

# **ENERGY AND WATER DEVELOPMENT APPROPRIATIONS FOR FISCAL YEAR 2016**

**WEDNESDAY, MARCH 25, 2015**

U.S. SENATE,  
SUBCOMMITTEE OF THE COMMITTEE ON APPROPRIATIONS,  
*Washington, DC.*

The subcommittee met at 2:30 p.m., in room SD-124, Dirksen Senate Office Building, Hon. Lamar Alexander (chairman) presiding.

Present: Senators Alexander, Cochran, Murkowski, Graham, Lankford, Feinstein, Murray, Udall, and Shaheen.

**DEPARTMENT OF ENERGY**

**OFFICE OF THE SECRETARY**

**STATEMENT OF HON. ERNEST J. MONIZ, PH.D., SECRETARY  
ACCOMPANIED BY FRANKLIN ORR, PH.D., UNDER SECRETARY FOR  
SCIENCE AND ENERGY**

**OPENING STATEMENT OF SENATOR LAMAR ALEXANDER**

Senator ALEXANDER. The Subcommittee on Energy and Water Development will please come to order. This afternoon we are having a hearing to review the President's fiscal year 2016 budget request for the Department of Energy. Senator Feinstein and I will each have an opening statement. I will then recognize each senator for up to five minutes for an opening statement, alternating between the majority and the minority. And then we will turn to Secretary Moniz. Secretary Orr is here to answer questions relating to fusion science, not because Secretary Moniz does not know anything about it, but because he does. So under our brilliant rules, we do not get to ask him.

I am going to make one adjustment if it is necessary. Senator Feinstein has an unavoidable conflict at about 3:15, and I want to make sure that, she as well as I get to hear Secretary Moniz's testimony, and that she gets to make her opening statement and to ask her questions. So I may have gotten out of order a little bit with the Senators, and I am sure Senator Murray will be fine with—well, Senator Feinstein has to leave at 3:15, and I wanted to give her a little—I want to make sure she gets the chance to ask her questions before she leaves.

Our witnesses today include Dr. Moniz and Dr. Orr. We are here today to review the President's fiscal year 2016 budget request for the Department of Energy, an Agency with three critical missions:

nuclear security, science and energy, and environmental management. This is the subcommittee's fourth and final hearing this year on the President's budget request, and I look forward to hearing what the Secretary has to say.

The Department's budget request for 2016 is about \$30.5 billion. This is an increase of about \$2.5 billion over the amount Congress appropriated last year. Governing is about setting priorities, and given our fiscal constraints, especially on non-defense spending, we are going to have to make some tough decisions this year to make sure the highest priorities are funded.

The President's entire discretionary budget request this year exceeds the Budget Control Act's spending caps by about \$74 billion. This is not realistic. In fact, if we were to fully fund just the Department of Energy's budget request of \$30.5 billion, our subcommittee would need almost the entire increase available, about \$3 billion, in both defense and non-defense for fiscal year 2016 under the Budget Control Act spending caps.

The real driver of our Federal debt is out of control mandatory spending on entitlement programs. I plan to work with our Republican majority, and I hope the President and Senate Democrats who share the same concerns, to make the tough choices so we can pass a real plan to fix the long-term debt, while supporting other important priorities like national defense, national labs, and medical research.

That is why we are holding this hearing, to give the Secretary an opportunity to talk about the Department of Energy's most urgent priorities so Senator Feinstein and I and the other committee members can begin to put together our appropriations bill over the next several weeks.

I am going to focus my attention on four areas: number one, doubling basic energy research; two, reducing Federal spending on mature technologies; three, leading the world in advanced scientific computing; and four, solving the stalemate over what to do with our country's nuclear waste. Just a few comments about each of those areas.

I believe doubling basic energy research is one of the most important things we can do. It is hard to think of any important technological advance in the sciences—physics, and biology in any event—since World War II that has not involved at least some form of government-sponsored research, whether it is the development of unconventional gas or the work being done to develop small modular reactors. That is why it is so important to double the more than \$5 billion the U.S. Department of Energy spends on basic energy research. That was the goal set out in the America COMPETES legislation which passed under President Bush with bipartisan support. That grew out of the Rising Above-the-Gathering Storm report. The goal was to double the Federal Government's investment in basic research.

Two of the ways we have increased investment in basic research are, one, our national lab system and, two, ARPA-E, which Congress created as part of America COMPETES. The Office of Sciences manages 10 of the 17 Department of Energy national laboratories that are critical to our national competitiveness and our way of life. They are home to the world's largest collection of sci-

entific user facilities operated by a single organization, used by more than 31,000 researchers each year.

Since 2009, Congress has provided about \$1 billion in appropriations for ARPA-E, which has resulted in more than 400 projects. ARPA-E is successful because it stops funding projects that do not meet their research milestones, and funding is limited to 5 years.

The next priority is Federal spending on mature technology. Washington has a bad habit of picking winners and losers and an addiction to wasteful subsidies, and we need to end those policies. The most conspicuous example of this is the wasteful wind subsidy, which costs taxpayers about \$6 billion every year we extend it, enough to double basic energy research at the Department of Energy.

President Obama's former Energy Secretary, Steven Chu, said in 2011 that wind energy is a mature technology. There is a place for limited, short-term subsidies to jump start technologies, and I have supported some of those. But it is long past time for wind to stand on its own in the market. The subsidy for big wind has been renewed nine times since 1992. It is so generous that wind producers can literally give their electricity away in some markets and still make a profit. That is called negative pricing, and it is distorting the market and undercutting other forms of clean, reliable energy, such as nuclear power.

The third area is leading the world in advanced scientific computing. I got involved with super computing with Senator Bingaman when I first became a Senator. At his direction, I flew to Japan to see why they were first in the world and we were not. I am glad to say that we have been with the Obama Administration over the last several years. We see eye-to-eye on the importance of these fast super computers, and I am glad that because of a recent announcement, the Secretary was able to make in the budget request that he includes that we will be able to say that the world's fastest super computer would be, again, in the United States by 2017.

Finally, I would like to discuss, and I will save most of my comments for questions. The 25-year-old stalemate about what we do about used fuel from nuclear reactors. I want to make sure we have a strong future in this country for nuclear power. It is essential, therefore, we have a permanent place to put used nuclear fuel. The Federal Government is responsible for disposing of that. It has failed in its responsibility even though the rate payers have deposited billions to pay for it. The government's failure to follow the law not only imperils the future of nuclear power, it also results in wasting billions of hard-earned taxpayer dollars.

To help solve this stalemate, Senator Feinstein and I will again include a pilot program for nuclear waste storage in the Energy and Water Appropriations Bill as we have for the past 3 years when she was the chairman. We have also introduced legislation yesterday with Senator Murkowski and Cantwell to create both temporary and permanent storage sites for nuclear waste. The new sites we are seeking to establish would not take the place of Yucca Mountain. We have more than enough used fuel to fill Yucca Mountain, but rather would complement it. Our legislation is con-

sistent with the President's Blue Ribbon Commission on America's Nuclear Future. The Secretary served on that commission.

I should note that Federal law designates one repository for our country's used nuclear fuel, Yucca Mountain. After years of delay, Yucca Mountain can and should be part of the solution to our nuclear waste stalemate. The regulatory commission, Nuclear Regulatory Commission, recently completed the safety evaluation report that said that Yucca "met all of the safety requirements through the period of geologic stability." The Commission and the Environmental Protection Agency defined that period as one million years. So to continue to oppose Yucca Mountain because radiation concerns ignores science as well as the law.

Secretary Moniz had an important announcement to make yesterday on used nuclear fuel. I appreciate, and I know Senator Feinstein appreciates, his putting a priority on the subject. We are going to need your help, Mr. Secretary, to set priorities and make tough funding decisions for the Department this year.

With that, I would recognize Senator Feinstein for an opening statement.

[The statement follows:]

#### PREPARED STATEMENT OF SENATOR LAMAR ALEXANDER

We're here today to review the President's fiscal year 2016 budget request for the Department of Energy, a Federal agency with three critical missions: nuclear security, science and energy, and environmental management.

This is the subcommittee's fourth and final hearing this year on the President's budget request, and I look forward to hearing what Secretary Moniz has to say about the department's priorities.

The Department of Energy's budget request for fiscal year 2016 is about \$30.5 billion. This is an increase of about \$2.5 billion over the amount Congress appropriated last year.

Governing is about setting priorities, and given our current fiscal constraints—especially on non-defense spending—we are going to have to make some tough decisions this year to make sure the highest priorities are funded.

The President's entire discretionary budget request this year exceeds the Budget Control Act spending caps by about \$74 billion. This is not realistic.

In fact, if we were to fully fund just the Department of Energy's budget request of \$30.5 billion, our subcommittee would need almost the entire increase available—about \$3 billion—in both defense and non-defense for fiscal year 2016 under the Budget Control Act's spending caps.

The real driver of our Federal debt is out-of-control mandatory spending on entitlement programs.

I plan to work with our Republican majority—and, I hope, the President and Senate Democrats who share the same concerns—to make tough choices so we can pass a real plan to fix the debt while supporting other priorities like national defense and national labs and medical research.

And that is why we are holding this hearing: to give Secretary Moniz an opportunity to talk about the Department of Energy's most urgent priorities, so Senator Feinstein and I can make informed decisions as we begin to put together the Energy and Water Appropriations bill over the next several weeks.

Today, I'd like to focus my questions on four main areas, all with an eye toward setting priorities:

1. Doubling basic energy research;
2. Reducing Federal spending on mature technologies;
3. Leading the world in advanced scientific computing; and
4. Solving the stalemate over what to do with our country's nuclear waste

#### DOUBLING BASIC ENERGY RESEARCH

Doubling basic energy research is one of the most important things we can do to unleash our free enterprise system to help provide the clean, cheap, reliable energy we need to power our 21st-century economy.

It's hard to think of an important technological advance since World War II that has not involved at least some form of government-sponsored research. Take, for example, our latest energy boom: natural gas.

The development of unconventional gas was enabled in part by 3D mapping at Sandia National Lab in New Mexico and the Department of Energy's large-scale demonstration project. Then our free enterprise system, and our tradition of private ownership of mineral rights, capitalized on the basic energy research.

Another example is the work being done to develop small modular reactors, which would allow nuclear power to be produced with less capital investment and to be accessible in more places.

That's why it's so important that we work to double the more than \$5 billion the U.S. Department of Energy spends on basic energy research. We set out on this goal with America COMPETES, legislation that was first passed under President Bush with overwhelming bipartisan support.

America COMPETES grew out of the "Rising Above the Gathering Storm" report on American competitiveness, written by Norm Augustine. The goal was to double the Federal Government's investment in basic research, including math, the physical sciences and engineering.

Two of the ways we have increased investment in basic energy research is through our national laboratory system and the Advanced Research Projects Agency-Energy (ARPA-E), which Congress created as part of America COMPETES to fund transformational energy technology projects.

The Office of Science manages 10 of the 17 Department of Energy national laboratories, including Oak Ridge National Laboratory in Tennessee. These national laboratories are critical to our Nation's competitiveness and our way of life.

The laboratories are also home to the world's largest collection of scientific user facilities operated by a single organization, used by more than 31,000 researchers each year.

Since 2009 Congress has provided about \$1 billion in appropriations for ARPA-E, which has resulted in more than 400 projects. ARPA-E is successful because it stops funding projects that don't meet their research milestones and funding is limited to 5 years.

#### REDUCING FEDERAL SPENDING ON MATURE TECHNOLOGIES

That brings me to the next priority I'd like to discuss, which is to reduce Federal spending on mature technologies. Washington has a bad habit of picking winners and losers, and an addiction to wasteful subsidies of all kinds—we need to end these policies.

The most conspicuous example of this addiction is the wasteful wind subsidy—which costs taxpayers about \$6 billion every year we extend it, enough to double basic energy research at the Department of Energy.

President Obama's former Energy Secretary, Stephen Chu, said in 2011 that wind energy is a "mature technology."

There is a place for limited, short-term subsidies to jumpstart new technologies, but it is long past time for wind to stand on its own in the marketplace.

The subsidy for Big Wind has been renewed 9 times since 1992 and is so generous that in some markets, wind producers can literally give their electricity away and still make a profit.

This is called "negative pricing" and it shows that the wind subsidy isn't just wasting money that could go toward other priorities—it's distorting the market and undercutting other forms of clean, reliable energy like nuclear power.

#### LEADING THE WORLD IN ADVANCED SCIENTIFIC COMPUTING

Supercomputing is critical to our economic competitiveness and a secure energy future.

The United States faces a choice between falling further behind competitors like China, or advancing technology that can make the United States safer and more competitive in a global, 21st-century economy.

In November of last year, I was glad to announce with you, Secretary Moniz, that by 2017 the world's fastest supercomputer would again be in the United States, and that it would again be at Oak Ridge National Laboratory.

That computer will be called Summit, and it will help researchers better understand materials, nuclear power, and new energy breakthroughs. I am glad to have your support for this initiative, and I appreciate that the President's budget request includes funding to make Summit ready for users by 2018 and also for the next generation of supercomputers.

Funding this next generation, known as exascale, is essential to U.S. national security, competitiveness in science and technology and to enable our free enterprise system to create the good-paying jobs of the future.

Supercomputing has helped maintain our nuclear stockpile, allowed manufacturers to make better products and save money and even allowed scientists to map the human heart at one beat per second.

#### SOLVING THE NUCLEAR WASTE STALEMATE

I'd also like to discuss solving the 25-year-old stalemate about what to do with used fuel from our nuclear reactors, to ensure that nuclear power has a strong future in this country.

Federal law makes the government responsible for disposing of used nuclear fuel. Yet the government has failed in this responsibility, even though ratepayers have deposited billions into the Nuclear Waste Fund to pay for it.

The government's failure to follow the law not only imperils the future of nuclear power in our country, but it also results in wasting billions of hard-earned taxpayer dollars to settle lawsuits by utilities, who are stuck with the used fuel until the government takes it.

To help solve this stalemate, Senator Feinstein and I will again include a pilot program for nuclear waste storage in the Energy and Water Appropriations bill, as we have for the past 3 years.

We also introduced bipartisan legislation yesterday with Senator Lisa Murkowski and Senator Maria Cantwell to create both temporary and permanent storage sites for nuclear waste.

The new sites we are seeking to establish would not take the place of Yucca Mountain—we have more than enough used fuel to fill Yucca Mountain to its legal capacity—but rather would complement it.

Our legislation is consistent with the President's Blue Ribbon Commission on America's Nuclear Future, and is the result of many meetings with experts like Secretary Moniz, who served on the Blue Ribbon Commission.

I should note that Federal law designates one repository for our country's used nuclear fuel, Yucca Mountain. After years of delay, I want to be clear: Yucca Mountain can and should be part of the solution to our nuclear waste stalemate.

The Nuclear Regulatory Commission recently completed the Safety Evaluation Report that said Yucca Mountain met all of the safety requirements through "the period of geologic stability." The commission and the Environmental Protection Agency define the "period of geologic stability" as 1 million years.

To continue to oppose Yucca Mountain because of radiation concerns is to ignore science—as well as the law.

Secretary Moniz, we are going to need your help to set priorities and make tough funding decisions for the department this year, and I look forward to your testimony.

With that, I would recognize Senator Feinstein to make her opening statement.

#### STATEMENT OF SENATOR DIANNE FEINSTEIN

Senator FEINSTEIN. Thank you very much, Mr. Chairman, and I agree with virtually all of your statement. And it is really a pleasure for me to work with you over these many years, and I think we have gotten some things done. I will put my written remarks in the record if I may. And I just want to say that I am delighted that we have finally introduced a waste policy act bill for our country, which has no waste policy that we know of, and which at the price of about \$20 billion a year registers debt because we are unable to carry out our mission. And I understand we will owe about \$20 billion by 2020. So this is a step along the way.

