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THE FISCAL YEAR 2012: DEPARTMENT OF ENERGY AND NUCLEAR REGULATORY COMMISSION BUDGETS

JOINT HEARING

BEFORE THE

SUBCOMMITTEE ON ENERGY AND POWER

AND THE

SUBCOMMITTEE ON ENVIRONMENT AND THE ECONOMY

OF THE

COMMITTEE ON ENERGY AND COMMERCE
HOUSE OF REPRESENTATIVES

ONE HUNDRED TWELFTH CONGRESS

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THE FISCAL YEAR 2012: DEPARTMENT OF ENERGY AND NUCLEAR REGULATORY COMMISSION BUDGETS

WEDNESDAY, MARCH 16, 2011

HOUSE OF REPRESENTATIVES,
SUBCOMMITTEE ON ENERGY AND POWER,
JOINT WITH THE
SUBCOMMITTEE ON ENVIRONMENT AND THE ECONOMY,
COMMITTEE ON ENERGY AND COMMERCE,
Washington, DC.

The subcommittees met, pursuant to call, at 9:35 a.m., in room 2123 of the Rayburn House Office Building, Hon. Ed Whitfield (chairman of the subcommittee on Energy and Power) presiding.

Members present: Representatives Whitfield, Upton (ex officio), Barton, Shimkus, Pitts, Terry, Burgess, Bilbray, Bass, Scalise, Latta, Harper, Cassidy, McKinley, Gardner, Griffith, Waxman (ex officio), Dingell, Markey, Rush, Green, DeGette, Capps, Doyle, Inslee, and Matsui.

Staff present: Maryam Brown, Chief Counsel, Energy and Power; Allison Busbee, Legislative Clerk; Andy Duberstein, Special Assistant to Chairman Upton; Mike Gruber, Senior Policy Advisor; Dave McCarthy, Chief Counsel, Environment and the Economy; Mary Neumayr, Counsel, Oversight/Energy; Peter Spencer, Professional Staff Member, Oversight; Jeff Baran, Democratic Senior Counsel; Phil Barnett; Democratic Staff Director; Gret Dotson, Democratic Energy and Environment Staff Director; Caitlin Haberman, Democratic Policy Analyst; and Karen Lightfoot, Democratic Communications Director, and Senior Policy Advisor.

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

Mr. WHITFIELD. We will call the hearing to order this morning. The title of today's hearing is "The Fiscal Year 2012 Department of Energy and Nuclear Regulatory Commission Budgets." And we certainly extend a warm welcome to Secretary Steven Chu, Secretary of the U.S. Department of Energy. Mr. Secretary, we appreciate your being with us today very much and look forward to your testimony. We also have with us on the second panel the Honorable Gregory Jaczko, who is chairman of the Nuclear Regulatory Commission.

Circumstances have certainly changed since we decided to have this hearing, and with the events taking place in Japan we all

want to extend our very best wishes and thoughts to the people of Japan as the result of this tragedy. And we will certainly benefit today from the insights of Dr. Chu and Dr. Jaczko on this ongoing matter.

Obviously, nuclear energy plays a vital role in the energy needs of our country today. It provides roughly 20 percent of all electricity generated in America. Countries like France and Japan have an even greater percentage of electricity produced from energy. And we recognize the importance, when we talk about energy, also of the safety aspect of that as well.

And while I didn't really intend to talk a lot about nuclear energy today, there are so many points relating to our country as it pertains to nuclear energy today: the storage issue, Yucca Mountain, what is happening there, the 104, 106 nuclear plants around the country and the location on those sites of the waste material instead of going to Yucca Mountain, the permitting period, roughly 10 years to get a plant permitted. In other countries it is less than that but, as we have learned just in the last few days from what happened in Japan, we can expect unexpected events to occur and we have to maximize safety. I, for one, do not believe that we can meet our future demands of energy without nuclear playing a vital role in that.

So Mr. Secretary, we are going to look forward to your testimony. I know that there will be a lot of questions for you. And at this time I would recognize for his opening statement Mr. Rush of Illinois.

[The prepared statement of Mr. Whitfield follows:]

PREPARED STATEMENT OF HON. ED WHITFIELD

• Sadly, this hearing has been overtaken by events in Japan. Our hearts go out to an ally that has lost thousands of its citizens in this tragedy, and we closely follow unfolding events there, including the situation at the damaged nuclear power plants. On the last point we will certainly benefit from the insights of Dr. Chu and Dr. Jaczko on this ongoing matter.

• The energy challenges America faces are daunting,

o from high gasoline prices,

o to EPA global warming regulations adding even further to the regulatory burden on fossil fuels,

o to questions about whether there will be enough electric generating capacity to meet the nation's future needs and enough transmission lines to deliver it,

o to whether we have a long-term solution for nuclear waste storage, and a great many others.

• The Department of Energy and Nuclear Regulatory Commission have long dealt with many of these challenges, and I look forward to working with both of them to find the energy solutions America needs.

• But those solutions begin with the reality that fossil fuels—the coal, oil, and natural gas that provide America with 70 percent of its energy—are a critical component. Without affordable fossil fuels consumers suffer at the pump and when paying their electric and natural gas bills, and manufacturers don't have the low cost energy they need to compete in a global marketplace. After all, the only reason we use so much fossil fuels is that they are affordable relative to the alternatives.

• Yet the Office of Fossil Energy, in line with President Obama's State of the Union remarks that fossil fuels are "yesterday's energy," gives short shrift to funding into fossil energy sources.

• Quite frankly, a 44.5 percent decrease is out of step with the challenges we face. This is especially so given EPA regulations that increasingly make it more difficult to use fossil fuels. We should not have one agency complicating the use of fossil fuels with more and more regulations while another cuts back on the research into needed breakthroughs. And we certainly do not need the proposed tax increases on do-

mestic oil and gas, which would only serve to constrain production here in the U.S. and raise prices on consumers.

• The cuts in the Office of Fossil Energy include a 26 percent reduction in funding for coal research. Given the economic and national security benefits of coal—the energy source America possesses in greatest abundance, and one whose full potential is still not being realized—I believe these cuts are ill-advised.

• I am pleased that the DOE budget included additional funds for the nuclear loan guarantee program, but I do not support the Administration's concurrent actions to shut down the statutorily mandated Yucca Mountain Program. DOE alone has spent $13.5 billion of ratepayers' money on this project and because the project is not finished another $15 billion has been spent in settlements with utilities companies because the federal government is not meeting its obligations.

• I am pleased that in America we have the most robust and dependable nuclear power systems in the world and I believe that we need to promote that power in a way that is beneficial to the public. However, permitting for new plants and repermitting for existing plants is simply too slow at the Nuclear Regulatory Commission.

• I know we will learn a great deal from the events unfolding in Japan, but in the process we should not do anything from a regulatory or legislative standpoint to unnecessarily threaten the continued development of what is a safe and important part of our base-load power system here in the United States.

• I look forward to hearing from our witnesses and I now yield to the Ranking Member, Mr. Rush.

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

Mr. RUSH. Well, now, thank you, Mr. Chairman. I want to thank Mr. Secretary Chu for being here today. I understand we have Chairman Jaczko coming in a little later.

Before I give my thoughts on the nuclear situation in Japan, as you have, Mr. Chairman, I would like to bring attention to the drastic cuts that have been proposed by my Republican colleague under H.R. 1. Section 3001 of H.R. 1 would rescind all unobligated Recovery Act funds without any exception. And these cuts would directly impact crucial job-creating renewable energy projects under the Loan Guarantee Program. At least 26 job-creating projects across the country, from California to Illinois, Michigan to New York, and Oregon to Texas would be affected by these proposed cuts.

In all, projects with negotiated terms reach $12.5 billion in loan guarantees that would create over 28,000 construction jobs and over 5,000 permanent jobs are at stake. The Republican proposal would basically put all of DOE loan guarantee funding into 1 category, and that category is nuclear energy.

And while I am in support of nuclear energy, I also believe we must invest in renewable energy projects that would generate power from solar, wind, geothermal, biomass, and cellulosic ethanol, as many of these projects do. Mr. Chairman, my State of Illinois obtains 47 percent of its electricity from nuclear, one of the highest in the Nation. I personally believe that nuclear must be part of any portfolio of renewable energy sources that will move this Nation forward.

However, as far as the events unfolding in Japan are concerned, my advice for the nuclear energy industry, both here and in Japan and elsewhere, would be to be as transparent as possible. Transparency is really the key word. The American people, the people around the world are looking for transparency. They want to believe in the nuclear energy and I think it is up to us and others

to make that happen. We must make sure that we are honest with the American people about exactly what we know and also what we do not know.

Mr. Chairman and Mr. Chairman, I look forward to discussing this more in depth during the discussion with Secretary Chu and Chairman Jaczko. Thank you, Mr. Chairman, and with that I want to recognize Mr. Waxman. I yield back the balance of my time.

[The prepared statement of Mr. Rush follows:]

PREPARED STATEMENT OF HON. BOBBY L. RUSH

Thank you, Mr. Secretary and Chairman Jaczko for being here today. Before I give my thoughts on the nuclear situation in Japan, I would like to bring attention to the drastic cuts that have been proposed by my Republican colleagues under H.R. 1.

Section 3001 of H.R. 1 would rescind all unobligated Recovery Act funds without any exceptions, and these cuts would directly impact crucial, job-creating renewable energy projects under the loan guarantee program.

At least 26 job-creating projects across the country from California to Illinois, Michigan to New York, and Oregon to Texas would be affected by these proposed cuts.

In all, projects with negotiated term sheets of $12.5 billion in loan guarantees that would create over 28,000 construction jobs and over 5,000 permanent jobs are at stake.

The Republican proposal would basically put all of DOE loan guarantee funding into nuclear energy, and while I am a supporter of nuclear energy, I also believe we must invest in renewable energy projects that would generate power from solar, wind, geothermal, biomass and cellulosic ethanol, as many of these projects would do.

Mr. Chairman, my state of Illinois obtains 47-percent of its electricity from nuclear, one of the highest on the country.

I personally believe that nuclear must be part of any portfolio of renewable energy sources that will fuel this country moving forward.

However, as far as the events unfolding in Japan are concerned, my advice for the nuclear energy industry, both here and in Japan, would be to be as transparent as possible.

We must make sure that we are honest with the American people about exactly what we know, and also what we don not know.

In a letter earlier this week, my Democratic colleagues and I called for hearings and an independent investigation so that when the current crisis mode has ended we can accurately explain to the American people what happened and assure them that we are prepared for any contingency in our own nuclear energy arsenal.

I look forward to discussing this more in depth during the questioning session for Secretary Chu and Chairman Jaczko.

Thank you Mr. Chairman, and with that I would like to recognize Mr. Green from the Environment and the Economy subcommittee.

Mr. WHITFIELD. Mr. Rush, thank you for your comments. I noticed you had about 2 minutes left on your opening statement. I had about 2 minutes left on my opening statement, and I was looking so forward to hear what you said that I neglected to recognize my friend, Mr. Shimkus, who is chairman of the Energy and Environment Subcommittee. So I am going to recognize him for the remaining 2 minutes of my opening statement. So Mr. Shimkus, you are recognized for 2 minutes.

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

We always live in interesting times and this is another one. This is a DOE budget hearing and, of course, budgets are all the rage, size-of-government spending. Your budget request is 29.5 billion, which is about a 12-percent increase from fiscal year 2010, so a lot of questions will be—obviously, that is not going to happen. We are

going to have to prioritize and we are going to have to see what works and go through the list and make sure we are funding the priorities, but nowhere in America is anyone expecting us to increase the size of government and federal agencies by 12 percent. In fact, I would—as I said in another hearing—be prepared for 2008 spending levels or a significantly reduced amount. So that is an issue.

Having said that, we want to, you know, applaud the work and continue to support, as Mr. Rush said—I am from Illinois also—the nuclear power industry, make sure it is safe. There are interesting issues going on with your loan guarantees that we want to keep pursuing the 3 facilities that are moving forward, while we still have to address—and my subcommittee has a nuclear waste portfolio. And we have got to get serious about addressing this issue. I will talk about that more in my questions, but for the President to have a Blue Ribbon Commission that excludes any discussion about Yucca Mountain is a fraud. And I think you probably had some writings in the past that also addressed the importance of Yucca Mountain. And we will continue pushing all of the above energy strategies.

So with that, my time is expired, Mr. Chairman. So I yield back.

Mr. WHITFIELD. Thank you. At this time I recognize the gentleman from California, the ranking member, for his opening statement.

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

Mr. WAXMAN. Mr. Chairman, during the last year we have had wakeup call after wakeup call warning us that we need a new energy policy. Last April a coalmine explosion in West Virginia killed 29 miners. It was the worst coal disaster in 40 years. That same month, Deepwater Horizon exploded in BP's Macondo well. Oil was gushing into the Gulf for 3 months. Now oil is $100 a barrel because the Middle East is in turmoil. And Japan faces potential nuclear meltdowns at its damaged reactors. We don't know yet whether Japan will be able to avoid catastrophic release of radioactive material. We don't know what the full impact will be, but we should be investigating the safety and preparedness of the U.S. facilities.

After all of these energy catastrophes, it should be obvious we need a new energy policy that promotes clean, safe, and affordable energy. We need more vehicles that run on electricity, natural gas, and renewable fuels. We need more wind and solar power. And we need more energy efficiency. Instead, what we have gotten from the Republican-controlled house is partisanship and an assault on clean energy.

The Republican budget for this year, H.R. 1, would slash DOE's energy efficiency and renewable energy budget by 35 percent. It would completely eliminate assistance to low-income families who want to weatherize their homes or save energy and lower their utility bills. And the Republican budget would wipe out DOE's ability to award loan guarantees to worthy renewable energy projects. This would cost us thousands of jobs. Some of these loan guaran-

tees have recipients just waiting to close the deal, and now there will be no money left for them, whether it is a solar project in California, a wind turbine plant in Idaho, a geothermal project in Oregon, a biofuels facility in Louisiana. The list goes on. All these projects and all these jobs are on the Republican chopping block.

Yesterday in this committee we debated a bill the Republicans said, oh, we are for all-of-the-above energy policy. But that is not is what is in their budget. The Republican budget would rescind 25 billion of the 47 billion in loan guarantee authority provided by Congress in 2009. The bill would preserve the entire 18.5 billion in loan guarantees for new nuclear reactors and $2 billion available for uranium-enrichment projects, while leaving only $1.5 billion for all other technologies. This is not an all-of-the-above strategy. This is an all-nuclear strategy.

Mr. Chairman, instead of spending our time debating partisan legislation that denies science and guts the Clean Air Act, we should be working together to encourage clean energy investments that will create jobs in the U.S. It should not take a nuclear meltdown to make us face reality. We urgently need a new energy policy, and I hope the testimony today from Secretary Chu and Chairman Jaczko will help point the way.

I would ask unanimous consent to enter into the record a supplemental memo detailing the effects of the Republican budget on clean energy jobs.

Mr. WHITFIELD. Without objection.

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

Mr. WAXMAN. And Mr. Chairman, I yield now to the ranking member of the subcommittee on environment, Mr. Green.

Mr. WHITFIELD. The gentleman is recognized.

Mr. GREEN. Thank you, Mr. Chairman, for holding the hearing today on the Department of Energy and Nuclear Regulatory Commission's fiscal year 2012 proposed budgets. I want to thank Secretary Chu and also Chairman Jaczko for taking the time to appear before our committee and I know both of you are extremely busy working with Japan to assist them in their current situation at several of their nuclear reactors.

Our thoughts and our prayers are with the people of Japan, and I hope the United States can assist them in their time of need. This is truly a devastating disaster and they need as much assistance from around the world so they can recover.

As a Member of Congress who represents one of the largest energy-producing areas in the country, an area of the country that also has permits pending before the Office of Management and Budget for construction of new nuclear power plants, I am interested in the testimony of our witnesses today.

In 2008 our Nation produced over 800 billion kilowatt hours from nuclear power. Japan produced 245 billion. We need to step back and take a breath and see what we need to do to produce clean electricity safely and at a reasonable cost. And I know that is our bottom line and we need to do that, particularly with what has happened with Japan.

And I do hope that Secretary Chu and Chairman Jaczko can update us on the current situation in Japan, as well as give us information on the fiscal year 2012 budget and how Congress can take

the leadership in doing that. And with that, Mr. Chairman, I yield back my time.

Mr. WHITFIELD. Mr. Waxman, you can call the time.

Mr. WAXMAN. Mr. Chairman, I don't know if we are reserving any balance of our time, but we have exhausted our speeches for the opening of——

Mr. WHITFIELD. Thank you very much. At this time I recognize the full chairman of the committee, Mr. Upton, for his opening statement.

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

Mr. UPTON. Well, thank you, Mr. Chairman, and welcome, Mr. Secretary.

Given all of the energy challenges the American people face, this hearing on DOE and the NRC '12 budgets would have been a very important one even if it was held before the tragedy in Japan. But given the unfolding of events there and the impact on several nuclear reactors, today's hearing certainly takes on added significance.

In the midst of a natural disaster and a tragedy that we are watching unfold literally hour by hour, we need to allow time for reflection and careful analysis and learn from their mistakes. This is especially true when it comes to proposals that would make permanent changes in policy based on incomplete information.

We will be having a number of hearings on this issue as details unfold and we welcome your participation. This committee is going to hear the facts as soon as they become available. That is for sure.

For me, I live 15 miles from two nuclear power plants, so the safety of U.S. nuclear facilities is not an issue that I have ever taken lightly. I am not straying from my support for safe nuclear energy as a vital component of America's present and future energy mix. It is just as important to dispel overstated fears as it is to discuss legitimate concerns. And I know that we can begin the process of doing both.

The Department of Energy's '12 budget is $29.5 billion, an increase of almost 12 percent or $3 billion from current levels and I see areas where funding is excessive and perhaps others where it is insufficient. Spending—even for laudable goals like energy efficiency or developing affordable alternative energy sources and technologies—needs to be scrutinized for effectiveness. Indeed, we just had a large-scale real-world test of the merits of throwing a lot of money at nice-sounding energy projects in the 2009 stimulus. The stimulus program was very generous the American people's tax dollars and certainly for energy programs, but a series of DOE inspector general reports on stimulus spending for home and building weatherization projects in other agencies found significant flaws.

In other areas I believe that the budget is inappropriately cheap, and this is especially the case with regard to fossil fuels. Wishful thinking about magic bullet alternatives is not going to heat and cool our homes, get us where we need to go, and power the businesses the provide the jobs that America wants. The reality is we still need fossil fuels and we will continue to do so for the foreseeable future. Now, I don't believe that this reality is reflected in the

budget, which calls for a 44-percent decline in funding for the Office of Fossil Energy. That, along with the President's support for raising taxes on domestic oil and natural gas producers, is indicative of a hostility to domestic fossil fuel production.

On nuclear energy we have got similar concerns. Blocking Yucca Mountain is penny-wise and pound-foolish, especially considering we have spent nearly $13.5 billion and the need ultimately to find a repository for nuclear waste. Instead, preventing the need for interim storage is one way of reducing risk from nuclear energy and reducing risk is certain to be a major part of the energy discussion moving forward.

This committee will look long and hard at Yucca Mountain, the nuclear fuel cycle and spent-fuel policies. Now more than ever the politically-based policies must end. America demands safe, common-sense solutions. And I yield the balance of my time to Chairman Emeritus, Mr. Barton.

[The prepared statement of Mr. Upton follows:]

PREPARED STATEMENT OF HON. FRED UPTON

Given all of the energy challenges the American people face, this hearing on the DOE and NRC 2012 budgets would have been a very important one even if held before the tragedy in Japan. But given the unfolding events there and the impact on several nuclear reactors, today's hearing takes on added significance.

In the midst of a natural disaster and a tragedy we're watching unfold hour by hour, we need to allow time for reflection and careful analysis and learn from their mistakes. This is especially true when it comes to proposals that would make permanent changes in policy based on incomplete information. We will certainly be having a number of hearings on this issue as details unfold. The Committee will hear the facts as soon as they become available.

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The Department of Energy's 2012 budget is $29.5 billion, an increase of 11.8 percent or $3.1 billion from current levels. I see areas where funding is excessive and perhaps others where it is insufficient.

Spending, even for laudable goals like energy efficiency or developing affordable alternative energy sources and technologies, needs to be scrutinized for effectiveness. Indeed, we just had a large scale, real world test of the merits of throwing a lot of money at nice-sounding energy projects, in the 2009 stimulus. The stimulus was very generous with the American people's tax dollars, and especially for energy programs. A series of DOE Inspector General Reports on stimulus spending for home and building weatherization projects and other agency efforts found significant flaws.

In other areas, I believe the budget is inappropriately cheap, and this is especially the case with regard to fossil fuels. Wishful thinking about magic bullet alternatives is not going to heat and cool our homes, get us where we need to go, and power the businesses that provide jobs. The reality is we still need fossil fuels and will continue to do so for the foreseeable future. I don't believe this reality is reflected in the budget, which calls for a 44.5 percent decline in funding for the Office of Fossil Energy. That, along with the President's support for raising taxes on domestic oil and natural gas producers, is indicative of a hostility to domestic fossil fuel production.

On nuclear energy, we have similar concerns. Blocking Yucca Mountain is penny wise and pound foolish, especially considering the $13.5 billion already spent and the need for an ultimate repository for nuclear waste. Indeed, preventing the need for interim storage is one way of reducing risks from nuclear energy, and reducing risks is certain to be a major part of the energy discussions moving forward. This Committee will look long and hard at Yucca Mountain, the nuclear fuel cycle, and spent fuel policies. Now more than ever the politically based policies must end. America does demand safe common sense solutions.

Mr. BARTON. Thank you, Mr. Chairman, I concur with your statement. We welcome the distinguished Secretary of Energy and the distinguished Chairman of the Nuclear Regulatory Commission. I think you know that I was a White House fellow for one of your predecessors, Dr. James B. Edwards, so it is always good to have the Secretary of Energy here.

Obviously, we want to talk about the budget and a big part of the budget is going to be the $36 billion Loan Guarantee Program for nuclear energy. But in light of what has happened in Japan, we are obviously going to be interested in your comments about the safety and the NRC Chairman's safety of our existing nuclear reactors and the new reactors that are beginning to be permitted and hopefully be built in our Nation. I continue to be a strong supporter of nuclear energy, and I hope that you and the President also continue to do so.

I noticed your support for a clean energy standard. I am not sure, Mr. Secretary, that we need any kind of an energy standard for America, but I think myself and others may be willing to look at it. Obviously, it depends on what the definition of clean is. And I think any definition should include clean coal, nuclear, and natural gas.

With that I yield back to the chairman or yield back to the subcommittee chairman.

Mr. WHITFIELD. Thank you very much, Mr. Barton. Because of the fact that Mr. Rush did not use all of his time and had 2 minutes left, I am going to recognize Mr. Rush for an additional 2 minutes.

Mr. RUSH. Thank you, Mr. Chairman. Mr. Chairman, I yield 2 minutes to Mr. Markey.

Mr. MARKEY. Thank you, Mr. Rush, very much.

Right now, a few dozen brave souls are fighting a nuclear meltdown with water trucks. We send our prayers to those heroes and to the people of Japan.

The effects of this disaster have already rippled through the world. China, Venezuela, Germany, Switzerland, and other countries are shutting down older plants and scrapping plans for new ones. We, too, need a seismic shift in our approach to nuclear reactor safety. I fear that we are not moving fast enough to take these important steps.

Just yesterday, the Department of Health and Human Services announced that it would study the distribution of potassium iodide, a radiation emergency pill that is being distributed to Japanese people and to U.S. military personnel in the region. It has been 32 years since the Kemeny Commission that investigated the Three Mile Island accident recommended it.

It has been 29 years since I held a hearing and called for its use. It has been 10 years since the Nuclear Regulatory Commission began making potassium iodide available within 10 miles of a nuclear reactor. It has been 9 years since this committee passed my law to expand the distribution zone of these pills from 10 miles to 20 miles away from the reactor. It has been 7 years since the National Academy of Sciences endorsed its use. And yet two administrations have ignored the law. We don't need to study these pills to know that they can prevent cancer. I believe that the Obama ad-

ministration should immediately implement my law from 7 years ago, having it be distributed within a 20-mile radius.

Our economy crumbled because Wall Street took high-risk investments and transformed them into safe-looking bonds. As the underlying sub-prime loans defaulted en masse, these investments turned into toxic assets that no one wanted. So President Bush created the TARP Program so the government could buy them. That is pretty much what we are looking at on nuclear loan guarantees. They are just like a toxic asset, literally and financially guaranteed by the federal taxpayers if something goes wrong. The industry will be OK financially. The taxpayers will be left with the tab. We have already known what happens when the taxpayer has to pick up the tab when things go wrong. We should be very careful from this moment on.

Mr. WHITFIELD. Thank you, Mr. Markey. At this time, Secretary Chu, we recognize you for your opening statement and look forward to your testimony.

STATEMENT OF STEVEN CHU, SECRETARY, UNITED STATES DEPARTMENT OF ENERGY

Mr. CHU. Thank you, Chairman Whitfield, and I thank Chairman Upton, Ranking Member Waxman, Mr. Barton—Mr. Dingell I don't see is here today—and of course all the members of the committee. Thank you for the opportunity to discuss the President's fiscal year 2012 budget request for the Department of Energy.

I want to begin by expressing the administration's support for the people of Japan, as well as American citizens in Japan as they respond to and recover from the tragic events of the past few days.

Officials from the Department of Energy, the Nuclear Regulatory Commission, and other agencies have maintained close contact with Japanese officials and provided the Japanese Government with expertise in a variety of areas. As far as that effort, the Department of Energy has sent 2 experts to Japan to provide advice and technical assistance. We are positioning Consequence Management Response Teams in U.S. Consulates and military installations in Japan. These teams have the skills, expertise, and equipment to help assess, survey, monitor, and sample areas. They include smaller groups that could be sent out to gather technical information in the area. We have sent our Arial Measurement System Capability, including detectors, analytical equipment used to provide assessments of contamination underground. In total, the DOE team includes 39 people with more than 1,700 pounds of equipment.

The Department is also monitoring activities through the DOE Nuclear Incident Team as employing assets at its national laboratories to provide ongoing predictive atmospheric modeling capabilities based on a variety of scenarios. The American people should have full confidence that the United States has rigorous safety regulations in place to ensure that our nuclear power is generated safely and responsibly.

Information is still coming in about the events unfolding in Japan, but the administration is committed to learning from Japan's experience as we work to continue to strengthen America's nuclear industry. Safety remains at the forefront of our effort to responsibly develop America's energy resources, and we will continue

to incorporate the best practices and lessons learned in that process.

To meet our energy needs the Administration believes we must rely on a diverse set of energy sources, including renewables like wind and solar, natural gas, clean coal, and nuclear power. We look forward to a continued dialogue with Congress in moving that agenda forward.

Now, I would like to turn to the budget. President Obama has a plan to win the future by out-innovating, out-educating, out-building the rest of the world, while at the same time addressing the deficit. The President's budget makes touch choices, and cutting in many areas while recognizing that we must invest in strategic areas like clean energy innovation that will create jobs and strengthen competitiveness. To that end, President Obama has called for an increase in investments in clean energy research, development, and deployment. In addition, he has proposed a bold but achievable goal of generating 80 percent of America's electricity from clean sources by 2035.

A clean energy standard will provide clean long-term signal, a clean long-term signal to industry to bring capital off the sidelines and into the clean energy sector. The government does not need to pick favorites. The most competitive clean energy sources will win in the marketplace.

The Department of Energy's fiscal year 2012 budget requires that $29.5 billion supports the President's goals. Defense-related activities such as nonproliferation and cleaning up the Cold War sites account for roughly half that budget. The other half, which includes energy and science programs, are also critical to national security in addition to economic competitiveness.

Through energy efficiency programs, we will save money for consumers by saving energy. In addition, the budget supports the research, development, and deployment of renewable energy, the modernization of the electric grid, and the advancement of carbon capture and sequestration technologies. And it helps reduce our dependence on oil by developing the next generation of biofuels, by accelerating electric vehicles research and deployment.

The budget supports loans for renewables and energy efficiency technologies. Nuclear energy also has an important role to play in our energy portfolio. The budget requests up to 36 billion in loan guarantee authority to help deploy a new generation of American nuclear reactors. It also invests in research and development of advanced nuclear technologies. The budget invests in basic and applied research and keeps us on a path to doubling funding for key scientific agencies, including the Office of Science.

The budget invests 550 million in Advanced Research Projects Agency-Energy. The administration also seeks an additional 100 million for RPE as part of the President's Wireless Innovation and Infrastructure Initiative. This investment will allow RPE to continue the promising early-stage research projects that aim to deliver game-changing clean energy technologies.

Another key piece of our research effort is the Energy Innovation Hubs. The hubs bring together our Nation's top scientists and engineers to achieve similar game-changing energy goals. Over a concentrated effort over a longer-time horizon is needed to establish

innovation leadership. The budget requests $146 million to support three existing hubs and to establish three new hubs.

Finally, the budget supports the Energy Frontier Research Centers, which are mostly university-led teams working to solve specific scientific problems that are blocking clean energy development. To reach our energy goals we must take a portfolio approach: pursuing several research strategies that have proven to be successful in the past. This is not a kitchen-sink approach. This work is being coordinated and prioritized with a 360-degree view of how the pieces fit together.

Together, these initiatives will help America lead in innovation. In addition to strengthening out economy, the budget request also strengthens our security by providing $11.8 billion for the Department's National Nuclear Security Administration.

The Department is mindful of our responsibility to the taxpayer. We are cutting back in multiple areas, including eliminating unnecessarily fossil fuel subsidies. We are streamlining operations. And we are making some tough choices by freezing salaries and bonuses for hardworking National Laboratory Site and Facility Management contractor employees.

The United States faces a choice today. Will we outcompete the rest of the world or will we fall behind? To lead the world in clean energy, we must act now. We cannot afford not to.

Thank you. And I would be pleased to answer any questions you may have.

[The prepared statement of Secretary Chu follows:]

Statement of Secretary Steven Chu
U.S. Department of Energy
Before the
Subcommittee on Energy and Power
And
Subcommittee on Environment and the Economy
Committee on Energy and Commerce
U.S. House of Representatives

FY 2012 Budget Hearing
March 16, 2011

Chairmen Whitfield and Shimkus, Ranking Members Rush and Green, and Members of the Committee, thank you for the opportunity to appear before you today to discuss the President's Fiscal Year 2012 budget request for the Department of Energy.

In his State of the Union address, President Obama laid out a plan for the United States to win the future by out-innovating, out-educating and out-building the rest of the world, while at the same time addressing the deficit. The President's budget request invests in much-needed programs while cutting back where we can afford to.

Many countries are moving aggressively to develop and deploy the clean energy technologies that the world will demand in the coming years and decades. As the President said, this is our generation's "Sputnik moment."

We must rev up the great American innovation machine to win the clean energy race and secure our future prosperity. To that end, President Obama has called for increased investments in clean energy research, development and deployment. In addition, he has proposed a bold but achievable goal of generating 80 percent of America's electricity from clean sources by 2035.

A Clean Energy Standard will provide a clear, long-term signal to industry to bring capital off the sidelines and into the clean energy sector. It will grow the domestic market for clean sources of energy – creating jobs, driving innovation and enhancing national security. And by drawing on a wide range of energy sources including renewables, nuclear, clean coal and natural gas, it will give utilities the flexibility they need to meet our clean energy goal while protecting consumers in every region of the country.

The Department of Energy's FY 12 budget request of $29.5 billion supports these goals and strengthens the nation's economy and security by investing in the following priorities:

- Supporting groundbreaking basic science, research and innovation to solve our energy challenges and ensure that the United States remains at the forefront of science and technology;

- Leading in the development and deployment of clean and efficient energy technologies to reduce our dependence on oil, accelerate the transition to a clean energy economy and promote economic competitiveness; and

- Strengthening national security by reducing nuclear dangers, maintaining a safe, secure and effective nuclear deterrent and cleaning up our Cold War nuclear legacy.

While we are investing in areas that are critical to our future, we are also rooting out programs that aren't needed and making hard choices to tighten our belt. Additionally, we are improving our management and operations so we function more efficiently and effectively.

Leading in the Global Clean Energy Economy

As the President said in his State of the Union address, investing in clean energy will strengthen our security, protect our planet, and create countless new jobs here at home. The Department's budget request invests $3.2 billion in energy efficiency and renewable energy programs.

Through programs to make homes and buildings more energy efficient, including a new "Better Buildings Initiative" to make commercial buildings 20 percent more efficient over the next decade, we will save money for families and businesses by saving energy. That is money that can be re-invested back into the economy. In addition, the budget supports the research, development and deployment of renewable sources of energy like wind, solar and geothermal. It supports the modernization of the electric grid and the advancement of carbon capture and sequestration technologies. And it helps reduce our dependence on oil by developing the next generation of biofuels and accelerating electric vehicle research and deployment to support the President's goal of putting one million electric vehicles on the road by 2015. This includes a $200 million competitive program to encourage communities to invest in electric vehicle infrastructure.

We're also focused on moving clean energy technologies from the lab to the marketplace. Over the past two years, the Department's loan programs have supported more than $26 billion in loans, loan guarantees, and conditional commitments to guarantee loans for 23 clean energy and enhanced automotive fuel efficiency projects across the country, which the companies estimate will create or save more than 58,000 jobs. Building on this success, we are requesting new credit subsidy that will support approximately $1 billion to $2 billion in loan guarantees for innovative renewable energy and energy efficiency technologies. These deployment efforts build on the substantial investment made in the clean energy sector by the Recovery Act, and are supplemented by tax incentives that have also played an important role in bringing clean energy projects to market, such as the 48C manufacturing tax credits and the 1603 cash grants in lieu of investment tax credits, which the 2012 budget also expands. We are also requesting $100

million in credit subsidy for a new "Better Buildings Pilot Loan Guarantee Initiative for Universities, Schools, and Hospitals," which will guarantee up to $2 billion in loans to support energy efficient retrofits.

Nuclear energy also has an important role to play in our energy portfolio. To jumpstart the domestic nuclear industry, the budget requests up to $36 billion in loan guarantee authority. It also invests in the research and development of advanced nuclear technologies, including small modular reactors.

Supporting Groundbreaking Science

To spur innovation, the President's budget request invests in basic and applied research and keeps us on the path to doubling funding for key science agencies, including the Department's Office of Science. As Norm Augustine, former Chairman of Lockheed Martin and former Under Secretary of the Army, has said, under-funding R&D in a time of austerity is like removing the engine of an aircraft to reduce its weight.

That is why the budget request increases support for the Department's comprehensive research strategy to accelerate energy breakthroughs.

Through $5.4 billion for the Office of Science, we're expanding our investment in basic energy sciences, advanced scientific computing and biological and environmental sciences – all key areas for our future economic competitiveness.

The budget invests $550 million in the Advanced Research Projects Agency-Energy, also known as ARPA-E. The Administration also seeks an additional $100 million for ARPA-E from the Wireless Innovation Fund to support wireless clean energy technologies. This investment will allow ARPA-E to continue the promising early-stage research projects that aim to deliver game-changing clean energy technologies. ARPA-E's projects are generating excitement both in the Department and in the private sector. For example, through a combined total of $24 million from ARPA-E, six companies have been able to advance their research efforts and show the potential viability of their cutting-edge technologies. This extremely valuable early support enabled those companies to achieve R&D milestones that, in turn, have attracted more than $100 million in private sector funds to the projects. This is precisely the innovation leverage that is needed to win the future.

Another key piece of our research effort is the Energy Innovation Hubs. Through the Hubs, we are bringing together our nation's top scientists and engineers to achieve similar game-changing energy goals, but where a concentrated effort over a longer time horizon is needed to establish innovation leadership. The Department has established three Energy Innovation Hubs in the areas of energy efficient buildings, modeling and simulation for nuclear reactors and fuels from sunlight. The budget requests $146 million to support the three existing Hubs and to establish three new Hubs in the areas of batteries and energy storage, smart grid technologies and systems, and critical materials.

The Energy Innovation Hubs were modeled after the Department of Energy's BioEnergy Institutes, which have established an outstanding three-year track record.

Finally, the budget continues to support the Energy Frontier Research Centers, which are mostly university-led teams working to solve specific scientific problems that are blocking clean energy development.

The Energy Innovation Hubs, ARPA-E, and EFRCs represent three complementary approaches to advance groundbreaking discovery. When you think of the EFRCs, think about a collaborative team of scientists such as Watson and Crick unlocking the secrets of DNA. When you think of ARPA-E, think about visionary risk-takers launching new technologies and start-up companies out of their garages. When you think of the Hubs, think of large, mission-oriented research efforts such as the Manhattan Project, the development of radar at MIT's Radiation Laboratory during World War II and the research in America's great industrial laboratories in their heyday.

We don't know where the big energy breakthroughs are going to come from. To reach our energy goals, we must take a portfolio approach to R&D: pursuing several research strategies that have proven to be successful in the past. But I want to be clear – this is not a "kitchen sink" approach. This work is being coordinated and prioritized, with a 360-degree view of how these pieces fit together. Taken together, these initiatives will help America lead in science and technology innovation.

Nuclear Safety and Security

In addition to strengthening our economy, the budget request also strengthens our security by providing $11.8 billion for the Department's National Nuclear Security Administration. The five-year FY 12 to FY 16 request of nearly $65 billion for NNSA reflects the President's nuclear security priorities, as well as his commitment to modernize the U.S. nuclear weapons enterprise and sustain a strong nuclear deterrent for the duration of the New START Treaty and beyond.

The request of $7.6 billion for Weapons Activities provides a strong basis for transitioning to a smaller yet still safe, secure and effective nuclear stockpile without additional nuclear testing. It also provides much-needed resources to strengthen science, technology and engineering capabilities and to modernize the physical infrastructure of our nuclear security enterprise.

The President has identified the danger of terrorists getting their hands on nuclear weapons or the material to build them as the greatest threat to global security. To support the President's goal of securing all vulnerable nuclear material around the world in four years, the budget invests $2.5 billion in the NNSA Defense Nuclear Nonproliferation program. This is part of a five-year, $14.2 billion commitment for the program.

The budget also requests $1.2 billion to support the Navy's nuclear powered submarines and aircraft carriers. And it provides $6.1 billion to protect public health and safety by cleaning up the nation's Cold War nuclear legacy.

Fiscal Responsibility

Through our investments, we are laying the groundwork for the nation's future prosperity and security. At the same time, we are mindful of our responsibility to the taxpayer.

We are cutting back in multiple areas, including eliminating unnecessary fossil fuel subsidies, reducing funding for the Fossil Energy program and reducing funding for the hydrogen technology program. We're streamlining operations to reduce administrative costs. And we're making some painful cuts, including ending operation of the Tevatron accelerator and freezing salary and bonuses for hard-working National Laboratory, site and facility management contractor employees.

Finally, we continue to make progress on a management excellence agenda to improve our operations.

The United States faces a choice today: will we lead in innovation and out-compete the rest of the world or will we fall behind? To lead the world in clean energy, we must act now. We can't afford not to.

Thank you, and now I am pleased to answer any questions you may have.

HIGHLIGHTS OF THE FY 2012 BUDGET REQUEST

In his State of the Union address, President Obama said that America faces "our generation's Sputnik moment" and that we need to out-innovate, out-educate and out-build the rest of the world to capture the jobs of the 21st century. "In America, innovation doesn't just change our lives. It's how we make our living." Through innovation in promising areas like clean energy, the United States will win the future and create new industries and new jobs. To lead in the global clean energy economy, we must mobilize America's innovation machine in order to bring technologies from the laboratory to the marketplace. The Department of Energy (DOE) is on the front lines of this effort. To succeed, the Department will pursue game-changing breakthroughs, invest in innovative technologies, and demonstrate commercially viable solutions.

In addition to energy advances that spark economic growth, national security remains fundamental to the Department's mission. Through bipartisan ratification of the New START treaty with Russia, America and its global partners are leading by example in implementing the focused expansion of domestic and international activities to reduce the threat of nuclear weapons, nuclear proliferation, and unsecured or excess weapons-usable materials. The National Nuclear Security Administration (NNSA) supports the international effort to secure all vulnerable nuclear materials around the world within four

years. The NNSA also fulfills the President's commitment to modernize the nation's nuclear stockpile until a world without nuclear weapons can be realized.

The Department's Fiscal Year (FY) 2012 budget request is $29.5 billion, an 11.8 percent or $3.1 billion increase from FY 2010 current appropriation levels. The FY 2012 request supports the President's goals to increase America's competitiveness by making strategic investments in our nation's clean energy infrastructure and to strengthen our national security by reducing the global threat of nuclear materials. The President has called for advancing research on clean energy technologies and manufacturing, doubling the share of electricity generated from clean energy supplies by 2035, and putting one million electric vehicles on the road by 2015. The Department's request prepares for a multi-year effort to address these interconnected objectives and prioritizes research and development of renewable energy technologies to expand sustainable energy options for the United States.

The FY 2012 budget builds on the intense planning, execution, and oversight of the $35.2 billion from the American Recovery and Reinvestment Act of 2009. By the end of FY 2010, the Department successfully obligated $32.7 billion of Recovery Act funds, including all funding that was set to expire. In developing the FY 2012 budget request, the Department has taken these investments into account and will oversee execution of these funds with value to the taxpayer in mind. Recovery Act investments are focused on: energy conservation and renewable energy sources ($16.8 billion), environmental cleanup ($6 billion), loan guarantees for renewable energy and electric power transmission projects ($2.4 billion), grid modernization ($4.5 billion), carbon capture and sequestration ($3.4 billion), basic science research ($1.6 billion), and the Advanced Research Projects Agency – Energy ($0.4 billion). The Department's Recovery Act activities are strengthening the economy by providing much-needed investment, saving or creating tens of thousands of jobs, cutting carbon pollution, and reducing U.S. dependence on oil.

The President's FY 2012 Budget supports three strategic priorities:

- **Transformational Energy:** Accelerate the transformation to a clean energy economy and secure U.S. leadership in clean energy technologies.
- **Economic Prosperity:** Strengthen U.S. science and engineering efforts to serve as a cornerstone of our economic prosperity and lead through energy efficiency and secure forms of energy.
- **Nuclear Security:** Enhance nuclear security through defense, nonproliferation, naval reactors, and environmental cleanup efforts.

As the President has articulated, innovation is essential to America's economic competitiveness. To meet the challenge of 'our generation's Sputnik moment,' the Department supports a coordinated strategy for research and development across all of its programs. With every initiative the Department undertakes, sound science is at the core. In FY 2012, we will increasingly emphasize cross-cutting initiatives to link science throughout the Department, specifically with energy and national security programs in

order to deliver results to the American taxpayer. In the Office of Science, the Department requests $5.4 billion, a 9.1 percent or $452 million increase over the FY 2010 current appropriation levels, to support an elevated focus on the advancement of the United States' leadership in fundamental research. Advanced Research Projects Agency – Energy (ARPA-E) is building on established gains since its initial funding in FY 2009 through the Recovery Act to perform transformational research and create game-changing breakthroughs for eventual market adoption. The FY 2012 budget request includes $550 million for ARPA-E to sustain investment in new energy technologies.

