I think, does have very significant responsibilities that bear on America's economic, energy, environmental, and nuclear security future. I have appreciated the opportunity to collaborate with members of this committee and with other Members of Congress both in my previous tenure at DOE—some of you were here then—and in the years since, and I am committed to working with Congress in search for solutions to this country's energy and nuclear security challenges.

Mr. Chairman, I have submitted a longer statement for the record and I look forward to your observations, suggestions, and questions. Thank you.

[The prepared statement of Mr. Moniz follows:]

**Testimony of Secretary Ernest Moniz
U.S. Department of Energy
Before the
House Committee on Energy and Commerce
Subcommittee on Energy and Power
June 13, 2013**

Chairmen Upton and Whitfield, Ranking Members Waxman and Rush, and Members of the Committee, thank you for the opportunity to appear before you today to lay out my vision for the Department of Energy.

This is my first opportunity to appear before the House of Representatives as Secretary of Energy and I look forward to introducing myself to the members of this Committee and to this chamber. I have had the opportunity to meet with several members of the Committee during my first three weeks on the job and I look forward to meeting with and working with this Committee in the coming weeks, months, and years. Indeed, I look forward to continuing my engagement with members of Congress from both parties and both chambers to constructively illuminate our perspectives on important national challenges and to seek solutions in a collaborative fashion.

I am very pleased to be back at the Department of Energy (DOE), even if some have characterized my return as a “triumph of hope over experience.” I served as DOE Under Secretary during the Clinton Administration, after working as Associate Director for Science of the Office of Science and Technology Policy in the Executive Office of the President. In fact, my experience at the Department was that we could indeed accomplish much and I do have hope and expectations for doing the same in collaboration with Congress.

I have been working on energy, science, and security issues for most of my professional career. I served on the MIT faculty beginning in 1973, including as Head of the Department of Physics and as Director of the William H. Bates Linear Accelerator Center, a DOE facility operated by MIT. Since 2001, when I returned to MIT from DOE, my principal focus has been at the intersection of energy technology and policy, especially on research and education aimed at a future low-carbon economy. I was the Founding Director of the MIT Energy Initiative in 2006, a campus wide initiative that aligns well with President Obama’s “all-of-the-above” approach to our energy future.

The mission of the Department of Energy could not be more urgent or important. From our efforts to find affordable and clean sources of energy, to ensuring the security of our nuclear stockpile, to cleaning up the legacy of the Cold War — our work, which includes advancing the science that underpins these missions, is essential to our prosperity, environment, and security.

Today, I will lay out my vision for how the Department can be best positioned to address these challenges. Given the circumstances and scheduling of this hearing, my presentation is not that of a conventional budget hearing, but I will touch on some of the initiatives in the President’s Fiscal Year 2014 Budget Request for DOE and their relationship to priorities for the next few years. I will organize my remarks by DOE mission area.

Energy Technology and Policy

As already noted, the President advocates an all-of-the-above energy strategy and I am very much in tune with this. As the President said when he announced my nomination, “we can produce more energy and grow our economy while still taking care of our air, water, and climate.”

Since President Obama took office, the global energy landscape has undergone a profound change. In the United States, oil and gas production has increased each year, while oil imports have fallen to a 20 year low. At the same time, renewable electricity generation from wind, solar, and geothermal sources has doubled; and carbon emissions have fallen to the lowest level in the U.S. in nearly two decades. These changes have important implications for our economy, environment, and national security. Already we are seeing the effects of increased U.S. oil and natural gas production on global energy markets.

Even with the increase in domestic oil and gas production and clean energy generation, there is more work to be done. High gasoline prices impact American families and businesses every day and remind us that we are still too reliant on oil as an energy source. As the President has emphasized, there is no quick fix to a challenge that has built up over decades, but the elements of a solution are in place — more efficient vehicles as supported by the President’s CAFE standards; alternative fuels, such as potential increased use of natural gas and development of economic next generation biofuels; and vehicle electrification. This week, the Department released eGallon, which provides the “fuel cost” for electric vehicles compared to the gasoline price posted at the corner gas station; the national average cost of fueling a vehicle with electricity is the equivalent of about \$1.14 a gallon compared to a similar vehicle that runs on gasoline. Together, these three advances – efficiency, alternative fuels, and electric vehicles – will reduce fuel costs for American families.

While we have made important progress in domestic production of fossil fuels and we are seeing progress in the small, but rapidly growing, electric vehicle market, we still need to support research into technological breakthroughs that will free us from the volatility of the oil market. An initiative in the FY 2014 President’s Budget is a request for \$2 billion over the next ten years, set aside from Federal oil and gas development revenue, to invest in a new Energy Security Trust that would provide a reliable stream of mandatory funding for R&D on cost-effective transportation alternatives that reduce our dependence on oil. The President’s plan builds on an idea that has bipartisan support from energy experts, retired admirals and generals and CEOs of leading companies; it focuses on one goal: shifting America’s cars and trucks off oil.

The increase in domestic natural gas production over the past five years has helped contribute to market-led reductions in carbon dioxide emissions as well as an expansion of manufacturing and associated job opportunities. The increase in U.S. unconventional oil production, combined with increased vehicle efficiency and biofuels production will continue to reduce American oil imports and our trade deficit.

The increase in domestic natural gas production is expected to continue. This May, the Energy Department announced that it has conditionally authorized the second proposed facility — the Freeport LNG Terminal on Quintana Island, Texas — to export domestically produced liquefied natural gas (LNG) to countries that do not have a Free Trade Agreement with the United States. And we will expeditiously work through the remaining applications, reviewing each one on a case-by-case basis to ensure that all approvals are in the public interest.

The risks of global climate change threaten the health, security, and prosperity of future generations. DOE must continue to support a robust R&D portfolio of low-carbon options and key enablers: efficiency, renewable, nuclear, carbon capture and sequestration, energy storage, and smart and resilient grids. The President's FY 2014 Budget requests resources to invest in programs that support research, development, and deployment of the energy technologies of the future that will reduce greenhouse gas emissions and increase energy security. These investments will help us double American energy productivity by 2030, double renewable electricity generation again by 2020, cut net oil imports in half by the end of the decade, save consumers and businesses money by reducing energy use, and support groundbreaking research and innovation to safely and responsibly leverage every domestic source of energy. For example the Administration has already committed about \$6 billion to CCCUS, and the forthcoming demonstration projects will be critical for coal utilization in a carbon constrained future.

The President's Budget increases investments in DOE's applied energy programs. These investments include funding for programs designed to help meet the President's goals of investing in the next generation of renewable energy technologies, advanced vehicles and fuels, and energy efficiency measures that reduce energy use in Federal agencies and the industrial and building sectors. Among these efforts are the Department's successful SunShot Initiative, which aims to make solar energy cost-competitive with conventional sources of electrical energy, and cross-cutting initiatives such as the EV Everywhere Grand Challenge, which aims to reduce the overall cost of electric vehicles, and the Clean Energy Manufacturing Initiative. The Clean Energy Manufacturing Initiative focuses on strengthening U.S. competitiveness through both improved manufacturing of clean energy products and increased manufacturing energy productivity more broadly. It will help enable U.S. companies to cut manufacturing costs, enhance the productivity of their investments and workforce, and reduce the life-cycle energy consumption of technologies. The first DOE operated National Additive Manufacturing Innovation Institute in Youngstown, Ohio focuses on additive manufacturing, often referred to as 3D printing, and a solicitation is active for a new manufacturing institute focused on wide bandgap semiconductors for power electronics.

To encourage increased energy efficiency and a modernized electricity grid, the Department's Race to the Top for Energy Efficiency & Grid Modernization will incentivize states, local governments, co-operatives, and tribes to implement effective policies to cut energy waste and modernize the grid. The President's Budget requests \$200 million in one-time funding for technical assistance and performance-based awards after the policies are implemented and evaluated.

The Race to the Top initiative is an important part of my larger focus on states, tribes, and local governments. States have been out in front with innovative policies that we want to support and,

as appropriate, replicate on a national scale when they prove effective. Different regions of our country have very different energy opportunities and needs, and we need to build from those to a national policy. In this vein, our national labs have unique capabilities and expertise to provide technical assistance to regional partners. I look forward to expanding our cooperation and collaboration with governments, tribal governments, and other partners across the country.

We need to support cutting edge research across the board that will help create the clean energy economy of tomorrow. The President's Fiscal Year 2014 budget also requests continued support for the Advanced Research Projects Agency - Energy (ARPA-E), to support high-impact energy-related research projects with the potential to transform the energy sector.

ARPA-E has invested in roughly 285 high-risk, high-reward research projects that, if successful, could create the foundation for entirely new industries. Seventeen of these projects, which received an initial investment from ARPA-E of approximately \$70 million in total, have attracted over \$450 million in publicly-announced private sector follow-on funding. ARPA-E funded companies and research teams have produced a battery that doubled the energy density of any previous design, successfully engineered microbes that use carbon dioxide and hydrogen to make fuel for cars, and developed a one megawatt silicon carbide transistor the size of a fingernail.

The Loan Programs Office at DOE has been a critical force supporting large-scale clean and renewable energy projects and advanced technology vehicle manufacturing here in America. Building on work of the previous administration, the Department of Energy has made a number of investments to support these innovative technologies. When you are talking about cutting-edge clean energy technologies, not every investment will succeed — but the latest indications show that the Energy Department's portfolio of more than 30 loan projects is delivering big results for the American economy.

The portfolio includes 19 new clean energy power plants that are adding enough solar, wind and geothermal capacity to power a million homes and displace 7 million metric tons of carbon dioxide every year — roughly equal to taking a million cars off the road. And just this month, Tesla Motors repaid the entire remaining balance on a \$465 million loan from the Department of Energy, nine years earlier than required.

An important part of the President's all-of-the-above approach is nuclear energy. Addressing the disposition of used nuclear fuel and high-level radioactive waste is essential to the long-term viability of the industry. I was pleased to be part of the Blue Ribbon Commission on America's Nuclear Future (BRC) and we submitted our findings to Congress and the White House. The BRC report recommended a consent based approach focused on the dual tracks of interim storage and geologic disposal capacity. The Administration has issued a strategy that embraces the core findings of the BRC, but the path forward requires Congressional action. I look forward to working with Congress on expeditiously implementing policies that ensure that our nation can continue to rely on carbon-free nuclear power.

During my time at MIT, I had the pleasure of serving on President Obama's Council of Advisors on Science and Technology (PCAST). At the end of 2010, PCAST issued a report to the President on *Accelerating the Pace of Change in Energy Technologies through an Integrated*

Federal Energy Policy. It specifically recommended an Administration-wide Quadrennial Energy Review (QER) with DOE in the executive secretariat role.

The Quadrennial Technology Review of 2011 was the first installment in the QER process. I plan to build on this foundation by working with colleagues across the Administration, garnering strong input from the Congress and private sector stakeholders, and enhancing the Department's analytical and policy planning capabilities.

Science

DOE's science programs provide the technical underpinnings to accomplish the Department's missions and form part of the backbone of basic research in the physical sciences in the United States. The Department provides the national research community with unique research opportunities at major facilities for nuclear and particle physics, energy science, materials research and discovery, large-scale computation, and other disciplines. More than a hundred Nobel Prizes have resulted from DOE-associated research.

Competing in the new energy economy will require us to harness the expertise of our scientists, engineers, and entrepreneurs. As the President said, "the world is shifting to an innovation economy, and nobody does innovation better than America." The President is committed to making investments in research and development that will grow our economy and enable America to remain competitive, and has requested significant resources to ensure America leads the world in the innovations of the future. The President believes in a robust scientific research infrastructure, strong support for research, and a buildup in human capacity.

Energy Frontier Research Centers (EFRCs) provide an important example of the Department's focus on supporting new and emerging research areas. These centers support scientists and engineers as they work to solve specific scientific problems to help unleash new clean energy technology development. Importantly, the EFRCs followed an outstanding process organized by the previous Administration, engaging about 1,500 scientists from across the country who identified key basic energy science challenges. So far, the EFRCs have generated some 3,400 peer-reviewed papers, 60 invention disclosures, and 200 patents; and the Centers report numerous instances of technology transfer. In their three-plus years of existence, the EFRCs have achieved scientific breakthroughs in multiple areas, from solar power and batteries to new catalysts for refining petroleum and powering fuel cells. In FY 2014, we plan to hold an open re-competition to select new EFRCs and consider renewals of some existing EFRCs. This process is not reinventing the wheel but ensuring that our research dollars are supporting projects with the highest possible impact across the energy landscape.

Earlier this month, I made my first trip as Secretary to Oak Ridge, Tennessee to visit the Oak Ridge National Lab (ORNL) and the Y-12 National Security Complex. During my visit, I toured the Spallation Neutron Source, a facility that is helping us better understand the properties of the advanced materials needed to harness and store energy, and which is just one example of the cutting edge facilities across our national labs that are critical for our economic competitiveness and our national security.

While at ORNL, I also had the opportunity to see Titan, the world's fastest supercomputer and Everest, a state-of-the-art facility for data exploration and visualization. These tools are helping us with a variety of scientific solutions, such as better prediction of climate change today by modeling the climatic changes at the end of the last ice age, 20,000 years ago, to improving the production of biofuels by visualizing how cellulosic plant materials are broken down into sugars.

We have long been the global leaders in supercomputing and DOE and its predecessors have long been key drivers. In 1954 a group of researchers at ORNL created one of the world's first supercomputers — built from vacuum tubes, transistors, and diodes. The Oak Ridge Automatic Computer and Logical Engine helped in the early research of nuclear physics and the biological effects of radiation.

Currently, the U.S. has three of the five most powerful computers in the world, but our global competitors are not far behind. By pursuing the research necessary to enable and build the next-generation of supercomputers, exascale machines with 50-100 times more capability than the current generation, we can help ensure continued U.S. leadership in this important area.

While I was at Oak Ridge, I also visited our Consortium for Advanced Simulation of Light Water Reactors (CASL). CASL is the first of DOE's five existing Energy Innovation Hubs. Through the Hubs, we are bringing together our nation's top scientists and engineers to make game-changing progress in energy technologies. For example, CASL has released software that support simulating a virtual model of an operating physical reactor. I had the pleasure of serving as the first Chairman as CASL's Board of Directors and saw firsthand how the Hub was making a real difference on critical issues for nuclear power. The President's budget continues support for our Hubs and proposes a new Hub in electricity systems.

Nuclear Security

The President, beginning with his speech in Prague in 2009, has laid out a clear vision of nuclear security. This strategy includes step-by-step reductions in nuclear weapons, while ensuring the safety, security and effectiveness of our stockpile as long as we have nuclear weapons; strengthened efforts to prevent the spread of nuclear weapons; and measures to prevent nuclear terrorism. DOE has significant responsibilities spanning much of this agenda.

Earlier this week the Department released its Stockpile Stewardship Management Plan, which lays out the Administration's plan to ensure that our nuclear arsenal remains an effective deterrent so long as we should need it.

The President's Budget requests resources to strengthen our national security with investments in the Department's National Nuclear Security Administration (NNSA) as described in the Administration's Nuclear Posture Review (NPR) of 2010. This funding proposal is the result of an unprecedented cooperative analysis and planning process jointly conducted by NNSA and the Department of Defense. The Budget meets the goals of the NPR by funding cost increases for nuclear weapon life extension programs, such as upgrades to the W76 and B61 nuclear weapons; initiating new upgrades for the W78 and W88 nuclear weapons; improving or replacing aging facilities, such as the Uranium Processing Facility; adding funds for tritium production and

plutonium manufacturing and experimentation; and sustaining the existing stockpile by maintaining the underlying science, surveillance, and other support programs.

This national security investment provides a strong basis for transitioning to a smaller yet still safe, secure and effective nuclear stockpile. It also strengthens the science, technology and engineering base of our enterprise.

NNSA plays a vital role in achieving President Obama's other nuclear security objectives, including in the prevention of nuclear terrorism — and the grave and urgent threat it presents to our nation and the world. The Budget requests support for NNSA's efforts to detect, secure, and dispose of dangerous nuclear and radiological material around the world, helping the Department to fulfill its role in completing the President's four-year plan to secure all vulnerable nuclear materials worldwide.

The Department of Energy's enterprise-wide intelligence and counter intelligence capability is also critical to our national defense and nuclear security. And I intend to make sure that these assets continue to sustain our national security.

Environmental Remediation

Environmental remediation at the many sites involved in decades of nuclear weapons production during the Cold War remains a major mission for the Department. This is a legal and moral imperative. DOE has made substantial progress in cleaning up this legacy waste but, as you know, the hardest challenges remain as long-term, expensive, complex projects in several states.

The President's budget requests the resources necessary to support the environmental remediation effort, led by the Office of Environmental Management. I pledge to work with members of Congress, and the affected communities and other stakeholders openly and transparently as we confront the many challenges involved in remediation efforts. As part of that effort, I will renew the Department's emphasis on the management and performance of its major projects.

One of our most challenging Environmental Management projects remains the Hanford Site in Washington. I have committed to a plan to address the serious issues at hand, and I look forward to visiting Hanford next week and determining the path forward on the project.

Management and Performance

The Department of Energy has a broad range of responsibilities that stretch across cutting edge science and technology programs, national security priorities, and complex environmental cleanup projects. Responsibility for taxpayers' money demands that we manage our resources in the most efficient manner possible. Improving the management and performance of the Department is one of my top priorities as Secretary.

I have been carefully reviewing the organization and management practices within the Department and am working with my staff to develop options to reorganize. I see this as a

sustained effort for continuous improvement and I look forward to working with members of this committee and others in Congress and the Administration to elevate the focus on management and performance at DOE.

As part of this process, I have identified several areas where I plan to make improvements:

- To better support the President's all-of-the-above energy strategy, we need to improve the Department's systems approach to energy policy analysis. DOE has analysis capabilities housed in each major program area, but to strengthen our integrated policy assessment capability to provide the Secretary, the President, and the Congress with comprehensive assessments of key energy policy issues. I am considering plans to consolidate and strengthen policy and systems analysis, to make better use of existing resources.
- A key factor in successful technology innovation programs is the ability to closely integrate and move quickly from basic science, to applied research, to technology demonstration. The Department has made important strides to foster communication between its science and energy programs, but we must do more organizationally to drive this process. I am considering ways to more closely integrate the management of science and energy programs to improve the dexterity and effectiveness of the innovation process.
- The security breach at the Y-12 facility revealed unacceptable shortcomings in the Department's oversight of its security programs and systems. I plan to revamp the security oversight apparatus, including a stronger independent oversight function that will report directly to the Secretary. A culture of safety and environmental compliance go hand-in-hand with good security, and I believe that all of these functions should be given greater attention
- We need to build consistency and accountability across the entire Department. The various mission support functions of DOE require greater day-to-day oversight, coordination and integration. I am considering means of strengthening the lines of authority and management of these functions.
- Finally, I am examining the organization of the Office of the Secretary. I look forward to building councils of advisors that will provide enterprise-wide advice and analysis on issues ranging from cyber security to the management of the National Labs. I also plan to engage the Directors of the National Laboratories regarding the Department's mission and to appoint and work closely with the Secretary of Energy Advisory Board. Bringing together these measures to improve internal coordination and reaching out for expert outside advice will provide me with a broader base of information and analysis to make informed decisions.

Conclusion:

In summary, the Department of Energy has significant responsibilities that bear on America's economic, energy, environmental and nuclear security future. I have appreciated the opportunity to collaborate with members of this Committee and with other members of Congress both during my previous tenure at DOE and in the years since. I am committed to working with the Congress in a search for the solutions to the country's energy and nuclear security challenges.

As President Obama has said, "Today, no area holds more promise than our investments in American energy. After years of talking about it, we're finally poised to control our own energy future." The investments included in the Administration's Energy Department budget request are vital to ensuring America's energy security and securing America's place as the world leader in the clean energy economy.

Thank you, and now I am pleased to answer your questions.

Mr. WHITFIELD. Well, thank you, Mr. Secretary. We appreciate your comments and look forward to working with you as you move forward at the Department of Energy.

I think today's opening statements reflected the divergent views here in the Congress about energy and its impact on economic growth and job promotion. And Mr. Waxman talks about climate change, and I know that he genuinely is concerned about that issue, as we all are. And I think one of the key issues that many of us that are elected to represent over 700,000 people each is our economy has been very sluggish. We are trying to promote economic growth, we are trying to create jobs, we are trying to increase revenues for the government so we can do more programs.

And many of my friends on the other side of the aisle, as I said, are very sincere in their views, and they would like to see us go right down the road the European Union has gone down, and we know that the European Union has pursued a broad range of climate policies, including renewable energy subsidies for wind and solar power. They had a cap-and-trade system. But the results of this, it appears quite clearly, is not working.

As I said, The Economist just a few months ago had a big article talking about "Europe's energy policy delivers the worst of all possible worlds." And their gas prices are so high, you have companies leaving Europe. They closed all their nuclear power plants in Germany. They were backing away from coal, and now, they are planning to build 69 new coal-powered plants in Europe.

And then recently, we had this article in the New York Times, "high-energy costs plaguing Europe." And they talk specifically about how the head of the European power and carbon at the energy consulting firm in Paris said we embarked in Europe on a big transition to a low-carbon economy without taking into account the cost and without factoring in the competitive impact.

And I know many of our friends on the side of the aisle view us as we are too far this way and we think they are too far that way, so we hope that you can help lead this country in a more balanced approach on energy.

I am a fan of the Sierra Club in that it has done a lot of good things for America and protecting our environment, but when the president of the Sierra Club says we want to get to a place where we do not use any fossil fuels, and next week, the Sierra Club is going to be in Louisville, Kentucky; they are going to be demonstrating and protesting against the use of coal. And I don't think anyone realistically can say that we can meet our electricity demands in this country and remain competitive without a strong fossil fuel presence. You can't build enough windmills and solar panels to meet that need.

And I talked to you soon after your confirmation and you are certainly not involved in it, but right across the line in Tennessee from my home State of Kentucky, Hemlock Corporation built a \$1.4 billion plant to make some component parts for solar panels, and they said it was going to be 2,500 new jobs. There was government stimulus money in the project, and they announced in January after they got up to 400 employees that they were going to close the plant down. They were never even going to open the plant. So now they are down to 20 employees. They built a \$20 million rail-

road line into that plant, and they are not going to move one product out of there. It is being closed down.

So I think the challenge we face in this country is just having a balanced approach without someone saying, hey, we don't need fossil fuels at all. I do believe what the President said. We need an all-of-the-above policy, but frequently, my view is that this Administration says one thing and does another in that arena.

Now, I meant to ask you some questions. I don't know how I got so worked up here, but one thing I would just ask you quickly on the Paducah plant. Hopefully, it is the Department of Energy's policy to try to maintain the viability of that plant and protect the 1,200 jobs there. Would you agree with that?

Secretary MONIZ. Yes, Mr. Chairman. We do agree with that.

Mr. WHITFIELD. And you are going to consider requests for proposals for expressions of interest to continue to operate the plant?

Secretary MONIZ. Correct. In fact, if I may, I can even reflect on a little history in terms of the history with the Portsmouth plant where USEC ceased operations there in 2000. And the plan, which I think is a good model going forward with Paducah, is that we go into cleanup. That prepares the way for decommissioning but on a parallel track we look for new business opportunities to use the site, the people at the site, the resources that the site.

Mr. WHITFIELD. OK. Thank you. My time is expired. I now recognize the gentleman from Illinois, Mr. Rush.

Mr. RUSH. Thank you, Mr. Chairman.

Mr. Secretary, as I stated in my opening remarks, it is a huge priority for me to ensure that all Americans, especially those who have been historically underrepresented in the energy field, have access to the employment, business, and economic opportunities that this industry provides.

I stated in my previous statement that I have had talks with various industry leaders on the issue of jobs from both the demand and the supply side, and they have spoke of and they are very concerned with the fact that up to half of the current energy workforce in some sense will need to be replaced due to retirements and attrition over the next 5 to 10 years. And in order to replace these energy workers, the industry leaders are beginning to recognize that minorities and other historically underrepresented groups will need to be called upon to help fill these jobs. So we must therefore be proactive in ensuring that future workers are being trained with the necessary skills.

Are you, Mr. Secretary, confident in your capacity and your programmatic trust, are you confident that your department has the resources, including the budget and staff, the authority to effectively engage the minority communities and help them enter into all aspects of the energy sector by helping them, creating access through training, STEM education, jobs, and other business opportunities?

Is there anything that your department needs from the Members of Congress to make sure they assist you in your pro-activity in terms of outreach to minorities?

Secretary MONIZ. Congressman Rush, thank you for the question. I think you raise a really important issue. As you say, the energy industry, I think, is booming and I think it has every indication

that it will in the future from fossil fuel production to hopefully our leadership role in producing advanced technologies for the future. If you look at the demographics of our country and where they are heading, we will need to draw upon all of our people, women, minorities who have not yet played a sufficient role. So I think this is a place that I would really like to work with you on this.

I might note that, recently, at the White House there was a focus on women in clean energy. Perhaps we could talk about doing some similar things with underrepresented minorities in that regard. I think we should focus on also what we do with small and minority businesses. We do have a program there.

What I will do is I will go back and scrub where we are in terms of resources and authorities, and after I understand that, I would like to come back to you to discuss some specifics of what we might do.

Mr. RUSH. Mr. Secretary, I look forward to our discussions and our working together.

I would like to just ask you a question about the impact that sequestration—sequestration is harming our competitiveness. In the race to see which country will lead the clean energy economy, your department has an important role. The ARPA-E has had several major technological achievements and commercial successes. These technologies have affected over 450 million in follow-on investment from private sector after receiving just 70 million of initial investment from ARPA-E. How will the funding cuts due to sequestration effect the ARPA-E in its mission to continue its support of research and development for breakthrough technologies?

Secretary MONIZ. Well, sir, clearly, the sequestration has had an impact. I believe the impact is about \$1.9 billion across the Department, across all the missions. And, as of today, we are at about 1,500 workers laid off or with substantial furloughs. This obviously is affecting our work. I want to thank the Congress for working with us in some reprogramming, which has ameliorated the impacts in various sites. But clearly, we cannot avoid those impacts. So it is everything from putting at risk milestones in some of our cleanup programs to diminished research capacity in programs like ARPA-E.

Mr. WHITFIELD. The gentleman's time is expired.

At this time, I recognize the gentleman from Texas, Mr. Barton, for 5 minutes.

Mr. BARTON. Thank you, Mr. Chairman.

And, Mr. Secretary, welcome. You are no stranger to the Committee, and certainly in the past few years have been a very forthcoming witness and decent representative for the Administration. So with that, we look forward to working with you.

Secretary MONIZ. Is "decent" praise?

Mr. BARTON. Decent is good. Decent is good. There are other D words that I could use that are not good, but decent is good.

In your immediate position at MIT, you were an author or co-author of the study entitled, "The Future of Natural Gas," and it recommended that the U.S. should not erect barriers to natural gas imports or exports. I share that.

You are now the Secretary of Energy, and as Secretary of Energy, you are going to have some decisionmaking authority on

whether to approve permits to export LNG to nations that do not have a Free Trade Agreement with this country. There is a rebuttable presumption in the law that the Department of Energy should authorize the permit unless they can find that it is not in the national interest. There is apparently a finding document, which, if it is public, I don't know that it is public. Could you enlighten the Committee on the evaluation process you are using on these permits and also enlighten us as to whether you still agree with the study recommendation that the U.S. should not erect barriers to natural gas imports or exports?