And I want to point out that it is voluntary. If we have learned anything it is that these facilities have to have the approval of their community and their State. And so, the bill we have submitted essentially achieves that, and also has the Congress approving it as well. So it has been a long work in progress.

We have had the pleasure of meeting with two Secretaries, Secretary Chu and Secretary Moniz, with the Blue Ribbon Commis-

sion, with virtually a number of other people. We have discussed among ourselves different mechanisms. And, the four of us have always come to agreement, and one more time we have come to agreement in a bill that has now been introduced. And hopefully Senator Murkowski will schedule it and have a hearing, and it can move ahead. I view that as a very important legislative endeavor.

The rest of my—I would rather save my time for the questions if I may, and thank you very much.

Senator ALEXANDER. Thank you, Senator Feinstein. Here is how we will proceed. I will ask Senator Murray to her opening statement, and then we will go Secretary Moniz for his testimony. Then we will go to Senator Feinstein for her questions so that she has a chance to offer them before she needs to leave.

Senator FEINSTEIN. Thank you.

Senator ALEXANDER. Senator Murray.

Senator MURRAY. Mr. Chairman, thank you. I will just save my time for questions.

Senator ALEXANDER. Thank you, Senator Murray. I might just say that I am a fortunate chairman because the ranking members that I work with are both here today, and I really appreciate my ability to work with both of these senators. They are direct. They are easy to work with. They state their positions, and they look for results. So it makes my work here much more useful.

Secretary Moniz, welcome. We look forward to your testimony.

#### SUMMARY STATEMENT OF DR. ERNEST J. MONIZ

Secretary MONIZ. Thank you, Mr. Chairman, and I might say that I enjoy working with all three of you as well. Ranking Member Feinstein, Senator Murray, I am pleased to be here to discuss our fiscal year 2016 budget request of \$29.9 billion.

As you know, the Department is entrusted with a diverse portfolio. It includes advancing the all-of-the-above energy strategy, providing a good part of the backbone of basic research in the physical sciences in this country, ensuring nuclear security, and cleaning up the Cold War environmental contamination. The request represents an increase, as you said, of \$2 and a half billion, or nine percent, above the fiscal year 2015 appropriations level, and we feel supports a balanced portfolio within those mission areas.

In funding for nuclear security activities, including NNSA and defense-related environmental cleanup, that totals almost \$19 billion. Nearly 2/3 of our budget is in the defense line. The non-defense line—science, energy, and other activities—about \$10.9 billion.

Let me just summarize a few highlights so that we can move on to our discussion. First, in science and energy, that fiscal year 2016 request is \$5.3 billion for science, a 5 percent increase. Among other things, we are very committed to continue building and upgrading and operating our national research infrastructure to really stay at the cutting edge of light sources, super computer, neutron sources, and other large-scale facilities that we make available to the national community.

As one highlight, just last month we completed—celebrated the completion ahead of schedule and within budget of the brightest light source in the world, the National Synchrotron Light Source

II at Brookhaven, and we have a number of other upgrades at other places coming along. We have also commissioned major facilities at Jefferson Lab and at Princeton. We are now building a second generation light source at SLAC, and the rare isotope beam facility at Michigan State. So I just want to emphasize that it is a pattern of advancing these important facilities for our user community.

The energy portfolio is about \$5.38 billion in the proposal. Over the past year we have seen accomplishments across our all-of-the-above energy technology portfolio. We have actually—we have sequestered now over nine million metric tons of CO<sub>2</sub> in DOE-sponsored projects. Two cellulosic ethanol facilities that were partially supported by DOE grants and loan guarantees have begun operating. We issued last year 10 final appliance efficiency standards, which all together will reduce CO<sub>2</sub> emissions by over 435 million metric tons and save consumers about \$80 billion through 2030.

Advanced manufacturing is a key priority, and the budget provides about \$400 million to fully fund, and it is 5 years of funding, of two new clean energy manufacturing institutes while continuing funding for four institutes. Just last month we announced the Manufacturing Innovation Institute for Advanced Composites, which I think you are familiar with, Mr. Chairman. This technology has the potential to revolutionize advanced manufacturing with implications reaching from better wind turbines to more efficient vehicles.

The budget increases our investments in sustainable transportation, including \$40 billion for technologies to double freight truck efficiency by 2020. Also \$253 million for advancing the Electric Vehicle Everywhere Initiative to promote that technology. In fossil energy, we will continue development of carbon capture utilization and storage for coal plants, and note this was done in concert with the new tax credits that are proposed in the Administration's Power Plus Initiative for carbon sequestration.

I would like to highlight our proposed increase in ARPA-E, an increase of \$45 million. We are now at the fifth anniversary of the first ARPA-E grants, and now we can start talking about the impressive successes in outcomes from that program, including moving technologies to the marketplace.

And finally, the budget includes \$63 million to initiate two new programs of grants to States, one on reliability planning and one on energy assurance planning. The forthcoming, and it is forthcoming, quadrennial energy review will provide supporting analyses for these initiatives.

Let me then turn briefly to national nuclear security. The fiscal year 2016 budget allocates \$11.6 billion to NNSA. The budget supports a key objective to sustain the successful two-decade now Scientific Stockpile Stewardship Program to maintain a safe, secure, and effective nuclear weapon stockpile without testing. The budget also includes funding increases to modernize the stockpile through life extension programs and new investments in the supporting infrastructure.

Last year in our nonproliferation programs, we removed or disposed of almost 200 kilograms of vulnerable nuclear materials out of six countries and expanded radiation detection systems world-



wide to prevent illicit trafficking of nuclear and radiological materials. The budget includes \$1.9 billion for the Nonproliferation Office. The budget also includes construction of the Mixed Oxide Project of Savannah River at the same funding level as Congress appropriated in fiscal year 2015, while completing congressionally directed studies on plutonium disposition costs and alternatives.

The budget also provides \$1.4 billion for the Naval Reactors Program to continue development of the Advanced Ohio Class replacement reactor, support refueling of the land-based prototype reactor, and expand design work for the Spent Fuel Handling Recapitalization project.

Finally, within our management and performance portfolio, the largest element by far is the Environmental Management Program. The fiscal year 2016 budget request is \$5.8 billion, essentially equal to the fiscal year 2015 appropriation. We know significant challenges remain, but for perspective, DOE has cleaned up over 85 percent of sites and 90 percent of the land area.

The fiscal year 2015 appropriation provided a large one-time funding increase to implement the recovery plan for the Waste Isolation Pilot Plant. Bringing this facility back on line is a very high priority, and we believe we are on schedule to resume operations in about a year. The fiscal year 2015 funding also enabled us to complete demolition of the K25 Facility at Oakridge.

The fiscal year 2016 budget allocates increased funding for a phased approach for the Hanford Waste Treatment Plant to begin vitrifying low activity waste early next decade. We will also operate the Integrated Waste Treatment Unit at Idaho, and complete construction of the Salt Waste Processing Facility at Savannah River. Finally, elsewhere within management and performance, we continue to strengthen cross-program coordination and to improve efficiency and effectiveness of mission support functions.

That concludes my statement, and I look forward to our discussion. Excuse my voice.

[The statement follows:]

PREPARED STATEMENT OF HON. ERNEST J. MONIZ

Chairmen Cochran and Alexander, Ranking Members Mikulski and Feinstein, and members of the subcommittee, thank you for the opportunity to appear before you today to discuss the Department of Energy's (DOE) budget request for fiscal year 2016. I appreciate the opportunity to discuss how the budget request advances the Department of Energy's missions.

ADVANCING NUCLEAR SECURITY, SCIENCE & ENERGY, AND ENVIRONMENTAL CLEANUP

DOE is entrusted with a broad and diverse portfolio across its three major mission areas of nuclear security, science and energy, and environmental management. The budget request for fiscal year 2016 for the Department of Energy is \$29.9 billion, \$2.5 billion above fiscal year 2015 enacted, to support our mission responsibilities and to continue improving our management and performance in support of those missions.

For nuclear security, the budget includes \$12.6 billion, an increase of \$1.2 billion over the fiscal year 2015 enacted level, to support DOE's responsibilities of maintaining and modernizing, via life extension programs, the nuclear deterrent without testing; controlling and eliminating nuclear materials worldwide and providing nuclear and radiological emergency response capabilities in an age of global terrorism; and propelling our nuclear Navy.

For science and energy, the budget includes \$10.7 billion, an increase of \$1.3 billion over the fiscal year 2015 enacted, to support DOE's missions of enabling the transition to a clean energy future with low-cost, all-of-the-above energy tech-

nologies; supporting a secure, modern, and resilient energy infrastructure; and providing the backbone for discovery and innovation, especially in the physical sciences, for America's research community.

For environmental management, the budget includes \$5.8 billion, to support DOE's responsibility of cleaning up from the Cold War legacy of nuclear weapons production.

Approximately \$18.9 billion, or 63 percent of the Department's budget request, is national security-related funding, including the nuclear security and most of the environmental management programs. The remaining 37 percent is for nondefense programs in energy, science, and other programs such as building capabilities to respond to energy disruptions, enhancing data collection and analysis in critical areas, and supporting obligations for international cooperation in clean energy and energy security.

#### SCIENCE: LEADING EDGE RESEARCH AND WORLD CLASS RESEARCH INFRASTRUCTURE

Starting with basic research, DOE's Office of Science is the largest Federal sponsor of basic research in the physical sciences, supporting 22,000 researchers at 17 National Laboratories and more than 300 universities. Informed by the latest science advisory council reports and recommendations, the fiscal year 2016 budget request provides \$5.34 billion for Science, \$272 million above the fiscal year 2015 enacted level, to continue to lead basic research in the physical sciences and develop and operate cutting-edge scientific user facilities while strengthening the connection between advances in fundamental science and technology innovation.

One of the signature aspects of our basic science research program is the Department's support for the construction and operation of major user facilities at the national laboratories that serve over 31,000 scientists and engineers each year on an open-access basis. We are committed to staying at the cutting edge of light sources, super computers, neutron sources, and other facilities essential to advancing our mission. In the last year, for example, we completed the brightest light source in the world, the National Synchrotron Light Source II at Brookhaven National Laboratory, ahead of schedule and on budget. We are at the commissioning phase of the 12 GeV Upgrade to the Continuous Electron Beam Accelerator Facility at the Thomas Jefferson National Accelerator Facility, and the National Spherical Torus Experiment at Princeton Plasma Physics Laboratory intends to begin research this summer after a significant upgrade.

Looking forward in the fiscal year 2016 budget, we continue construction of critical, new user facilities while ensuring increased investment in national laboratory infrastructure renewal to help sustain America's scientific enterprise. The Request supports a major upgrade of the Linac Coherent Light Source at SLAC and construction of the Facility for Rare Isotope Beams at Michigan State University. In addition, the budget provides approximately \$2 billion to fund operations of our 27 existing scientific user facilities.

These facilities investments and research grants funded by the Office of Science will ensure that we continue to support discovery science, as well as science that underpins future energy and other technologies.

For example, using the current Linac Coherent Light Source at SLAC, scientists last year mapped for the first time the structure of a protein within a living cell. This single example highlights the tremendous benefits of our national laboratories in a broad range of scientific and applied areas. In addition, the Office of Science supports research at hundreds of universities in all 50 States through competitive grants to advance our mission. For example, a university group recently developed a new class of polymer-based flexible electronics for solar cells and medical applications through DOE-funded research.

High performance computing is a traditional area of strength and responsibility for the Department of Energy that has been an important component of U.S. leadership in science and technology more broadly. The fiscal year 2016 budget grows our investment significantly to \$273 million for a multi-year, joint Office of Science-National Nuclear Security Administration (NNSA) effort to achieve exascale computing—computing platforms with 100 to 1000 times more computational power than today's systems. This effort requires researchers and industry to overcome a number of technical challenges, including energy and big data management, as part of our push to develop enabling capabilities for exascale computing. We recently announced the joint Collaboration of Oak Ridge, Argonne, and Lawrence Livermore (CORAL) to advance within an order of magnitude of the exascale target within a few years. In addition, the Office of Science is supporting the Computational Science Graduate Fellowship program to support training in advanced scientific computing.

These investments will ensure continued U.S. leadership of this critical capability in a very competitive global environment.

The budget provides funding at the fiscal year 2015 level for the U.S. contributions to the ITER project, a major international fusion facility currently under construction in France. ITER will be the world's first magnetic confinement long-pulse, high-power burning plasma experiment aimed at demonstrating the scientific and technical feasibility of fusion energy, and the request includes support for important critical-path items.

We will continue in this budget to grow the Energy Frontier Research Center (EFRC) program by initiating five new centers and continuing support for existing Centers, for a total investment of \$110 million in fiscal year 2016. This EFRC program is our flagship investment in basic science that underpins future energy technologies.

With our budget request, we support Fermilab operations at a total of \$135 million for operations, which includes operations of the NOvA neutrino experiment. We are also investing \$20 million to move forward planning and design for the Long Baseline Neutrino Facility at Fermilab. Last year, the particle physics community came forward with a visionary strategic plan for the High Energy Physics program, and our budget request responds to their recommendations, specifically by aiming to develop a strong international consortium for the next generation of neutrino physics experiments.

#### ENERGY

##### *All-of-the-Above Energy Approach for a Clean Energy Economy*

Preparing for the clean energy economy in order to address climate change and energy security, principally through science and technology, is an essential focus of the Department of Energy. The President's Climate Action Plan is a guiding document for our efforts to mitigate climate change risks through clean energy technologies. The Administration remains committed to an all-of-the-above energy approach, and we believe that we need to enable technologies across all fuel sources to become competitors in a future clean energy marketplace.

In the last year, we have seen important accomplishments across the Department's technology portfolio that highlight our all-of-the-above approach. We have geologically sequestered over 9 million metric tons of CO<sub>2</sub> through DOE-supported projects. Two commercial-scale cellulosic ethanol facilities supported by DOE grants or loan guarantees have commenced operations. We have commissioned one of the world's largest battery storage systems at the Tehachapi Wind Energy Storage Project. We have issued ten final appliance energy efficiency standards in calendar year 2014, which altogether will help reduce carbon dioxide emissions by over 435 million metric tons through 2030. Standards enacted since 2009 are projected to avoid a cumulative total of 2.2 billion metric tons of carbon emissions through 2030. The Office of Energy Efficiency and Renewable Energy (EERE) has achieved 70 percent of the SunShot goal of cost parity for utility scale solar energy.

The Advanced Research Projects Agency—Energy's (ARPA-E) grant program has attracted more than \$850 million in private follow-on funding to 34 ARPA-E projects, with 30 ARPA-E teams forming new companies.

EERE has launched the Frontier Observatory for Research in Geothermal Energy (FORGE), a first-of-a-kind field laboratory to deploy enhanced geothermal energy systems, and we have seen battery technology improvements that are projected to reduce battery costs for electric vehicles by 40 percent. The Office of Nuclear Energy has successfully completed the first 5-year program at the Consortium for Advanced Simulation of Light Water Reactors (CASL) nuclear modeling Hub at Oak Ridge and has initiated a second award for design and licensing support of a small modular nuclear reactor with advanced safety features.

Consistent with an all-of-the-above energy strategy, the DOE Loan Programs Office has issued loan guarantee solicitations for innovative technologies in four areas, including \$4 billion for renewable energy and energy efficiency, \$8 billion for fossil energy, \$12 billion for nuclear energy, and \$16 billion for advanced vehicle technology manufacturing.