Energy Innovation Hubs play a key role in solving specific energy challenges by convening and focusing top scientific and engineering talent to focus on those problems. The Hubs bring together multidisciplinary team of researchers in an effort to speed research and shorten the path from scientific discovery to technological development and commercial deployment of highly promising energy-related technologies. The Department is proposing to double its commitment to this research approach by requesting three new Hubs to focus on batteries and energy storage, critical materials, and Smart Grid technologies and systems. The Department will continue funding the three Energy Innovation Hubs introduced in FY 2010 to focus on developing fuels that can be produced directly from sunlight, improving energy efficient building systems design, and using modeling and simulation tools to create a virtual model of an operating advanced nuclear reactor. Complementing the Hubs, the Department plans in FY 2012 to continue coordination with the Office of Science's Energy Frontier Research Centers, which exemplify the pursuits of broad-based science challenges for energy applications.

Energy Security: Promoting America's Energy Security through Reliable, Clean and Affordable Energy

In his State of the Union address, the President outlined clearly to the American people his roadmap for transforming our nation's energy economy to meet the demands of future generations. "Instead of subsidizing yesterday's energy, let's invest in tomorrow's," he said. To meet the President's challenge, the Department must recruit the sharpest research minds and build on its aggressive discovery agenda across all programs to achieve breakthroughs on the most pressing energy challenges facing the United States.

In his address, President Obama laid out a goal for clean energy sources to account for 80 percent of America's electricity by 2035. In FY 2012, the Department requests funds to help achieve this Presidential objective and address many of the energy delivery challenges facing American families and energy providers.

- **Applied Research, Development and Deployment** – Meeting the President's goal of making America the first country to have one million electric vehicles on the road by 2015, the Department will research cost competitive methods to develop electric vehicles, increase the adaptability and capacity of the grid to enable vehicle charging, incentivize communities to invest in electric vehicles and infrastructure and send these vehicles to the nation's roadways. The Department will also launch competitive manufacturing research for breakthrough

technologies in energy efficiency diagnostics and retrofits to help business owners around the country save money on energy costs.

- **Loan Guarantees:** The Loan Programs Office (LPO) is a vital tool for promoting innovation in the energy sector across a broad portfolio of clean and efficient energy technologies. In FY 2012, the Department is requesting credit subsidies to support approximately $1 to $2 billion in loan guarantees for renewable energy deployment and up to $36 billion in additional authority to loan guarantees for nuclear power projects. The Department will also continue to streamline and prioritize the issuance of loan guarantees to leverage private sector investment in clean energy and energy efficiency projects that will save and create jobs.

- **Better Buildings Initiative:** Last year, commercial buildings consumed roughly 20 percent of all energy in the U.S. economy. Improving energy efficiency in our buildings can create jobs, save money, reduce our dependence on oil, and make our air cleaner. The President's Better Buildings Initiative will make commercial buildings 20 percent more energy efficient over the next decade through initiatives that include: re-designing the current tax deduction for commercial buildings and upgrades to a credit that is more generous and that will encourage building owners and real estate investment trusts (REITs) to retrofit their properties; improving financing opportunities for retrofits through programs including a new Better Buildings Pilot Loan Guarantee Initiative for Universities, Schools and Hospitals, for which the Department of Energy requests $100 million in credit subsidy to guarantee up to $2 billion in loans for energy efficiency retrofits for these facilities; creating a $100 million Race to Green competitive grant program for state and municipal governments to implement innovative approaches to building codes, performance standards, and regulations so that commercial building efficiency will become the norm in communities across the country; and calling on CEOs and university presidents to join the Department of Energy and other Federal partners in a Better Buildings Challenge to make their organizations leaders in saving energy. The Better Buildings Initiative builds on our investments through the Recovery Act and our continued commitment to passing "HOMESTAR" legislation to encourage American families to make energy saving upgrades in their homes.

- **Electricity Reliability and Energy Management:** Reliable, affordable, efficient, and secure electric power is vital to expanding economic recovery, protecting critical infrastructures, and enabling the transition to renewable energy sources. The FY 2012 request invests $238 million to bring the next generation of grid modernization technologies closer to deployment and commercialization, to assist states and regional partners in grid modernization efforts, and to facilitate recovery from energy supply disruptions when they occur. The request includes a new Smart Grid Technology and Systems Hub that will address the total electricity system, covering applied science, technology, economic, and policy issues that affect our ability to modernize the grid. The FY 2012 request also

plans an expansion of the Home Energy Score program that provides homeowners with information on how their homes can be more energy efficient and guidance for saving on home energy costs. This is in addition to the President's support for passage of the Home Star rebate program in 2011.

Investing in energy efficiency, renewable energy generation, and grid modernization are fundamental steps necessary for creating a clean energy economy. We must also invest in the improvement of existing sources of energy that will provide a bridge between current and future technologies. These technologies are already a major segment of the energy mix and will play a critical role in providing a solid foundation that will make possible the creation of a new energy economy.

- **Leadership in Nuclear Energy:** Nuclear energy currently supplies approximately 20 percent of the Nation's electricity and 70 percent of the Nation's clean, non-carbon electricity. The request for the Office of Nuclear Energy includes $380 million for research and development, in addition to key investments in supportive infrastructure. In addition, the Department is engaging in cost-shared activities with industry that may help accelerate commercial deployment of small modular reactors. The request includes funding for cost-shared design certification and licensing activities for small modular reactors, the deployment of which holds promise for vastly increasing the generation of clean energy on a cost competitive basis. The Department will also promote nuclear power through the Loan Guarantee Program, which is requesting up to $36 billion in additional loan guarantee authority in FY 2012.

- **Advanced Fossil Energy: Experience in Carbon Capture and Storage:** The world will continue to rely on coal-fired electrical generation to meet energy demand. It is imperative that the United States develop the technology to ensure that base-load electricity generation is as clean and reliable as possible. The Office of Fossil Energy requests $452.9 million for research and development of advanced coal-fueled power systems and carbon capture and storage technologies. The Budget focuses resources within the fossil energy program on activities that can reduce carbon pollution and have potential benefits for both the existing fleet and new power plants – specifically, post-combustion capture R&D and geologic carbon storage R&D.

- **Ending Tax Subsidies to Fossil Fuel Producers:** In accordance with the President's agreement at the G-20 Summit in Pittsburgh to phase out subsidies for fossil fuels so that we can transition to a 21st century energy economy, the Administration proposes to repeal a number of tax preferences available for fossil fuels. Tax subsidies proposed for repeal include, but are not limited to: the credit for oil and gas produced from marginal wells; the deduction for costs paid or incurred for any tertiary injectant used as part of a tertiary oil recovery method; the ability to claim the domestic manufacturing deduction against income derived from the production of oil and gas and coal; and expensing the exploration and development costs for coal.

Economic Security: Sharpening America's Competitive Edge through a Clean Energy Economy

To meet "our generation's Sputnik moment" and promote economic competitiveness, the U.S. must demonstrate leadership in clean energy technologies. "We'll invest in biomedical research, information technology and especially clean energy technology – an investment that will strengthen our security, protect our planet, and create countless new jobs for our people," said President Obama before Congress in the State of the Union address. President Obama outlined his comprehensive vision to lead our nation's clean energy economy and provide economic security to Americans. As the Administration seeks to reduce federal government spending, the Department recognizes its role and has tightened its expenditures in several areas such as oil and natural gas. The FY 2012 budget request acknowledges the Department's missions to achieve these imperative goals while setting forth a clean energy economy for entrepreneurs and manufacturers to reclaim their competitive edge in clean energy innovation.

The Department plans to promote economic security by building on the progress made through the over $32 billion in grants and contracts under the American Recovery and Reinvestment Act of 2009, which made historic investments in the nation's economy and has put the country on target to double renewable energy generation by 2012. The Recovery Act helped create tens of thousands of jobs and, combined with the FY 2012 request, will help the Department accelerate the transition of our nation to a clean energy economy.

The President's FY 2012 Budget supports the plan to rebuild our economy through clean energy research and development by:

- **Expanding ARPA-E to spur innovation** – The President's request proposes $550 million for the Advanced Research Projects Agency – Energy (ARPA-E) program, plus an additional $100 million for the program from the Wireless Innovation and Infrastructure Initiative for a total of $650 million. ARPA-E performs transformational and cutting edge energy research with real-world applications in areas ranging from grid technology and power electronics to batteries and energy storage. The budget also supports programs with significant promise to provide reliable, sustainable energy across the country, such as the SunShot initiative aimed at making solar energy cost competitive. With focused investment in manufacturing innovation and industrial technical efficiencies, the President's proposal will move private sector capital off the shelves and into the marketplace.

- **Targeting investments for future economic growth** – To secure a competitive advantage in high-tech industries and maintain international leadership in scientific computing, we will invest in core research activities for energy technologies, the development of general biological design principles and new synthetic molecular toolkits to improve understanding of natural systems, and

core research activities to advance the frontiers of high performance computing. Underlying these investments in research is the education and training of thousands of scientists and engineers who contribute to the skilled scientific workforce needed for a 21st century innovation economy.

- **Doubling the number of Energy Innovation Hubs to solve key challenges** – Innovation breakthroughs occur when scientists collaborate on focused problems. The FY 2012 budget request proposes three new Energy Innovation Hubs that will bring top American scientists to work in teams on critical energy challenges in areas such as critical materials, batteries and energy storage, and Smart Grid technologies. These will join three existing Hubs that focus on fuel generation from sunlight, building efficiency, and nuclear reactor modeling and simulation.

- **Integrating Research & Development:** The Department has identified areas where coordinated work by discovery-oriented science and applied energy technology programs hold the greatest promise for progress in achieving our energy goals. The Energy Systems Simulation to increase the efficiency of the Internal Combustion Engine (ICE) will produce a set of modern, validated computer codes that could be used by design engineers to optimize the next generation of cleaner, more efficient combustion engines. An initiative on extreme environments will close the gap between actual and ideal performance of materials in nuclear environments. And the Department's Exascale Computing initiative will allow the Department to take the lead in developing the next generation of scientific tools and to advance scientific discoveries in solving practical problems.

- **Pursuing the passage of HOMESTAR** – Enactment of this program will create jobs by providing strong short-term incentives for energy efficiency improvements in residential buildings. The HOMESTAR program has the potential to accelerate our economic recovery by boosting demand for energy efficiency products and installation services. The program will provide rebates of $1000 to $3000 per household to encourage immediate investment in energy-efficient appliances, building mechanical systems and insulation, and whole-home energy efficiency retrofits. This program will help middle-class families save hundreds of dollars a year in energy costs while improving the comfort and value of their most important investment – their homes. In addition, the program would help reduce our economy's dependence on fossil fuels and support the development of an energy efficiency services sector in our economy.

- **Extending access to tax credit and tax grant programs** – Two provisions of the American Recovery and Reinvestment Act have been extraordinarily successful in spurring the deployment of renewable energy projects and building advanced manufacturing capabilities: Section 48C Advanced Energy Manufacturing Tax Credit program and the Section 1603 Energy Cash Assistance program. The Administration is pursuing an additional $5 billion in support for the Section 48C program, which, by providing a 30% tax credit for energy manufacturing

facilities, will continue to help build a robust high-technology, U.S. manufacturing capacity to supply clean energy projects with U.S. made parts and equipment. The Section 1603 tax grant program has created tens of thousands of jobs in industries such as wind and solar by providing up-front incentives to thousands of projects. The Administration is seeking a one-year extension of this program.

- **Promoting efficient energy use in our everyday lives** - Currently, weatherization of more than 300,000 homes of low income families has been achieved, providing energy cost savings and financial relief to households. The FY 2012 request of $320 million continues residential weatherization, while increasing the focus on new innovative approaches to residential home weatherization.

National Security: Securing Nuclear and Radiological Materials, Maintaining Nuclear Deterrence, and Advancing Responsible Legacy Cleanup

A pillar of President Obama's national security agenda for the United States is to eliminate the global threat posed by nuclear weapons and prevent weapons-usable nuclear material from falling into the hands of terrorists. As part of this agenda, the Administration and Congress worked tirelessly toward the December 2010 bipartisan ratification of the New Strategic Arms Reduction Treaty (New START) with Russia, which cuts the number of strategic nuclear weapons each country can deploy to 1,550. After signing this agreement in April 2010, President Obama said, "In many ways, nuclear weapons represent both the darkest days of the Cold War, and the most troubling threats of our time. Today, we've taken another step forward ... in leaving behind the legacy of the 20th century while building a more secure future for our children. We've turned words into action. We've made progress that is clear and concrete. And we've demonstrated the importance of American leadership -- and American partnership -- on behalf of our own security, and the world's".

The Department's National Nuclear Security Administration (NNSA), through work with global partners and efforts to secure vulnerable nuclear materials, achieved significant milestones during FY 2010 and FY 2011 to reduce the risk of proliferation and leverage science to maintain our nation's nuclear deterrence. Additionally, the Environmental Management program made progress advancing responsible nuclear cleanup from the Cold War. The Department's FY 2012 request seeks to build upon these successes and advance the President's nuclear security agenda.

Reduce the Risk of Proliferation

In 2009, President Obama committed the United States to an international effort to secure vulnerable nuclear material worldwide in four years. To solidify international support for this effort, and to address the threat of nuclear terrorism, the President convened leaders from 47 countries at the Washington Nuclear Security Summit in April 2010. The Summit resulted in a Communiqué which stated, "Nuclear terrorism is one of the most

challenging threats to international security, and strong nuclear security measures are the most effective means to prevent terrorists, criminals, or other unauthorized actors from acquiring nuclear materials."

The FY 2012 budget for the NNSA Defense Nuclear Nonproliferation program will help advance further work that is needed to meet the goals of President Obama and the Nuclear Security Summit, recognizing the urgency of the threat and making the full commitment to global cooperation on nonproliferation. The budget provides $2.5 billion in FY 2012, and $14.2 billion through FY 2016 to detect, secure, and dispose of dangerous nuclear and radiological material worldwide. This request is a decrease of 5 percent, or $138 million, from the FY 2011 request, which reflects completion of accelerated efforts to secure vulnerable nuclear materials within the President's stated timeframe. The decrease also reflects our decision to await agreement between the United States and Russia on detailed implementation milestones prior to requesting additional U.S. pledged funding to support Russian plutonium disposition. The FY 2012 budget request follows through on securing vulnerable materials and supports efforts to design new technologies in support of treaty monitoring and verification, which will contribute to implementation of New START. The budget also broadens cooperative nonproliferation initiatives with foreign governments and international organizations in support of the President's objective of a world without nuclear weapons. The budget continues the provision of security upgrades at selected sites, both within the United States and in foreign countries, to address outsider and insider threats, and accelerates the pace of research reactor conversions from use of highly-enriched uranium fuel to low-enriched uranium fuel.

Leverage Science to Maintain Nuclear Deterrence

The FY 2012 budget request advances the Department's commitment to the national security interests of the United States through stewardship of a safe, secure and effective nuclear weapons stockpile without the use of underground nuclear testing. The 2010 Nuclear Posture Review Report calls for the United States to reduce nuclear force levels. As the United States begins the reduction required by New START, the science, technology and engineering capabilities and intellectual capacity within the nuclear security enterprise become more critical to sustaining the U.S. nuclear deterrent. NNSA continues to emphasize these capabilities, including functioning as a national science, technology, and engineering resource to other agencies with national security responsibilities. Through the NNSA, the Department requests $7.6 billion for the Weapons Activities appropriation, an 8.9 percent, or $621 million, increase from the President's FY 2011 request. It also is an 18.9 percent, or $1.205 million increase from the FY 2010 enacted appropriation. This increase reflects an investment strategy that provides a strong basis for transitioning to a smaller yet still safe, secure and effective nuclear stockpile without additional nuclear testing, strengthening the science, technology and engineering base, modernizing the physical infrastructure, and streamlining the enterprise's physical and operational footprint. These investments will further enable the Nuclear Posture Review's comprehensive nuclear defense strategy, based on current and projected global threats that rely less on nuclear weapons, while

strengthening the nation's nuclear deterrent through completing major stockpile system life extensions, stabilizing the science, technology and engineering base, and modernizing the infrastructure.

The Naval Reactors program ensures the safe and reliable operation of reactor plants in nuclear-powered submarines and aircraft carriers, constituting 45 percent of the U.S. Navy's combatants. The FY 2012 request for Naval Reactors of $1.2 billion, is an increase of $83.2 million or 7.8 percent over the FY 2011 request and $209 million or 18.1 percent above the FY 2010 enacted appropriation. Funding for this program is ramping up for reactor design and development efforts for the Ohio Class Replacement Submarine ($121 million), refueling of the Land-Based Prototype ($99.5 million), and recapitalization of the naval spent nuclear fuel infrastructure for the Spent Fuel Handling Recapitalization program ($53.8 million) at the Naval Reactors Facility located at the Idaho National Laboratory.

Advance Responsible Environmental Cleanup

The FY 2012 budget includes $6.13 billion for the Office of Environmental Management (EM), to protect public health and safety by cleaning up hazardous, radioactive legacy waste from the Manhattan Project and the Cold War. This funding will allow the program to continue to accelerate cleaning up and closing sites, focusing on activities with the greatest risk reduction. Acceleration of cleaning up sites where funding would have immediate impact was established as the overarching objective of the $6 billion in Recovery Act funding. EM will use the remaining $309 million of Recovery Act funding during FY 2012 as it completes footprint reduction and near-term completion cleanup activities.

As the Department continues to make progress in completing environmental cleanup, the FY 2012 budget request of $170 million for the Office of Legacy Management supports the Department's long-term stewardship responsibilities and payment of pensions and benefits for former contractor workers after site closure.

DEPARTMENT OF ENERGY FY 2012 PROGRAM OFFICE HIGHLIGHTS

Office of Science: Invest in the Building Blocks of American Innovation

The Department of Energy's Office of Science (SC) delivers scientific discoveries and major scientific tools to transform our understanding of energy and matter and advance the energy, economic, and national security of the United States. SC is the largest Federal sponsor of basic research in the physical sciences, supporting programs in areas such as physics, chemistry, biology, environmental sciences, applied mathematics, and computational sciences. In FY 2012, the Department requests $5.4 billion, an increase of 9.1 percent over the FY 2010 current appropriation, to invest in basic research. The FY 2012 request supports the President's *Strategy for American Innovation*, and is consistent with the goal of doubling funding at key basic research agencies, including the Office of

Science. The FY 2012 Office of Science budget request supports the following objectives from the *Strategy*, including:

- Unleash a clean energy revolution
- Strengthen and broaden American leadership in fundamental research
- Develop an advanced information technology ecosystem
- Educate the next generation with 21st century skills and create a world-class workforce

In FY 2012, SC continues to support fundamental research for scientific discovery, but today our country needs to move strongly to solve our energy problems. Therefore, the central theme of this year's budget in SC is research in new technologies for a clean energy future that address competing demands on our environment. These efforts, coordinated with the DOE applied technology programs and with input from the scientific community and industry, will emphasize research underpinning advances in non-carbon emitting energy sources, carbon capture and sequestration, transportation and fuel switching, transmission and energy storage, efficiency, and critical materials for energy applications.

In the area of advancing non-carbon energy sources, the FY 2012 budget request will provide for new investments in the science of interfaces and degradation relevant to solar photovoltaics, basic actinide chemistry research related to advanced nuclear fuel cycles, and research in materials under extreme environments relevant to extreme nuclear technology environments, and genomics-based research on biological design principles and synthetic biology tools to underpin bio-based energy solutions. Carbon capture and sequestration research will focus on novel molecular design for materials and multiscale dynamics of flow and plume migration, respectively. SC will initiate an energy systems simulation research effort focused on predictive modeling of combustion in an evolving fuel environment in support of the Department's efforts in transportation and alternative fuels. Also underpinning transportation and fuel switching, as well as energy storage, the FY 2012 request will support an Energy Innovation Hub for Batteries and Energy Storage. The Fuels from Sunlight Hub, established in FY 2010, as well as the Energy Frontier Research Centers and DOE Bioenergy Research Centers also continue. Research in enabling materials sciences will support needs of future electricity transmission systems and novel building materials to improve building efficiencies.

The FY 2012 budget request also provides for foundational science in condensed matter and materials physics, chemistry, biology, climate and environmental sciences, applied mathematics, computational and computer science, high energy physics, nuclear physics, plasma physics, and fusion energy sciences; and provides for research facilities and capabilities that keep U.S. researchers at the forefront of science. The FY 2012 request supports targeted increases in areas such as computational materials and chemistry by design, nanoelectronics, and advanced scientific applications and integrated application-hardware-software co-design for exascale, which position the U.S. to secure a competitive advantage in high-tech industries and maintain international leadership in scientific computing. Underlying these investments is the education and training of

thousands of scientists and engineers who contribute to the skilled scientific workforce needed for the 21st century innovation economy.

The Office of Science supports investigators at about 300 academic institutions and from all of the DOE laboratories. Over 26,000 researchers from universities, national laboratories, industry, and international partners are expected to use the Office of Science scientific user facilities in FY 2012.

Advanced Research Projects Agency – Energy: Transformational Research and Development

The FY 2012 budget request includes $550 million for the Advanced Research Projects Agency – Energy (ARPA-E), plus an additional $100 million for the program from the Wireless Innovation and Infrastructure Initiative for a total of $650 million. ARPA-E was launched in FY 2009 to sponsor specific high-risk and high-payoff transformational research and development projects that overcome the long-term technological barriers in the development of energy technologies to meet the Nation's energy challenges, but that industry will not support at such an early stage. An essential component of ARPA-E's culture is an overarching focus on accelerating science to market. Beyond simply funding transformational research creating revolutionary technologies, ARPA-E is dedicated to the market adoption of those new technologies that will fuel the economy, create new jobs, reduce energy imports, improve energy efficiency, reduce energy-related emissions, and ensure that the U.S. maintains a technological lead in developing and deploying advanced energy technologies.

Office of Energy Efficiency and Renewable Energy: Investing in Breakthrough Technology and a Clean Energy Future

The Office of Energy Efficiency and Renewable Energy (EERE) supports research, development, demonstration, and deployment activities on technologies and practices essential for meeting national security goals by reducing dependence on oil, meeting environmental goals by minimizing the emissions associated with energy production and use, and stimulating economic growth and job creation by minimizing the cost of energy services. The EERE portfolio emphasizes work areas where the potential impact is largest, where Federal funds are most critical. It balances investments in high-risk research with partnerships with private firms that speed the translation of innovations into practical business opportunities. The diverse set of technologies supported helps ensure that the U.S. has many options for meeting its energy goals. Program management is designed to identify the best groups in the country to address these challenges and supports work in universities, companies, national laboratories, and consortia.

The FY 2012 budget request of $3.2 billion, the increase of 44.4% over the FY 2010 current appropriation, is aimed at accelerating innovation and change in the Nation's energy economy. The request includes programs associated with meeting the President's goals of investing in the next generation of clean energy technologies, vehicles and fuels, and energy efficiency measures that reduce energy use in Federal agencies and the industrial and building sectors.

Clean, Renewable Energy Generation

The FY 2012 budget request continues to work to transform the Nation's energy infrastructure by investing over $1,164.9 million in a variety of renewable programs including solar ($457.0 million), wind ($126.9 million), water ($38.5 million), hydrogen ($100.5 million), biomass ($340.5 million), and geothermal ($101.5 million). Research, development, and deployment of these technologies will reduce the production of greenhouse gas emissions and revitalize an economy built on the next generation of domestic production. The request includes the solar SunShot program which will invest in transformative research focusing on achieving radical cost reductions in photovoltaic modules, balance of systems, and power electronics.

Energy Efficiency

The Department implements a number of efforts to increase energy efficiency in homes, transportation, and industry. The FY 2012 budget requests $1,805.3 million to accelerate deployment of clean, cost-effective, and rapidly deployable energy efficiency measures in order to reduce energy consumption in residential and commercial buildings, and the industrial and Federal sectors. The Department will invest $470.7 million in the Building Technologies program and $33.0 million for the Federal Energy Management Program. Federal assistance for state-level programs such as State Energy Program ($63.8 million), Tribal ($10.0 million) and Weatherization Assistance Program ($320.0 million) will continue to help citizens implement energy efficiency measures, lower energy costs and greenhouse gas emissions, and build a technical workforce. ($319.8 million) for Industry will provide a balanced portfolio of advanced R&D and pursuit of near-term low cost opportunities with the objectives of increasing U.S. competitiveness, enhancing clean energy manufacturing, and improving energy productivity. There will be a focus on next generation manufacturing processes and materials, activities for clean energy manufacturing, and refocused efforts for Industrial Technical Assistance to achieve greater results with less funding through more effective leveraging of funding for deployment partnerships. A new Energy Innovation Hub on critical materials will be competed through the Industrial Technologies program. The FY 2012 request also includes $588 million to accelerate research, development and deployment of advanced vehicle technologies, working in concert with biomass RD&D to reduce the use of petroleum and greenhouse gas emissions.

Better Buildings Initiative for Commercial Energy Savings – The President's Better Buildings Initiative is focused on achieving a 20 percent improvement in commercial buildings' energy use by 2020. The initiative will include many new components to achieve this goal. The following are supported in the Department's FY 2012 request: launch of the Race to Green competitive grant program for states and municipal governments to encourage higher standards for commercial energy efficiency, which is funded within the Buildings Technologies Program; a new pilot loan guarantee program to support energy efficiency retrofits for buildings that serve as community assets; and increased R&D funding for building technologies. The Department intends to work with

the business and academic communities to make their organizations leaders in saving energy.

Office of Electricity Delivery and Energy Reliability: Enabling a Clean Energy Economy

The Office of Electricity Delivery and Energy Reliability (OE) is responsible for leading national efforts to modernize the electric grid, enhance the security of energy infrastructure, and facilitate recovery from disruptions to the energy supply. The Department's FY 2012 budget request for OE of $238 million, a 38% increase over the FY 2010 appropriation, represents a clear and determined effort to accelerate the transformation of one of the Nation's key enablers of a clean energy economy – the electricity delivery system.

The U.S. electricity delivery system was built on technology that was developed early in the 20th century and designed for the demands and challenges of that era. Today, this aging and often congested system is facing many new and complex challenges that require considerable improvements in the physical and technological components of the system. In order to alleviate the stress on the system from increasing demand for electricity and to enable greater use and integration of renewable and distributed resources, all while maintaining the reliability, security, and affordability of electric power, research and development breakthroughs and new energy management approaches are critical in the areas of transmission and distribution, energy storage, and cyber security.

OE's FY 2012 budget request provides $193 million for research and development in these critical areas to bring the next generation of grid technologies closer to deployment and commercialization. The increased investment reflects the President's vision and OE's role in competing in a worldwide technological race. As such, with $20 million in FY 2012, OE will establish a new Energy Innovation Hub, or in the words of President Obama, one of "the Apollo projects of our time." The Smart Grid Technology and Systems Hub will bring together a diverse, multi-disciplinary group to develop an integrated approach to enhancing smart grid technologies and systems. OE will also expand its advanced modeling capabilities to include other system layers in order to provide a more in-depth system understanding. The energy storage program will expand to aggressively support the deployment of grid-scale energy storage technologies with new demonstrations, and the cyber security program will continue to focus on the development and integration of secure control systems.

The budget request continues to support Permitting, Siting, and Analysis (PSA) with $8 million to develop and improve policies, state laws, and programs that facilitate the development of electric infrastructure needed to bring new clean energy projects to market, and to provide technical assistance to states and regions. It also supports Infrastructure Security and Energy Restoration (ISER) with $6.2 million to enhance the reliability and resiliency of critical energy infrastructure and to facilitate recovery from energy supply disruptions.

Office of Environmental Management: Meeting Commitments and Making Progress

The mission of the Office of Environmental Management (EM) is to complete the safe cleanup of the environmental legacy brought about from over six decades of nuclear weapons development, production, and Government-sponsored nuclear energy research. This cleanup effort is the largest in the world, originally involving two million acres at 110 sites in 35 states, dealing with some of the most dangerous materials known to man.

EM continues to pursue its cleanup objectives within the overall framework of achieving the greatest comparative risk reduction benefit and overlaying regulatory compliance commitments and best business practices to maximize cleanup progress. To support this approach, EM has prioritized its cleanup activities:

- Activities to maintain a safe and secure posture in the EM complex
- Radioactive tank waste stabilization, treatment, and disposal
- Spent nuclear fuel storage, receipt, and disposition
- Special nuclear material consolidation, processing, and disposition
- High priority groundwater remediation
- Transuranic and mixed/low-level waste disposition
- Soil and groundwater remediation
- Excess facilities deactivation and decommissioning

The FY 2012 budget request for $6.13 billion will fund activities to maintain a safe and secure posture in the EM complex and make progress against program goals and compliance commitments by reducing the greatest risks to the environment and public health, using science and technology to reduce lifecycle costs, and reducing EM's geographic footprint by 90 percent by 2015. EM continues to move forward with the development of the capability for dispositioning tank waste, nuclear materials, and spent (used) nuclear fuel. The budget request includes the construction and operation of three unique and complex tank waste processing plants to treat approximately 88 million gallons of radioactive tank waste for ultimate disposal. It will also fund the solid waste disposal infrastructure needed to support disposal of transuranic and low-level wastes generated by high-risk activities and the footprint reduction activities.

EM carries out its cleanup activities with the interests of stakeholders in mind. Most importantly, EM will continue to fulfill its responsibilities by conducting cleanup within a "Safety First" culture that integrates environment, safety, and health requirements and controls into all work activities to ensure protection to the workers, public, and the environment, and adheres to sound project and contract management principles. EM is also strengthening its project and planning analyses to better assess existing priorities and identify opportunities to accelerate cleanup work. Working collaboratively with the sites, EM continues to seek aggressive but achievable strategies for accelerating cleanup of discrete sites or segments of work. In addition, functional and cross-site activities such as

elimination of specific groundwater contaminants, waste or material processing campaigns, or achievement of interim or final end-states are being evaluated.

After the EM program completes cleanup and closure of sites that no longer have an ongoing DOE mission, post closure stewardship activities are transferred to the Office of Legacy Management (LM). LM also receives sites remediated by the U.S. Army Corps of Engineers (Formerly Utilized Sites Remedial Action Program) and private licensees (Uranium Mill Tailings Radiation Control Act, Title II sites). Post closure stewardship includes long-term surveillance and maintenance activities such as groundwater monitoring, disposal cell maintenance, records management, and management of natural resources at sites where active remediation has been completed. At some sites the program includes management and administration of pension and post-retirement benefits for contractor retirees.

Loan Programs Office: Helping Finance Clean Energy Deployment

Innovative Technology Loan Guarantee Program - To encourage the early commercial deployment of new or significantly improved technologies in energy projects, the Department requests up to $36 billion in loan guarantee authority for nuclear power facilities and $200 million in appropriated credit subsidy to support an estimated $1 to $2 billion in loans for renewable energy system and efficient end-use energy technology projects under section 1703 of the Energy Policy Act of 2005. The additional loan guarantee authority for nuclear power projects will promote deployment of new plants and support an increasing role for private sector financing. The additional credit subsidy will allow for investment in the innovative renewable and efficiency technologies that are critical to meeting the Administration's goals for affordable, clean energy, technical leadership, and global competitiveness.

The FY 2012 budget also requests $38 million to evaluate applications received under the eight solicitations released to date and to ensure efficient and effective management of the Loan Guarantee program. This request is expected to be offset by collections from borrowers authorized under Title XVII of the Energy Policy Act of 2005 (P.L. 109-8).

Advanced Technology Vehicle Manufacturing Program- The Department requests $6 million to support ongoing loan monitoring activities associated with the program mission of making loans to automobile and automobile part manufacturers for the cost of re-equipping, expanding, or establishing manufacturing facilities in the United States to produce advanced technology vehicles or qualified components, and for associated engineering integration costs.

Better Buildings Pilot Loan Guarantee Initiative for Universities, Schools, and Hospitals - To spur investment in energy efficiency retrofits for buildings which serve as assets to our communities, the Department requests $100 million for loan guarantee subsidy costs to support up to $2 billion in loan authority for universities, schools, and hospitals. This pilot program is one component of the President's Better Buildings Initiative and would fund cost-effective technologies and measures to assist universities, schools, and

hospitals save on energy usage and associated energy costs. The Department also requests $5 million for administrative expenses to carry out the program. The request is subject to the enactment of legislation authorizing this program.

Office of Nuclear Energy: Investing in Energy Innovation and Technical Leadership

The Department is requesting $852.5 million for the Office of Nuclear Energy (NE) in FY 2012 – a decrease of 0.6 percent from the FY 2010 current appropriation. NE's funding supports the advancement of nuclear power as a resource capable of meeting the Nation's energy, environmental, and national security needs by resolving technical, cost, safety, proliferation resistance, and security barriers through research, development, and demonstration as appropriate.

Currently, nuclear energy supplies approximately 20 percent of the Nation's electricity and over 70 percent of clean, non-carbon producing electricity. Over 100 nuclear power plants are offering reliable and affordable baseload electricity in the United States, and they are doing so without air pollution and greenhouse gas emissions. NE is working to develop innovative and transformative technologies to improve the competitiveness, safety and proliferation resistance of nuclear energy to support its continued use.

The FY 2012 budget supports a balanced set of research, development, and deployment (RD&D) activities. This program is built around exploring, through its R&D: technology and other solutions that can improve the reliability, sustain the safety, and extend the life of current reactors; improvements in the affordability of new reactors to enable nuclear energy to help meet the Administration's energy security and climate change goals; development of sustainable nuclear fuel cycles; and minimization of risks of nuclear proliferation and terrorism.

NE is requesting $125 million for Reactor Concepts Research, Development and Demonstration. This program seeks to develop new and advanced reactor designs and technologies. NE is also requesting $67 million for the Light Weight Reactor SMR Licensing Technical Support program, which will support cost-shared design certification and licensing activities for two light water reactor-based designs. Small modular reactors are a technology that the Department believes has the promise to help meet energy security goals. Work will continue on R&D for the Next Generation Nuclear Plant to support demonstration of gas-cooled reactor technology in the United States. The program also supports research on Generation IV and other advanced designs and efforts to extend the life of existing light water reactors.

The FY 2012 request includes $155 million for Fuel Cycle Research and Development to perform long-term, results-oriented science-based R&D to improve fuel cycle and waste management technologies to enable a safe, secure, and economic fuel cycle. The budget also requests $97.4 million to support the Nuclear Energy Enabling Technologies program, focused on the development of cross-cutting and transformative technologies relevant to multiple reactor and fuel cycle concepts. The Crosscutting Technology Development activity will focus on a variety of areas such as reactor materials, creative

approaches to further reduce proliferation risks, and establishing advanced modeling and simulation capabilities to complement physical experimentation. The Transformative Nuclear Concepts R&D activity supports, via an open, competitive solicitation process, investigator-initiated projects that relate to any aspect of nuclear energy generation ensuring that good ideas have sufficient outlet for exploration. Modeling and Simulation Energy Innovation Hub, supported within this program, will apply existing modeling and simulation capabilities to create a "virtual" reactor user environment to simulate an operating reactor and is a prime example of the type of crosscutting, transformative activity that will enhance many research areas within NE. NE will also continue its commitments to investing in university research, international cooperation, and the Nation's nuclear research infrastructure – important foundations to support continued technical advancement.

Office of Fossil Energy: Sustaining American Energy Options through U.S. Ingenuity

The FY 2012 budget request of $521 million for the Office of Fossil Energy (FE) will help ensure that the United States can continue to rely on clean, affordable energy from traditional domestic fuel resources. The United States has 25 percent of the world's coal reserves, and fossil fuels currently supply over 80 percent of the Nation's energy.

The Department is committed to developing technologies and providing technology-based options having public benefits including enhanced economic, environmental and energy security impacts. In FER&D, the emphasis, in keeping with Presidential priorities, is in supporting long-term, high risk initiatives targeted at carbon capture and storage as well as advanced energy systems and on cross-cutting research.

In addition, $122 million of FE's $521 million request will be to provide for national energy security through the continued operations of the Strategic Petroleum Reserve. The budget proposes to sell $500 million of SPR oil in order to provide operational flexibility in managing the Reserve.

The National Nuclear Security Administration: Leading Global Partners on Nonproliferation by Securing Vulnerable Nuclear Materials; Reaffirming Commitment to Stockpile Modernization

The National Nuclear Security Administration (NNSA) continues significant efforts to meet Administration and Secretarial priorities, leveraging science to promote U.S. national security objectives. The FY 2012 President's budget request for NNSA is $11.8 billion; an increase of 5.1 percent from the President's FY 2011 Request. The five-year FY 2012-2016 President's Request for the NNSA reflects the President's global nuclear nonproliferation priorities and his commitment to modernize the U.S. nuclear weapons complex and sustain a strong nuclear deterrent, as described in the 2010 Nuclear Posture Review (NPR) Report, for the duration of the New START Treaty and beyond. The NNSA's defense and homeland security-related objectives include:

- Ensure that the U.S. nuclear deterrent remains safe, secure and effective while implementing changes called for by the 2010 NPR and the New START Treaty
- Broaden and strengthen the NNSA's science, technology and engineering mission to meet national security needs
- Transform the Nation's Cold-War era weapons complex into a 21st century national security enterprise
- Work with global partners to secure all vulnerable nuclear materials around the world and implement the President's nuclear security agenda expressed in the May 2010 National Security Strategy and the Nuclear Posture Review report
- Provide safe and effective nuclear propulsion for U.S. Navy warships

The FY 2012 budget request of $7.6 billion for the Weapons Activities appropriation provides funding for a wide range of programs. Requested activities include providing direct support for the nuclear weapon stockpile, including stockpile surveillance, annual assessments, life extension programs, and warhead dismantlement. Science, Technology and Engineering programs are focused on long-term vitality in science and engineering, and on performing R&D to sustain current and future stockpile stewardship capabilities without the need for underground nuclear testing. These programs also provide a base capability to support scientific research needed by other elements of the Department, the federal government national security community, and the academic and industrial communities. Infrastructure programs support facilities and operations at the government-owned, contractor-operated sites, including activities to maintain and steward the health of these sites for the long term and construct new facilities that will allow the United States to maintain a credible nuclear deterrent. The unique nuclear security expertise and resources maintained by NNSA are made available through the National Laboratories to other Departmental offices, agencies and to the Nation for security and counterterrorism activities.

The Weapons Activities request is an increase of 8.9 percent over the President's FY 2011 Request. This level is sustained and increased in the later outyears. The multi-year increase is necessary to reflect the President's commitment to maintain the safety, security and effectiveness of the nuclear deterrent without underground nuclear testing, consistent with the principles of the Report on the Plan for the Nuclear Weapons Stockpile, Nuclear Weapons Complex, and Delivery Platforms (known as the "1251 Report") and the Stockpile Management Program as stipulated in Sections 1251 and 3113(a)(2) of the National Defense Authorization Act of Fiscal Year 2010. Increases are provided for direct support of the nuclear weapon stockpile, for scientific, technical and engineering activities related to maintenance assessment and certification capabilities, and for recapitalization of key nuclear facilities. The President's Request provides funding necessary to protect the national resource of human capital at the national laboratories through a stockpile stewardship program that exercises and retains these capabilities.

The FY 2012 request for Defense Nuclear Nonproliferation (DNN) is $2.5 billion; a decrease of 5.1 percent from the President's FY 2011 Request. This decrease reflects completion of long-lead procurements for the Mixed Oxide Fuel Fabrication Facility

(MOX) and Waste Solidification Building (WSB). It also reflects our decision to await an agreement between the U.S. and Russia on detailed implementation milestones prior to requesting additional U.S.-pledged funding to support Russian plutonium disposition. The Administration prioritizes U.S. leadership in global nonproliferation initiatives as directed through the National Security Strategy and has advanced this agenda through commitments from global partners during the 2010 Nuclear Security Summit. In addition to the programs funded solely by the NNSA, Defense Nuclear Nonproliferation programs support interagency and international efforts to protect national security by preventing the spread of nuclear weapons and nuclear materials to terrorist organizations and rogue states. These efforts are implemented in part through the International Atomic Energy Agency, the G8 Global Partnership against the Spread of Weapons and Materials of Mass Destruction, and the Global Initiative to Combat Nuclear Terrorism.

DNN supports the President's goal to secure vulnerable nuclear materials around the world within four years. The Global Threat Reduction Initiative's emphasis in FY 2012 is to convert domestic and international nuclear reactors from weapons-usable highly enriched uranium fuel to low-enriched uranium fuel (LEU); while preserving our capability to produce the critically needed Molybdenum 99 isotope. The FY 2012 President's request for International Nuclear Materials Protection and Cooperation reflects selective new security upgrades to buildings and sites in accordance with the President's goal to secure vulnerable nuclear materials around the world within four years, as well as enhancements and sustainability support for previous work. The Fissile Materials Disposition program continues domestic construction of the MOX Fuel Fabrication Facility scheduled to come online in 2016; and design for the pit disassembly and conversion capability to provide it with plutonium oxide feedstock.

The President's request of $1.2 billion for Naval Reactors is an increase of 7.8 percent over the President's FY 2011 Request. The program supports the U.S. Navy's nuclear fleet, comprised of all of the Navy's 72 submarines and 11 aircraft carriers, which constitute 45 percent of the Navy's combatants. The U.S. relies on these ships every day, all over the world, to protect our national interests. The budget provides funding increases for the Ohio Class Replacement submarine to design and develop required submarine reactor plant technologies. R&D is underway now, and funding during this Future Years Nuclear Security Program is critical to support the long manufacturing spans for procurement of reactor plant components in 2017, and ship construction in 2019. Resources are also requested in FY 2012 to support design work for the recapitalization of the spent nuclear fuel handling infrastructure and refueling of the Land-based prototype.

The Office of the Administrator appropriation provides for federal program direction and support for NNSA's Headquarters and field installations. The FY 2012 request is $450.1 million; a 0.4 percent increase over the President's FY 2011 Request. This provides for well-managed, inclusive, responsive, and accountable organization through the strategic management of human capital, enhanced cost-effective utilization of information technology, and integration of budget and performance through transparent financial management practices. The increase reflects additional federal oversight for construction

of the Pit Disassembly and Conversion project, the Uranium Processing Facility, and the Chemistry and Metallurgy Research Replacement Facility.

Mr. WHITFIELD. Well, thank you, Secretary Chu. And because of the event in Japan and Chernobyl and Three Mile Island and other events, the news media certainly is focused on what is happening in Japan and the impact that that would have on nuclear power in America. It is my understanding that the International Atomic Energy Agency has a 7-level international nuclear and radiological event scale, and that on that scale, the event that occurred in Japan was at a Level 4. It is my understanding that Three Mile Island was a Level 5, which, according to the International Atomic Energy Agency, would have been more serious than even what is in Japan is the information that I have.