Secretary MONIZ. Thank you, Mr. Barton. And we have had many opportunities to talk before in the past. I should clarify one thing and then I will go directly to the answer. In terms of the study, I just want to emphasize that those statements were in somewhat different context in terms of they were addressing the potential for imports in about 25 years.

But fundamentally, I think as the guidance, which you have stated, that there is a presumption of approving licenses unless there is something that would jeopardize the public interest, I think, reflects the kind of philosophy that you have just stated. So the question then becomes how do we judge the public interest? And there, I think there has been a whole set of criteria put forward as guides. They are not statutory but have been put forward by the Department, and certainly, these issues of balance of trade, of job creation, environmental considerations, energy security, domestic need, impacts on the economy are all part of that.

Perhaps I can say what I am today. First of all, I am 3 weeks—

Mr. BARTON. So far, you are doing a good answer at not answering the question.

Secretary MONIZ. Well, I am—

Mr. BARTON. I am assuming that at some point in time there will be a pony in all of this that you are giving us, and we will get an answer.

Secretary MONIZ. So I am 3 weeks and 2 days into the job.

Mr. BARTON. You are learning quickly.

Secretary MONIZ. And I have said that I have been reviewing assiduously the processes used to date and I am intending to move now expeditiously into evaluating the license applications. That will be done case-by-case, go right through them with the order, as has been stated by the Department in terms of the filing requirement.

Mr. BARTON. OK. Now, I want to make sure in the remaining minute, this study, this was when you were at MIT, "the U.S. should not erect barriers to natural gas imports or exports." I am quoting that study correctly, correct?

Secretary MONIZ. Correct.

Mr. BARTON. OK. So that we haven't abused you there?

Secretary MONIZ. No, no.

Mr. BARTON. All right. You are now the Secretary of Energy. You have a different hat you have to wear. You did agree, though, that the presumption is that the project should be approved unless you believe it is not in the public interest. Now, I think you agreed with that statement?

Secretary MONIZ. That was——

Mr. BARTON. You agreed with that?

Secretary MONIZ. Right.

Mr. BARTON. And you just did say that you are going to look at these in an expeditious fashion, which, in my dictionary, means as quickly as possible.

Secretary MONIZ. Correct.

Mr. BARTON. So could you give us a time frame, the next 3 months, the next 6 months? And I know you have got multiple projects, but would you be expecting to make some decisions in this calendar year? We don't want another Keystone pipeline thing.

Secretary MONIZ. Absolutely. Absolutely.

Mr. BARTON. OK. Thank you. Perfect timing, zero time.

Mr. WHITFIELD. All right. Thank you.

At this time, I recognize the gentleman from California, Mr. Waxman, for 5 minutes.

Mr. WAXMAN. Thank you.

Mr. Secretary, you can play an important role in educating Congress and the public about the threat of climate change and the urgent need for action. There is no debate about the science that indicates that climate change is happening now and it is caused by humans and the impacts are real.

Mr. Secretary, you are an esteemed scientist. You were unanimously confirmed by the Senate. Can you take a moment and explain why it is important for us to act now to address climate change?

Secretary MONIZ. Yes, thank you, Mr. Waxman.

Well, first of all, I certainly agree that it is indisputable that we are experiencing warming and that the pattern of consequences that has long been expected—in fact are appearing around us—are unfortunately typically at the higher end of the predicted ranges, whether it is melting ice, which is easily visible, to the issues I think that you raised earlier, be they storm intensities, droughts, wildfires.

Now, clearly, this is a statistical result as opposed to something that applies to any one event, but the fact is the pattern is completely consistent with that expected prolonged time only, unfortunately, accelerating faster than we expected.

Mr. WAXMAN. Does that mean we should do something now?

Secretary MONIZ. Yes. And a key reason is that, in particular, especially carbon dioxide, the principal greenhouse gas associated with energy supply, resides in the atmosphere for many, many centuries. So it is a cumulative impact, not something that we can just kind of turn on and off very easily. And we are building up an irreversible momentum. So prudence suggests that I think we need to start talking about how, within the all-of-the-above energy philosophy, we manage the transition to a low-carbon economy.

Mr. WAXMAN. Our chairman and others have said that, look, U.S. carbon dioxide emissions are at their lowest level in 20 years. The implication is that no further action to address climate change is necessary. I don't believe that is the case. What matters is not whether U.S. emissions have declined; it is whether we are on track to decline in the future by the amount needed to prevent dangerous climate change.

Mr. Secretary, are you aware of any reputable expert who believes we are currently on track to avoid dangerous climate change?

Secretary MONIZ. Well, certainly, the overwhelming preponderance—I mean nearly unanimous in the scientific community of relevance certainly expects that we are on a pathway to very negative consequences.

Mr. WAXMAN. That is a mild way of putting it. Look, we are told that the market is working, that we are doing more than our share in the United States. The Europeans and others aren't doing nearly as much. And I just wanted to cite for you some information that I think is worth noting. This was all in a letter dated March 11, 2013, that Mr. Rush and I sent to Chairman Upton and Chairman Whitfield.

We pointed out that the European Union is committed to reduce all greenhouse gas emissions from its member states by 20 percent by 2020 compared with 1990 levels and is on track to meet this target. The European Union has pledged to achieve even more reductions if the United States and other developed countries would agree to do more.

The President pledged, when he was in Copenhagen in 2009, we are going to reduce our greenhouse gas emissions by 17 percent below 2005 levels by 2020. This is equivalent to a reduction of just 3 percent compared to 1990 levels. Several European countries outside the European Union have made more ambitious pledges than the U.S. Do you think we are the best in the world in reducing these emissions? You would think that recent carbon dioxide emission reductions in the U.S. is due to the marketplace. Now, it is certainly due to the fact that we are in a recession. It is due to the fact that we have more renewables. It is due to the fact that natural gas is playing a better role and that we are promoting renewable energy. Is that happening because of the marketplace or U.S. laws and policies?

Secretary MONIZ. Well, I think, as you have said, I mean, it is a mixture of drivers. Certainly, the large increase in gas use for the electricity sector has been a market-driven approach, but of course policies at the state and federal level have stimulated this, for example, this doubling of renewables only in the last 4 years, which is a major, major, major advance.

Mr. WAXMAN. And we need more policies to accelerate the transition to a clean energy economy. Do you agree?

Secretary MONIZ. I think we need more technology and more policy to move towards the low-carbon economy.

Mr. WAXMAN. Thank you.

Thank you, Mr. Chairman.

Mr. WHITFIELD. At this time, I recognize the gentleman from Louisiana, vice chairman of the subcommittee, Mr. Scalise, for 5 minutes.

Mr. SCALISE. Thank you, Mr. Chairman. Appreciate you having this hearing.

And, Mr. Secretary, welcome to our committee. Thank you for coming to testify before us and talk about some of the issues that we work on here in the Energy Subcommittee.

I know over the years a lot of us have been pushing for a true all-of-the-above energy strategy to open up more areas that are right now blocked for exploration in America to try to green-light projects like the Keystone pipeline so that we can bring in more energy from a trusted partner and friend like Canada that gives us less reliance on some of these Middle Eastern countries who don't like us, help our trade imbalance, and just many other things that are needed to expedite the process of producing American energy, keeping agencies like EPA from trying to interfere with the hydraulic fracturing process that has been so successful and opened up so many of these shale plays across the country that are not only creating a lot of American energy but a lot of jobs, really a bright spot in our economy.

Your predecessor in this position had made comments over the years that we should have gas prices at the levels of Europe and really pushed for an energy policy that, I think, the President shared that actually has led to making less American energy, made it harder for us to open up areas and do more exploration in America.

I am curious to see what your overall strategy is on energy in general but also specifically things like gas prices as families still pay over \$3 a gallon right now, and with the summer approaching, likely to be paying higher. Do you have a plan to try to lower gas prices, to try to increase American energy, to try to keep the Federal Government from making it even harder to produce in this country than it is right now and create those jobs? If I can just throw that out to you.

Secretary MONIZ. Quite a few questions in there, thank you.

So, first, again, I very much subscribe to the President's all-of-the-above strategy and I think—

Mr. SCALISE. We disagree with the President's definition of "all of the above." It seems to be more focused on above and nothing below, which is not all of the above.

Secretary MONIZ. Yes, I mean, with all due respect, I would have to say, the ground truth is, as we all know, that oil production is up dramatically. In fact, we had a little—

Mr. SCALISE. And, I mean, I have actually had a conversation with the President about this because he says that a lot. He says oil production, energy production, has never been higher under his Administration. When I pointed out to him in fact on federal lands it is actually dramatically down; on private lands it is up. And so in the areas where the President has no control it is up, but in the areas where he has had control, it has been down in many cases because of his policies.

So I do think it is disingenuous for the Administration to go out and say, you know, and the President himself to say since I have been President, energy production has never been higher, when in fact his policies on federal lands have actually reduced production. And that is a fact that the Energy Department has actually confirmed.

And so, as you say that, you can say it because it is an accurate statement across the board to say it is higher, but on federal lands, energy production is down in many cases because of the Adminis-

tration's policies. And that is why we disagree with this connotation of all of the above.

I mean, you can't be for all of the above when you are saying no to Keystone, when you are making it harder to actually explore on federal lands for American energy. And so I hope you understand that distinction.

Secretary MONIZ. No, I understand. I was trying to address it. I think the reality is it is a question of what choices are made by private companies where they want to go to drill. There are many leases—this is a Department of Interior issue—

Mr. SCALISE. Right.

Secretary MONIZ [continuing]. Not Department of Energy, but there are many leases going unused on federal lands. The fact is the industry is moving hard and producing more oil, moving hard and producing more gas. There are some infrastructure issues which will involve both state and federal permitting, but, I mean, the ground truth is we are producing more oil. We are producing more gas. We are—

Mr. SCALISE. But do you recognize that where we are producing more gas is primarily on private land and on federal land, production is lower?

Secretary MONIZ. These are facts but all I was saying is—

Mr. SCALISE. But as Secretary of Energy, though, would you encourage a change in that policy where we can actually open up some of those federal lands that are right now closed? I mean so many areas of our federal lands across the country are closed to production where you have got very rich reserves. You know, we have been trying to get the Administration to be an all-of-the-above administration and open some of that up. Would you be open to kind of promoting that as Secretary of Energy where you have a bully pulpit to push for that kind of increase in production on federal lands where it is down?

Secretary MONIZ. Again, we both understand that is a Department of Interior responsibility—

Mr. SCALISE. Right, but I mean you are the Secretary of Energy. And you have the President's ear on energy issues in general.

Secretary MONIZ. In terms of where I am is, A) supporting the idea that the country pursues what we call "all of the above." That is, we will continue to produce more oil, decrease our exports, help our balanced trade. The Department of Energy will be supporting that certainly in trying to advanced technologies for environmentally sound production. We want to work with our other sister agencies like DOI and EPA in terms of getting better data. There are issues such as methane emissions and beneficial reuse by the companies. I had a meeting this morning in fact which was very, very interesting in that regard.

So I think we are totally supportive of this vision of pushing all of the above.

Mr. SCALISE. I look forward to working with you on that and—

Mr. WHITFIELD. The gentleman's time is expired.

Mr. SCALISE [continuing]. I know that we will have more of this. I know I am out of time.

Secretary MONIZ. Oh, I am sorry.

Mr. SCALISE. I appreciate that. I know we will have more of this conversation in the future but thanks for coming—

Secretary MONIZ. Thank you. I would be happy to discuss that.

Mr. SCALISE [continuing]. And I think congratulations on getting this new position. I look forward to working with you.

Mr. WHITFIELD. At this time, I recognize the gentleman from California, Mr. McNerney, for 5 minutes.

Mr. MCNERNEY. Thank you, Mr. Chairman.

Thank you, Mr. Secretary, for coming today. It is a good thing to get to know you a little bit. I haven't been on the committee long enough to see your testimony before, so I appreciate your coming forward.

Secretary MONIZ. Thank you.

Mr. MCNERNEY. I want to talk a little bit about fracking. We are going to be producing a lot of natural gas and oil using that technique, and that may be beneficial, but there is a significant risk in my opinion of natural gas escaping into the environment, which is a strong greenhouse gas, and potential for groundwater contamination, which is very important in California and many Western States.

I see a budget request of \$17 million for research into the safety of fracking. Do you think that is going to be a sufficient amount to help guide us through this boom in the fracking that we are going to be seeing?

Secretary MONIZ. Well, of course, the \$17 million request I think is very important for getting engaged in this but of course there is a lot of work as well going on through industry. There is work going on in a cost-shared way using the Royalty Trust Fund. So I think the DOE component and also Interior and EPA, so the DOE component is one part. I think a key will be for us to make sure that we are kind of integrating what we support with that of what other agencies and the private sector are doing.

Mr. MCNERNEY. OK, good. Thank you.

Secretary MONIZ. And I would just add the methane emissions that you alluded to is something we clearly need to get our arms around. Currently, the estimate is that about 2½ percent of total greenhouse gas emissions in the United States is CO₂ equivalent of methane emissions in fossil fuel production, so it is about 2½ percent, but the data are not very good, number one.

And, number two, we believe there are many opportunities to capture and beneficially use that methane in the production.

Mr. MCNERNEY. Thank you. To change the subject a little bit, what do you think are the biggest barriers to financing clean energy projects today?

Secretary MONIZ. Oh, there are lots. I think one issue is—well, turning it around, how can one mobilize a lot of private capital that is kind of on the sidelines today to come in in terms of clean energy and clean energy projects? This is something that I have brought in some new people. We are trying to analyze these issues.

But I will give you as an example it is very difficult to, say, in the renewable space, say distributed solar, we have a lot of small projects. You have nothing like what I would call the standard contracts as you have in the mortgage business, and therefore, it is very difficult to aggregate them and be able to get access to the

kinds of capital markets that one can in other parts of the energy industry. So these are the things we need to discuss, I think.

Mr. MCNERNEY. And you are going to be aggressively moving to find the solution?

Secretary MONIZ. And, as part of this Quadrennial Energy Review, we will be working with Treasury and OMB and others trying to see what are the right mechanisms to stimulate private capital coming into these markets more strongly.

Mr. MCNERNEY. OK. Well, I understand that the DOE has a stated goal of wind energy producing 20 percent of our electricity by the year 2020. Is that a realistic goal? Can we make that goal?

Secretary MONIZ. That is the President's goal.

Mr. MCNERNEY. Can we make that goal?

Secretary MONIZ. We are going to try. Yes.

Mr. MCNERNEY. So part of the barriers are financial barriers?

Secretary MONIZ. Yes. I would have to check this, but I think we are about halfway there so we have to pick up the pace, and moving private capital in would be important.

Mr. MCNERNEY. And then moving on to electric vehicles, what are our barriers in terms of getting electric vehicles accepted in the marketplace?

Secretary MONIZ. Well, electric vehicles clearly have a lot of promise. In fact, the Tesla was—of course, it is an expensive vehicle, but Tesla was rated by Consumer Reports as the best car they ever tested, not in that year, but ever. I mean I think often what we forget is electric vehicles are very high-performance vehicles.

Now, clearly, the biggest barrier right now is getting the cost of the batteries down because if you want to have a long range on electric drive, you are talking today a battery that, you know, is literally in the tens of thousands of dollars.

Mr. MCNERNEY. And there is some promising technology in the DOE in that area?

Secretary MONIZ. And so there has been about a 40 percent drop in net cost in the last few years. We have got to keep driving down. The goal is to get to \$100 to \$200 per kilowatt of storage. Today, we are in the 5, \$600 range.

Mr. MCNERNEY. Thank you, Mr. Chairman.

Mr. WHITFIELD. The gentleman's time is expired. At this time, I recognize the gentleman from Texas, Mr. Hall, for 5 minutes.

Mr. HALL. I thank you, Mr. Chairman.

And Mr. Waxman has made a statement that, as I understood it, climate change is caused by people, and I like to agree with him sometimes, but the closest I can get to that is it punishes people. It punishes taxpayers. It punishes taxpayers to the extent of \$34 billion and we haven't gotten anything yet, nothing that alludes to getting the benefit of the money that the taxpayers have had to pay out. I don't think you disagree with that, do you?

Secretary MONIZ. I am sorry, Mr. Hall, if you could clarify the question. I didn't quite understand it. I apologize.

Mr. HALL. It wasn't a question. It was a statement.

Secretary MONIZ. Oh, I am sorry.

Mr. HALL. That Mr. Waxman said climate change caused by people—and the Sierra Club, and I am certainly not a fan of the Sierra Club; I want that to go on the record. I think they are an enemy

of anybody that is 18 years old or older that needs a job or is looking for a job. But climate change has cost the taxpayers \$33 to \$34 to \$35 billion so far and we have gotten very little out of that. How can you disagree with that?

Secretary MONIZ. Well, sir, the——

Mr. HALL. And what have we got out of it?

Secretary MONIZ. I am sorry? Oh, OK. So, well, I would say, first of all, as we said before, the United States, among industrialized countries, is unique in having decreased our CO₂ emissions; but secondly, I think we have laid the foundation for a new technology enterprise in this country.

Mr. HALL. You laid the foundation that nobody is following. Russia is not, Mexico is not, India is not; no one is helping us. They want us to clean the world. You are not recommending that, are you?

Secretary MONIZ. Well, I would be happy if we are——

Mr. HALL. If we could, I would be happy, too.

Secretary MONIZ [continuing]. Of exporting technologies to those countries.

Mr. HALL. Let me get to my real questions. New York Times earlier this year related the power shortages in New England and noted the importance to the region of being able to import power from the Indian Point nuclear facility quoting one individual as saying, “without Indian Point, New England would have been toast.” The situation in New England was due to an overdependence on gas. Would you agree this reflects why it is important to have fuel diversity?

Secretary MONIZ. Definitely.

Mr. HALL. All right.

Secretary MONIZ. Yes.

Mr. HALL. And in your view do nuclear facilities play a critical role in ensuring the reliability of the grid?

Secretary MONIZ. Well, clearly, nuclear power is 20 percent of our electricity today, and it is carbon-free.

Mr. HALL. And did you know that, Mr. Secretary, during your confirmation hearing, you promised to review what is out there before approving any additional LNG export applications? And I think Mr. Barton got into that a little bit. Let me ask you a little bit more. Can you update the Committee on the progress?

Secretary MONIZ. It has gone very well. Frankly, tomorrow, I have perhaps the key summary meeting on the review and also we have had the EIA look at how developments in the markets in the last few years might influence this, but I think, as I said to Mr. Barton, we are getting pretty much ready to start evaluating the dockets on a case-by-case basis.

Mr. HALL. At an event in Palo Alto this last week, President Obama reportedly said, “we believe in a light touch when it comes to regulations.” Would you characterize EPA’s wave of rules affecting the energy sector during the President’s first term as a light touch?

Secretary MONIZ. Well, sir, again, I am at the Department of Energy. We are not doing those regulations. I look forward to working with the EPA as appropriate in terms of providing analytical basis, technical advice, but it is clearly their——

Mr. HALL. And you should. You have a tough job. For one, it has been working on energy science and security issues for most of your professional life, served on the MIT faculty beginning in 1973, included as head of the Department of Physics. You were the founding director of MIT Energy Initiative in 2006. That seems like that knowledge that you have gleaned there and that you have departed makes it pretty tough for you to agree with the person that appointed you?

Secretary MONIZ. Well, sir, I completely agree with the President in terms of, again, all-of-the-above energy approach, and I think the facts on the ground support—

Mr. HALL. Would you characterize EPA's wave of rules affecting the energy sector during the President's first term as a light touch?

Secretary MONIZ. Again, I think the EPA is statutorily—

Mr. HALL. And you agree with that, the way the EPA has handled their business?

Secretary MONIZ. That is not for me to judge.

Mr. HALL. But I will just ask you one last question.

Mr. WHITFIELD. The gentleman's time has expired, Mr. Hall.

Mr. HALL. In that case, I will yield back my time.

Mr. WHITFIELD. OK. Thank you.

At this time, I recognize the gentlelady from California, Mrs. Capps, for 5 minutes.

Mrs. CAPPS. Thank you, Mr. Chairman.

And congratulations on your confirmation, Secretary Moniz, and thank you for your testimony.

The Department of Energy has been doing great work in recent years, particularly in the development of renewable technologies. Basic research is obviously critical to developing these technologies and I know you understand this coming from MIT.

The fiscal year 2014 budget clearly prioritizes this research, and I commend the Administration for making a firm commitment to this critical work even in these tough fiscal times. I am fortunate to have to world-class research institutions in my district—Cal Poly San Luis Obispo and UC—Santa Barbara—that have benefited from DOE funding.

For example, UCSB is one of DOE's Frontier Energy Research Centers and has produced numerous local spinoff companies. Just earlier this year, a Cal Poly research team received a DOE grant to further advance its research in reusing the wastewater used in the production of algae-based biofuels. This research project could produce technologies that could save Californians hundreds of millions of dollars in water recycling costs each year. These research dollars are creating tangible economic benefits in my district, and I am sure there is quite a similar impact at other universities throughout the Nation with their surrounding communities.

Could you elaborate briefly on this? I want to ask you a couple more questions as well, but what are some other examples of DOE research dollars being turned into tangible benefits for taxpayers?

Secretary MONIZ. Thank you for the question.

Well, those are two outstanding institutions, and as you say, actually our great research universities across this country are really engines of innovation, particularly when they are embedded in a

broader system of investors, et cetera. So if one just looks at ARPA-E as an example—

Mrs. CAPPS. Yes.

Secretary MONIZ [continuing]. We are getting close to about 300 projects, which have been funded, and you take a subset of less than 20, you have a multiplier of like a factor of five in terms of private capital coming in to follow those investments. That is just one example of this multiplier effect.

Mrs. CAPPS. Let me try another topic. I know you probably have several other examples you could cite immediately, but meeting our renewable energy needs is going to require more than just research. So many great ideas are developed in the lab that never make it into the marketplace due to a lack of investment. The biggest issue I hear from these energy innovators in my district is the difficulty they have in bridging what they call the valley of death.

What is DOE doing, if you are doing anything at all, to address this problem and help move more technologies out of the lab in the research institution out into that marketplace?

Secretary MONIZ. I might just add that many, many of them would say there are actually two valleys of death. They have to get through both of them to scale in the market. But I think in particular at the Department I would highlight three programs there. One is ARPA-E, as I already mentioned, which I think is developing a strong track record of getting things into the economy. Another, which I think will take a little bit more time to judge, but the Energy Innovation Hubs, these are structured so that they can work on a specific problem but anywhere across the innovation chain as it makes sense for that problem to move out into the marketplace.

In California, there is one on Sunlight to Fuels, for example. And of course a third has been the loan programs, for example, which started in the last administration, came to this administration and have helped move some of the world's largest concentrated solar plant, for example, in California is about to have first light.

Mrs. CAPPS. Thank you. I do want to get one further question out on a solar technology. There are so many roofs and parking lots and homes, businesses, nonprofits, government buildings that are perfect for solar, yet go unused because the owners can't afford the high cost of installation. I faced this same challenge when I wanted to do something in my own private home in Santa Barbara.

Thankfully, my county, Santa Barbara County, has a program that they call emPowerSBC in Santa Barbara County. It helps secure low-cost financing and rebates for homeowners that want to install solar and other energy-efficient programs. These programs are not very common yet. Is there anything you are doing to encourage the development of programs like emPowerSBC help make small- and medium-scale solar more widely available?

Secretary MONIZ. Well, part of that, as I alluded to earlier in terms of looking at how to move private capital off the sidelines—

Mrs. CAPPS. Yes.

Secretary MONIZ [continuing]. Is that I think we need to find ways of better aggregating small projects into ways with uniform

contracting that can attract, you know, market capital into the game. That is one point.

A second point is what I did not mention earlier but I have emphasized in the Department that one of the kind of shifts in philosophy a little bit that I want to emphasize is much more work with States. I think States have been a center of innovation in advancing energy. One of the issues, however, is we have enormous variability and so we could not do one-size-fits-all.

Mrs. CAPPS. Right.

Secretary MONIZ. I think we need to work with the States and then build up from the States to a more national.

Mrs. CAPPS. Thank you very much.

Mr. WHITFIELD. Time is expired.

At this time, I recognize the gentleman from Illinois, Mr. Shimkus, for 5 minutes.

Mr. SHIMKUS. Thank you, Mr. Chairman. Welcome, Mr. Secretary.

The Administration's proposed budget cuts 46 million from the Office of Energy's carbon storage research line. This is down from 107 million it was funded at last year. This program funds research at the Carbon Sequestration Project in Decatur, Illinois, which is already halfway to injecting a million metric tons of carbon. The University of Illinois, as a part of the Midwest Geological Sequestration Consortium, has great concern that these cuts will leave the research incomplete, compromising the 3-year monitoring phase demonstrating the project's safety and viability.

I have a letter here from the University of Illinois that goes into greater detail on the project, its progress and success to date, as well as recommendations for moving forward, and I would ask, Mr. Chairman, for unanimous consent for the letter to be submitted for the record.

And for you, Mr. Secretary, I will provide you with a copy of that letter directed to you and your staff for review and consideration. So if I could do that, Mr. Chairman.

Mr. WHITFIELD. Without objection.

[The information appears at the conclusion of the hearing.]

Mr. SHIMKUS. And then to my favorite topic, Mr. Secretary, as you are aware, the Circuit Court of the District of Columbia has a pending case before with regard to whether the Nuclear Regulatory Commission must review the Yucca Mountain repository license application mandated in the Nuclear Waste Policy Act. If the court orders the NRC to resume the license review, will you honor the court's decision and support the NRC process?

Secretary MONIZ. We will follow the law, sir.

Mr. SHIMKUS. Good answer. I wish we were following it now. That is the problem. This past April, Assistant Secretary Peter Lyons testified before the House Energy and Waters Appropriations Subcommittee that DOE currently has 18.5 million from nuclear waste fund carryover that are unspent from prior appropriations. Is that your understanding?

Secretary MONIZ. Sir, I will have to explore that. I am not aware of that specific number.

Mr. SHIMKUS. It is a similar question that I asked before so I think your staff should be pretty well in agreement with that. So if you would get back to us if that is the case.

Secretary MONIZ. It appears to be correct, I think.

Mr. SHIMKUS. Good. Good answer. If the Court rules and you find that DOE has insufficient funding to fully support the license review process, will you commit to prepare and submit a supplemental budget request this fiscal year if needed? Now, remember, the court has ruled that they have to finish the study. You have got some money available. If you are going to comply with the law, if you need additional funds, would you then let us know what that would be?

Secretary MONIZ. I presume that would be the path forward.

Mr. SHIMKUS. I will take that as a yes, thank you. Are you aware of any technical or scientific issues that would prevent Yucca Mountain from being a safe repository?

Secretary MONIZ. Well, I think the answer to that question really would come out from a detailed look. To be straightforward, I am on the record many, many years ago as pointing out that there are some issues in terms of, to be mildly technical about it, it is an oxidizing environment, and one would probably prefer a chemically reducing—

Mr. SHIMKUS. Well, and that is the importance of the final report which will make a judgment of whether it is safe for a million years or not and that is what we await and hopefully the court—

Secretary MONIZ. And obviously, that is what I said. That is an NRC decision ultimately to be taken, but there is that little scientific factoid.