Projects that this program has supported include one of the world's largest wind farms; several of the world's largest solar generation and thermal energy storage systems; Tesla Motors; and more than a dozen new or retooled auto manufacturing plants. This program's accomplishments include issuing loan guarantees for projects that avoided more than 6.1 million metric tons of carbon dioxide cumulatively in 2014, and for companies that produced more than 2.1 million fuel-efficient vehicles in 2014. We are moving aggressively in finding good projects to deploy innovative

energy technologies using the remaining \$40 billion in loan authority in the coming years.

Together, these accomplishments illustrate how DOE's programs invest in an all-of-the-above spectrum of energy technologies, and the fiscal year 2016 budget request continues forward on that strategy with a \$5.4 billion request for our applied energy programs.

Advanced manufacturing will continue to be a major focus of our investments. We will continue to help support an American manufacturing renaissance. The fiscal year 2016 budget fully funds two new clean energy manufacturing innovation institutes and continues funding for four institutes, as part of the larger National Network for Manufacturing Innovation, including the advanced composites manufacturing institute in Tennessee the President announced in January. To support these institutes, the Request provides \$196 million out of a total request of \$404 million for EERE's Advanced Manufacturing program.

In energy efficiency, the Request invests \$264 million, an increase of \$92 million, to develop and promote the adoption of technologies and practices that, when fully deployed, would reduce U.S. building-related energy use by 50 percent from the 2010 Annual Energy Outlook baseline. It also provides \$228 million, \$35 million above fiscal year 2015, to support competitively selected projects, training and technical assistance, and residential energy efficiency retrofits to approximately 33,000 low-income households nationwide.

The FEMP budget includes \$15 million for the Federal Energy Efficiency Fund which provides direct assistance to agencies for investing in priority energy projects for efficiency and renewables. By providing direct funding and leveraging cost sharing at other agencies, the fund creates greater opportunities to develop Federal projects that may not otherwise be implemented.

The Request increases our investments in sustainable transportation, including \$40 million for the SuperTruck II initiative to develop and demonstrate technologies to double class 8 freight truck efficiency by 2020 from a 2009 baseline. The Request also continues our focus on electric vehicles by investing \$253 million in the EV Everywhere initiative, which aims to enable domestic production of plug-in vehicles that are as affordable and convenient as gasoline vehicles by 2022. By continuing to make progress in core component technologies such as the dramatic reductions we are seeing in battery and fuel cell costs, we are looking to achieve transformative performance improvements for electric vehicles in the marketplace.

In biofuels, the budget continues our focus on drop-in fuels, which can take advantage of existing infrastructure, and we will provide \$45 million for the jointly funded USDA/DOD/DOE commercial scale biorefineries program to produce military specification drop-in fuels. We will also continue research and development efforts on supplying, formatting, and converting cellulosic and algae-based feedstocks to bio-based gasoline and diesel, with a \$138 million investment in the fiscal year 2016 Request.

The budget continues to support accelerated advances in renewable energy. The SunShot Initiative has helped accelerate the reduction in solar costs, and our request of \$337 million, an increase of \$104 million, aims to continue progress to achieve cost parity without subsidies by 2020. For wind energy, the Request of \$146 million, an increase of \$39 million, includes funding for year 5 of a 6 fiscal-year Offshore Wind Advanced Technology Demonstration program supporting three offshore wind projects on track to begin operation in 2017. Our request of \$96 million for geothermal energy, \$41 million above fiscal year 2015, implements the FORGE, an experimental facility aimed to advance enhanced geothermal systems, and pursues new approaches to hydrothermal development with a special focus on collaborative efforts with the Office of Fossil Energy on subsurface science, technology and engineering.

As we witness the transformation of our Nation's electric grid, the Department continues to drive electric grid modernization and resilience. In May 2014, with cost-share funding provided by the Office of Electricity Delivery and Energy Reliability (OE), Southern California Edison constructed and installed equipment for a prototype 8 megawatt/32 megawatt-hour battery storage plant for wind integration at Tehachapi, CA. The Tehachapi Wind Energy Storage Project is positioned to demonstrate the effectiveness of lithium-ion battery and smart inverter technologies to improve grid performance and assist in the integration of variable energy resources. In addition, we continue improving the security of the Nation's energy infrastructure. Oak Ridge National Laboratory announced in January 2015 the licensing of its Hyperion software, which helps detect software that has been maliciously altered. Today, more than 20 new technologies that OE investments helped support are now being used to further advance the resilience of the Nation's energy delivery systems.

In fossil energy, we will continue our across-the-board focus on carbon capture and sequestration and improving the environmental performance of natural gas development. In particular, the fiscal year 2016 budget includes funding to conduct initial R&D towards demonstration of carbon capture and storage for natural gas plants. While natural gas is an important bridge fuel, natural gas, as well as coal, will need carbon capture and sequestration to compete in a future clean energy economy.

And while the fiscal year 2016 budget does not request new authority in these areas, the Department has \$8 billion in loan guarantee authority for advanced fossil technologies, as I mentioned earlier, and the Department will continue to work with prospective applicants. Through the President's budget request for the Treasury Department, the Administration is also proposing a new, \$2 billion refundable investment tax credit, including support for the infrastructure for carbon capture and sequestration, as well as a sequestration credit for commercial carbon capture use and storage (CCUS) deployment to allow for enhanced oil recovery or injection into deep saline aquifers.

In the area of nuclear energy, the Request includes \$62.5 million to continue technical support for moving a small modular reactor to the Nuclear Regulatory Commission licensing stage by the end of 2016, as a step towards industry's demonstration of this important technology early in the next decade. The Request includes \$326 million to support research and development on reactor aging issues, advanced reactor concepts, and the fuel cycle. This request continues to support R&D on nuclear fuel issues at the Idaho National Laboratory. It also supports research on accident tolerant fuels and includes funding to continue laying the groundwork for implementing the Administration's Strategy for the Management and Disposal of Used Nuclear Fuel and High-Level Radioactive Waste, including a consent-based approach to the siting of storage and disposal facilities for nuclear waste. The Request also focuses resources on maintaining operational readiness at the Idaho National Laboratory, including \$23.2 million for major power distribution infrastructure refurbishments and \$11.7 million for critical security infrastructure investments.

The Request includes \$325 million for ARPA-E, an increase of \$45 million from fiscal year 2015, to continue to grow this important program. The program, which received its first appropriation in 2009, is now showing impressive results. It has over 400 projects to date, and the first group of completed projects has led to 30 new companies, of which five have been acquired by large strategic investors. Altogether, 34 ARPA-E projects have attracted over \$850 million in follow-on funding.

Through ARPA-E, we will continue to invest in early-stage innovation with the potential to lead to transformational energy technologies.

For the loan programs, while the Request does not propose new authority for the Title 17 or Advanced Technology Vehicles Manufacturing loan programs, the fiscal year 2016 budget does include \$9 million for credit subsidy to support a new loan guarantee solicitation for new clean energy projects on Tribal Lands.

In addition to the new loan program, the Request provides \$20 million for the Office of Indian Energy Policy and Programs, an increase of \$4 million, for its technical and financial assistance programs, with increased emphasis on remote communities and the National Strategy for the Arctic Region.

The Department's final fiscal year 2015 budget supported a new workforce development effort for graduate and post-doctoral training in three areas of specific mission need for the Department: high performance computing in the Office of Science, advanced manufacturing in the Office of Energy Efficiency and Renewable Energy, and subsurface topics and project management in the Office of Environmental Management. These DOE traineeships are modeled in part after other Federal programs for university-led graduate traineeships and include components that are uniquely focused on DOE mission workforce training needs. Our fiscal year 2016 budget request proposes to add a fourth traineeship on radiochemistry, supported by the Office of Nuclear Energy, where we see a specific mission need.

#### *Transforming Energy Systems, Investing in Resilient Energy Infrastructure*

In addition to the clean energy investments I just discussed, our Nation's energy infrastructure is an area that needs—and is now getting—more attention.

We have had several recent accomplishments relating to our energy infrastructure. Following the aftermath of Superstorm Sandy, the Office of Electricity Delivery and Energy Reliability committed \$500,000, along with EERE, totaling \$1 million for Sandia National Laboratories to provide technical assistance to New Jersey Transit and the Board of Public Utilities to assess NJ Transit's energy needs and help develop a conceptual design of an advanced microgrid system that will avoid disruptions and make it easier to get the power back on after a major disaster.

Led by our Office of Energy Policy and Systems Analysis, we have also completed a nationwide public stakeholder process and analytical work in support of the upcoming release of the first-ever Quadrennial Energy Review (QER) of U.S. energy infrastructures.

The QER is a 4-year interagency process, with the first year focusing on energy infrastructure—the transmission, storage, and delivery of energy. We expect the first QER installment to be released soon, and many of you may be interested in that document for its systematic analysis of the breadth of challenges with our current energy infrastructure. The QER will also include recommendations to drive future program directions.

The electricity grid underpins many other infrastructures, and the fiscal year 2016 budget Request includes \$356 million, an increase of \$160 million, for a major crosscutting initiative led by the Office of Electricity Delivery and Energy Reliability to focus on the modernization of the electricity grid. This initiative invests in technology development, enhanced security, and modeling to enable the electricity grid of the future. This initiative includes \$10 million for R&D to improve resilience of large-scale electricity transformers and \$14.5 million to transition to an integrated system at the distribution level and develop a platform for market-based control signals. In addition, the Request establishes a virtual collaborative environment for conducting real-time advanced digital forensics cybersecurity analysis, which can be used to analyze untested and untrusted code, programs, and websites without allowing the software to harm the host device.

The Request includes \$15 million to develop advanced technologies to detect and mitigate methane emissions from natural gas transmission, distribution, and storage facilities, and \$10 million to improve methane leakage measurements.

We will focus new attention on State grants for energy assurance and reliability, recognizing that many authorities and actions in this area depend upon the States. The fiscal year 2016 Request includes \$35.5 million to provide grants to State, tribal, and local governments to update energy assurance plans to address infrastructure resilience, as well as \$27.5 million that is part of the Grid Modernization crosscutting initiative to provide competitive grants to States and multi-State entities to address electricity reliability.

Finally, while we move toward implementation of recommendations on the first installment of the QER on infrastructure, DOE will move forward on future installments of the 4-year QER. The budget includes \$35 million for the Office of Energy Policy and Systems Analysis to provide integrated energy systems analysis and follow-on QER support activities.

In addition to the longstanding major mission areas of nuclear security, science and energy, and environmental cleanup, emergency response is an important mission for the Department. While we have had an ongoing responsibility for nuclear and radiological incident response, the Department has intensified its efforts for energy infrastructure emergency response, working with FEMA. Our budget proposes an increase from \$6 million to \$14 million for Infrastructure Security and Energy Restoration, the lead program for these responses. While the budget for this emerging responsibility is relatively small, it is an increasingly important focus.

#### *Enhancing Collective Energy Security*

The Department's work in energy security is modest in budget requirements but greatly important for the Nation. Particularly given the events in Europe and Ukraine, we have an increased global focus on collective energy security—energy security for the United States and its allies.

In the last year, we worked with the G-7 and the European Commission to achieve a G-7 Leaders Agreement on a new collective energy security framework. Led by our Office of International Affairs, we also worked directly with Ukraine to provide technical support in developing its first ever energy emergency management plan, especially for the winter. In December, we also signed a Memorandum of Understanding with Canada and Mexico to initiate improved coordination of North American energy data. Led by DOE's Energy Information Administration (EIA), this will help us develop stronger active collaboration moving forward.

To continue on this progress for collective energy security, the fiscal year 2016 budget request includes \$24 million for the Office of International Affairs. While the funding level is not large compared with other parts of the Department, the Office of International Affairs is taking on increased responsibility, as I just highlighted, and funding at this level is needed to fulfill its important mission and strengthen international energy technology, information and analytical collaborations.

Similarly, the budget increases investment in the EIA to \$131 million, in order to fill gaps in current energy data, including transportation of oil by rail and integrating energy data with Canada and Mexico. The EIA recently initiated a data re-

porting program on oil and natural gas production trends by region, and the requested increase is needed to continue with this and other improvements in our data collection, analysis, and reporting.

Last year, the Department also completed a 5 million barrel test sale for the Strategic Petroleum Reserve (SPR) to look at infrastructure challenges resulting in large part from pipelines now flowing in opposite directions from when the SPR was originally established. Through the test sale, we found challenges confronting the SPR's distribution system, and the fiscal year 2016 budget proposes an increase of \$57 million above fiscal year 2015 for the SPR to begin addressing the operational readiness issues found through the test sale to enhance distribution flexibility and reliability and to begin to address the existing backlog of deferred maintenance projects.

#### *Strategic Partnerships with National Laboratories to Advance DOE Missions*

The Department is continuing its focus on building the strategic partnership with the National Laboratories. DOE is a science and technology agency, and our efforts across all of our mission areas are heavily grounded in science and technology. The National Labs are a major core asset in executing our missions, and strengthening our partnerships is critical to our success.

We are doing that in a variety of ways. For example, DOE is engaging the laboratories very early on in our program planning. The National Laboratories Ideas Summit helped shape fiscal year 2016 budget initiatives and was instrumental in forming a special consortium of 14 National Laboratories arranged to implement the crosscutting grid modernization research.

We also have begun using the National Laboratories' expertise in science and technologies in some of our major challenges outside of the science and energy arena. When faced with what looked like major problems with the cost and schedule of the Uranium Processing Facility (UPF) at the Y-12 National Security Complex in Oak Ridge, or the major problem we had at the Waste Isolation Pilot Plant (WIPP), we engaged Laboratory leadership to help reformulate our approach to those issues. In those two examples, Oak Ridge National Laboratory led the Red Team review and restructuring of UPF, and the Savannah River National Laboratory led the forensics effort to investigate the cause of the failure of the waste canister at WIPP.

The Laboratory Operations Board (LOB), a body that we put in place in 2013, performed the first-ever uniform assessment of general purpose infrastructure at all Laboratories and NNSA plants. That has led to identifying over \$100 million in the fiscal year 2016 budget in new investments for priority general purpose infrastructure projects guided by LOB assessments, while also avoiding an increase in deferred maintenance.

Finally, we have developed new strategies to strengthen institutional capability of the National Laboratory system based on advice from the Secretary of Energy Advisory Board (SEAB).

#### *Enhancing Impact: Crosscutting Initiatives in Key Technology Areas*

The fiscal year 2016 budget expands the crosscutting initiatives introduced in the fiscal year 2015 budget designed to advance key technology areas that have multiple energy resource applications. Each crosscut reflects an integrated plan of work to optimize programmatic objectives by efficiently allocating resources. Through deliberate and enterprise-wide planning and coordination of these research efforts, the crosscutting initiatives will help bolster DOE's efforts to institutionalize enhanced program management and coordination across program offices, while accelerating progress on key national priorities.

The programs and budgets within the three mission areas include over \$1.2 billion in crosscutting R&D across six initiatives focusing on: electricity grid modernization, subsurface technology and engineering, supercritical carbon dioxide technology, energy-water nexus, exascale computing, and cybersecurity. These initiatives are the product of a concerted coordination effort among all three DOE Under Secretariats and program offices across the Department in close collaboration with the National Laboratories.

The fiscal year 2016 budget continues to build on the five crosscutting initiatives established in fiscal year 2015. The Exascale Computing initiative invests to make progress toward a thousand-fold improvement over current high performance computers. Grid Modernization supports technology development, enhanced security, and stakeholder support to enable evolution to the grid of the future. The Subsurface Engineering initiative invests in new wellbore systems, seismic research, and other areas supporting a wide variety of energy sources. The Supercritical Carbon Dioxide initiative establishes a 10 MWe-scale pilot Supercritical Trans-

formational Electric Power facility aiming to increase the efficiency of power generation, and the Cybersecurity crosscutting initiative strengthens cybersecurity across DOE's Federal and laboratory sites, and improves cybersecurity for the Nation's electric, oil, and gas sectors.