My question is that I read an article recently about Three Mile Island and it said that a person standing at the property line of Three Mile Island during that event would have received a dose of radiation equivalent to between a chest x-ray and a CAT scan. And my question, as a layman, that does not sound like a lot of exposure, and particularly when you consider this would be a Level 5. And I was just curious, are you aware of that kind of exposure at Three Mile Island or do you have any additional information on that?

Mr. CHU. My knowledge of Three Mile Island actually comes from an NRC report that was issued—I don't know exactly when—but after the analysis had been done, and what I remember is within a 20-mile-or-so radius, the average exposure of those people closest to Three Mile Island was a very small fraction of background radiation. It could have been a scale of 1 percent or less.

Mr. WHITFIELD. Right.

Mr. CHU. That is what I recall.

Mr. WHITFIELD. Well, you know, I think that is important that we talk about that because, obviously, safety is an important issue. We don't want to American people to be panicked about any of this. And did you have an additional comment you were going to make?

Mr. CHU. Yes, I do. I think that the events unfolding in the Japan incidents actually appear to be more serious than Three Mile Island. To what extent we don't really know now. And so as they are unfolding very rapidly on an hour-by-hour, day-by-day basis and there are conflicting reports, and so we don't really know in detail what is happening. This is one of the reasons why the Department of Energy and the NRC are there with boots on the ground, with detectors in the ground, not only to help assist the Japanese power company and the Japanese Government, but also for our own sake, to know what is really happening directly though our own instruments.

Mr. WHITFIELD. But the U.S. Government is offering any and all assistance that has been requested?

Mr. CHU. That is correct.

Mr. WHITFIELD. OK. Now, just to touch on Yucca Mountain for a moment, it is my understanding that the Department of Energy or the U.S. Government had entered into contracts with the nuclear power plants in the U.S. to take their waste material from the operation in their reactors. And because Yucca Mountain has not been completed, that lawsuits were eventually filed by the industry against the Federal Government for violation of that contract. Is that the case?

Mr. CHU. That is the case.

Mr. WHITFIELD. And do you know what the total amount of judgments against the U.S. Government is as of today?

Mr. CHU. I don't exactly recall. There have been some judgments. They are certainly non-trivial. They are a considerable amount of funds. These are settlements so that the money could be used by the industry to help store the waste on their own sites.

Mr. WHITFIELD. Now, I don't know if my information is correct, but I have been told it is in the neighborhood of 10 or $12 billion in judgments already. Does that sound in the neighborhood to you?

Mr. CHU. I don't know. It is certainly over a billion. I don't know where my staff is but we can get back to you on that.

Mr. WHITFIELD. Well, we could follow up.

Mr. CHU. We will get you the exact number.

Mr. WHITFIELD. OK. And I am assuming that this is ongoing legal action because of Yucca Mountain not being completed, is that correct?

Mr. CHU. Not specifically Yucca Mountain not being completed. It is a legal action in the sense that we have a responsibility to provide for the storage of the nuclear waste, and the NRC has determined that dry cask storage at the site——

Mr. WHITFIELD. Right.

Mr. CHU [continuing]. Is a safe procedure for at least a half a century, but we would be still obligated to reimburse the companies——

Mr. WHITFIELD. Yes, we just don't have the capability to take care of it, right?

Mr. CHU. Right. Exactly.

Mr. WHITFIELD. My last question, and this would just not be a question but to ask for information. Would your staff be able to provide me information on the dollar value of loans, loan guarantees, and/or grants that the Department of Energy may be making for wind and solar projects in the U.S.?

Mr. CHU. Yes, we would be able to—in the sense that the ones that we have offered conditional commitments to or that have closed.

Mr. WHITFIELD. Yes, sir. Thank you. At this time I will recognize the gentleman from Illinois for 5 minutes.

Mr. RUSH. Thank you, Mr. Chairman. Mr. Secretary, it is good to see you again here before the committee.

And I am going to get my questions about Japan asked and over with in the first one, OK? The first question I have, as far as security, can you assure the members of this committee, the American public, that what happened in Japan cannot happen here in America at any of our nuclear power plants?

Mr. CHU. We are going to be looking very, very closely at the events happening in Japan and those lessons. And you can be assured that with the NRC leading, but the Department of Energy employing any assistance to look again at the current existing nuclear power plants and any that are being considered for design, to look very hard and see how one could, if possible, upgrade the security. We don't believe that there is imminent danger, but in any instance like this when there are truly unfortunate events like what we are seeing in Japan, what we do is we look and we learn from

that. This is true of all of the technology—transportation technologies, energy technologies, you name it. And so we will be looking very carefully and gathering whatever lessons that can be learned from that double disaster of the 4th-largest earthquake in recorded history and a huge tsunami. And so we will take those lessons and apply them to all the nuclear facilities we have in the United States, not only earthquakes, but violent storms, everything, anything that could affect them

Mr. RUSH. I have been told, Mr. Secretary, that as far as natural disasters, that it would be fairly difficult to have created and repeated what happened in Japan happened here in America as far as man-made disasters. And I have also been told that our number-one threat to our nuclear facilities is terrorism and that that is really what we should also keep a sharp eye on, especially terrorism, to our nuclear facilities. Can you expound on what the level of activity at the DOE and you have committed and what are your plans for countering any terroristic attack that might wind up having the same results or even different results?

Mr. CHU. Well, all of the civilian nuclear facilities are tasked to have very high security measures, and I can certainly vouch for the Department of Energy nuclear facilities. They have extraordinarily high security measures. I would rather say whether terrorism or natural disasters is higher or lower, we and the NRC are very focused on actually preventing either from happening.

Mr. RUSH. OK. I am going to shift my direction. Section 1425 of H.R. 1, the Republican-proposed Continuing Resolution plan, where we sent 25 billion of the 47 billion in DOE's Loan Guarantee Programs under Title XVII, which includes funding for renewable energy and energy efficiency projects, can you speak on the impact of cutting funds for renewable sources of energy under the DOE Loan Guarantee Program? How important is it that we invest in renewable sources of energy?

Mr. CHU. Yes. In our budget request for 2012 we ask for those additional funds to help support the 1705 loan guarantees, but also for an expanded authority so we could also invest in energy efficiency technologies as well, because energy not used is money saved and energy saved. Without that additional loan guarantee authority, many of the projects that would also help unleash private capital and bring that off the sidelines we are afraid would not go forward. And so that would mean a significant decrease in job creation going forward. It would really set back what we are trying to do both in starting our economy and also, quite frankly, in giving a signal to industries in the United States to be developing these new sources. We want to give that signal because it is a competitive world out there and there is going to be a race in who develops these technologies that will be demanded worldwide.

Mr. RUSH. Thank you. I yield back the balance.

Mr. WHITFIELD. At this time I recognize the gentleman from Michigan for his questions.

Mr. UPTON. Thank you, Mr. Chairman. I have a number of questions and I will abide by the 5-minute rule.

I must say that I have the same complaint with you as I may have with your predecessors. At least I think I have a complaint with you. And that is from time to time we hear the Department

give its gas estimates and, at least when I hear them, I wonder if we are not going to hit those estimates by the end of the week and not by Memorial Day. And last week I heard a national report that the Department was indicating that they thought that gas prices would be $3.70 by Memorial Day. The particular gas station that I was passing that day going into the office from Northern Virginia was already at 3.89, and it is higher than that in a lot of places around the country. USA Today had a headline, it must have been about a month ago, "Will Gas Prices Hit $5 by the 4th of July?" I look at the projections that the Administration has put forth showing—as we all know, we get about a third of our oil from the Gulf. We are a quarter of a million barrels less per day than we were getting a number of months ago, and when you looked at the time from '09 to '12, again, DOE indicates that we are going to get about 450 million barrels less per day in '12 than we got in '09.

As one that believes in supply and demand, I see Alaska has, you know, continued declines in production. Where do you think we really will be? And this was, again, before Libya, before Egypt, before all the different things that were happening in the Middle East. Where do you really think we are going to be on gas prices, something that is on every household's mind across the country?

Mr. CHU. Well, there is an official EIA prediction as you mentioned.

Mr. UPTON. They must be career bureaucrats. Whether it is Republican or Democratic administration, it just——

Mr. CHU. Actually——

Mr. UPTON [continuing]. Seems wrong——

Mr. CHU. It is actually an independent arm so it is independent of any political influence. But in any case, certainly, the gas prices in Washington, D.C., are higher than the average in the country. The gas prices in California are——

Mr. UPTON. But I see those same prices in Michigan.

Mr. CHU. Yes.

Mr. UPTON. They were 3.80 this week in Michigan.

Mr. CHU. But anyway, I don't really know what the gas prices are going to be this summer. The mean projection is 43.70 as you said. There are large uncertainties. So we don't really know. And I don't have any better crystal ball than you do on that.

In terms of the oil production in the United States, again, first, you were talking about the oil production in the Gulf of Mexico and what is going to be projected. And I believe you were talking about this is what was happening because there was a suspension for a while of the deepwater exploration. The oil production in the Gulf has continued. The shallow-water exploration has continued but the deepwater permitting has begun again.

Mr. UPTON. But again, if you look at the actual production levels, they are down from the projection from only 4 or 5 months ago, and they are down again according to your own numbers from the trend line from '09 to '12.

Mr. CHU. I don't want to focus just on the Gulf. If you look at the total oil production in the United States, again, there are some uncertainties, but we are actually seeing increased oil production in the continental United States. And we are actually expecting to see an increase in oil production from the extraction of shale rock.

And again, it is uncertain to how much that will grow, but already it is a couple hundred thousand barrels a day production. It could increase 12 million barrels per day in the near future. So again, it is the total oil production in the United States we are also looking at.

Mr. UPTON. In my remaining time let me ask 2 questions. I know you have been in contact with your counterparts in Japan. Is there anything that they have asked for that we have not done?

Mr. CHU. To the best of my knowledge, no. They have accepted our help in terms of the services, the airborne radiation detectors, things of that nature. We are continuing to offer them help, and they are accepting it.

Mr. UPTON. I just note, too, I know I said million. I mean hundreds of thousands in my declining production.

Mr. CHU. Hundreds of thousands of——

Mr. UPTON. Yes, I said 450 million——

Mr. CHU. Right.

Mr. UPTON [continuing]. But I——

Mr. CHU. Right. I understand.

Mr. UPTON. Last question in my 2 seconds, a number of us sent you a letter back in February asking questions about the Nuclear Waste Policy Act. If you could take a look at the letter and give us as a response as we get prepared——

Mr. CHU. All right.

Mr. UPTON [continuing]. That would be terrific. Thank you.

Mr. CHU. OK. Thank you.

Mr. UPTON. I yield back my time.

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

Mr. WAXMAN. Thank you, Mr. Chairman. Mr. Secretary, after Chernobyl many said such an event could not happen in the United States because the Soviet Union's nuclear sector was not as advanced as our own. And there was truth to that. The Chernobyl plant was not as advanced and was not designed with many of the safeguards we have in the United States. But Japan is a highly developed country. It is technologically sophisticated as us and there is much concern in the U.S. that a similar accident can occur here. How do you respond to that concern?

Mr. CHU. Well, first, I would agree with you. The reactor in Chernobyl was of a different design. It had points of instability. It had no containment vessel. But we are looking very carefully at what is happening in Japan because, as you say, they are using more advanced designs. A number of reactors in the United States are similar designs, and we are going to look at what went wrong in terms of this double-barreled whammy of this huge, huge earthquake and then a huge tsunami and look to our reactors again and learn as much as we can so we can, if needed, improve the safety. By "if needed," what I really mean is that we are always increasing the safety of our reactors, and not only our reactors but the safety of all our industrial systems.

Mr. WAXMAN. Mr. Secretary, 2 days ago a number of us wrote the Chairman Upton, Whitfield, and Stearns, requesting that our committee here investigate and hold hearings about the safety and preparedness of nuclear power plants in the United States. Do you

think we should investigate the issues to ensure the safety of our nuclear plants?

Mr. CHU. I think that will naturally occur, especially given the events in Japan. We will look back as we learn what happened and apply those lessons where needed to all of our nuclear power reactors. That will be a natural consequence.

Mr. WAXMAN. Well, a natural consequence for everybody to look at it but, quite frankly, I think we have a responsibility——

Mr. CHU. Right.

Mr. WAXMAN [continuing]. In Congress, not just you in your position but we in the Congress for our oversight and investigative purposes since we write the laws.

Now, let me ask you about the laws that we are in the middle of writing. We are trying to figure out our energy policy. And the Republican energy policy seems to be depending on coal, oil, and nuclear power. That is what they look to for the future. In fact, it has been the past. And we do have a problem of climate change because of the carbon and other greenhouse gases. We do have a problem now that so much of all of our eggs are in the nuclear basket.

When we look at the Republican budget, they are putting in billions of dollars of investment and thousands of construction and permanent jobs are all going to nuclear, but they are rescinding a lot of your budget to deal with other things that are clean and reliable and safe such as renewable energy and energy efficiency.

Just to dramatize this issue, Republicans would rescind 25 billion of the 47 billion in loan guarantee authority that was provided to you in 2009. But they preserve $20.5 billion in loan guarantees for nuclear energy while leaving only 1.5 billion for all other technologies. They say they are for an all-of-the-above strategy. That is an all-nuclear strategy to me. I would like to have you explain why it is so important for America to be looking at these other projects as we devise our energy strategy to move us away from dependence on oil and coal and maybe even nuclear for our future.

Mr. CHU. Certainly. If you look at what is going to be happening in this century, we believe, for example, that the prospect of solar power coming down in price, the business community thinks that within this decade the falling costs of solar generation of electricity will be cut in half. We have had a number of workgroups and we think it is very possible that by the end of this decade that costs can be cut to 25 percent of what it is today.

Mr. WAXMAN. They will be competitive if we make investments in them.

Mr. CHU. It will be very competitive and realizing that there is a high probability, a reasonable probability that solar energy, other renewable energies—wind—could be competitive with fossil fuel by the end of this decade——

Mr. WAXMAN. But nuclear energy, on the other hand, is not competitive unless the government subsidizes it. The market does not pick nuclear power as a winner if the market works its will by itself, isn't that correct?

Mr. CHU. At the moment I think nuclear and renewables do need help, but going forward we are trying to figure out a plan where none of those will need subsidy.

Mr. WHITFIELD. The gentleman's time has expired. At this time I recognize the gentleman from Illinois for 5 minutes.

Mr. SHIMKUS. Thank you. And again, Mr. Secretary, welcome. I have got a lot of questions, short, and I am going to try to go, not disrespectful, but trying to get through my list. But I will just say to the chairman emeritus, that is why coal will still be king because it does address the market issues, and coal will still have a major issue in our portfolio for years to come.

Just an issue I had by a battery technology guy who said that he was laughed out of your battery office. And my concern is is that the DOE may be so big and already have a designed belief on battery technology that if someone comes with something new that they are not going to get a good hearing. Can we talk about this later on and visit with this——

Mr. CHU. Sure.

Mr. SHIMKUS [continuing]. Because if we are going to do research, we don't want to have—because we put billions of dollars into one sector, if a new entry comes in that may offer more, we want to give them a fair hearing. Can you define clean?

Mr. CHU. Well, you can start with what we all recognize are traditional pollutants, sulfur dioxide, nitrogen oxide, mercury, particulate matter——

Mr. SHIMKUS. The criteria of pollutants in the Clean Air Act.

Mr. CHU. Yes, but clean also includes carbon dioxide.

Mr. SHIMKUS. OK. And that is good because a lot of people will not add that. They will say clean but they won't address the CO2 issue. And just a message, Waxman-Markey failed as a national policy through the legislative process because the public decided to not price carbon. So we had that argument yesterday. We have a bill moving through the floor of the house that will start addressing the EPA, but we need another approach. And I would say energy security is a better way to bring both sides together than pricing carbon.

DOE was established in, what, 1977?

Mr. CHU. Around that time, '75, '76.

Mr. SHIMKUS. I got a yes. Our reliance on imported crude oil at that time was what percent? Do you have any idea?

Mr. CHU. The '70s? I am going to take a wild stab, something around 25 percent for petroleum imports.

Mr. SHIMKUS. Yes, I thought maybe 35. I am not sure. And what is it today?

Mr. CHU. It was 49 percent in 2010.

Mr. SHIMKUS. So can we say that we have really made any great strides by having the DOE here over 25 years?

Mr. CHU. No. In fact, it was 57 percent in 2008.

Mr. SHIMKUS. Thank you. That is a point. FutureGen 2.0, is that really BushGen 1.0?

Mr. CHU. No. This is——

Mr. SHIMKUS. Let me explain. I followed FutureGen a lot.

Mr. CHU. Yes.

Mr. SHIMKUS. FutureGen was a new coal fire plant that actually would go to hydrogen technology and a research center. Bush tubed it, said let us gasify coal in existing plants and use CCS. Isn't that what FutureGen 2.0 is?

Mr. CHU. No. The first FutureGen was a gasification and capture and storage. This is——

Mr. SHIMKUS. Using hydrogen turbines, though, new technology.

Mr. CHU. Yes. In gas turbines in most——

Mr. SHIMKUS. OK. So my point is just for clarify when we are retrofitting Meredosia with current technology, which is gasification, capturing it, that really was the Bush plan. That is really what Bodman was moving to do. Was that correct?

Mr. CHU. Certainly the taking of a commercial-scale power play and capturing the carbon dioxide and sequestering it was the Bush plan. This FutureGen is different because it is burning in an oxygen atmosphere, this is new technology.

Mr. SHIMKUS. Thank you. I got the answer that I needed. We want to decrease reliance on imported crude oil. Senator Obama joined Senator Bunning to push coal-to-liquid legislation through the Senate. What is the DOE's position on coal-to-liquid technologies?

Mr. CHU. We think it is something we should look at. There are new coal-to-liquid technologies. I am not talking about the older ones invented by Germany during World War II but new ones that are more efficient. We have to capture the excess carbon dioxide in those technologies. And, indeed, the National Academy of Sciences, through the America's Energy Future initiative, has issued a report looking at the mixture of coal plus biomass gasification methods to then create liquids with carbon capture.

Mr. SHIMKUS. And it is my understanding that carbon footprint is actually lower than crude oil refineries in that design?

Mr. CHU. Significantly lower, and once you exceed 30 percent biomass, it actually becomes negative.

Mr. SHIMKUS. We want to be helpful in that. Last question is one of the risks in Japan is that one of the decommissioned or offline nuclear power plants had a storage pool that went dry, is that correct?

Mr. CHU. We don't know——

Mr. SHIMKUS. At least that is what the industry reports are.

Mr. CHU. There are many conflicting reports.

Mr. SHIMKUS. Let me just make this point and I will be done. There are 11 pools within 40 miles of downtown Chicago. Wouldn't it make sense to have one center location for storage of high-level nuclear waste? Like you identified in your report when you were the lab director when you said licensing of Yucca Mountain repository as a long-range resource was one of the findings.

Mr. CHU. We are talking about 2 different things. In a nuclear reactor site immediately after you take out the rods, you need to put them in water pools. That is a very short-term storage. Yucca Mountain is a long-term——

Mr. SHIMKUS. The folks who are holding the nuclear waste in pools think it is pretty long-term right now.

Mr. WHITFIELD. The gentleman's time has expired. I recognize the gentleman from Texas for 5 minutes.

Mr. GREEN. Mr. Secretary, in the line of questioning we had a lot of questions of Members talking about solar and wind. Does either solar or wind have the potential in the next 10 years of ever

becoming a stabilized base load like coal or nuclear or even natural gas?

Mr. CHU. It depends on the development of energy storage technologies along with that. You know that they are variable, and when the sun sets or the wind stops blowing, they are no longer generating electricity. So it would have to depend on that. But before that happens I think that it can certainly go to a reasonable fraction of our electricity use. Countries like Ireland are now at 20 percent wind coupled with fossil fuel.

Mr. GREEN. Is there any country in the world—I know Denmark's is lead—what is the percentage of wind, for example, in Denmark?

Mr. CHU. It is a little over 25 percent but there it is coupled into a massive grid, and so Ireland is actually a better example because they have to be self-sufficient in themselves.

Mr. GREEN. According to our grids, we have it much more difficult in our own country is because Texas our own and, of course, the East and West Coast. Let me ask another question, though. The administration has proposed repealing numerous subsidies for tax preferences on fossil fuels, one you mentioned that has been part of the U.S. Code since 1926, another created to help U.S. manufacturers maintain and create U.S. jobs. I am concerned about this because increasing cost for domestic energy industry would jeopardize both some small business jobs but also increase our reliance on foreign sources of energy.

Would you agree that increasing cost for domestic production may also impact our ability to address climate change because we failed to provide natural gas, which is cleaner burning, as a bridge, whatever we have, whether it is nuclear or solar or whatever, to meet our short-term carbon reduction goals that we hope to have while providing affordable and reliable supplies for energy for American consumers?

Mr. CHU. Well, I would say based on what has been happening in shale gas and the lower gas prices and the anticipation that for the next decade and possibly 2 decades natural gas prices will be low. There will be a natural move towards gas. But I would also say, then, I think the utility companies, the power generators are very aware of this, that you still want a diverse set of energy sources.

Mr. GREEN. Well, and I know what could hurt us on our natural gas success in our country—we pay actually less, you know, per MCF than anywhere else in the world almost for natural gas because of our success—but either tax increases or limitation on hydrofracking could eliminate that 100 years of natural gas that we have. So I would caution you. To jumpstart the domestic nuclear energy industry, your budget requests 36 billion in loan guarantees and authority for fiscal year 2012. How many projects do you think we would be able to support with that even with the tragedy that has happened in the last few days? Do you still think we ought to go forward after taking a breath, for example, and saying OK, what do we need to do different? Do you still think we need to go forward in expansion of nuclear power in our country?

Mr. CHU. Well, first, I agree with you. I think based on the events in Japan we need to look harder at these projects and guar-

antee that they can go forward in a safe way. This is a question of the $36 billion we believe should be able to fund something like 6 to 8 projects. The loan guarantees could get six to eight projects going. Then we believe if they can proceed and be built on time, on schedule, there would then be enough confidence that the private sector should be able to pick that up.

Mr. GREEN. Thank you. In the President's State of the Union address he had a goal of clean energy sources account for 80 percent of American's electricity by 2035. If we shut down our expansion of nuclear power like we did after, you know, Three Mile Island and Chernobyl, is there any possibility we can even get anywhere near 80 percent from clean burning fuels?

Mr. CHU. It would certainly make it harder. Right now we are 40 percent clean by this rough definition where you account, you know, for combined cycle natural gas giving half-credit. But I think we will need, certainly, a large increase in wind and solar. We will need clean coal. And I believe we will need to have some fraction coming from nuclear.

Mr. GREEN. OK. And I know the Energy Information Institute, Mr. Chairman, and I was surprised at the billions of kilowatt hours that our country generates even compared to what Japan does. Of course, Japan is blessed with a great deal of hydropower that, for example, in my area in Houston, we are flat. We don't have the option for hydropower like the West Coast or other areas of the world. So we have to look at natural gas and nuclear and coal. Mr. Chairman, thank you for your patience.

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

Mr. BARTON. Thank you, Mr. Chairman. Again, thank you, Mr. Secretary, for being here.

In light of what has happened in Japan, I would like to hear what you believe President Obama's position is now on nuclear power generally in the United States. Does he still support a rebirth of nuclear power and construction of new plants? Could you just give us your best estimate of what his position is?

Mr. CHU. Well, I think the President and the Administration believe that we have to be looking very, very closely at the events in Japan. As I said before, we have to apply whatever lessons that can be and will be learned from what has happened and is happening in Japan. Those lessons would then be applied to first look at our current existing fleet of reactors to make sure that they can be used safely and also to look at how, as one proceeds forward, that any lessons learned could be applied. It would be premature to say anything other than we will use this opportunity to learn as best we can and consider carefully how to go forward.

Mr. BARTON. I am not sure what you just said.

Mr. CHU. OK.

Mr. BARTON. Does the President support new nuclear power plant construction in the United States?

Mr. CHU. The present budget is what it is, and we are asking for loan guarantees. The present budget is also calling for small modular reactors. That position has not been changed.

Mr. BARTON. So that is a yes?

Mr. CHU. That is a yes.

Mr. BARTON. Good. That is what I wanted you to say. See, if you had just said yes. Now, with regards to the loan guarantees that you just mentioned, given again what has happened, do you and the President want the Congress to support the full 36 billion that you have put in the President's budget?

Mr. CHU. Yes.

Mr. BARTON. OK. You are learning. You are not a Nobel Prize winner for nothing, I guess. OK. This one is going to be a little bit trickier. You are a former director of a national laboratory and did an excellent job. I am a strong supporter of the national laboratories. At one time I had hoped to have one in Texas, the Super Collider laboratory that wasn't funded under President Clinton. However, having said that, given the situation of our budget, do you think it might be time to reevaluate the number of national laboratories and perhaps begin to come up with a plan to reorganize and consolidate them?

Mr. CHU. You are right. That is a toughie. I would say before we do that, there are a lot of things we can do to look at how we can get real efficiencies in what we do. Even though the President and I firmly believe that the Department of Energy will play a critical role in guaranteeing the future prosperity of the United States in its research and development, we do also recognize that we have to look to gain efficiencies wherever we can and to streamline what we do, knowing that ultimately the money that we give to universities, to national laboratories and help research in businesses, that is our real job. And the other structures are there to ensure that we do this in the most intelligent way possible, in the most responsible way possible. So we are going to be working very hard to look at how we can increase those efficiencies.

Mr. BARTON. Well, I support the national laboratories, but I do think we ought to begin to reevaluate them in the light of the budget and also the fact that perhaps some of their missions are not quite what they were when they were originally established.

My last question, Mr. Secretary, is, again, something that is of a sensitive nature. We have had repeated security violations at the Sandia National Laboratory in Los Alamos. There have been a number of investigations, a number of special taskforces trying to get control of the security situation in terms of our national secrets in those institutions. Can you elaborate and tell the committee what the status is of trying to make sure that those 2 laboratories are secure in terms of the secrets that we have out there?

Mr. CHU. I think the Department of Energy takes security very seriously, not only in Los Alamos, Sandia, but also Livermore, the NNSA laboratories. There are other laboratories that carry out classified information, and we take those responsibilities very, very seriously. And I can give you the details. I have a slightly different view than you on the number of security violations, but every one of them we take seriously, and we would be glad to brief you and your staff on that.

Mr. BARTON. I appreciate that. And thank you, Mr. Chairman, for the courtesy of giving me the time to ask some questions.

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

Mrs. CAPPS. Thank you, Mr. Secretary, for your timely testimony. I recently toured the University of California Santa Barbara's Institute for Energy Efficiency, which was named a frontier research center by your Department, and I was pleased that you mentioned your support for this program in your testimony.

As you know, this center is researching energy savings in photovoltaics and solid state lighting. I am so impressed by the work of the professors and the students, especially their commitments to the commercialization of new technologies like LEDs.

So would you talk for a minute or two about how your budget request will support the administration's effort to get projects from the laboratory and the marketplace with a direct impact on the economy?

Mr. CHU. Certainly. I think the budget request in the Office of Science that is funding the group that you are speaking about is precisely the kind of research we will need to ensure that America stays at the forefront in these developing technologies. It is a very competitive world out there. Currently, the United States does make the best LEDs but we can easily lose that lead. Korea, China, Japan, Europe all want to take this away.

In the meantime we are actually trying to recapture the lead in things we have lost. For example, advanced battery technology and what we see coming out of universities and national labs are the next generation of new batteries where I think we can recapture that lead. These are multi-billion-dollar markets in the future, and this goes to the heart of what the budget request is about, that in this very competitive world where all of the countries and companies are trying to say we want to own this share, this is what is going to be at risk.

Mrs. CAPPS. Thank you. I also want to ask you about the State Energy Program. Decreased support for these programs will limit efficiency aid to small businesses and families, as well as to our local governments. As you mentioned earlier, efficiencies will produce major energy and cost savings. That has been clearly demonstrated over time. I have been told that the State Energy Program has produced cost savings of $300 million annually. It also leverages $10 in private money for every $1 of government money spent. So would you describe now about how the cuts in the State Energy Program, particularly those proposed in H.R. 1 by the Republican majority will affect local clean energy initiatives? Would you anticipate job losses from these cuts and how would these cuts affect small businesses trying to reduce their energy bills, not to mention homeowners and other——

Mr. CHU. Right. Well, they certainly will have the impacts you talked about, and this is one of those areas where we have to make some tough choices. You know, we had a very good State Energy Program in the Recovery Act and the EECBG program, and we will have to work with Congress going forward and how to apportion what monies Congress gives us between research and development and things like the State Energy Program.

Mrs. CAPPS. Finally, I want to ask you about the innovative approaches to generating electricity from marine renewables. And I have a particular company in mind. Right now the Department has planned funding for 9 companies with active projects, including a

company based in my congressional district called Ecomerit. First, can you please talk to us about the promise of marine renewables, maybe the steps the Department is taking to avoid or mitigate environmental impacts in coastal areas? And second, are you concerned that cuts to clean energy programs like this one might slow down the development and deployment of marine renewables?

Mr. CHU. Well, again, the cuts would definitely affect the research we can fund. And by marine renewables I think you are referring to kinetic energy-type extraction techniques. There are at least a dozen companies that I know of that are looking into this both here in the United States and abroad. It is something that is a research project, so we don't really know if it is going to see wide deployment, but it is certainly one of those areas that there is tremendous energy in ocean waves and in ocean currents. And so that is why companies, universities, and national labs are looking at this.

Mrs. CAPPS. And the other steps that your Department is taking to mitigate environmental impacts——

Mr. CHU. Yes.

Mrs. CAPPS [continuing]. In coastal areas?

Mr. CHU. It is all part of the package because we all know that whatever form of energy production we use, they could easily have environmental impacts. And you do this, you know, at the very beginning because in the end what you want to do is develop a technology that can actually be deployed and there would not be strong objections to that deployment. So it is always a part of the package, environmental impacts.

Mrs. CAPPS. Thank you.

Mr. WHITFIELD. At this time Dr. Cassidy of Louisiana is recognized for 5 minutes.

Mr. CASSIDY. Now, I am struck that you mentioned the subsidies, the heightened or continued subsidies for wind and solar and other renewables. I am looking at something from—I think this is from EIA, Energy Information Administration, and it says as of 2007, which I gather is the latest it is available, the subsidy and support per unit of production of solar is $24.34 per megawatt hour, for wind it is $23, for coal it is 44 cents, and for natural gas and petroleum liquids, it is 25 cents. So given that there is almost, what, 100 times increase subsidy for solar and wind versus natural gas and petroleum, maybe 80 times for coal, how much subsidy is required for us to take wind and solar up to 25 percent of our grid and can we afford that subsidy?

Mr. CHU. Well, there are two ways of calculating subsidies. One is by absolute dollar amount and another is by fraction of energy produced. I think you referred to fraction of energy produced——

Mr. CASSIDY. And does it seem a more reasonable way because obviously if coal is 50 percent of our energy production to take the absolute number is a little misleading versus that as a percentage of the energy it actually produces.

Mr. CHU. Well, it really depends because if you look at the subsidy of oil and gas beginning in the beginning of the 20th century——

Mr. CASSIDY. If we can just stay on—just because I have limited time. I don't mean to interrupt. I don't mean to be rude. But just

to take right now electricity because there is a kind of, if you will, lingua franca, which is the megawatt hour and the subsidies per, so it is $25 roughly for solar and wind, 25 cents for natural gas per megawatt hour. How long can we subsidize solar and wind and can we afford it if we are going to increase it to 25 percent of our electrical use?

Mr. CHU. Well, I certainly think that wind and solar should not have any longer subsidies than oil and gas, which is about 80 or 90 years.

Mr. CASSIDY. My concern is—because obviously others have attempted to do this, so there is a renewable energy magazine, "Renewable Power News," which is kind of an advocacy group for renewable power. Spain has clearly attempted this high-subsidy market. I am quoting from an article they wrote. "Spain will cut renewable energy subsidies. These have grown exponentially, their use of renewable energy, but it has been associated with an astronomical rise in energy prices, which has equally resulted in heightening inflation and decreasing levels of competitiveness, which is an alarming threat to a feeble economy." So not to put words in your mouth, but are you committing to 80 years of us to follow the path of Spain?

Mr. CHU. Absolutely not. As I said, we are developing plans of what we can do in order to bring the costs of renewables like solar and wind down to the cost of fossil fuel, and we are talking about a decade, maybe 2 decades maximum. So this is an accelerated plan because the world is racing ahead. The development and the drop in price of these renewables will be very fast.

Mr. CASSIDY. Now, my concern, though, is is that we are racing ahead, but there are certain laws of physics. Who am I to tell you about laws of physics? But the battery capability to store huge numbers, millions of electrons, if you will, doesn't really seem that it is ready for commercial use in the next decade.

Now, that said, I am from Louisiana. Our hydropower ability is limited. Clearly, the reason that wind works in Denmark is that they have lots of hydropower, so if the base load goes down from wind, they can ramp up with hydropower. In my State, the Peking Plant will be coal or natural gas. You still get carbon emissions, but you get the higher cost of the renewables. This works in hydropower. What do we do elsewhere?

Mr. CHU. Well, first, Denmark has access to other grids. Denmark itself, I don't believe, has hydropower. But never mind.

Mr. CASSIDY. Sweden's hydropower is what I was referring to.

Mr. CHU. Right. Yes, the point is that they have access to other sources of energy outside their own borders. In terms of batteries, we are pretty certain that within the next couple of years the battery storage technology that begins to go to utility scale will be dropping perhaps by 50 percent——

Mr. CASSIDY. But will it be adequate to say power in Washington, D.C., if we have windmills turning and the wind stops to blow or the night comes or the cloudiest day, will it have sufficient capacity to power Washington, D.C.?

Mr. CHU. I think it is going to take several decades to transition to renewables at that extent, but to get to 10, 20, 30 percent renewables, you can get to 20 percent renewables, possibly even 30 with-

out energy storage, but energy storage will be an increasingly important part as you go higher than that.

Mr. CASSIDY. I think we are a little circular because obviously the Peaking Plants will still be necessary, in which case you still have your emissions. I yield back. Thank you.

Mr. WHITFIELD. At this time I recognize the gentleman from Washington, Mr. Inslee, for 5 minutes.

Mr. INSLEE. Thank you. Mr. Secretary, I was excited by your comments about prospective gains in solar. I just said the other day that Kleiner Perkins, the folks who started Google, just made a big investment in a group that could, I think, obtain I think they said 30 percent efficiency from solar cells. Could you tell us sort of in layman terms to the extent you can why you think we can get these big advances in solar and what do you think realistic projections for those advancements are in the decade?

Mr. CHU. The realistic projections within a decade are somewhere between a 50 percent drop and a 70 percent drop in the cost. It is full cost. Not only is it the module but it also includes the installation cost, the electronics cost, the full cost. We actually don't know which of the photovoltaic technologies will work because silicon continues to make dramatic strides, and we are especially looking at dramatically changing the costs of the manufacturing of silicon cells. There are wonderful ideas out there that are being pursued by companies and by researches. There are also a number of thin-film technologies.

But if you look at these, and all the companies are looking at each other, we also need to increase the efficiency. Silicon is now in the low 20 percent efficiency. We expect it to make climbs in efficiency. The thin-film technologies are also beginning to make significant increases. And so there is a great deal of excitement. When I talked to the photovoltaic manufacturers, they are pretty certain this drop will occur in this decade. But we think it can even better. And that is what we are focused on.

Mr. INSLEE. Well, shoot for that. The Republican budget has proposed a 35-percent cut from last year in efficiency and renewable energy portfolio, and about half of that degree of cut for nuclear. That just doesn't make any sense to me. It would seem to me you would want to have a balanced portfolio. We have great strides available in efficiency and renewable. Would you want to comment on that?

Mr. CHU. Yes, I think we would like to see research in both, just as we would like to support the engineering for small modular reactors. The engineering for looking at how we can improve both the safety and the productivity of future nuclear power plants, we think a balanced approach we should be looking at renewables as well.

Mr. INSLEE. Thank you. I want to ask about Yucca Mountain. We have some real issues, my state. We have paid about $300 million are rate-payers into the nuclear waste fund. There has been about $100 billion spent already on Yucca. We are told that the Office of Civilian Radioactive Waste is proposed to be shut down that was responsible for moving forward. In the State of Washington we have had 53 million gallons of radioactive and chemical waste stored in 77 underground tanks. We need a solution. Right now we

don't see a viable proposal by the administration in this regard and would like to see one in the near future. Could you give us what options you intend to put on the table because we would like to see Yucca move forward.

Mr. CHU. Well, first, as you well know, the waste treatment plant at Hanford got a lot of attention, a lot of personal attention from me and a lot of personal attention from my deputy secretary, Dan Poneman. And we have, in fact, put on the table first both the contractor and all the people in the DOE involved. We now have 8 teams there. We have proposed to accelerate the budget so that we can drive this project forward so that we will be delivered on time, on budget. And that is the first thing that we get the material from those liquid waste tanks and into a much more stable form.

Mr. INSLEE. And we appreciate your work there. There is good work going on there and we appreciate your leadership. But we are concerned about——

Mr. CHU. Right.

Mr. INSLEE [continuing]. The depository. If you could address that.

Mr. CHU. Certainly. And so the first order of business is to stabilize that waste. The second order of business is that going forward we do need a plan. I believe that is the intent of the Blue Ribbon Commission, to look at what to do in the future beyond what we now have, beyond what the knowledge was when Congress wrote the Nuclear Waste Act of 1982 and modified in 1985. A lot of water has passed under the bridge. And so that is the charge of that committee. I believe they are going to be coming out with results this June.

Mr. INSLEE. I suspect you know our position, but not only water over the bridge, but there is some radioactive water may be burning right now and we do have pools around this country in scores of places that do present risk, not just financial risks. So we are going to continue to press the administration on this issue. Thank you, Mr. Secretary.

Mr. WHITFIELD. Thank you. At this time I recognize the gentleman from West Virginia for 5 minutes, Mr. McKinley.

Mr. MCKINLEY. Thank you, Mr. Chairman. There were several questions I have. One was there has been a dialogue from people who have come before you in this hearing have called about coal subsidies. I don't expect you to give them to me now, but could you share with us those companies that are being subsidized and how that is? Because people seem to be loosely applying their coal subsidies. And I have had opportunities to talk to quite a few coal companies and they are not getting any subsidies. So I would be curious if you could share with us any coal subsidies.

There is another issue is this SOAP program, this Small Operators Assistance Program. There seems to be some funding difficulties with that and I would appreciate if you would look into that. Your Department is not freeing up monies to the State to reimburse some of the small operators that are producing coal. So if you could get back to me on that I would appreciate it.

Also as it relates to funding ratios of cost/benefit ratios for you that it was alleged earlier that since you have been funded some-

where in the early '70s, you have probably received in the neighborhood of maybe $800 billion of revenue to operate, and I am just curious on a cost/benefit ratio if you could share with us sometime if you could put that from your staff that what are the benefits that we have received out of that $800 billion? If you could just provide something. I don't want to get into that right now. I am sure it could go on for some time because I am hoping that it is a more than 1-to-1 ratio that we have received. So I would like to get some idea of where that would be.

But more importantly where I want to spend as much time was talking about with the National Energy Technology Lab that we have in Pennsylvania, Texas, Alaska, Oregon, West Virginia. When I met with them, they indicated that they are the only laboratory for the DOE that is owned and operated by the DOE according to their literature as well. And they are indicating that the budget being proposed is going to reduce their expenditure by almost $800 million by their own data that they have. That is very threatening because I see a paradox with this. I heard the administration talking about we want to do more research and development in energy but yet the very laboratory that you all fund is being reduced by $800 million. There must be a misunderstanding there someplace, either in the administration making that representation or in the data that they have provided in a chart.

So if you could provide us something back on that because they are doing some wonderful things there at the NETL and they are trying to build research cooperatives with the universities in the area. And for us to cut their expenditures at this time is just unconscionable.

For example, one is with the Marcellus Shale that we have in Pennsylvania, New York, West Virginia, and they are trying to find ways through NETL of getting more than 15 percent of the gas out. Right now that is all they are getting out of Marcellus for all of that expenditure and they want to spend the money but yet the proposed budget is cutting the amount of money that we have for research. Can you share what is that underlying current? Why are we cutting money in energy research at your own facilities?

Mr. CHU. I will get back to you on that. I certainly know the NETL labs, and we have an excellent laboratory director that I am very positive about. And I know what they are doing in terms of increased interactions with the universities. I am very positive about it. I will get back to you on the details of that because there may be a misunderstanding. Certainly, the research that NETL does and does in universities we are very positive on that. And I will get back to you.

Mr. MCKINLEY. You can get back to me and I appreciate it. Thank you very much.

Mr. WHITFIELD. Thank you. At this time I recognize the gentlelady Matsui from California.

Ms. MATSUI. Thank you, Mr. Chairman, and thank you, Mr. Secretary for being with us here today. I applaud your leadership on supporting continued investments and clean energy technology. These investments are critical for the economic growth in my home district in Sacramento.

The developing nuclear situation in Japan has captured the attention of the world and certainly this committee. And my thoughts and prayers are certainly with the people of Japan.

Mr. Secretary, when Chairman Whitfield asked you about the crisis in Japan, he mentioned the international rating system for nuclear accidents, and you explained that the situation in Japan is already likely worse than that on Three Mile Island. My understanding is that the big difference between Three Mile Island and Chernobyl is that in Three Mile Island, the reactors containment system was able to contain the radioactive material. So most of that radioactive material didn't spread into the environment. At Chernobyl there was no containment. So the release of radioactive material devastated the Soviet Union and other countries.

Mr. Secretary, what happens if there is a meltdown and one or more of the Japanese reactors and the containment system fails?

Mr. CHU. Well, we think there is a partial meltdown but—as you correctly noted—that doesn't necessarily mean the containment vessel will fail. Three Mile Island had a partial meltdown, and it did not fail.

But we are trying to monitor very closely. We hear conflicting reports about exactly what is happening in the several reactors that are now at risk. And I would not want to speculate on exactly what will happen. So let us just say that we monitor it very closely and we will take it as it comes.

Ms. MATSUI. I imagine we do not want to go there at all. We don't want this to become Chernobyl. But I would think that in the light of these events, the committee should investigate the safety and preparedness of our own reactors. And I think you said that also. But I think this committee should really take that seriously because we have an obligation to make sure that our own reactors are safe.

Mr. Chairman, my home district of Sacramento, we have a decommissioned nuclear power plant which now manages the used nuclear fuel. And there are about 10 sites around the country, including Sacramento, where used nuclear fuel is being stored but where the nuclear power plant has been dismantled. I am interested in knowing what is being done at DOE to prioritize these sites, to move the used fuel so that they can be placed back into productive use. How does your requested budget address these issues?