Mr. SHIMKUS. DOE's document strategies for management and disposal of used nuclear fuel and high-level radioactive waste issued on January 11 of this year and dictates legislation is needed to deploy that strategy. Why hasn't the Administration sent legislation to Congress yet?

Secretary MONIZ. I believe the Administration's position is that it will be working with the Congress to develop it, and I might say that I have personally been working with some Senators on their draft and I would be happy to work with Members in this chamber.

Mr. SHIMKUS. I would suggest, since we have a bicameral legislation, a legislative body, and there are two chambers that might be helpful if you would have ideas of how to move forward, that you would come and talk to us.

Secretary MONIZ. If I was asked to come and join the discussion, I would be most delighted to accept an invitation here as well.

Mr. SHIMKUS. Thank you, Mr. Chairman. And with that, I will yield back my time.

Mr. WHITFIELD. Thank you.

At this time, I recognize the gentlelady from Florida, Ms. Castor, for 5 minutes.

Ms. CASTOR. Thank you, Mr. Chairman.

Congratulations, Secretary Moniz, on your appointment and confirmation. You will bring a fresh perspective to the Department, so good luck to you. I look forward to working with you.

I want to bring to your attention an important issue relating to the economic well-being of our country, particularly jobs in Amer-

ican shipping, our ports and related businesses. It involves the Jones Act and the excessive numbers of waivers that the Administration and the Department of Energy have granted to that important federal law.

Mr. Secretary, the Jones Act requires that cargo that is shipped between U.S. ports, domestic ports be transported on American vessels. The law is vital to our Nation's economic and national security because it supports the core maritime industries of our country, American shipbuilding and American jobs.

In 2011 when the Administration tapped the Strategic Petroleum Reserve and a few other times, the Administration agreed to almost 50 waivers of the Jones Act. This is more than all in American history combined, and it was excessive. The law says that in order to grant a waiver, there must be a national security emergency and domestic carriers must not be available. They must be unavailable.

At that time, that was the time of the Libyan conflict and I guess the powers that be decided that it was more important to get that oil delivered. But it was an excessively high number of waivers. It took jobs from American maritime industries, American cargo vessels. The work went instead to foreign shippers, and I just think this is very poor public policy, particularly at a time when we had a high unemployment rate. The only ones that really benefited at that time were the oil speculators and foreign-owned oil companies and foreign shippers.

So I wanted to ask you at the outset of your service, can you assure me that you and the Department will stand by American workers and American businesses, support the Jones Acts and the related American jobs and U.S. maritime industries and look very skeptically upon further waiver requests?

Secretary MONIZ. Well, certainly supporting American jobs is obviously one of our key objectives. And so we are totally committed to that. On this particular issue, I was not aware of these particular waivers, but I can assure you that to the extent to which I am involved in that discussion—and I am not entirely sure at the moment—that we clearly will follow the law and the guidance in terms of only emergency waivers of the Jones Act.

Ms. CASTOR. I appreciate that. And I thought that might be the case and just wanted to bring that to your attention at the outset of your services, Secretary.

Secretary MONIZ. Thank you.

Ms. CASTOR. On another topic, as we look at all of the various sources of energy, the power of America, it seems like the one big area that is out there that is clean, that would save consumers money, is in energy efficiency. And I don't think that we have done enough to unlock the power of consumers to implement smart technology to be able to pick up their smartphones and change the thermostats to do things on set clock stops on table. I think that technology is changing quickly and I think there is significant energy savings.

It seems like the entire business model for electric utilities is outdated now, and we should be looking at incentives for them to promote conservation to a greater extent. What are your priorities?

What do you see in the future? What do you think the Congress should be focused on to move in that direction?

Secretary MONIZ. Thank you. First of all, I think immediately after I was sworn in, within 2 hours I was speaking at an efficiency meeting, which was symbolic in a certain sense of the very high priority. This will be a major focus area. For the Department, there are several threads and I would be happy to come and discuss this in more detail.

Of course, one is that the Department does have compliance with efficiency standards responsibilities. Frankly, we need to accelerate getting a number of those out, which are in various stages of review in the Department and in OMB.

Number two, I think we need to really advance the enablers, and I think you already alluded to it, particularly the integration of information technology, smart grids, controls, sensors, consumer choice. So that is second.

And third, I would say this is very much in the line of the emphasis I want to give to working with States because, for example, you mentioned utilities and we need to talk about the utility of the future, which is not the same thing as the future of the utility because there may be very many different services involved in the utility of the future. But the regulatory structures are very different in different States, and so the programs again cannot be a one-size-fits-all. But I think we need to work with the States in providing assistance in moving in a direction that you outlined.

Mr. WHITFIELD. The gentlelady's time is expired.

At this time, I recognize the gentleman from Texas, Dr. Burgess, for 5 minutes.

Mr. BURGESS. Thank you, Mr. Chairman.

Mr. Secretary, welcome to our humble little committee, appreciate you being here today, look forward to lively exchanges with you during your tenure.

This year in December will mark the 60th anniversary of when President Eisenhower went before the United Nations and gave his very famous "Atoms for Peace" speech. The United States Congress the following year took up that concept and passed the Atomic Energy Act of 1954 and declared that we should use atomic energy to make the maximum contribution to the general welfare. One of the purposes of the Act was to provide for "a program of international cooperation to promote the common defense and security and to make available to cooperative nations the benefits of peaceful applications of atomic energy as widely as expanding technology and the considerations for the common defense will permit."

So in light of the challenges that we have in developing domestic nuclear energy, would you agree that nuclear exports can help maintain a sustainable commercial nuclear infrastructure in the United States?

Secretary MONIZ. Certainly, and in addition, support our non-proliferation aims.

Mr. BURGESS. Correct, which was part of the intent of President Eisenhower's appearance at the United Nations that day. So as a committee, can we look forward to you working with us to explore and examine ways to increase the United States' competitiveness in the nuclear trade?

Secretary MONIZ. Yes, indeed. And I might add also if I may, sir, that Deputy Secretary Poneman has also been very, very committed to this same issue.

Mr. BURGESS. Very well. One element of the atomic energy mission involves the Department's role in the export of nuclear technology. Probably preceding your tenure by just a little bit in March, the Committee wrote the Department of Energy for detailed information concerning how the Department implements its nuclear technology export reviews. The response from the Department was received last week, probably was not adequate, and I think your staff is aware of the Committee's feelings on that.

So as a committee, can we count on you providing a more robust response to our requests on this important issue?

Secretary MONIZ. I will certainly look into that and get back to you, sir.

Mr. BURGESS. I have copies of our original letter and the response, and, Mr. Chairman, I will ask unanimous consent to enter these into the record.

Mr. WHITFIELD. Without objection.

[The information appears at the conclusion of the hearing.]

Mr. BURGESS. We will make them available to you before you leave today.

Secretary MONIZ. Thank you.

Mr. BURGESS. And then one important benefit of increased United States nuclear exports is to ensure that the United States' know-how on safety and security is implemented worldwide. Will you help us by taking a close look at the Department's and the National Nuclear Security Agency's current activity regarding export controls to ensure the process continues to work for the benefit of the United States?

Secretary MONIZ. I would be happy to work with you on that. It is an important issue, yes.

Mr. BURGESS. Well, I thank you for your responses to those questions.

I had a question on the actual line item of the budget that we received. I guess it was referred to as the highlights. And under the section dealing with fossil energy—I apologize for not having turned to it earlier so I would have the page number for you—but you look down the line. All the numbers are negative in the—oops, sorry. That is renewable energy. Let's just skip ahead, shall we?

Fossil energy, page 33, if you look at the line items, they are fiscal year 2014 versus fiscal year 2012. For fiscal year 2014 all of the numbers are negative and substantially negative, and yet the total fossil research energy and development is reported to be plus \$83 million. I guess the line item that confuses me on that page is the line that says "adjustments" about halfway in the page under total fossil energy, last line item that is entered and there is a line that says "adjustments." Can you tell me what "adjustments" is referring to? Or, if not, can you possibly get back to us and let us know what that represents?

Secretary MONIZ. I think I had better get back to you on that and not give an incorrect answer. So we will do that promptly. I do want to note that, of course, in addition to what is here, there was several billion dollars already put in to the currently going Carbon

Capture Utilization and Sequestration Demonstration project. So that is not captured here in this budget.

Mr. BURGESS. Very well. And just to note, I appreciate your comments on the fracking issue, the fact that it can be done environmentally in a safe manner. The United States should be the leader in developing that technology, and indeed, we should be exporters of that technology to other places in the world. And I thank you for that.

Mr. WHITFIELD. The gentleman's time is expired.

At this time, I recognize the gentleman from New York, Mr. Tonko, for 5 minutes.

Mr. TONKO. Thank you, Mr. Chair. Mr. Secretary, congratulations.

Secretary MONIZ. Thank you.

Mr. TONKO. It is great to have you here before the Subcommittee.

I represent a district in New York in the capital region of New York, which has incorporated much wind opportunity into the State's supply of energy. Can you give us an overview of what the Department of Energy is doing to spur the ongoing development of advanced wind energy?

Secretary MONIZ. Well, there are obviously two major directions. One is on the technology side. There is, for example, a focus on helping simulate the technology for effective use of lower wind speeds, which would greatly increase the deployment possibilities. And another one is to basically try to drive down the cost of offshore wind, which where, of course, you have a great resource but it is a difficult environment to work in. So that is on the technology side.

And the other dimension I would say is some of the loan and assistance projects have helped deploy substantial amounts of wind and solar.

Mr. TONKO. Thank you. And I have had legislation that will deal with efficiency in terms of wind turbines and their assembly, how they are manufactured, how they are placed in order to get the maximum for the investment.

Not only are we using more and more wind power, I am told we are building more of it right here in the U.S. The wind components such as turbines and towers, blades, gears are increasingly being built by United States' manufacturers. My understanding is that the percentage of wind components that are domestically manufactured has doubled from 35 percent in 2005 to 70 percent today. Do you find that accurate?

Secretary MONIZ. I don't know the precise numbers but I do know the trend is in that way. And by the way, in addition, wind I believe was the largest capacity addition over the last year in the American system.

Mr. TONKO. OK. And is DOE's wind program on target to reduce the average cost of utility-scale onshore wind power to around 5 cents a kilowatt hour by, I believe it was the year 2020?

Secretary MONIZ. Yes, I think. Of course, it depends upon the location, et cetera, but in good wind locations the costs are dropping dramatically. Five cents is a very reasonable expectation. Of course, there is the other issue up sometimes those good wind loca-

tions are far away from the load center and we have to solve the transmission problem.

Mr. TONKO. Right. And what about the interconnect systems, too, because I am told that much of the capacity for wind—especially wind, perhaps solar—but we have interconnect situations that are still of major concern?

Secretary MONIZ. Well, you mean in terms of the transmission?

Mr. TONKO. The transmission or the actual technology that needs to be perhaps better developed or more high-tech in nature.

Secretary MONIZ. Well, I am not certain of that, sir, but what is an issue potentially is, for example, if you have remote, high-quality wind farms, you might want to go to high voltage direct current lines, and for that, technology in terms of the power electronics is very important because—

Mr. TONKO. Right.

Secretary MONIZ [continuing]. With D.C. it is the ends that kill you.

Mr. TONKO. Absolutely. Now, you somewhat alluded to this, Mr. Secretary, in that there are some barriers out there, long distances by which to get wind over to the source that is required. What is the Department doing to address those barriers to widespread wind development?

Secretary MONIZ. Well, again, on the technology side a key issue is large-scale storage. And, for example, the Department supports some very interesting work in terms of efficient compressed air storage. So if we can have storage that meets the scale of intermittent resources, then you have the opportunity to dispatch it and you solve that problem. In the nearer term, until these costs come down, I think we have a lot more to do, and NREL in particular is looking at the integration of natural gas in renewables. That is another way to balance the load-serving function.

Mr. TONKO. In terms of the storage issue, what are the best hopes there for the development of battery types that will store incremental type powers?

Secretary MONIZ. Well, it is not only batteries. I mean, in fact, today, if you are in the right place, for example, in the TVA service territory, they have some very good pumped hydro as a way of storage. In general, hydro is a very good way of balancing renewables. There are more far-out things. ARPA-E funded a so-called liquid metal battery, a whole different architecture. There is compressed air. There are flywheels. So all of these technologies are being pushed. A lot of them are materials problems.

Mr. TONKO. Thank you very much, Mr. Secretary. I yield back, Mr. Chairman.

Mr. WHITFIELD. At this time I recognize the gentleman, Mr. Terry, from the State of Nebraska.

Mr. TERRY. Thank you, Mr. Chairman. Mr. Moniz, I appreciate you being here. You have an impressive résumé and you are doing a good job today.

Secretary MONIZ. Thank you.

Mr. TERRY. I have focused on natural gas as an energy transportation fuel, and I appreciated your comment in your written statement that domestic natural gas production over the past 5 years has helped contribute to market-led reductions in carbon dioxide

emissions, as well as the expansion of manufacturing and associated jobs. We have actually held a hearing that I chair in the Commerce, Manufacturing, and Trade Subcommittee especially in the steel industry the importance of natural gas. And Ed and I are going to be doing, I think, next week in other manufacturing areas as a combined hearing. So I appreciate your comments and support, particularly for the manufacturing.

But my questions are going to focus more on the transportation side. Would the same hold true if more semis and straight trucks and large fleets were to change from diesel or gasoline to natural gas? Would we see reductions in CO₂ emissions?

Secretary MONIZ. Yes. So if we convert gas to liquid fuels, typically, we do not see a reduction. But if we directly use the gas, then we can—

Mr. TERRY. So you are saying compressed versus liquid would have a benefit?

Secretary MONIZ. No, liquefied natural gas is fine.

Mr. TERRY. OK.

Secretary MONIZ. No, but I mean the other direction is to convert gas to a liquid fuel to convert it to a liquid fuel. That does not give typically any clear benefit.

Mr. TERRY. Doesn't it?

Secretary MONIZ. But CNG or LNG—

Mr. TERRY. It would.

Secretary MONIZ [continuing]. Would benefit as long as methane leakage is controlled.

Mr. TERRY. At the pump side or at the side of production as you had mentioned with talking about with McNerney?

Secretary MONIZ. If you use LNG for your Class A truck, you are going to have some boil-off, and so the question is how you control for safety reasons. And so the question is it is a quantitative issue.

Mr. TERRY. Right.

Secretary MONIZ. But the potential is there to save carbon.

Mr. TERRY. That is part of our intent, as well as not importing OPEC fuel or oil. So it then concerns me a little bit when I see this \$17 million set aside for natural gas technologies, and we have \$356 million in batteries and electric vehicles—is actually 575 million. So there seems to be a real disparity, a gap between natural gas technologies and battery technologies, electric vehicles. So the first thing that pops into my mind is that is DOE implementing the Sierra Club's Beyond Natural Gas campaign in any way?

Secretary MONIZ. No, sir. I think the point is that the research funding is for technologies of tomorrow. I think in terms of natural gas vehicles, you know, the technology is largely here. There is research also in ARPA-E, I believe, in terms of getting new materials for better storage tanks so that you can put more in because—

Mr. TERRY. So there is DOE funding on the tank side?

Secretary MONIZ. Correct.

Mr. TERRY. And is that part of the 17 million?

Secretary MONIZ. I think that may be in ARPA-E but I will get back to you on that.

Mr. TERRY. OK. I would appreciate that.

Secretary MONIZ. I will clarify that for you and for me.

Mr. TERRY. So from the cynical side when we see such a gap between the funding, we are assuming that there is a legitimate, logical conclusion that there is not much interest in natural gas.

Secretary MONIZ. I think the issues are, for example, if you take the LNG trucks, the Class A trucks, and there are trucks out there now using LNG.

Mr. TERRY. Yes.

Secretary MONIZ. In many ways, the issue is the OEMs to try to get the capital cost difference. A Class A truck capital cost—

Mr. TERRY. Oh, no, I am well aware of the cost and that is one of the barriers is—

Secretary MONIZ. Yes, and then it is the infrastructure.

Mr. TERRY. And that is coming despite our best efforts.

Secretary MONIZ. Yes, the open road use is very difficult, but I think the market is going to be station-to-station.

Mr. TERRY. Yes, and I have so many other questions on that, but in the last 8 seconds, have you formed a position on Keystone pipeline in regard to your position from DOE?

Secretary MONIZ. That is a Department of State decision—

Mr. TERRY. Well, other agencies have input and DOE will be one of them.

Secretary MONIZ. We will make input certainly in technical analysis but the decision is in Secretary Kerry's hands.

Mr. WHITFIELD. The gentleman's time is expired.

At this time I recognize the gentleman from Texas, Mr. Green, for 5 minutes.

Mr. GREEN. I think for my colleague from Nebraska I think the Secretary has enough on his plate to pick a fight, but I appreciate you.

And congratulations, Mr. Secretary, again. And I know we have met before. And in Texas they would say you know where I come from, but you know the area I represent, and I appreciate and look forward to working with you.

I would ask you some questions about LNG exports but our Natural Gas Caucus is actually holding a briefing now with Chris Smith, a bipartisan briefing, so I think that will handle a lot of the questions I have.

Let me talk about something that has come up over the years. Carbon capture and storage is consistently discussed in context that it is used possibly as carbon control technology under EPA rules on utilities and refiners. The problem is it is still too expensive commercially to be used, and I ask DOE this question every budget hearing so I could continue to monitor the progress. Can you please describe current DOE CCS activities?

Secretary MONIZ. Yes. Well, we have about a half-dozen now major projects going forward, some are power plants, some are industrial facilities, for example, a large ethanol plant of Archer Daniels Midland plant. And I think the majority of them actually also is what is called CCUS—utilization and sequestration—specifically using it for enhanced oil recovery.

So today, I think a story not well known is that today we are using about 60 million tons per year of CO₂ to produce 300,000 barrels a day of oil from enhanced recovery, and a Department of En-

ergy study a few years ago estimated that could go up by a factor of 10. So 3 million barrels a day is getting pretty serious.

Mr. GREEN. Yes.

Secretary MONIZ. And to do that—

Mr. GREEN. That is two more than we would ever get from Keystone pipeline.

Secretary MONIZ. Yes. And to do that we would need to use CO₂ from power plants or industrial facilities. There is not enough natural CO₂ for that scale.

Mr. GREEN. OK. And is there any idea when CCS may be commercially viable? I know these plants wouldn't be there where they are now without the assistance of the Department of Energy.

Secretary MONIZ. Right. I think this is the case where government funding is the only way to get to the demonstration phase. The goal is to demonstrate it at the level where the regulatory requirements can be settled such that the private sector knows what the game is. But, of course, that will only come as well when carbon emissions are being limited and/or we have enough use of the CO₂ like enhanced oil recovery or other applications.

Mr. GREEN. OK. OK. I am a strong supporter of smart grid technology and I noticed that the Administration is recommending a 37.9 percent decrease in smart grid funding. Is that because we are moving these activities elsewhere or are they truly reducing the activities for smart grid?

Secretary MONIZ. No, our intention is to increase the focus on smart grids, so I will clarify, Mr. Green, that budget issue for you.

Mr. GREEN. OK. In the President's budget for fiscal year 2014, the budget request for ARPA-E is 379 million, an increase of 38 percent above enacted levels. He mentioned one of the strategic areas that funding will go toward is providing greater reliability and security in delivery of electricity. Electric reliability is a priority of mine and I am wondering if you could elaborate on some of the projects or what projects are going on within the space?

Secretary MONIZ. There is a whole bunch of projects; some of them are very much in the technology development area. I mentioned earlier power electronics. That is a new focus area which is a critical component of that. Another different cut on it is of course cyber security. You can't forget cyber security very long when you are talking about the grid and the smart grid—

Mr. GREEN. And reliability. I understand.

Secretary MONIZ. And that is a huge focus. Another area is the proposed race to the top, which is for both energy efficiency and grids. We are—

Mr. GREEN. OK. I only have about 19 seconds. Do you have flexibility with current revenue funds for that race to the top?

Secretary MONIZ. No, that is a proposal to the Congress in the fiscal year 2014 budget.

Mr. GREEN. OK. But you don't have the current funds? You can't put current funds toward this and this would not happen without those additional funds?

Secretary MONIZ. That is my understanding, yes.

Mr. GREEN. OK. Thank you, Mr. Chairman.

Mr. WHITFIELD. At this time I recognize the gentleman from Ohio, Mr. Latta, for 5 minutes.

Mr. LATTA. Thank you, Mr. Chairman.

And, Mr. Secretary, thanks very much for being with us today. It is good to have you before us.

And I think you have heard a wide range of questions from members on both sides of the aisle. And, if I could, maybe just to kind of reiterate a little bit here, just kind of give you a background.

I think that we talk a lot about all-of-the-above energy policy, and I know it was in 2008 that Republicans put forward our plan for an all-of-the-above energy policy, and that is really going through, you know, everything that we have today you have been hearing from nuclear to clean coal to oil to natural gas to hydro and all of the alternatives. We want to make sure that those are being used.

And at the same time, I look at my district. I represent a manufacturing district with 60,000 jobs. I also represent the largest ag district in the State of Ohio. And so it comes down to we use a lot of energy in my neck of the woods. And so when we use energy, we talk about baseload capacity because when those factories are running three shifts a day, they have got to make sure that they have that energy straight through the day. And at the same time, to get that energy, we have to make sure that we have that ability.

On the front page of today's Wall Street Journal we had the report showing that we have about a million barrels more of oil being produced in this country every day, which is very, very important because again we want to get our reliance off of foreign countries. And I think the last number I saw we were importing about 43 percent of the oil that we are using every day into the country.

So, when you look at what is happening out there and it is great that what we are doing in production here in the United States, and I think that Dr. Burgess had asked a little bit about it, but really what has really helped us get there is on the whole the means that we are using to bring this oil and natural gas up. And it is a known technology which is fracking.

And there are reports from several weeks back of OPEC countries that some of them are getting into a panic and they are saying it is all because of fracking that is going on in the United States that is bringing up our ability to bring up this oil and to really get this into the United States market. Can I just ask you again, what is your stand on fracking?

Secretary MONIZ. Well, I am not sure it is a stand, but what my view is that, as we have said, that I would say all of the environmental issues that have arisen I believe are manageable. I think we know what to do. They may be challenging in some cases but we know what to do; the issue is doing it. And there, of course, has not been—we have had obviously incidents.

As an example, the biggest problem in terms of the number of incidents has been, frankly, just poor well completion, bad cement jobs. You know, again, you would know what to do in principle but you just have got to have best practices done all the time. Another example which is slightly more challenging to address but again I think we know what to do is methane emissions.

Now, we are moving more than half I believe now of the frack jobs are so-called green completions where the methane is captured and is for economic benefit. In fact, if I may just add one more, just

this morning I was speaking with someone from a company where it is interesting. They are capturing the methane in the frack job not using 30,000 horsepower diesel engines anymore to drive the hydraulic fracturing but using gas-fired engines. And that then in turn is greatly improving air quality issues by displacing the diesels. So I think there are solutions there; we just have to make sure we are using them.

Mr. LATTI. OK. In my last 40 seconds here, another issue that is a real concern out there is on cyber security. And I know I have had several events in my district on cyber security, and it is a big issue out there. But one of the questions is that, when we are looking at really protecting the grid out there, can you justify right now when I am looking at your budget numbers here that the cyber security for the electric grid would be only about 38 million is what your department is asking for? And shouldn't there be more dollars out there to make sure that the grid is protected?

Secretary MONIZ. Well, the cyber security activity in the budget actually appears in many different places in the Department, and I have pulled together a council bringing together the various entities. So the Office of Electricity has a cyber security budget. The Office of Intelligence; the NNSA, the National Nuclear Security Administration, has a big program on cyber security. And I am forgetting one. Oh, and the CIO of course is heavily involved.

So what we are trying to do is to make sure we bring all of these assets together to look at everything from grid reliability and resilience to frankly protecting our own national security secrets.

Mr. LATTI. Thank you. Mr. Chairman, my time is expired and I yield back.

Mr. WHITFIELD. At this time, I recognize Ms. Matsui of California for 5 minutes.

Ms. MATSUI. Thank you, Mr. Chairman.

And thank you, Secretary Moniz, for joining us today. And I congratulate you on your new position.

I appreciate the Department of Energy's continued commitment to clean energy technology, energy efficiency, and the reduction of carbon emissions.

The American manufacturing sector has an essential role when it comes to U.S. competitiveness. It accounts for 12 percent of GDP, 70 percent of private sector R&D investment, and 60 percent of exports. And the manufacturing sector added a half-a-million jobs in the past 3 years. The President has emphasized the importance of investing in American manufacturing to build on this momentum.

My district of Sacramento boasts nearly 14,000 clean energy, clean technology jobs and more than 230 clean technology firms. I am keenly interested in advancing our clean energy manufacturing sector and have introduced legislation that would assist these companies in exporting these products abroad, thus allowing them to create jobs and better compete in the global market.

Mr. Secretary, the Energy Department's Clean Energy Manufacturing Initiative is focused on improving the manufacturing of clean energy products and increasing manufacturing energy productivity more broadly. Why is this initiative important and what benefits are we going to see?

Secretary MONIZ. Well, I think the initiative is important, frankly, for the reasons that you have already stated, that this is the way of getting the next cutting-edge technologies moved into the manufacturing environment in this country so we can capture those immediate jobs. But then, we should not forget the spillover in the sense of capturing important parts of the supply chain, that supply chains like to go together, and so you have a multiplier effect.

The project in Youngstown, Ohio, for example, on the 3-D manufacturing—or additive manufacturing sometimes it is called—is a good example. This is a technology that is already penetrating the manufacturing sphere but it is only just kind of a toe in the water. So that is a place where we have got to put that into our manufacturing environment quite solidly. The next one will be on some semiconductors. That is out there right now.

So again, I think we really need to think about in the end we need to capture the high-margin parts of the supply chains of clean technologies.

Ms. MATSUI. OK. This market is going to be worth trillions of dollars in the next decade. What needs to happen for the United States to lead in this market?

Secretary MONIZ. Well, I think much of this will happen in the private sector, but I think the Federal Government does have a role, as we just described. This is a good example in the manufacturing initiative. But I would go back to what may be even more important and that is developing our human capital. I mean this is absolutely essential and, in fact, one of the things that I would like to perhaps at some point—and I think about it more—talk with members of this committee and others in the Congress is I think at the Department of Energy we should maybe think about doing traineeships that focus right in on the key parts of energy technologies, energy activities where perhaps we are not producing enough young people, and to go back to Congressman Rush's point in making sure we are drawing upon the entire range of our human capital.

Ms. MATSUI. OK. Well, that is good.

First of all, I want to talk a little bit about ARPA-E. Can you tell us about the work ARPA-E is doing to invest in potentially breakthrough technologies and attract private capital support to the development of these technologies?

Secretary MONIZ. ARPA-E is, I think, was a wonderful initiative. And I really credit Secretary Chu for pushing that both before he was Secretary in a report of the National Academy and then as Secretary. I think ARPA-E, in many ways, I think it is the face of innovation for the Department of Energy. It does business in a different way. It is targeting specific areas.

For example, going forward, there will be a much bigger focus on advanced transportation options coming forward and soliciting ideas that sometimes are a little bit out there, pretty risky. I think, you know, we will have to judge ultimately 7 years down the road whether these technologies scale up to be major marketplace players. But every indicator is extremely encouraging, certainly, lots of lots of patents, disclosures, startup companies coming out of it.