The fiscal year 2016 budget also proposes one new crosscutting initiative, the Energy-Water Nexus. This initiative recognizes that the Nation's energy system uses large quantities of water, and the Nation's water system uses large quantities of energy, and that DOE's coordinated science and technology efforts can contribute to the Nation's transition to more resilient energy-water systems.

#### NUCLEAR SECURITY

The fiscal year 2016 budget request provides \$12.6 billion for the NNSA, an increase of \$1.2 billion over fiscal year 2015, to carry out our missions for the nuclear deterrent, nuclear nonproliferation programs, and propulsion for the nuclear Navy.

##### *Effective Stewardship of the Nuclear Deterrent*

The Request includes \$8.8 billion for Weapons Activities, \$667 million above fiscal year 2015, to maintain a safe and effective nuclear deterrent while continuing to reduce the size of the active stockpile.

In pursuit of this mission, we have recently achieved a number of major accomplishments. We have, first and foremost, had another year of science-based certification of the stockpile as safe, secure, and effective without nuclear testing. It is important to remember the remarkable story that a science research program has enabled the paradigm to shift since nuclear testing ceased to allow us to consistently certify the stockpile as safe and reliable without testing, even as it shrinks.

In the major life extension programs, we have now passed the halfway mark in Life Extension Program (LEP) for the W76-1 warheads for the Navy, and our fiscal year 2016 budget request of \$244 million will keep us on track to complete the program in 2019. We have conducted successful first integration testing of the B61-12 LEP for the Air Force on or ahead of schedule, and the Request of \$643 million supports delivery of the First Production Unit in 2020. By the end of fiscal year 2024, completion of the B61-12 LEP will shrink the number of active and inactive weapons, reduce the mass of nuclear material used in these weapons, and allow us to retire the B83, the last U.S. megaton class weapon. Our Request of \$220 million for the W88 ALT 370 supports delivery of the First Production Unit with conventional high explosives refresh by fiscal year 2020.

This budget supports the Nuclear Weapons Council decision to accelerate a new cruise missile capability, and the selection of the W80 as the warhead for the Air Force's Long Range Stand-Off system (LRSO). The fiscal year 2016 budget request includes \$195 million to accelerate the program by 2 years, to be completed in 2025, in order to meet military requirements.

We have begun operations in the new Kansas City Responsive Infrastructure Manufacturing and Sourcing (KCRIMS) facility with half the footprint and an improved operating environment compared to the old environment. And at the National Ignition Facility, we have significantly increased the shot rate and achieved impressive advances in experimental results in closer alignment with modeling predictions.

As I mentioned earlier, we have used strategic partnerships with the National Laboratories to rethink some of our challenging projects. As a result of the Red Team review of the Uranium Processing Facility at the Y-12 National Security Complex in Oak Ridge, led by the Director of the Oak Ridge National Laboratory, and a similar review of the Chemistry and Metallurgical Research Replacement Facility (CMRR) capability at Los Alamos National Laboratory, we are developing a disciplined modular approach for both sites that will remove risks early in the process and build to a more rigorous budget and schedule. This rigorous process will be an important and recurring project management theme at the NNSA and across the Department of Energy—in particular, at the Office of Environmental Management.

##### *Controlling and Eliminating Nuclear Materials Worldwide*

The fiscal year 2016 budget request includes \$1.9 billion for Defense Nuclear Nonproliferation, \$325 million above fiscal year 2015, to continue the critical missions of securing or eliminating nuclear and radiological materials worldwide, countering illicit trafficking of these materials, preventing the proliferation of nuclear weapon technologies and expertise, and ensuring that the U.S. remains ready to respond to high consequence nuclear and radiological incidents at home or abroad, and applying technical and policy solutions to solve nonproliferation and arms control challenges around the world. The Request is a \$101 million, or 5 percent, increase from the comparable fiscal year 2015 enacted level after adjusting for a budget structure



change moving counterterrorism efforts from the Weapons Activities appropriation to the Defense Nuclear Nonproliferation appropriation.

We have completed the removal or disposal of a total of 190 kilograms of vulnerable nuclear material, through bilateral agreements, and trilateral agreements with Russia and countries with material of Russian origin. Despite a difficult relationship at the moment, we are continuing to work with Russia to repatriate weapons-usable material to the United States or Russia.

In 2014, we obtained a pledge from Japan at the 2014 Nuclear Security Summit in The Hague to remove and dispose of all highly-enriched uranium and separated plutonium from the Fast Critical Assembly in Japan. We also helped prevent the illicit trafficking of nuclear and radiological materials, technology and expertise by installing 37 fixed and 22 mobile radiation detection systems worldwide.

The fiscal year 2016 budget request reorganizes the Defense Nuclear Nonproliferation program into four business lines: Global Material Security; Materials Management and Minimization; Nonproliferation and Arms Control; and Nonproliferation Research and Development. We have also strengthened Counterterrorism and Emergency Response by consolidating these efforts with Nuclear Nonproliferation programs in one account. Together, these reorganizations create a clearer set of business lines for the nonproliferation programs and represent the full continuum of our nonproliferation efforts as we prevent, counter, and respond to global threats.

In fiscal year 2015, the Congress appropriated \$345 million to continue construction of the mixed-oxide (MOX) project at Savannah River. The fiscal year 2016 budget includes \$345 million, which is the current services projection from the fiscal year 2015 enacted level, while we complete congressionally-directed studies on plutonium disposition costs and alternatives.

#### *Advancing Navy Nuclear Propulsion*

The fiscal year 2016 budget request includes \$1.4 billion for Naval Reactors, \$142 million above fiscal year 2015, to support the Navy fleet and maintain progress on current efforts to refuel the land-based research and training reactor. The Request increases funding for Naval Reactor's core objective of ensuring the safe and reliable operation of the Nation's nuclear fleet (73 submarines and 10 aircraft carriers), constituting over 40 percent of the Navy's major combatants.

The Naval Reactors programs achieved some significant accomplishments this year. In 2014, we began integrated testing of the lead A1B reactor plant of the next-generation FORD-class aircraft carrier and provided technical resolution support for the nuclear fleet which steamed over 2 million miles.

The fiscal year 2016 budget provides \$187 million to continue development of the advanced Ohio-Class Replacement Reactor, and \$133 million to initiate refueling of the Land-based Prototype reactor. We also provide \$86 million to continue construction of the Spent Fuel Handling Recapitalization Project.

#### CLEANING UP THE COLD WAR NUCLEAR WEAPONS LEGACY

The fiscal year 2016 budget request includes \$5.8 billion for Environmental Management, \$43 million below the fiscal year 2015 enacted level, to position DOE to meet the Nation's Manhattan Project and Cold War legacy responsibilities. DOE is responsible for the cleanup of millions of gallons of liquid radioactive waste, thousands of tons of used nuclear fuel and special nuclear material, disposition of large volumes of transuranic and mixed/low-level waste, huge quantities of contaminated soil and water, and deactivation and decommissioning of thousands of excess facilities.

I will discuss in a moment the difficult challenges we face with some of our remaining Environmental Management projects. But I would like to start by pointing out that when the program started, there were 107 sites to be closed, and we have cleaned up all but 16 sites. To be sure, the remaining sites are not the simplest to remediate; however, we started with over 3,000 square miles to remediate, and we're down to only 300 square miles. And so, by some metrics, we have cleaned 90 percent of our total footprint. However, it will be decades before we finish the most difficult remaining sites.

Though we are down to some of the most difficult sites, progress is steady. Last year, we completed demolition of the K-25 facility at Oak Ridge, the largest demolition project DOE has ever undertaken. We have converted 15 million pounds of liquid waste into solid glass at the Defense Waste Processing Facility at Savannah River, enabling closure of six high level waste storage tanks.

We have put forward and are beginning to implement an alternative phased approach to completing the Hanford Waste Treatment Plant (WTP). We have cleaned

up 479 square miles of the 586 square mile area at Hanford, including 90 percent of the River Corridor.

Going forward in fiscal year 2016, recovery of the Waste Isolation Pilot Plant in New Mexico is one of our high priorities. The fiscal year 2016 budget includes \$248 million to implement the WIPP recovery plan, leading to initial resumption of waste emplacement in the first quarter of calendar year 2016. The fiscal year 2016 budget will also support continued operations of the Integrated Waste Treatment Unit at Idaho and work towards closing the tanks.

With \$1.4 billion for the Office of River Protection, we will move forward on our phased approach to begin vitrifying low activity waste early next decade. The budget moves forward with construction of the Low Activity Waste (LAW) facility at the Hanford Waste Treatment Plant, including design of a new pretreatment system required for our phased approach. We will also continue technical issue resolution at the site, and we will bring the Plutonium Finishing Plant (PFP) at Hanford, once the highest risk nuclear facility at Hanford, down to slab-on-grade by the end of fiscal year 2016.

Finally, we will continue construction and prepare for commissioning of the Salt Waste Processing Facility at Savannah River, which is on schedule to complete construction by December 2016.

#### MANAGEMENT AND PERFORMANCE: IMPROVING EFFICIENCY AND EFFECTIVENESS

Building on the Department's fiscal year 2015 emphasis on management and performance, the fiscal year 2016 budget moves forward on initiatives that continue to identify and institutionalize improvements across the DOE enterprise.

In the Department's efforts to improve management and performance, we have adopted project management reforms, including strengthening the Energy Systems Acquisition Advisory Board (ESAAB) from an ad hoc process into an institutionalized regular process for situational awareness on project progress and issues, as they arise. ESAAB will be supported directly by a Project Management Risk Committee, which brings together DOE experts for a continuous look at the risk profile of major projects and issues. We have also taken steps to improve the project peer review process and institutionalize other project management reforms.

We have also continually worked to improve management, increase efficiency, and support diversity on a number of fronts. We have recruited 30 high-level Ambassadors from industry, academia, and nonprofits to increase participation of minorities in energy. We have resolved hiring issues at the Bonneville Power Administration, providing additional Human Resources training and restoring hiring authority. The Department's management and operating contractors have reduced pension plan liability by \$100 million through lump sum buyouts. Our management and operating contractors have also established Health Reimbursement Accounts at 13 sites for their medical-eligible retirees, reducing long term financial statement liability by \$2.8 billion.

Going forward, the budget includes \$25 million for the Office of the Human Capital Officer to implement a new Human Resources service delivery model to streamline our HR model and eventually consolidate 17 current service centers to five key delivery centers. We will also implement a new Energy Jobs Council to improve calculation of energy jobs data and strengthen technical support for State workforce development programs. We will also continue to strengthen Departmental cybersecurity programs, part of the Cybersecurity crosscutting initiative, through an enterprise-wide cyber council established in 2013 for securing personal data, our nuclear security data, and the privately-owned energy infrastructure.

#### ADVANCING THE PRESIDENT'S VISION: IMPLEMENTING DOE'S STRATEGIC PLAN

In conclusion, we have much to do to advance the President's vision and implement DOE's Strategic Plan.

We will continue implementing the President's Climate Action Plan, to reduce emissions at home and around the globe.

We remain committed to our all-of-the-above energy strategy, to encourage innovation, create jobs, enable economic growth, and contribute to domestic manufacturing and net exports.

We must maintain leadership in basic research in the physical sciences—and increasingly in the life sciences, develop the next generation of computation technology, and develop and maintain world-class scientific user facilities.

We will continue to maintain a safe, secure, and effective nuclear weapons stockpile in the absence of testing, and manage the infrastructure needed to meet national security requirements.

We must continue to reduce the global nuclear terrorism threat through measures to identify, control, and eliminate nuclear weapons worldwide.

We will address the legal and moral imperative of cleaning up legacy waste to protect human health and the environment.

We will strengthen DOE and its national missions through cross-cutting initiatives that leverage the science, technology, and engineering capabilities across programs and National Laboratory partners.

And we will continually improve DOE effectiveness and efficiency through project management reform and constant attention to maintaining a safe and secure workplace.

Thank you, and I would be pleased to answer your questions.

Senator ALEXANDER. Thank you, Mr. Secretary. While you recover there, I will say to Senators Lankford and Cochran, we are going to call on Senator Feinstein first and give her an opportunity to ask her questions since she has an Intelligence Committee-related commitment and will leave early. Senator Feinstein.

Senator FEINSTEIN. Thank you very much, Mr. Chairman. I very much appreciate this privilege. I wanted to—oh, good. Just a word to the distinguished chairman of the Energy Committee, both Senator Alexander and I mentioned that we had completed our joint effort at a nuclear waste policy act, and have worked with you and two former Democratic members, or ranking members, or chairs—Senator Bingaman and Senator Wyden, Senator Landrieu, and now Senator Cantwell. Senator Cantwell has gone on the bill, and my understanding is that our chairman has introduced it this morning on behalf of the four of us, and we are hopeful that you will see fit to have an early hearing so that we can possibly develop a nuclear waste policy for our country.

#### INTERNATIONAL THERMONUCLEAR EXPERIMENTAL REACTOR

Senator FEINSTEIN. Well, thank you. Thank you very much, Madam Senator.

I wanted to ask a question about—here we go—ITER. It is behind schedule and over budget. In 2005, DOE's preliminary cost estimate for United States contributions to ITER was \$1.122 billion, with completion in 2013. The current estimate is \$4.1 billion with completion in 2034 and '35. As we all know, an independent cost review found that the costs could be as high as \$6.5 billion, and the date could slip further.

We discussed this at our last—during our last bill, and I think both the chairman and I, we are seeing little benefit from our participation in ITER. I do not believe that fusion will be developed during my lifetime, and perhaps not the lifetime of the younger members of this body. And it is building a facility in another country that we may never see benefits from. So I have some question about continuing this, and particularly continuing it at the amount that it is budgeted to be.

Dr. Orr or Secretary Moniz, I would love to have your reaction and comment to those statements.

Secretary MONIZ. I will have to defer to Secretary Orr, I am afraid.

Mr. ORR. So, yes, it is my job to try to answer a complicated question. The numbers you saw, of course, are correct as we know them. The project has encountered some serious delays, and there have been some management issues raised as well. The current state of play is that there is a new director-general who has been

named, Bernard Bigot. He was confirmed in early March. He has put together a plan that would, if accepted fully by all the members, correct the management issues that have been raised in the external reviews. We think that the plan includes the right elements, but obviously there is work to be done to implement that. The next steps include building a realistic timeline for completion of the project and a realistic budget. And we will, of course, be watching very carefully as all of that develops.

As you know, we are committed to 9 percent of the project costs, and the spending proposed for next year is consistent with what we think the rate that the project can absorb that funding. And I would also note that about 80 percent of that funding that we commit actually goes to make the parts, the equipment that we are committed to supply to the project, and so, therefore, it is actually spent in this country.

Senator FEINSTEIN. Well, it sounds to me like we have spent a billion—\$1.22 billion just now in getting ready to get a project put together.

Mr. ORR. Yes, it is fair to say, I think, that the design of the project in the early stages was not far along as it needed to be to provide realistic cost estimates, and that is being corrected now. That work has actually—the design work has gone on, but now, of course, they have to implement it.

#### DEPARTMENT STAFF PARTICIPATION

Senator FEINSTEIN. Yes, I guess this is a problem that I certainly have is that you spend a billion, \$1.22, and you do not really have a project yet. My conclusion is, Mr. Chairman, we ought to take another look at it, but I will move along.

The GAO has been working with DOE staff to review current practices and share advice and best practices based on their experience. GAO reports that in several instances, DOE staff have been unresponsive or unhelpful. The GAO noted that regarding reports on cost estimating and analysis of project alternatives—here is a quote—“DOE’s unspecified open-ended date for responding to many of these recommendations may have indicated a lack of urgency or concern about the need to implement these recommendations.”

Mr. Secretary, can you instill a sense of urgency in your staff to change the management culture and move it to participating in this in an active way?