Mr. CHU. Well, I would have to get back to you on the details of the sites you are speaking about, but there are various stages. After you take the fuel rods out of the reactor, immediately you put them in a pool of water for a period of time where they are actually still dissipating a considerable amount of heat. But then after that, the next stage is that you can put them in dry cask storage——

Ms. MATSUI. Yes.

Mr. CHU [continuing]. Which is much safer and Chairman Jaczko will be following me, but the NRC has recently ruled that storage on site of dry cask storage would be a safe interim—by interim, something on the scale of 50 or 60 years—and that gives us time to develop a coherent, integrated strategy on what to do with spent fuel.

Ms. MATSUI. So we have, well, maybe not 50 or 60 years for our Rancho Seco, but maybe 40.

Mr. CHU. Well, we hope to develop a plan far sooner than that.

Ms. MATSUI. OK, great. Mr. Secretary, we are fortunate in the Sacramento region that we have access to clean hydropower resources as part of our growing renewable energy portfolio. I believe if we are to achieve the President's goal of establishing a clean energy future, hydropower needs to be part of the discussion.

I would like to know what DOE is doing to advance the adoption of new hydropower systems to generate more clean electricity in the country.

Mr. CHU. There are several things we can do. We don't anticipate building new, large dams, but we can replace the old turbines in existing dams with more efficient turbines that are actually friendlier to fish——

Ms. MATSUI. Yes.

Mr. CHU [continuing]. And more efficient. We should look at what are called run-of-the-river hydro dams. So again, it has far less environmental impacts than a conventional dam. And we should also look at sites where we store water for flood control——

Ms. MATSUI. Yes.

Mr. CHU [continuing]. And we release the water to put turbines in those sites, again, would have virtually no environmental impact but you can capture the electricity. So those are things we are looking at.

Ms. MATSUI. OK. Thank you, Mr. Secretary. I see my time has run out.

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

Mr. GARDNER. Thank you, Mr. Chairman. And Mr. Secretary, thank you for your attendance today.

A couple of questions for you following up somewhat on other Members' questions but also some questions concerning Yucca Mountain and also what is happening in Japan. Right now, what is your level of communication with the administration in Japan regarding the events?

Mr. CHU. Well, I spoke to the METI minister. It was yesterday morning. And offered him some of our services, our equipment, things like that, to which he accepted and expressed gratitude for that. I don't know whether it is hourly, but our people are certainly in constant contact with people in Japan. There are communications with Ambassador Roos, several daily, and so we are mostly going through channels. The State Department is also communicating, NRC, and then other informal channels. But we are continuing to offer assistance to Japan in any way we can, as well as informing ourselves of what the situation is.

Mr. GARDNER. And at this point you are satisfied with their response to the situation?

Mr. CHU. Well, I can't really say. I think we hear conflicting reports, but I will go back to say that Japan is a very advanced country. They take these things very seriously and so I don't want to say anything more than we will stand by and help them as best we can.

Mr. GARDNER. Thank you. And Mr. Secretary, I have seen various what appear to be conflicting statements regarding the use of the Strategic Petroleum Reserve in news reports. Do you or do you not support at this point the access of the Strategic Petroleum Reserve?

Mr. CHU. Well, if by access you mean that regarding the Strategic Petroleum Reserve as one of several options that we can hold in our arsenal, it is designed for severe disruptions in supply. The President has made very clear that that is an option that he can consider. And there are other things that are happening right now. I think the other oil-producing countries in the world are stepping up their production.

Mr. GARDNER. What about production here? Have you talked to Secretary Salazar or perhaps the Department of Agriculture about stepping up production within our own resources?

Mr. CHU. That is right. As I understand it, two deepwater leases have been recently issued by the Department of the Interior. There have been a number of shallow-water leases that have been issued. There is an increase in production in the continental United States, as I mentioned before, because the shale gas actually has shale oil in it as well. We see an increase in recovery of that, and that is going to be a significant asset going forward.

Mr. GARDNER. Are you encouraging domestic production to help lower the price of gasoline in the country?

Mr. CHU. I think domestic production should be part of a coherent plan going forward in what we need to do with our transportation fuel.

Mr. GARDNER. But what is the President's plan right now to lower gas prices by the summer?

Mr. CHU. Well, first, domestic production itself doesn't turn on instantly, even if you have a known reserve. Producing more production from that known reserve will actually take months to years. Developing new reserves would take longer.

Mr. GARNER. But the fact that that is coming online should be reflected in price?

Mr. CHU. That is true. So the immediate thing is that if you know that there are reserves coming online, just as oil-producing exporting countries around the world, you know that they are increasing their production. So that should have a calming influence on price. But in the long run I think we should also say that if we look at the demand —by the long run I mean 10-plus years——

Mr. GARDNER. So the administration's plan to lower gas prices by this summer is 10 to 12 years?

Mr. CHU. No, we are working toward doing what we can in the short term, but I am also saying that this problem can emerge easily again because of the laws of supply and demand.

Mr. GARDNER. So what is the administration's plan, though, by the summer to lower the price of gas?

Mr. CHU. Well, we are going to be seeing if production can be increased. We are in conversations with other countries around the world on how we can increase production. And again, the petroleum reserve option is on the table.

Mr. GARDNER. But you are talking to the Secretary of Interior and Agriculture, Department of Agriculture, to increase production here?

Mr. CHU. Well, I talked to the Secretary of Agriculture and Interior several times a week. But I think the licensing and things of that nature are in the purview of Secretary Salazar, and it is in good hands.

Mr. GARDNER. Again, I have additional questions on Yucca Mountain that I would like to submit if you wouldn't mind giving them back for the record. Thank you.

Mr. WHITFIELD. At this time the chair recognizes the gentleman from Michigan for 5 minutes.

Mr. DINGELL. Curtis, I thank you for holding the hearing and for your courtesy in recognizing me. Mr. Secretary, welcome to the committee.

The President, in his State of the Union, said if the United States is to compete, we intend to out-innovate, out-educate, and out-build the rest of the world. A big part of that from my perspective is the Section 136 Program or the Advanced Technology Vehicles Manufacturing Loan Program. I have heard from numerous entities that have applied for funding under Section 136 and I find that in the development of that, none of them have been able to tell me that it has been an entirely positive experience, although I believe you and the Department have tried to be as helpful as you can. It is, of course, a complicated and a new law, which is somewhat made difficult by the fact that you had to function under very, very limited time frames.

In fact, I hear a complaint that the goalposts are constantly moving. This is perhaps the most serious and it is perhaps the one that I hear most. Companies feel that everybody enters into the negotiations with the best of intentions but they have no assurance that they will ever get to the end of the road. For the record, please, would you provide a detailed summary of how Section 136 process works?

Mr. Secretary, I note that your budget request for this year is 40 percent less than was requested in 2011 and that the 2011 request is 50 percent less than the 2010 enacted levels. I understand our budget situation is serious but this seems to be inconsistent with the President's out-innovate, out-educate, and out-build message. Has the need for funding to reequip, expand, and build more facilities to create the vehicles of the future gone down since 2010? Yes or no?

Mr. CHU. No, we certainly need to expand and build facilities. Were you comparing the recovery budget or our base budget?

Mr. DINGELL. Well, my concern here is the Section 136 process and how it is working. And what I am trying to find out is has the need for that section to be used for funding to reequip, expand, and build more facilities to create the vehicles of the future gone down since 2010 so as to justify the reduction in the level of funding requested by the administration? Yes or no?

Mr. CHU. I think it has gone down if you are including Recovery Act funding.

Mr. DINGELL. Say again?

Mr. CHU. I said if you are referring to the ATVM loans and including the Recovery Act funding for 2010, if you include that, our funding request has gone down.

Mr. DINGELL. Well, I think it would be helpful to both of us if you were to submit the answers to the record, but where I am concerned is that we up there find that there is still a substantial need and yet we are finding that the requests for funding are going down. And what I am soliciting, Mr. Secretary, is your comments on this matter.

Last question, Mr. Secretary. Could you for the record submit a comprehensive list of applicants for assistance under Section 136 and give us each—with regard to each—an indication of where they are in the process?

Mr. CHU. Really we would be violating some confidentiality in the applicants of who has applied, and so that would be difficult.

Mr. DINGELL. Well, Mr. Secretary, I am not trying to lay any traps for you. And I recognize this is difficult, which is why I ask that you submit this for the record. And my staff will be happy to work with your staff to see to it that we are able to work together to get the proper answers.

Mr. CHU. We can supply information in the aggregate, anonymity, things of that nature, and we can do that.

Mr. DINGELL. And I hope you understand, Mr. Secretary, these are friendly questions, not hostile. Mr. Chairman, I thank you for your courtesy.

Mr. WHITFIELD. Thank you. At this time I recognize for 5 minutes the gentleman from Pennsylvania, Mr. Pitts.

Mr. PITTS. Thank you, Mr. Chairman. Thank you, Secretary Chu, for your testimony today. In light of your opening statement, I believe if I can paraphrase it, you said nuclear power should continue to be a key part of our national energy policy, is that correct?

Mr. CHU. That is correct. We would like it to be part of our energy in this century, yes.

Mr. PITTS. In light of this, the administration has eliminated the Office of Civilian Radioactive Waste Management, an office within DOE expressly created by statute. The administration has also shut down the Yucca Mountain repository program. There are currently concerns about the status of spent nuclear fuel rods that have been in wet storage at the Japanese nuclear plants affected by the recent earthquake.

In light of the events in Japan, does the decision to eliminate the Office of Civilian Radioactive Waste and the shutdown of Yucca Mountain program deserve reconsideration from the President?

Mr. CHU. Well, we shouldn't conflate what is happening with the events in Japan and the need to have a long-term repository. And again, as I said, there are stages. Once the fuel rods have been used, they are stored in a pool, but that is a very short-term thing. And then you convert after several years to dry cask storage and then finally you look for disposition. But technology is changing and there is, again, I don't want to preempt what the Blue Ribbon Commission will say, but there could be potentially going forward in the coming years other opportunities to perhaps capture more of the energy content of that used yield.

Mr. PITTS. So at present, how does the administration fulfill its obligations under Nuclear Waste Policy Act to manage and permanently dispose of the Nation's spent fuel inventories?

Mr. CHU. Pardon?

Mr. PITTS. How do you manage and permanently dispose of the Nation's spent fuel inventories today?

Mr. CHU. Well, the Department of Energy is responsible for dealing with the spent fuel, and again, we are asking the Blue Ribbon Commission to give us advice on—which they will do in June in a draft report on how to proceed forward so that we can actually take this spent fuel. As I said, I don't want to preempt what they are saying, so I don't really know what they are going to be recommending in terms of what you use with the fuel once it is cycled once.

Mr. PITTS. In light of the events in Japan, can you make any conclusions at this point about the safety of nuclear power in the United States as a result of what you know about the incident?

Mr. CHU. No, as I said before, what we want to do is look at what happened in Japan and say if there are these multiple events, as what has happened in Japan, a terrible earthquake and a tsunami, and look to whether we would vulnerable to a cascade of multiple events and how they might compromise safety. And so we first intend to look fully at whether we have considered all possibilities and get whatever lessons we can learn from——

Mr. PITTS. What is DOE doing in terms of monitoring any potential radiation emitted from the Japanese facility? Will you collect exposure and health effect data?

Mr. CHU. Well, what we have done is we have airlifted airborne equipment that can help monitor. We have made that available to the Japanese. We also have ground equipment that can pick up exposure levels and the type of radiation of people on the ground that we have also in the process—so it is in Japan now. And we are looking to deploy this in various areas so that we can have a firsthand understanding of what the exposure levels are and how they might change.

Mr. PITTS. And in your testimony you say we are cutting back in multiple areas, including eliminating unnecessary fossil fuel subsidies, reducing funding for the Fossil Energy Program and reducing funding for the Hydrogen Technology Program. Will this decision increase or decrease gas prices in your opinion?

Mr. CHU. Because of the Recovery Act, there was a tremendous amount of investments in clean coal technologies, carbon capture, sequestration technologies. And so because of that we thought that given that essentially $4 billion of investments that we can, given the issues about the fiscal responsibility, we thought that that very large investment can carry us forward for a number of years. So that is where most of the investments in our Fossil Energy Program were going into. It was going into clean coal technology. So we will still continue to make those investments because we believe that is a proper government role, to develop clean coal technologies. But that is different than transportation fuel.

Mr. PITTS. Thank you, Mr. Chairman. Thank you, Mr. Secretary.

Mr. WHITFIELD. At this time the chair recognizes the gentleman from Massachusetts, Mr. Markey.

Mr. MARKEY. Thank you, Mr. Chairman. Dr. Chu, you wear many hats as the Secretary of Energy. One of them is banker-in-chief to the nuclear industry, a socialist system that allows for the U.S. Government to provide taxpayer-backed loan guarantees for nuclear power plant construction in our country. I want to know from a purely financial-risk perspective, do you think that the events in Japan will probably make it less likely for Wall Street investors or utility executives to want to assume the financial risks associated with ordering new nuclear power plants?

Mr. CHU. I can't really predict what Wall Street will do, but certainly the events in Japan are going to cause everybody to look back and look back at their existing plants and their future plans and I think that is a good thing in the sense that you take this opportunity to look back and see what you are doing and are you doing everything possible to maximize the safety.

Mr. MARKEY. So along those lines, are you going to reassess as the banker-in-chief the risk premium that you charge nuclear utilities for the loan guarantees you are giving them in light of the events in Japan?

Mr. CHU. The risk premium is ultimately a credit subsidy issue.

Mr. MARKEY. Are you going to reexamine it in light of what happened in Japan?

Mr. CHU. Well, I think all factors get folded into a nuclear loan.

Mr. MARKEY. So you are going to reexamine it?

Mr. CHU. But ultimately, as you know, the OMB is the part of the government responsible for the determination of that credit——

Mr. MARKEY. Should OMB reexamine the risk premium?

Mr. CHU. I think they will include anything like what has happened in Japan in their determination.

Mr. MARKEY. So they should go back again. I thank you.

The Department has awarded an $8.3 billion loan guarantee to the Southern Company conditional upon the certification of the brand New Design, the AP1000 reactor by the Nuclear Regulatory Commission. Three days before the Japanese earthquake I sent a letter to the NRC because I learned that one of its most senior scientists, Dr. John Ma, has said that the design of that plant may be too brittle to withstand a strong earthquake and that it will "shatter like a glass cup" under strong impact. He even said that Westinghouse modeled the resiliency of the reactor using a totally unrealistic earthquake simulation.

Don't you think it is too risky to issue conditional loan guarantees backed by the federal taxpayer for reactors like the AP1000 that have not been fully approved by the NRC in final form after public notice and comment, particularly when one of the NRC's own top technical people has raised serious concerns about its safety?

Mr. CHU. One of the conditions of a loan is that the NRC has to grant approval of the license, and that is still pending before the NRC. And so the Southern Company and its collaborators do not get federal money until the NRC approves their construction.

Mr. MARKEY. Don't you think that we should hold off on licensing new reactors on new reactor designs or approving new loan guarantees until we assure that these new reactors are safe and we have learned the lessons of Fukushima?

Mr. CHU. I think we will, no matter what happens going forward, try to take the lessons of Fukushima and apply them to our existing fleet and any future reactors that we will be building.

Mr. MARKEY. Now, in the case of the conditional loan guarantee you gave the Southern Company for the two new AP1000 nuclear reactors at Vogtle, that $8.3 billion taxpayer loan guarantee will then allow the Southern Company to get an $8.3 billion loan directly from the Federal Financing Bank at the Department of Treasury, again, a U.S. taxpayers entity. So the taxpayers are fully on the hook for 8.3 billion out of the $14 billion project. If there is a default on this Vogtle plan—and the first 2 units that they have already built in past years there were 11 times over budget—So if there is a default on the Vogtle loan, what would happen?

Mr. CHU. In our loan guarantee program the people who work in that program work very, very hard so that they make sure that if there is a default, that the government taxpayers are protected, that there are assets in Southern Company and others——

Mr. MARKEY. But if you can't get paid off, what happens then?

Mr. CHU. Well, it is a very complex agreement and there are specific——

Mr. MARKEY. Would we own the Southern Company like we involuntarily wound up owning General Motors if they can't pay?

Mr. CHU. That I would have to get back to you on the details of what the exact——

Mr. MARKEY. Yes.

Mr. CHU [continuing]. Recovery is.

Mr. MARKEY. I think the American taxpayer really has to be protected here going forward.

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

Mr. MARKEY. Should not be licensing AP1000s——

Mr. WHITFIELD. The gentleman from Mississippi, Mr. Harper, is recognized for 5 minutes.

Mr. HARPER. Thank you, Mr. Chairman. Thank you, Secretary Chu, for being here today. I know that you can see the end in sight here of the questioning. I know you will appreciate your time, though, today being here.

And I wanted to talk to you about something that President Obama said in a press conference recently, that we should increase energy production in this country and he mentioned oil specifically, but it appears in his 2-plus years in office I would argue the President has really not done much in that way, not much towards increasing our production of oil. When the President came into office, gas at the pump was actually under $2 a gallon. We are approaching $4 a gallon in many regions. And, of course, we have had the Deepwater Horizon explosion back on, I believe it was April 20, approaching that 1-year anniversary. And then a moratorium was placed on the deepwater offshore drilling in the Gulf of Mexico following that and there have been limiting of leases on the East Coast. And of course, we continue to ignore our resources in ANWR.

And I would ask if you have had any conversations with the President recently about expanding exploration and production of domestic oil, and if you have had those conversations, what input or direction have you received from the President?

Mr. CHU. The President has already spoken on this matter. He mentioned in a press conference that in 2010 the production of oil in the United States was as high as it has ever been since 2003. Prior to the Macondo accident, what had happened is more land was made open to have access to drilling, and that was certainly an Administration policy. The oil companies are seeing a lot of leases are not fully utilized, and the President has said that they would ask if those companies are just sitting on those leases, they are not actually using them, that we can explore mechanisms to find other lessees who would, then, explore those. So the President is, as part of a comprehensive transportation strategy, going forward. That is one of the things, in order to deal with what we are now facing.

Mr. HARPER. When we say, or when the President says, or the White House says that production is as high as it has been since 2003, is that high enough in light of what is going on around the world, first with the concerns in Egypt, and then Libya, and now what has happened in Japan? Are you convinced that we are pursuing the recovery of our own natural resources as it comes to oil in this country and the regions that we can go into offshore? Do you believe we are doing a sufficient amount at this level?

Mr. CHU. I think we are going to have to do many things. Increased oil production is only part of the solution. As the President said, we now have 2 percent of the known oil reserves in the world, and yet we consume 25 percent of the oil. And so we can increase production in the United States, but it clearly can't be the full solution. That is why we are focused on improving still further energy efficiency in automobiles, biofuels, advanced biofuels especially, and finally electrification.

Mr. HARPER. Secretary Chu, have you had any conversations with the Department of Interior about the slowness in the permits being approved for the Gulf of Mexico drilling?

Mr. CHU. No, I haven't.

Mr. HARPER. OK. Do you intend to have any about the slowness of the permit process?

Mr. CHU. Well, I believe that this has gotten started again, and the shallow-water permits were continuing and now we have 2 deepwater permits. And I anticipate that that will be accelerating.

Mr. HARPER. And what is your position on drilling and ANWR?

Mr. CHU. Right now there are many other sites open for drilling, and so we need not tap there. And the President is also exploring other sites in Alaska both on- and offshore. And so at the present time, there are many sites open for drilling that are not being used. And so I think we first look to those sites and try to get the oil companies interested.

Mr. HARPER. Would you look to those sites being used first before you tap into the Strategic Petroleum Reserves?

Mr. CHU. Well, the Strategic Petroleum Reserve, again, is something which was meant to have a continuous oil supply in case of significant disruption, and that is a strategic reserve. I mean, oil is very essential for our country and so that is the original intent.

What you are speaking of are things that has—even in a known reserve, it takes a year or two to bring up production and then for unknown reserves and exploration——

Mr. HARPER. Sure.

Mr. CHU [continuing]. Five-plus years.

Mr. HARPER. And exactly, wouldn't it be necessary? I will yield back my time with that. Thank you.

Mr. WHITFIELD. Thank you, Mr. Harper. At this I recognize the gentlelady from Colorado, Ms. DeGette.

Ms. DEGETTE. Thank you so much, Mr. Chairman. Thank you for coming today, Mr. Secretary. Mr. Upton said that we are going to have more hearings about what happened with the nuclear power plants in Japan, but I just wanted to ask you a couple of questions that have been on my mind since the terrible events of last week.

The Fukushima Daiichi plant, at that plant, three of the six reactors were operating at the time of the earthquake to my understanding. Is that correct?

Mr. CHU. That is my understanding also.

Ms. DEGETTE. OK. And so when the earthquake struck, the control rods essentially shut down those reactors as it was designed to do if there was an earthquake. Is that also right?

Mr. CHU. That is my understanding.

Ms. DEGETTE. And then after the reactors were shut down, then power was lost in the plant and then the cooling pumps were shut off. Is that correct?

Mr. CHU. That is correct. The power was lost.

Ms. DEGETTE. So then the backup diesel generators came on as that was also designed to do and then those generators quit functioning because they went under the floodwaters from the tsunami. Is that right to your knowledge?

Mr. CHU. The generators came on and then later I have been informed that some of them then shut off. This is where I couldn't give assurances because you hear conflicting reports, but the story I heard was that the cooling for the generators was at risk and they tripped off for that reason.

Ms. DEGETTE. Right. OK. So then now what they are trying to do is pump the seawater in to keep these rods from melting down, right?

Mr. CHU. That is correct. They are using, now, fire trucks.

Ms. DEGETTE. So——

Mr. CHU. And other pumps.

Ms. DEGETTE [continuing]. This is the concern I have got—and I imagine you share this concern—is that there were numerous failsafe systems here with this plant. I mean, it is 40 years old but it is a pretty technologically advanced plant and there were numerous failsafe methods, correct?

Mr. CHU. Yes.

Ms. DEGETTE. The plant was built to withstand earthquakes, but because of the tsunami, now we have got this crisis about what to do. And the thing I am concerned about is that you can't always plan for every exigency in these situations. We saw this on this committee. You saw it last year with the Deepwater Horizon disaster because there were numerous failsafe mechanisms on that rig and then each one of them failed, and then we saw huge amounts of oil spewing out into the Gulf.

So my question for you is I know DOE is putting resources towards advanced reactor technology and there are a lot of concerns

from this committee and from my colleagues who live in California and some of the other earthquake zones. But here is my question is how can you, with something so potentially destructive as these nuclear rods, how can we ever anticipate the worst so that we can be prepared for it? That is a tough question, I know, but maybe you have some initial thoughts on it.

Mr. CHU. Well, what the Department of Energy is very interested in doing is developing tools to get a better handle on these multiple cascading events, interacting events, an earthquake plus a tsunami, a tornado plus this or that, things like that. One of the things that we are very keen on doing because we have developed high-performance computers and simulation techniques, that this is one of the tools we think that can actually be used to make any system we have, including nuclear reactors, safer. You know, if you consider all the things we do now, we fly on airplanes, we do all sorts of things, and there is ever-increasing ability to make each of these systems safer as we go forward.

Ms. DEGETTE. Sure. Well, you know, 1 thing that strikes me—and I was just in Japan a couple of weeks ago with the Congressional Delegation—and the 1 thing that strikes you about Japan, this is not, you know, Chernobyl. This is not some Third World country with rinky-dink technology. This is state-of-the-art technology and yet it failed.

So I really think one of the questions, Mr. Chairman, we are going to want to explore as we move forward is do we really have the kinds of modeling that we need to develop nuclear energy safely in this country. And I am sure you are looking at that, too.

Mr. CHU. Yes.

Ms. DEGETTE. Thank you. Thank you, Mr. Chairman.

Mr. WHITFIELD. At this time I recognize the gentleman from California, Mr. Bilbray.

Mr. BILBRAY. Yes, Mr. Chairman. And I think the secretary will agree with the statement that Japan is state-of-the-art is inappropriate. It is a state that was designed maybe 40 years ago. We have now got designs even in the fuel composition that really address these issues. So as somebody who lives downwind of San Onofre, I just want to assure everybody our surge wall is three times what they had in Japan. The surge wall, the construction at Diablo is eight times higher and the fault line is inland, not offshore. So I think when we talk about this, there are differences scientifically.

Let me just say, Mr. Secretary, I am 1 guy sitting on this side of the aisle that is very excited to see you as the secretary. And we talked about this last year over in the Science Committee. I just realized the connection. Back when I was a young 26-year-old city councilman, the Department of Energy was created. Back in the '70s when it was created our dependency on imported energy was what again?

Mr. CHU. Well, I heard 35. I was guessing 25. But I will provide a more precise number for the record.

Mr. BILBRAY. I think you are right. I think it was more like 25. And when you took over in '08 the imported energy was what percentage?

Mr. CHU. In 2008 it was 57 percent.

Mr. BILBRAY. And that is how much success our Department of Energy has had in the past, but that is why I am optimistic that you are the right guy at the right time with the right President to finally get this country to, rather than have an anti-energy policy, actually have an energy policy. And that is one of the things I am really encouraged about. My biggest concern—and I will say this with tongue-in-cheek—to the fact of how much obstructionists always seem to be there every time you come up with an innovative approach.

I want to point out that as one of the three California surfers in Congress, you mess with our ways to try to generate electricity, you are going to have a real problem with us, OK? Just the fact is every time somebody says there is something nobody will complain about, believe me. You start talking about wave actions in Southern California and Hawaii, we are going to have some concerns.

But that aside is that one of the things I want to talk about is you are being asked to do things in isolation. And my attitude about our oil reserves or the areas being drilled is that right now we are buying oil overseas, sending our resources overseas. What happens to the federal profits that we get from opening up lands like ANWR or Alaska? We do make some profits off those oil exploration and development, don't we?

Mr. CHU. We do.

Mr. BILBRAY. And where does that resource go now?

Mr. CHU. As far as I know it goes to the Treasury.

Mr. BILBRAY. OK. Don't you think that we may want to at least discuss the possibility of opening up lands and committing those profits to next-generation green fuel so that we have a built-in resource like the transportation components, the freeway interstate system, have a built-in source for you to use to be able to pay for that bridge to a greener future?

Mr. CHU. I would love the Department of Energy to have a built-in source that we can do the research that will lead to technology the private sector will pick up.

Mr. BILBRAY. OK. Let us talk about obstructionists. We talk about going to electrical generation. We talk about energy development. Isn't it true that the technology we use for efficient electric motors and the efficient generation of wind power depends on permanent magnet technology because it is so much more efficient than the AC technology that it replaced?

Mr. CHU. The permanent magnet technology is more efficient, and we are also looking at other because these permanent magnets and the rare-earth magnets——

Mr. BILBRAY. This is where we come down, the rare-earth. At the same time we are talking about electrification, nobody in this town is talking to the Department of Interior about opening up public lands to allow the mining of rare earth, 70 pounds in every Prius where in 30 years that we have gone with this Energy Department, the Department of Interior has created an environment where instead of 98 percent of the rare earth being produced in the United States, it is now in China. Don't you agree that we need in this committee if we want to create efficient electrical generation and use, we have got to be brave enough to ask our colleagues over at the Department of Interior and the Resource Committee to start

looking at opening up public lands within our country so these essential rare earth can be developed if we are going to go to electrification?

Mr. CHU. I agree with you that having China control 98, 99 percent of the rare earths of the world is not a good situation. And we are looking—I believe Molycorp Corporation in California will be—I think it is in California—will be—I am not sure actually.

Mr. BILBRAY. My point, Doctor, is that you understand the barriers. My frustration is the barriers is more government obstructionism. We write checks quick but we are not willing to change regs. We talk about we need a Manhattan Project for energy independent. The fact is today the Manhattan Project would be legal to perform under federal and state regulations. And we have got to be willing to not just tell other people how they have to change their operation and their way to do business, those of us in government have to change the way we do business, too. Wouldn't you agree?

Mr. CHU. I think we are going to be looking at many, many things, but certainly there need to be requirements is something we also have to take seriously and I would be glad to talk to you about that in private.

Mr. WHITFIELD. At this time I recognize the gentleman from Pennsylvania, Mr. Doyle.

Mr. DOYLE. Thank you, Mr. Chairman. Mr. Secretary, welcome. It is a pleasure to have you here before our committee today.

Secretary Chu, you know in Pittsburgh we are fortunate to have the National Energy Technology Lab that does a lot of innovative research. And I was hoping I could ask you a few questions concerning some of the cuts in the administration's upcoming budget proposal. I see that you have terminated all of the natural gas and oil programs run out of the NETL. Don't you view these research programs as being particularly relevant today, since it funds environmental protection projects that are related to drilling, hydraulic fracturing, oil and gas production, as well as the development of advanced technologies that will allow increased recovery from our domestic unconventional oil and gas resources?

Mr. CHU. Well, the Department of Energy played a very important role in the developing of natural gas recovery in the late '70s, early '80s to 1992. It was actually the Agency that funded the research that led to the fracking of natural gas. But the private sector has picked it up and is doing quite well.

There has been a transfer of funds from FE, Fossil Energy, to the Office of Science for doing research in methane hydrate recovery because, commercially, energies are that interested so far, but the bulk of our funding in FE, as you know, is for carbon capture and sequestration.

Mr. DOYLE. Yes. And I understand the larger companies have the ability to pick up some of that slack but, you know, this program, at least in my view, is really not subsidizing the bigger companies. In the United States we have 5,000 small independent producers. They do 90 percent of the wells and 60 percent of the domestic oil and 80 percent of the natural gas comes from these small companies that employ an average of 12 people or less and they don't have the resources to invest in the R&D. And this is where DOD

has really fulfilled a critical need for technology advancements through partnerships with companies like these and university researches and technology.

I do want to ask also to follow up because you just mentioned this. The administration has proposed that the Gas Hydrate Research Program and fossil energies being terminated and transferred responsibility for future research over to the Department's Office of Science. Now, the program has been well managed. It has made significant progress, and it concerns me that you are going to kill a program that is on the verge of making production from gas hydrate a practical reality after decades of research and millions of dollars spent by DOE and other agencies to bring this to this point, that you are going to start up a new program in the Office of Science that I think would have little bearing on anything.

And when you look at the language just in the most recent Energy and Water Senate report, we contain language about this that the committee recommended, includes 22 million. Of this amount 15 million is provided for methane hydrate activities. The committee actually restored this hydrates technology program of the account, and they don't support funding this within the Office of Science. Their intention was that this was to be funded out of Fossil Energy. So I am curious why you are deciding to defund this program and transfer it over to the Office of Science?

Mr. CHU. Well, I know the program very well and I do think highly of it. We hope the Office of Science will be the people doing that research, but we will abide by Congress' wishes.

Mr. DOYLE. Thank you. One more question, too. As the co-chair of the Hydrogen and Fuel Cell Caucus, I am also concerned about the Department is basically zeroing out funding for the Fuel Cell Energy Program within the Office of Fossil Energy. I understand that one of the projects managed by DOE won and R&D 100 award in 2010 for improving the service life of solid oxide fuel cell stack materials. I am curious, why would you eliminate this very successful Fossil Energy program that is developing fuel cell technology required for large-scale power generation applications to produce affordable, efficient, and environmentally friendly electricity from coal?

Mr. CHU. Well, we actually have several fuel cell programs within the Department of Energy. We are continuing to fund fuel cell development as stationary fuel cells, but not in Fossil Energy.

Mr. DOYLE. See, my understanding is that you are continuing to fund transportation fuel cells but that you have zeroed out the stationary fuel cells. Are you saying that is not accurate?

Mr. CHU. It is my understanding that we are mostly concentrating on stationary fuel cells. We do have some on transportation but it is concentrated on that.

Mr. DOYLE. Thank you. I see my time has expired. Thank you, Mr. Secretary.

Mr. WHITFIELD. At this time the chair recognizes the gentleman from Virginia, Mr. Griffith.

Mr. GRIFFITH. Thank you, Mr. Chairman. Continuing talking about coal a little bit, I am concerned that new regulations will slow growth and send jobs to China. Both you and the President are supporters of China's energy policy. We hear time and time

again from the administration that China has a strong commitment to wind and solar energy and that we need to catch up or we will lose the future.

But you would agree and are aware that China gets 70 percent of its total energy and 80 percent of its electricity from coal. Wouldn't you agree with that?

Mr. CHU. I have heard numbers like that, yes.

Mr. GRIFFITH. Yes, sir. And isn't it true that China uses 3.5 times as much coal as the United States uses and that that number is actually growing?

Mr. CHU. I think so. Again, I am not sure of the exact numbers.

Mr. GRIFFITH. OK. And you are aware that under the Kyoto Protocol, China has no obligation to reduce emissions and it is not imposing anything anywhere close to the EPA's greenhouse gas regulations on its coal use, isn't that correct?

Mr. CHU. That is correct.

Mr. GRIFFITH. And you are also aware that the Chinese Government has repeatedly stated that they would never put a price on carbon, isn't that also true?

Mr. CHU. I don't know. China is committed very emphatically to transition to 15 percent renewable energy by 2020 and they may get to 20 percent.

Mr. GRIFFITH. OK. And while you are aware that wind and solar in China are growing in percentage terms, they will never—or at least not anytime in the near future—be equal to their relationship or their reliance on coal, isn't that true?

Mr. CHU. Well, it is their intention to greatly diversify their energy supplies. In the short term they are heavily dependent on coal, but they have made it very clear that they want to develop wind, solar, hydro, nuclear.

Mr. GRIFFITH. Yes. And the factories that make the wind turbines and solar panels for export to Europe and the U.S., isn't it true that they are actually powered by coal energy sources?

Mr. CHU. I would presume given that coal is still the dominant form of energy.

Mr. GRIFFITH. And don't you think that is a part of their competitive advantage is that they are using a cheap source of fuel that we seem to not want to use in this country?

Mr. CHU. Well, it is more complicated than that. If you don't mind, I will tell you a little story. I toured a Chinese solar company and they would get their silicons from companies in the United States and then add the high value part of it to make the modules in China——

Mr. GRIFFITH. And I appreciate that. My concern is I only get a certain number of minutes to ask you questions, and I guess my concern is is that, you know, it appears to many that the future of coal in the United States is merely to mine it and send it to China for them to use and that our jobs are going to go over there. They are going to send their pollution back to us over the Pacific Ocean because they are not going to have even some of the more reasonable regulations that we have, but that we are not using our own coal for our manufacturing purposes. And so as a part of that I am wondering if you have talked to any of the folks at the EPA about their slowness to permit new coalmining or is this part of an

administration plan to slow down the production of coal and thus force us to, I think, lose jobs? But the plan would be force us to not use coal because there isn't a supply available domestically?

Mr. CHU. I have not talked to the EPA regarding this, but just to finish that story, China takes its silicon from the United States because it says that energy is so cheap in the United States and that is why we do it.

Mr. GRIFFITH. OK. And in regard to coal you would agree that it is a fairly affordable and reliable source of energy in the United States and that it is a good source, at least over the next 20 or 30 years it is a good source that we shouldn't cripple, would you not agree?

Mr. CHU. Well, I think that is why the Department of Energy is committed to developing those technologies to use coal as cleanly as possible.

Mr. GRIFFITH. And I would encourage you to work with the Environmental Protection Agency to make sure that they don't shut down your supply for those purposes and other purposes. Thank you.

Mr. WHITFIELD. Thank you. At this time I recognize the gentleman from Texas, Dr. Burgess.

Mr. BURGESS. Thank you, Mr. Chairman. Dr. Chu, I appreciate you being here. I certainly appreciate how generous you have been with your time over the past 2 years to visit with Members of the committee outside of the committee room.

In response to a question from the gentleman from Mississippi about ANWR and whether or not the President would consider that, you said that there were other sites in Alaska that the President was looking at. Now, in all honesty, I mean, his background is as a community organizer; you are the energy expert. Are you helping him with that?

Mr. CHU. Well, actually, this is the domain of the Secretary of Interior, and so it is the Secretary of Interior who would be helping him with that.

Mr. BURGESS. All right. But he has got some petroleum people who are actually helping him make that decision?

Mr. CHU. I would think so, yes.

Mr. BURGESS. OK. Maybe we ought to find that out who can help him. Now, also mentioned in a previous answer to a previous question, you said that oil can't be our only solution. We have 2 percent of the reserves and 25 percent of the consumption.

Now, a resource where we do have significant reserves is natural gas. And in my part of Texas we have new technology that allows recovery of natural gas from strata that previously were thought to be inert and that is ongoing at the present time. As you are aware, there is some controversy about the methods of extraction and to be certain all of us do need to be concerned about safety. We have seen it in Japan this week. We saw it in the Gulf Coast last year, so we do need to be concerned about safety. But we also need to be concerned about the overregulation of these processes that inhibit our ability to take advantage of a resource that we do have in abundance.

Now, on the utilization end, I am sure you are familiar with people like Boone Pickens who talk about our heavy transportation

fleet should be run much more on natural gas rather than liquid petroleum products. What are you doing at the Department of Energy right now in regards to that?

Mr. CHU. We are supporting pilot programs. We think especially in delivery vehicle situations where there are central fueling stations because we don't have a natural gas infrastructure, that that would be a good place to prove natural gas and establish the technology. I think we had a loan guarantee for natural gas vans for helping handicapped people. We have supported programs using Recovery Act money for centralized fueling stations.

Mr. BURGESS. Sure. So things like city buses and school buses make sense because they are not long-haul vehicles and they——

Mr. CHU. And they always go back to the same place.

Mr. BURGESS. Correct. They could be centralized. Now, are you working with your counterparts at the Environmental Protection Agency to help ensure the correct utilization of this resource, the ability to continue to recover it and that it is to be done in a safe manner? Because you know the EPA has a couple studies going on right now as regards to hydrologic fracturing. Are you communicating with them about that?

Mr. CHU. Well, first, the Department of Energy is using some resources in this fiscal year to look at fracking safety. I think it is something that can be done safely but we have to——

Mr. BURGESS. Can you say that again?

Mr. CHU. The Department of Energy currently——

Mr. BURGESS. I think that—finish that thought.

Mr. CHU. I think that——

Mr. BURGESS. I think that it can be done safely. Did I hear you say that?

Mr. CHU. I believe it is like everything else. We learn from what is happening and it can be done much more safely just as deepwater oil drilling can be done more safely than it has been done in the past. We learned from the——

Mr. BURGESS. Don't parse your own language. I heard you say it. It can be done safely as a simple statement of fact?

Mr. CHU. It can be done safely.

Mr. BURGESS. I agree with you, Mr. Secretary.

Mr. CHU. But you also have to be on guard. One can't be absolutely certain of these things and you have to take that responsibility very seriously.

Mr. BURGESS. Absolutely. And I will tell you in my home area right now the public doesn't get the sense that its safety is being protected. That is why I urge you to work with your counterparts at the Environmental Protection Agency. This is an important resource for the country and we cannot afford it to become locked in where we can't develop it because it was either done incorrectly or unsafe practices were pursued and the public's then reaction against it is such that it just can't be developed.

Just briefly on Japan for a moment. Is your Department sending a contingent to Japan or has Japan asked for any help from the United States Department of Energy?

Mr. CHU. As I said in my opening remarks, we have sent some 33 or 34 people to Japan to help them monitor with equipment.

Mr. BURGESS. Just for what it is worth, I think at some point in the future when you deem it safe, your presence in Japan, I think, would go a long way towards reassuring the people there. Thank you, Mr. Secretary.

Mr. WHITFIELD. The gentleman from Ohio, Mr. Latta, is recognized for 5 minutes.

Mr. LATTA. Thank you, Mr. Chairman. And Secretary, thanks very much for your indulgence with us today. We really appreciate you being here and I am going to follow up a little bit on Dr. Burgess' comments a little bit ago.

But just to kind of give you a little background about my district and how important energy is out there, Ohio overall gets about 80 percent of its energy is coal-based. And also, interestingly enough, about 80 percent of everything that comes in and out of Ohio comes in by truck. So we are talking about oil.

The 5th Congressional District, according to the National Manufacturers, is the 20th largest manufacturing district in Congress. It is also, interestingly enough, the largest ag district in the State of Ohio. We also have two solar manufacturing plants in the district. I have two ethanol plants in my district. The first four really working turbines in the State of Ohio I can see from my backyard. There are four of them not too far from my home. And I am one that really truly believes that we have an all-of-the-above energy policy. And again, that is your oil and natural gas, coal, nuclear, and all of the alternatives because we have to really utilize all of those.

But at the same time when I am out talking to my companies, my businesses, the factories across my district, one of the things that always comes up in the conversation is we have to have baseload capacity to turn these machines on in the morning. And I know that a question was asked, I think it might have been Mr. Green had asked a little earlier in regards to, you know, where are we at that, you know, through the alternatives? I think the question he posed was in 10 years that we could really start supplanting, you know, some of the oil, natural gas, coal, and nuclear.

But, you know, to make sure that we can compete, and I know the questions have come up because it all comes down to really jobs and making sure people can get out there and work and we have these jobs in the future. Is there anything out there right now that can supplement those 4 basic methods that we have right now from nuclear, the clean coal, the oil, and natural gas?

Mr. CHU. I think it is going to be a transition period. If you look at other countries around the world and if you look at what we are doing here in the United States that these things don't happen overnight. It will take decades to make these transitions. And one recognizes that.

Mr. LATTA. Well, let me ask this. I represent quite a few co-ops in my district and one of the things that they are worried is is that, you know, the cost of having to buy a lot of the alternatives right now are driving up their cost, which is driving out the businesses from the area. And do you foresee that happening?

Mr. CHU. There is background noise.

Mr. LATTA. Sorry. I have a lot of co-ops in my district. And one of the questions that they always bring up to me is that they are

fearful that if they have to buy too much on the alternative side—and I know that we all want to see alternative—but they see it that they are not going to be able to supply power cheaply enough to be able to maintain the businesses that they service right now. And do you see that as a problem?

Mr. CHU. Well, we have to be very sensitive to that and that is why the Department of Energy is so focused on looking at exactly where we think the trajectory will be and what are the time scales that would be needed in order to bring down the price of renewables so that they are absolutely competitive without subsidy with fossil generation of energy.

Mr. LATTA. You know, in your testimony you also, on page 8 where the cuts are occurring under the Office of Fossil Energy, how do you define unconventional fossil energy?

Mr. CHU. Unconventional fossil energy I would think methane hydrates would be an example of that. This is natural gas trapped in crystalline structures of ice.

Mr. LATTA. And just kind of following along in the lines that Dr. Burgess talked, especially in the fracturing question. You know, we now have in Ohio and Pennsylvania, New York, the Utica reserves are being found. They are saying that probably Ohio they will be able to get to that maybe first. And again, just making sure because I know there has been talk around the Hill by some individuals that, you know, fracturing shouldn't be done. And I am one who has looked at the EPA reports that they have put out from several years back that said that fracturing can be done. And I know that, you know, Dr. Burgess has asked that question of you that, you know, I believe it can be done safely. And, you know, will the Department of Energy also make sure that that can be done and that these people out there aren't going to be impeded to get this energy that we need in this country?