I will note we shouldn't forget I think if you go back to the very first request for proposals or concept papers, there were more than 3,000 concept papers put in for 37 awards. I do not think we are tapping our full capacity to innovate in this country. We need to do more of it.

Ms. MATSUI. All right. Thank you, Mr. Secretary. Thank you.

Mr. WHITFIELD. The gentlelady's time is expired.

At this time, recognize Mr. McKinley from West Virginia for 5 minutes.

Mr. MCKINLEY. Thank you, Mr. Chairman.

Mr. Secretary, earlier in the remarks, Chairman Whitfield noted about your predecessor and his aversion to fossil fuels, very clear, and he made that throughout the 4 years he was there making that clear with that. It manifested itself in the budget with increasing money is being spent on renewable energy sources, on R&D, but it decreased in fossil energy R&D. So I have got a chart that shows that what happened in the time preceding his administration and then in the last; you see the direction we have gone and in fossil fuel research.

So I am just concerned with that, not only the direction but also because I found that I am trying to reconcile the information that your office up here only had provided from your predecessor, and that was over the \$421 million, as indicated there at the end. It says that is a 24.8 percent increase. Mr. Secretary, just saying so doesn't mean it, so I am trying to understand if your office would get back to me to explain why they think that is a 24 percent increase when in reality you can see that it is a fairly significant decrease in funding for the National Energy Technology Laboratory. I am sure that Mr. Doyle, Murphy, and all of those of us that have an interest in those facilities that we don't see that money cut any further.

So my point here with this a little bit is that during your Senate confirmation there were statements to that effect and newspaper articles how you are supporting the CCS research and R&D, and I applaud you for that because we need to have that. I am a little concerned whether you will be able to carry that out if we continue to have a lessening amount of money in R&D with NETL.

So the question that I would ask is do you support or are you supporting the President's proposed decrease in funding for NETL or will you make an effort to alter or work with us to alter it so that we can get that money back up to a more reasonable level?

Secretary MONIZ. First of all, I think there is again—I think not shown on this graph is the \$3 plus billion of Recovery Act funding that has already been put out there for the CCS projects. So that is—

Mr. MCKINLEY. This all came from the Congressional Research Service.

Secretary MONIZ. But I think that is separate. But I think we need to look at the whole picture. The other thing—and I just don't know from this picture—NETL also receives \$12½ million a year for research from the Royalty Trust Fund. Now, I think the bottom line is, however, frankly, back in 1999 we were part of forming NETL from the previous FETC—

Mr. MCKINLEY. OK.

Secretary MONIZ [continuing]. And I think that NETL is our lead laboratory for fossil energy research—

Mr. MCKINLEY. Thank you.

Secretary MONIZ [continuing]. And I have worked with—

Mr. MCKINLEY. If I could—and I appreciate you—we are going to have more of a discussion, but there were some other remarks earlier, and I want to maybe parse the words a little bit. You said that it is indisputable that there is global temperature change. I don't know too many of us who disagree that there has been some global temperature change, but my question, do you agree with Congressman Waxman that it is primarily manmade? Or is it natural and cyclical?

Secretary MONIZ. I believe in my view there is no question that a major component is anthropogenic.

Mr. MCKINLEY. Interesting.

Secretary MONIZ. And that comes from—

Mr. MCKINLEY. Is that from a consensus?

Secretary MONIZ. It is practically—I would say 98 percent of scientists involved in this area—

Mr. MCKINLEY. You are aware of the petition process has 32,000 scientists and physicists who have disagreed that it is manmade?

Secretary MONIZ. But sir—

Mr. MCKINLEY. They say it is contributing. I think it would be irresponsible to say we don't contribute, but is it primarily—

Secretary MONIZ. If I may say, and I would be happy to come and have a long discussion, but a few facts that, first of all, the rise in CO₂ emissions in the last half-century is clearly tracked to our global increased energy use. Secondly, I know how to count. I can count how many CO₂ molecules have gone out from fossil fuel combustion, and I know how many additional CO₂ molecules are in the atmosphere.

Mr. MCKINLEY. Let me just close with saying in terms of consensus, I think consensus has a place in politics but consensus doesn't have a place in science.

Secretary MONIZ. Again, sir, I just want to clarify. My—

Mr. MCKINLEY. I yield back my time.

Secretary MONIZ [continuing]. Judgment is based on numbers on data and not on the consensus. And I would be really delighted if we could have a discussion.

Mr. MCKINLEY. If we could have that, I would like to do it. Thank you very much.

Secretary MONIZ. Thank you.

Mr. KINZINGER [presiding]. The gentleman's time has expired. The chair recognizes the member from Virgin Islands, Ms. Christensen, for 5 minutes.

Mrs. CHRISTENSEN. Thank you, Mr. Chairman.

And welcome, Secretary Moniz, and thank you for your testimony and we look forward to working with you to implement your and the President's agenda for the Department and the country.

Some of my questions have been answered. I had some questions around weatherization because it is such an important program. It has helped low-income families for over 30 years now. And in 2012 the funding was at a historic low but the President's request for 2014 really aims to ensure that the program can continue pro-

viding these important services. And that would be especially important for every place in the United States but in my district where we face energy costs of over five times the national average.

You talked a bit about including job training. Is that included in the President's budgetary increase or is that something that you are looking forward to doing? Because I think that is very important as well as, you know—

Secretary MONIZ. This traineeship idea is one that I would like to start to work to develop.

Mrs. CHRISTENSEN. OK. And in determining the funding that goes to the States and the territories—I represent the Virgin Islands, so I am a territory—you generally have a formula, but is the funding level ever influenced by need or is it just a straight formula? And you may not know that at this point.

Secretary MONIZ. I believe that at the moment we are locked into kind of a formula, but as you said, also in the weatherization case, what was—

Mrs. CHRISTENSEN. It is the weatherization I am talking about.

Secretary MONIZ. Yes, in weatherization it is absolutely critical if a Continuing Resolution would have that funded at 70 million. It got so low because of the Recovery Act funding but it has to now come back up. And the request is for 184 in fiscal year 2014. At 70 million we could not sustain the program nationally.

Mrs. CHRISTENSEN. OK. And I am asking because we have a letter into your office requesting an increase even just for a couple of years because of our high energy costs.

And then the other question I had has to do with solar programs, and as you have said already, DOE is conducting a range of research development and demonstration and deployment activities for renewable sources, and could you tell us about the SunShot Initiative? Did you speak about that already?

Secretary MONIZ. Well, no, I have not. So the SunShot Initiative we feel very good about in terms of where it is going. It is about driving down the cost of solar, and it is happening. The solar costs have dropped incredibly. Solar module cost is now somewhere around \$1 per watt, and it wasn't long ago that that was \$2.50. So we are getting into a very interesting area.

Mrs. CHRISTENSEN. You have a very ambitious goal of dropping to 6 cents per kilowatt by the end of the decade. You think you are on track for that?

Secretary MONIZ. I think we are on the technology. Then the question is to get that, there will be a lot of requirements as well in terms of local regulations, how you install systems because installation costs are now getting to be larger than the solar technology cost itself.

And I might say, you know, in Germany, for example, their installation costs are about 40 percent of our costs through some uniform standards.

Mrs. CHRISTENSEN. I have been interested in OTEC for quite a while. Is the Department investing in research of that particular technology, the ocean thermal—

Secretary MONIZ. To be honest, I am not sure where the Department stands right now on that program.

Mrs. CHRISTENSEN. I have not noticed or seen anywhere where there is a lot of activity but, you know, for a place like ours, small islands surrounded by ocean—

Secretary MONIZ. Yes.

Mrs. CHRISTENSEN [continuing]. Some deep water that can accommodate it, it would just seem like a renewable energy that we ought to pursue. And, you know, I hope that in your tenure you will take a look at it.

Secretary MONIZ. OK. I will.

Mrs. CHRISTENSEN. Thank you. Mr. Chairman, I yield back.

Mr. KINZINGER. The gentlelady yields back.

The chair now recognizes himself for 5 minutes.

Mr. Secretary, thank you for being here. The Department of Energy is fortunate to have somebody with your technical and scientific expertise. Personally, I am excited to see the direction you take regarding nuclear policy considering your background. As we are all aware, your time is short in office but the course that you take now has the potential to steer the Department for years and decades to come. I hope you choose nuclear policy as one of your priorities.

I am concerned with the current direction of our nuclear energy policy as nuclear is a reliable and clean source of massive amounts of energy both domestically and through the world. In fact, in Illinois 50 percent of our energy is from nuclear. With our infrastructure and experience, the U.S. should be the leader in the realm of nuclear know-how and operation, but our current nuclear energy strategy is unstructured and without clear goals. This lack of direction leaves our scientists and labs vulnerable when appropriators are looking for areas to cut.

With the closure of a number of nuclear plants in just the past few months alone, I am afraid the U.S. is going to see a vacuum of nuclear energy experts in the very near future, and as those individuals and their knowledge are snatched up by foreign competitors, there is no getting them back.

An effective nuclear energy policy should look to use the best resources available to us in order to lead the world in this area. In your written testimony, you mentioned that our national labs have unique capabilities and expertise to provide technical assistance. I was happy to read this, as I also believe that our national labs such as Argonne National Lab in my home State of Illinois can play a key role in devising an enhanced nuclear energy security strategy. Collaborative partnerships among our national laboratories to develop such a strategy are going to be key to U.S. nuclear energy leadership in the future, and I hope that you will look towards developing the unique capabilities of those labs as you look to improve innovation and effectiveness of the Department of Energy's energy programs.

Just a few questions: A number of DOE national labs, Idaho, Oak Ridge, Savannah River, Argonne—have begun talks with one another in order to gain full advantage of their collective expertise in nuclear energy. Do you have any plans or what are your plans to help with this collaborative process moving forward in order to get the most of what each of them has to offer?

Secretary MONIZ. Thank you. First, more generally than nuclear energy specifically, I have met already with all the lab directors. We met down in Oak Ridge actually in my first week in office basically. And so I am working with them to engage the laboratory leadership much more what I would call in a strategic partnership for the Department as to where we are going. The phrase I would use is if you want people there on the landing, you should have them there on the takeoff. And so we are working to try to talk about what are the strategic technology directions that we are going.

Among those is clearly nuclear, and you have named to the labs that are leading it. Actually, others; Los Alamos also contributes, but clearly, Idaho and Argonne historically and Oak Ridge were probably the three largest.

Mr. MCKINLEY. And what are your goals for the growth of nuclear energy overall and how do you believe the budget put forward by your agency can successfully accomplish all of those goals?

Secretary MONIZ. Well, I think in my view the way I have always looked at it is our job is to make sure the marketplace in the end has the choices that it needs. Among those choices should be nuclear power. I think now there are several issues. I mean one is, as you know—

Mr. MCKINLEY. I have got a couple more so I will just cut you off if that is OK.

Secretary MONIZ. Yes, sure. Sure, sure.

Mr. MCKINLEY. We have done high-level comparisons with this Administration's budget proposal for the Office of Nuclear Energy. What we found is a decline since 2010 of actually almost 28 percent. What is a little more striking is that during that time DOE moved some additional line items into the nuclear energy budget that seem to mask even a sharper decline. Given the environmental benefits of nuclear energy and its contribution to energy security do you think such a decline is appropriate or could it cause any problems? And will you commit to examine this apparent decline knowing that you are new in this position and respond to this committee with a full explanation of it?

Secretary MONIZ. I would be happy to, and I have spoken with Pete Lyons. I am committed to maintaining a healthy nuclear energy program. SMRs are an important direction, for example. Also, we should note there is the commitment at least made on the very, very large loan guarantee to help stimulate the construction of reactors in Georgia.

Mr. MCKINLEY. Wonderful. Thank you and I yield back.

And the chair recognizes Mr. Doyle for 5 minutes.

Mr. DOYLE. Thank you, Mr. Chairman.

Mr. Secretary, welcome back for your inaugural visit in a different capacity, but we are happy you are here and we look forward to working with you. I just want to get some clarity to some of the remarks that my friend Mr. McKinley made on CCS.

The President's fiscal year 2014 budget request for research related to CCS is 376.6 million, which is a decrease of 23 percent below the fiscal year 2012 enacted levels. Now, I heard you make mention of stimulus money, some \$3 billion, and I am curious. That

is back in, what, 2009? How much of that \$3 billion has yet to be spent or is currently being—you know, is that \$3 billion gone?

Secretary MONIZ. No, it is not. I can't give you the exact number. I can get it later on. But in some cases much of the funding has been expended. As an example, the industrial project which I believe is in Illinois is well along. On the other hand, another project in Illinois actually, I think the FutureGen, is still in the second phase prior to the major construction, and they are, to be honest—and it is well known that we need to pick up the pace in order to have those funds expended prior to the end date for recovery funds.

Mr. DOYLE. Yes, I would be curious to see how much still exists in the 3 billion.

Secretary MONIZ. OK.

Mr. DOYLE. The other thing I am just curious about when you look at the subprograms within CCS, in the carbon capture part of this subprogram there is an increase of 62 percent in that budget from fiscal year 2013, but in the storage subprogram, that has been decreased, almost been cut in half. I am just curious why the increase in the money is going into capture and then a decrease in funding on the storage end? What is all of that?

Secretary MONIZ. I think the reason is that—I think I like to just think about it as these two fundamental problems. One is we need to demonstrate the storage with substantial injections over an extended period of time. That is what those recovery-funded projects are going to do using conventional capture technology. But for power plants in the long-term, the big cost driver is the capture technology. So the research is looking at the cost reduction of new capture technologies while the big demonstration projects will address the storage side.

Mr. DOYLE. Thank you very much.

Mr. Secretary, over the past 10 years, my colleagues and I have been championing efforts to support the development and commercialization of fuel cell technologies to promote our U.S. energy independence. And in particular, I am deeply committed to promoting the success of the Solid State Energy Conversion Alliance, SECA, under your fossil energy section.

SECA is a successful partnership, as you know, between the government, academia, industry, and the national labs in developing solid oxide fuel cells that are capable of cleanly and efficiently utilizing our domestic energy resources, most notably natural gas, in the coming years. In fact, SECA has met or exceeded every benchmark that has been set for it by Congress and the DOE.

Now, you have spoken of the importance of natural gas as a bridge to a cleaner energy future. Solid oxide fuel cells such as those under development in SECA are the cleanest, most efficient way to use natural gas, as well as a range of domestic energy sources. So in light of your support for natural gas, what are your plans for ensuring the continued success of the SECA program to ensure we develop technologies that make the most efficient use of that fuel?

Secretary MONIZ. To be honest, I will have to go and look at that in detail, but I can make a few comments because I have not been briefed on this to be honest in the last 3 weeks. But one, I do know that certain costs have come down, perhaps partly through SECA,

I mean, 35 percent kind of cost reductions in the last few years. And secondly, I think also solid oxide fuel cells could be very interesting for combining power applications because of their higher temperatures. So I will look into that and get back to you on the specifics.

Mr. DOYLE. Thank you, Mr. Secretary. I wish you well and I look forward to working with you. I yield back.

Secretary MONIZ. I do as well.

Mr. WHITFIELD. Sorry. I was thinking about something else there for a moment. Your comments are so insightful that it makes me think about other things.

Secretary MONIZ. Thank you.

Mr. WHITFIELD. Mr. Olson of Texas, you are recognized for 5 minutes.

Mr. OLSON. I thank the chair.

And welcome to Secretary Moniz. Congratulations on your nomination by the President to be the 13th Secretary of Energy and by being confirmed by the Senate with an impressive 97-to-nothing vote.

Mr. Secretary, my home State of Texas is the fastest-growing State in the Union. Texans want to sustain that growth and they know that one of our challenges is reliable power being available. Federal and state regulators agree that we could see a crisis on our grid if we have another hot summer like the August 2011.

One of the most significant areas of fossil fuel research in the DOE's budget is carbon capture and sequestration. And since I gathered this information on sequestration at MIT.edu, I assume you are aware of a DOE-supported—I guess you would call it—CCUS project at the W.A. Parish power plant outside of Needville, Texas, in my district. The goal of this project is to decrease CO₂ emissions by 90 percent with appropriate reductions in SO_x, NO_x, and mercury emissions. The captured CO₂ will be used for enhanced oil recovery operations in nearby old oil fields.

DOE issued its final EIS on March 15 of this year with the finding of negligible to minor environmental impacts. The W.A. Parish plant is leading the CCUS research but they will tell you, like you said here, CCUS is not ready for prime time.

Well, let me step back. CCUS is not realistic for many power plants. We are unique because we are so close to a former oil field. Unfortunately, EPA is not waiting for DOE to do the research and the proposed regulations that essentially mandate the use of unproven CCUS technologies on any new coal-fired power plant. My State needs power but the EPA is effectively banning a major source of new generation by requiring unproven technology in our power plants. In a sense, W.A. Parish has committed to invest \$163 million in this project. Will you commit to work with them to see that their unique circumstances for CCUS are economically viable from a market perspective?

Secretary MONIZ. I should be happy to be briefed by them and to discuss with them, yes.

Mr. OLSON. And help them get EPA out of the way?

Secretary MONIZ. Well, I think that we will have to see what the situation is.

Mr. OLSON. Yes, sir. I appreciate your commitment.

And as you know, another tool you have to help my home State avoid blackouts is Section 202(c) of the Federal Power Act. Under Section 202(c) DOE has the authority to order a power plant to run during an emergency even if that would cause a brief violation of environmental laws.

Unfortunately, EPA environmental groups have usurped DOE's 202(c) of authority by bringing lawsuits which have resulted with power plant owners paying fines for complying with DOE regulations and orders. Two weeks ago, the House passed my bill, H.R. 271 to prevent this regulatory trap. The last Congress it was favorably discussed by the FERC commissioners and your predecessor Secretary Chu.

The Senate has yet to take up the bill, so I am going to go Texan and shoot straight. Do you support my bill, H.R. 271?

Secretary MONIZ. Sir, I will have to study it first but it sounds like an issue I should get up to speed on. Thank you.

Mr. OLSON. Thank you. I appreciate that.

And finally, your department has some critical decisions ahead of it on LNG exports. My support for LNG exports comes from a strong belief in free markets and my State's booming energy production. But most importantly, LNG exports can sustain our national security, strengthen it, by developing relationships with countries that are important to the United States of America.

One of those countries is India. There is a vibrant Indo-American community in my district. Our relationship with India is key and our Indian allies can either buy gas from us or by gas from nations like Iran.

My first question—and I am running out of time here—is do you support energy exports? Yes or no?

Secretary MONIZ. Well, again, I will be evaluating the export applications on a case-by-case basis expeditiously. I might also add I will be in India in two weeks.

Mr. OLSON. Great. Great. Bring this up. They will bring it up with you; I can guarantee you. I am out of my time. Thank you.

Mr. WHITFIELD. The gentleman's time is expired. At this time, I recognize the gentleman from Virginia, Mr. Griffith, for 5 minutes.

Mr. GRIFFITH. Thank you, Mr. Chairman. I appreciate that. Following up on LNG, multiple studies of LNG exports have pointed out that the U.S. projects are in a race to meet worldwide demand for LNG with international projects all around the world. Do you agree the delays in the DOE permitting process are putting U.S. export projects at a disadvantage compared to competing projects in the Middle East, Russia, and elsewhere?

Secretary MONIZ. Well, I am not sure I characterized delays. I mean I am starting my own process now—

Mr. GRIFFITH. Yes, sir.

Secretary MONIZ [continuing]. Expeditiously, but I do want to point out the pitfalls of litigation, et cetera, are there so we have to do it right. So I want to be very, very systematic, transparent, and march through these as expeditiously as I can.

Mr. GRIFFITH. And I would also be remiss being a representative from Virginia—even though I am a long way from the shore—that Virginia believes that we have a lot of natural gas offshore, and we would love to be able to get to that and any oil that might be out

there as well. And that has been the policy of at least the House of Delegates in Virginia since 2004 when I was there and has been the policy of the State as a whole, I think, for about the last 45 years. But if you could expedite that, that would be great. We are ready to get started.

Secretary MONIZ. It is not in my lane.

Mr. GRIFFITH. I understand. I will tell you that it is interesting when you study all of these issues and you look at the environment and you look at ways and problems and things that we have to move forward on. And it is one of those things that I have always loved is that in the 1890s the major cities of the world, particularly northeastern United States and some others, were very concerned about the environmental problem that they were having with dealing with the dead horses. And through technology, we were able to move forward without having that problem. They worried about having to deal with manure as high as 30-story buildings and the environmental impact of not being able to get the decaying horse carcasses out of the streets in a timely fashion when the population rose and they were looking at projections out to 1930 and 1950.

That being said, you were, I believe, the cochairman of a group at MIT that did a report in 2007 on the future of coal. And while there are a number of difficulties that people look at with coal, there is also some really interesting technological advances that are moving forward. And so I would ask why, when we look at the budget, do we not see more money being spent on looking at some of these technological advances that have come forward?

And I would point to a number of things. One of the things that was mentioned there is chemical looping and that was mentioned in that report. And now, it appears that an Ohio State University professor, whose first name I am not familiar with how to pronounce but his last name is easy, I think, Fan, has come up with a way to use coal. Obviously, it is in the preliminary stages but to burn or to get the energy out of coal with virtually no pollutants. A little coal ash leftover is about it. And he is now taking that or they are taking that to Alabama and DOE has some money in that.

But I am wondering why, when we look at reports—and I am looking at one of the charts that we were provided, budget for Applied Energy, I am wondering why we don't have more money going into projects like that to see if we can't make this technologically feasible since we are in fact in the United States, the kings of coal throughout the world?

Secretary MONIZ. Well, again, I will repeat but not go into detail there is of course the huge amount of money sitting there in advancing the CCS projects, some of which are also advancing the technologies along the lines you are saying. For example, one of the projects is a so-called oxy combustion project as opposed to a conventional boiler, et cetera. The chemical looping, very interesting.

As was already said, we do have an increased focus on carbon capture technologies and also advanced materials, very important for—

Mr. GRIFFITH. I think that means that we can count on you to embrace, develop, and ensure the success of these types of programs for transformational coal technologies. All right. And I just have a few seconds left but I would ask that you continue to work

in those directions and do fund I believe it is the National Energy Technology Laboratory that has been working with the Ohio State project even though they have got \$5 million. It was 15 years in the development.

Secretary MONIZ. Right.

Mr. GRIFFITH. But I do have to say when I look at this chart and I see, you know, biomass and bio refineries ahead of coal, I am disturbed by that because I really believe that with our great resource out there of coal that finding a way to make everybody happy and burning it and giving jobs back to the 9th District that had been stripped away over the last few years is extremely important, and I would encourage you to continue to pursue that and count on me in any way that I can be helpful in moving those projects forward. Thank you.

Secretary MONIZ. Thank you.

Mr. GRIFFITH. And I yield back, Mr. Chairman.

Mr. WHITFIELD. The gentleman yields back.

At this time, I recognize the gentleman from Colorado, Mr. Gardner, for 5 minutes.

Mr. GARDNER. Thank you, Mr. Chairman.

And thank you, Mr. Secretary. And I don't know. You may need a little more time to answer this question; I am not sure yet. But one of the issues that I hope that you would be able to address is the building of transmission lines to help get power to and from rural areas. My district in Colorado is the size of the State of South Carolina. In fact, it is a little bit bigger than the State of South Carolina. And there have been significant issues with the building of transmission lines on federal lands. Are you aware, and if so, what is your view of the Interagency Rapid Response Team which is housed in your agency?

Secretary MONIZ. You are right; I will have to get back to you on that.

Mr. GARDNER. All right. So I would like to ask a series of questions—

Secretary MONIZ. Yes.

Mr. GARDNER [continuing]. If you don't mind on the Interagency Rapid Response Team and just perhaps get some examples of successes they have had, some measurements that you are using to define or determine success. And perhaps if you could get back with us on specific results of the RRT's efforts to this point so far and a discussion of the process the RRT uses, recommendations for improving its effectiveness, and plans for how to implement those recommendations going forward. It is very important, I think, to the development of renewable energy in Colorado and opportunities that we have on federal lands and resources.

In your testimony you cited that the President's budget increased investment for Department of Energy efficiency measures. You also state that you are instituting energy efficiency measures that reduce energy use in federal agencies and the industrial and building sectors. I was interested in your Department's promotion of energy savings performance contracts. As you know, the President wrote a memorandum to federal departments and agencies on improving energy efficiency in our federal building inventory December 2011. It is a program where private companies take the risk on the up-

grading of federal buildings at no cost to the taxpayer. Can you provide an update of the use of ESPCs by the Department of Energy? And you can get back to us if you would like.

Secretary MONIZ. Sure. And I can't note also now, well, first of all, that I am a big fan of ESPCs. Number two, right now, the commitments are approaching \$600 million against the \$2 billion target.

Mr. GARDNER. The overall target, right?

Secretary MONIZ. The overall target. And I have to admit the end of this year is going to be pretty tight but I think that the pipeline that is in there will hit the \$2 billion target in maybe a year or two later.

Mr. GARDNER. And I just would like to note that one of my colleagues on this committee, Peter Welch from Vermont, and I are going to be working on legislation that will encourage even more utilization of ESPCs and hope that we could work together on the use of ESPCs.

Secretary MONIZ. In general in the whole efficiency agenda is one I would love to work with you on.

Mr. GARDNER. Very good. And are you consulting the President on the Keystone XL pipeline?

Secretary MONIZ. No, I am not.

Mr. GARDNER. Do you think you should be consulting with the President as Department of Energy Secretary?

Secretary MONIZ. Well, I think the Department is prepared, of course, to provide technical analysis. Of course, the EPA is involved in terms of the environmental statements. And then Secretary Kerry, I think, is the lead—

Mr. GARDNER. But so far you haven't consulted with the White House or the Department of State on the Keystone pipeline?

Secretary MONIZ. To date I have personally not. Of course, Secretary Chu may have.

Mr. GARDNER. And what is your opinion of the Keystone XL pipeline?

Secretary MONIZ. I think that it is a decision for Secretary Kerry.

Mr. GARDNER. Well, what would your advice be to Secretary Kerry?

Secretary MONIZ. To evaluate all the factors in the public interest.

Mr. GARDNER. Very good. So no answers on that. That is quite all right for the time being.

The Americans against Fracking opposed your nomination.

Secretary MONIZ. Say that again?

Mr. GARDNER. Americans against Fracking opposed your nomination because you had stated earlier today your position on fracking. Would you agree with both previous Administrator Lisa Jackson, as well as Governor Hickenlooper in Colorado, who have said that they are not aware of any proven case where the fracking itself has affected water?

Secretary MONIZ. That is true to my knowledge as well.

Mr. GARDNER. And what did you say or your response to Americans against Fracking in your support of hydraulic fracturing? What did you respond to them?

Secretary MONIZ. Well, actually, I did not respond. I have a public record in terms of what I think. I have repeated that here today and that remains my position. Manageable, challenging, must be managed.

Mr. GARDNER. You know, city did a report talking about energy independence, North American energy independence is a real possibility of the American energy renaissance in this Nation. Can we get to energy independence and continue the energy renaissance in this country without hydraulic fracturing?

Secretary MONIZ. Well, that is a difficult question. I mean I think certainly given all of our assets, particularly in North America, there really is a chance that we could be that independent. It doesn't mean we wouldn't be exporting and importing but—

Mr. GARDNER. Right, but can we do it without—

Secretary MONIZ [continuing]. And have as many BTUs as we do—

Mr. GARDNER. Can we do it without hydraulic fracturing?