Secretary MONIZ. I will certainly look into this. We have made a point, in fact, of trying to speed up our responses. I hope those of you here in Congress have noticed that the responses have been—the time lag for response has been decreased dramatically. We have done that with the DNFSB. I will now look into the GAO as well.

#### AMERICAN CENTRIFUGE PROJECT

Senator FEINSTEIN. Okay. And the last question is about the American Centrifuge Project, and I do not like to ask this, but I am going to. It was recently announced that Dan Poneman will become the new CEO of Centrus, the company formerly known as USEC. He served as Deputy Secretary of Energy from 2009 to 2014, serving under both Secretary Chu and yourself. He was heav-

ily involved in decisions to keep USEC afloat, particularly when that is just what was being done. It was not meeting its goals or timetables as I understand it.

I understand that there are restrictions on Mr. Poneman relative to his contact with DOE for the balance of this Administration, but this seems to ignore his potential influence with career bureaucrats. And I am really less concerned about the optics for Mr. Poneman than I am the Department's. And given Mr. Poneman's direct role at DOE in advancing USEC, how can anyone fully trust a DOE or contractor decision which benefits Centrus?

Secretary MONIZ. Well, I can assure you, first of all, that we did make sure that Mr. Poneman had a refresher course on the restrictions. We have also made sure to distribute those guidelines to those in the Department. We will certainly try to adhere absolutely to that wall as called for in those restrictions. We will be having to make—as you infer, we will be having to make some difficult decisions going forward. You mentioned the ACP, for example. That is an area combining our enrichment and tritium studies. We will be coming back to the Congress soon, and that will cause implications for what is the future of that project. But I can assure you that we will be having no content—

Senator FEINSTEIN. Is USEC able to perform adequately at this point?

Secretary MONIZ. Well, I cannot get into the company's because I do not know the company's overall posture. But I would say on the ACP, as you know, we took that away from them and actually through Oak Ridge we are managing this project. But in the meantime, the former USEC employees who ran those machines are the ones that we need to hire to keep the machines running until we make a decision.

Senator FEINSTEIN. Thank you. Thank you, Mr. Chairman.

#### SPENT NUCLEAR FUEL STORAGE

Senator ALEXANDER. Thank you, Senator Feinstein. I will now continue a round of questioning, and I will take five minutes, and then go to Senator Murray, and then we will continue.

Mr. Secretary, I want to focus during this time on used nuclear fuel. We have got Senator Murkowski here, who is the chairman of the Energy Committee. Senator Feinstein is still here. Senator Murray I know is interested in used nuclear fuel because of the Hanford situation. Federal law says Yucca is—I am going to ask you a large question and then just ask you to—and then I am going to listen.

Yucca is the current repository. I fully support the current licensing process, but Yucca's legal capacity is 70,000 metric tons of used fuel. We have already more than that, so we have more than enough used fuel sitting safely at sites around the country, more than enough to fill up Yucca Mountain. So the conclusion we have come to is that whether you are for or against Yucca Mountain—I am for it—we need new repositories.

We also have a small amount of used nuclear fuel from the Navy reactors and submarines, and we have canisters of high-level waste from the Manhattan Project. And you made an announcement yesterday about defense and commercial fuel, which is relevant to this.

So it is clear we need new and temporary and permanent storage sites.

So in addition to Yucca Mountain, we have the idea of the pilot program, which comes from the Commission on which you serve. Senator Feinstein and I will include that in the Energy and Water bill. There is the legislation that we introduced yesterday together for a long-term solution, also based in large part upon the President Commission's recommendations. That is two.

Another option that may be available is a private consolidated storage site like the one recently proposed by a group from West Texas, who have indicated their interest in filing with the Nuclear Regulatory Commission for an application. What they have said is that they might build a private site in units of 10,000, maybe 5,000 tons, but up to 40,000. So the site would be able to hold about half as much as Yucca Mountain could if it were open. There is \$36 billion of money we have collected from electric bills of Americans to pay for all of this. The Department of Education is supposed to be taking titles.

So I am trying to get in my mind of these various proposals which one is likely to come on first. I know Senator Feinstein, for example, would like to get used fuel out of California from closed plants to somewhere else. There are seven other sites like that around the country.

So here are my questions. How realistic is the possibility of an additional private repository? Do you think the Nuclear Regulatory Commission needs any authority to license private sites like the one proposed in Texas? Would you need any new authority for the Department of Energy to be able to store used fuel at a private facility assuming you are taking title and storing it there? And will you work with the subcommittee to give us technical advice on whatever we might do in the appropriations bill that would keep this option on track if it is a real option?

Secretary MONIZ. Thank you, Mr. Chairman. First of all, I completely agree with the inference that you made that we need a comprehensive approach to both spent fuel and to defense fuel, and we need to look at storage facilities, repositories, and in the context of yesterday's announcement on defense waste, potentially even other geological disposal pathways.

In terms of the timing, I think it is pretty clear, and the Administration policy document of January 2013 reinforces the Blue Ribbon Commission report. And I think your legislation that moves towards a pilot scale storage facility is probably the thing that we could bring on the fastest, 6 to 8 years perhaps. Now, we had always been envisioning that in the context of a Federal facility that the Blue Ribbon Commission did and Administration policy did. I think this new dynamic by the announcement out of Texas that you referred to is extremely interesting, and we want—first of all, we want to learn about that.

With regard to authorities, I think I am not in the best position to talk about NRC, although NRC has worked in some similar areas before. But with regard to our own authorities, I would say that I do not quite know yet what those authorities would be, but I can certainly imagine that, especially for a private sector facility, that a certain clarification that might come out of the legislative

process could be quite desirable. And we are certainly happy to work as often as you would like in terms of discussing the technical aspects of this.

Senator ALEXANDER. Well, thank you for that. My time is up, but we would, I think speaking for Senator Feinstein and myself—and I will let Senator Murkowski speak for herself—we would be interested in working on that in the next 3 or 4 weeks to see, (A) what might appropriately be included in the appropriations bill, if anything; and (B) what might need to come before Senator Murkowski's committee with the whole objective, if it is—it sounds to me like you believe the private facility could be a realistic option. Then given our desire to find a place to put used nuclear fuel, we need to know what else do we need to do to put you in a position to move that option along.

Secretary MONIZ. Yes.

Senator ALEXANDER. Senator Murray.

#### HANFORD RICHLAND

Senator MURRAY. Well, thank you very much, Mr. Chairman. Secretary Moniz, in your testimony you said that it will be decades before DOE finishes cleanup at most of our difficult nuclear waste sites. The prospect of another 20, or 30, or 40 years passing before the Federal Government completes this critical work at the Hanford site in Central Washington and other sites throughout the Nation is pretty unacceptable.

And it strikes me that year after year Congress receives budget requests that fail to meet the necessary investments to fulfill the Federal Government's legal and moral obligations here. And I am really concerned that the Administration has once again cut Hanford Richland Operations by nearly \$100 million just like last year. Tell us how the Administration is going to meet its legal commitments under the Tri-Party Agreement at this significantly reduced funding level.

Secretary MONIZ. Thank you, Senator. First, of course, I would like to talk about the entire Hanford site where we have a net \$100 million increase in the budget, but admittedly Richland is down \$100 million, and essentially the WTP is up for us to move that forward.

On the Richland side, I would note that we have made considerable progress opening up a good portion of the river corridor and with the budget as proposed. And the EM budget proposal is \$200 million above last year's proposal to the Congress, but about equal in appropriation. But going back to Richland, we will still—I believe we are going to finish the plutonium finishing plant down at this lab. But we will continue to clean up the groundwater in the central plateau. We will continue to make progress along the corridor. So I think it is a strong program. Obviously the best, you know, optimizing within our overall program.

Senator MURRAY. Well, I appreciate that, but there are several high-risk projects close to the city of Richland, close to the Columbia River, and Energy Northwest that remain. I am really concerned the fiscal year 2016 budget request would hamper this cleanup. And in the case of the 324 building and the 61810 burial grounds, they would be stopped, or mothballed, or kicked down the

road. Those are projects that are well underway, and we have spent \$209 million on them combined. And it seems to me that DOE is now trying to pull the plug on them, which creates a safety risk, a cleanup delay, cost increases, and missing those Tri-Party Agreement milestones.

The budget request that you gave cites technical challenges when rationalizing the cuts to those projects, but no one has been able to pinpoint for me what these technical challenges are. So what is holding you back from continuing to make progress on those projects?

Secretary MONIZ. What I would suggest is maybe the best thing is if we come in and talk with you or your staff as you prefer and try to work through the whole program.

Senator MURRAY. Well, I mean, our subcommittee fought to provide \$45 million in additional funding for those projects last year. And why has DOE not used that money to forward these really critical projects.

Secretary MONIZ. Again, let me look into in more detail, Senator, and get back to you, and see what we can do to advance those.

Senator MURRAY. Well, I would like that part of the public record as well, so I think it is really important for this committee to understand it. And I would hope that we can answer in writing as well so that we can have that as part of the record.

Secretary MONIZ. We would be happy to. Thank you.

#### YUCCA MOUNTAIN

Senator MURRAY. Okay. And let me just mention one final issue. The Nuclear Regulatory Commission completed its Safety Evaluation Report earlier this year and found that it would be safe to operate Yucca Mountain as its nuclear waste repository, confirming what more than 30 years of independent studies have found. While the fiscal year 2016 requests no funding to restart the adjudication process with the Atomic Safety and Licensing Board Panel, should Congress provide such funding, I really urge you, Mr. Secretary, to follow the congressional intent as directed in the Nuclear Waste Policy Act and defend DOE's Yucca Mountain license application as an active, engaged participant in those proceedings.

Secretary MONIZ. Do you want a response or not?

Senator MURRAY. I am hoping you just nodded.

Secretary MONIZ. Sorry.

Senator MURRAY. I hope you just nodded. Thank you, Mr. Chairman.

Secretary MONIZ. May I just note, Senator, that we do have about \$17 million of unobligated carryover funds and additional obligated carryover funds. So right now, we have no request from the NRC, and we think that in a contingency we have the funds to cover any work that would be needed.

Senator MURRAY. Okay. Thank you very much, Mr. Chairman.

Senator ALEXANDER. Thank you, Senator Murray. Senator Lankford.

#### LIQUEFIED NATURAL GAS EXPORTS

Senator LANKFORD. Thank you, Mr. Chairman. Good afternoon, gentlemen. Questions about the LNG (liquefied natural gas) ex-



ports. I know that DOE has a new process on that working with FERC (Federal Energy Regulatory Commission), now putting FERC first in line and all that. I want to know how that is going at this point, and if any additional legislation is needed to help expedite the process and to make sure that is a consistent process?

Secretary MONIZ. Thank you, Senator. Let me first say that I would not phrase as it having put FERC first in line in the sense that FERC was always in the line in terms of needing to do the EIS. What we did is to say that when projects are ready, which is being interpreted as having gone through the EIS process, that we will then have enough information for our public interest determination, and then we will act.

Senator LANKFORD. Right. So how is that going?

Secretary MONIZ. On our side it is going quite well. In the last turnaround from the EIS at FERC, we responded literally within a day actually. So I think once that information is available on environmental impact, I think we are being pretty expeditious.

Senator LANKFORD. Is there a need for additional legislation to put timelines on some of the permitting at this point, or where do you stand on that?

Secretary MONIZ. Well, as we have said consistently, I think we are executing very expeditiously. I understand that Congress has some desire to provide some certainty over some years, and with reasonable timing we could work with that. But I think we are already responding quite well.

#### AGENCY DUPLICATIONS

Senator LANKFORD. Just the geopolitical issues that we face right now with the export of LNG, you are extremely aware of as well, and some sort of certainty to our allies and other individuals that are interested in picking up that fuel is extremely important right now based on a lot of our negotiations.

Let me ask a couple of things on some agency duplications and just how you manage these and how they work together. I want to note the lanes of this. DOE has an Office of International Affairs. The State Department has a Bureau of Energy Resources. The DOE has the Indian Energy Policy and Program Division. The Bureau of Indian Affairs has a Division of Energy and Mineral Development. How is that going as far as making sure that we have clear lanes of responsibility so we do not have overlap and duplication? Obviously we have—both those things we are interested in as a committee, but we do not want to fund them twice basically. There are other examples I can bring to bear as well. How do you manage that overlap of programmatic definitions and cooperation where you need it?

Secretary MONIZ. Yes. First of all, obviously number one is we do have strong coordination. For example, the head of our International Office and the head of the State DNR typically meet once a—

Senator LANKFORD. Are those unique lanes of responsibility or do you feel like they are overlap?

Secretary MONIZ [continuing]. And then clearly having different lanes of responsibility. Much of our responsibility ends up being driven by our underlying technical energy technology expertise. So,

for example, if one takes China, there we have the clean energy research center we put in some funds, China matches, industry matches all of that. Our funds are spent on American scientists and engineers. It is a very technology driven program. That would be a DOE activity as opposed to some of the more, let us call it, geopolitical responsibilities at State.

#### CELLULOSIC ETHANOL

Senator LANKFORD. Okay. Let me ask you about a couple of other grants that are sitting out there. You had mentioned cellulosic and some of the advances in cellulosic ethanol. Did you mention that there are a couple of companies that are coming on board that are producing at this point that you are doing grants for, or is it some of the research and development?

Secretary MONIZ. It is certainly R&D as well, but, no, we also provided some grants to do some cost sharing to get commercial scale activities going. In fact, in the last year one in Iowa and one in Kansas will be producing about 25 million gallons of cellulosic.

Senator LANKFORD. Did we have grant money involved in the QER facility in Mississippi that went bankrupt last year? The largest cellulosic producer in the country closed in November of 2014 after multiple years of trying to make the technology work. What I am trying to figure out is if we are doing new grants to new cellulosic companies, have we learned the lesson of the cellulosic companies that already started, could not make it go, and closed?

Secretary MONIZ. Well, in general, I think we are having very, very rigorous processes in our portfolio management, strong risk management approaches. And I think our portfolios are performing well overall.

Senator LANKFORD. Sure, I understand that. Do you know if we had Federal dollars involved in the QER facility?

Secretary MONIZ. I do not know that. We could respond for the record.

Senator LANKFORD. It was the largest producer of cellulosic ethanol in the country when it closed. Obviously we are producing under a million gallons total in the entire country, and it was the largest of those.

Secretary MONIZ. Okay. We will look at that. Thank you.

Senator LANKFORD. Okay, thank you. I will yield back.

Senator ALEXANDER. Senator Udall is next. While Senator Feinstein is still here, I am going to ask Senator Murkowski as chairman of the authorizing committee if she has anything she wants to say before Senator Feinstein leaves, or if you have to leave early. I want to make sure you have a chance to ask your questions.

Senator MURKOWSKI. Well, I do not want to preempt my colleague on the other side, but I do want to make the commitment to you, Mr. Chairman, and to your ranking member on this subcommittee that as we move forward with this legislation that we have worked so cooperatively on, that I really do hope that we have full cooperation and participation from the Secretary and from his team in identifying how we can truly move this forward. So if it is something where we need to understand a little bit more about what this private entity may offer and what needs to be done to facilitate that, if that is the best way to go. Know that I, too, am

interested in advancing legislation that will begin to make a difference as we deal with our nuclear waste.

So I do not have a specific question to the Secretary because quite honestly, Mr. Chairman, mine would have just mirrored yours exactly in terms of now that we have this legislation out there, what is the best way to proceed from the Secretary's perspective. So I got that answer from him.

Senator ALEXANDER. Well, thank you, and we will come back to you then.

Senator FEINSTEIN. May I add one thing?

Senator ALEXANDER. Sure, of course.

Senator FEINSTEIN. Is it necessary for anything for him to proceed? Could he unilaterally approve a Texas facility I think is a question worth asking.

Senator MURKOWSKI. Yes.