Mr. CHU. I think yes. When I said it can be done safely, let me reiterate "can be done" is different than "is being done" safely. I think industry can take the steps needed to extract these resources safely. And I think it is important that we continue taking those steps to improve the methods.

Mr. LATTA. Well, I guess finally is that as we look at everything that is out there, hopefully the Department of Energy always is looking at all of these alternatives that people are coming up with. And I know my array of individuals working on clean coal technology and trying to make sure that, you know, we can utilize high sulfur coal that comes from like our region of the country and put it to use since the United States does have such large reserves when it comes to coal.

And with that I appreciate you being here today. And Mr. Chairman, I yield back.

Mr. WHITFIELD. At this time I recognize the gentleman from Iowa, Mr. Terry.

Mr. TERRY. Or Nebraska. Yes, corn states. Confuses tobacco state people.

Mr. WHITFIELD. At least I got your name right.

Mr. TERRY. Yes, coal states.

Mr. WHITFIELD. I got your name right.

Mr. TERRY. It is progress, Mr. Chairman. Sorry, Doctor. I really appreciate you being here and I think we all have great respect for you and your talents that you are lending to the Nation right now.

Harping on the fracturing, let me ask you a simple question. You mentioned earlier that you are in discussions with Interior and EPA all the time. Have there been any discussions about limiting fracturing now?

Mr. CHU. I have not been part of those discussions. I have not been.

Mr. TERRY. OK. Because there is a lot of discussion or rumors that Interior is going to shut down all fracturing within Interior lands and there is rumors that EPA is going to come down on current fracking techniques. Now, have you heard any of that within the administration discussions?

Mr. CHU. No, the only thing I heard about, the EPA has requested that monitoring be done and certainly there have been reports of possible contamination and things of that nature. So the ones I have heard said we should monitor what is being discharged. For example, the water being used and the fluids being used in fracking as they go into, let us say, sewer treatment plants that the EPA has, I believe, asked for the monitoring in the discharge of those sewage plants.

Mr. TERRY. Very good. And I appreciate that you said to Dr. Burgess that fracking can be done safely.

Mr. CHU. Yes.

Mr. TERRY. Without that technique we aren't going to have the level of natural gas that we are going to count on. The Bakken shale up in North Dakota, their production would go down greatly. We want to do it safely and cleanly but we don't want an overreaction and just start shutting it down either. So we need to do it safely. Are you engaged in any activities right now to set out what techniques or changes to make it safe or safer?

Mr. CHU. Right now we do have a small program—it is located in universities—to look at what are the issues in terms of the safety in fracking fluids. The Department of Energy does have expertise in how fluids move around in rock because of both carbon capture sequestration, also because of the underground repository work that we need to do. And so those same technologies can be brought to bear on fracking.

Mr. TERRY. I have got one more question in my minute-forty-five. So let me interrupt with this one. I want to know if there are any reports due or their findings—and I will send you a written question as fairly common at the conclusion of hearings that we will send written questions to you. Expect that one from me. It would be nice to know when you will get that information in so we could look at it, too, and maybe have you back.

But in regard to natural gas you have a lot of proponents of natural gas not only in electrical generation but moving it more towards a transportation fuel. I see in your budget that there is $200 million in the competitive program to encourage communities to invest in electrical vehicle infrastructure. Can you tell me what measures the DOE is undertaking to promote natural gas vehicles?

Mr. CHU. Yes. As I said, we have invested in some pilot projects for centralized delivery van type of things where you can go to a

centralized fueling station. I can get back to you on the full details of what we are doing on natural gas.

Mr. TERRY. I would appreciate it. And I think the focus, if I could be so bold, is probably in large fleets with on-premises fueling stations.

Mr. CHU. That is correct.

Mr. TERRY. And so in regard to providing us information if you could do that on any of the programs that would help implement or build on-site stations for large fleets I think that would be helpful. Thank you.

Mr. WHITFIELD. Thank you, Mr. Terry. At this time I recognize the gentleman from Louisiana, Mr. Scalise.

Mr. SCALISE. Thank you, Mr. Chairman. Mr. Chu, I appreciate you being with us today.

I want to talk about the broader picture of energy policy. And I know a few of my colleagues touched on some of the various objectives. And over the years our dependence seems to have increased on foreign oil especially over the history of the Department of Energy. In your mission statement you talk about ensuring America's energy security.

And I think one of the concerns I have is when you look at what the current policies are from this administration. It seems like despite the current levels of production which are the result of years of exploration in the past, it seems like this administration has shifted policies away from energy exploration in America. And, of course, we are seeing this in a very devastating way in the Gulf of Mexico and the parts of the outer continental shelf that have been closed down where only two permits have been issued in 10 months. And that seems to run counter to even the President's own scientists, a panel he had put together after the explosion of the Deepwater Horizon where his own scientists and engineers recommended against any kind of moratorium or now permitorium where you literally are strangling the ability for our country to seek its own energy, which then increases our dependence on countries like those Middle Eastern countries that are so volatile.

So how do you, I guess, reconcile what the mission statement of your Department is that really says you are going to strive to increase our American energy security when, in fact, you have got the President initiating policies that close off more areas of our known resources?

Mr. CHU. Well, the President actually increased the resources in the sense that more areas were open to exploration with not such great timing, a couple weeks before the Macondo disaster. And——

Mr. SCALISE. But has since closed those areas off and they are not issuing permits at any level close to what they were before. And while the President may hang his hat on two permits issued in 10 months, that is an embarrassing low number, you know, when you look at the safety records of those companies that didn't make the mistakes of BP that are being punished for BP's actions.

Mr. CHU. Well, the permitting of deepwater has resumed and——

Mr. SCALISE. Would you consider than an adequate resumption, 2 permits in 10 months?

Mr. CHU. Well, you could say it is two permits over the last couple weeks as well, so I think it has been resumed and will continue

to resume. I think the committee that investigated the Deepwater spill said that, you know, it is not only just BP that has been implicated in this, that the whole industry can up its game and make improvements in safety.

Mr. SCALISE. Well, and there were some serious flaws in the report where they basically try to say it was the entire industry that was at fault when, in fact, that is not the case, considering the fact that in all of the wells, thousands of deepwater wells that have been drilled, you had one disaster because of a series of mistakes by that partnership that weren't replicated at all of the other wells. So I think it is inaccurate for them to say it is systemic. I would hope you wouldn't think that it is the entire industry that is at fault when you clearly had an example of one company in a partnership that did cut corners where others didn't.

And I think that is the key point is there is this kind of broad brush it seems like from this administration that they are almost shying away from American energy exploration. I wanted to ask you about a comment you had referring to use it or lose it provisions in leases. And you seem to imply that there are companies that are not utilizing their leases adequately and you inferred that maybe other people should be given that ability when, in fact, right now in the Gulf of Mexico, all of those companies that want to go and reestablish what they were doing before and exploring for American energy are not being allowed to. And yet the clock is still ticking on their leases. Now, would you support a change in policy where if a company does want to expand and go and explore that lease but right now they are being prevented by the administration that that clock shouldn't keep running while the administration is holding them back?

Mr. CHU. I think the leases, the permits for exploration has started again and you were talking about a hold on deepwater leases for something like 6, 8 months. I think the lease time is considerably longer than that.

Mr. SCALISE. And let me ask one last question as my time is about to run out. When you were talking about known reserves, you used the term 2 percent of the world's reserves are in America. There is a CRS report and I am not sure you have read it. I am sure you have read something like this that looks at this. Nineteen billion barrels of oil reserves are what I think are alluded to in this 2 percent number, but in fact there are about 145 billion barrels of reserves that are estimated to be recoverable using new technology. So there are some outdated numbers when people use this 2 percent number. First, are you aware when people say 2 percent they are referring to 19 billion barrels of known reserves when, in fact, it is estimated that there are over 145 billion barrels of reserves in America using the newest technologies?

Mr. CHU. Reserves are a very specific thing. It is a known asset, bankable asset. You are talking about potential future reserves and there is a difference there. There are potential future reserves in the U.S. territories.

Mr. SCALISE. Would you give an estimate on how much?

Mr. CHU. Well, I am not sure the exact numbers but I can get them to you. But there are significant potential reserves in——

Mr. SCALISE. I would appreciate it if you would share that with the committee. Thank you, Mr. Chairman. I yield back.

Mr. WHITFIELD. I recognize the gentleman from New Hampshire, Mr. Bass, for 5 minutes.

Mr. BASS. Thank you, Mr. Chairman. Mr. Secretary, I don't come from coal or oil or nuclear. I am interested in biomass. What is the status of the DOE's support for advanced biofuels development?

Mr. CHU. It is in a very good position. We have, as you may know, three biofuel centers and we do sponsor a lot of research in universities, also in national labs. Those biofuel centers and other research with DOE support have generated a significant amount of intellectual property. That intellectual property is being picked up by industry. Already some of the intellectual property in the first 3 years of our biofuels centers advanced biofuels, so this is to make a drop in diesel fuel, gasoline jet fuel from simple sugars using bacteria. Those things have been licensed and already there are now plans in the private sector for building pilot plants based on that. So it is a very good track record.

Mr. BASS. As I recall when I was here before, Secretary Bodman was announcing or getting a loan guarantee program to build a commercial-scale advanced biofuels facilities around the country. How many of those have you—I don't know the answers to these questions. What is the status of that program?

Mr. CHU. That we are looking at. I know we did one loan guarantee but that is not for the fuels research. I think the loan guarantee program is constrained in that if the research is too advanced and if it is too much of a pilot because in our loan guarantee program, we have to make sure that the taxpayer is protected. And when it becomes too much of a research enterprise, then there are some constraints. And so I can get back to you on the details of those.

Mr. BASS. That is fine. And I would like to have a further discussion about that. You mentioned run-of-the-river hydro dams. That is hydrokinetics. Is there any action there?

Mr. CHU. No. There are two forms, hydrokinetics in the ocean of waves and things that extract wave energy or things that bob up and down or flex like this or currents. Run-of-the-river is you take a little part of the river and you make a detour and put in a spinning turbine——

Mr. BASS. OK. Let me change the subject, then. What about hydrokinetics? Is there anything going on——

Mr. CHU. Well, we are supporting some of it. It is a very research-oriented thing. It is certainly not ready for primetime but there are a number of companies that are very excited about the process.

Mr. BASS. I am taking the subject slightly once more to see does the Energy Department support any research in hydrofracking compounds or materials that would be perhaps more environmentally acceptable?

Mr. CHU. Well, right now we aren't supporting research in hydrofracking because when very big oil and gas exploration companies like Schlumberger got into it in 1992——

Mr. BASS. Yes.

Mr. CHU [continuing]. Or '91 we got out. I do know that there is some exploratory work going on. Fracking has become mainstream, and so it is now supplying 30 percent of U.S. gas. There are companies looking at fracking with carbon dioxide as, perhaps, a better fluid.

Mr. BASS. Lastly, I am trying not to express any opinions here. I love ARPA–E, though. You described there is significant difference between the ARPA–E program and the grants that are given out under EERE?

Mr. CHU. Yes, there are. ARPA–E's projects have a very short time scale, a leash of 2 years, perhaps renewable for yet another year and that is it. And so it is a very short program that tries to identify what we call radical breakthrough technology. So in doing that it also knows full well that some of these grants may turn out not to yield anything. But on the other hand, it is looking for really dramatic advances that completely change the landscape of our choices. And so it is a more venture-capital approach if you will to——

Mr. BASS. Are there any notable successes there, (a)? And (b), what is the EERE grant program? How does it differ?

Mr. CHU. OK. First, there are some notable successes in the sense that in about half a dozen of our grants, we have given companies money to do some research. They have done that research, and in less than a year they were able to go out and raise five times, four times that amount in the private sector because the private sector says OK, this is great. We now have enough confidence to invest in you. That is precisely what we want to do to allow companies to do research and get further funds from the private sector.

We are looking in EERE. There are now a whole new cast of program directors who are full of energy and we are looking towards rejuvenating those areas to do the best it possibly can in giving out whatever precious dollars we have.

Mr. BASS. Thank you, Mr. Chairman. Thank you, Mr. Secretary.

Mr. WHITFIELD. Thank you, Mr. Bass. I am going to recognize Mr. Inslee for 30 seconds.

Mr. INSLEE. Thank you. If we can put this picture up. Mr. Secretary, I just wanted to congratulate you, sir, on the work you are doing on advanced biofuels. I want to show you a picture. This is a picture of the U.S. Green Hornet. It is a picture of an F–18. It is the first jet ever to fly on biofuels breaking the sound barrier. And you have been doing some great work in conjunction with the DOD. I just want to compliment you and hope you continue that and is there anything we could do in 10 seconds that we could really do to help you in that regard?

Mr. CHU. Well, I think you can do much more in appropriations.

Mr. INSLEE. We will work on that and I am sure our Republican friends are listening to you with great interest. Thanks very much.

Mr. WHITFIELD. We are always interested in appropriating money so—but Secretary Chu, we thank you for joining us today. We enjoyed the dialogue. We look forward to working with you as we strive to meet the energy needs and safety of our country.

And we are going to actually recess until 1:30 because Mr. Jaczko has been called down to the White House. So we will reconvene at 1:30.

And once again, Mr. Secretary, we look forward to working with you and appreciate your time today.

Mr. CHU. All right. Thank you.

Mr. WHITFIELD. Thank you.

[Recess.]

Mr. WHITFIELD. OK. I will call the hearing back into order. We took a recess because, Commissioner, you were called away to the White House, I believe, for a meeting. And we completed with Secretary Chu. So everyone has already given their opening statements. So at this time we would recognize you for 5 minutes for your opening statement.

STATEMENT OF GREGORY JACZKO, CHAIRMAN, NUCLEAR REGULATORY COMMISSION

Mr. JACZKO. Well, thank you, Mr. Chairman, to you and the other chairman of the two subcommittees and the Ranking Members Rush and Green and other Members of the subcommittee. I am honored to appear before you today on behalf of the U.S. Nuclear Regulatory Commission.

Given the events that are unfolding overseas, my opening remarks will focus on the crisis in Japan. And I have additional information on the fiscal year 2012 budget that I have submitted for the record. Of course, I would be happy to answer questions on those matters, but I will focus my testimony on the situation in Japan.

I would first like to offer my condolences to all those affected by the earthquake and tsunami in Japan over the last few days. My heart goes out to those who have been dealing with the aftermath of these natural disasters. And I want to publicly acknowledge the tireless efforts, professionalism, and dedication of the NRC staff and other members of the federal family in reacting to the events in Japan. This is just another example from my 6–1/2 years on the commission of the dedication of the NRC staff to the mission of protecting public health and safety.

The American people can be proud of the commitment and dedication within the federal workforce exemplified by our staff every day. While the NRC regulates the safe and secure commercial use of radioactive materials in the United States, we also interact with nuclear regulators from around the world. Since Friday, the NRC's headquarters operations center has been operating on a 24-hour basis to monitor events unfolding at nuclear power plants in Japan.

Since the earthquake hit Northeastern Japan last Friday, some reactors at the Fukushima #1 plant have lost their cooling functions leading to hydrogen explosion and rises in radiation levels. Eleven NRC experts on boiling water reactors have already been deployed to Japan as part of a U.S. international Agency for International Development team. And they are currently in Tokyo.

Within the U.S. the NRC has been coordinating its efforts with other federal agencies as part of the government response to the situation. This includes monitoring radioactive releases and predicting their path. Given the thousands of miles between Japan and the United States, Hawaii, Alaska, the U.S. territories, and the West Coast, we are not expected to experience any harmful levels of radioactivity.

Examining all available information is part of the effort to analyze the event and understand its implications both for Japan and the United States. The NRC has been working with several agencies to assess recent seismic research for the central and eastern part of the country. That work continues to indicate that the U.S. nuclear facilities remain safe, and we will continue to work to maintain that level of protection.

U.S. nuclear power plants are built to withstand environmental hazards, including earthquakes and tsunamis. Even those plants located outside of areas with extensive seismic activity are designed for safety in the event of such a natural disaster. And the NRC requires that safety significant structures, systems, and components be designed to take into account the most severe natural phenomenon historically reported for the site and surrounding area. The NRC then adds a margin for error to account for the historical data's accuracy. This basically means that U.S. nuclear power plants are designed to be safe based on historical data from the area's maximum credible earthquake.

And the NRC remains attentive to any information that can be applied to U.S. reactors. Our focus is always on keeping plants in this country safe and secure. As this immediate crisis in Japan comes to an end, we will look at whatever information we can gain from the event and see if there are changes we need to make to our own system.

Within the next few days, I intend to meet with my colleagues on the commission on the current status and to begin a discussion of how we will systematically and methodically review information from the events in Japan. In the meantime, we continue to oversee and monitor plants to ensure that the U.S. reactors remain safe.

The NRC will continue to monitor the situation and provide updates by our press releases and our public blog. The NRC also stands ready to offer further technical assistance as needed. We hope that this situation will be resolved soon so that Japan can begin to recover from this terrible tragedy.

And I would like, if possible, to give you a brief update of what we believe the current status of the reactors in Japan is. There are essentially four reactors that we are currently monitoring as best we can. They are all at the Fukushima #1 site. Three of those reactors were operating at the time of the earthquake and were shut down following their normal procedures. We believe that in general for these three reactors they have suffered some degree of core damage from insufficient cooling caused ultimately by the loss of offsite power and the inability of the onsite diesel generators to operate successfully following the tsunami. We also believe that for these three reactors that seawater is being injected with reported stable cooling. The primary containment is described as functional.

Now, I would note that for Unit #2 at this site we believe that core cooling is not stable. But also for that site believe at this time that primary containment is continuing to function. I would also note that for Unit #2 we believe that the spent fuel pool level is decreasing.

For Unit #3 we believe that the spent fuel pool integrity has been compromised and that there has perhaps been a Zerck water interaction.

Now, in addition to the three reactors that were operating at the time of the incident, a fourth reactor is also right now under concern. This reactor was shut down at the time of the earthquake. What we believe at this time is that there has been a hydrogen explosion in this unit due to an uncovering of the fuel in the fuel pool. We believe that secondary containment has been destroyed and there is no water in the spent fuel pool. And we believe that radiation levels are extremely high, which could possibly impact the ability to take corrective measures.

For the two remaining units at this site we have an IAEA report that the water level was down a little bit in this spent fuel pool as well. And for the final reactor we don't have any significant information at this time.

Recently, the NRC made a recommendation that based on the available information that we have, that for a comparable situation in the United States, we would recommend an evacuation to a much larger radius than has currently been provided in Japan. As a result of this recommendation, the ambassador in Japan has issued a statement to American citizens that we believe it is appropriate to evacuate to a larger distance, up to approximately 50 miles.

The NRC is part of a larger effort, continues to provide assistance to Japan as requested, and we will continue our efforts to monitor the situation with the limited data that we have available.

So that provides a general summary of where the incident stands. And with that and my testimony, I would be happy to answer questions you may have. Thank you.

[The prepared statement of Mr. Jaczko follows:]

STATEMENT
BY GREGORY B. JACZKO, CHAIRMAN
UNITED STATES NUCLEAR REGULATORY COMMISSION
TO THE
HOUSE COMMITTEE ON ENERGY AND COMMERCE
SUBCOMMITTEES ON ENERGY AND POWER, ENVIRONMENT AND THE ECONOMY
MARCH 16, 2011

Mr. Chairmen, Ranking Members Rush and Green, and Members of the Subcommittees, I am honored to appear before you today on behalf of the U.S. Nuclear Regulatory Commission. Given the events that are unfolding overseas, my opening remarks will focus on the crisis in Japan, and I have additional information on the Fiscal Year 2012 budget that I have submitted for the record.

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While the NRC regulates the safe and secure commercial uses of radioactive materials in the United States, we also interact with nuclear regulators from around the world. Since Friday, the NRC's headquarters Operations Center has been operating on a 24-hour basis to monitor events unfolding at nuclear power plants in Japan. Since the earthquake hit northeastern Japan last Friday, some reactors at the Fukushima No. 1 plant have lost their cooling functions, leading to hydrogen explosions and rises in radiation levels. Two NRC experts on boiling-water reactors have already been deployed to Japan as part of a U.S. International Agency for International Development team, and they are currently in Tokyo. Since then, the Japanese government has formally asked for assistance from the United States as it continues to respond to the situation. Another NRC team is scheduled to land today.

Within the U.S., the NRC has been coordinating its efforts with other Federal agencies as part of the government response to the situation. This includes monitoring radioactive releases and predicting their path. Given the thousands of miles between Japan and the United States, Hawaii, Alaska, the U.S. Territories and the West Coast are not expected to experience any harmful levels of radioactivity.

Examining all available information is part of the effort to analyze the event and understand its implications both for Japan and the United States. The NRC has been working with several agencies to assess recent seismic research for the central and eastern part of the

country. That work continues to indicate that the U. S. public remains safe; we will continue to work to maintain that level of protection.

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The NRC will continue to monitor the situation and provide updates via press releases and our public blog. The NRC also stands ready to offer further technical assistance as needed. We hope that this situation will be resolved soon so that Japan can begin to recover from this terrible tragedy.

STATEMENT

BY GREGORY B. JACZKO, CHAIRMAN

UNITED STATES NUCLEAR REGULATORY COMMISSION

TO THE

HOUSE COMMITTEE ON ENERGY AND COMMERCE

SUBCOMMITTEES ON ENERGY AND POWER, ENVIRONMENT AND THE ECONOMY

MARCH 16, 2011

Mr. Chairmen, Ranking Members Rush and Green, and Members of the Subcommittees, I am honored to appear before you today to discuss the Fiscal Year (FY) 2012 budget request for the U. S. Nuclear Regulatory Commission (NRC) and to respond to any questions that you may have. During the past few weeks, I've had an opportunity to meet with a number of you and your staff. I appreciate these conversations and your interest in the NRC's work. I look forward to working with all of you as this session of Congress continues.

The NRC is an independent Federal agency established to license and regulate the Nation's civilian use of byproduct, source, and special nuclear materials to ensure adequate protection of public health and safety, promote the common defense and security, and protect the environment. Our critical mission entails broad responsibilities for the agency. The NRC currently licenses, inspects, and assesses the performance of 104 operating nuclear power plants, as well as many fuel cycle facilities and research and test reactors. Furthermore, nuclear materials are in use at thousands of hospitals, universities, and other locations around the country. Each of these facilities and materials users presents different challenges for the NRC and requires that the NRC develop and sustain a diverse array of regulatory capabilities. The safety and security of these facilities and materials is, and always will be, our number one priority.

The NRC's Safety goal is to ensure adequate protection of public health and safety and the environment. The agency's safety program objectives are to prevent the occurrence of any nuclear reactor accidents, inadvertent criticality events, acute radiation exposures resulting in fatalities, significant releases of radioactive materials and significant adverse environmental impacts. The Security goal is to ensure adequate protection in the secure use and management of radioactive materials. The security program objective is to prevent any instances in which licensed radioactive materials are used in a hostile manner in the United States.

The NRC can be proud of its strong track record and our recognition by the international community as a leader in regulating the nuclear industry. The Commission cannot give enough credit for the NRC's effectiveness as a regulator to the NRC's diverse, hard-working, talented, and dedicated staff. The Commission is continually impressed by their expertise, experience, diversity, and commitment to public service.

It is important that the NRC maintain our commitment to continuous improvement. That has long been a defining value of the NRC and a key to our success in meeting our important safety mission. We have a responsibility to the public to always try to do better – whether by planning and prioritizing to allow for more timely implementation of agency actions by licensees, or by communicating more effectively to better engage stakeholders in agency decisions.

We also, however, have an additional imperative, in light of the prevailing budgetary climate and the strong desire by many to see federal agencies do more with less. No matter the outcomes of these current budget decisions, the agency must continue focusing on the critical task of how to make the most efficient use of our funds. The NRC must ensure that we are in

the strongest possible position to efficiently and effectively use our financial resources to meet our mission.

In this area, as in many others, good process is the key to good outcomes. In accordance with the Government Performance and Results Act, the NRC is taking steps to improve our strategic planning and annual performance plans in order to achieve greater alignment of goals and performance across the agency. As part of the NRC's efforts to build a Strategic Acquisition Program, we are taking steps to ensure agency contracting initiatives are implemented in a more timely and efficient manner. We have resources dedicated to other business process improvements including the Transforming Assets into Business Solutions (TABS), a task force focused on identifying the most efficient, effective and cost-conscious manner for the NRC to accomplish its corporate support functions.

These initiatives allow us to fully meet our safety and security responsibilities while also effectively reviewing applications associated with a renewed interest in the construction of new nuclear power plants and applications to construct and operate facilities that are part of the nuclear fuel cycle. The NRC is actively reviewing 12 combined applications to construct and operate new nuclear power reactors. Five different reactor designs are referenced in these applications; the NRC is currently reviewing the design applications for certification. If these design certifications are approved they will be available to be referenced in future COL applications, and thereby make those reviews more straightforward. The NRC is also performing safety, security, and environmental reviews of facility applications, a uranium deconversion facility application, and applications for new uranium recovery facilities.

With these efforts as a backdrop, the agency has formulated its FY 2012 budget to support the agency's Safety and Security strategic goals and objectives.

Specifics of the FY 2012 Budget Request

The NRC's FY 2012 budget request is organized by business lines within our two program areas: (1) Nuclear Reactor Safety, and (2) Nuclear Materials and Waste Safety Programs. The NRC's proposed FY 2012 budget for both programs is $1,038.1 million, including 3,981.0 full-time equivalents (FTE), which represents a decrease of $28.7 million, including an increase of 0.8 FTE, when compared to the FY 2010 funding levels. The funding levels reflected above also support the Office of the Inspector General (OIG). The OIG FY 2012 proposed budget of $10.9 million includes resources to carry out the Inspector General's mission to independently and objectively conduct audits and investigations to ensure the efficiency and integrity of NRC programs and operations and to promote cost-effective management.

Pursuant to the provisions of the Energy Policy Act of 2005, the NRC's FY 2012 budget provides for 90 percent fee recovery, less (1) appropriations from the Nuclear Waste Fund, (2) appropriations to implement Section 3166 of the Ronald W. Reagan National Defense Authorization Act for Fiscal Year 2005, (which pertain to waste incidental to reprocessing), and (3) appropriations to conduct generic homeland security activities. Accordingly, $909.5 million of the FY 2012 budget would be recovered from fees assessed to NRC licensees and applicants. This would result in a net appropriation of $128.6 million, which is a decrease of $26.1 million in net appropriations when compared to the FY 2010 funding levels.

Nuclear Reactor Safety Program

The Nuclear Reactor Safety Program encompasses NRC efforts to license, regulate, and oversee civilian nuclear power, research, and test reactors in a manner that adequately protects public health and safety and the environment. This program also provides high assurance of the

physical security of facilities and protection against radiological sabotage. This program contributes to the NRC's Safety and Security goals through the activities of the Operating Reactors and New Reactors Business Lines, which regulate existing and new nuclear reactors to ensure their safe operation and physical security. Overall resources requested in the FY 2012 budget for the Nuclear Reactor Safety Program are $800.8 million, including 3,032.9 FTE. This funding level represents an overall funding decrease of $8.0 million, with an increase of 48.4 FTE when compared with FY 2010 funding levels.

Within this program, the Operating Reactors Business Line supports the licensing, oversight, rulemaking, research, international activities, generic homeland security, and event response associated with the safe and secure operation of 104 civilian nuclear power reactors and 31 research and test reactors. The FY 2012 budget request for operating reactors is $521.3 million, including 2,064.4 FTE. This represents an overall funding decrease of $20.5 million, including 26.3 FTE, when compared with FY 2010 funding levels. Examples of activities that the requested resources would support include the following:

- conduct technical review for 950 licensing actions, including complex actions such as license amendment requests from power reactor licensees adopting the requirements for performance standards for fire protection, often referred to as National Fire Protection Association (NFPA) 805
- review extended power uprate requests for increasing electric generating capacity and one improved standard technical specification conversion
- conduct 13 active, high- and medium-priority rulemaking activities
- conduct critical research and test reactor project management functions pertaining to license renewal application efforts, and applications to produce medical isotopes
- continue reviews of 12 license renewal applications
- conduct inspection activities for the 104 operating nuclear power reactors, including the component design-basis inspections, fire protection inspections, and generic issues inspections (approximately 100 per year)
- continue the Resident Inspector Pipeline Initiative to maintain an experienced and stable onsite inspection presence of qualified resident inspectors at the 104 nuclear power reactors

- conduct domestic and international security reviews and support for screening approximately 3,000 national and international operational events, with detailed evaluation of approximately 200 of those events
- carry out cyber security evaluations, as well as 24 force-on-force security inspections to complete a 3-year cycle for inspecting power reactors
- evaluate licensee emergency preparedness during biennial exercises

The resources within the Operating Reactors Business Line reflect a decrease in license renewal activities because of schedule changes, and the reduced number of applications that will be under review.

The New Reactors Business Line supports the licensing, oversight, rulemaking, research, international activities, and generic homeland security associated with the safe and secure development of new power reactors from design, site approval, and construction to operational status. The FY 2012 budget request for new reactors is $279.5 million, including 968.6 FTE. This represents an overall funding increase of $12.5 million, including 74.8 FTE, when compared with FY 2010 funding levels. Examples of activities that the requested resources will support include the following:

- perform licensing and hearing support for 15 combined licenses, including two new combined license applications during FY 2012
- certify one design certification amendment, continue licensing reviews, rulemaking, or both on five applications and begin pre-application review on a new design
- review two early site permit applications and begin review of one new application expected in FY 2012
- develop and implement the construction inspection program
- inspect the four reactors expected to be under construction
- continue licensing and oversight activities for the construction of Watts Bar Unit 2
- conduct 15 domestic and international vendor inspections of component manufacturing quality
- conduct pre-application activities for two small modular reactor designs
- perform an acceptance review and initiate a design certification review for one small modular reactor
- continue the implementation of the Next Generation Nuclear Plant licensing strategy, which was developed in accordance with the Energy Policy Act of 2005

- continue to develop the regulatory framework that integrates the use of risk insights into the review process and support the resolution of key policy and safety issues associated with small modular reactors

The New Reactors Business Line shows an increase primarily driven by construction oversight of two new potential reactors under construction (for a total of five) and by development of the workforce to support inspection of up to an additional six reactors in future years. In addition, resources increase to support the review of new advanced reactor applications, increased pre-application interactions with prospective applicants, and funding for the one-time build-out of a new Headquarters office building.

Nuclear Materials and Waste Safety Program

The Nuclear Materials and Waste Safety Program encompasses the NRC's responsibility to license, regulate, and oversee nuclear materials and waste in a manner that adequately protects public health and safety and the environment. This program's goal is to verify the safety and security of materials and waste and protection against radiological sabotage, theft, or diversion of nuclear materials. Through this program, the NRC regulates uranium processing and fuel facilities; research and pilot facilities; nuclear materials users (medical, industrial, research, and academic); spent fuel storage; spent fuel storage casks and transportation packaging; decontamination and decommissioning of facilities; and low-level and high-level radioactive waste.

Overall resources requested in the FY 2012 budget for the Nuclear Materials and Waste Safety Program are $226.5 million, including 868.5 FTE. This funding level represents an overall funding decrease of $20.7 million, including 49.6 FTE, when compared with FY 2010 funding levels.

Within this program, the Fuel Facilities Business Line supports licensing, oversight, rulemaking, research, international activities, generic homeland security, and event response associated with the safe and secure operation of various fuel facilities, such as conversion, enrichment, and fuel fabrication facilities, and nuclear fuel research and pilot facilities. The FY 2012 budget request for fuel facilities is $55.2 million, including 226.5 FTE. This represents an overall funding increase of $0.6 million, including 18.2 FTE, when compared with FY 2010 funding levels. Examples of activities that the requested resources would support include the following:

- licensing and oversight activities associated with fuel facilities and licensees with greater than critical mass quantities of special nuclear material
- operation and maintenance of the Nuclear Material Management and Safeguards System database and the Nuclear Materials Information Program
- emergency preparedness, security, and licensee performance reviews
- licensing, certification, inspection, oversight, environmental reviews, research, adjudicatory, enforcement, allegation, and other regulatory activities associated with new and operating fuel facilities, including uranium conversion and enrichment and fuel fabrication
- completion of mandatory hearings on the uranium enrichment license applications for the AREVA centrifuge and General Electric-Hitachi laser enrichment facilities
- licensing review of the International Isotopes depleted uranium deconversion facility
- oversight of construction activities at the proposed Mixed Oxide (MOX) Fuel Fabrication Facility and commencement of construction of the AREVA, General Electric-Hitachi, and International Isotopes facilities

The Fuel Facilities Business Line resources increase to account for the significant construction activities planned at the MOX facility; the commencement of construction at the AREVA centrifuge and General Electric-Hitachi laser enrichment facilities, and the International Isotopes depleted uranium deconversion facility; and to reflect staffing required at resident inspector offices. Resources also increase to support rulemaking activities regarding the potential licensing of reprocessing facilities. These increases are offset by the completion of the licensing and environmental reviews of the AREVA and General Electric-Hitachi license applications, as well as the completion of the licensing and environmental reviews for the International Isotopes depleted uranium deconversion facility application.

The Nuclear Materials Users Business Line supports the licensing, oversight, rulemaking, research, international activities, generic homeland security, event response, and State, Tribal, and Federal program activities associated with the safe and secure possession, processing, handling, and use of nuclear materials for the many and diverse uses of these materials. Resources also support the National Materials Program and the Agreement State activities. The FY 2012 budget request for nuclear materials users is $92.1 million, including 347.1 FTE. This represents an overall funding increase of $0.4 million, including 9.1 FTE, when compared with FY 2010 funding levels. Examples of activities that the requested resources would support include the following:

- completion of 2,500 materials licensing actions and 1,000 routine health and safety inspections, including naturally occurring and accelerator-produced radioactive material and security inspections
- event evaluation, research, incident response, allegation, enforcement and investigations, and rulemaking activities to maintain the regulatory safety and security infrastructure needed to process and handle nuclear materials
- materials activities related to State, Tribal, and Federal programs, including oversight, technical assistance, regulatory development, and cooperative efforts
- operation of the National Source Tracking System, a secure, Web-based, nationalized central registry designed to enhance the accountability for radioactive sources
- development of the Integrated Source Management Portfolio, which consists of the National Source Tracking System, the Web-Based Licensing System, and the License Verification System
- reviews of 135–180 import/export of nuclear equipment and material license applications
- investigations into 45–55 allegations of materials-related wrongdoing

The Nuclear Materials Users Business Line resources increase slightly because of adjustments made within the business line to cover emergent activities. Overall, a slight increase resulted to address the workload associated with the implementation of the Integrated Source Management Portfolio major information technology system, which consists of the National Source Tracking System, the Web-Based Licensing System, and the License Verification System.

The Spent Fuel Storage and Transportation Business Line supports the licensing, oversight, rulemaking, research, event response, and international activities associated with the safe and secure storage of spent nuclear fuel and safe and secure transportation of radioactive materials. The FY 2012 budget request for spent fuel storage and transportation is $41.2 million, including 152.4 FTE. This represents an overall funding increase of $7.4 million, including 29.7 FTE, when compared with FY 2010 funding levels. Examples of activities that the requested resources would support include the following:

- review of license requests for site-specific independent spent fuel storage installations (ISFSIs), dual-purpose (storage and transport) casks, transportation security plans, and route approvals to support safe and secure domestic and international transportation of radioactive materials, regulatory requirements for full-core offload capability at operating reactor sites, and transfer of spent fuel to ISFSIs to support reactor decommissioning
- regulatory improvements to the proficiency and effectiveness of the licensing, inspection, and enforcement programs associated with storage and transportation of spent nuclear fuel
- inspection of storage cask and transportation package vendors, fabricators, and designers to ensure safety
- resolution of technical issues associated with allowance of burn-up credit for transportation and storage casks and the transportation and storage of high burn-up fuels (greater than 45 gigawatt-days/ metric tons of uranium)
- interaction with the International Atomic Energy Agency and other international regulators to inform the development of the regulatory framework for transportation of radioactive materials, long-term spent fuel and high-level waste storage, deferred transportation, and ultimate geologic disposal

The Spent Fuel Storage and Transportation Business Line resources would increase to develop the information necessary to evaluate extended long-term storage of radioactive material. Resources are provided for a risk-informing gap study to identify methods, data, decision criteria, and regulatory actions that are needed to implement a regulatory framework for very long-term (more than 120 years) dry spent fuel storage that is enhanced by risk insights. Resources will also support a scoping study for a generic environmental impact statement for ensuring protection of the environment from such spent fuel storage. Resources will also be provided to conduct research on technical issues associated with this storage, and to coordinate

with international partners on options for harmonizing international standards for certification of transport packages and licensing of storage cask designs.

The Decommissioning and Low-Level Waste Business Line supports the licensing, oversight, rulemaking, research, and international activities associated with the safe and secure removal of a nuclear facility from service and reduction of residual radioactivity to a level that permits release of the property and termination of the NRC license. The FY 2012 budget request for decommissioning and low-level waste is $37.9 million, including 142.6 FTE. This represents an overall funding decrease of $0.3 million, including 7.6 FTE, when compared with FY 2010 funding levels. Examples of activities that the requested resources would support include the following:

- project management and technical reviews for decommissioning activities for 10 power reactors, 10 decommissioning research and test reactors, 24 decommissioning materials facilities, 21 inactive Title I decommissioning, 11 Title II decommissioning, uranium recovery facilities, and five sites that are under general license with the U.S. Department of Energy (DOE)
- interfaces with licensees, applicants, Federal and State agencies, the public, other stakeholders, and Native American Tribal governments
- 8 environmental reviews and 11 safety reviews (hearings included) in support of licensing and oversight of uranium recovery facilities
- oversight of certain DOE waste determination activities and plans for waste incidental to reprocessing consistent with the NRC's responsibilities in the Ronald W. Reagan National Defense Authorization Act for Fiscal Year 2005

The Decommissioning and Low-Level Waste Business Line resources decrease reflect a refocusing of long-term waste research activities and adjustments made to the contract, travel, and training needs and other carryover balances for waste incidental to reprocessing work.

The High-Level Waste Repository Business Line supports activities associated with DOE's Yucca Mountain geologic repository application. This activity terminates in FY 2011. No resources are requested in FY 2012 for this business line.

In the FY 2012 budget structure, the New Fuel Facilities and Operating Fuel Facilities Business Lines were merged into the Fuel Facilities Business Line.

Mr. Chairmen, Ranking Members, and Members of the Subcommittees, this concludes my formal testimony on the NRC's FY 2012 budget request. On behalf of the Commission, thank you for the opportunity to appear before you. I look forward to continuing to work with you to advance the NRC's important safety mission. I would be pleased to respond to any questions that you may have. Thank you.

Mr. WHITFIELD. Well, Commissioner, thank you. We appreciate your being with us this afternoon.

In the earlier question-and-answer period with Secretary Chu, the gentleman from Massachusetts, Mr. Markey, had referred to a finding by Mr. John Ma for—I believe his last name M-a—relating to the AP1000 design. And he had indicated that Mr. Ma had some serious reservations about the design. And I was just curious, have you all had the opportunity to review his concerns and have you come to any conclusions about that?

Mr. JACZKO. We have done a very thorough review of the AP1000 design relative to a large number of safety issues. As part of that review process, we have had a vibrant discussion among the members of the NRC staff. We have thoroughly reviewed as part of that discussion the concerns by one of our staff members that you indicated. And we believe based on a thorough analysis that that design going forward can be acceptable. It is right now in the process of additional review. It is right now out for public comment essentially. We do our designs almost like a regulation, so we allow them to be commented on by the public. And so we are at that stage in the process of that review. But the concerns while we believe would certainly enhance the safety of the design, we don't believe at this time that they are necessary to meet our strict regulations.

Mr. WHITFIELD. Right. Well, thank you for that comment. I just wanted to follow up on that.

Of course, as a result of what has happened in Japan, the focus is on safety as it relates to nuclear, and I believe this is a safe industry. Historically, it has been a safe industry. And I know that in France and Japan and many other countries, a large percentage of their electricity comes from generation by nuclear. In the U.S. it takes—and you can correct me if I am wrong because I may be—but it takes roughly 10 years or so to obtain permitting for a nuclear plant. Am I in the ballpark when I say 10 years or not?

Mr. JACZKO. Well, I think right now the process is taking, I would say, closer to about 5 years right now to go through the permitting. Now, of course, we are not finished, but we are getting nearer to the end of our reviews. And I like to think about this in a way like when I went to college. People go to college with the intent to graduate in 4 years, but as you go through that process, you take your classes, if you do well you have a chance to get done in four, sometimes a little bit sooner. Some people take a little bit longer time depending on how things go. So as we continue to work with the licensees or the applicants, we have, I think, improved our understanding of how to make the process work effectively and efficiently. So right now this has been the first-of-a-kind effort and something we haven't done in a long time and it involves a new process. So I would say at this time I think we are moving at a relatively effective pace, but again, keeping our focus first and foremost on safety.

Mr. WHITFIELD. And in your testimony you did say that you evaluated these permit applications for seismic as well as tsunami-type activities, correct?

Mr. JACZKO. That is correct. We review all designs against a wide range of natural disasters: tsunamis, earthquakes, tornadoes, hurricanes. It just depends on the geographic location.

Mr. WHITFIELD. Right. But with all the publicity surrounding Japan right now, everyone, as I said, is certainly focused on safety and we are certainly thinking about the Japanese people, but with more focus on safety, I am not a nuclear engineer but I know that there is some technology based around sodium-cooled reactors. And I have been told that sodium-cooled reactors, that there is not a possibility of a meltdown and that these are smaller-type plants, maybe 50- to 100-megawatt plants. And I was wondering if you would mind commenting on that technology of sodium-cooled technology?

Mr. JACZKO. Well, we don't currently have any specific applications in front of us for a sodium-cooled design. I would say it is a different type of technology than what we currently have operating in this country, and as a result, it presents its own challenges when it comes to operation. But I wouldn't want to speculate too much on what those kinds of challenges are because we really haven't gone through the specific review of one of these. But in general, with a smaller reactor, a smaller energy output, usually the risks are lower because you just have a smaller amount of radioactive material——

Mr. WHITFIELD. Right.

Mr. JACZKO [continuing]. But as I said, sodium reactors do present slightly different technical challenges because of the way that they operate. The sodium has to be maintained in a liquid form and there are different types of risks and hazards that you would have on that type of design.

Mr. WHITFIELD. But that type of technology, I guess, was developed in the United States at one point and there are some countries that evidently have at least some of these plants in operation. Is that your understanding?

Mr. JACZKO. Yes, it is my understanding, but we don't currently have any license in operating in the U.S.

Mr. WHITFIELD. OK. Well, thank you very much. My time has expired. I would like to recognize the gentleman from Illinois, Mr. Rush, the ranking member.