Secretary MONIZ. Well, today, obviously, it is a huge contributor for both oil and gas. So—

Mr. GARDNER. So the answer is no, we could not do it without—

Secretary MONIZ. No, I have a harder time seeing it clearly without that. But, you know, we are going to be moving, I think, increasingly to alternative technologies as well, so I can't rule it out. But clearly, if you look at—

Mr. GARDNER. But hydraulic fracturing is a critical part of our energy—

Secretary MONIZ. Today, it is absolutely critical. Sure, we would not have the increased oil and gas production without it.

Mr. WHITFIELD. The gentleman time is expired. At this time I will recognize the gentleman from Ohio, Mr. Johnson, for 5 minutes.

Mr. JOHNSON. Well, thank you, Mr. Chairman, for holding this important committee and for allowing me to participate.

And, Mr. Secretary, congratulations to you for your appointment and confirmation to what I believe is one of the most important Cabinet positions in the Nation right now.

As you may know, my colleague from Ohio, Tim Ryan, and I have formed a bipartisan LNG Export Working Group along with six Republicans and Democrats. It is a bipartisan group. And a number of them are on this committee and have already participated in this hearing today. I am going to stay on a subject that is familiar, LNG exports for a minute or two.

You know, we did not expect you to be sworn into your new job and start approving pending applications to export to non-Free Trade Agreement countries overnight. Many in Congress, however, believe that the time for review has passed. You have commented just a few minutes ago in your questions that, I think if I understood you right, you said you couldn't comment on the delays or what the delays were. But I can tell you that almost all of the applications have been pending for over 100 days, and at least one of them has been pending for almost 800 days. The studies have been done.

So my question to you—and I appreciate and I am encouraged that you have said you are going to be expeditiously evaluating and planning to take action through the remainder of this year, but there is quite a bit of time left in this year and there are a lot of applications out there. So when will you and the Department start making decisions on what have been languishing for the better part of 2 years?

Secretary MONIZ. Well, as I have said, sir, you know, I have had to get my head around it, as you have acknowledged. We are getting, I think, very close to the time. We are going to start evaluating those dockets.

Mr. JOHNSON. Well, I would encourage you—and I am sure you have heard this before, let the market drive this. Our private sector oil and gas folks, they will make the right decisions given that all of the evaluations have been done. Let's open this up and let the market drive it and create the jobs that are going to come with it.

Do you foresee in the evaluation process the Department of Energy working through the application list in a different order than in which they were submitted or filed to take into account which projects may be more viable than others to build? And if so, what factors might the Department look at in determining that?

Secretary MONIZ. Well, no, sir. I think we are going to stay with the order. I think to start injecting new subjective judgments I think would just kind of confuse the situation and open up some more criticism and possible intervention so—

Mr. JOHNSON. Wow. Well, I like that answer. You are one of the first in this Administration to avoid picking winners and losers here in Washington. I think that is commendable. I would again urge you to consider let's just get these approved and let's let the market drive it.

Let me move to another subject now. I would like to switch gears a little bit, a subject that one of our colleagues mentioned earlier, and talk about an issue that is important not only to my constituents but to our country, and that is the issue of making sure that America has an indigenous and solely U.S.-owned enriched uranium producer.

Since the Department and USEC were not able to come to an agreement to keep the Paducah plant operating, once the Department's current inventory is depleted, the government is left without a continued source of enriched uranium for national security purposes. Given this serious situation, I commend the Department for conducting a 2-year, \$350 million cost-shared RD&D program to demonstrate reliability of the U.S. centrifuge project at the Piketon facility. This program has been very successful to date, constructing over 120 centrifuge machines and associated plant systems on budget and on schedule to demonstrate reliability of the technology.

At the same time, the Federal Government is investing about 230 million through the end of the current fiscal year in this RD&D program and has taken title to the centrifuge machines and the support facilities. The balance of the 48 million of federal cost-share funding is needed to complete this critical RD&D effort by year's end. And while we in Congress will continue to have the funding included in any appropriations bills, given the critical role

that this program has for national security and the fact that the government is heavily invested in its outcome, can you tell me how you are going to or what your plans are to find the balance of the 48 million needed to complete by December 31 if the Senate and the House are not able to come to resolution on an Energy and Water Appropriations bill?

Secretary MONIZ. I think we are going to have to have the discussion with the Congress in the funding. I very much want to see that demonstration completed because I think that is a critical decision point for the path forward. And it would be, if successful, as you say, our only indigenous American technology.

Mr. JOHNSON. Certainly. Well, you know the history that we have had with working with the Senate to try and get financial bills—whether they be budgets or appropriations bills—passed. So have you and the Department begun thinking about how we will come up with that 48 million in funding?

Secretary MONIZ. I don't have a plan for that yet but we will have to address it as we see how progress comes.

Mr. JOHNSON. OK. Well, thank you very much, Mr. Secretary.

Mr. WHITFIELD. The gentleman's time is expired. And that, I think, completes the questions.

I have one additional question, Secretary Moniz, and I don't know if Bobby does or not, but we have heard a lot about carbon capture and sequestration research and funding for that research at the Department of Energy, and I was glad to hear you earlier—or someone—not say sequestration but say utilization because we hope that there will be technologies out there to use CO₂ instead of storing it, maybe use it commercially in some way.

And so as Secretary of Energy, do you feel like you have the authority, the ability to direct money into research for carbon capture and utilization rather than sequestration?

Secretary MONIZ. Well, yes. I think we certainly have the authorities to do that, and I think ARPA-E has some ideas in terms of novel utilization techniques. But the other one is a discussion, I think, with industry, et cetera. It is not an R&D issue as such, but if the utilization through enhanced oil recovery is to scale-up, we have a big infrastructure issue to look at—

Mr. WHITFIELD. Right.

Secretary MONIZ [continuing]. Probably as a public-private partnership.

Mr. WHITFIELD. But even in addition to enhanced oil recovery, other types of utilization.

Secretary MONIZ. Yes, other things, building materials, et cetera, yes.

Mr. WHITFIELD. Right, right. And then my final comment would be I would urge you once again to use all of the speed that you all have available to you on your request for proposal for the economic development at the Paducah plant.

Secretary MONIZ. I should have mentioned earlier—I forgot—that, as you know, we have several proposals in and we will be evaluating those, sir.

Mr. WHITFIELD. Thank you. Thank you. Mr. Rush?

Mr. RUSH. Mr. Secretary, I was a little disturbed earlier when the fine gentleman from Louisiana, Mr. Scalise, would not allow

you to complete your answers. So there were a lot of questions. It was quite interesting. I am sure you have some additional comments that you wanted to make regarding Mr. Scalise's questions that he was asking you.

Secretary MONIZ. Well, I think we made our points in the discussion, so thank you, Congressman.

Mr. RUSH. Yes. You know, the drilling on federal lands as opposed to nonfederal lands, I think that that was a pretty interesting line of questioning, and I wanted to hear what your real answers were to that.

Secretary MONIZ. Well, I mean I think my answer was what I am saying, that I think that the industry is, you know, it is going out there pretty hard in terms of this increased production. There is a lot of infrastructure to do, et cetera. Frankly, there are limits to the number of rigs, and there are a number of leases on federal lands that are not being used. So I think the issue is to keep your eye on the ball, that oil production, gas production is going up. It is going up at a pretty rapid pace in fact. And so I think that is—

Mr. RUSH. Thank you very much. I really appreciate it. Thank you.

Mr. WHITFIELD. Secretary Moniz, thank you for being with us today. We appreciate your patience and you answered all of our questions. We look forward to working with you as we move forward, and thank you once again.

Secretary MONIZ. Thank you.

Mr. WHITFIELD. And this hearing is adjourned.

Secretary MONIZ. And all the members, thank you.

Mr. WHITFIELD. Thank you.

[Whereupon, at 12:50 p.m., the subcommittee was adjourned.]

[Material submitted for inclusion in the record follows:]

PREPARED STATEMENT OF HON. ELIOT L. ENGEL

Thank you Mr. Chairman.

Secretary Moniz, thank you for joining us today. I look forward to working with you on energy policy over the next few years.

Overall, I am satisfied with the President's FY14 budget for the Department of Energy. I am particularly interested in the budgeting for alternative transportation fuels. I commend you and the President for proposing a \$2 billion set aside for an Energy Security Trust, as well as other investments in alternative fuels and energy efficiency.

I will soon be re-introducing the Open Fuels Standard Act with my colleague from Florida, Ms. Ros-Lehtinen. I have done so for the past several years. I believe that this legislation will help drive domestic production of all types of alternative fuels, while greatly decreasing our reliance on foreign oil from hostile regimes. This has also been the goal of my Oil and National Security Caucus, which has focused on ways to reduce our dependence on foreign oil, while making the U.S. energy independent.

UNIVERSITY OF ILLINOIS
URBANA • CAMPAIGN • CHICAGO • SPRINGFIELD

**PROPOSED FY 14 ADMINISTRATION CUTS TO
Dept. of Energy Coal and Fossil Energy Research and Development Program**

The University of Illinois is concerned with the Administrations proposed cut to the Department of Energy's Coal and Fossil Energy Research and Development program. The Administration's FY 14 recommended level proposes to cut \$46 million out of the \$107 FY 13 CR level from the Office of Fossil Energy's Carbon Storage Research line.

A robust Fossil Energy program at DOE will ensure our nation's domestic energy, economic and environmental goals are achieved while we expand our use of coal, our nation's most abundant natural resource. Globally the U.S. has approximately one-third of the world's total recoverable coal reserves. In the U.S., coal accounts for 93% of the proven fossil energy reserves and currently supplies 42% of total U.S. electricity generation. And because coal is predicted to remain affordable, reliable and will be used in an increasingly clean manner, the Energy Information Administration (EIA) expects coal to continue to provide over 35% of our nation's electricity through 2040. Given the extent of this important domestic energy resource, investing in technologies for the future is critical.

The University of Illinois is a member of the Midwest Geological Sequestration Consortium (MGSC) which is one of seven national research partnerships working to find a balance between our growing energy needs and dealing with carbon dioxide created in energy production and industrial processes. At the Carbon Sequestration Project in Decatur Illinois and the MGSC have been leader in researching best practices in capturing and storing carbon dioxide safely underground in natural geological formations. The MGSC is funded by the U.S. Department of Energy through the National Energy Technology Laboratory via the Regional Carbon Sequestration Partnership Program and by a cost share agreement with the Illinois Department of Commerce and Economic Opportunity, Office of Coal Development, through the Illinois Clean Coal Institute.

The Carbon Storage project in Decatur is halfway through its injection period with 1.5+ years remaining to inject the 1 million metric ton injection target. When we reach 1 million tons at the end of 2014, we are to then carry out three years of post-injection environmental monitoring (to end 2017). Completion of injection and the post-injection monitoring are most at risk by this proposed cut because DOE may not have adequate funds going forward among the six regional research projects to carry our Decatur project as currently planned.

The University is concerned about the clear risk that the work that has been done in Phase III efforts in Decatur since 2007 will be cut severely short and the funding will be moved over to carbon capture before carbon storage completes the research effort that was defined as essential by the Department and Congress at the start of the project. The severity of this proposed cut almost certainly ensures that the research outcomes will be incomplete and the final three years of demonstrating the safety and viability of the project might be compromised.

The University recommends funding the Department's Fossil Energy program at the FY 2013 House recommended level of \$554 million and provide funding for the coal research and development program at the FY 2013 recommended level of \$384 million (the coal RD&D program is a subprogram of the Fossil Energy program at DOE).

BENEFITS OF COAL RESEARCH ON THE UNIVERISTY OF ILLINOIS AND CENTRAL ILLINOIS

Benefits to University of Illinois

Total project funding for Illinois Basin - Decatur Project since 2007 through 2017 is about \$74.7 million. Remaining funding, from now through Fall 2017 is approximately \$23.8 million, which is received from the Coal and Fossil Energy Research and Development program budget line.

Full-time jobs supported at University of Illinois = 10
 Fractions of jobs supported at University of Illinois = 4
 Schlumberger Carbon Services Company based in Champaign = 3

Benefits in Decatur

Full-time jobs 100% supported at ADM = 5

Ancillary Benefits

Spin-off funding received and in place at University of Illinois = \$15.2 million for related research projects dependent on data, rock materials, socio-economic analyses, and geophysical surveys from the Illinois Basin – Decatur Project

Ancillary Jobs directly created = 2

Summary of the Administration's FY2014 Dept. of Energy Coal R&D Budget Request

	FY11	FY12	FY13 Req	FY13 CR	FY14 Req
CO2 Capture R&D	\$59M	\$69M	\$60M	\$64M	\$112M*
CO2 Storage R&D	\$121M	\$115M	\$95M	\$107M	\$61M
Advanced Energy Sys	\$169M	\$100M	\$55M	\$92M	\$48M
Crosscutting Research	\$41M	\$49M	\$30M	\$46M	\$21M
NETL Coal R&D	**No Funds	\$35M	\$35M	\$33M	\$35M
Total	\$390M	\$368M	\$276M	\$341M	\$276M

*Includes \$25M for prize for best Gas/CCS technology (details on this not available)

**\$35M for NETL Coal R&D provided under the Program Direction budget line

FRED UPTON, MICHIGAN
CHAIRMAN

HENRY A. WAXMAN, CALIFORNIA
RANKING MEMBER

ONE HUNDRED THIRTEENTH CONGRESS
Congress of the United States
House of Representatives

COMMITTEE ON ENERGY AND COMMERCE

2125 RAYBURN HOUSE OFFICE BUILDING
WASHINGTON, DC 20515-6115

Majority (201) 225-3927
Minority (202) 225-3941

March 26, 2013

The Honorable Steven Chu
Secretary of Energy
U.S. Department of Energy
1000 Independence Avenue, S.W.
Washington, D.C. 20585

Dear Secretary Chu:

Pursuant to Rules X and XI of the Rules of the U.S. House of Representatives, the Committee on Energy and Commerce is commencing oversight of U.S. implementation of nuclear export control policies. We seek to examine how current policies and Administration efforts affect opportunities for enhancing or expanding U.S. manufacturing and competitiveness, both for strengthening domestic job growth and for the benefit of U.S. influence over international nuclear safety and nuclear security.

We understand that, for the first time in 25 years, the Department of Energy (DOE) is revising the Federal regulations that apply to civilian nuclear exports, *10 C.F.R. 810* (Part 810). These revisions may substantially change the scope and requirements for approval of exports of nuclear technology and services, with direct implications for U.S. nuclear-related commerce. To assist us in evaluating the impact of new U.S. nuclear export control regulations and DOE's implementation of these regulations, we request information relating to the regulatory process, reviews, and decision-making concerning nuclear export licenses, as implemented through the National Nuclear Security Agency (NNSA).

Accordingly, we request a briefing for Committee staff on the Part 810 review process and decision-making by April 12, 2013. During this briefing, we ask that DOE officials be prepared to describe in detail how DOE is implementing each of the requirements of section 57b of the Atomic Energy Act of 1954 and 10 CFR 810. In addition, we ask that you provide the requested documents and written responses to the following questions by April 12, 2013:

1. Please provide a list of the 25 most recent Part 810 export license decisions. For each license request, please identify the date the license request was filed; the dates each Federal agency reviewing the license request began and completed its review; the date

Letter to the Honorable Steven Chu
Page 2

the license request was either approved or denied; and the date the license applicant was informed of this decision.

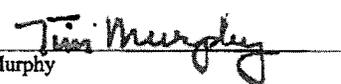
2. Please describe how DOE evaluates Part 810 export license requests, including the criteria used to determine acceptability; how DOE works with other Federal agencies, including the Departments of Commerce, Defense, and State and the Nuclear Regulatory Commission, to complete their portions of the review; and how and when DOE apprises Part 810 export license applicants about the status of their applications.
3. Does DOE measure and track its performance in reviewing Part 810 license requests? If so, please provide the results of all performance assessments conducted over the past five years.
 - a. Has DOE benchmarked its process and performance against other countries involved with nuclear technology exports, such as France or Russia? If so, please provide copies of all such assessments.
 - b. Has DOE benchmarked its process and performance against Nuclear Regulatory Commission (NRC) export license reviews pursuant to 10 CFR Part 110? If so, please provide copies of any such assessments.
4. Describe any overlaps that may exist between the DOE Part 810 review process and the NRC Part 110 process and whether the agencies undertake measures to avoid overlapping or duplicative processes.
5. DOE's September 7, 2011 proposed revisions to Part 810 list the countries eligible for general authorization.
 - a. Please describe the basis for creating a general authorization list and the criteria for inclusion of specific countries on this list.
 - b. Did the State Department provide guidance on the inclusion of countries on this list? If yes, please provide copies of all such guidance.
 - c. Has there been any analysis of the potential impact on future exports of nuclear technologies and services to countries that are not on this proposed general authorization list? If yes, please provide such analyses.
6. Please provide a copy of the economic impact analysis(es) prepared for DOE's September 7, 2011 proposed revision of Part 810.
7. Describe any changes being considered to the current DOE process that are focused on enhancing the U.S. role to compete for international commercial opportunities.
8. As commercial nuclear power continues to increase globally and with the United States currently having the largest operating fleet of nuclear power reactors, there may be circumstances in which nuclear operations and safety practices outside the United States may be advanced through foreign visits to U.S. nuclear facilities. Please explain whether there are procedures in place to facilitate such foreign visits.

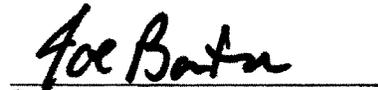
Letter to the Honorable Steven Chu
Page 3

If you have any questions regarding this request, please contact Peter Spencer with the Majority Committee staff at (202) 225-2927.

Sincerely,

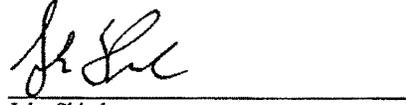

Fred Upton
Chairman


Tim Murphy
Chairman
Subcommittee on Oversight and Investigations


Joe Barton
Chairman Emeritus


Ed Whitfield
Chairman
Subcommittee on Energy and Power


Marsha Blackburn
Vice Chairman


John Shimkus
Chairman
Subcommittee on Environment and the Economy


Michael C. Burgess
Vice Chairman
Subcommittee on Oversight and Investigations

cc: The Honorable Henry A. Waxman, Ranking Member

The Honorable Diana DeGette, Ranking Member
Subcommittee on Oversight and Investigations



Department of Energy
National Nuclear Security Administration
Washington, DC 20585

June 4, 2013

The Honorable Fred Upton
Chairman
Committee on Energy and Commerce
U.S. House of Representatives
Washington, DC 20515

Dear Chairman Upton:

Thank you for your letter of March 26, 2013, requesting information on the Department of Energy's export licensing process regulated under 10 CFR Part 810 (Part 810) and the ongoing rulemaking to revise that regulation.

Part 810 regulates the export of unclassified nuclear technology and assistance by persons subject to the jurisdiction of the United States, to facilitate international commerce while at the same time protecting against the spread of nuclear technologies and material that would be contrary to the nonproliferation and other national security interests of the United States. Part 810 implements section 57 b. (2) of the Atomic Energy Act of 1954, as amended, which provides that it shall be unlawful for any person to directly or indirectly engage or participate in the development or production of special nuclear material outside the United States without a determination by the Secretary of Energy, made with the concurrence of the Department of State and consultations with the Departments of Defense and Commerce and the Nuclear Regulatory Commission, that such activity will not be inimical to the interest of the United States.

As you know, Part 810 has not been comprehensively updated since 1986. Considering changes in the nuclear technology market since that last revision, in September 2011, DOE published a notice of proposed rulemaking (NOPR) and sought public input on potential changes to the regulation. DOE also held an informational webinar on the proposed rule. In response to the NOPR, DOE received numerous public comments. DOE has carefully considered the public comments and will respond to those comments in a supplemental notice of proposed rulemaking (SNOPR), which is currently under review at the Office of Management and Budget. The SNOPR will also provide another opportunity for public comment.

Please let us know if your staff wishes to discuss the SNOPR once DOE publishes it. In the meantime, we would be happy to brief your staff on other aspects of the Part 810 program.



Printed with soy ink on recycled paper

Thank you again for the inquiry about the Part 810 process and the rulemaking. Should you or your staff have any questions or need further assistance, please call me or please contact Mr. Clarence T. Bishop, Associate Administrator for External Affairs at (202) 586-7332.

Sincerely,

A handwritten signature in black ink, appearing to read "Neile L. Miller". The signature is written in a cursive style with a prominent flourish at the end.

Neile L. Miller

cc: The Honorable Henry A. Waxman, Ranking Member

The Honorable Diana DeGette, Ranking Member
Subcommittee on Oversight and Investigations

April 25, 2013

President Barack Obama
The White House
1600 Pennsylvania Avenue, NW
Washington, D.C. 20500

Dear Mr. President:

We write to underscore the importance of preventing nuclear weapons proliferation, and to caution against the adoption of policies that could inadvertently weaken the ability of the United States to continue to provide international leadership on this critically important issue.

For more than half a century, the cornerstone of global efforts to prevent nuclear weapons proliferation has been the "atoms for peace" formula. With very few exceptions, the countries of the world have accepted this formula. Countries that enter into it commit not to pursue nuclear weapons, and in exchange are guaranteed support for their right to develop civil nuclear power and other peaceful uses of atomic energy, and submit to international supervision.

The Atoms for Peace formula has been very successful. Access to commercial nuclear technology was not seen as a threat to the nuclear nonproliferation regime, but rather as a sign of the health of that regime and an essential means for implementing it. One of our nation's most powerful tools for guaranteeing that the countries acquiring this technology continue to use it exclusively for peaceful purposes is to ensure that the U.S. commercial nuclear industry continues to play a leading role in the international civil nuclear marketplace. Here the news is not encouraging.

While the United States and one or two other countries had a near-monopoly on civil nuclear technology in the 1950s, today the list of countries actively competing in the international civil nuclear marketplace includes Russia, France, Canada, Great Britain, Germany, the Netherlands, Japan and South Korea. And it is likely soon that China and India will become active participants in the international nuclear marketplace. According to a November 2010 Government Accountability Office (GAO) report on nuclear commerce, the U.S. share of global exports of "nuclear reactors, major components and equipment, and minor reactor parts" fell from 11 percent to just 7 percent between 1994 and 2008. The U.S. share of global exports of nuclear fuel fell from 29 percent to just 10 percent over that same period of time.

This decline in U.S. market share translates to substantially diminished U.S. influence in such areas as nuclear nonproliferation and nuclear safety. As a result, the United States is in an increasingly weak position to unilaterally impose onerous requirements on potential buyers of civil nuclear technology, simply because buyers have so many alternatives to U.S. sources of supply. It follows that, in order to restore its nonproliferation influence around the globe, the United States Government must find ways to strengthen the competitiveness of the U.S. nuclear industry, and avoid policies that threaten to further weaken it.

We therefore urge that, as part of your export control reform initiative, streamlining of the process for licensing civil nuclear exports be made a top priority. We know that there are experts who

President Obama
 April 25, 2013
 Page 2.

argue that we should make access to American nuclear technology even more restrictive in the future. This would have the unintended effect of further diminishing America's competitiveness in the global nuclear marketplace. America's ability to lead the global nuclear nonproliferation regime will diminish steadily as America abandons the field.

Consistent with the Atoms for Peace policy framework, America restricts the right of other countries to buy from American nuclear suppliers unless those countries agreed to stringent security procedures and conditions (the so-called 123 process). Historically we have managed this process on a sensible case-by-case basis. If we adopt a much more restrictive approach, we will not prevent countries from acquiring nuclear technology, but instead will encourage nations to turn to suppliers that do not impose difficult standards. The non-proliferation regime is weakened in that circumstance.

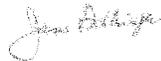
We share your Administration's concern about the risks associated with the potential spread of sensitive nuclear fuel cycle technologies such as enrichment and reprocessing. But as our nation seeks to reduce these risks, we must be careful not to diminish America's influence in the international civil nuclear marketplace. America's nuclear industry exports are shrinking, and this is bad for non-proliferation policy.

The U.S. Government must recognize that the U.S. civil nuclear industry is one of its most powerful tools for advancing its nuclear nonproliferation agenda. It is critical to adopt policies that will strengthen that tool. Weakening it will merely cede foreign markets to other suppliers less concerned about nonproliferation than the United States.

Sincerely,



Senator William S. Cohen
 Former Secretary of Defense



Dr. James Schlesinger
 Former Secretary of Energy, Secretary of Defense
 and Director, CIA



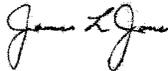
Admiral Michael Mullen
 Former Chairman, Joint Chiefs of Staff



Dr. John Hamre
 Former Deputy Secretary of Defense



General Brent Scowcroft
 Former National Security Adviser



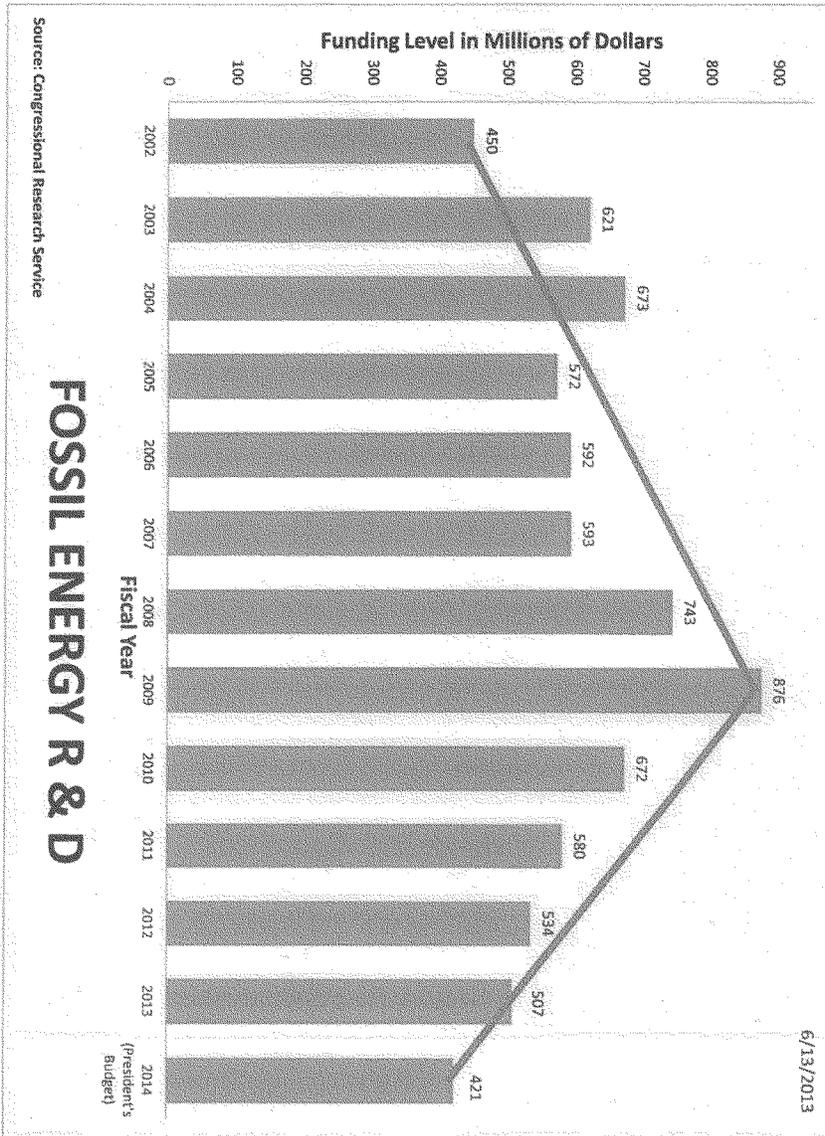
General James Jones
 Former National Security Adviser



Senator Pete Domenici
 Former Chairman Senate Budget
 Committee



Ms. Susan Eisenhower
 Chairman Emeritus, Eisenhower
 Institute



FRED UPTON, MICHIGAN
CHAIRMAN

HENRY A. WAXMAN, CALIFORNIA
RANKING MEMBER

ONE HUNDRED THIRTEENTH CONGRESS
Congress of the United States
House of Representatives
COMMITTEE ON ENERGY AND COMMERCE
2125 RAYBURN HOUSE OFFICE BUILDING
WASHINGTON, DC 20515-6115

Majority (2011 225-292)
Minority (2011 225-364)

July 2, 2013

The Honorable Ernest J. Moniz
Secretary
U.S. Department of Energy
1000 Independence Avenue, S.W.
Washington, D.C. 20460

Dear Secretary Moniz:

Thank you for appearing before the Subcommittee on Energy and Power on Thursday, June 13, 2013, to testify at the hearing entitled "The Fiscal Year 2014 U.S. Department of Energy Budget."