Senator ALEXANDER. Well, the application will be before the Nuclear Regulatory Commission—

Secretary MONIZ. NRC.

Senator FEINSTEIN. But who would make the application?

Senator ALEXANDER. They would make the application, but there are some—but, Senator Feinstein, there are some questions that probably need to be understood and resolved about—I think the NRC is ready to act on an application should it receive it. I think there are some questions that need to be resolved about whether the Department of Education is prepared and whether there are some things that we need to do make sure that they might be able to do it in a more rapid way. Is that a fair way to say it?

Secretary MONIZ. Yes, I think it is, Mr. Chairman, and I would add to that that part of it will depend upon things that I just do not know.

Senator ALEXANDER. Right.

Secretary MONIZ. For example, what would be the business model, and that might influence what kind of authorizations are required.

Senator ALEXANDER. Okay. Well, we will go to Senator Udall, and then we will come back to you, Senator Murkowski. If you have to leave, let us know, and we will work you in.

Senator MURKOWSKI. If I can go after Senator Udall, that is perfect. Thank you.

Senator ALEXANDER. Okay. Is that all right, Senator Cochran? Thank you, Senator. I feel like a ringmaster here. Thank you, Tom, for your patience, and we will go to Senator Udall, then Senator Murkowski, and then Senator Cochran if that is all right with Senator Cochran. Senator Udall.

#### WASTE ISOLATION PILOT PLANT

Senator UDALL. Thank you, Chairman Alexander. You are the ringmaster, and you are doing a very good job of it, and that is great. Secretary Moniz, wonderful to have you here and Dr. Orr, and appreciate very much your staff and how they have been working to ensure positive discussions with the State of New Mexico on the State's fines for the accident that occurred at the Waste Isolation Pilot Project (WIPP), and that Los Alamos was involved in. And I am hopeful that those discussions are going well.

But I just want to reiterate my view that the State of New Mexico has a regulatory role, and I think you understand this very well. This was something I fought hard for as New Mexico's attorney general. We actually won a lawsuit against the Department of Energy at the time. So I just want to take this opportunity to remind you as discussions continue, that this is a unique situation. You are dealing with the only State in the Union that has ever accepted a nuclear waste facility, and I am hopeful that a constructive dialogue over the State of New Mexico's fines for the Department can continue along that line.

Now, can you talk to us a little bit about working constructively to make sure this happens rather than heading into a litigation track, which could take many, many years I think, and are you committed to working with us to try to get that situation resolved?

Secretary MONIZ. Thank you, Senator, and I appreciate your interest and support in this area to the extent possible. Let me say that, yes, we very much would like to be able to resolve this with the governor, with the New Mexico Environmental Department, the discussions. Obviously I cannot go into the details here since they are part of a resolution pathway we hope, but we are very committed, and we are very encouraged that the discussions are going on at a very professional level. And I am hopeful we will be able to resolve this to the benefit of all the citizens of New Mexico and the Department.

Senator UDALL. Yes. No, that would be great. And as you know, the Accident Investigation Board report is expected to be released soon. Do you have any idea when that would be released on the accident?

Secretary MONIZ. I believe we are in the weeks time scale, I believe. I can go check on that. The technical evaluation was already presented to me.

Senator UDALL. Okay, good. And as you know, that contamination with the facility has been shut down. And so, I think it is very important that we see it be reopened safely, and I underline the "safely." And so, I am hoping that we take that cautious approach to make sure that workers are not at risk. And will you commit to ensuring DOE does not repeat these mistakes again and expose workers to unsafe situations as well as radioactivity?

Secretary MONIZ. Well, I can assure you that we are doing all that we can in that dimension. First of all, at the very beginning, frankly I insisted that we not set schedules before we understood what the issues were for safety because otherwise safety could be compromised. Now we feel comfortable in terms of how the actions are going. We have a plan in terms of sealing off the two panels, and we have a plan for looking at all the other barrels that have some of the elements that have been identified as the cause of the thermal reaction. So we need to keep going as fast as we can to make sure that all of those other barrels are safe. Every indication is they are. We have done a lot of work on them already in terms of putting into safe conditions.

B-61

Senator UDALL. Yes, and thank you for that work. And just a final question here on the B-61. I know you have made that a pri-

ority in the budget, but do you worry that the threat of sequestration might hurt our modernization in terms of the stockpile in the nuclear enterprise?

Secretary MONIZ. Absolutely, and, in fact, DOD and DOE, for our different but complementary responsibilities for nuclear security, have both said that sequestration caps will make it very, very difficult. Frankly, if the budget that we have requested in concert with the DOD and the Nuclear Weapons Council is reduced substantially, I think there is no doubt that we will have to work with DOD to push out military capabilities that they very much want.

In fact, in this budget, the B-61, we would try to probably hold that, but then the cruise missile, for example, would almost certainly have to get pushed out substantially, as we have already pushed out other parts of the stockpile refurbishment.

Senator UDALL. Thank you very much. Thank you, Chairman Alexander. Thank you, Secretary.

Secretary MONIZ. Thank you.

Senator ALEXANDER. Thank you, Senator Udall. Senator Murkowski.

Senator MURKOWSKI. Thank you, Mr. Chairman. And, Secretary, welcome before the committee.

Secretary MONIZ. Thank you.

Senator MURKOWSKI. I feel like I have got a second bite at the apple because you were before the Energy Committee not too many weeks ago, and I did have an opportunity to ask questions. I would ask you, I did submit a series of questions for the record. We still have not received responses on that, so if you could have someone to check on the status.

Secretary MONIZ. I will check.

Senator MURKOWSKI. And we had also hoped to have a hearing actually tomorrow, Thursday, on the QER and the release of that. And we had hoped—we figured that we were going to be setting this well enough in advance, so we have rescheduled that for the 28th of April. Are we going to be good with our timing so that you think we can proceed with that? We will have had a chance to look at that QER that is going to be before the Congress.

Secretary MONIZ. I think we will be good with that.

Senator MURKOWSKI. Okay, good.

Secretary MONIZ. You will have time to review it in advance as well.

Senator MURKOWSKI. Well, we are looking for it with great anticipation—

Secretary MONIZ. Thank you.

#### ARCTIC ENERGY SUMMIT

Senator MURKOWSKI [continued]. As you and I have discussed. We are hopeful that there will be a useful framework as we work on our energy legislation, so we will look forward to that. At the Energy Committee hearing, I did ask you about the Arctic priorities contained within the Energy Department's budget, and I am continuing to advocate on these issues that you know I believe have great significance and priority.

We have an Arctic Energy Summit that is to be scheduled. It is scheduled already. It is going to be in Fairbanks from September

28th through the 30th. I do not know if you or your staff have been notified of this, but as I have invited you to Alaska to review our renewable energy resources, I would also invite you to attend that summit or perhaps a designee if that would be appropriate. I think it will be timely, and, again, an issue that you have and I have discussion on.

Secretary MONIZ. I will certainly look into my schedule, but certainly I can assure you we will have senior representation.

#### NATIONAL LABS

Senator MURKOWSKI. Great, I appreciate that. Let me move to our national labs. In recent weeks we have seen both this congressionally directed commission to review the effectiveness of our national energy labs as well as the Task Force on National Labs highlight the level of bureaucracy that exists between the Department and the labs. That is something that I think most of us realize we did not need a report or a Commission to determine that. We know that it is an issue.

Where do we go from here with that? What do we do with these latest recommendations to ensure that we do have just a greater connect or synchronization here?

Secretary MONIZ. Well, I think we are making progress, and I think that was acknowledged in the reports, but there is more to do. I think the major overarching critique is that the system has become too transactional as opposed to kind of outcome oriented. And we have—frankly from day one I created the Laboratory Policy Council and the Laboratory Operations Board to address these issues, the bringing of—I would say kind of restoring a more strategic relationship between the Department and the labs. And I think we are getting some traction, but we have to keep at it and sustain it. That is on the strategic plane.

But then one comes to the operational level, we have two task forces, one working and one just about to be charged, which address these transactional issues. So one is a task force headed by the head of the Office of Science looking at what are the streamlining actions we can take on the M&O contracting approach, and they will be reporting reasonably soon. And our management and procurement people are all involved in that, and so I am hoping for some interesting steps that we can take quickly.

But then we are about to form another group, which is more the “revolutionary group,” which is going to take one particular site, which has some simplicities in its management structures, governance structure, with regard to some of the other laboratories. And at least in that case look to do a pilot program for perhaps tweaking the very structure of the M&O contract to help get around some of those transactional issues.

Senator MURKOWSKI. Well, it has long been a problem, so I hope that this revolutionary approach pans out.

Secretary MONIZ. That was in quotes.

#### ADVANCED TECHNOLOGY VEHICLES MANUFACTURING DIRECT LOAN PROGRAM

Senator MURKOWSKI. I understood it, and I put it in quotes as well. I want you to notice. Very briefly on this last question. This

is the 48th consecutive month that the ATVM Direct Loan Program has been unable or unwilling to finalize a new direct loan for an auto maker or a component supplier. So it really begs the question in terms of why we would continue to have this program on the books, why we would continue to have taxpayer support there.

I have been critical of this program I think you know, and have questioned the need and the justification for a direct loan program for auto makers and these component suppliers. So know that this is something that I am looking at. I do not know how many applications you actually have that have been submitted to DOE, and whether or not you are even considering making a yes/no decision coming up. But you look at that program in 48 months, and there has not been a loan made. It does cause you to question why we are engaged in this.

Secretary MONIZ. I certainly understand the question. Let me just say that I think we have restructured not only the ATVM, but the loan programs as a whole. And on the ATVM Program, I think it was about a year ago when I and Peter Davidson went out to make it clear that for one thing, component suppliers were certainly eligible as they face retooling challenges for the highly efficient vehicles that we need by 2025. And secondly, that the program—that ATVM Program had some problems in terms of its dealing with the applicants. I believe we have cleaned that up, and we are getting a lot of interest. We have an interesting proposal stream, and I think you will see some outputs pretty soon.

Senator MURKOWSKI. Well, Mr. Chairman, thank you for allowing me a little extra time. I want to note we have a group of young Alaskans that are part of the Close Up Program that have been watching this. I told them that while nuclear waste is not necessarily something that we are worried about in Alaska right now, these are national problems, these are national issues, and these kids are getting a firsthand look at it.

Senator ALEXANDER. Well, and they are getting a chance to see the chairman of the Senate's Energy Committee, which is very important to Alaska, who is also a member of this committee. So we welcome them. We are glad they are here. Thank you, Senator Murkowski.

Senator MURKOWSKI. Thank you, sir.

Senator ALEXANDER. And thanks to Senator Cochran, who is chairman of our whole committee, for deferring to other Senators. And we will call on him now, then we will go to Senator Shaheen.

#### SPENT FUEL STORAGE

Senator COCHRAN. Thank you, Mr. Chairman. Mr. Secretary, I was looking through the notes that I have been given by my staff before the hearing, and we had been advised that there was serious consideration given to placing in some Mississippi reservoirs a repository for nuclear waste. Those who are worried about that from a public safety point of view are opposed to even, you know, talking about it, much less seeing it happen because of fears, the fears of the unknown in large part, but there may be reasons why they are justified. Could you give us a status report here or submitted for the record, whatever your choice is? I would like to know some-

thing about the status now, and maybe something a little more elaborate to put in the record.

Secretary MONIZ. Okay. Thank you, Mr. Chairman. First of all, I was aware—I think it was about a year ago when some Mississippi community expressed in a storage facility and others expressed lack of interest. But more generally, in our fiscal year 2016 budget request we have about \$30 million requested to start a consent-based process to reach out to communities, and States, and regions to see about potential interest or interest in potentially hosting a storage facility, above ground storage if you like, or potentially a repository.

So we will be—let me be very clear. We do not have the authority to actually implement, to build a storage facility without congressional action, but we can move on these early stages and deal with communities, provide information, and see if they would like to then be a part of a process going forward.

Senator COCHRAN. Have you developed any sort of schedule in terms of when you expect to make a decision as to what you would recommend?

Secretary MONIZ. No, I am afraid that is probably too unclear at the moment, but we would like to move out in this calendar year for sure with this outreach to communities. It is not only about storage and repositories. It is also about transportation issues, et cetera. So we would really like to start laying the groundwork for what will be a set of consent-based facilities for managing nuclear waste.

Senator COCHRAN. Is there contained in the budget request that has been submitted by the Department any request for funding for anything, any activities?

Secretary MONIZ. Well, the \$30 million that I just mentioned just for this kind of initial planning and reaching out to communities. So that is the near term thing, and we envision having some town hall meetings, et cetera.

Senator COCHRAN. Thank you.

Secretary MONIZ. Yes.

Senator ALEXANDER. Thank you, Senator Cochran. Senator Shaheen.

#### THERMAL BIOMASS

Senator SHAHEEN. Thank you, Mr. Chairman, and thank you, Secretary Moniz and Dr. Orr for being here this afternoon, and for your service to the country. Secretary Moniz, I read with great interest the President's recent executive order planning for Federal sustainability in the next decade. I was pleased to see that it recognizes thermal power as one of the ways in which the Federal Government can address its energy needs. And as I know you know, because you are from the northeast, we use a great deal of home heating oil in the northeast. New Hampshire has the second highest percentage of homes using home heating oil. And one of the exciting things about thermal biomass is that it offers an alternative for homes and businesses in New Hampshire, and also contributes to our timber economy in the State.

And I have had a chance to visit the White Mountain National Forest supervisor's office in Campton, New Hampshire where they



have installed a 90 percent efficient gasification pellet boiler system. That has been very beneficial to them. And so, I wonder if you could talk a little bit about the potential that you see in thermal biomass and what the role of DOE can be in promoting that or encouraging its use, not just across the Federal Government, but in other ways that are beneficial to homeowners like in New Hampshire.

Secretary MONIZ. Thank you. Well, thermal biomass, of course, it tends to be regional in terms of its attractiveness.

Senator SHAHEEN. Right.

Secretary MONIZ. And certainly in New England there is a long history of doing it in industry—the paper industry, et cetera, forestry. Then there is a second dimension comes in to co-firing, for example, in parts of the country with, for example, coal plants. One way of addressing CO<sub>2</sub> emissions is by co-firing. In fact, some even would say that with enough biomass co-firing and capture, one could even have negative CO<sub>2</sub> emissions. So that is a very interesting development.

And then as you refer to the developments in terms of pellets in pellet stoves is also something that actually has a non-trivial potential if it were fully exploited. But these are all interesting areas with—

Senator SHAHEEN. What do you mean by a non-trivial potential?

Secretary MONIZ. Well, I think in the sense of participating—I mean, producing essentially heat, oil, electricity at a significant level, not 50 percent of electricity or heat, but not, .5 percent either. So somewhere in between.

Senator SHAHEEN. And can you talk about the role of the Department of Energy in encouraging, looking at the use of thermal biomass throughout the Federal Government and what kind of an alternative it might provide, and what other opportunities there are for DOE to help educate people about those opportunities?

Secretary MONIZ. I think there are some programs that have gone on in terms of also helping support pilot semi-commercial scale projects, especially with wood biomass. But I have to say perhaps we should go back and look at the question, whether we need to take a more coherent view of that, and carry out some of the educational activities that you said. I do not know, Lin, if you want to add anything.

Mr. ORR. I do not have anything to add.

Secretary MONIZ. Okay, thank you. We will do that.

#### SMART MANUFACTURING TECHNOLOGIES

Senator SHAHEEN. That would be great. I would encourage you to do that. I know that there is legislation that has authorized but has never been appropriated money to encourage some districting through biomass. So let me now switch to smart manufacturing, again manufacturing, and the re-emergence of a strong manufacturing based in this country is very critical to our economy. And one of the concepts that seems to be most promising to encourage manufacturing is the concept of smart manufacturing, the encouragement of new technologies to help with that.