Mr. RUSH. I want to thank you, Mr. Chairman. And to Chairman Jaczko, it is good to see you and welcome to the committee. I am going to get my Japan question in first.

The question in Japan that is first and foremost on the mind of many of my constituents in Illinois for the specific reason we have more reactors in Illinois than any other State. And my constituents are asking a simple question. And that question was summed up in a Fox Chicago News headline published on Sunday, "Should Illinois be Worried About its Nuclear Plants?" And before you answer the question, I want to also note that Illinois lies within the new Madrid earthquake zone, although we do not have to worry about tsunamis. But what assurances can we give to the people in my State with as high a concentration of nuclear reactors that also sits on an earthquake zone? And in your answer, would you please speak to the possibilities and to the effect—we are in a tornado zone—that tornados could have on nuclear reactors?

Mr. JACZKO. Well, Congressman, at the NRC we focus every day. And the dedicated women and men at the NRC work every day to make sure that nuclear power plants in this country continue to

operate safely. All the nuclear power plants that are in the United States are reviewed against a very significant standard for seismic activity. We take what we can find out from the historical record from looking at the rocks and the geology and the seismology, we try and determine what we think is the largest earthquake that can happen in an area. And from that we do an analysis of what kind of effect we think that will have on the power reactor. Namely, how much will the building shake or what kind of forces will it feel? And we require that the nuclear power plants can withstand that kind of event. And we actually go a little bit larger than that just to make sure if there are any uncertainties in our analysis. So that is a part of what we do for every reactor in the country, whether it is in the Midwest—of course, the seismic activity may be different in that part of the country versus another part of the country.

Mr. RUSH. It seems to me, though, in Japan it wasn't just the earthquake that caused the problem; it was the tsunami that really caused the problem. And my question is in terms of a tornado?

Mr. JACZKO. We look at tornadoes as well.

Mr. RUSH. All right.

Mr. JACZKO. We actually look at all natural phenomena: hurricanes, tornadoes, earthquakes, tsunamis, although as you indicated, some sites in the country don't experience all of those phenomena. But we look historically to make sure we have captured all the natural phenomena that occur. So in Illinois we certainly would examine the impacts of tornadoes and other extreme weather events in Illinois.

Mr. RUSH. OK. And it seems to me—I asked this question of the secretary this morning—that the number-one threat to nuclear facilities in this Nation is terrorists' actions and activities and acts. So can you speak to how the NRC is handling the threat of terrorists?

Mr. JACZKO. Well, we have a very robust program that requires nuclear utilities to ensure that they can protect their plants against terrorist-type attacks. That includes a very strong program to do exercises once every 3 years to actually participate in a mock terrorist attack on the facility. And we observe that and oversee that and ultimately use that as a way to ensure——

Mr. RUSH. Once every 3 years?

Mr. JACZKO. Once every 3 years. In addition to that, we do conduct our normal inspections at the facilities to make sure that all the security systems are in place and operating effectively. And I would add that in addition, following September 11, we required all of the nuclear power plants in this country to look at some of the more severe kinds of impacts and effects you could get at a nuclear power plant from a terrorist attack or other types of severe natural phenomena, and as a result, we require——

Mr. RUSH. My time is almost over and on Friday I am headed to Dresden to sort of generate a station there in rural county Grundy, Illinois in northern Illinois and I am going to be there with some of your resident inspectors on location there. So I will give them your regards.

Mr. JACZKO. Well, good. Well, I appreciate that and we are very fortunate to have some very fine people at our power reactors overseeing them.

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

Mr. SHIMKUS. Thank you, Mr. Chairman, and welcome, Mr. Jaczko.

When did the Licensing Board return its decision denying the Department of Energy motion to withdraw its Yucca Mountain application?

Mr. JACZKO. I believe that was earlier in the——

Mr. SHIMKUS. End of June.

Mr. JACZKO. End of June. Thank you.

Mr. SHIMKUS. Isn't it true that all commissioners participating in the decision-making relating to the License Board decision have already filed votes on that matter, including you?

Mr. JACZKO. We have filed what I would consider to be preliminary views that we exchange among our colleagues on the commission. Those are views that we use, then, to inform our final decision-making.

Mr. SHIMKUS. So you are saying you have not filed votes?

Mr. JACZKO. We have not come to a final decision at this point.

Mr. SHIMKUS. So it is your position you have not filed final votes?

Mr. JACZKO. That is correct. We have not reached a final decision on our act, unlike perhaps here, your familiarity with voting. I would consider votes to be more akin almost to prepared statements and remarks of members of the commission. The practice of the commission is to circulate those prepared remarks on any of the things that we do, and then, based on those circulated views, we work to see if there is a majority position.

Mr. SHIMKUS. So you are saying, then, on October 29, 2010, there wasn't filed votes cast by all commissioners?

Mr. JACZKO. On October 29 I believe we had all prepared our written statements that we circulated among——

Mr. SHIMKUS. So those written statements are considered votes?

Mr. JACZKO. They are considered votes but they are not the final decision of the commission.

Mr. SHIMKUS. OK. So since you have written statements that are considered votes, when do you plan to schedule a commission meeting?

Mr. JACZKO. We will have a meeting and issue an order when we have, per statute, a majority position.

Mr. SHIMKUS. And so you have these statements. They are considered votes but you don't have a majority position?

Mr. JACZKO. Correct. As I indicated, the terminology here I think is unfortunate. These votes are not, as I said, the final statement of the commission. In an adjudicatory matter, which is what this is, a formal hearing that we issue, the final statement——

Mr. SHIMKUS. Is there a minority decision already rendered——

Mr. JACZKO. There is no——

Mr. SHIMKUS [continuing]. By commissioners?

Mr. JACZKO [continuing]. Decision by the commission at this point.

Mr. SHIMKUS. By the chairman?

Mr. JACZKO. There is no decision by the commission.

Mr. SHIMKUS. Was the NRC decision to close out Yucca review and hearing activities yours alone or one made by the full commission?

Mr. JACZKO. That was a decision that I made as chairman of the Agency consistent with the budget that was prepared by the commission——

Mr. SHIMKUS. OK. But let me ask you this question. What was your legal authority to do so?

Mr. JACZKO. My legal authority was as chairman of the commission and the decision was fully consistent with appropriate law.

Mr. SHIMKUS. No, I think your position is the budget zeroed it out, but I would beg to differ that you had the legal authority to do that.

Mr. JACZKO. Well, I would respectfully disagree with that.

Mr. SHIMKUS. Well, I think we will review that and follow up.

Mr. JACZKO. And I would add if I could that following that decision——

Mr. SHIMKUS. I mean, you wouldn't do anything that would be illegal, would you?

Mr. JACZKO. Of course I wouldn't. Following the decision to begin the closedown activities of the Yucca Mountain project——

Mr. SHIMKUS. Begging to differ, I think it is a stated federal position by law that Yucca Mountain should be opened. That is the legal authority. There is no legal authority to close Yucca Mountain. The only authority that has been rendered is the administration in compliance with Majority Leader Reid to pull funding. But there is no legal authority to close Yucca Mountain by law.

Mr. JACZKO. As I indicated, our action is consistent with all appropriate appropriations law and any other statutes that we have.

Mr. SHIMKUS. You better be double-checking your facts because we are not through with this debate on legal authority. And I hope you are well prepared. We have been told that the courts may not rule on whether or not the commission's position is legally defensible until the full commission takes a position. But you seem to be preventing that vote from occurring. If the court runs out of patience and does rule, will you abide by the court's decision and act promptly to carry it out?

Mr. JACZKO. The Agency will act according to any legal decision by the courts or any act of Congress.

Mr. SHIMKUS. Thank you, Mr. Chairman. I yield back.

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

Mr. GREEN. Thank you, Mr. Chairman. Welcome, Mr. Jaczko. And I know you are busy and I appreciate you coming back to our committee. And I know last week you and I talked about the President's budget and the proposals to go back to fiscal year 2008 for your funding and we both expressed concerns about the layoff of hundreds of workers and particularly what happened in Japan. Obviously, this is not the time to go after our Nuclear Regulatory Commission. So share that and hopefully that message will get to other folks.

Let me talk about a local issue because I think all politics is local, as is what has happened in Japan. Texas has 1 proposed nu-

clear plant that is pending at the OMB. And they are receiving their funding from CPS Energy, NRG, and Tokyo Electric Power Company, which presents part of the problem. One of the sites experienced problems. They own one of the sites that is experiencing the problems in Japan. And so knowing what may happen with their potential investment, CPS Energy and NRG have announced they have trouble finding new investors. Again, part of it is the market. We have low natural gas prices and for someone to buy into a long-term investment of nuclear power, which our country needs but we may not be able to get the investors. Can you talk about the review process for new plants like Texas and how long NRC and OMB processes are taking? It seems like I have worked on the congressional side now for a number of years to get the expansion at the South Texas plant that is just southwest of Houston and just to see just some information on how long it took, for example, for that expansion that goes through both your process and the OMB?

Mr. JACZKO. Well, right now the South Texas project was one of the first applications that we received for new licensing. The review that we do for that project will be focused, for sure, on safety and security. That is always our primary focus.

We are continuing to do that review. We are nearing some significant milestones as we work to complete the actual design reviews for that type of reactor. That design review right now is out for public comment as part of our process and we anticipate having that back in and working to resolve the comments over the summer. If we resolve those comments and it is successful, then we would move forward with completing the final reviews that are necessary, possibly perhaps within 12 months or so.

But as I said, I want to reiterate our focus fundamentally, first and foremost, is on the safety and security of these designs.

Mr. GREEN. When you said it was one of the first applications, can you tell me the time frame when that was filed?

Mr. JACZKO. It was approximately, I believe, 2007. However, we immediately within several months had to suspend our review because the applicant in that case made a change in the vendor that they were using to support the design. So that took about a year, year and a half to work through that particular issue on the part of the applicant.

Mr. GREEN. OK. I know the concern, literally, for the whole world and particularly for our own country, if what we are doing, making sure we are learning from what has happened to Japan—and I understand the Texas plant southwest of Houston has actually three safety backup systems instead of two. and it is my understanding that Texas emergency power sources are separate and watertight. We don't have a problem on the Gulf Coast with, you know, tsunamis or earthquakes. We do have a hurricane every once in a while and tornadoes. But I understand that they have watertight concrete buildings that could withstand a hurricane or storm surges and even earthquakes. But like I said, I don't think in geological time we have had an earthquake along the Gulf Coast. Our soil is too soft. But the Agency actually looked at that plant and all the applications, like you said, for safety.

Mr. JACZKO. That is correct. We look at all the plants for a variety of natural phenomena. And on the Gulf Coast than can include seismic activity, hurricanes, and other types of events. And we do have some analyses to look at tsunamis along the Gulf Coast and portions of the Atlantic coast. Those wouldn't be expected to be tsunamis that are the same magnitude as ones we could——

Mr. GREEN. That particular plant is about 11 miles inland. It is not right on the coast. I know there have been technological advances. I am almost out of time. But sometime I would like if your staff could provide to the committee separately some of the technological advances in the current and proposed plants in the United States as compared to, for example, what has happened in Japan with the tsunami and also the earthquake.

Mr. JACZKO. We can certainly provide that.

Mr. GREEN. Thank you. Thank you, Mr. Chair.

Mr. WHITFIELD. The gentleman from Michigan, Mr. Upton, is recognized for 5 minutes.

Mr. UPTON. Thank you, Mr. Chairman. And again, Chairman, we welcome you here today. And I just want to say a couple things at the beginning.

First of all, I certainly did appreciate our meeting that we had several weeks ago. I know we both discussed Yucca. We may have a different view but we are going to have ample time in Mr. Shimkus' subcommittee with all the commissioners sometime this spring to fully talk about that and ask a good number of questions.

As you know, I—as you do—we both support safe nuclear power. We both support appropriate and rigorous oversight of all of our 104 sites around the country. And I, too, appreciated the visit that I paid to the NRC several years ago and viewed firsthand the NRC operations center and looked in in terms of your day-to-day activities to make sure that things are safe.

Could you tell us what specifically the functions are of the 11 folks that you have sent to Japan and what they are doing and they are reporting back to you and some of the information you might have received?

Mr. JACZKO. The 11 individuals that we have in Japan are providing a variety of services. They are helping to organize the look at the reactors, the nuclear look at the reactors and helping to provide a good coordinated team to provide assistance to the embassy in Japan.

Mr. UPTON. So does Japan have a similar operation like we have in terms of the operations center that I visited in Maryland out there?

Mr. JACZKO. It is my understanding they do but I am not terribly familiar with——

Mr. UPTON. But they are in Tokyo, right? They are not at the Fukushima site?

Mr. JACZKO. Our staff is in Tokyo working to interface with their counterparts in the Japanese nuclear regulatory authority.

Mr. UPTON. And you announced that our ambassador now has urged all Americans to move at least 50 miles away. What reaction did you receive from your counterparts in Japan and the government there?

Mr. JACZKO. I am not familiar of any reaction.

Mr. UPTON. But that announcement was made very shortly, right?

Mr. JACZKO. It was made about 45 minutes ago.

Mr. UPTON. You talked about the four different reactor vessels and the status of the four. Do you know where the hydrogen explosion was in the fourth reactor?

Mr. JACZKO. At this point we don't know that kind of specific information. But we believe that there was a hydrogen explosion at some point, likely because the spent fuel in that reactor has lost its cooling and at some point, then, was producing some degree of hydrogen. And that ultimately accumulated and led to an explosion.

Mr. UPTON. And was that explosion today, U.S. time today?

Mr. JACZKO. No, it occurred several days earlier. We can get you the exact date and time as we know it.

Mr. UPTON. OK. As it relates to your budget—remember that was the original ask for you to be here today—what is your budget for safety oversight as part of the NRC?

Mr. JACZKO. The bulk of our budget, probably about ¾ of our budget goes to the reactor safety work, about 77 percent. It is slightly over approximately $800 million.

Mr. UPTON. So does that include the personnel? Because I visited my two sites in my district and I would welcome you and I know you that you indicated a willingness to come out. But on all of my visits I have always stopped to say and welcome the oversight of your staff that has been there.

Mr. JACZKO. Yes, most of our budget goes to our staff. We have mostly salaries and benefits. We have a small portion of our budget that is contracting dollars, but the bulk of it, about 60 percent, is the salaries and benefits of the staff.

Mr. UPTON. And do you have any reason to believe that your proposed budget is not adequate to assess and monitor the nuclear power plant safety systems? I mean, do you feel that it fits the bill?

Mr. JACZKO. At this time we believe it is a sufficient request that will allow us to do the work we need to make sure that plants stay safe. The only caveat I would add is that as we continue to review the situation in Japan, if it becomes apparent that we would need additional resources to address issues related to the situation in Japan, then we would perhaps have to come back and ask for additional resources for that.

Mr. UPTON. Well, I was going to ask you if you thought you were going to need—will you be able to determine that within the next couple of weeks?

Mr. JACZKO. I intend to meet with the commission within the next several days and begin looking at the kinds of questions we have to answer. And I think that will be one of the first. But first we want to kind of systematically figure out what it is that we need to look at and what are the important sources of information.

Mr. UPTON. But you don't really have a reserve cushion today to do that, is that correct?

Mr. JACZKO. At this time——

Mr. UPTON. For fiscal year 2011?

Mr. JACZKO. At this time I would say we don't necessarily have that. But again, I would like to take a look at that first before I make any conclusions.

Mr. UPTON. OK. Well, again, I appreciate your willingness to be up here on a day as tough as it is today. And we appreciate your answers and look forward to working with you on a host of issues. Thank you. I yield back.

Mr. WHITFIELD. I recognize the gentleman from California for 5 minutes, Mr. Waxman.

Mr. WAXMAN. Thank you, Mr. Chairman. Mr. Jaczko, you describe a pretty dire situation in Japan. I want to ask you about this. An official from the European Union today used the word apocalypse to describe the potential damage that could occur in Japan. What is your reaction to this comment? Could Japan be facing widespread devastation from a nuclear meltdown or radiation release?

Mr. JACZKO. Well, I don't really want to speculate too much at this point on what could happen. I think people are working really very diligently to try and address the situation. It is a very serious situation without a doubt. And that is part of the reason why I thought it was important for the Agency to make the statement it did that we thought in a comparable situation in the United States we would have issued evacuation instructions to a larger distance away from the plant.

Mr. WAXMAN. Yes.

Mr. JACZKO. So it is a very serious situation. And efforts are ongoing to try and resolve it. but it will be some time, I think, before it is finally resolved.

Mr. WAXMAN. Well, you said that you are recommending an evacuation of U.S. citizens within 50 miles. What are the risks that are causing you to make this recommendation?

Mr. JACZKO. Well, it is based on an assessment of the current conditions of the site. Because of the damage to the spent fuel pool, we believe that there is very significant radiation levels likely around the site. And given that the reactors, the 3 reactors that were operating, given that they are operating with more of a backup to a backup, if you will, to a safety cooling system, if anything goes wrong with that, it would be very difficult for emergency workers to get into the site and perform emergency actions to help maintain that cooling. So there is the likelihood that the cooling functions could be lost, and if they are lost, it may be difficult to replace them, and that could lead to a more significant damage to the fuel and potentially some type of release. So as a prudent measure with a comparable situation here in the United States, we would likely be looking at an evacuation to a larger distance.

Mr. WAXMAN. So is it the spent fuel problem in this Unit 4 where there is no water covering the fuel rods? Is that the greatest concern you have at the moment?

Mr. JACZKO. Well, I think it is all of the factors together really. It is the combination. And so, yes, there is the possibility of this progressing further. And so, as I said, in this country we would probably take the prudent step of issuing an evacuation to a larger distance.

Mr. WAXMAN. High levels of radiation are being released from the pool, is that right?

Mr. JACZKO. We believe that around the reactor site that there are high levels of radiation. Again, we have very limited data so I don't want to speculate too much.

Mr. WAXMAN. And what would be the significance of that?

Mr. JACZKO. Well, first and foremost, it would mean that it would be very difficult for emergency workers to get near to the reactors. The doses that they could experience would potentially be lethal doses in a very short period of time. So that is a very significant development and largely is what prompted the Agency to make the statement that it did.

Mr. WAXMAN. And if the emergency workers cannot get in there because of the danger to themselves, what would be the possibility then to deal with this problem of the spent fuels?

Mr. JACZKO. Well, again, I don't want to speculate too much because, again, we don't have direct information about the conditions on the ground. But it is certainly a difficult situation and one that needs to be addressed.

Mr. WAXMAN. Well, you describe serious risk at these facilities. Can you describe what you think are the highest risks and why?

Mr. JACZKO. At the sites in Japan?

Mr. WAXMAN. Yes.

Mr. JACZKO. I think right now, as I think it has been the situation from the beginning, the efforts are to continue to keep the reactors cool, the three reactors that were operating at the time of the earthquake. And that is right now being done with a variety of different systems, and again, in more of a nontraditional way because they have lost a lot of their electrical power in their offsite power capabilities.

In addition, the other risk is really to the spent fuel that may be in the spent fuel pools for possibly up to six of the reactors at the site. So keeping those pools filled with water and keeping that fuel cooled is also then the primary concerns.

Mr. WAXMAN. And what is the significance of the report of a crack in the unit itself, in the containment unit?

Mr. JACZKO. I want to be clear. Certainly, the indication that I was referring to was a crack possibly in the spent fuel pool on one of the other units. And the significance of that would be if there is a crack then there is the possibility of water draining from that pool and perhaps an inability to maintain the appropriate level of water in the pool, which could lead to damage of the fuel in that pool.

Mr. WAXMAN. What would you say is the best case now for Japan and what do you think might be the worst case?

Mr. JACZKO. Well, I think certainly the efforts are to continue to provide cooling of the reactors and to do everything possible to provide cooling to the spent fuel pools. Again, I don't want to speculate on what could happen because, you know, it is a very dynamic situation and there are, you know, certainly a lot of efforts that are being undertaken with efforts of the U.S. Government in particular. I want to emphasize that this is really a U.S. Government response. The NRC is playing one small part but other assets have

been located from other parts of the U.S. Government and are being provided to help provide this cooling and do what we can.

Mr. WAXMAN. Thank you very much.

Mr. WHITFIELD. The gentleman from Texas, Mr. Barton, is recognized 5 minutes.

Mr. BARTON. Thank you, Mr. Chairman, and thank you, Chairman, for being here on what is obviously a very difficult day for you.

You may have answered some of these questions before or you may have even commented on them in your opening statement so I apologize if I ask something that has already been addressed.

My understanding is that the safety systems at the power plants or the reactors in Japan are an older technology that requires an active backup and that the licenses that you are reviewing now have a different system that is a passive backup, i.e. if something happens catastrophic, the system automatically shuts itself down and the cooling system can perpetuate itself without outside power. Is that correct?

Mr. JACZKO. Well, I wouldn't necessarily want to comment too much on the Japanese sites because they are designed a little bit different from the designs we have that are similar in this country. But we are reviewing new reactors that do operate on what they call a "passive cooling system." It is not all of the designs that we are reviewing, however. It is only two of the designs that we are looking at but——

Mr. BARTON. Well, my understanding is that there is—and correct me if I am wrong—that there is one new nuclear power plant under construction and that is the Southern Company facility in Georgia and that their safety system is a passive safety system. Of course you won't have a tsunami in central Georgia but you could have an earthquake. And if there were to be an earthquake that it would automatically shut itself down without outside intervention and the coolant is a gravity-flow cooling system that self-perpetuates itself, again, without any outside power. Is that correct?

Mr. JACZKO. That is correct. The system that is used for that particular design, which is the AP1000, does essentially rely on gravity to initiate circulation of water through the reactor and then naturally circulate based on the heat flow. It will circulate without the use of offsite power. However, there are other safety systems that do rely on the offsite power and——

Mr. BARTON. But we could say in the instance of the 1 new plant that is currently under construction, what happened in Japan, assuming the construction of the plant is robust enough that the containment is not destroyed by the earthquake in terms of cooling the reactors and shutting down the reactors, they would be shut down and they would stay cool.

Mr. JACZKO. Well, again, I wouldn't necessarily want to speculate on everything. We don't really know what happened in Japan. We obviously know there was an earthquake. We know that there was a tsunami. We know a lot of safety systems haven't functioned as would be needed. So, you know, at this point I don't really want to speculate on how that applies to any U.S. facilities until we have a chance to really do a methodical and systematic——

Mr. BARTON. I am not asking you to speculate on what happened in Japan. I am asking specifically if an earthquake hit the power plant in Georgia, based on your Agency's review of their safety design, would it withstand that earthquake?

Mr. JACZKO. All of the plants that we have licensed and all of the plants that we are currently reviewing will meet strict safety standards for earthquakes and other natural phenomena. So certainly, for the existing plants we believe absolutely that they can withstand an earthquake and they can meet the high standards that we have put in place. In the new plants we are still continuing our review. We haven't completed our review so I don't want to prejudge the outcome of that by making any final determinations.

Mr. BARTON. OK. But you are allowing this plant in Georgia to be constructed, so you have approved something.

Mr. JACZKO. It is a preliminary approval for a limited amount of construction activity that is not related to the most safety significant systems at this time.

Mr. BARTON. Now, in general, for each plant in the United States, regardless of where it is located, does it have a minimum safety requirement to withstand an earthquake?

Mr. JACZKO. That is true. All the plants have a requirement to be designed to deal with the kinds of earthquakes we would expect in about a 200-mile radius from that nuclear power plant.

Mr. BARTON. Now, obviously, if a plant is in an area that is more prone to earthquakes, it might have a higher requirement than a plant that is in a location that has never had an earthquake in 500 years, but they all have to withstand some base-case earthquake design criteria?

Mr. JACZKO. That is correct. They all have to withstand what we think is the maximum expected earthquake from the historical record within about 200 miles of that site.

Mr. BARTON. Now, I am told that the earthquake that hit Japan is order of magnitude the fifth most powerful ever recorded anywhere in the world. So that is obviously a very powerful earthquake. In the United States is the design criteria currently for that level of an earthquake or is it for an earthquake that would be, say, the standard of the earthquake that hit San Francisco in 1906?

Mr. JACZKO. Would you like me to answer?

Mr. BARTON. I would like you to answer.

Mr. JACZKO. I think it is important—I want to try and give a demonstration. I think we talk a lot about the magnitude of the earthquake, and that is not really what the NRC looks at. If you look at the cup of water that I have over here and you think of that as the nuclear reactor, the earthquake would be—I probably should fill up the water glass.

Mr. BARTON. This is going to make TV so do it right.

Mr. JACZKO. I practiced it before I started. So if you think of this as the nuclear power plant, when you talk about the magnitude of the earthquake, it would be like me hitting the table with my fist. So something like that. And you will see that it makes the glass over here vibrate. That is what we actually measure and we design our nuclear power plants around is that shaking of the power plant. So the actual impact depends upon where I hit in relation

to the glass. So if you have a large earthquake like this that is very far away may not have the same impact on a site as an earthquake that is maybe a little bit less but much closer. So something like that. So we actually worry more about—we look at all of the different earthquakes that could happen in this region and we look at what that shaking is and we make sure that that shaking can handle what we think are the maximum historical earthquakes in that region. Now——

Mr. BARTON. No, go ahead.

Mr. JACZKO. Sorry.

Mr. BARTON. Summarize.

Mr. JACZKO. In addition to that, we know that we don't always know everything. So we have done a lot of studies over the years to look at earthquakes and phenomena beyond that kind of design earthquake, and we have had the plants go back and look and see if there are things that they could do to ensure that they would be able to better withstand some possible earthquake that nobody has thought of or seen at this point. And so we have what we call severe accident programs that all of the utilities have where they have procedures and they have ability to mitigate that kind of more severe event that may not ever have occurred in a particular region. So it is a multi-layered system of defense.

And if I could just briefly summarize one other point, in addition to that, following September 11, we required all of the nuclear reactors in this country to pre-stage equipment that can perform this emergency last—kind of—ditch effort cooling to the reactor and the spent fuel. And that is a variety of procedures and different types of equipment that are required to be at the reactor sites. And we have inspected the reactors to make sure that they have that. So, you know, that gives you another level of defense beyond, really, just what the design of the reactor is.

Mr. BARTON. Thank you. And thank you for the chair's courtesy in letting him answer that question.

Mr. WHITFIELD. The gentlelady from California is recognized for 5 minutes.

Mrs. CAPPS. And Mr. Chairman, if you wouldn't mind granting me a little consideration. I represent Diablo Canyon Nuclear Facility and I have three questions. But something was stated earlier that I believe needs to be clarified just for the record if I could ask the chairman in addition to thanking him for his testimony, did you say that Unit 4 in Japan in the incident there that there was no water in Unit 4 surrounding the spent fuel and that Unit 3 was in danger of losing the water source?

Mr. JACZKO. We believe at this point that Unit 4 may have lost a significant inventory if not lost all of its water.

Mrs. CAPPS. And that Unit 3 is in danger?

Mr. JACZKO. Well, what we know at Unit 3 is that there is possibly—again, and our information is limited so we do—well, we believe that there is a crack in the spent fuel pool for Unit 3 as well, which could lead to a loss of water in that pool.

Mrs. CAPPS. Thank you. Diablo Canyon Nuclear Facility in my congressional district sits on the Hosgri Fault Zone, then in 2008 the U.S. Geological Survey informed the utility that a new fault had been found near Diablo Canyon. It is called the Shoreline

Fault. You are well aware about the California law requiring the Energy Commission to perform reviews of the seismic issues associated with our State's nuclear plants, sir. The Energy Commission recommended and our State PUC directed that independent peer-reviewed advanced seismic studies be performed prior to applying for re-licensure. Do you think the NRC should take advantage of the talent, expertise, and resources available in California so that all information on seismic issues could be analyzed with the goal of avoiding a costly duplication?

Mr. JACZKO. Well, ultimately, we have to make decision as an Agency based on the technical review that we as an Agency do. And again, I can't get too far into some of these issues because we do have an ongoing hearing related to some of the very points that you have raised. So in our hearing process we are prohibited from discussing those things outside the context of the commission.

Mrs. CAPPS. Right. I will tell you what it seems to me——

Mr. JACZKO. Yes.

Mrs. CAPPS [continuing]. And to my constituents that having the best eyes and minds in our country working together looking at the seismic issues makes the most sense. First and foremost, for my constituents this is about safety. But seismic concerns also impact affordable and reliable generation as well. So I hope that this issue can be revisited not to take away from the responsibility and authority of the federal agency but to work with other agencies. And I look forward to working with you as we go along in this area.

Mr. JACZKO. Well, Congresswoman, if I could just briefly say——

Mrs. CAPPS. Sure.

Mr. JACZKO [continuing]. We actually did host a workshop within the last year, actually, that brought together a lot of these technical experts to have a discussion for the point that you said. We certainly are always open to hearing information from any technical expert that can provide information to us. So I just want to make the point that in the end the decision-making has to come from our——

Mrs. CAPPS. Right.

Mr. JACZKO [continuing]. Expert staff.

Mrs. CAPPS. Right. Here is another question. My constituents have become increasingly concerned about the preparation for a station blackout event. If power is lost, they want to be assured that backup power will be available throughout the duration of an accident in order to prevent fuel melting. In the last half-decade both California reactors have been cited by you, by the NRC, for instances in which both backup diesel generators were down or there were problems involving battery power availability. In such instances, merely citations were given to the utilities. Should the NRC reevaluate its regulations and perhaps increase the penalties for such infractions in light of the accident in Japan as an incentive to force better compliance from the nuclear operators?

Mr. JACZKO. Well, as I said, we intend to do a very systematic and methodical look at any lessons we can learn from this Japanese incident. And I certainly will keep your suggestion in mind as something for us to take a look at.

Mrs. CAPPS. Finally, I would like you to address some safety issues in the event of an earthquake and a simultaneous accident

in a nuclear plant. Diablo Canyon has a workable evacuation plan. They would not be able to operate without one. But as you may know, there is basically only one way in and out of San Luis Obispo, narrow Highway 1 along the coast. The NRC has ruled that it was non-credible that there could ever be multiple catastrophes such as an earthquake and a meltdown at the plant. This is the quote from the NRC. "The commission has determined that the chance of such a bizarre concentration of events occurring is extremely small. Not only is this conclusion well supported by the record evidence, it accords most imminently with common-sense notions of statistic probability." That is the end of their quote.

Now, we have just witnessed an earthquake, a tsunami, and a nuclear meltdown all occurring sequence. I want to ask the commission, if you would on my behalf, do they still believe the chance of this bizarre concentration of events is merely hypothetical? Do you think this decision should be revisited in light of the events in Japan?

Mr. JACZKO. Well, I certainly will take your suggestion back to the commission. I would want to review that entire document in its entirety because certainly we do examine the possibility of earthquakes as an initiating event for a possible reactor problem. Of course, we believe we have systems in place that would, (1), really prevent any kind of core damage from that but (2), if there is subsequent problems, we have mitigating strategies in other ways to cope with those. So I would be happy to take a look at that document in its entirety.

Mrs. CAPPS. Thank you. And just in conclusion, Mr. Chairman, that is what they said 2 weeks ago, no doubt, in Japan as well. I have enormous anxiety and sadness over the events that happened there. And here we have seen in the past year our three major sources of energy that this country uses, coal, oil, and nuclear, all experiencing tragic accidents. And I do look forward to working with your commission on the number-one goal of keeping our energy sources safe. Thank you.

Mr. JACZKO. Thank you. And Congresswoman, if I could just add, of course, you understand we have not had any nuclear incidents in the last year in this country. The incidents were another country.

Mr. WHITFIELD. The gentleman from West Virginia, Mr. McKinley, is recognized for 5 minutes.

Mr. MCKINLEY. Thank you, Mr. Chairman. In light of what has happened in Japan, I assume the NRC still has the authority to grant the permits for continuing the design implementation of nuclear facility?

Mr. JACZKO. Certainly. The Agency is an independent regulatory agency.

Mr. MCKINLEY. Is there any delay or are you hearing anything that would set up—I would expect some extension might be necessary but what would you suggest is a reasonable time frame for someone making an application?

Mr. JACZKO. Well, as I said, I think the process of reviewing an application for a nuclear power plant is a very complicated process. And this is the first time we are doing this, the first time we have done it in a long time. So I think there is going to be some lessons

that we learned, both the applicant and the Agency. I am sorry. I don't want to get into kind of speculating how long or surmising how long I think it should happen. I would just say that we will do the thorough job we need to——

Mr. MCKINLEY. OK.

Mr. JACZKO [continuing]. Do to ensure safety of——

Mr. MCKINLEY. Given that this also is for budgeting, do you have some R&D money allocated for researching alternate uses for spent fuel rods?

Mr. JACZKO. We currently in our budget right now have significant resources that we are using to look at spent fuel, the safety and security of spent fuel and transportation. We have a small piece of our budget that is looking at reprocessing and developing a framework for reprocessing, which would be perhaps what you are referring to——

Mr. MCKINLEY. If you could send more to me, I would like to know a little bit more about it.

And let us go to the Yucca Mountain just for a moment. I don't know whether it is anecdotal or I know, of course, the application has been withdrawn but it was my understanding that consumers are still paying on their utility bills funds for that project. Is that accurate?

Mr. JACZKO. I believe it is, although I would add that that is not an area that the NRC has authority over.

Mr. MCKINLEY. But is that accurate?

Mr. JACZKO. I believe it is, but again, I don't follow that very closely other than generally what I read in the press.

Mr. MCKINLEY. OK. I am just curious because from what I understand that we are collecting money for something that is never going to happen. You don't understand that?

What about Shippingport? I think that was the first facility we had in this country, isn't it? Was that '65? '63? When was Shippingport opened?

Mr. JACZKO. I don't have the exact date of the initial license but it was very early on in the U.S. Nuclear Program.

Mr. MCKINLEY. In light of the circumstances—and maybe I don't want to do a knee-jerk reaction at all to this —but will you be looking at some of the older facilities what new technology or has Shippingport been upgraded all along?

Mr. JACZKO. Shippingport is no longer an operating reactor.

Mr. MCKINLEY. It is no longer in operation at all? So what happens when Shippingport goes out?

Mr. JACZKO. Any of the reactors when they go out of service are eventually decommissioned. And we have decommissioned a large number of reactors in this country.

Mr. MCKINLEY. OK. There was also a story in the media that one of our naval vessels sailed through a cloud out off Japan's—were you aware of that?

Mr. JACZKO. Yes. We did have indications that the early days of this incident the reactor was going through a process that involves venting steam that accumulates in the reactor containment structure. And that steam needs to be released in order to reduce the pressures in that containment vessel, which is one of the important barriers to——

Mr. MCKINLEY. Could that have been avoided, the ship going through that? Could that have been avoided?

Mr. JACZKO. Well, my understanding was they were performing activities to support search-and-rescue efforts in Japan and that the doses that they were experiencing were from that particular plume were not doses that would have a significant impact to health and safety.

Mr. MCKINLEY. That is all. I yield back my time. Thank you very much.

Mr. WHITFIELD. Thank you. At this time I recognize the gentleman from Massachusetts, Mr. Markey, for 5 minutes.

Mr. MARKEY. Thank you, Mr. Chairman. Welcome.

What interim safety measures are you going to require while you study the issue? In Germany they are taking interim steps right now, as well as Switzerland, China, Venezuela. Are there any steps you would like to announce that you are going to take in order to ensure that the plants in our country are safe?

Mr. JACZKO. Well, Congressman, we continue every day to make sure that the plants are safe. And at this time we don't have any specific actions that we think are necessary to add to the safety of the facilities beyond what we do.

Mr. MARKEY. Are there any interim advisories that you are going to send out? After 9/11 the NRC sent out some interim advisories. After Fukushima are you planning on doing that?

Mr. JACZKO. We do intend to send out what we refer to as a Regulatory Information Summary. That will generally characterize the event in Japan. Again, at this point we don't have detailed information. But that will remind licensees of, of course, their obligations under their existing license, but as well as these additional measures that I talked about to these severe accident types of strategies, as well as the efforts that we implemented after 9/11 to put in place these systems and procedures to ensure that they could provide emergency cooling to the reactor if necessary.

Mr. MARKEY. Going back to the question which Chairman Whitfield asked you about, Dr. Ma and his concern about the AP1000 design, you said with your vote that "while it is clear that the use of ductile material in all areas of the shield building would provide an additional enhancement to safety, that I am not convinced that such a design requirement exists." After what is going on in Japan right now, would you reconsider that in order to perhaps consider adding that ductile material as part of the process of the construction of AP1000 plants?

Mr. JACZKO. As I said, I think we will do a very thorough review of the information from Japan. And we don't anticipate getting to a final decision on that design at least until the end of the summer. So I think there will be plenty of information from our review at that time to inform that decision.

Mr. MARKEY. Yes. As you know, I authored legislation in 2002 that required the distribution of a potassium iodide to residents living within a 20-mile radius of nuclear power plants based upon a Sandia study, because we learned after Chernobyl that this cheap medication can prevent cancers caused by radioactive iodine. The Bush White House ignored my language and blocked an effort by HHS to implement it. In fact, they even took away HHS' power to

complete its KI distribution guidelines. The Obama administration has not implemented it even though the surgeon general has just said yesterday that she thought it was a worthwhile precaution for West Coast residents. Don't you think that distribution of potassium iodide to residents within 20 miles of nuclear power plants is a common-sense measure that should be implemented?

Mr. JACZKO. Well, the particular protective actions that would be issued for any nuclear power plant incident are ultimately the responsibilities of the state and local governments. They have that primary on-the-ground responsibility to decide how to deal with an accident. So——

Mr. MARKEY. But the plants are licensed by the Nuclear Regulatory Commission, not by the states. You are the Agency of expertise in terms of the spread of nuclear materials, not state officials. Do you believe that it is advisable to look at a 20-mile radius for distribution of potassium iodide?

Mr. JACZKO. The current policy of the commission is that potassium iodide would be one of the protective action that could be considered within what we call our emergency——

Mr. MARKEY. The Bush guideline was that for 10 to 20 miles, people should just start running or ducking under their bed. There is no other medicine. So is there a recommendation from you that they should look at potassium iodide for the 10- to 20-mile radius?

Mr. JACZKO. Again, I would really in many ways defer to state and local governments as they believe that that is appropriate. I think there certainly are many protective actions that could be taken.

Mr. MARKEY. I just don't think that they have the expertise looking at the probabilistic risk assessment of the likelihood of an accident in terms of having KI there. Now, the San Onofre reactor is also rated to withstand a 7.0 earthquake. Should we be retrofitting those reactors to ensure that they can withstand much stronger earthquakes? The IAEA warned Japan 2 years ago that their nuclear power plants were not designed well enough to withstand a strong earthquake and they were only able to withstand a 7.0 earthquake. That is what San Onofre is designed to withstand. Should we be looking at retrofitting of the San Onofre plant and plants like that?

Mr. JACZKO. Well, as I said, the plants are actually designed to the ground motion and the shaking that you would get at any facility. And that is based on what we think is the maximum earthquake that has occurred in any particular area. So it doesn't directly necessarily mean a 7.0 earthquake. It is what we think is the maximum credible earthquake. And I continue to believe that that is the appropriate standard for the Agency. But again, we will take a look at all of the information we have from Japan as that comes in and if we have to make modifications to our requirements, we will.

Mr. MARKEY. I would just hope that maximum credible earthquake would be reexamined after what has happened in Chile, New Zealand, and Japan, we being in the other part of that earthquake zone that is yet to have an earthquake so that we do have the proper protections.

Mr. WHITFIELD. The gentleman from Louisiana, Mr. Cassidy, is recognized for 5 minutes.

Mr. CASSIDY. Thank you, sir. I am a physician so I am going to speak about it and sound like a physician. In effect, there is going to be a postmortem done on that accident and folks are going to go in there and see what went wrong and learn from it to ideally keep it from occurring again. Now, are there going to be people from industry invited to that party if you will or to that postmortem or will it only be academia and government? It seems all 3 need to be there. And so I don't think I have heard you mentioned having industry there to kind of, well, what do we do? Thoughts?

Mr. JACZKO. Well, we haven't yet decided how we will go about our review but I want it to be systematic and methodical. Those are the two words that I think are most important right now. And in our normal practice as an Agency, we always reach out to—there is not just industry but public interest groups and other members of the public. So I would expect that whatever we do as part of this process will have a significant public involvement.

Mr. CASSIDY. Now, let me ask because when I toured the nuclear power plant near my home—I am from Louisiana so it is the River Bend Nuclear Power Plant—and as I recall they were coming up with a failsafe mechanisms to keep the generators running even if there was something dire that happened to the plant. I gather what has happened here is that the tsunami, because the diesel was on the ground, washed away the diesel so they were unable to run the generators. So just for the reassurance to folks here and frankly my city if you will, it seems that we have been proactive on that particular issue so that there is a backup to the backup to the backup to keep the generators running to pump the water in case—you see where I am going with that.

Mr. JACZKO. Well, we do. And again, I don't want to speculate on exactly what happened in Japan because we really just don't know yet.

Mr. CASSIDY. I think I am channeling CNN right now.

Mr. JACZKO. All the diesel generators at nuclear power plants in this country are considered vital equipment. The emergency diesel generators are vital pieces of equipment, so they are designed as with the other safety-significant structures and components to be able to withstand the natural phenomenon. So depending on the plant that could be hurricanes, tornadoes, tsunamis, earthquakes, whatever the natural phenomena are that are relevant to a particular site.

Mr. CASSIDY. Knowing that we are not speculating on what happened in Japan but just to go to the point, the backup generators, to keep those cooling units running, we have proactively addressed this in this country and there is a way if Hurricane Katrina comes through and hits my State and 1 system goes out, there is another system to keep it running. Is that my understanding?

Mr. JACZKO. That is correct. Each reactor has at least two diesel generators. In the event that one of them can't perform its function, there will be an additional. In addition to that, many sites have what we call a station blackout diesel or some other type of electrical power supply that can function in the event that those

primary emergency diesel generators are not operating. And then, of course, in addition to that, as I have referred to, all of the plants in this country have been required to look at pre-staging other additional emergency equipment that could deal with this kind of situation.

Mr. CASSIDY. You mentioned that.

Mr. JACZKO. In some cases that would be electrical power supplies or portable generators and things like that.

Mr. CASSIDY. Got you. You may have answered this next question. I am sorry I was out of the room for a bit. Clearly, we are talking not just natural disasters but manmade. Do I understand the new nuclear power plants or do I not understand correctly that they have to be built so that if there is a terrorist attack and a plane is driven into them that somehow it is still protected?

Mr. JACZKO. For the existing fleet of reactors, we have required them to be able to deal with large fires and explosions that could occur at the plant. And some of that was related to the possibilities of terrorist attacks involving aircraft. For new plants the new designs are required to be able to withstand an aircraft-type impact at the site.

Mr. CASSIDY. Again, you may have said this. The containment structure, though, even if there is a meltdown, how effectively can a containment structure keep it contained?