Pursuant to the Rules of the Committee on Energy and Commerce, the hearing record remains open for ten business days to permit Members to submit additional questions for the record, which are attached. The format of your responses to these questions should be as follows: (1) the name of the Member whose question you are addressing, (2) the complete text of the question you are addressing in bold, and (3) your answer to that question in plain text.

Also attached are Member requests made during the hearing. The format of your responses to these requests should follow the same format as your responses to the additional questions for the record.

To facilitate the printing of the hearing record, please respond to these questions and requests by the close of business on Thursday, July 18, 2013. Your responses should be e-mailed to the Legislative Clerk in Word format at Nick.Abraham@mail.house.gov and mailed to Nick Abraham, Legislative Clerk, Committee on Energy and Commerce, 2125 Rayburn House Office Building, Washington, D.C. 20515.

Thank you again for your time and effort preparing and delivering testimony before the Subcommittee.

Sincerely,



Ed Whitfield
Chairman
Subcommittee on Energy and Power

cc: The Honorable Bobby L. Rush, Ranking Member, Subcommittee on Energy and Power

Attachments



Department of Energy
Washington, DC 20585

December 3, 2013

The Honorable Ed Whitfield
Chairman
Subcommittee on Energy and Power
Committee on Energy and Commerce
U. S. House of Representatives
Washington, DC 20515

Dear Mr. Chairman:

On June 13, 2013, Secretary Ernest Moniz testified regarding "The Fiscal Year 2014 U.S. Department of Energy Budget."

Enclosed are the answers to 49 questions that were submitted by Representatives Upton; Barton; Shimkus; Latta; Olson; McKinley; Gardner; Griffith; Engel; and you to complete the hearing record.

If we can be of further assistance, please have your staff contact our Congressional Hearing Coordinator, Lillian Owen, at (202) 586-2031.

Sincerely,

A handwritten signature in cursive script that reads "Christopher E. Davis".

Christopher E. Davis
Principal Deputy Assistant Secretary
for Congressional Affairs
Congressional and Intergovernmental Affairs

Enclosures

cc: The Honorable Bobby L. Rush, Ranking Member



QUESTION FROM CHAIRMAN WHITFIELD

Q1. I understand that the administration has been encouraging agencies to advance their use of Energy Savings Performance Contracts to improve the energy efficiency of Federal buildings and to reduce energy consumption. However, I also understand that only 16 companies can compete for these contracts under the current Indefinite Delivery Indefinite Quality (IDIQ) that was established to provide a stream-lined bidding process for qualified companies. Further, of these 16 qualified companies, less than 8 actively pursue programs within federal space. There are other qualified Energy Service Companies (ESCO) who wish to participate, but they cannot because the IDIQ is closed.

What is DOE doing to ensure that all qualified ESCOs can participate on ESPC projects so that the federal government can utilize energy savings techniques to reduce taxpayer dollars on Federal energy costs?

A1. Qualified ESCOs can participate in performance contracts through a number of different outlets. They include:

- 1) DOE Qualified List – Agencies can enter into ESPCs outside of the IDIQ. These ESPCs are done through an open solicitation and are often referred to as “site specific ESPCs.” In order to enter into an ESPC, a company must be included on the DOE Qualified Contractors List. Companies can submit their qualifications to DOE and, once qualified, are eligible to bid on site specific ESPCs. There are currently approximately 100 companies on this list that are eligible to compete for these projects. The list is available on the Federal Energy Management Program (FEMP) website at http://www1.eere.energy.gov/femp/financing/espes_qualifiedescos.html.
- 2) General Services Administration (GSA) Schedule 84, SIN 246-53 – This GSA vehicle is currently open and accepting applications from ESCOs that are interested in implementing ESPC ENABLE projects that focus on smaller, targeted federal facilities. There are approximately 11 companies that have been awarded SIN 246-53 along with another 8 that have submitted applications.

- 3) Utility Energy Service Contract (UESC) Participating Utilities – The UESC program offers another opportunity where ESCOs can support projects by serving as sub-contractors to a local utility company.
- 4) DOE IDIQ and Huntsville IDIQ – Both DOE and the U.S. Army Corps of Engineers administer IDIQ contracts with a number of companies that implement performance contracts at both civilian and defense facilities. Although those contracts are currently closed, there are sub-contracting opportunities available for other firms interested in participating in these projects.

As part of a request for information (RFI) published in April in the Federal Register, DOE asked for comments on structuring an ESPC IDIQ contract so that new contractors may be added during the life of the contract. DOE will consider these comments regarding opportunities for improvement and ways to enhanced usability and flexibility at the next point at which the IDIQ contract is competed.

QUESTION FROM CHAIRMAN WHITFIELD

Q2: During the President's first term, thousands of pages of new regulations were issued by EPA affecting the production, supply, distribution or use of energy. These rules collectively cost tens of billions of dollars and effectively set national energy policy. Will you commit that under your watch DOE will independently review EPA's proposed rules to assess the impacts on the energy reliability or costs to consumers?

A2: The Department of Energy (DOE) recognizes the significance of regulations affecting the energy sector. In previous years, DOE has engaged in the interagency review process and, where appropriate, conducted analyses of the impacts of proposed rules affecting the energy sector. I intend to continue this practice.

QUESTION FROM CHAIRMAN WHITFIELD

Q3(a): What role do you see DOE taking to ensure federal regulatory policies do not lead to higher electricity prices for businesses and consumers?

A3(a): A regulatory impact analysis that includes an assessment of electricity price impacts is typically conducted for proposed federal regulations that significantly impact the electricity system. The Department of Energy reviews proposed rules through the interagency comment process led by the White House Office of Management and Budget. In addition, the Department of Energy is available to provide technical assistance, where appropriate, to ensure the best possible outcomes for potential rules that impact the energy system.

Q3(b): Would you say this is an urgent issue, given the state of the power sector today?

A3(b): The power sector is currently being affected by several factors, including the availability of inexpensive natural gas. DOE will continue to review potential regulations with respect to their impact on the energy sector, including on energy consumers, through the interagency comment process.

QUESTION FROM CHAIRMAN WHITFIELD

Q4. One of DOE's statutory duties under the DOE Organization Act is to "promote the interest of consumers through the provision of an adequate and reliable supply of energy at the lowest reasonable cost."

Q4(a): As Secretary of Energy, are you concerned about the impact of EPA rules on electricity rates and gas prices for consumers?

A4(a): DOE recognizes the importance of promoting the interests of consumers. DOE reviews proposed rules from other agencies through the interagency comment process. The regulatory impact analyses accompanying such proposals often include an analysis of costs and benefits.

Q4(b): If you have cost concerns, will you raise them with EPA?

A4(b): The Department is currently working with EPA and will continue working with EPA to address any issues that may arise in the implementation of its recent rules and in the promulgation of its future rules. Through this on-going coordination, we will raise such concerns with EPA when appropriate.

QUESTION FROM CHAIRMAN WHITFIELD

Q5(a): What is your understanding of the President' second term climate agenda as it relates to DOE?

A5(a): On June 25, the President gave a speech announcing a comprehensive plan to address climate change. This plan includes a number of federal commitments, some of which involve DOE. Examples of activities in which DOE is involved include spurring investment in advanced fossil energy via loan guarantee authority, instituting a federal Quadrennial Energy Review, developing and deploying advanced transportation technologies, and establishing a new goal for energy efficiency standards, among others. DOE may support other federal activities in relevant areas.

Q5(b): As Energy Secretary, have you been consulted about EPA's planned greenhouse gas regulations for power plants?

A5(b) : Before the Secretary was confirmed, the Environmental Protection Agency began its greenhouse gas rulemaking process for new power plants, and the Department of Energy participated in the interagency review of the proposed rule issued in 2012. The Department of Energy was also engaged in the development of the President's Climate Action Plan, which was released in June of 2013 and called on EPA to develop regulations of greenhouse gases for existing power plants under the Clean Air Act.

Q5(b)(i): What is your understanding of the Administration's plans for regulating greenhouse gas emissions from new or existing power plants?

A5(b)(i): On June 25, the President gave a speech announcing a comprehensive plan to address climate change. Following this speech, the Administration released a Climate Action Plan and a Presidential Memorandum outlining a timeframe for EPA to issue flexible standards for greenhouse gas emissions from new and existing power plants under section 111 of the Clean Air Act. In addition, both potential rules are listed in the recent update to the Unified Agenda published by OMB.

Q5(b)(ii): Should DOE have a significant role in the development of any EPA rules affecting power plants given the impacts such rules would have on national energy policy?

A5(b)(ii): DOE will review proposed rules through the interagency comment process led by the White House Office of Management and Budget. DOE may also provide technical assistance in the development and implementation of such rules, where appropriate.

QUESTION FROM CHAIRMAN WHITFIELD

Q6. Do you believe renewable energy sources such as solar, wind, and geothermal can completely replace traditional sources of energy like coal, nuclear, and hydropower? If so, would such a transition come with an increase in energy prices?

- A6. The Department of Energy (DOE) supports the President's all-of-the-above energy strategy. President Obama's goal is to generate 80 percent of our electricity from a diverse set of clean energy sources – including renewable energy sources like wind, solar, biomass, and hydropower; nuclear power; efficient natural gas; and clean coal - by 2035. The Office of Energy Efficiency and Renewable Energy has established goals for its technology development programs to make renewable electricity market competitive without subsidies.

QUESTION FROM CHAIRMAN WHITFIELD

Q7. Under your leadership, will DOE facilitate the continued use of coal as part of your national energy plan? If so, how?

A7. Today, coal accounts for about 20% of the total energy consumption in the United States, and fuels about 40% of our electricity generation. Although no new coal fired power plants are being proposed in the U.S., coal will continue to be an important part of our energy strategy.

The coal power industry has a history of responding to environmental challenges. Sulfur dioxide, particulate matter, and nitrogen oxide emissions from coal fired power plants have all declined over the past 30 years, while total coal consumption and electricity generation have increased. This trend was driven by strict environmental regulations and new emissions control technologies to reduce pollution.

The development of carbon capture and storage is continuing this trend, and will allow coal to generate electricity with a corresponding decrease in carbon dioxide emissions. We see coal as a key component of our energy strategy now and into the future.

QUESTION FROM CHAIRMAN WHITFIELD

Q8. In addition to CCS technologies, what is your position on advanced coal combustion technologies, such as ultra-supercritical coal combustion and advanced ultra-supercritical coal combustion technologies? Will DOE be supporting these types of highly efficient, low-emitting technologies in addition to CCS? If so, how?

A8. Advanced ultra-supercritical steam cycles are anticipated to be more efficient, exhibit improved environmental performance compared with today's conventional plants using less advanced steam conditions, and may reduce the cost of CCS due to their increased efficiency. The Office of Fossil Energy is supporting materials research and development for operation at steam pressures up to 5,500 pounds per square inch, and temperatures approaching 1,400 Fahrenheit, as well as support for steam turbine materials that can operate in this range of steam conditions. We are partnered with several U.S. technology suppliers in these activities.

QUESTION FROM CHAIRMAN WHITFIELD

Q9. During your confirmation hearing, you indicated support for additional research into beneficial uses for CO₂, rather than just sequestration. The President's budget requests approximately \$276 million for carbon capture and storage research. If Congress provides this funding, how much do you intend to allocate for research into beneficial uses of CO₂?

A9. The FY2014 budget requests \$500,000 for beneficial uses of CO₂, such as conversion to chemicals, plastics, building materials, and curing for cement. While these technologies show potential, they are in the early stages of development and must be proven in laboratory-scale tests before potentially transitioning to larger scales. While beneficial use of CO₂ presents options for commercialization of carbon capture technologies, the scale of emissions reductions necessary to address climate change necessitate that the focus of carbon storage research and development remain on large geologic reservoirs.

QUESTION FROM CHAIRMAN WHITFIELD

Q10. The budget for the Office of Energy Efficiency and Renewable Energy (EERE) is almost double the budgets for the Offices of Nuclear, Fossil Energy, and Electricity combined.

- a) Wouldn't you agree that the Offices of Nuclear Energy, Fossil Energy, and Electricity have critical roles to play in shaping future U.S. energy policy?

The Department's Offices of Nuclear Energy, Fossil Energy, and Electricity Delivery and Energy Reliability have vital roles to play in shaping future U.S. energy policy. Funding for these offices is requested to support critical investments to advance technologies related to the reliable, efficient, affordable, and environmentally sound use of fossil fuels, the safety and reliability of new and existing nuclear reactors, and a secure and dependable electric grid to deliver an increasingly diverse energy mix.

- b) The EERE budget request is a 55.9% increase from the FY 2013 EERE budget request. How does this reflect the President's "all-of-the-above" energy strategy?

The requested increase for the Office of Energy Efficiency and Renewable Energy (EERE) supports the President's aggressive goals of reducing the energy intensity of American industry, enhancing energy security and reliability by reducing net oil imports by half by 2020, and doubling electricity generation from renewable sources by 2020. EERE funding provides critical investments in sustainable transportation, renewable energy generation, and energy efficiency to innovate our way to a clean energy future and provide consumers with choices to reduce energy costs and save energy. Through this budget, EERE is positioned to achieve these goals by developing and accelerating the adoption of a new generation of energy technologies that are clean, safe, efficient, and cost effective. EERE supports high-impact applied research, development, demonstration, and deployment (RDD&D) in the fields of sustainable transportation, renewable electricity, and energy efficiency in homes, buildings, and factories. EERE funds RDD&D at some of America's most innovative businesses and research institutions

with the explicit goal of making clean energy technologies directly cost-competitive, without subsidies, with the energy technologies we use today.

- c) Under your leadership, how do you plan to ensure that future budgets do a better job of allocating funds to the various offices more equitably, rather than concentrating the vast majority of taxpayer dollars within the Office of EERE?

The Department's applied energy budget request is formulated to provide the greatest impact in targeted areas of the energy sector. The fiscal year 2014 request supports an energy strategy that will enhance economic growth, create jobs through American innovation, save consumers money by cutting energy costs to families and business, enhance energy security by reducing the nation's dependence on oil, and promote health and safety by mitigating the impact of energy production on air quality and our climate. The request supports an all-of-the-above approach to develop every source of American energy in safe and responsible way.

QUESTION FROM CHAIRMAN WHITFIELD

Q11. Before an LNG export terminal is permitted to trade with a non-free trade country, DOE must certify that the exports are in the public interest. Section 3A of the Natural Gas Act creates a rebuttable presumption that a proposed export project is in the public interest. In other words, DOE must grant the application unless interveners show that the project is not consistent with the public interest.

a. Who within DOE will be making the final decision on the pending LNG export projects?

A11a. Section 3(a) of the Natural Gas Act states that “[N]o person shall export any natural gas from the United States to a foreign country or import any natural gas from a foreign country without first having secured an order of the [Secretary of Energy] authorizing it to do so.” (15 U.S.C. § 717b). The Secretary’s authority was established by the Department of Energy Organization Act, 42 U.S.C. § 7172, which transferred jurisdiction over import and export authorizations from the Federal Power Commission to the Secretary of Energy. This authority is delegated to the Assistant Secretary for Fossil Energy pursuant to Redelegation Order No. 00-002.04E (Apr. 29, 2011). The Secretary will ultimately make the final decision on the pending LNG export applications.

b. Acting Assistant Secretary of Fossil Energy, Christopher Smith, testified before Congress on the wide range of public interest criteria considered by DOE. Please share with the Committee the guidance document that DOE is currently using to conduct the public interest analysis. We are interested in the document describing DOE policy regarding “criteria weighting.”

A11b. A wide range of criteria are considered as part of DOE’s public interest review process. DOE identifies the criteria considered as part of DOE’s public interest review process in each Federal Register Notice of Application. Each order includes a discussion of the public interest criteria considered by the Department. These criteria are not statutory but rather have been developed over several decades and supplemented and

refined by subsequent agency adjudication. It is important to emphasize, however, that these criteria are not exclusive. Other issues raised by commenters and/or interveners or DOE that are relevant to a proceeding may be considered as well. DOE does not have a document describing “criteria weighting”.

c. Are there any plans to codify the guidance?

A11c. DOE identifies the criteria considered as part of DOE’s public interest review process in the orders addressing applications to export LNG to non-free trade agreement countries. These criteria are not exclusive, since other issues raised by commenters and/or interveners or DOE that are relevant to a particular proceeding may be considered as well. There are no plans to codify the criteria employed in reviewing these applications.

d. How will one decision -- either a rejection or approval of a project -- impact the review process for subsequent applications?

A11d. DOE reviews each application to export LNG to non-free trade agreement countries on a case-by-case basis on its own merits. As part of that review, DOE/FE assesses the cumulative impacts of each succeeding request for export authorization on the public interest, with due regard to the effect on domestic natural gas supply and demand fundamentals. Therefore, the approval of any single export application is considered, collectively, in the review process for subsequent applications.

QUESTION FROM CHAIRMAN WHITFIELD

Q12. This budget raises questions about the Administration's energy priorities.

- a) Please justify requesting 15 times more on batteries and electric cars (\$575M) than on cybersecurity for the electric grid (\$38M).

The transportation sector accounts for two-thirds of U.S. petroleum use, with on-road vehicles responsible for 80% of that amount. We continue to send nearly \$1 billion a day overseas to satisfy our demand for oil. The requested funding for the Office of Energy Efficiency and Renewable Energy's Vehicle Technologies Program supports critical investments in advanced transportation technologies that reduce petroleum consumption and greenhouse gas emissions, while meeting or exceeding vehicle performance and cost expectations. These technologies include cost-effective batteries, higher performance electric drive systems, advanced combustion engines, superior fuels and lubricants, and lightweight materials. Research into these areas will improve the nation's energy security and strengthen our economic competitiveness in the global clean energy race.

The Office of Electricity Delivery and Energy Reliability's Cyber Security for Energy Delivery Systems program is also a critical to the United States' energy future. The request for fiscal year 2014 supports expanded efforts to improve cybersecurity technologies and capabilities for control systems used in critical energy infrastructure, improve situational awareness, and develop operational capabilities in the energy sector. Innovative solutions in these areas will maintain a reliable and resilient energy infrastructure, which is vital to our nation's economy, human health and safety, and national security.

- b) Please justify requesting 9 times more on wind energy (\$144M) than on energy infrastructure security and restoration (\$16M).

Wind power has tremendous potential as a domestic U.S. energy resource that can contribute to a diverse, clean, inexhaustible U.S. energy portfolio. There are 90 quads of U.S. land-based wind

potential and 50 quads of U.S. offshore wind potential, which, when combined, represent the potential for more than 10 times the total current U.S. delivered electricity consumption. The Office of Energy Efficiency and Renewable Energy's Wind Energy Program supports investments that will tap into this potential and increase efficiency of the wind power sector. The program invests in high-risk, transformative technology innovations that industry does not address, provides a national testing platform, drives improvements in permitting, and generates methodologies and data to address market barriers and grid integration.

The Office of Electricity Delivery and Energy Reliability's Infrastructure Security and Energy Restoration Program is another critical piece of the overall energy strategy to ensure a clean and reliable energy future for the nation. The requested funding for fiscal year 2014 supports vital work in the areas of emergency preparedness and response; physical and cyber system assurance; and data analysis and situational awareness. In recognition of the demands on the nation's energy infrastructure precipitated by Hurricane Sandy and other disasters, the Department is also requesting funding for an Operational Energy and Resilience program to provide continuous monitoring of the status of the nation's critical energy infrastructure and a robust, state-of-the-art ability to assess, visualize and synthesize data to support a more focused, regionally-based rapid response to threats and hazards.

- c) Please justify requesting 17 times more on building efficiency (\$300M) than on developing new natural gas technologies (\$17M).

In the United States, homes and commercial buildings consume 40% of the nation's total energy, with an annual bill of more than \$400 billion. This translates into more than 70% of the electrical energy consumed in the U.S. These energy bills can be cost-effectively reduced by 20-50% or more through energy efficient technologies and techniques. The Office of Energy Efficiency and

Renewable Energy's Building Technologies Program supports technologies, systems, and practices that will foster economic prosperity, lower greenhouse gas emissions, and save American families and business money. The budget request for fiscal year 2014 supports the long-term goal of reducing building-related energy use by 50% by 2030.

The Office of Fossil Energy's Natural Gas Technologies program will focus research and development to understand and minimize the potential environmental, health, and safety impacts of shale gas development. Through an interagency research effort with the Environmental Protection Agency and the Department of Interior's U.S. Geological Survey, the Department seeks to bring its technical expertise to ensure that hydraulic fracturing for natural gas development is conducted in a manner that is environmentally sound and protective of human health and safety. The program also intends to conduct laboratory and/or field-based research focused on increasing public understanding of methane hydrates in gas-hydrate-bearing areas.

- d) The DOE budget priorities do not seem to be aligned with current and future U.S. energy needs and opportunities. Under your leadership, how do you plan to ensure that future budgets are better aligned with the nation's energy needs and priorities?

As stated earlier, the Department's applied energy budget request is formulated to provide the greatest impact in targeted areas of the energy sector. The request continues to support an all-of-the-above approach to develop every source of American energy in safe and responsible way.

QUESTION FROM REPRESENTATIVE UPTON

Q1. The increase in domestic gas production and unconventional oil promises to transform America's energy future from one of perceived scarcity to one of abundance. What do you see as DOE's role in ensuring this future comes to pass?

- a. What role do you see for DOE in finding new and more efficient ways to produce fossil energy -oil, gas, coal -and to use it for the benefit of American prosperity over the next 50 years?

A1a. DOE will continue to focus its efforts and that of its National Laboratories on assessing and mitigating risk, and improving environmental sustainability and safety through the development of key technologies for oil and gas exploration and production activities.

Q1b. You testified about shifting America's cars and trucks off oil entirely. How do you reconcile this effort with ensuring the United States takes advantage of its abundant energy resources? Do you see the U.S. turning away from some of its resources?

A1b. DOE supports the President's all-of-the-above energy strategy, including his focus on continuing to expand responsible oil and gas development, increasing the fuel economy of the vehicles we drive which will save families money at the pump, supporting renewable energy sources, and investing in infrastructure and research and development, all of which play a central role in increasing our nation's energy security. As the renewable and alternative fuels and energy efficiency measures and technologies are deployed at costs comparable to current end uses of traditional fuels, especially in the transportation sector, the balance of energy consumption will shift away from oil. This shift will provide both economic and energy security benefits to the nation, and traditional domestic energy resources will continue to play an important role in both these outcomes.

Q1c. What future do you see for coal in this nation, and what do you believe DOE's role should be to enhance this abundant resource?

A1c. DOE's role in clean coal research and development is to advance technologies related to the reliable, efficient, affordable, and environmentally sound use of fossil fuels. To this end, our research and development is primarily focused on carbon capture and storage, a technology that can permanently reduce carbon dioxide emissions from utility and industrial processes which generate carbon dioxide, through the use of fossil fuels including coal.

QUESTION FROM REPRESENTATIVE UPTON

- Q2. The U.S. is currently the world's largest producer of natural gas and has a chance to surpass Saudi Arabia as the world's largest oil producer by 2020. Under your leadership, how will DOE facilitate this energy transition and take full advantage of the nation's new energy abundance?**
- A2. The transition will be made more efficient through the efforts DOE is making to assess and mitigate risk, and develop technology for increased safety and environmental sustainability.**

QUESTION FROM REPRESENTATIVE UPTON

- Q3. You note in your testimony that you are reviewing DOE organization and management practices to develop options to improve how the Department performs its missions.
- a. Would you briefly elaborate on potential changes that may improve how the Department tackles its most pressing management challenges, such as environmental cleanup?
 - b. Would you work with this Committee as you undergo this effort? And will you commit to DOE appearing before the Committee in the near future to outline in more detail your management changes?

A3a-3b. The reorganization consolidates the primary mission and operational support functions of the Department within the office of the Under Secretary for Management and Performance, and also includes the Office of Environmental Management and Office of Legacy Management as part of its structure and functions. The purpose of this consolidation is to elevate the Department's focus on and attention to these important functions. This office will have full-time oversight of the operational functions of the following offices:

- Office of Management and Administration (MA)
- Office of the Chief Human Capital Officer (HC)
- Office of the Chief Information Officer (CIO)¹
- Office of Economic Impact and Diversity (ED)
- Office of Hearings and Appeals (OHA)
- Office of Environmental Management (EM)
- Office of Legacy Management (LM)

Moving the Office of Environmental Management under the purview of the Under Secretary for Management and Performance brings the Department's strongest project management capabilities, resident within the Office of Acquisition and Project Management, directly to bear on one of the Department's most vexing yet

¹ The CHCO and CIO would continue to have direct access to the Secretary so that they can provide broad policy advice and other functions, as specified by statute or regulation.

vital challenges: cleaning up nuclear waste that is a legacy byproduct of the Cold War. These DOE sites include Hanford, WA, Savannah River, SC, and Paducah, KY.

This reorganization will enable the new Under Secretary for Management and Performance to utilize a more concentrated level of resources and to apply better managerial discipline to address project management issues in this critical area. Reforms initiated over the past several years have begun to bear fruit. The GAO has narrowed the scope of its high-risk designation for DOE's contract administration and project management to major capital asset projects — those costing more than \$750 million. Efforts are now under way to address the serious challenges confronting several major construction projects. In addition, the Secretary has approved the formation of a new working group, representing offices across the Department, including NNSA, to continue on efforts to improve performance in this area.

In addition, transferring the Offices of Environmental Management and Legacy Management from the Undersecretary for Nuclear Security will allow this undersecretary to focus exclusively on NNSA's forward-looking missions — including stewardship of our nation's nuclear stockpile and advancing the President's nuclear security agenda — while entrusting the Environmental Management mission to an organization devoted to solving management challenges.

These organizational changes will enhance the Department's ability to carry out its responsibilities to the President and to the Congress, while improving our financial

stewardship at a time of tight fiscal constraints. Reducing the cost of doing business within the Department will enable us to allocate more resources toward our mission objectives in national security, science, clean energy, and environmental stewardship.