Can you discuss what the potential is for deploying smart manufacturing technologies and what DOE's role might be in that?

Secretary MONIZ. Certainly. The smart manufacturing is one of a number of kind of enablers of a next generation of manufacturing. Certainly one of the—in terms of DOE, a specific initiative is that of establishing these national manufacturing initiatives. And we have done so while we worked with DOD to establish a pilot in Ohio for 3-D printing. But, again, for example, our Oak Ridge Laboratory, for the chairman, he knows very well. Our Oak Ridge laboratory, for example, working with a small, private company printed the first car using that technology. We then established another one on wide band gap semi-conductors, another on composite materials. And now we are in the process of running a competition for one on smart manufacturing, integration of sensors, controls, real time modeling, et cetera. And we think these kinds of technologies, if we propagate them, and that is why these institutes are really alliances of a number of academic institutions and companies that we have to get this technology out, not only to the very biggest companies, but to the mid-size companies so that they can compete.

Senator SHAHEEN. Thank you. My time is up. Thank you, Mr. Chairman.

Senator ALEXANDER. Thank you, Senator Shaheen. Senator Graham.

Senator GRAHAM. Thank you, Mr. Chairman. Mr. Secretary, thank you for your service. From my two cents worth, I think you are doing a very good job.

Secretary MONIZ. Thank you.

#### SEQUESTRATION

Senator GRAHAM. I hope that does not hurt you with the White House. But in 30 seconds—you may have already done this—can you tell us what sequestration will do to your Department if we do not find a replacement for these cuts?

Secretary MONIZ. Yes, sequestration would be very, very harmful. I think we would see a repeat of what we saw a few years ago. And earlier we discussed it particularly in terms of on the defense side, that our Stockpile Stewards Plan simply could not be executed to meet military capabilities on the schedule as desired.

On our civilian side as well, I should say, because it was also said earlier that we are way under investing in clean energy technology. So it is on both sides, certainly on the stockpile side, that we have discussed before. It blows the schedule.

Senator GRAHAM. And the bottom line is that our nuclear deterrent would be compromised.

Secretary MONIZ. Yes. We could not meet the dates that DOD is looking at to meet their military requirements.

#### MIXED OXIDE FUEL FABRICATION FACILITY

Senator GRAHAM. I am not so sure that is a message we want to send any potential enemy of the country. My favorite topic, and I am sure yours, MO<sub>x</sub> (Mixed Oxide Fuel Fabrication Facility). So just for the record, the MO<sub>x</sub> Program is an agreement between Russia and the United States to dispose of 34 metric tons of weapons grade plutonium. It started back in the 90s, right?

Secretary MONIZ. Each.

Senator GRAHAM. Yes.

Secretary MONIZ. Yes.

Senator GRAHAM. That is equivalent to 17,000 warheads someone told me. Is that about right?

Secretary MONIZ. Yes.

Senator GRAHAM. That is a lot of weapons material. And the goal is to take that off the market forever and turn it into commercial grade fuel here, the MO<sub>x</sub> Program.

Secretary MONIZ. Correct.

Senator GRAHAM. Take a sword and turning into a plowshare.

Secretary MONIZ. Correct.

Senator GRAHAM. In 2010, we signed an amendment to the agreement with the Russians where we pledged to use MO<sub>x</sub> as the disposition path.

Secretary MONIZ. Correct.

Senator GRAHAM. Taking weapons grade plutonium, blending it down to create commercial grade fuel that would supply our reactors. So at the end of the day we are about 60 percent complete, is that right?

Secretary MONIZ. On the MO<sub>x</sub> fabrication facility. There are other facilities as well.

Senator GRAHAM. Yes.

Secretary MONIZ. Right.

Senator GRAHAM. Okay. So we have had a funding problem. I want to reduce costs. There are some studies being done as an alternative to MO<sub>x</sub>. When can we expect those studies to be submitted to the committee or to the Congress?

Secretary MONIZ. Well, the first study is due April 15th, and we are hoping to meet that date.

#### THE FUTURE OF NUCLEAR POWER

Senator GRAHAM. Okay, thank you. And I just want to thank you for helping us the best you can to lower costs. But as the Chairman knows, this is a very big deal for South Carolina. We have agreed to be a partner with the Federal Government, to be the site that would accept the 34 metric tons of weapons-grade plutonium, and build and utilize the technology that would turn it from a sword to a plowshare.

I do appreciate the President's budget this year. It is better than last, and I know we have got some out-year costs that we have got to deal with, so I really appreciate your effort to work with us. And I do not believe there is a viable alternative that is cheaper or practical, so thank you very, very much.

In terms of the future of nuclear power in this country, how would you evaluate the future of nuclear power in this country, and particularly on the waste side dealing with nuclear waste? What do you see happening in the coming years?

Secretary MONIZ. Well, with regard to the future of nuclear power plants, first of all, I would just mention I think it is very important how the plants in Georgia and South Carolina end up coming in—with regard to budget and schedule, there have been some problems, but we will see how that ends up. Another direction, small modular reactors could be very interesting as well on the—

Senator GRAHAM. Are you open-minded to that concept of small modular reactors?

Secretary MONIZ. Absolutely.

Senator GRAHAM. Yes, it makes perfect sense.

Secretary MONIZ. I am very enthusiastic that we find out what the cost is, et cetera. They have very attractive features.

Senator GRAHAM. I agree.

Secretary MONIZ. On the waste side, well, we discussed it a little bit earlier, and I would say that we think we have to move out on three fronts. It used to be two perhaps, and yesterday it became three. The one is we should be moving towards interim storage, and especially a pilot project, as soon as we can. We discussed earlier that may have the flavor now of being a private as opposed to Federal. We are open to discussion on that.

We are continuing to push for the science based on ultimate geologies. We will need probably multiple repositories eventually for civilian spent fuel, especially if the fleet grows.

Senator GRAHAM. And would you encourage it to grow? Would we be smart as a Nation to increase our nuclear power production capabilities?

Secretary MONIZ. Well, as you know, I am very committed to a low carbon future. And today, of course, nuclear—

Senator GRAHAM. You cannot get there without nuclear.

Secretary MONIZ. Nuclear is the biggest contributor today. And, of course, if we do not have nuclear in the future, it certainly makes it a lot harder to get there. And finally as we announced yesterday, the President has authorized us to start planning for a separate disposal track for defense waste, which we think is a very, very good move for a whole variety of reasons.

And I might just add in pursuing that, clearly a small repository would be needed, but there may even be alternative geological pathways, like the bore holes, so it gives us more flexibility. And I think the whole system will move ahead sooner in this approach.

Senator GRAHAM. Well, thank you for your service. Dr. Orr, thank you for your contributions to our country. And I look forward to working with the Department. I think you are doing a good job, and we have got some challenges, but I look forward to working with you and the committee.

Secretary MONIZ. Thank you.

#### NUCLEAR REACTOR LICENSE RENEWAL

Senator ALEXANDER. Thank you, Senator Graham. Dr. Moniz, I know you have somewhere to go. I will ask a few more questions of you. Following up on Senator Graham's comment, are you concerned—the Center for Strategic and International Studies reported that perhaps as many as 25 of our 99 reactors might close by 2020. And in talking with utility executives, I am a little surprised that a number of them are not planning at the moment on asking for renewal of their licenses from 60 to 80 years. How many reactors do you think we will have in the United States 10 years from now?

Secretary MONIZ. Well, I think—I do not want to speculate on the number. I think that CSIS number is probably rather on the high side. But we do know that there are certainly another handful

or so at risk over these next years, depending on the outcome of various regulatory structures, et cetera.

This question of 60 versus 80 years, I would just note that if reactors go to 60 years, let us just say 60 years, then the large wave of retirements would be starting around 2030. That next decade would see a lot of retirements. And that is why if you run that movie back and ask about capital planning decisions, et cetera, at utilities, et cetera, having options understood in that 2025 or so timeframe is really critical. And that applies to the experience with building Gen 3 plus large plants. It also applies to the small modular reactors, and that is why our program on the SMRs has been really geared to trying to get something operating in the first half of the next decade so that it is there in time for this critical decision period potentially.

#### SMALL NUCLEAR REACTORS

Senator ALEXANDER. Well, I will give you credit for being a consistent supporter of the small reactor research and support for certification and licensing activities, even though we have been disappointed with one of the grants, which was not your fault. The Department has selected new scale power for the Second Technical Support Award Program, and your budget supports that. Are you at a point yet where some of the money this next year would be used to help pick a site? Do you know a site yet for the new scale project?

Secretary MONIZ. No, we do not, but I believe they have announced the intent to file at NRC at the end of next year.

Senator ALEXANDER. So what will happen in the next year? What is the status of the Small Reactor Program? Where are we?

Secretary MONIZ. Well, the status is for them to complete all of the design engineering work to the place where they can apply to NRC. Being a light water-based reactor, we hope that that could then go, which is where NRC, of course, has immense experience, we hope that that could go reasonably quickly and still hit something like a deployment date of, you know, 2022, 2023.

Senator ALEXANDER. Are small reactors an option you think will be important for the United States as it seeks to provide more carbon-free base load electricity generation?

Secretary MONIZ. It certainly could be. I think it is going to depend upon the cost performance. But if the cost performance is good, I see significant potential because it certainly makes a much more attractive financing approach.

#### WIND

Senator ALEXANDER. There are a variety of obstacles to nuclear plants. The cost of regulation is one. The low cost of natural gas is another. A third, according to some of the utilities, is the big wind production tax credit in markets which are not regulated. In some markets, the production tax credit now in its 22nd or 23rd year is so rich for the developers that they can actually pay the utility to take their electricity so the developers still make a profit. And this has the effect, according to the utilities, of what they call negative pricing, and it is one more pressure—it undermines their

ability to operate other kinds of base load activities like coal or nuclear power.

So the bottom line of that is one contributing aspect in some markets of the difficulty of economically operating a nuclear plant, much less building a new one, is the high subsidy for wind, allowing it to undercut nuclear. Secretary Chu in 2011 in response to my question said that wind was a mature technology. It costs us about \$6 billion a year every time we renew that big production tax credit. I would like to be spending the \$6 billion on energy research instead of a subsidy that 22 years ago jump started technology. Usually we measure maturity in terms of age.

If Secretary Chu, a Nobel Prize winning scientist, said a few years ago that wind power is a mature technology, would you not agree that today it must be an even more mature technology?

Secretary MONIZ. I do not follow the logic.

Senator ALEXANDER. Well, if I am older than you are, and we go 3 more years, am I not likely to be mature if I am older? If wind was mature in 2011—

Secretary MONIZ. The clock runs, I agree.

Senator ALEXANDER. If wind was mature in 2011, is it not even more mature today?

Secretary MONIZ. But I would just note that—okay. I do not know exactly what Secretary Chu was—how he was referring to—

Senator ALEXANDER. I asked him the question is it a mature technology. He said yes. That was 2011. Do you think it is a mature technology?

Secretary MONIZ. Well, I would say the technology continues to evolve in very important ways. It certainly is not at its asymptotic performance, if you like. The continued increase in turbine size and blade size, et cetera, the ability to work at lower wind speeds, these are all critical developments that are still going on.

Senator ALEXANDER. Well, in 22 years, should wind not be standing on its own, especially if it is undercutting nuclear power? I mean, wind is 4 percent of our electricity after billions of dollars. Nuclear is 20 percent, but 60 percent of our carbon-free electricity. Why would we want to have any sort of policy that would undercut our ability to produce carbon-free electricity that is base load, like wind, like nuclear?

Secretary MONIZ. Again, I would say the Administration clearly supports the PTC, and the tax credit also helps incentivize not just the deployment of the same technologies, but of these evolving technologies that are very important in terms of efficiency, costs, and being able to work in a greater variety of wind speeds, for example.

Senator ALEXANDER. If you had \$6 billion, would you rather spend it each year on subsidizing a 22-year-old mature technology or \$6 billion of energy research?

Secretary MONIZ. I think I would have to think about that.

#### MERCURY TREATMENT FACILITY

Senator ALEXANDER. I hope you and the Administration will. Let me switch to a more local concern since I have got you captured here all by myself. Mercury containment is the highest environ-

mental priority in and around Oak Ridge in Tennessee due to releases into the East Fort Poplar Creek, which runs through the City of Oak Ridge. You have been attentive to that, and I want to thank you for that. It is very important as we move from concern about radiation, which is not completely gone, but to begin to pay attention to the mercury contamination.

I believe your budget request includes some funding to begin testing technologies to stabilize the mercury in the soil. We are going to need to build a new mercury treatment facility, which will be able to capture a majority of the mercury before it can escape into the environment. When does the Department project that the mercury treatment facility will be started and completed?

Secretary MONIZ. I had the impression it was in the next couple of years, but I will have to get back to you on that, Mr. Chairman.

Senator ALEXANDER. Could you get back to me on that?

Secretary MONIZ. Yes.

Senator ALEXANDER. That is the most important new priority.

Secretary MONIZ. I am sorry, I misspoke. 2022 is apparently the target date.

Senator ALEXANDER. For?

Secretary MONIZ. For completion and operation.

Senator ALEXANDER. 2022 is the target date for completion of the mercury treatment facility. Has it started yet?

Secretary MONIZ. I think it is going to start next year. It is in the project engineering phase right now.

Senator ALEXANDER. Design phase?

Secretary MONIZ. Design phase, yes. Yes.

Senator ALEXANDER. Thank you for that information. There is a big increase in the Department's budget request for cleanup. There is a big increase in the Department's request, but there is a decrease in the request for cleanup. In Oak Ridge, funding is down \$65 million. Do you suspect that that is likely to produce layoffs of workers who are involved in the cleanup, and if it were to do that, would you not agree that it is wasteful and inefficient to have to lay people off and then rehire them again?

Secretary MONIZ. Well, I do not know all the specifics, but I know that certainly part of it is in things like the funding requirements for, you know, contract and post-retirement issues in terms of what is the contribution there. But certainly we would not like to see any significant force reduction, but I will have to look in more detail at the analysis of that.

#### EXASCALE SUPER COMPUTING

Senator ALEXANDER. Would you take a look at that cleanup? That is extremely important to us. Moving on to another—an area where the Administration and the Congress have seen eye-to-eye is in Exascale super computing, and I want to thank you for the priority you placed on that. Give me a little update on this super computer we call Exascale. What is the first step toward developing it, and how much do you estimate it will cost, and when can we expect it will be billed?

Secretary MONIZ. First of all, let me note that there is an intermediate step towards Exascale, which is the so-called CORAL computing initiative. In fact, Oak Ridge will be the first site for that.

That will get up into probably the \$150 petaflop region, and that would be in 2017, 2018 timeframe.

Senator ALEXANDER. This was the announcement you made just recently.

Secretary MONIZ. About a month ago or so. Yes, that is right. And Oak Ridge, Livermore, and Argonne are the three in that CORAL initiative. The Exascale target date is maybe 8 years from now or so. A lot of work to do. The estimated cumulative costs will be \$2 to \$3 billion. We actually have a report from my Secretary of Energy Advisory Board, which we will be happy to supply to you, which is an analysis of this, and that is kind of the scale. And I think this year it is \$325 million or so, and times eight or 10, you get into that region. So it is a major effort.

I should emphasize that going to this scale, it is not about the flops. It is about just managing huge data, so this is really big data to be managed. There are energy management issues. We have got to reduce the energy consumption by a significant factor to make this practical. Many, many challenges, but I think we have got to be out there in front.

Senator ALEXANDER. Well, I believe you said it is not just who has the biggest computer. It is also who has the personnel to operate such.

Secretary MONIZ. Right, because how you operate the computer is very, very challenging.