Mr. JACZKO. Well, that is the purpose of the containment structure is, again, in the very unlikely event that all of the safety systems fail and we are not able to keep cooling to the core and it were to eventually have significant fuel damage or some kind of melting that any radiological material would be contained within that structure.

Mr. CASSIDY. Given that there is some that will be vented off but nonetheless, if there is a disaster, it is a disaster within the containment?

Mr. JACZKO. That is the design goal and the expectation. And of course, if that were to fail, we have very robust programs in place to do emergency evacuations——

Mr. CASSIDY. So this is the 1970s-circa plants, so I presume since it dates from the '70s since we have even more robust protections?

Mr. JACZKO. We have looked at all of these plants over the years and in some cases—well, actually in the late '80s and early '90s we did systematic evaluations of the plants to see how they would deal with these kind of very severe accidents. In some cases, plants took the step of low-cost modifications that would deal with these more severe kinds of events. So we have a lot of things that have been done. The plants are certainly not the same plants that they were when they were originally built and designed.

Mr. CASSIDY. Thank you very much.

Mr. WHITFIELD. The gentleman from Michigan, Mr. Dingell, is recognized for 5 minutes.

Mr. DINGELL. Mr. Chairman, I thank you for your courtesy.

Mr. Chairman, I am sure you are making a careful review of the events that are going forward in Japan with regard to the nuclear facility over there and the attendant circumstances. Will you make such a review?

Mr. JACZKO. We certainly do intend to. Once we have good, credible information we will do a thorough and systematic review.

Mr. DINGELL. Good. Well, first of all, (1), would you submit to this committee your plans with regard to that as to how you intend to go into that to ascertain what happened?

Mr. JACZKO. We certainly will. We will make those available.

Mr. DINGELL. And would you see that we are informed as events go forward so we know what is taking place over there?

Mr. JACZKO. We will certainly do that.

Mr. DINGELL. And would you also submit to us for the record how NRC is going to go about defining the lessons that you have learned about events in Japan and how you will incorporate them into your regulatory requirements? You would do that for us?

Mr. JACZKO. We will certainly do that.

Mr. DINGELL. Now, does the NRC regularly use new information about the different types of risk as these different types of risks and information become available? Yes or no?

Mr. JACZKO. Yes.

Mr. DINGELL. Would you provide for the record the process by which NRC does this risk assessment?

Mr. JACZKO. Well, there is a variety of——

Mr. DINGELL. No, just for the record.

Mr. JACZKO. Oh, well, of course. Yes.

Mr. DINGELL. Our time, Mr. Chairman, is very limited.

Mr. JACZKO. Of course.

Mr. DINGELL. I have a lot of questions here. Mr. Chairman, do the NRC's licensing standards for nuclear plants take into account the risk of earthquake or tsunami?

Mr. JACZKO. They incorporate all natural hazards, including earthquakes and tsunamis.

Mr. DINGELL. I would note with distress, I think you probably remember Diablo Canyon some years ago where they were going to build right on a fault. Are you more careful about that than your predecessors were in that particular——

Mr. JACZKO. Right now we look at all the nuclear power plants in the country. We look at seismic activity from all of them because while not all plants are in high seismic areas, almost all plants could experience some seismic activity from lower-level earthquake activity. So we consider that for all plants.

Mr. DINGELL. Now, Mr. Chairman, would you provide a list of the kinds of disasters for which NRC takes account of in terms of its licensing standards? Just submit that for the record, please.

Mr. JACZKO. We will provide that.

Mr. DINGELL. Now, Mr. Chairman, it is my understanding that one of the main problems in Japan has been inadequate access to emergency power to keep the reactors cool and that that poses some substantial ongoing risk. Do NRC's licensing standards include adequate access to emergency power and are you satisfied that they do so?

Mr. JACZKO. We believe that our requirements are very strong in this area and we continue actively in our inspection program to ensure that licensees have the appropriate equipment such as diesel generator and that it operates successfully.

Mr. DINGELL. Now, Mr. Chairman, you have an unholy mess on your hands, you and the Department of Energy, with regard to Yucca Mountain. You have spent near as I can gather something like 17 billion on this that has been collected from ratepayers for long-term storage of nuclear waste. The administration opposes going forward. You have got this nuclear waste that is piling up all over the country. Some of it is going in to cooling ponds. You are talking about putting the rest in dry cask storage. Do you have any kind of long-term plan to address what you are going to do with this infernal mess and how you are going to deal with the problem?

Mr. JACZKO. Well, right now we are looking at a longer time frame for storage of spent fuel than we have in the past. But right now we believe that that spent fuel certainly can be stored safely and securely with the existing systems——

Mr. DINGELL. But you don't have——

Mr. JACZKO [continuing]. For storing several decades' worth——

Mr. DINGELL [continuing]. A plan for how you are going to deal with it. You are being sued by the electrical utilities because they are collecting monies from their ratepayers that are not being spent on the purposes for which they are being collected. The stuff keeps piling up and you have doubled the amount that you can store in a single pool but that is running out. You are running out of pools in which to store it. And as these plants close, you are going to perhaps lose the responsibility of the persons who are storing this thing and the stuff just keeps piling up. Is there a long-term plan anywhere in government, in your Agency, in the Department of Energy, in the Office of Management and Budget, or in any other Agency of Federal Government as to what we are going to do about this infernal mess?

Mr. JACZKO. Well, although it is not an area that we are directly working, the Secretary of Energy has convened a Blue Ribbon Commission to look at some of those longer-term options and see what an optimal approach will be.

Mr. DINGELL. The answer, Mr. Chairman, is no, is it not?

Mr. JACZKO. I believe there are plans through this Blue Ribbon Commission to look long-term. And we believe certainly from the Agency that the existing systems are——

Mr. DINGELL. The answer, my beloved friend, is no. And I say this with respect and affection. But the simple fact of the matter is you are sitting on a mighty fine mess that nobody knows what to do with and each and every one of those situations offers unique opportunity for terrifying mischief to the proud public interest and to the people in the area and the cost of this whole sorry-ass mess keeps going up and going up.

Mr. WHITFIELD. And we agree with you, Mr. Dingell. At this point I would like to recognize the gentleman from Texas, Mr. Burgess, for 5 minutes.

Mr. BURGESS. Thank you, Mr. Chairman. And Mr. Chairman, thank you for being here and spending so long with us today. Thank you for speaking with me yesterday at the end of, obviously, what was a very long day for you. And I appreciate your willingness to make yourself to Members of both sides of the dais during this crisis in Japan.

Recently, an email has been circulating and I think it came to the committee staff that suggested a much higher level of radioactivity at one of the plants that had previously been reported. Do you know anything about that?

Mr. JACZKO. Well, we are continuing to monitor the situation as best we can. Again, I am not familiar with the email that you are talking about but we do believe that certainly with one of the spent fuel pools, that there have been certainly elevated radiation readings. And over the last several days there have been times based on certain incidents in the site where radiation levels have gone up and come back down.

Mr. BURGESS. Well, when you say elevated, ballpark, are you talking about chest x-ray, CAT scan, multiple CAT scans? What sort of numbers are you talking about?

Mr. JACZKO. Right now we have indications at the site of radiation levels that would be levels that would be lethal within a fairly short period of time. So they are very significant radiation levels.

Mr. BURGESS. Very significant. OK. And that is different from kind of what we have been hearing before, is that correct?

Mr. JACZKO. Again, I would say it is certainly a more recent development that we have seen these very, very high readings.

Mr. BURGESS. OK. Now, you were very good to provide us with written testimony. You were very good to provide us with some updates on the situation. It is obviously a very fluid situation in Japan. Would you be good enough to give us in written form what you have described to us as you were finishing up your prepared testimony this afternoon so that there is no confusion over what—when we quote you, the press is here and we will all be asked questions as you finish up. Could you provide us the written information that you would like us to have?

Mr. JACZKO. We will provide that for you.

Mr. BURGESS. And I think Mrs. Capps on the other side talked about a little bit, I mean, you talked about spent fuel pool being dry and radiation being high, again, things that were different from what I had been gathering from just the press reports just prior to coming in here. And it would be good to see that, again, what is factual and what is not.

Mr. JACZKO. We would be happy to provide that. And I would just say that our information is limited so we have been very careful to only provide information that we believe is very reliable.

Mr. BURGESS. Well, now, we are here to talk about the budget and the budget you prepared obviously was before all this happened. Do you anticipate submitting an addendum to the request in light of things that have happened this past week?

Mr. JACZKO. That is something we will review. At this point I don't have an answer for you, but I will certainly come back to the committee if we do.

Mr. BURGESS. Can you give us just kind of a back-to-the-envelope estimate, in a perfect world what would be the percentage of electricity in this country produced by nuclear power?

Mr. JACZKO. It is approximately 20 percent.

Mr. BURGESS. What is being produced now?

Mr. JACZKO. Currently, I would have to look but I would take an estimate of probably about that number. I am not aware of any significant planned outages right now.

Mr. BURGESS. So it would be your position as chairman of the Nuclear Regulatory Commission that the percentage of electricity produced in America would not increase over what it is today? Do I understand that correctly?

Mr. JACZKO. I am sorry.

Mr. BURGESS. In an ideal world this country, maximizing all of the different energy-production possibilities that we have, what percentage would be nuclear?

Mr. JACZKO. Well, it is really not up to us to decide that. I think the Agency's responsibility is to make sure that if there are nuclear power plants in this country that they continue to operate safely and securely.

Mr. BURGESS. Do you have a concept of what would be the ideal number of nuclear power plants in this country in the next 10, 20, 30 years.

Mr. JACZKO. Certainly, as an Agency we don't have a concept of an ideal number. Our job is to make sure it is safe and secure.

Mr. BURGESS. How many would be too many for you to keep up with to ensure that they were safe?

Mr. JACZKO. Right now we think certainly we are planning for the possibility of new plants to be under construction in the next several years, so we believe with the budgets that we have developed, we would have the resources we need to handle those additional units if they are licensed.

Mr. BURGESS. All right. Chairman Dingell described in very colorful terms an infernal mess at Yucca Mountain. If you were the king of the nuclear regulatory world, the sole decision-maker on nuclear waste, what would be the ideal solution? The cynic went on. What would you do?

Mr. JACZKO. Well, as I said, I can't get too much into that because we do have an ongoing proceeding with regard to Yucca Mountain. And the job of keeping plants and the materials and all the things that we regulate safe is pretty much a job that, in particular these days, keeps me awake almost 24 hours a day. So I will let somebody else worry about some of those other broader policy questions.

Mr. BURGESS. We thank you for your activities during this crisis. Thank you.

Mr. WHITFIELD. At this time I recognize the gentleman from Pennsylvania, Mr. Doyle, for 5 minutes.

Mr. DOYLE. Thank you, Mr. Chairman. Chairman, thanks for your patience and endurance today.

Given what has happened in Japan, I am sure this has been a reminder to all of us that everyone agrees that certifying new nuclear designs is a crucial and important task to make sure these reactors are durable and can be safely operated. And I understand that the new reactor design certification process involves not only professional and accredited NRC staff but there is also an outside expert advisory committee that oversees the review and recommendations of the NRC staff, is that correct?

Mr. JACZKO. It is an Agency Independent Advisory Committee.

Mr. DOYLE. That is right, the ACRS.

Mr. JACZKO. Right.

Mr. DOYLE. And then, ultimately, you and your colleagues also evaluate and make your own independent judgments, correct?

Mr. JACZKO. Correct.

Mr. DOYLE. So I want to address this situation to get more clarification and more on the record about concerns raised by my good friend, Ed Markey, regarding Westinghouse's AP1000. I want you to hopefully provide some more clarification to the process that was involved certifying this reactor.

Now, is it true that Dr. Ma's non-concurrence issues during the deliberation for the Westinghouse AP1000 Advanced Final Safety Report Evaluation were in fact given due consideration by his NRC staff colleagues?

Mr. JACZKO. I believe that they were.

Mr. DOYLE. And also the members of the Independent Advisory Committee for Reactor Safeguards?

Mr. JACZKO. As part of their review, they did specifically receive a presentation from Mr. Ma about the situation.

Mr. DOYLE. And you and your commission colleagues?

Mr. JACZKO. I don't want to speak for the actions of all of my colleagues, but I personally met with him and talked to him about his concerns.

Mr. DOYLE. And can you tell us, what happened after Dr. Ma made his presentation and raised his concerns? So he raised these concerns and tell us what happened after that.

Mr. JACZKO. Well, I think they were looked at by certainly all of the staff at the Agency that were reviewing the design. This advisory committee also did look at his perspective and they came to their own conclusions that I think, ultimately, no one disputes that the recommendations that he had would make the design safer, but we think the design as it is right now would appear to meet our standards. But I would add that it was also Mr. Ma who originally raised concerns with a previous iteration of the design. And as a result of those concerns, the Agency did indicate to Westinghouse that significant changes would need to be made. They, in fact, did make significant changes and again, I don't want to speak for him directly, but my understanding of Dr. Ma's position is that he thinks that those changes are not necessarily enough to satisfy his initial concerns.

Mr. DOYLE. But it is true that his concerns were put forward and that the NRC team of reviewers that, throughout the drafting of the AFSCR, they evaluated it and they basically overruled his concerns, basically, as did the subcommittee. I mean, this went through a process. I just want to make clear for the record that we don't have a person at the Department who has raised concerns and they were swept under the rug or ignored. I mean, these concerns were addressed. Is that not correct?

Mr. JACZKO. Yes, I feel very strongly that we create an environment at the Agency where people can raise concerns and those concerns can be thoroughly reviewed and vetted. And I believe in this that that is what happened.

Mr. DOYLE. Thank you very much. That is all I have, Mr. Chairman.

Mr. WHITFIELD. The gentleman from Nebraska, Mr. Terry, is recognized for 5 minutes.

Mr. TERRY. Thank you for being here. I am just curious, there are two power plants. Mr. Barton talked about one in Georgia but there is one in Georgia, one in South Carolina that sometime this year, early next year should be issued their combined construction and operating licensure. My question, first, is there are any discussions occurring to delay that CO well now because of the Japanese disaster?

Mr. JACZKO. Well, right now, those two potential plants that you referenced are all based around the AP1000 design. That design is currently undergoing a public review process. I expect we will get comments as a result of that public process related to the situation in Japan. So we will evaluate those as we get them.

Mr. TERRY. So it is yes and maybe no?

Mr. JACZKO. At this point we are following our normal path with the reviews at this point.

Mr. TERRY. All right. It sounds like there may be some uncertainty in that process of whether they will get their combined construction operating license in '11 or early '12.

Mr. JACZKO. Well, we are proceeding down a path to continue the reviews. As I said earlier——

Mr. TERRY. There is no reason to repeat the answer. I am curious to how many other applications have been made for the early site permits? Do you know how many are sitting with you all?

Mr. JACZKO. We currently have, I believe, 1 or 2 new early site permits in front of the Agency or expected to come.

Mr. TERRY. All right. Are there any that have been provided the early site permit and now on course to go to the next level of permitting? I am just trying to figure out how many are in the pipeline.

Mr. JACZKO. Right now, we have 12 applications in front of us for approximately 20 reactors. Those are actual combined license applications, and then we have I believe it is two early site permits that are not yet tied specifically to an actual license for a plant.

Mr. TERRY. All right. I have studied a lot over the past couple years the small modular reactors. Just want to know what your personal opinion is, where the process is in reviewing the technology, how close we are to perhaps even rolling out a pilot project.

Mr. JACZKO. Well, I like to think of the small modular reactors in three groupings. We have the small modular reactors, which are very much based on the existing type of reactors that we have now but smaller. For that type of design, which we call integral light water reactors, we would anticipate in the next year or so an application for the construction of a small modular reactor type. We also anticipate one or more applications for designs related to those smaller modular reactors.

The second category we have are what are basically called high-temperature gas fractures, so it is a slightly different technology. That is mostly work that is tied to the Next Generation Nuclear Plant project and that is an activity that is a little bit farther away, probably more like 2013 where we might see an application.

The area in which probably there is the least certainty is with more of the nontraditional reactor types——

Mr. TERRY. The one that——

Mr. JACZKO [continuing]. Sodium-cooled reactors——

Mr. TERRY [continuing]. The chairman may have raised earlier with you?

Mr. JACZKO. Exactly. Those are much more right now in what I would call the conceptual stage. So they haven't progressed to the point where we really have detailed discussions about possible reviews of applications.

Mr. TERRY. All right. I appreciate that. I will yield my 59 seconds back to the Chairman.

Mr. WHITFIELD. Thank you. At this time I recognize the gentleman from Louisiana, Mr. Scalise, for 5 minutes.

Mr. SCALISE. Thank you, Mr. Chairman, and Mr. Jaczko. I appreciate you being before our committee. I know we have some votes on the House floor so I will try to be brief and ask direct questions. I think the secretary had indicated that the United States was helping Japan doing some testing on contamination on the ground. Are you familiar with what types of testing that is currently being done that we are involved in and have you all found anything right now that is a concern?

Mr. JACZKO. Well, right now my understanding is we are working to provide the ability to do air sampling of radiation. We have some readings, as I said, of very high levels of contamination around some of the reactor sites. And at this point I am not sure of the origin of that, whether that is coming from U.S. assistance in Japan or whether that is coming directly from the Japanese.

Mr. SCALISE. OK, thanks. I would imagine right now there are a number of applications that are pending before your Agency at various levels awaiting decisions. Do you anticipate that those decisions will still go forward at the current pace or do you see anything changing there?

Mr. JACZKO. Right now we don't have any intention to change the approach we are taking. But as I said, we are going to do a very systematic and methodical review of the information coming from Japan. And if there is some information that would require us to revise our approach, then we will certainly do that.

Mr. SCALISE. And I would imagine, you know, as with any crisis and, you know, we have experienced more than our fair share in South Louisiana, but there will be an evaluation in general just to see what lessons can be learned. And I would imagine, you know, we will make sure that if we learn some things from how they did things right, maybe how they did things wrong if they did, that we can incorporate that but in the end still move forward and not retreat from energy production in this country.

Mr. JACZKO. Well, we will certainly do that type of review. And again, I don't want to prejudge what comes out of it. If we get information that tells us we need to make a change, we will. If we get information that tells us things are good, then we will continue to proceed as we are.

Mr. SCALISE. Thank you for your time. I appreciate it. Thank you. Mr. Chairman, I yield back.

Mr. WHITFIELD. Mr. Commissioner, I just want to ask in response to Mr. Terry's question you talked about on these small modulars there are three or four different categories, the exiting

type, the third type is NGNP 2013 conceptual. What determines what category a design would be in? Is that based on actual applications or is that just on general knowledge?

Mr. JACZKO. It is really I would say the state of readiness of the designers and the venders themselves.

Mr. WHITFIELD. OK.

Mr. JACZKO. So——

Mr. WHITFIELD. The state of readiness of the vendors and the designers.

Mr. JACZKO. Yes.

Mr. WHITFIELD. OK. Thank you. Mr. Rush, do you have anything else?

Mr. RUSH. Mr. Chairman, Mr. Administrator, I would like to know if, in fact, over the last 5 years, can you furnish this committee with the infractions or violations or emergency where the NRC had to send an emergency crew to any of the facilities that operates within the continental United States?

Mr. JACZKO. We can certainly send you that information.

Mr. RUSH. Yes, I would like to just know what level of responses and what level of issues that you have dealt with over the last 5 years.

Mr. JACZKO. We will send you that information.

Mr. WHITFIELD. Thank you very much. Mr. Rush, you and I have 3 minutes to go. Mr. Commissioner, thank you for your time today. We appreciate it very much. We look forward to working with you as we move forward in nuclear energy and safety. And we look forward to future opportunities.

Mr. JACZKO. Thank you.

Mr. WHITFIELD. With that, the hearing is ended.

[Whereupon, at 3:35 p.m., the subcommittees were adjourned.]

[Material submitted for inclusion in the record follows:]

PREPARED STATEMENT OF HON. MARY BONO MACK

Secretary Chu and Director Jaczko, I appreciate you being here today to talk about your respective Agency's budget.

As we closely monitor the tragic events unfolding in Japan, I'd like to take a moment to express my sincere condolences for those impacted.

Friday's massive earthquake in Japan is the latest in a series of major quakes in the recent past: the 6.3 magnitude quake in New Zealand this past February and the 8.8-magnitude quake in Chile last year. These incidences will undoubtedly raise questions about what it means for our nation's nuclear energy industry but particularly for those plants most vulnerable—those located near earthquake fault lines in California. These are important questions that must be addressed. I believe that in a state like California, with areas of high population coupled with the lingering risk of a major earthquake, it is particularly important for nuclear power operators to be held to the highest level of safety standards.

While the fault geology may be different in California than Japan, we all know that the San Andreas Fault—which runs through my district—is due to rupture one day and we must do everything we can to be prepared. Earthquake experts predict that the next earthquake could register a magnitude of 7.5 or greater. It is my understanding that San Onofre Nuclear Power Plant was built to withstand a 7.0 quake, and the Diablo Canyon is engineered to withstand a 7.5 earthquake, and that many safety measures have been taken to address potential hazards. However, we must learn from the tragedy in Japan and apply the lessons learned to our nuclear facilities in order to ensure that the potential risks are fully evaluated. It is important to note that Japan thought their plants were prepared to deal with the worst possible scenarios, yet the magnitude of the disaster overwhelmed their precautions. I look forward to working with the Department of Energy and the Nuclear

Regulatory Commission to ensure that the San Onofre and Diablo Canyon plants are built and operated based on the strictest safety standards.

While we learn from the tragedy in Japan, we cannot lose site of the important role nuclear energy plays in our energy security and our future efforts to achieve energy independence. As we move forward, we still need to address the issues facing the disposal of spent nuclear waste. I look forward to hearing the Administration's plan.

Mr. Secretary, on a separate note, I look forward to working with you regarding renewable energy projects—many of which are being developed in my congressional district and are awaiting DOE Loan Guarantees. It is my understanding that there are more than 70 projects worth more than $30 billion waiting loan guarantees. Given that the sunset date of the Section 1705 Program is just months away [September 30, 2011], I'm interested in learning more about how you plan to have these loans closed. Many of the projects in my congressional district have gone through a lengthy and costly process. All the while, the unemployment rate in Riverside County is above 14 percent and people are waiting to be put to work.

Secretary Chu and Director Jaczko, thank you for being here today to discuss your proposed budgets. It is critical that the federal government prioritizes our spending. Just as families in my congressional district are making tough budget sacrifices, we too must make fiscally responsible decisions here in Washington.

PREPARED STATEMENT OF HON. GREGG HARPER

Mr. Chairman:

Nuclear power is vital to meeting America's future energy needs. I support the effective low-cost programs that Congress has established in recent years to facilitate development of the next generation of nuclear power facilities.

Congress has discussed on many occasions the need for energy security. Two elements of energy security do not enter frequently enough into our discussions of energy security: the diversity of domestic fuel sources we use, and workforce experience in developing new facilities.

It is not enough to say that nuclear is important because we have a ready domestic supply of nuclear fuel, or because it constitutes nearly 20 percent of U.S. electric generation, or because it is a clean energy source. We need to facilitate the commercial nuclear renaissance because having a diverse generation mix is in the interest of energy security, and it is in the interest of customers because diversity helps to maintain lower prices for consumers. And in a country that has now gone more than two decades without completing a new nuclear generation facility, we need to rebuild a skilled workforce if nuclear is to maintain its vital position as part of America's diverse electric generation mix.

The Department of Energy (DOE) Loan Guarantee program is a very cost effective way for the federal government preserve nuclear energy's role in our diverse energy portfolio and bring into operation new, more efficient, and even safer plant designs than those that have safely served the nation for the past five decades. At minimal (virtually no) cost to the government, the DOE loan guarantee program very significantly reduces the cost of borrowing to construct nuclear facilities. The program will save consumers billions of dollars with the overwhelming likelihood that taxpayers will bear only the modest costs of administering the program, and much of those costs are offset through application fees.

Given the serious economic trough of the past several years and the recent twin natural disasters in Japan affecting the Fukushima Daiichi nuclear facility, it is natural that concerns could arise about repayment of any loans that are guaranteed. Is there a new significant risk to the government? No.

Take the example of Southern Company's Vogtle Units 3 and 4 project, through which two new reactors are being constructed by Georgia Power Company, a Southern Company operating company. DOE has agreed to guarantee $8.3 billion in loans for the project, again, substantially reducing the interest paid on the money loaned by private sources. Characteristic of the entities that have applied for the guarantees, Southern Company's market value far exceeds the amount guaranteed, as do the assets of Georgia Power. In the unlikely event of a default on the loan, DOE has a first lien on the plant and full recourse to all of Georgia Power's $25 billion in assets along with its other debt holders. The loan is expected to be less than 15 percent of Georgia Power's projected book capitalization and less than 10 percent of Southern Company's projected book capitalization at the time of commercial operation.

Furthermore, the Georgia Public Service Commission, which regulates Georgia Power, certified the construction project, which certification includes cost recovery

in customer rates as the facility is being constructed. The cost recovery process included in the certification requires semi-annual verification and approval of costs. This further reduces DOE's minimal risk.

Neither the economic downturn nor Japan's emergency have changed materially the factors on which DOE's loan guarantee was premised: a large, well-capitalized, regulated company borrowing a small fraction of its net worth to construct facilities required to meet future needs.

The situation in Japan demands that we consider whether existing and new nuclear reactors will be operated safely in the U.S. To what extent is it relevant to apply the circumstances of one of the most powerful earthquakes in recorded history and a resulting tsunami when we review the safety of our fleet? Many have discussed the existing fleet; again, let me concentrate on the future.

Vogtle Units 3 and 4 will be constructed using the Westinghouse AP1000 design. This and other new designs incorporate a variety of safety advances beyond those in the existing domestic nuclear fleet, which as noted above has operated with a very strong safety record for a half-century. As an example, the AP1000 design will shut down in the event of a design-basis accident in the absence of power or pumps. It depends on natural circulation and gravity to maintain containment and prevent the reactor from overheating.

In closing, I repeat for emphasis two statements made by Nuclear Regulatory Commission Chairman Greg Jaczko at the hearing on March 16:

> We review all designs against a wide range of natural disasters—tsunamis, earthquakes, tornados, hurricanes—it just depends on the geographic location.

> All the plants have a requirement to be designed to deal with the kinds of earthquakes we would expect in about a 200 mile radius from that nuclear power plant. . . . They all have to withstand what we think is the maximum expected earthquake from the historical record within about 200 miles of that site.

I thank the Chairman for the opportunity to submit these materials for the record.

FRED UPTON, MICHIGAN
CHAIRMAN

HENRY A. WAXMAN, CALIFORNIA
RANKING MEMBER

ONE HUNDRED TWELFTH CONGRESS

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House of Representatives
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SUPPLEMENTAL MEMORANDUM

March 16, 2011

To: **Democratic Members of the Subcommittees on Energy and Power and Environment and Economy**

Fr: **Democratic Staff of the Committee on Energy and Commerce**

Re: **Analysis of the Effects of H.R. 1, the Full Year Continuing Appropriations Act, on Department of Energy Activities**

On February 19, 2011, the House passed H.R. 1, the Republican funding resolution. This memorandum provides a brief analysis of the effects this funding bill would have on the Department of Energy's efforts to create jobs and encourage the transition to a clean energy economy.

Despite Republican calls for an "all of the above" energy strategy, the Republican budget represents an "all nuclear" approach. The Republican spending bill would undermine several DOE programs that accelerate the development and deployment of clean energy technologies and encourage job-creating investments in renewable energy and energy efficiency. It would:

- Undermine DOE's ability to award loan guarantees to worthy renewable energy and energy efficiency projects, including those that have already received funding commitments, while maintaining all of the loan guarantee authority for new nuclear facilities.
- Cut funding for renewable energy and energy efficiency programs by 35%.
- Completely eliminate funding for home weatherization and support for state energy offices.

According to DOE, these and other provisions in H.R. 1 threaten over 40,000 construction and permanent jobs.

I. H.R. 1 Eliminates Loan Guarantees for Renewable Energy and Efficiency

Under the Title 17 loan guarantee program that was established in 2005, DOE issues loan guarantees for a wide array of innovative energy technologies.[1] The American Recovery and Reinvestment Act of 2009 expanded the loan guarantee program to promote deployment of commercial renewable energy and transmission projects.[2] H.R. 1 undermines DOE's ability to award loan guarantees to worthy renewable energy and energy efficiency projects under either of these programs while preserving DOE's ability to provide loan guarantees to new nuclear projects.

Section 3001 of H.R. 1 would rescind all unobligated Recovery Act funds without any exceptions. This will have a disastrous effect on the loan guarantee program. After months of financial, technical, and environmental reviews, the most worthy projects receive a "conditional commitment" from DOE. This means that if the developer meets a number of final conditions, DOE will provide the loan guarantee. But these conditional commitments will not survive H.R. 1, if it is enacted, because funds for the loan guarantees are not technically obligated until the loan guarantees are finalized.

Major solar, wind, geothermal, and biofuels projects from across the country are depending on these loan guarantees. Thousands of jobs and billions of dollars of investment are at stake. Currently, seven projects are at risk of losing their conditional commitments as a result of H.R. 1. Those projects and the number of jobs associated with them follow:[3]

- BrightSource's Ivanpah Solar Complex in California - 1,000 construction jobs
- Nordic Windpower's wind turbine assembly plant in Idaho - 75 permanent jobs
- U.S. Geothermal's Oregon geothermal generation project - 150 construction jobs
- First Solar's Agua Caliente solar generation project in Arizona - 400 construction jobs
- Diamond Green Diesel's renewable diesel facility in Louisiana - 700 construction jobs
- SoloPower's retrofit of a solar manufacturing facility in Oregon - 270 construction jobs
- Record Hill Wind's wind power plant in Maine - 200 construction jobs

Section 3001 would also abandon more than 20 additional job-creating, renewable energy projects that are on track to receive a conditional commitment, but have not yet received one.

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[1] Title 17, Energy Policy Act of 2005.

[2] Sec. 7003, American Recovery and Reinvestment Act of 2009.

[3] Department of Energy, Loan Programs Office, "Our Projects" (online at http://lpo.energy.gov/?page_id=45).

These projects have undergone months of financial, technical, and environmental review and negotiated "term sheets" with DOE.

If allowed to continue, these projects with negotiated term sheets would generate clean electricity from solar, wind, geothermal, and biomass resources, refine bio-crude and cellulosic ethanol, and manufacture solar components. The projects are located across the country, including in Arkansas, California, Colorado, Georgia, Idaho, Illinois, Iowa, Kansas, Maryland, Michigan, Mississippi, Nevada, New Jersey, New York, Pennsylvania, Puerto Rico, and Texas.

The projects with negotiated term sheets would receive over $12 billion in loan guarantees. They would create over 28,000 construction jobs and over 5,000 permanent jobs. Cumulatively, these projects and those with conditional commitments would use all of the remaining funds appropriated for this loan guarantee program.

The Republican spending bill would rescind these funds before they can be put to use creating jobs, generating clean power, and building new manufacturing facilities. Instead of providing companies with the certainty they need to make significant clean energy investments in the U.S., H.R. 1 would prevent DOE from finalizing loan guarantees for renewable energy companies.

In addition, H.R. 1 would dramatically curtail DOE's ability to award loan guarantees to innovative renewable energy and efficiency projects through the original Title 17 program. Section 1425 would rescind $25 billion of the $47 billion in loan guarantee authority provided by the 2009 Omnibus Appropriations Act. This reduction is not spread across all of the eligible technologies. Rather than employing an all-of-the-above energy strategy, H.R. 1 explicitly picks winners and losers. The bill would preserve the entire $18.5 billion in loan guarantees for new nuclear reactors and $2 billion available for uranium enrichment projects while leaving only $1.5 billion for all other technologies, like solar, wind, biomass, energy efficiency, and even advanced fossil fuels.

II. H.R. 1 Slashes Funding for Energy Efficiency and Renewable Energy Programs

The Republican spending bill also undermines DOE's support for clean energy by slashing the funding for the Office of Energy Efficiency and Renewable Energy (EERE) and prohibiting the use of any funds for DOE's successful home weatherization program and state energy program.

Under H.R. 1, EERE's budget would drop by 35% from over $2.2 billion in fiscal year 2010 to less than $1.5 billion. This will have immediate and damaging consequences. According to DOE, these cuts would lead to the elimination of the solar photovoltaic manufacturing initiative and the concentrating solar power demonstration zone program. The cuts will significantly reduce industry and laboratory photovoltaic research and likely delay attainment of grid parity for this technology. The budget cuts will also eliminate a new solicitation for utility-scale biopower demonstrations, three demonstration projects for low-head hydropower, technical assistance to a pumped storage project, and all manufacturing and supply chain research and development for wind power.

Section 1434 of H.R. 1 also prevents DOE from spending any funds for its home weatherization assistance program and state energy program.

The weatherization assistance program is one of the country's most successful energy efficiency programs. It leverages state investments by sharing in the cost of cost-effective energy efficiency upgrades to the homes of low-income Americans. Energy efficiency improvements save low-income families money on their monthly energy bills, while making their homes safer and more comfortable. During the program's 33 years, more than 6.4 million low-income households have received weatherization assistance. Families receiving weatherization services see their energy bills reduced by an average of $437 every year.[4]

The Recovery Act provided a one-time extra infusion of funding to enhance weatherization efforts throughout the country. More than $5 billion was distributed to the states to make low-income homes more efficient. As of November 2010, more than 300,000 homes had been weatherized using this funding.[5] H.R. 1 would rescind the Recovery Act funds that have yet to be used to weatherize homes.

With all funding for weatherization assistance eliminated, DOE expects at least 8,000 people employed in this sector to lose their jobs by July 1. The number of homes weatherized with DOE's non-Recovery Act funds during the remainder of the fiscal year would drop from 31,000 to zero.

DOE's state energy program (SEP) supports the nation's state energy offices, which use DOE funds to leverage additional investments that boost energy efficiency upgrades, save consumers money by lowering their energy bills, and create good-paying jobs in local communities. According to DOE, $50 million in SEP funding leverages $585 million for energy-related economic development and produces $333 million in annual energy cost savings. H.R. 1 would specifically prohibit DOE from using any funds to support SEP and realize these benefits.

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[4] Department of Energy, Weatherization Assistance Program (online at http://www1.eere.energy.gov/wip/wap.html).

[5] Department of Energy, Homes Weatherized by State for November 2010 (online at http://www1.eere.energy.gov/wip/pdfs/homes_weatherized_by_state_november_011811.pdf).

Department of Energy
Washington, DC 20585

August 8, 2011

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

Dear Mr. Chairman:

On March 16, 2011, Secretary Steven Chu testified regarding "The FY 2012 Department of Energy and Nuclear Regulatory Commission Budgets."

Enclosed are the answers to 25 questions that were submitted by you, Chairman Upton, Ranking Member Rush, and Representatives Scalise, Bilbray, McKinley, and Matheson 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,

Amelia Jenkins
Principal Deputy Assistant Secretary
Congressional and Intergovernmental
Affairs

Enclosures

cc: The Honorable Bobby L. Rush, Ranking Member

Printed with soy ink on recycled paper

QUESTION FROM COMMITTEE CHAIRMAN FRED UPTON AND SUBCOMMITTEE CHAIRMAN ED WHITFIELD

Carbon Capture and Sequestration

The Environmental Protection Agency has issued greenhouse gas permitting guidance for large industrial facilities. The guidance addresses how to determine the "Best Available Control Technology" (BACT) for controlling carbon dioxide emissions at those facilities.

a. The Guidance requires permit applications to consider Carbon Capture and Storage (CCS) as a potential add-on pollution control technology for large fossil fuel-fired power plants and industrial facilities. In the guidance, EPA requires permit applicants to consider CCS as an "available" technology and then explain why it cannot be used at a specific project.

Q1ai. Is CCS technology currently available for power plants or large industrial facilities?

A1ai. Yes. CCS technology is currently available for power plants and large industrial facilities, but widespread deployment on a commercial scale is not presently cost-effective and reliability/interoperability issues need to be addressed. The Office of Fossil Energy's Research, Development, and Demonstration (RD&D) Program is addressing these issues.

QUESTION FROM COMMITTEE CHAIRMAN FRED UPTON AND

SUBCOMMITTEE CHAIRMAN ED WHITFIELD

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Q1aii. For large power plants or industrial facilities, CCS operations would involve compression, transportation, injection, and a storage site for storing the carbon dioxide emissions. What are the key factors that would need to be considered in deploying CCS for such large projects?

A1aii. The key factors that need to be considered in deploying CCS technology for large-scale projects are:

- Permitting for geologic storage of carbon dioxide;
- Determining long-term liability for the stored carbon dioxide;
- Financing;
- Ensuring adequate storage capacity and containment near the project site;
- Deploying an adequate measuring, monitoring and verification (MVA) program; and
- Educating the public and stakeholders.

QUESTION FROM COMMITTEE CHAIRMAN FRED UPTON AND

SUBCOMMITTEE CHAIRMAN ED WHITFIELD

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Q1aiii. How long do you estimate it will be before CCS technologies would be commercially and economically available for power plants or large industrial facilities? Do you know?

A1aiii. The President's Interagency Task Force on Carbon Capture and Storage proposed a comprehensive and coordinated strategy to overcome the barriers to widespread, cost-effective deployment of carbon capture and storage within the next 10 years.

QUESTION FROM COMMITTEE CHAIRMAN FRED UPTON AND SUBCOMMITTEE CHAIRMAN ED WHITFIELD

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Q1aiv. Is DOE working with EPA on developing a regulatory and legal framework for carbon capture and sequestration technologies? How many years before such a regulatory and legal framework will be established?

A1aiv. Yes. DOE has coordinated with EPA on the Underground Injection Control (UIC) Class VI well-permitting program, which regulates CO_2 well construction, operation, closure, and post closure; the Greenhouse Gas (GHG) Mandatory Reporting Rule (MRR) Subparts RR & UU, which establish programs for quantifying CO_2 that remains in the subsurface; and the GHG BACT guidance. The UIC and MRR rules were finalized in late 2010, and the GHG BACT guidance was finalized in March of 2011. DOE is actively participating in the ongoing Resource Conservation and Recovery Act (RCRA) hazardous waste applicability rule, which is currently at the early stages of the regulatory process. DOE will also provide input into the GHG New Source Performance Standards as it moves through the interagency process to proposal, and ultimately to promulgation. In addition to the regulatory work highlighted above, DOE is collaborating with EPA, along with DOI, DOJ, and Treasury, on additional recommendations for long-term liability associated with CO_2 injection as

discussed in the Report of the Interagency Task Force on Carbon Capture and Storage, released in August of 2010.

QUESTION FROM COMMITTEE CHAIRMAN FRED UPTON AND SUBCOMMITTEE CHAIRMAN ED WHITFIELD

Section 1222 of the Energy Policy Act of 2005

Q2. Section 1222 of the Energy Policy Act of 2005 would allow the Department of Energy's Power Marketing Administration to partner with the private sector to develop new or upgrade existing transmission facilities. These partnerships would be no cost to the federal government and are intended to support development of renewable energy resources. Please state whether there are any applications that have been made under Section 1222, and if so how long they have been pending and when DOE plans to act on those applications.

A2. On June 10, 2010, the DOE, acting through the Southwestern Power Administration (Southwestern) and the Western Area Power Administration, both power marketing administrations (PMAs) within DOE, published a *Federal Register* Notice seeking project proposals from entities interested in providing contributed funds under section 1222 for the upgrade of existing transmission facilities owned by either PMA, or for the construction of new transmission lines in the states in which either PMA operates. In July of 2010, Clean Line Energy Partners (Clean Line) responded with a proposal to provide Southwestern with contributed funds for purposes of developing, constructing and operating 800 miles of double circuit 500 kV direct current transmission line from western Oklahoma and Texas to the southeastern United States. Subsequently, on September 20, 2010, Clean Line submitted an additional proposal to provide contributed funds to Southwestern for a project termed the Grain Belt Express Clean Line Project. After extensive review of Clean Line's proposals, DOE decided not to pursue ether project under the Section 1222 framework at this particular time.

QUESTION FROM COMMITTEE CHAIRMAN FRED UPTON AND SUBCOMMITTEE CHAIRMAN ED WHITFIELD

Climate Change

Q3. How much funding in DOE's budget is dedicated to climate change-related research?

A3. DOE's climate change-related research cuts across several accounts and program areas including scientific research aimed at understanding the relationship between energy production and our climate and environment and R&D related to technologies that reduce or mitigate the release of greenhouse gases into the atmosphere.

QUESTION FROM COMMITTEE CHAIRMAN FRED UPTON AND SUBCOMMITTEE CHAIRMAN ED WHITFIELD

Q4. How many FTEs are carrying out climate change-related research?

A4. Given the cross-cutting nature of DOE's climate change-related research, any attempt at providing a concrete number of FTE's would be speculative. DOE can report that climate change research under the U.S. Global Change Research Program is performed by about 750 scientists and other technical staff at universities and national laboratories across the country.

QUESTION FROM SUBCOMMITTEE CHAIRMAN ED WHITFIELD

Q1. With regard to Yucca Mountain and the spent fuel litigation, how much money has been paid in court judgments and/or settlements?

A1. To date, 74 lawsuits have been filed and the Judgment Fund has paid out $1.001 billion for settlements and judgments in the spent fuel litigation.

QUESTION FROM SUBCOMMITTEE CHAIRMAN ED WHITFIELD

Q2. Please provide information on the dollar value of loans, loan guarantees, and/or grants that the Department of Energy has made or may be making for wind and solar projects in the U.S.?

A2. The following information details the spending to date on loans, loan guarantees and grants for solar and wind deployment projects, but does not include any grants or loans we have given for research and development of solar or wind-related technologies or processes.

As of July 25, 2011, the Loan Programs Office (LPO) has closed over $5.4 billion in loan guarantees to six solar and wind projects. In addition, LPO has offered conditional commitments for over $14.3 billion in loan guarantees to another 19 solar and wind projects. The six finalized projects and the 19 projects in conditional commitment are projected to produce over 18.1 million megawatt-hours of clean energy, enough to power over 1.5 million homes each year. The projects are also projected to create over 19,000 jobs.

Over the past ten years, excluding congressionally directed projects, the Wind and Water Power Program in the Office of Energy Efficiency and Renewable Energy (EERE) funded two wind deployment projects, both of which were Fiscal Year (FY) 2009 grants from the American Recovery and Reinvestment Act. The grants were competitively awarded to the University of Minnesota ($8 million) and the Illinois Institute of Technology ($7.9 million), and were used to purchase wind turbines and to establish curricula and research programs using the wind turbines

as test and research platforms. The Wind and Water Program also plans to support an offshore wind demonstration project starting in FY 2011, subject to funding availability.

To date, the Solar Program in EERE has not funded any deployment projects, although it has announced a notice of intent for $50 million in concentrated solar power and concentrated photovoltaic demonstration projects as part of the FY 2011 budget. Funding of these projects remains uncertain due to constraints on new starts under the FY 2011 Continuing Resolution.