QUESTION FROM REPRESENTATIVE UPTON

Q4: How do you plan to improve integration of energy and science programs, as you reference in you testimony?

A4: I believe that it is important to integrate our energy and science programs in order to move quickly from basic science, to applied research, to technology demonstration. The Department has made important strides to foster communication and collaboration between its science and energy programs during the past few years—the Energy Innovation Hubs program, which pulls together senior managers from across the Department, is just one example. However, I believe that we can do more organizationally to advance this process, and I am considering ways to more closely integrate the management of science and energy programs to improve the dexterity and effectiveness of the innovation process.

QUESTION FROM REPRESENTATIVE UPTON

Q5. How do you plan to address safety and security challenges across the DOE complex?

A5. Safety and security are my top priorities and I have made this clear to our DOE Federal and contractor managers. It is imperative that the entire DOE community understand that safety and security are integral to the mission of DOE and that it is our responsibility to our people and to the communities that surround our facilities to maintain the highest standards of excellence in these areas. The Department will continue to seek ways to strengthen our safety and security performance and clarify lines of authority, particularly in managing our security responsibilities.

QUESTION FROM REPRESENTATIVE UPTON

Q6. You note that you will work with the Administration to produce a Quadrennial Energy Review. My understanding is this review is modeled on the Defense Department's legislatively-mandated Quadrennial Defense Review, which sets a long-term course for DOD as it assesses the threats and challenges the nation faces.

a. Why is this review critical to DOE's mission?

A6a. The mission of the Energy Department is to ensure America's security and prosperity by addressing its energy, environmental and nuclear challenges through transformative science and technology solutions. Innovation and new sources of domestic energy supply are transforming the nation's energy marketplace, creating economic opportunities at the same time they raise environmental challenges. To ensure that federal energy policy meets our economic, environmental, and security goals in this changing landscape, the Administration will conduct a Quadrennial Energy Review which will be led by the White House Domestic Policy Council and Office of Science and Technology Policy, supported by a Secretariat established at the Department of Energy, and involving the robust engagement of federal agencies and outside stakeholders. This first-ever review will focus on infrastructure challenges, and will identify the threats, risks, and opportunities for U.S. energy and climate security, enabling the federal government to translate policy goals into a set of analytically based, clearly articulated, sequenced and integrated actions, and proposed investments over a four-year planning horizon.

b. To the extent the defense review is guided by the fundamental policy of providing for the common defense of Americans, do you see the purpose of the energy review as providing for American prosperity and energy security?

A6b. American prosperity and energy and environmental security are at the core of the Department's missions and are a fundamental concern of the QER.

c. What is the time frame?

A6c. The Department should know more about the time frame in the coming months.

d. Will you work with this Committee to ensure this review is focuses appropriately?

A6d. The Committee is welcome to contribute comments on and during the review and will be briefed when appropriate.

QUESTION FROM REPRESENTATIVE UPTON

- Q7. Part of DOE's core mission involves defense programs and national security, but those programs should be performed within the overall framework of civilian control and development of nuclear technology, under the Atomic Energy Act.
- a. There has been pressure over the past few years to place DOE's NNSA programs within the Department of Defense, separate them as an independent agency, or otherwise silo them from DOE's core mission. How do you ensure that defense programs and other important security missions are performed within the framework of DOE's broad mission?
 - b. What can you do to increase the translation of important physics and other national weapons research to civilian benefit?
- A7. The legislative history of the 1946 Atomic Energy Act reveals that a prominent theme of the organizational placement of the program was that the science was not segregable into solely military, naval, or civil pursuits. The multidisciplinary range reflected in the Department's suite of National Laboratories - - including the three weapons laboratories - - reflects this reality.

The Department's capabilities formed in order to meet atomic energy defense missions have aided many civil pursuits. Beginning in the mid-1980s, the Department's extensive supercomputing capacity, developed for the weapons program, prompted Congress to fund the Department as the early lead in the Human Genome Project which ultimately led to the mapping of the complex human genome sequence. Commercial civil developments prompted or aided by the capacities and expertise of the weapons laboratories include chip-scale atomic clocks (to enhance GPS performance), radiation detection from fast-moving vehicles, simple hand-held biohazard detectors, and small and disposable forensic explosive detectors.

In addition, one of the weapons laboratories has developed, with EPA, open-source software for prompt detection of drinking water contamination that is used by several large utilities, and has developed with the University of New Mexico a promising enhanced-efficiency membrane for use in reverse-osmosis water desalinization.

The Department employs several tools to apply the results of scientific research devoted initially to “weapons research” to society at large. These include direct appropriations where the capabilities of the weapons research laboratories are directed to civil projects. The statutory recognition of technology transfer as a Departmental mission under the National Competitiveness Technology Transfer Act of 1989 (granting National Laboratory directors significant authority to retain and license intellectual property), complemented by DOE IP policies, are tools designed to provide necessary incentives and partnership opportunities that encourage commercial application of the fruits of the scientific and technical research of the DOE National Laboratories, including the weapons laboratories.

QUESTION FROM REPRESENTATIVE UPTON

Q8. How do you, as Energy Secretary, most effectively manage the diverse missions of the Department in a way that protects taxpayer funds and ensures safety and security across the complex?

A8. To manage effectively we must set clear mission goals; establish unambiguous requirements and expectations for cost controls and safety/security performance; closely monitor performance; and hold our managers and contractors accountable for delivering mission outcomes in a safe and secure manner across the complex. While the missions of the Department are diverse, the principles of effective management can and should be applied to all.

QUESTION FROM REPRESENTATIVE UPTON

- Q9. Over the past year, there have been serious security shortcomings identified at the National Nuclear Security Administration (NNSA) and DOE, underscored by the breakdown at the Y-12 site in Tennessee.
- a. Would you elaborate on what you think is necessary to restore accountability and strong oversight of the nation's nuclear weapons facilities?
 - b. What is necessary to ensure the national weapons labs operate with a consistent safety and security culture?
- A9. The several reviews conducted by or for the Department in the aftermath of the Y-12 incident (Inspector General review, the General Finan review, the report by the Department's Independent Oversight office, and the assessments of the "Three Wise Men") collectively provide a thorough analysis of the security and management deficiencies of the Department and the beginnings of a roadmap for actions by DOE. While the Department continues to consider aspects of its approach to strengthening security, our approach unquestionably includes clarifying and simplifying lines of authority and accountability. It also includes strengthening and improving our line management oversight and contractor assurance processes for nuclear security, and ensuring rigorous and comprehensive Departmental Independent Oversight of nuclear security and other high consequence activities, such as nuclear safety.

The Department places a high priority on the strength of the safety culture and security culture at all DOE sites, and within our federal workforce. We formally emphasize the importance of culture in the Department's nuclear safety and integrated safety management policies. We have undertaken a systematic approach to assess our organizational culture, with primary emphasis on nuclear safety culture, across the Department, utilizing a framework endorsed by the Nuclear Regulatory Commission.

We have taken steps to further increase knowledge and awareness of this topic throughout the workforce, including providing tailored training to federal and contractor managers. This initiative will require sustained effort over a long period of time, and our goal is to fully realize a safety and security culture such that the organizational values and behaviors modeled by our leaders, and internalized by our workforce, serve to make safe and secure performance of work the overriding priority. Further, we seek to consistently demonstrate an environment in which employees are encouraged and are willing to raise safety and security concerns to their own management and to DOE without fear of retaliation.

QUESTION FROM REPRESENTATIVE BARTON

By passing Section 999 of the Energy Policy Act of 2005 (EPAAct), Congress directed the U.S. Department of Energy (DOE) to support a program to improve domestic energy production, protect the environment and increase U.S. jobs. The program has established a successful track record of public, private and academic cooperation-with oversight from the National Energy Technology Laboratory (NETL) and a Federal Advisory Committee. Since 2006, the EPAAct Section 999 program has been managed by the Research Partnership to Secure Energy for America (RPSEA) -- a consortium of over 160 organizations of leading researchers and experts in industry and academia.

Q1. Please describe how the Section 999 program has worked as intended to improve technology and environmental safeguards related to energy production.

A1. The program has facilitated public-private research partnership that has developed technologies and best practices for oil spill prevention offshore and environmental protection onshore.

QUESTION FROM REPRESENTATIVE BARTON

Q2. Which areas of program administration do you believe need improvement?

A2. The President's Budget has consistently proposed repeal of Section 999 of the Energy policy Act of 2005 since FY2007. The FY2014 Annual Plan will detail remaining program activities prior to the statutory sunset of program authorities.

QUESTION FROM REPRESENTATIVE BARTON

Q3. Program participants have expressed concerns that DOE has failed to award Section 999 program funding in a timely manner. I understand these delays have resulted in lost opportunities for much needed field testing and R&D projects.

a. Please describe the role DOE Office of Fossil Energy will play in implementing Sec. 999.

A3a. The Secretary of Energy has ultimate responsibility for, and oversight of, all aspects of the program. DOE is responsible for planning the annual solicitations, managing the Program Consortium, RPSEA, and two Federal Advisory Committees and all their meetings, approval of all solicitations and selections, and evaluating the quality of technology transfer efforts. Currently, all DOE actions are up to date, and no actions are pending. The President's Budget has consistently proposed repeal of Section 999 of the Energy policy Act of 2005 since FY2007. The FY2014 Annual Plan will detail remaining program activities prior to the statutory sunset of program authorities.

b. What administrative changes will you make to improve implementation of Sec. 999 and ensure timely decision-making?

A3b. An important administrative change is having NETL provide more hands on support for RPSEA in their execution of the government procurement regulations and contract negotiation. This change has already been implemented. On three occasions during 2012, NETL sent a team to Houston to assist RPSEA with their backlog of awards. The President's Budget has consistently proposed repeal of Section 999 of the Energy policy Act of 2005 since FY2007. The FY2014 Annual Plan will detail remaining program activities prior to the statutory sunset of program authorities.

QUESTION FROM REPRESENTATIVE SHIMKUS

1. A New York Times article earlier this year relating to power shortages in New England noted the importance to the region of being able to import power from the Indian Point nuclear facility, quoting one individual as saying: "Without Indian Point, New England would have been toast.
 - Q1(a): This situation in New England was due to an overdependence on gas. Would you agree this reflects why it is important to have fuel diversity?
 - A1(a): The New England situation illustrates the importance of developing and implementing regional-scale plans to ensure the adequacy, diversity and flexibility of the region's generation supplies.
 - Q1(b): In your view, do nuclear facilities play a critical role in ensuring the reliability of the grid?
 - A1(b): In general, yes. Local conditions will be important, however, with the result that some nuclear facilities are likely to be more important for regional reliability than others. In fact, the siting and operation of all types of generation is important for reliability at both the local and regional levels.
 - Q1(c): Do you agree that if our country wants to continue to have affordable, reliable electricity, federal policies should support fuel diversity?
 - A1(c): Fuel Diversity is important to address several issues, including reliability and affordability. However, regulators have to find an appropriate balance between these objectives and costs to consumers.

QUESTION FROM REPRESENTATIVE SHIMKUS

- Q2. In your testimony, you refer to doubling the use of renewable electricity generation by 2020. Do you have any goals for the growth of nuclear energy?
- A2. I am committed to maintaining nuclear energy as part of the President's "all-of-the-above" strategy. Nuclear power currently provides 20 percent of our electricity generation and over 60 percent of our carbon emission free electricity. I believe work in areas such as small modular reactors, modeling and simulation, accident tolerant fuels, nuclear loan guarantees, and potential solutions to the back-end of the fuel cycle will help ensure nuclear power continues to be part of the nation's energy mix.

QUESTION FROM REPRESENTATIVE SHIMKUS

- Q3. DOE's core mission derives from the Atomic Energy Act of 1954, in which Congress established the policy of promoting the civilian development and control of nuclear energy towards "promot[ing] world peace, improv[ing] human welfare, increas[ing] the standard of living, and strengthen[ing] free competition in private enterprise, and promoting world peace."
- a. Do you see this as an important element of DOE's current mission?
 - b. If so, what will you do to invigorate this mission at the agency?
- A3. Yes, I do see the work on civil nuclear energy as an important part of DOE's mission. The President's FY 2014 Budget requests \$735.46 M for the Office of Nuclear Energy. As mentioned above, I believe efforts in areas such as SMRs, fuel cycle R&D, and modeling and simulation all contribute to that important mission.

QUESTION FROM REPRESENTATIVE SHIMKUS

- Q4. Federally sponsored research at Argonne labs tells us that vehicle components on Flex Fuel Vehicles (FFVs) and Gasoline vehicles are mostly identical. So based on DOE funded scientific reports, most every vehicle on the road today can already use or could be converted to E85 with the advancement of EPA certified technologies.

However, DOE's Clean Cities sponsors a program that discourages converting existing vehicles even with EPA certified technology claiming that ethanol is bad for vehicles, fuel is too expensive, and conversion cannot be done economically. DOE claims most every fuel line and engine component must be modified while EPA has concluded these changes are not needed.

- a. We have been working on legislation for blender pumps and making higher concentrations of ethanol available e.g., E15, E20, E30 in support of the Energy Independence Act. What does your own research show regarding ethanol compatibility with vehicles on the road today? What is the material compatibility issue you have found with modern vehicles?
- A4a. DOE promotes the development and use of alternative fuels, including ethanol, which can reduce U.S. dependence on petroleum in the transportation sector. Recent DOE research on ethanol blends focused on determining the effects of E15 and E20 (15% and 20% ethanol, respectively) on vehicle systems.² This research included some materials compatibility testing but was not intended to be a comprehensive evaluation of all ethanol blends with all vehicles in all driving conditions. The results did not identify significant issues with E15, and ultimately were instrumental in forming the basis for the EPA decision that allows the sale of E15 for vehicles model year 2001 and newer.

² Oak Ridge National Laboratory. "Compatibility Study for Plastic, Elastometric, and Metallic Fueling Infrastructure Materials Exposed to Aggressive Formulations of Ethanol-blended Gasoline." (May 2012), <http://info.ornl.gov/sites/publications/files/Pub35074.pdf>.

However, the results did indicate a range of sensitivity to increased levels of ethanol. Though fuel lines are generally alcohol-tolerant in modern vehicles, there are other components that require upgrading for use with E85 in flexible fuel vehicles (FFVs). These components include injectors and fuel pumps, valves and valve seats, and, sometimes, piston rings.⁵

⁵ The Department commissioned an engineering analysis (from ASG Renaissance) in 2008 to estimate the incremental cost of making FFVs (relative to conventional vehicles). A large part of the incremental cost is due to the use of special materials. http://www.transportation.aol.gov/pdfs/AF_914.PDF

QUESTION FROM REPRESENTATIVE SHIMKUS

Q5. I'm troubled with the widely held misconception that our nation's vehicles would be damaged by the use of any ethanol because of the belief that fuel lines and gaskets on FFVs are somehow special and different from gasoline vehicles. I'm not aware of any example where ethanol has created corrosion problems in modern vehicles since the introduction of E10 and E85.

a. What material compatibility issues has DOE found on vehicles produced since the introduction of E10 and OBDII?

A5a. Automobile manufacturers adapted their vehicle production to be compatible with E10 when it was introduced in the late 1970s. As such, virtually all vehicles on the road today are compatible with ethanol blends up to E10. OBDII was introduced with the adoption of the Tier II emissions standards for light-duty vehicles in the 2004 model year. All vehicles equipped with OBDII are compatible with E10.

It is important to note, however, that there are sensitivities to higher ethanol levels. An extensive DOE study examining the sensitivity of legacy vehicles to mid-level ethanol blends did not identify significant issues with E15, and ultimately was instrumental in forming the basis for the EPA decision that allows the sale of E15 for vehicles in model year 2001 and newer. For higher-level blends, although fuel lines are generally alcohol-tolerant in modern vehicles, there are other components that may require upgrading, depending on the blend level. These components include injectors and fuel pumps, valves and valve seats, and, sometimes, piston rings.⁴

⁴ The Department commissioned an engineering analysis (from ASG Renaissance) in 2008 to estimate the incremental cost of making FFVs (relative to conventional vehicles). A large part of the incremental cost is due to the use of special materials. <http://www.transportation.nl.gov/pdfs/AF/914.PDF>

- b. Have you identified any specific parts on popular vehicles or any vehicles produced on the last 15 years that are not compatible with gasoline blended with ethanol. If so, how many of these vehicles are on the road today?
- A5b. The materials that manufacturers use for specific parts vary widely by manufacturer and frequently change. Automobile manufacturers adapted their vehicle production to be compatible with E10 when it was introduced in the late 1970s. As a result, virtually all vehicles on the road today are compatible with ethanol blends up to E10. Higher blends, such as E85, do require some modifications. Flexible fuel vehicles (FFVs)—those built specifically to use blends of up to E85—have upgraded metal and gasket materials to avoid corrosion and other issues associated with higher ethanol levels.⁵ Though fuel lines are generally alcohol-tolerant in modern vehicles, there are other components that require upgrading for use in FFVs. These components include injectors and fuel pumps, valves and valve seats, and, sometimes, piston rings.

According to the Energy Information Administration, there are more than 8 million FFVs on the road today.⁶

⁵ The Department commissioned an engineering analysis (from ASG Renaissance) in 2008 to estimate the incremental cost of making FFVs (relative to conventional vehicles). A large part of the incremental cost is due to the use of special materials. <http://www.transportation.aal.gov/pdfs/AF-914.PDF>

⁶ <http://www.eia.gov/tools/faqs/faq.cfm?id=93&t=4>

QUESTION FROM REPRESENTATIVE SHIMKUS

Q6. Is DOE aware of any car manufacturers using fuel line materials that are compatible with E10 but not compatible with higher concentrations of ethanol? If so, has there been any scientific research done to confirm your findings?

A6. DOE is not aware of vehicle manufacturers using fuel line materials that are compatible with E10 but incompatible with higher concentrations of ethanol. Fuel lines in modern vehicles are essentially all alcohol-tolerant. There are other components, however, that must be upgraded for use in flexible fuel vehicles (FFVs) that use higher concentrations of ethanol (E85). These components include injectors and fuel pumps, valves and valve seats, and, sometimes, piston rings. Manufacturers consider specific material formulations proprietary, and as such, the Department does not have specific information about the materials that individual manufacturers use, although it is known that these materials vary widely and frequently change.

QUESTION FROM REPRESENTATIVE SHIMKUS

- Q7. DOE publishes guidance and tools for consumer and fleet managers on E85 fuel economy and other fuels. The guidance would lead consumers to believe that using E85 will only result in more cost to them as the guidance unfairly punishes ethanol. For example, a “28% loss in fuel economy”. Does DOE have any support for this guidance with consumer fuels?
- A7. To accelerate deployment of alternative fuel vehicles (AFVs), the Department provides technical and scientific information related to all alternative fuels recognized by the Energy Policy Act of 1992, including E85. The Department provides this information to fleets, businesses, and the general public through its on-line Alternative Fuels Data Center (AFDC)⁷ and Transportation Energy Data Book, as well as FuelEconomy.gov (a joint effort with EPA).⁸

The energy content of E85 is 81,600 Btu/gallon, compared to 115,400 Btu/gallon for conventional gasoline (approximately 29% less than gasoline).⁹ This difference in energy content results in a similar reduction in fuel economy when comparing flexible fuel vehicles using E85 and conventional vehicles using gasoline.

⁷ Alternative Fuels Data Center fuels page: <http://www.afdc.energy.gov/fuels/>

⁸ FuelEconomy.gov find-and-compare feature for E85 vehicles:
<http://www.fueleconomy.gov/feg/PowerSearch.do?action=alts&path=3&year=2013&vtype=E85&srctype=yearAfv&rowLimit=10&pageno=1>

⁹ Transportation Energy Data Book: <http://cta.ornl.gov/data/download31.shtml>

QUESTION FROM REPRESENTATIVE SHIMKUS

- Q8. EPA has certified Compressed Natural Gas (CNG) and E85 conversion technologies yet DOE consumer awareness programs only support and promote CNG conversion technology.
- a. What is the basis for this policy?
- A8a. To accelerate deployment of alternative fuel vehicles (AFVs), DOE provides technical information related to all alternative fuels recognized by the Energy Policy Act of 1992. This includes information related to converting vehicles to operate on natural gas, propane, electricity and ethanol. DOE provides this information to fleets, businesses, and the general public through its on-line Alternative Fuels Data Center (AFDC).¹⁰

In addition, DOE collaborates with EPA to exchange information related to vehicle conversion technologies and systems that have been tested and certified as compliant with EPA emissions regulations. With regard to FFV conversions, it is important to note the following:

- According to the U.S. Energy Information Administration, there are more than 8 million flexible fuel vehicles (FFVs) on U.S. roads today.¹¹ In addition, many FFV models are available directly from original equipment manufacturers at no additional cost over gasoline vehicles. As such, consumer interest in and demand for FFV conversions has been very limited.

¹⁰ AFDC conversion information: <http://www.afdc.energy.gov/vehicles/conversions.html>; FFV conversion page: http://www.afdc.energy.gov/vehicles/flexible_fuel_conversions.html

¹¹ <http://www.eia.gov/tools/faqs/faq.cfm?id=93&t=4>

- Conventional gasoline vehicles can be converted to FFVs; however, this conversion process requires modifications throughout the fuel system and electronic engine-control system.
 - To date, EPA has certified only two vehicle platforms for FFV conversion, compared to more than six hundred for CNG conversion.¹²
- b. What is DOE's experience in cost, performance, emissions, and available infrastructure with these two alternative fuel options?
- A8b. Emissions and performance data for alternative fuel vehicles is highly dependent on the type of vehicle (size, weight, engine/transmission configurations, etc.) as well as the duty cycle and driver's habits. In its commitment to provide technical information related to all alternative fuels recognized by the Energy Policy Act of 1992, the Department has developed and maintains a number of tools, including cost calculators, for determining the total cost of ownership as well as annual fuel cost for conventional as well as alternative fuel vehicles including CNG and E85. These tools and related data are available online through the Department's Alternative Fuels Data Center and Transportation Energy Data Book, as well as FuelEconomy.gov (a joint activity with EPA).

The table below shows current cost and infrastructure information for CNG and E85, as well as general emissions trends for vehicles using these fuels. Performance and tailpipe emissions information for specific vehicle makes and models is available on FuelEconomy.gov.

¹² EPA listing of compliant conversion systems:
www.epa.gov/oms/consumer/fuels/altfuels/documents/certified-conversions.xls

	E85	CNG
COST (April 2013)	\$3.30 gallon	\$2.10 gasoline gallon equivalent
INFRASTRUCTURE (June 25, 2013)	2610 refueling stations	1226 refueling stations
GENERAL PERFORMANCE EXPERIENCE	No noticeable difference in vehicle performance when E85 is used. Lower energy content than gasoline, resulting in fewer miles per gallon. Meets current emissions regulations.	Natural gas vehicles are similar to gasoline or diesel vehicles with regard to power, acceleration, and cruising speed. Vehicle range is generally reduced. Meets current emissions regulations.

References:

- Alternative Fuel Pricing Report: <http://www.afdc.energy.gov/fuels/prices.html>
- AFDC Fueling Station Locator: <http://www.afdc.energy.gov/locator/stations/>
- Vehicle-specific Performance and Emissions Information:
 - Vehicle-specific search: <http://www.fueleconomy.gov/feg/alternatives.shtml>
 - Ethanol references: <http://www.fueleconomy.gov/feg/ethanol.shtml>
 - Natural Gas references: <http://www.fueleconomy.gov/feg/bifueltech.shtml>

e. What is the experience in the Federal fleet?

A8c. The Federal fleet has not experienced a need for converting existing vehicles to run on E85. The fleet has acquired flex-fuel models that can use petroleum or E85 offered by

the major vehicle manufacturers. Over time, the manufacturers have increased the number of flex-fuel models available in many of the vehicle classes prevalent in the Federal fleet. Between FY 2005 and FY 2012, the number of flex-fuel vehicles in the Federal fleet has increased by 111 percent. (Source: http://federalfleets.energy.gov/performance_data.)

QUESTION FROM REPRESENTATIVE SHIMKUS

- Q9. GSA reports to Congress show only 3% of the fuel purchases by the Federal Government is E85 while almost 1/3 of the fleet are flex fuel capable; *no one is using the fuel in the Federal fleet*. What has DOE done to work with agencies such as USDA, DOJ, Armed Forces, and Post Office to ensure they are utilizing fuel for these flex fuel capable vehicles? What progress has been made?
- A9. The Federal fleet has increased its E85 use to 12.2 million gasoline gallon equivalents (GGE) in FY 2012 from 3.1 million GGE in FY 2005, an increase of 298 percent. The increase in E85 use has outpaced the growth in Federal flex-fuel vehicles, which increased by 111 percent over the same time period. (Source: http://federalfleets.energy.gov/performance_data.)

At the start of FY 2012, the Department of Energy's Federal Energy Management Program (FEMP) began providing Federal agencies with a Web-based dashboard that utilizes fuel transaction data for GSA-leased vehicles to provide monthly tracking of fuel consumption by each component fleet within an agency. The dashboard also tracks each fleet's missed opportunities to use E85 instead of gasoline when E85 was available nearby. Fourteen agencies are currently using the dashboard to increase their E85 use and reduce gasoline consumption.

QUESTION FROM REPRESENTATIVE SHIMKUS

Q10. Those same GSA reports show us that when the Federal Government does purchase ethanol fuels they pay too much wasting tax payer dollars. Fleets spent over \$4.00/gallon on E85 while national market prices were below \$3.00.

a. What is DOE doing to assist other agencies in purchasing fuel for their fleets?

A10a. The units for fuel consumption in GSA's Federal Fleet Report, though not specified, are gasoline gallon equivalents (GGE). A GGE is a unit of measurement used for alternative fuels so that they can be compared with gasoline on an energy-equivalency basis. A gallon of E85 has approximately 29 percent less energy content than a gallon of gasoline; converting gallons of E85 into GGE of E85 takes into account this difference in energy content. The data in GSA's FY 2011 Federal Fleet Report show that the cost of E85 to the Federal fleet was over \$4 per GGE of E85 and less than \$3 per gallon of E85.

At the start of FY 2012, the Department of Energy's Federal Energy Management Program (FEMP) began providing Federal agencies with a Web-based dashboard that utilizes fuel transaction data for GSA-leased vehicles to provide monthly tracking of fuel consumption by each component fleet within an agency. The dashboard also tracks each fleet's missed opportunities to use E85 instead of gasoline when E85 was available nearby. Fourteen agencies are currently using the dashboard to increase their E85 use and reduce gasoline consumption.

GSA's FY 2011 Federal Fleet Report can be found at

<http://www.gsa.gov/portal/content/242645>

- b. What do you believe is contributing to the higher than average price being paid by federal fleets for E85 costing the taxpayers a premium over market costs?

A10b. The units for fuel consumption in GSA's Federal Fleet Report, though not specified, are gasoline gallon equivalents (GGE). A GGE is a unit of measurement used for alternative fuels so that they can be compared with gasoline on an energy-equivalency basis. A gallon of E85 has approximately 29 percent less energy content than a gallon of gasoline; converting gallons of E85 into GGE of E85 takes into account this difference in energy content. The data in GSA's FY 2011 Federal Fleet Report show that the cost of E85 to the Federal fleet was over \$4 per GGE of E85 and less than \$3 per gallon of E85.