QUESTIONS FROM REPRESENTATIVE STEVE SCALISE

Q1-2 Can you supply for us the Department's latest estimate of technically recoverable oil in the U.S.? What percentage of the world's reserves does this constitute?

A1-2 [This answer was prepared by the Energy Information Administration (EIA).] EIA's current estimate of remaining technically recoverable resources (TRR) for crude oil and condensate in the United States is 216 billion barrels as of January 1, 2010 (22.3 billion barrels of which is proved reserves). This estimate includes the latest available assessment of undiscovered on shore resources by the Unites States Geological Survey (USGS) and offshore resources by the U.S. Bureau of Ocean Energy Management Regulation and enforcement (BOEMRE), with adjustments made by EIA to account for (1) the timing of discoveries, reserve growth and production in the years between the date of the latest available assessments and January 1, 2010; (2) additional shale oil resources in areas beyond the Bakken that have not been recently reassessed by the USGS; (3) additional resources recoverable through advances in enhanced oil recovery techniques, and (4) the exclusion of resources in areas where drilling is officially prohibited (primarily the Arctic national Wildlife Refuge). EIA's current 216 billion barrel estimate of remaining TRR updates the estimate developed for the *Annual Energy Outlook 2011* by including USGS's 9.7 billion barrel downgrade to the National Petroleum Reserve – Alaska (NPRA) TRR estimate which was released in late 2010.

The National Petroleum Council's (NPC) 2007 report, *Facing the Hard Truths About Energy*, used the USGS *2000 World Petroleum Assessment* mean estimate of total world TRR for crude oil and natural gas liquids for the world of 3,345 billion barrels. The NPC report also estimated there are 1,555 billion barrels of TRR extra-heavy crude oil and bitumen (e.g. Canadian oil sands). Cumulative world production of oil, natural gas liquids, and bitumen over the last 150 years has been roughly 1,100 billion barrels. The implied estimate for remaining TRR, defined as total TRR less cumulative production, is 3,800 billion barrels. This implies that the U.S. share of remaining world TRR is 6 percent (Table 1).

Table 1: Proved crude oil reserves and remaining technically recoverable resources for crude oil, natural gas liquids, extra heavy oil, and bitumen (billion barrels)

	U.S.	Total World	U.S. share of World
Proved crude oil reserves (as of 12/31/2009)	22	1,357	2 %
Remaining technically recoverable resources	216	~3,800 *	6 %

* Source: National Petroleum Council's 2007 report *Facing the Hard Truths About Energy* page 97.

QUESTION FROM REPRESENTATIVE BRIAN BILBRAY

Dr. Chu: The EPA is currently drafting a rule that affects water intake for power plants (the so-called "316(b) Rule"), which will affect 444 US power plants – one-third of US power generation. Power plants in my state are concerned that EPA would force them to retrofit their existing plants with closed cycle cooling systems (i.e. cooling towers) in order to reduce alleged impacts on fish. California power plants have already undergone decades and tens-of-millions-of-dollars worth of studies and face a stringent state policy of their own. Cooling towers would cost over $3 billion at San Onofre Nuclear Generating Station. They would reduce efficiency, and shift generation to higher-emission fuels. That means more pollution, less reliability and higher costs to consumers.

Q1. In inter-agency review with EPA, how did DOE consider the cost-benefit ratio, air quality impacts and power price impacts of a regulation like this?

A1. The 316(b) Rule, as currently proposed, includes guidelines for cooling water intake structure modifications to prevent the impingement of organisms against intake screens. These measures, which could include modified intake screens or a reduction of intake water velocity, are not expected to impact the net efficiency of the plant, nor are they expected to be prohibitively expensive.

Entrainment controls are proposed to be decided on a site-by-site basis, as opposed to a national technology standard. EPA's guidelines state that permitters must take into account various site-specific factors, including space requirements, localized air quality and energy impacts, and the remaining useful life of the plant to determine the applicability of any control technology. For further details on this proposed rule, you may wish to contact the responsible Agency.

QUESTION FROM REPRESENTATIVE DAVID B. MCKINLEY

Q1. Please provide total employment for the Department of Energy's National Energy Technology Laboratories (NETL).

A1. As of March 2011, there are a total of 1,793 employees at NETL.

QUESTION FROM REPRESENTATIVE DAVID B. MCKINLEY

Q2. Please provide reinvestment into the local economies that the NETL lab in Morgantown provides, and the jobs that have been created.

A2. Based on the recent NETL economic impact study for FY 2009, the NETL total employment multiplier for West Virginia is approximately 19 Full Time Equivalent Employees/million dollars.[1,2] This multiplier reflects the estimated direct, indirect, and induced employment impacts in West Virginia due to NETL funding from all laboratory sites. The single-year FY 2009 expenditures by NETL in West Virginia yielded an estimated $282 million in industry output, $89 million in employee compensation, and $41 million in other value added for the state. The expenditures within the state have additional non-estimated impacts on employment, output, and value added throughout the United States due to the state's profile of economic leakages. It is these leakages (e.g., purchases of goods and services by West Virginia entities from out-of-state entities) that are accounted for in the larger national-level multiplier discussed as part of the response to question 6a.

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[1] "National and State Economic Impacts of NETL West Virginia," February 2011, http://www.netl.doe.gov/energy-analyses/pubs/2009ImpactsWV.pdf.
[2] "NETL 2009 Economic Impacts Methodology Report," February 23, 2011, http://www.netl.doe.gov/energy-analyses/pubs/2009ImpactsMethod.pdf.

QUESTION FROM REPRESENTATIVE DAVID B. MCKINLEY

Q3. Since the NETL was created, how much money has been allocated to the NETL in Morgantown?

A3. The National Energy Technology Laboratory (NETL) was created by the Secretary of Energy in 1999. Prior to that, NETL was known as the Federal Energy Technology Center (FETC), which was created in 1996 through the unification of the Morgantown Energy Technology Center (METC) and the Pittsburgh Energy Technology Center (PETC). NETL expanded with the addition of the National Petroleum Technology Office (Tulsa, Oklahoma) in 2000; the Arctic Energy Office (Fairbanks, Alaska) in 2001; and the Albany Research Center (Albany, Oregon) in 2005. As a unified National Laboratory, NETL's budget is not allocated by site. The majority of NETL's funding is through the Office of Fossil Energy, with additional funds provided to NETL's Project Management Center from DOE's Office of Energy Efficiency and Renewable Energy and the Office of Electricity Delivery and Energy Reliability. Since 1999, NETL's cumulative funding has administered $13.4 billion, which does not include funding under the American Recovery and Reinvestment Act of 2009 (ARRA). Fiscal year funding has fluctuated from $449.2 million in FY 2000 to $1.9 billion in FY 2010. An additional $15.4 billion [$8.3 billion in FY 2009 and $7.1 billion in FY 2010] was allocated to NETL under ARRA. Of the $15.4 billion, $3.4 billion was Fossil Energy, $11 billion was Energy Efficiency and Renewable Energy, and $1 billion was Electricity Delivery and Energy Reliability.

QUESTION FROM REPRESENTATIVE DAVID B. MCKINLEY

You stated on page 9 of your testimony that "the world will continue to rely on coal-fired electrical generation to meet energy demand"; however many of the EPA's regulations contradict what your Agency is trying to do. EPA Administrator Jackson has gone on record stating that her agency isn't responsible for taking into consideration jobs and the economy; however the President Executive Order No. 13563 stated that benefits and cost must be taken into consideration for all regulations in a qualitative and quantitative manner.

Q4a. Are you concerned with any of the EPA's proposed rules affecting the coal sector?

A4a. The Department of Energy provides the technical review of many EPA regulations through the Interagency Review process before they are formally proposed. During the review, DOE and EPA work together to ensure that the resulting rule is both technically achievable and environmentally sound. In many cases, technology developed through DOE research has allowed both of these objectives to be met. Flue Gas Desulphurization (FGD) for Sulfur removal and Activated Carbon Injection (ACI) technologies were both developed with strong support from the National Labs, and the resulting EPA regulations were strongly supported with operational and performance data from these tests. In many of the upcoming regulations, DOE has been involved in the review process, and has commented on the technical implementation of these rules.

QUESTION FROM REPRESENTATIVE DAVID B. MCKINLEY

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Q4b. Do any of the regulations proposed by the EPA disrupt your Agency's role in advancing fossil energy research and development?

A4b. One of the largest concerns in the coal power industry today is the uncertainty over the future regulation of CO_2 emissions. Whether CO_2 is regulated under the Clean Air Act or through legislative means, there will likely be cases where older, less utilized plants will be required to retire and new technologies will be needed. These include plants that might be retired due to more stringent environmental regulations under consideration (e.g. ones impacting criteria pollutants) that will adversely impact the economics of many existing coal plants. There is promise in deploying carbon capture and storage (CCS) technologies to retrofit existing coal plants; however, in the current form, CCS is too expensive. Research being conducted by DOE, which will lower the capital cost and parasitic energy requirements, will enable this technology to be implanted for retrofit applications, and give certainty for future coal power projects that may choose to utilize CCS.

Furthermore, DOE has been working closely with EPA to define regulations surrounding the geologic storage of CO_2. Through the Underground Injection Control program, EPA has developed regulations specific to the injection of CO_2

for storage purposes. EPA has laid the groundwork to allow CCS to be implemented, and DOE will continue to work with EPA to review the technical aspects of future regulations that may affect the coal power industry.

QUESTION FROM REPRESENTATIVE DAVID B. MCKINLEY

Under your Agency's FY12 budget proposal for fossil energy R&D for coal, funding is decreased from $404 million under FY10, the last year a budget was enacted into law, to $291.3 million. This represents a decrease of 30 percent. As you are aware, President Obama called for an increase in R&D funding in his State of the Union Address.

Q5a. Please provide a detailed explanation and justification on why R&D funding for coal is decreased by over $112 million.

A5a. The Fossil Energy (FE) FY 2012 Budget Request upholds 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). FE's budget request takes into consideration the need for budget restraint, forcing us to make tough choices across all DOE research and development (R&D) program areas. So 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 time frame needed for deployment. In addition, the Recovery Act provided funding for front-end investments in carbon capture and storage RD&D ($3.4B from Recovery Act Funds).

QUESTION FROM REPRESENTATIVE DAVID B. MCKINLEY

The overall budget for the NETL was reduced by nearly $800 million from enacted FY10 levels of $2.178 billion to the FY12 Presidential request of $1.415 billion.

Q6a. Please provide qualitative and quantitative analysis on the impacts this funding decrease represents in terms of economic productivity, economic growth, employment, job creation, and international economic competitiveness.

A6a. Based on the recent NETL economic impact study for FY 2009, the NETL total employment multiplier is approximately 21 Full-Time Equivalent (FTE)/million dollars.[3,4] This multiplier reflects the estimated direct, indirect, and induced employment impacts across the United States, due to NETL funding from all laboratory sites. Presuming that the budget reduction from FY 2010 Enacted levels to the President's FY 2012 request was distributed across NETL programs in a manner that is consistent with the FY 2009 expenditure pattern, the planned FY 2012 budget reduction could yield a decline in supported employment of 15,500 FTE job-years. However, these numbers would not reflect the impact of prior year investments, particularly through the Recovery Act, and many of the issues raised in the question would require speculative analysis.

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[3] "National and State Economic Impacts of NETL United States," February 2011, http://www.netl.doe.gov/energy-analyses/pubs/2009ImpactsUS.pdf.
[4] "NETL 2009 Economic Impacts Methodology Report," February 23, 2011, http://www.netl.doe.gov/energy-analyses/pubs/2009ImpactsMethod.pdf.

QUESTION FROM REPRESENTATIVE DAVID B. MCKINLEY

The overall budget for the NETL was reduced by nearly $800 million from enacted FY10 levels of $2.178 billion to the FY12 Presidential request of $1.415 billion.

Q6b. Please provide the total number of graduate research positions affected by this decrease and what specific universities will be affected.

A6b. The NETL FE R&D budget was reduced by $220 million from the FY10 level of $642 million to the FY12 Presidential request of $422 million. A total of 26 Graduate Students and 5 Post Docs will be affected by the reduced funding. The affected universities include Carnegie Mellon University, University of Pittsburgh, West Virginia University, and Penn State University.

QUESTION FROM REPRESENTATIVE DAVID B. MCKINLEY

Under the President's FY12 proposal for termination of the Unconventional Fossil Energy Technologies Program, a new $7 million, one-of-a-kind test facility at Morgantown will be forced to close. This facility is studying drill bit-rock interactions in the high-pressure, high-temperature environmental typical of unconventional fossil energy resources. These studies provide an understanding of the best practices – leading to a safer and environmentally friendly access to these unconventional resources.

Q7a. Please provide justification for the termination of the program.

A7a. To foster the clean energy economy of the future and reduce our reliance on fossil fuels that contribute to climate change, the Administration proposes to repeal provisions in the 2005 Energy Policy Act for the mandatory oil and gas research and development (R&D) program that promotes fossil fuel production. In addition, these R&D activities have historically developed technologies that are more appropriate for the private-sector oil and gas industry to fund.

QUESTION FROM REPRESENTATIVE DAVID B. MCKINLEY

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Q7b. Also, please provide the number of graduate student research positions closed and the universities affected.

A7b. Based on 2010 funding levels, the number of students affected by the closing of the drilling test facility is:

West Virginia University	2 students
University of Pittsburgh	3 students
Carnegie Mellon University	5 students

QUESTION FROM REPRESENTATIVE DAVID B. MCKINLEY

Q8. Please provide the total number of jobs being affected by the decision by the Office of Energy Efficiency and Renewable Energy (EERE) to realign programmatic oversight. It is my understanding that the EERE is proposing shifting jobs from NETL to DC and/or Golden, Colorado.

A8. As Recovery Act workload has passed its peak and workload is leveling off, the reduction at NETL will be approximately 55 positions. Concurrent with these reductions, DOE headquarters (HQ) will assume greater responsibilities, including HQ staff assuming project management duties.

QUESTION FROM REPRESENTATIVE DAVID B. MCKINLEY

It is also my understanding that funding for the NETL's Oil and Gas programs are in severe jeopardy. As you know, the NETL is increasing its efforts for risk assessment relating to hydraulic fracturing. NETL is working with Range Resources in Washington County, PA to look at the water quality with funding from the oil and gas programs.

Q9a. Will the DOE allow funding to be continued so that the NETL will continue their risk assessment?

A9a. The President's 2012 Budget does not support R&D at the Department of Energy in oil and gas exploration and production. With funding received in FY 2010 and FY 2011, the Department is working with Range Resources to address the environmental challenges, particularly air, soil gas, and produced water, associated with the Marcellus Shale gas development.

QUESTION FROM REPRESENTATIVE DAVID B. MCKINLEY

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Q9b. With the increase in production, hydraulic fracturing, and employment due to Marcellus Shale Developments, what additional funding and employment will you offer to the NETL?

A9b. The President's 2012 Budget does not support R&D at the Department of Energy in oil and gas exploration and production. With funding received in FY 2010 and FY 2011, the Department is addressing the environmental challenges, particularly air, soil gas, and produced water, associated with the Marcellus Shale gas development.

QUESTION FROM REPRESENTATIVE DAVID B. MCKINLEY

A chart from the NETL shows the significant impacts of utility-based climate legislation and the transport rule will have on coal-fired power plants: (i) of the 499 small plants, ranging from 10 to 250 megawatts, 369 units will have to be retired; (ii) on mid-level 250-600 mega watt plants, 92 of the 271 units will have to be retired; and (iii) large coal-fired units of 600 megawatts or more, 29 will be forced to retire under these rules.

Q10a. Do you feel America can stand to lose two-thirds of its coal-fired generation by 2020 because of these regulations?

A10a. The retirements depicted on the referenced chart refer to a scenario whereby a price on CO_2 emissions is imposed that rises from $25 per ton (2009 dollars) in 2013 to $77 per ton in 2035. It does not include any specific provisions of proposed climate bills such as offsets, bonus allowances, targeted allowance allocations, or increased efficiency mandates that would alter the timing and magnitude of impact on coal-fired generation. The purpose of this chart was to examine how many units could be affected under a dramatic carbon reduction scenario. With the current cost and energy penalty that would be imposed on a plant with today's CCS options, many plants could retire under such a scenario. This chart should not be taken as a literal view of what would happen under existing regulations, but should be viewed as one potential example of impacts from scenarios calling for similar levels of carbon reductions.

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Q10b. Has DOE studied the economic impacts of such regulations?

A10b. The retirements depicted on the referenced chart refer to a scenario whereby a price on CO_2 emissions is imposed that rises from $25 per ton (2009 dollars) in 2013 to $77 per ton in 2035. It does not include any specific provisions of proposed climate bills such as offsets, bonus allowances, targeted allowance allocations, or increased efficiency mandates that would alter the timing and magnitude of impact on coal-fired generation. The purpose of this chart was to examine how many units could be affected under a dramatic carbon reduction scenario. With the current cost and energy penalty that would be imposed on a plant with today's CCS options, many plants could retire under such a scenario. This chart should not be taken as a literal view of what would happen under existing regulations, but should be viewed as one potential example of impacts from scenarios calling for similar levels of carbon reductions.

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Q10c. Will the DOE work with these coal-fired power plants to comply with these regulations in any way, as you have stated the need for this country's need to rely on coal-fired electrical generation to meet our energy demand?

A10c. The retirements depicted on the referenced chart refer to a scenario whereby a price on CO_2 emissions is imposed that rises from $25 per ton (2009 dollars) in 2013 to $77 per ton in 2035. It does not include any specific provisions of proposed climate bills such as offsets, bonus allowances, targeted allowance allocations, or increased efficiency mandates that would alter the timing and magnitude of impact on coal-fired generation. The purpose of this chart was to examine how many units could be affected under a dramatic carbon reduction scenario. With the current cost and energy penalty that would be imposed on a plant with today's CCS options, many plants could retire under such a scenario. This chart should not be taken as a literal view of what would happen under existing regulations, but should be viewed as one potential example of impacts from scenarios calling for similar levels of carbon reductions.

DOE's Office of Fossil Energy is primarily focused on the research and development of cutting-edge technologies through laboratory, pilot scale, and demonstration scale testing. The development of advanced, more efficient systems and carbon capture and storage (CCS) retrofit technologies for existing

plants would produce lower-cost, higher efficiency systems that could allow a large number of existing plants the option of continued operation under a carbon-constrained scenario.

QUESTION FROM REPRESENTATIVE BOBBY RUSH

Q1. Mr. Secretary, Section 1425 of H.R. 1, the Republican proposed Continuing Resolution plan would rescind $25 billion of the $47 billion in DOE's loan guarantee program under the Title 17 program, which includes funding for renewable energy and energy efficiency projects.

Mr. Secretary, can you speak on the impact of cutting funds for renewable sources of energy under the DOE loan guarantee program? How important is it that we invest in renewable sources of energy?

A1. As a result of the recently-passed 2011 Continuing Resolution (FY11 CR), the program currently has $18.5 billion in loan guarantee authority for nuclear power projects, $1.5 billion in authority for energy efficiency and renewable energy projects, $8 billion for advanced fossil projects, $4 billion for front-end nuclear projects, and $2 billion in mixed authority. In addition, and for the first time, the 1703 program, historically a "self pay" credit subsidy program, now has $170 million in appropriated credit subsidy to support loan guarantees for energy efficiency and renewable energy projects. There were no changes to Recovery Act-supported projects under the 1705 program, which means that DOE will continue to issue loan guarantees under the 1705 program up to its September 30, 2011 sunset date, using the current $2.4 billion in appropriated funds.

Investment in renewable sources of energy is very important. Not only does it have long-term strategic benefits such as global competitiveness and domestic energy security, it also has enormous implications for our ongoing economic recovery and the environment. Cutting funds for renewable sources of energy under the DOE's loan programs would greatly hinder progress towards our

nation's clean energy goals, which require the deployment of innovative technologies. The DOE loan programs are an important element of federal policy to facilitate that deployment and were designed to address the "valley-of-death" in the clean energy technology development cycle, between the pilot-facility stage and commercial maturity, where companies find it difficult to obtain the financing needed to deploy their technologies at commercial scale – the very point at which they begin to have a meaningful impact on jobs and the environment.

QUESTION FROM REPRESENTATIVE BOBBY RUSH

Q2. Mr. Secretary, we know that in 2009 China increased its investment in renewable energy technologies by 50% and in 2010, China committed to investing $740 billion over the next ten years in renewable energy programs making it the world's leader in this field, surpassing the U.S. for the first time.

Can you expound a little on the significance in the disparity in funding for renewable energy projects in the U.S. as compared to what China is doing and why this is important? Will this be the Congress that gives our technological advantage away to the Chinese?

A2. The gap between China and U.S. investments in clean energy is widening. Over the past five years, China's clean energy investment grew by 88 percent, while the United States' investment grew by 61 percent, according to analysis conducted by Bloomberg New Energy Finance.[i] China invested $39.1 billion in clean energy in 2009, while the United States invested $22.5 billion. Then in 2010, China increased their investment to $54.6 billion compared to $34.0 billion by the United States.[ii] These figures do not articulate the difference between private and public funding, but instead represent the sum of projects and investments according to transaction type, sector and geography.

Although both countries recognize the benefits of clean energy investments, China is, at least by some reports, intent on establishing a stronger competitive position in the clean energy economy than the United States. China has become the world's dominant producer of solar photovoltaics, originally an American invention, accounting for 40 to 50 percent of the world's market share, and has been the fastest growing market for wind energy installations over the past several years (although the quality of their wind turbines still trails those of the U.S.'s,

operating at a lower capacity factor) . Since 2008, China's output in clean energy technologies has risen by 77 percent a year compared to 28 percent a year for the United States, making China the second-largest producer of clean energy technologies as a percentage of national GDP (just behind Denmark), compared to 17th position of the United States.[iii]

China's quest for clean energy is not only driven by investment, but is also enhanced by its domestic policy decisions to create a domestic clean energy market. China has set a national goal to achieve 15% of its total energy mix from non-fossil (renewable and nuclear) sources by 2020. To support that goal, the government has put in place a range of incentives and mandates, such a national renewable energy standard, a carbon reduction target, clean energy tax incentives, green bonds, and feed-in tariffs for wind.

Like China, the United States has a range of clean energy incentives. But the United States lacks a similar level of market-pull policies such as a national renewable energy standard or carbon reduction target. We also lack certain incentive tools such as green bonds or feed-in tariffs. Instead the U.S. policy focus is on advancing a portfolio of clean energy technologies toward cost-competitiveness with fossil-fuel based technologies, with markets outcomes encouraged at the state level through state renewable energy standards.

[i] Pew Charitable Trusts, "Who's Winning the Clean Energy Race? G-20 Investment Powering Forward (2010 Edition)", 2011, available at http://www.pewenvironment.org/uploadedFiles/PEG/Publications/Report/G-20Report-LOWRes-FINAL.pdf.

[ii] Ibid.
[iii] Associated Press, "US ranks 17 as clean tech producer, China is No. 2," May 8, 2011, available at http://www.physorg.com/news/2011-05-tech-china.html

QUESTION FROM REPRESENTATIVE BOBBY RUSH

Q3. Secretary Chu, another program that I have been a very strong supporter of is the Weatherization Assistance Program, which helps low income families pay their energy bills. Under H.R. 1, all funding for weatherization assistance would be eliminated and DOE expects at least 8,000 people employed in this sector to lose their jobs by July 1. The number of homes weatherized with DOE's non-Recovery Act funds during the remainder of the fiscal year would drop from 31,000 to zero.

Can you explain how this funding cut would affect low income families?

A3. If the Weatherization Assistance Program (WAP) does not receive adequate funding in FY 2012, the Program would be unable to continue providing funds or assistance to any of the grantees in its national network. WAP has 59 primary grantees (50 states, 5 U.S. territories, 3 Native American tribes, and the District of Columbia) and a network of 1,007 subgrantees that employ many thousands of people who provide weatherization services in the homes of low-income families.

Every home weatherized realizes an average annual savings of $435 on their energy bills. These savings occur for 10 to 15 years beyond the installation due to the retrofit techniques employed (shell air infiltration reduction, attic and sidewall insulation, repair and replacement of mechanical systems, installing electric base load measure, etc.). Insufficient WAP funding would mean thousands of families that would have received weatherization services would be denied these savings.

At the 2011 funding level of $171 million, the network will weatherize approximately 27,000 homes. In the transition from American Recovery and

Reinvestment Act (Recovery Act) funding levels to traditional WAP funding the Department expects to lose about 10% of the 107 subgrantees and several thousands of jobs between July 2011 and March 2012.

The funding level of $30 million in formula funds proposed for FY 2012 by the House Energy and Water Appropriations Subcommittee would allow fewer than 5,000 families to receive weatherization services throughout the country. For the 55 of 59 grantees with 2012 production of less than 300 units, it is unlikely WAP could reasonably and cost effectively operate any type of service delivery network - resulting in the closing of 900 or more local programs and further job losses. In addition, the 40 existing weatherization training centers and a national workforce accreditation and certification program would be lost.

The cost to low-income families would be further compounded due to the leveraged activities that likely would also be terminated. For the past five years, WAP has leveraged about $2 for every dollar appropriated by Congress. Other public and private sector partners include utility companies, the Low-Income Home Energy Assistance Program, state funds, landlord contributions, Housing and Urban Development and others. These funds provide WAP with the ability to more than double the number of homes weatherized. However, without the core DOE investment in weatherization, the national infrastructure we've help to support would no longer be available to serve as a catalyst for the leveraged

investments that have resulted in 20,000 or more low-income families receiving WAP services each year.

QUESTION FROM REPRESENTATIVE JIM MATHESON

Q1. **Moab Tailings Remediation**
The Department of Energy continues to highlight the exceptional progress being made on the Moab tailings remediation – a truly bright spot on DOE's environmental cleanup program. So far, it is ahead of schedule and on budget, (in stark contrast to many other DOE sites). To date over 3 million of the 16 million tons of tailings have been moved, though there is still a long road ahead if cleanup is to complete by its statutory deadline of 2019, as required by the FY08 National Defense Authorization Act. As you know, the longer the pile remains in its current location, the longer the risk of contamination remains.

a. Is the DOE operating under a timeline for completion by the statutory deadline of 2019, keeping a promise to the people of Moab Utah, and to protecting the 25 million downstream water users?
b. If not, why not?
c. As DOE looks ahead to this looming deadline, can you share with me the Department's plan, including preliminary budget requests for future fiscal years, to would ensure this project completed by 2019?

A1. As noted in DOE's response to your May 5, 2011 letter, the Office of Environmental Management (EM) continues to pursue its cleanup objectives within the overall framework of achieving the greatest risk reduction benefit per radioactive content (wastes that contain the highest concentrations of radionuclides) overlaying regulatory compliance commitments and best business practices to maximize cleanup progress. The American Recovery and Reinvestment Act (Recovery Act) funding allowed EM to improve the efficiency of its operations at the Moab site by approximately 23 percent. These more efficient operations will result in the removal and disposition of 2.6 million tons of tailings by June 30, 2011, rather than the two million tons originally anticipated with the Recovery Act funding. EM will continue to look for ways to be more efficient and use available funds to shorten the duration of the project. Should DOE determine the 2019 deadline cannot be met, the Department will submit a

revised plan to Congress with the projected completion date and the estimated funding, as provided in the National Defense Authorization Act for Fiscal Year 2008 (Public Law 110-181).

QUESTION FROM REPRESENTATIVE JIM MATHESON

Q2. **Moab Tailings Remediation**
I understand DOE must put the contract for Moab Tailings remediation out for a new bid this year. Can you update me on the status of the new contract? Do you expect any delays in cleanup because of the new contract?

A2. DOE plans to award a new contract before the current contract expires on December 30, 2011. Proposals are currently being reviewed in preparation for this award. The new contract that DOE plans to award is an Indefinite Delivery/Indefinite Quantity (IDIQ) contract (used nationwide), and has an anticipated contract performance period of November 2, 2011, through September 30, 2016. This contract period includes a 60-day transition period (i.e., assumption of responsibility January 1, 2012). DOE does not anticipate there will be any impact to work as a result.

QUESTION FROM REPRESENTATIVE JIM MATHESON

Q3. I am pleased that the President's budget continues to provide no funding for storage of nuclear waste at Yucca Mountain. However, we know that we must address the long-term storage of nuclear waste in a comprehensive and forward looking approach. The Blue Ribbon Commission on America's Nuclear Future has been tasked with analyzing this issue. Can you comment on the status of the Commission's reports on this issue, and what option you think are best for where a long term repository would be?

A3. The Blue Ribbon Commission on America's Nuclear Future (the Commission) is in the process of preparing their draft report which is due no later than July 29, 2011. In support of that effort, with the Department's approval, the Commission established three subcommittees to review specific portions of the nuclear fuel cycle. These subcommittees are: Reactor and Fuel Cycle Technology, Transportation and Storage, and Disposal. The subcommittees are finalizing their separate subcommittee reports. These subcommittee reports will form a basis for the Commission's draft report.

The final report is due in January 2012.

QUESTIONS FOR THE RECORD

FOR THE NUCLEAR REGULATORY COMMISSION

HOUSE COMMITTEE ON ENERGY AND COMMERCE

SUBCOMMITTEE ON ENERGY AND POWER,

AND SUBCOMMITTEE ON ENVIRONMENT AND THE ECONOMY

Hearing on FY12 Department of Energy and Nuclear Regulatory Commission Budgets

March 16, 2011

Responses to Questions from the Honorable Bobby Rush

QUESTION 1. **What are the qualifications for becoming an NRC inspector and approximately how many qualified inspectors are there currently in the U.S.?**

ANSWER.

There are more than 400 NRC reactor inspectors in the United States. Inspectors have either an engineering or science college degree, extensive professional engineering or technical experience, or both. Each qualified NRC inspector is certified by the regional administrator or office director, the basis of which is a recommendation by the inspector qualification board. Full inspector qualification also indicates that the individual has completed the full complement of required training in NRC's qualification program outlined in Appendices to Inspection Manual Chapter 1245, "Qualification Program for Operating Reactor Programs." In general, each inspector takes about two years to complete required training and pass the final qualification board. A typical training program for a reactor inspector would include about 600 hours of training courses, 430 hours of independent study activities, and 400 hours of on-the-job training. In addition to reactor inspectors, the NRC has inspectors that oversee safety and security associated with nuclear materials and waste.

Achieving full inspector qualification allows an individual to independently perform the full scope of inspection related activities, with routine oversight and supervision from NRC management.

QUESTION 2. **What are the protocols for deploying Resident Inspectors? Where and how are they assigned geographically and logistically?**

ANSWER.

There are a minimum of two resident inspectors (RIs) assigned to each operating reactor site in the United States. RIs live near the reactor sites to which they have been assigned. They are expected to provide daily NRC oversight of these facilities, as well as act as the first NRC responders to any events at the facility. The NRC's RIs are an extremely dedicated corps of inspectors and take no direction from licensees. The NRC also assigns RIs to new reactor construction sites and selected nuclear fuel cycle facilities.

Each regional office selects RIs for assignment to each of the sites for which the region provides regulatory oversight. The maximum tour length for a RI is seven years at the same site, although some transfer from their site before the end of the seven year period. The NRC also has measures to assess the continued objectivity of inspectors in the field.

QUESTION 3. **What are the protocols for deploying Regional Inspectors? Where and how are they assigned geographically and logistically?**

ANSWER.

Regional inspectors are employed in each of the NRC regional offices: Region I in King of Prussia, Pennsylvania; Region II in Atlanta, Georgia; Region III in Lisle, Illinois; and Region IV in Arlington, Texas. They perform baseline inspections at each reactor site overseen by the regional office. Most inspections carried out by regional inspectors are announced and scheduled 18 months in advance, which enables the licensee to support the inspections with needed documentation and personnel. In addition, advance planning ensures the plant conditions are appropriate for the area to be inspected (ie, performing inspections during refueling outages of areas that are accessible only when the reactor is shutdown). In response to events, the NRC also deploys regional inspectors as needed to assess conditions, with little or no advance notice to the licensee.

Regional inspectors are specialists in areas such as radiation protection, emergency preparedness, security, design engineering, and fire protection, who perform inspections requiring their expertise.

QUESTION 4. **What is the rationale for deploying Resident Inspectors at facilities geographically and logistically?**

ANSWER.

Assigning inspectors to work onsite at nuclear power plants was initiated as a trial program in 1974. Prior to this, all NRC inspectors were stationed in regional offices. Chief criticisms of regional office-based inspectors were: (1) there were too few NRC inspections; (2) inspectors spent only about 25 percent of their total available time at licensed facilities; and (3) when onsite, inspectors spent too much time reviewing paperwork rather than observing actual work or other licensee activities.

Evaluation of the trial program concluded that the resident inspector (RIs) program provided more efficient and effective use of an inspector=s time and better enabled the NRC to assure the safety of licensee facilities. The RI program was initiated in 1978, and was intended to improve the existing region-based inspection program by:

(1) Increasing NRC knowledge of conditions at a licensed facility and providing a better technical basis for regulatory action.

(2) Improving NRC incident response.

(3) Improving the inspector=s ability to independently verify licensee performance, and providing assurance that licensee management control systems are effective.

QUESTION 5. **What is the rationale for deploying Regional Inspectors at facilities geographically and logistically?**

ANSWER.

Regional inspectors are assigned to their respective regional offices, and, unless engaged in an inspection activity, they are not normally deployed to the sites. Having inspectors assigned to the NRC's Regional Offices as opposed to Headquarters decreases the travel time for performing inspection activities and provides for better oversight of facilities.

Please see the answer to QUESTION 3 for a full discussion of Regional Inspectors.

QUESTION 6. **What are the term limits for both Resident Inspectors and Regional Inspectors?**

ANSWER.

Resident Inspectors are expected to rotate from their site assignment after seven years. Normally, they are not reassigned for the first four years of their assignment to allow them to become familiar with the facility, plant operations, and the community. They do not normally return to a previously assigned facility.

Regional inspectors are dedicated to all sites in a specific region. There are no term limits applied to Regional Inspectors.

QUESTION 7. **How do Resident Inspectors receive data for the plants [where] they are assigned? Is this data collected independently or obtained from facility managers?**

ANSWER.

A Resident Inspector (RI) has unfettered access to the site. Thus, the RI is able to obtain data from the plant's instrumentation at the same time as the plant's licensed operators. In addition, the RI has access to documentation such as operator logs, engineering evaluations, plant procedures, and maintenance reports. The RIs make independent evaluations of the data to determine whether any regulatory concerns require follow-up. RIs also obtain data from facility managers as required to conduct baseline inspections. Licensees often notify RIs of events or conditions in anticipation of the inspector's interest in the issue. RIs collect information for use by risk analysts in evaluating the risk significance of the event and whether a response beyond the baseline program is warranted.

QUESTION 8. **Does the NRC have independent sensors or monitoring equipment at each nuclear facility?**

ANSWER.

No. However, during a declared emergency of "Alert" or higher, the NRC requires each power reactor licensee to electronically transmit certain plant parameters collected by the plant process computer to NRC Headquarters. This is referred to as the Emergency Response Data System (ERDS). While the exact parameters transmitted to the NRC are specific to each nuclear power reactor unit, they include parameters selected to provide the NRC with an ability to independently determine the status of the reactor and containment, as well as measure radiation levels within certain parts of the facility. Meteorological information is also transmitted so that the NRC can independently assess the potential offsite consequences of a radiological release from the facility.

QUESTION 9. **If an emergency takes place at a facility, does the NRC have the authority to intervene independently or must it wait for permission from facility managers?**

ANSWER.

If an emergency takes place at an NRC licensed facility, the NRC has full authority to take whatever action is necessary to protect public health and safety, and can demand immediate licensee actions, up to and including a plant shutdown.

QUESTION 10. **Does the NRC require each nuclear reactor at each facility to have emergency backup power generators both underground and also off-site?**

ANSWER.

NRC regulations (10 CFR Part 50, Appendix A, General Design Criterion 17) require U.S. plants to have 2 independent power supplies (an onsite electric power system and an offsite electric power system). For the onsite electric power system, all plants, except one (i.e., Oconee), have emergency diesel power generators and battery backup systems. Most of the U.S. plants with emergency diesel power generators have two per unit and those that have only one dedicated diesel power generator have a swing diesel power generator available. The regulations require that the onsite electric power sources be protected from natural phenomena and hazards, but do not require them to be underground.

The NRC also has requirements (10 CFR Part 50.63) in place requiring plants to have additional means to power essential equipment on-site. U.S. nuclear power plants are required to conduct a "coping" assessment and develop a strategy to demonstrate to the NRC that they could maintain the plant in a safe condition during a scenario in which the plant has lost all offsite and onsite AC power sources (i.e., station blackout). Several plants added additional AC power sources to comply with this regulation.

QUESTION 11. **Does the NRC require each nuclear reactor at each facility to have hardened vents installed in the containment areas?**

ANSWER.

In the 1980s, the NRC staff completed a determination of what actions should be taken to reduce the vulnerability of the original Mark I containments to severe accident challenges. This work is documented in NRC's Generic Letter 89-16. The Mark I containment has a light-bulb shaped "drywell" in which the reactor pressure vessel is located; below the drywell, there is a donut or torus-shaped "wetwell" partially filled with water (i.e. the "suppression pool"). There are pipes that connect the drywell to the suppression pool. If there is damage to the reactor pressure vessel or piping connected to it, the drywell will fill with steam and the resulting pressure will force the steam into the suppression pool. The water in the suppression pool will cool and condense the steam, thus reducing the pressure in the containment drywell and wetwell. Even before the installation of the hardened wetwell vents, the NRC staff recognized that under emergency conditions the plant's operators might vent the wetwell to avoid exceeding the maximum containment pressure limits. However, the previous methods of venting used non-pressure retaining pathways, and thus could have made vital areas of the plant inaccessible and potentially unsafe during and after venting. Therefore, the Commission directed the staff to pursue enhancements to the Mark I containments, and in particular to approve installation of a hardened vent for plants that elect to incorporate this improvement. For the remaining plants, the staff was directed to initiate plant-specific backfit analyses for each of the Mark I plants to evaluate the efficacy of requiring the installation of hardened wetwell vents.

Given a scenario of a long-term loss of decay heat removal, the staff found that use of reliable containment venting path and procedures could reduce the chance of a core melt by a factor of

ten, and that the vent would also reduce the likelihood of a core melt accident during other events like a station blackout. Hardened wetwell vents are designed to allow operators to prevent containment failure by controlled reduction of containment pressure during severe accidents. Venting from the wetwell allows for significant reduction in the release of radioactive airborne contamination by the scrubbing action of the suppression pool water. The vent was designed to discharge away from the secondary containment building, better supporting subsequent operator actions there. The vent capability was also designed to allow release of combustible gas (hydrogen resulting from the reactor of fuel cladding with coolant at elevated temperatures) to prevent containment failure.

No NRC orders were issued to require installation of a hard pipe vent, and all modifications made were voluntarily. Licensees were allowed to justify not installing the hard pipe vent based on plant unique configuration and circumstances. All 23 BWR Mark I plants either installed the modification described in the generic letter (22 plants), or justified use of existing plant safety features (one plant). Installation of the vent was designed to improve safety of the plants in the U.S.

Responses to Questions from the Honorable Jim Matheson

QUESTION 1a. **I understand that the NRC is currently updating rulemaking and guidance regarding storage for blended radioactive waste and other "unique" waste streams, like depleted uranium. I have long had concerns about these unique waste streams and whether the Class A storage site in Clive Utah is appropriate to accept these wastes. I am pleased that the State of Utah decided to require a site-specific performance analysis for these types of waste before they are allowed to be stored there, and I hope that the State remains firm in requiring this analysis.**

a. When will NRC have their Branch Technical Guidance on site-specific performance analysis ready?

ANSWER.

On March 18, 2009, the Commission directed the NRC staff to pursue a limited rulemaking to specify a requirement for a site-specific performance analysis and associated technical requirements for unique waste streams including, but not limited to, the disposal of significant quantities of depleted uranium. In a Staff Requirements Memorandum on disposal of blended wastes, dated October 13, 2010, the Commission directed the staff to add large-scale blended wastes to the scope of the unique waste streams rulemaking. The staff has initiated this rulemaking, including the development of associated guidance that will describe how the new site-specific performance analysis can be conducted. The proposed rule is scheduled to be sent to the Commission in October 2011. After Commission approval, the proposed rule will be published for public comment. The final rulemaking is expected to be completed approximately one year after publication of the proposed rule. After its completion, Agreement States will have to adopt compatible rules within three years.

The NRC staff is aware of Utah's efforts to promulgate a site-specific analysis rulemaking and has supported this effort, including participation in a State-sponsored workshop. Because the NRC's site-specific analysis rulemaking will not be completed for more than a year, NRC staff has also issued interim guidance to Agreement States on how to conduct such analyses until the rulemaking is completed. The guidance was sent to States, including Utah, on April 13, 2010, for depleted uranium disposal, and on March 17, 2011, for large-scale blended waste disposal.

The NRC staff also has a related effort underway to update and risk-inform the Branch Technical Position on Concentration Averaging and Encapsulation. This guidance defines how low level waste generators and processors can appropriately average the concentrations of radioactivity in determining the classification of waste. Although this guidance will not specify how site-specific performance analyses are to be conducted, it will affect the characteristics of the waste (for example, how much radioactivity concentration can vary within a shipping container) that would be subject to such analyses. It is due to be completed in mid-2012.

QUESTION 1b. **Given the increase in unique waste streams that were not included in the low-level wastes classification system as defined in Federal code at 10 CFR 61.55, do you believe this classification system should be revised? If so, how long would this process take?**

ANSWER.

In the same March 18, 2009, action the Commission also directed the staff to propose the necessary resources for a comprehensive revision to risk-inform the 10 CFR Part 61 waste classification framework. Among other things, this rulemaking would explicitly address the waste classification of depleted uranium.

In another Staff Requirements Memorandum, dated July 1, 2010, the Commission directed the NRC staff to provide the Commission with the staff's approach to initiate activities related to a risk-informed, performance-based comprehensive revision to Part 61, including the resources and the timeline for completing the rulemaking. One of the options for such a revision is to risk-inform the waste classification framework in 10 CFR Part 61. On December 27, 2010, the NRC staff provided the requested approach in a formal paper to the Commission. This paper identified five options for revising 10 CFR Part 61, including the waste classification system. The staff committed to gather additional information from stakeholders on these approaches and to provide the Commission with a notation-vote paper summarizing their suggestions and recommending an option for Commission consideration. That paper will be submitted near the end of 2012. Because the staff provided a range of options in their paper to the Commission that vary in scope and complexity, it is not possible to provide a schedule for such a rulemaking at this early juncture. The rulemaking, however, would take at least as long as the ongoing

unique waste streams rulemaking addressed in response to question 1(a) (i.e., several years), and potentially longer depending on the option chosen.