GSA's FY 2011 Federal Fleet Report can be found at

<http://www.gsa.gov/portal/content/242645>

QUESTION FROM REPRESENTATIVE LATTA

- Q1. Advances in innovative technologies have played a major role in unlocking the vast oil and gas energy resources that have contributed to our new energy renaissance.
- a. In your role as Secretary of Energy, how will you facilitate the private sector's ability to maximize our resource abundance through advanced technologies?

A1a. America's abundant unconventional oil and natural gas resources are critical components of our Nation's energy portfolio. Their development enhances America's energy security and economy. The Department's work in this area has focused on developing technologies and best practices to address safety and environmental issues associated with hydraulic fracturing. Currently, FE's work includes unconventional resource characterization, developing technologies for mitigating impacts associated with unconventional gas development, and the treatment and handling of produced water. In addition, DOE is pursuing a range of research activities to support an integrated environmental risk assessment associated with unconventional resource development. This assessment integrates evaluations of risks to water and air quality, as well as issues related to induced seismicity.

The program is also evaluating methane hydrates. The program intends to conduct laboratory and/or field-based research focused on increasing public understanding of methane hydrates in gas-hydrate-bearing areas. These public sector-led efforts will be designed to evaluate the occurrence, nature, and behavior of naturally-occurring gas hydrates and the resulting resource, hazard, and environmental implications.

- b. Under your leadership, will DOE support the use of traditional energy resources -such as fossil fuels and nuclear energy - in advanced and innovative ways? How so?

A1b. The DOE works to achieve the President's goals to develop America's innovative competitive edge through strategic investments in our Nation's clean energy research development and demonstrations (RD&D). We are investing in only the key enabling technologies that are on critical paths and that show the highest potential impacts on achieving the program goals and benefits in the timeframe needed for deployment.

The development of innovative oil and gas technologies is being focused on ensuring that the Federal Government's understanding of the risks associated with oil and gas development keeps pace with advancements in production technology and developing technologies to mitigate these risks. Our current research focus is on safe and environmentally sustainable development of unconventional natural gas.

In the traditional energy source of nuclear energy, DOE is conducting research on advanced fuels that would be more tolerant of extreme conditions. In partnership with industry and universities, we are currently looking at a range of concepts in innovative coatings, claddings, and fuel designs that improve safety, as well as emission free energy production. DOE will also conduct research to address questions related to advanced nuclear energy technologies, , such as fuels and materials for high temperature gas reactors . DOE also conducts R&D for reactor technologies that can be used in remote locations with only infrequent refueling.

Today, coal accounts for about 20% of the total energy consumption in the United States, and fuels about 40% of our electricity generation. Although no new coal fired power plants are being proposed in the U.S., coal will continue to be an important part of our energy strategy.

The coal power industry has a history of responding to environmental challenges. Sulfur dioxide, particulate matter, and nitrogen oxide emissions from coal fired power plants have all declined over the past 30 years, while total coal consumption and electricity generation have increased. This trend was driven by strict environmental regulations and new emissions control technologies to reduce pollution.

The development of carbon capture and storage is continuing this trend, and will allow coal to generate electricity with a corresponding decrease in carbon dioxide emissions. We see coal as a key component of our energy strategy now and into the future. In addition we anticipate the application of carbon, capture and storage technology to natural gas fired electricity generation at a future time in order to meet the long term environmental goals for the country.

QUESTION FROM REPRESENTATIVE LATTA

Q2. Does DOE's all of the above approach to energy include coal? Will this require the use of carbon, capture and storage (CCS) technology? When do you expect CCS technology to be commercially available and economically viable? Is it fair to the coal industry to advocate an energy policy approach that requires technology not yet economically feasible to use?

A2. DOE supports the President's all-of-the-above energy strategy, including his focus on continuing to expand responsible oil and gas development, increasing the fuel economy of the vehicles we drive which will save families money at the pump, supporting renewable energy sources, and investing in infrastructure and research and development, all of which play a central role in increasing our nation's energy security. Research and development of advanced fossil energy technologies, including carbon capture and storage, are part of this strategy. While there are no insurmountable technological, legal, institutional, regulatory or other barriers that prevent carbon capture and storage (CCS) from playing a role in reducing greenhouse gas emissions, early CCS projects face economic challenges related to climate policy uncertainty, first-of-a-kind technology risks and the current high cost of CCS relative to other technologies.

CCS continues to be a critically important component in a portfolio of low-carbon energy technologies that will be needed to address global climate change mitigation. DOE is actively investing in the research, development, and demonstration of advanced CCS technologies to enable CCS deployment as rapidly as possible.

QUESTION FROM REPRESENTATIVE OLSON

1: Our Committee had a hearing earlier this year in which we heard from a broad range of electricity providers. They all testified that fuel diversity in the nation's electricity sector is important for ensuring low cost, reliable electricity.

Q1(a): Do you agree that fuel diversity is important to keeping electricity prices low?

A1(a): Fuel diversity is important for a number of reasons. Diversity enhances reliability, and it also gives grid operators a broader range of options for dealing with unanticipated conditions. However, diversity itself comes at a cost, and in some situations achieving diversity goals could put upward pressures on retail electricity rates.

Q1(b): Do you agree that fuel diversity is important for reliable electric service?

A1(b): Yes. However, fuel diversity is only one contributing factor in maintaining reliable service. Several other factors are also significant contributors to reliability, e.g., vegetation management, grid operation, and system resource scheduling and planning (generation, transmission, distribution, and demand-side).

Q1(c): Do you agree that fuel diversity is important for keeping the lights on and restoring electricity quickly during major weather events or natural disasters?

A1(c): Yes, but bear in mind that a region with diverse fuel options can still be impacted by weather or other natural disasters. Regardless of the source of electricity, a generator must still be connected to the consumer through the grid (both

transmission and distribution); and the grid is often the focal point of restoration efforts following such an outage.

QUESTION FROM REPRESENTATIVE OLSON

- 2: California has been pursuing its own climate policies, including a cap-and-trade program and renewable energy mandates. Concerns have been raised about electricity reliability because the state's growing reliance on wind and solar and a shrinking number of conventional plants. These concerns have increased due to the unexpected announced closure of the San Onofre nuclear power plant.
- Q2(a): While California regulators have said they don't anticipate blackouts this summer, do you have concerns about electricity reliability in that state?
- A1(a): California's regulators and utilities have pursued a multi-option strategy for dealing with the challenges raised by the absence of San Onofre's capacity. While major events could still cause reliability problems in California, situational awareness of grid conditions and careful planning to prepare for and respond to potential reliability events help reduce the likelihood of such events.
- Q2(b): Do you have any concerns about potential cost increases for Californians as they are mandated to use more and more renewable power?
- Q2(b): We have entered a period which is extremely challenging for utility regulators. They have to find an appropriate balance among several fundamental electricity-related goals, including the adoption of clean energy. Other goals include reliability, supply diversity, physical and cyber security, two-way flows of energy and information, and, of course, the cost of electricity to consumers.

QUESTION FROM REPRESENTATIVE OLSON

- Q3. Especially in competitive markets, several planned new full-scale nuclear plants around the country have run into some economic trouble and have been cancelled or put on hold. However, there are a number of companies working on novel new Small Modular Nuclear Reactors that could be more economically viable. One of the companies working on SMRs – NuScale – is actually partnered with Fluor, a firm headquartered in my district. I know that DOE has an ongoing grant program for SMR, but I would just like to hear your thoughts on this technology and really, how your budget reflects the future of nuclear power.
- A3. The Department is embracing the concept of Small Modular Reactors (SMRs) as an opportunity to provide the country with an alternative source of clean, safe, and affordable nuclear power. The Department views SMRs as a potential replacement that can provide clean nuclear power for certain aging fossil plants to help meet the Nation’s greenhouse gas reduction goals. There are many other features and advantages expected of SMRs:
- Passive safety designs that would allow the reactors to withstand and respond to severe accidents with little or no operator action;
 - Modular construction techniques that could improve cost and schedules;
 - Flexibility to add units to increase output in response to incremental demand growth;
 - Flexibility in siting at locations with remote grids and lower power requirements; and,
 - Potentially lower cooling water requirements with less environmental impact.

The Department’s SMR Licensing Technical Support program was initiated to assist in accelerating the commercialization and deployment of the safest and most mature SMR designs by supporting certification and licensing of these units.

The program will support cost-shared design and engineering work for at least two SMR technologies within the program's total budget of \$452 M over six years. This funding will support the development of SMR designs that would eventually compete for the nuclear market share.

QUESTION FROM REPRESENTATIVE MCKINLEY

Q1. Last year EPA proposed greenhouse gas standards for new power plants that would effectively ban new coal plants in the U.S. by requiring that they install carbon capture and storage (CCS) technology that is not commercially available.

a. Do you agree that coal has for decades played a critical role in providing affordable, reliable electricity in the U.S.?

A1a. Coal has provided a low cost, domestic source of energy to provide between 40% and 50% of our electricity production. We anticipate that coal will continue to provide low-cost base load electricity while meeting all environmental standards.

Q1b. Do you support EPA's proposal to ban construction of any new coal plants in the U.S. for the foreseeable future?

A1b. The draft proposal for regulation of certain new fossil fuel fired power plants under section 111(b) of the Clean Air Act does not ban construction of new coal plants.

QUESTION FROM REPRESENTATIVE MCKINLEY

2. Over 41,000 megawatts of coal-fired generation have been scheduled to shut down due to EPA rules.
- Q2a. Did DOE anticipate that so much capacity would be retiring the very near term?
- A2a. A number of coal fired power plants have recently announced plans to retire due to a combination of factors, including low natural gas prices and low demand growth. Both the 2012 and 2013 versions of the Energy Information Administration's Annual Energy Outlook Reference Case, which account for such factors, project that roughly 49 GW of coal-fired power plants would retire by 2020.
- Q2b. Are you concerned about the potential impacts on grid reliability?
- A2b. It is the Department of Energy's (DOE) responsibility to be concerned about grid reliability regardless of the source of any impacts. That said, DOE, FERC and EPA have been engaging with industry which is working hard to minimize any potential reliability impacts from EPA's energy sector rules. Through this coordinated effort, the agencies have been jointly working with the transmission operators and planners to ensure that any potential issues are raised and addressed as early and efficiently as possible. At the same time, one must remember that although the odds on reliability events can be reduced, preventing such events altogether is not feasible.
- Q2c. Are you coordinating with FERC and EPA to ensure that no outages occur?

A2c. The Department is coordinating with EPA and FERC to monitor and address any potential reliability impacts. For example, the agencies have been holding joint discussions with the nation's regional transmission operators/independent system operators (RTOs/ISOs) for updates on their respective monitoring and assessment activities as well as any updates from generators in their region as they implement the recently finalized EPA rules (e.g., Mercury and Air Toxics (MATS) rule). Through these dialogues, the agencies are also seeking early insights the RTOs/ISOs have on potential reliability problems in their respective footprints and any mitigation efforts planned. We are also, through publicly available information, monitoring the announcement of power plant retirements and the status of power plants expecting to retrofit. The Department is committed to identifying and resolving any anticipated reliability impacts associated with EPA's energy sector rules.

QUESTION FROM REPRESENTATIVE GARDNER

- Q1. As Secretary of Energy, will you encourage the Administration to open up new areas to domestic production as a part of national energy plan to capitalize on our nation's newly discovered oil and gas abundance?
- A1. DOE supports the President's "all-of-the-above" energy strategy where we pursue more domestic energy production while still protecting the environment and addressing climate risks. This strategy calls for continuing to expand responsible oil and gas development, increasing the fuel economy of the vehicles we drive which will save families money at the pump, supporting renewable energy sources, and investing in infrastructure and research and development, all of which play a central role in increasing our nation's energy security. As part of this plan the Administration will consider opening up new areas for development if those areas can be developed safely while protecting the environment.

QUESTION FROM REPRESENTATIVE GRIFFITH

Q1. The DOE FY 2014 Budget provides \$276 million for coal R&D programs, a 23% reduction from FY 2012.

a. Based on DOE's current projections, what is a realistic date by which CCS could be developed and deployed on a commercial scale?

A1a. DOE is actively investing in the research, development, and demonstration of advanced carbon capture and storage (CCS) technologies to enable CCS deployment as rapidly as possible. The first suite of full scale CCS demonstration projects, using the best currently available carbon capture technologies, will start operation over the next five years. While there are no insurmountable technological, legal, institutional, regulatory or other barriers that prevent CCS from playing a role in reducing greenhouse gas emissions, early commercial CCS projects face economic challenges related to climate policy uncertainty, first-of-a-kind technology risks, and the current high cost of CCS relative to other technologies.

CCS continues to be a critically important component in a portfolio of low-carbon energy technologies that will be needed to address global climate change mitigation. Many global climate models suggest that CCS will need to be widely deployed by 2050 to meet current climate mitigation targets.

b. In your view, is CCS currently a workable option on a large commercial scale?

i. If yes, what facilities demonstrate that?

A1bi. Although several carbon capture and storage (CCS) technologies already exist in different industries and applications, they have not yet been demonstrated successfully on a medium/large electric power plant. The expected first power plant to do so is Southern Company's 582 MWe (net) Plant Ratcliffe in Kemper County, Mississippi. The plant is scheduled to commence commercial operations in 2014 with over 65% of its CO₂ (3 million tons of CO₂ per year) captured, compressed and transported by pipeline to mature oilfields for long-term storage via Enhanced Oil Recovery (EOR.)

Other types of industrial facilities provide some indications of the commercial workability of CCS. In December 2012, Air Products began CCS operations at an oil refinery in Port Arthur, Texas. Air Products' CCS facility is capturing approximately 925,000 tons of CO₂ per year, for EOR. There are several more CCS examples within the oil & natural gas processing industry, both domestically and internationally. These include Statoil's Sleipner CCS project in Norway (approximately 1 million tons of CO₂ annually, since 1996); Exxon's natural gas facility in Labarge, Wyoming (4 million tons annually since 2008; 6 million tons annually since 2010); BP's natural gas field at In Salah in Algeria (3.8 million tons of CO₂ injected between 2004 and 2011); etc.

Also, Archer Daniels Midland (ADM) has been capturing 300,000 tons/year of CO₂ since 2011 at a biofuels plant in Decatur, Illinois, and successfully storing that CO₂ in the Mt. Simon sandstone formation. Expansion activities are under way at

Decatur, and ADM expects to increase its CCS activities to 900,000 tons annually later this year.

In addition, Dakota Gasification has been capturing approximately 3 million tons of CO₂ annually since 2000, from its Great Plains lignite gasification facility near Beulah, North Dakota, and sending the CO₂ 205 miles north to the Weyburn and Midale EOR fields in Saskatchewan. Although the Great Plains facility is not an electric power plant, it provides a good representation of commercial scale CCS at a large coal gasification facility.

In the electric sector, specifically for existing coal-fired power plants, Southern Company is currently demonstrating post-combustion CCS at a 25 MWe scale on Alabama Power's Plant Barry near Mobile, Alabama. That is presently the largest post-combustion CCS facility operating at a coal-fired power plant.

b. In your view, is CCS currently a workable option on a large commercial scale?

ii. Of those facilities, which is the most promising in your view?

A1bii. The eight major CCS demonstrations that DOE's Office of Fossil Energy is co-funding with industry certainly rank among the most promising CCS facilities, both nation-wide and world-wide.

- Demonstration of a Coal-Based Transport Gasifier; Southern Company Services; Kemper County, Mississippi; ~\$3B est. total plant cost, \$270M DOE share (9%);

Integrated Gasification Combined-Cycle (IGCC); 3,000,000 tons of CO₂/year to EOR.

- Texas Clean Energy Project; Summit Texas Clean Energy LLC ; Penwell, Ector County, Texas; \$1.73B total est. cost, \$450M DOE share (26%); IGCC/polygeneration (baseloaded); 2,200,000 tons of CO₂/year to EOR.
- Hydrogen Energy California (HECA) Project; Hydrogen Energy California LLC (a project company owned by SCS Energy); Bakersfield, Kern County, California; \$5B total est. cost, DOE share \$408M (8%); IGCC/polygeneration (load following); 2,570,000 tons of CO₂/year to EOR.
- W.A. Parish Post-Combustion CO₂ Capture & Sequestration Project; NRG Energy; Thompsons, Texas; \$775M total est. cost, DOE share \$167M (22%); post-combustion capture at an existing coal-fired power plant; 1,400,000 tons of CO₂/year to EOR.
- FutureGen 2.0; FutureGen Alliance, Meredosia, Morgan County, Illinois; \$1.77B total est. cost, DOE share \$1.05B (66%); oxy-combustion repowering; 1,000,000 tons of CO₂/year to saline storage.
- Demonstration of CO₂ Capture and Sequestration of Steam Methane Reforming Process Gas Used for Large-Scale Hydrogen Production; Air Products & Chemicals; Port Arthur, Texas; \$431M total est. cost, DOE share \$284M (66%); CO₂ from steam methane reforming for hydrogen manufacture at an oil refinery; 925,000 tons of CO₂/year to EOR.
- CO₂ Capture from Biofuels Production and Storage into the Mt. Simon Sandstone; Archer Daniels Midland; Decatur, Illinois; \$208M total est. cost, DOE

share \$141M (68%); CO₂ capture from an ethanol plant; 900,000 tons of CO₂/year to saline storage.

- Lake Charles Carbon Capture & Sequestration Project; Leucadia Energy LLC; Lake Charles, Louisiana; \$436M total est. cost, DOE share \$261M (60%); CO₂ capture from a petroleum coke-to-methanol gasification facility; 4,500,000 tons of CO₂/year.

The Air Products project at Port Arthur is already in operation. Two more, the Southern Company and ADM projects, are both under construction and slated to begin operations within the next 10 months. Taken together, these eight projects comprise the world's leading demonstration program for 1st-generation CCS technologies, with a diverse portfolio of IGCC, oxy-combustion, post-combustion, and industrial CCS processes. At DOE's Office of Fossil Energy, we are researching and developing 2nd- and 3rd-generation technologies that have a lot of potential for bringing down CCS costs in the medium- and long-terms.

QUESTION FROM REPRESENTATIVE GRIFFITH

Q2. Given the strict new regulations coming out of EPA that effectively prevent the construction of any new coal plants, what is DOE doing (outside of CCS research) to ensure that coal will remain a part of the US energy portfolio?

A2. Outside of research and development, and as part of President Obama's Climate Action Plan, the U.S. Department of Energy announced a draft loan guarantee solicitation for innovative and advanced fossil energy projects and facilities that substantially reduce greenhouse gas and other air pollution. The draft solicitation will be open for comments from industry, stakeholders, and the public.

The solicitation will support new or significantly improved advanced fossil energy projects and facilities – such as advanced resource development, carbon capture, low-carbon power systems, and efficiency improvements – that reduce emissions of carbon dioxide, methane, and other greenhouse gas pollution. The Energy Department will make available up to \$8 billion in loan guarantee authority through this solicitation.

QUESTION FROM REPRESENTATIVE GRIFFITH

- Q3. If the upcoming tests on Coal-Direct Chemical Looping at the National Carbon Capture Center in Wilsonville, Alabama are successful, what plans does DOE have to support additional testing on a larger scale and/or what plans does DOE have to help facilitate applying this technology on a commercial scale at a power plant?
- A3. In FY2012, a solicitation was issued by the National Energy Technology Laboratory Advanced Combustion Program seeking proposals for research and development on both pressurized oxycombustion and chemical looping systems. Three chemical looping projects have completed a 1-year detailed systems and technology gap analysis on their specific technologies (including the coal direct chemical looping technology tested at the National Carbon Capture Center). The results of these analyses are being used to select the most promising technologies for further development and scale up to large-pilot scale. These projects will develop and test novel process components to prepare them for potential application into a fully integrated commercial scale system.

QUESTION FROM REPRESENTATIVE ENGEL

- Q1. Mr. Moniz, in your testimony you mentioned electric vehicles. Can you expand on what other types of alternative fuels you foresee being developed and funded through the Energy Security Trust?
- A1. The President's FY2014 budget request proposes to invest \$2 billion of Federal oil and gas development revenue over ten years in a new Energy Security Trust. This Trust would provide a reliable stream of mandatory funding for research and development to lower the cost and improve the performance of transportation alternatives that reduce our dependence on oil—specifically, technologies that will allow us to power our cars and trucks using electricity, homegrown biofuels, renewable hydrogen, and domestically-produced natural gas.

QUESTION FROM REPRESENTATIVE ENGEL

You also spoke of the recent release of eGallon, which as you mentioned would give the “fuel cost” equivalent for operating an electric vehicle. I think this a positive development. Educating people regarding alternative fuels and their relative costs helps bring people and our country towards large scale usage of alternative fuels.

- Q2. Is the department going to release similar cost comparisons for other types of fuels, such as methanol or ethanol?
- A2. The Department has developed and maintains a number of tools, including cost calculators, to help fleets and consumers understand the relative benefits of different alternative fuels and choose the fuel that best meets their needs. In addition to eGallon, tools include the Department’s Alternative Fuels Data Center vehicle cost calculator, which calculates the total cost of ownership as well as emissions for different makes and models of conventional, advanced technology, and alternative fuel vehicles such as those that use ethanol.¹³ In addition, the Department, together with EPA, provides the fueleconomy.gov web site, which allows users to find and compare conventional and alternative fuel vehicles and calculate annual fuel cost.¹⁴

¹³ AFDC Vehicle Cost Calculator: <http://www.afdc.energy.gov/calc/>

¹⁴ <http://www.fueleconomy.gov/feg/alternatives.shtml>

QUESTION FROM REPRESENTATIVE ENGEL

In your testimony you spoke about the decreases in carbon emissions due to the large increase in natural gas production, specifically from hydraulic fracturing. While the drop in carbon emissions is a positive sign, fracking brings with it other concerns.

Q3. Can you address what, if any, steps the Department of Energy is taking to deal with environmental concerns that are a result of fracking, such as methane leaks and groundwater contamination?

A3. In response to the Secretary of Energy Advisory Board (SEAB), the onshore portion of the Section 999 research program was refocused to address the risks associated with shale gas production including protection of air quality and groundwater. The DOE then led an effort to implement a specific recommendation from the SEAB which was to coordinate the efforts of relevant Federal agencies. A tri-agency research plan is still under development. The work to date to develop the plan has been very helpful in both coordinating the research efforts of the three agencies and developing the President's FY 2014 Budget Request. The Department's work in this area has focused on developing technologies and best practices to address safety and environmental issues associated with hydraulic fracturing.

QUESTION FROM REPRESENTATIVE ENGEL

Q4. Can you comment on what steps the Department is taking to make nuclear power as safe as possible?

A4. The Department's Office of Nuclear Energy is developing and executing programs that are focused on improving the safety, security, efficiency and overall economics of a broad spectrum of nuclear power systems through a variety of activities. In the wake of the Fukushima accidents in Japan, the Department recognizes the value of reactor designs that can continue to provide safety functions under extreme conditions. One of the Department's priorities in nuclear power development is our support of small modular reactors (SMR). A key driver for the Department's interest in SMRs is the potential for safety improvements in nuclear power operations afforded by these technologies over the existing fleet of large reactors. Currently proposed light water-based SMR designs include passive reactor safety and protection features that not only could help to avoid severe accident conditions, but also could help mitigate the consequences of an accident without requirement for operator involvement for extended periods. These features are expected to include, but are not limited to:

- Deep underground siting to provide protection from natural and man-made threats.
- Compact, integral pressure boundary to avoid the possibility for large loss of coolant accidents.
- Large gravity-fed tanks to provide post-accident cooling capability that can function without offsite power.

- Containments that mitigate the release of fission products in the case of severe accidents.
- Large passive ultimate heat sinks that can dissipate reactor decay heat for days after an accident.

From a longer-term perspective, the Department is also conducting research projects aimed at more advanced small modular reactor concepts that are projected to have high potential for improving the safety, security and efficiency of nuclear power.

Member Requests for the Record

The Honorable Michael C. Burgess

The Department of Energy's FY 2014 Congressional Budget Request Highlights shows that after "adjustments," the request for the Office of Fossil Energy Research and Development is increased by \$83.5 million. Please explain what "adjustments" refers to.

A: In the FY 2012 Appropriations Act, Congress rescinded \$187 million from the Fossil Energy R&D budget, reflected in the "adjustments" row of the budget request. The adjustment listed in the FY 2014 column of the budget request represents the proposed use \$8.7 million in prior-year unobligated balances.

The Honorable Lee Terry

Q: During the hearing, you mentioned that the Department is conducting research regarding new materials for natural gas vehicle storage tanks to increase capacity. Which office is conducting this research, and how much money has been allocated for it?

A: (Please see Insert 1 sent to Chairman Whitfield on September 26, 2013)

The Honorable Cory Gardner

Please provide an update on the use of ESPCs by the Department of Energy.

A: (Please see Insert 3 sent to Chairman Whitfield on September 26, 2013)

The Honorable Gene Green

The Administration is recommending a 37.9 percent decrease in smart grid funding. Is that because we are moving these activities elsewhere or are they truly reducing the activities for smart grid?

A: Modernizing the grid is a crucial part of the Department of Energy's mission. While the specific Smart Grid program funding line shows a decrease in the FY 2014 request, the Office of Electricity Delivery and Energy Reliability's (OE) proposed Electricity Systems Hub and increases to other programs that also support grid modernization concepts and strategies. Moreover, the request continues to build upon the \$4.5 billion invested by the American Recovery and Reinvestment Act of 2009 (ARRA), which significantly accelerated the development and deployment of smart grid technologies. The FY 2014 request for the Smart Grid program supports an increased emphasis on microgrids, which are localized grids that have the ability to operate autonomously from the traditional electric grid in an emergency outage. Microgrids can enhance the reliability, resiliency, and fast recovery of the distribution system.

The Honorable Michael F. Doyle

Q: In light of your support for natural gas, what are your plans for ensuring the continued success of the SECA program to ensure we develop technologies that make the most efficient use of that fuel?

A: The Office of Fossil Energy (FE) established the Solid State Energy Conversion Alliance (SECA) in 1999 to develop low-cost, environmentally-friendly high temperature (~800 °C) solid oxide fuel cell (SOFC) technology.

At the time of its founding, SECA was part of the natural gas program, with an emphasis on distributed generation applications. The SECA approach was mass customization of a common module that could address diverse markets – stationary power generation, military applications, and the transportation sector (e.g., auxiliary power units for Class 8 trucks).

Later, the SECA program transitioned into NETL's Strategic Center for Coal, with an emphasis on coal-fueled central station generation with carbon capture. OMB targets were established for stack and system cost to be met in 2010 at an assumed high volume production rate; these targets, along with performance metrics, were met on-time by the Industry Teams.

The Program has shown significant progress towards commercialization; stack cost has been reduced by a factor of ten to \$175/kw, stack size increased by a factor of twenty-five, and the rate at which cells degrade has been reduced by a factor of 10 to <1.0% per 1,000 hours. It has developed technology that is fuel flexible and, as such, is directly applicable to near-term deployment in MWe-class natural gas-fueled distributed generation (DG) applications that will establish the technology foundation for longer-term central power stations, both natural gas and coal. The Program will continue to address technical (performance, reliability, durability, and high-volume manufacturing) and cost issues with the goal of widespread acceptance of the technology for commercial use.