#### SPALLATION NEUTRON SOURCE

Senator ALEXANDER. Moving on the Spallation Neutron Source at Oak Ridge, it is a one of a kind tool to discover how materials and biology work. It is the world's most powerful pulse neutron scattering facility. There are plans for a second target station at the Spallation Neutron Source. When does the Department plan to begin work on the second target station, and how much funding could be used this year to begin work on such a facility?

Secretary MONIZ. The Spallation Neutron Source, first of all, I just want to reinforce what you said. I mean, it is a real gem and a very, very critical facility for our science. There have been some issues, as you probably know, with the current target station, but I think we are confident that those issues will get resolved.

The second station, which I think would be more oriented towards coal neutrons, is in the queue, but it has to be prioritized now among other BES projects. So I have no fixed date that I know of.

#### CLEAN LINE

Senator ALEXANDER. One other question on wind. There is an outfit called the Clean Line Energy Wind Project trying to sell wind from Oklahoma to the Tennessee Valley Authority. TVA has projected that by 2020, it will be about 40 nuclear, so that is completely clean. About 10 percent hydro. That is completely clean. That is 50 percent. Its new plants are natural gas. That is pretty clean, much less emissions. TVA has got an emphasis on efficiency.

Why does it make sense to buy from 700 miles away when you can operate nuclear plants, clean up coal plants and gas plants, and use hydro power? Is that not an example of carrying things too



far? And I know that at least one State, Arkansas, has objected to the project. Does the Department plan to override Arkansas's objection, and will you allow eminent domain authority to be used for new transmission lines, which will have to be stretched, I guess, from Oklahoma to Tennessee to bring that wind power to the TVA?

Secretary MONIZ. Well, that is the question of the Section 1222 authorities in terms of interstate transmission lines. That project is now in the EIS phase, so we have to see what the environmental impact statement is, and then move forward to a decision. As you say, yes, it will cross Arkansas from Oklahoma to Tennessee.

#### BASIC ENERGY RESEARCH

Senator ALEXANDER. My last question is one in an area where we agree. The Administration and the Congress over the last few years have agreed on the importance of basic science funding. The Congress enacted the America COMPETES legislation a few years ago with strong bipartisan support, and President Bush's support. President Obama has continued that. We have talked about ARPA-E, which came out of the America COMPETES recommendation. I have said in statement I would like to double energy research. I have said a good place to get it would be to take it away from the wind tax credit. But do you have any comment to make, and the last question I will have for you, about the importance of increasing basic science funding for energy research in the United States and the advantages of it to our country's future?

Secretary MONIZ. Well, I certainly agree with you completely that; (A) it is critical, and (B) we are under-funding the American Energy Innovation Council already several years ago. That is the council composed of a bunch of rather recognizable CEOs, not directly in the energy business, that made that point. They actually suggested a factor of three rather than a factor of two in terms of the funding. That has been repeated by others, by PCAST. There is actually some simple arithmetic that tells you that this is kind of the scale that we should be thinking about.

So I think the outcomes of that would be enormous. I think I have every reason to believe that we have a lot of additional creative and innovative capability in our country to fruitfully use that kind of funding, as you said, the doubling perhaps of energy. I think it would be a leader, taking us into a low carbon future with technology costs just continuing to drop, drop, drop, coming down. It would give us great export potential. I think it is just a winner across the board. I totally agree with you.

Senator ALEXANDER. Well, Dr. Moniz, Dr. Orr, thank you both for coming. I would say, Dr. Moniz, I want to thank you for yourself in the Cabinet. That is not always an easy job, but you come to it very well prepared because of your previous service in Washington and your experience at MIT. And I think both of us—those of us on the Democratic and Republican side here—both appreciate your skill and the fact that you work hard to stay in touch in with Congress. So we will look forward to working with you in most areas to help create an environment where you can succeed, and we will look for your help on a whole variety of issues that we have discussed today, including technical advice on nuclear waste, which, as you can see, now has a pretty good head of steam—

Secretary MONIZ. It sure does.

Senator ALEXANDER [continuing]. On this committee and the authorizing committee, so we need to take advantage of that opportunity. So thank you for being here.

#### ADDITIONAL COMMITTEE QUESTIONS

The hearing record will remain open for 10 days. Members may submit additional information or questions for the record within that time if they would like. The subcommittee requests all responses to questions for the record be responded—be provided within 30 days of receipt.

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

#### QUESTION SUBMITTED BY SENATOR LINDSEY GRAHAM

*Question.* I applaud the Department of Energy's (DOE) work on the Grid Modernization Initiative, a critically important task for our Nation's security and economic strength. As such, Congress has previously funded the development of an industry-scale electric grid test bed. While I believe there is a continued need for such a facility to test additions to our electric grid and keep the grid secure, it seems prudent to examine whether such a facility already exists. Do you know of existing grid facilities that could serve in this capacity?

If such a facility does already exist, would the Department continue to require the development of a new facility? If so, what is the justification for duplicating limited Federal resources instead of partnering with existing facilities?

Separate from building a new facility, how does the Department plan to approach partnerships with any such facility for the testing and development of electric grid security going forward?

*Answer.* The Grid Modernization Initiative (GMI) is working to coordinate resources across the national laboratory complex and the Nation. A consortium of national laboratories is proposing an integrated network of test facilities across the laboratories, with connections to university and industry test facilities to perform coordinated testing that links testing assets across the Nation. The GMI is not proposing construction of new facilities. Rather, this effort reduces duplication, takes advantage of existing capabilities, and ensures that our resources are directed in coordination toward the multiple issues surrounding grid modernization. These issues include advanced control systems performance and protection, cybersecurity, resilience to natural disasters, new models and design platforms, and device integration and testing.

Congress has funded (directly and indirectly) several facilities across the DOE complex targeted at grid modernization activities. These include:

- The Savannah River National Laboratory (SRNL) partnership with Clemson, Duke Energy, and others.
- The Energy System Integration Facility (ESIF) at the National Renewable Energy Laboratory (NREL) for system testing of renewable and energy efficiency technologies.
- Pacific Northwest National Laboratory's (PNNL) Energy Infrastructure Operations Center and Electricity Infrastructure Cybersecurity and Resilience Center for grid operations tools development and cyber security research and response support.
- Idaho National Laboratory's (INL) extensive hardware testing and distribution feeder test loop for supervisory control and data acquisition (SCADA) testing and evaluation for security issues.
- Oak Ridge National Laboratory's (ORNL) extensive transmission cable testing, power electronics testing labs, and the CURENT Center for grid control research.

Universities and utilities expected to be linked into the national laboratory testing network include Southern California Edison, Pacific Gas and Electric, American Electric Power, Bonneville Power Administration, Tennessee Valley Authority, Clemson, Florida State, North Carolina State, Washington State, Arizona State, and others.

One goal of the GMI is to leverage these existing capabilities and link sites to expand overall capabilities to avoid duplication across the Nation.

To that end, rather than duplicating existing test bed capabilities, four national laboratories (PNNL, NREL, INL, and ORNL) have been coordinating the testing of advanced distribution circuits. DOE and other organizations, including the Electric Power Research Institute, the Smart Grid Interoperability Panel, and the National Institute of Standards and Technology (NIST), are considering techniques that expand the virtual connection of these distributed testing environments. In that way for example, renewable energy generation assets at NREL could feed realistic signatures and behavior to a control system test bed at PNNL, and cyber security threats could be introduced to both systems under test from a third test bed resource in Texas.

Newer capabilities at SRNL and NREL can test integrated distribution systems up to 10MW in size, creating unique opportunity for system simulation.

Robust information sharing and the resulting improvement in situational awareness have always been a key goal in the energy sector's Roadmap to Achieve Energy Delivery Systems Cybersecurity.<sup>1</sup> Several milestones are focused on tools and capabilities that will expedite the discovery, analysis, reporting, sharing, and mitigation of cyber threats. These milestones were identified by industry with concurrence from DOE and the Department of Homeland Security (DHS).

Achieving information sharing and communication is the first of six goals identified in DOE's Energy Sector Specific Plan as part of the National Infrastructure Protection Plan: establish robust situational awareness within the energy sector through timely, reliable, and secure information exchange among trusted public and private sector security partners.

We envision a robust, resilient energy infrastructure in which business and service continuity is maintained through secure and reliable information sharing, effective risk management programs, coordinated response capabilities, and trusted relationships between public and private partners at all levels of industry and government.

In its role as the Sector Specific Agency for Energy, DOE works collaboratively with two energy Sector Coordinating Councils (SCCs), one for electricity and one for oil and natural gas, and a Government Coordinating Council with members from all levels of government concerned with energy security. These coordinating councils represent nearly all members of the energy community and are committed to working closely with DOE and other government energy sector partners.

DOE works closely with the DHS's National Infrastructure Coordinating Center and National Cybersecurity Communications and Integration Center to enhance the efficient and effectiveness of the Government's work to secure the energy sector.

A centerpiece of DOE's efforts in information sharing is the Cybersecurity Risk Information Sharing Program (CRISP), which was tested in 2013 and 2014 and is now expanding in partnership with the North American Electric Reliability Corporation (NERC) and the Electricity Sector Information Sharing and Analysis Center (ES-ISAC). This activity is rapidly expanding grid operator engagement in information sharing both across industry and with appropriate Federal entities. The ES-ISAC establishes situational awareness, incident management, coordination, and communication capabilities within the electricity sector through timely, reliable, and secure information exchange. The ES-ISAC, in collaboration with DOE and the Electricity SCC, serves as the primary security communications channel for the electricity sector and enhances the ability of the sector to prepare for and respond to cyber and physical threats, vulnerabilities, and incidents.

Recent natural disasters have underscored the importance of having a resilient oil and natural gas infrastructure and effective ways for industry and government to communicate to address energy supply disruptions. To this end, in 2013 I asked the National Petroleum Council to give their advice through a study on Emergency Preparedness for Natural Disasters. This study resulted in seven recommendations, including leveraging the Energy Information Administration's (EIA) subject matter expertise within the DOE Emergency Response Team to improve supply chain situational assessments and recommending DOE and States establish routine education and training programs for key government emergency response positions. This report was delivered in December 2014 and the recommendations are currently being implemented.

I stand ready to work with all Members to develop practical solutions to address and respond to energy infrastructure security issues.

<sup>1</sup> [http://www.energy.gov/sites/prod/files/Energy%20Delivery%20Systems%20Cybersecurity%20Roadmap\\_finalweb.pdf](http://www.energy.gov/sites/prod/files/Energy%20Delivery%20Systems%20Cybersecurity%20Roadmap_finalweb.pdf).

## QUESTIONS SUBMITTED BY SENATOR PATTY MURRAY

*Question.* Secretary Moniz, during the hearing I raised concerns with the fiscal year 2016 Budget Request for Richland Operations at Hanford, with a specific focus on the 324 Building and 618-10 and 11 burial ground projects. These cleanup projects are well underway and are high risk projects located close to the City of Richland, Columbia River, and Energy Northwest facility. As of January 2015, the Department of Energy (DOE) has spent \$61 million on the 324 Building and this project is on track for completion of Phase 2 this summer. DOE has spent \$148 million on the 618-10 burial ground, which has resulted in completing 75 percent of the trench cleanup and completing all design preparations for cleanup of the vertical pipe units. And \$8 million has been spent on the 618-11 burial ground.

I am disappointed that you were unable to explain the Administration's proposed \$97.2 million cut to the Richland Operations budget, which would predominately come out of the River Corridor and Other Cleanup Operations account through which these three projects are funded. And I must point out that you failed to answer similar questions on these cleanup projects posed by my colleagues Senator Cantwell, Congressman Newhouse, and Congresswoman Herrera Beutler. Slowing or halting work on these projects poses a safety risk, delays cleanup, increases costs, and results in missing Tri-Party Agreement milestones.

The fiscal year 2016 Budget Request cites technical challenges when rationalizing the cuts to the 324 Building and 618-10 and 11 burial grounds, however, no one has been able to pin-point for me what these technical challenges are. Secretary Moniz, I again ask you to provide me with an explanation as to what these technical challenges are and what is holding you back from continuing to make progress on these critical cleanup projects.

*Answer.* Completing cleanup at the Richland Operations Office is a priority for the Department. There has been tremendous progress at Richland, and our fiscal year 2016 budget request focuses on continuing to make progress. Between now and the end of fiscal year 2016, we plan to complete the design and mockup to ensure we know how to safely clean up the 324 building, and complete trench work at the 618-10 burial ground.

At 618-10, the technology to remediate vertical pipe units (VPU's) has been successfully tested, but has not yet been deployed on actual waste. DOE-RL believes this technology will be successful, but we must increase our confidence that the technology will be successful when used on actual waste.

Much of the waste in 618-11 is in a similar configuration; however, 618-11 also includes waste contained in caissons, which are underground concrete vaults. The technology to remediate waste in caissons has not been designed, tested or deployed. Additionally, 618-11 is adjacent to an operating commercial nuclear power plant, and will require additional controls to ensure the safety of plant workers.

Remediation of the highly radioactive soils under the 324 building presents a number of technical challenges, including designing and testing equipment to remotely excavate the extremely high dose rate soils from under the building. The high dose presented by this waste site will also affect any electronic equipment used in the process.

We share a similar goal of focusing on high-risk cleanup projects, such as the Plutonium Finishing Plant and addressing the sludge in the K Basin, while addressing technical challenges in other cleanup work.

*Question.* Secretary Moniz, the fiscal year 2015 Consolidated and Further Continuing Appropriations Act provided \$45 million in additional funding for the River Corridor and Other Cleanup Operations account. This is additional funding that I fought to secure for DOE and was designated for use by Richland Operations for the 324 Building and 618-10 and 11 burial grounds. Report language included in the Senate Subcommittee mark for the fiscal year 2015 Energy and Water Development Appropriations bill stated "additional funding is provided for work related to . . . cleanup of remaining 300 area waste sites," which includes projects like the 324 Building and 618-10 and 11 burial grounds. Furthermore, during consideration of the fiscal year 2015 Energy and Water Development Appropriations bill on the House floor Chairman Simpson and Congressman Hastings clearly indicated that additional funding included in the bill was intended for cleanup along the Columbia River and for the River Corridor Closure project, which again specifically includes the 324 Building and 618-10 and 11 burial grounds.

It is my understanding that to date, DOE has not allocated the \$45 million in funding towards these cleanup projects. Secretary Moniz, why hasn't DOE used this funding to push forward on this critical cleanup work? Furthermore, I ask that you provide in writing a detailed explanation of how DOE intends to spend these funds in fiscal year 2015.

*Answer.* All funds have been allotted to the Richland Operations Office (RL), and the funds provided for fiscal year 2015 activities have been obligated to contracts consistent with the report language. RL has worked with the River Corridor Remediation Contractor to refine work planning for the remainder of fiscal year 2015 and fiscal year 2016. In fiscal year 2015, funding will enable RL to show progress in the following areas:

- Continued remediation of the 618–10 burial ground, including drum excavation in the trenches and installation of the Vertical Pipe Unit (VPU) over-casings.
- Completion of the design for the remediation of the 300–296 waste site under the 324 Building.
- Initiation of construction of mockup facility for remediation efforts associated with the 300–296 waste site.
- Completion of disposition of 300 Area Surplus Facilities, excluding the 324 Building.
- Completion of backfill of three deep-chromium contaminated waste sites in the 100–D Area.
- Continued remediation of the balance of 100/300 Area waste sites to include backfill and re-vegetation
- Continued operation and maintenance of Environmental Restoration Disposal Facility (ERDF).

*Question.* Secretary Moniz, I appreciate the commitment DOE has shown over the past year to protecting the Hanford workforce and addressing the risks associated with chemical vapors in the tank farms. We owe the men and women who work at Hanford the highest safety standards.

On February 10, 2015, DOE released an implementation plan for the “Hanford Tank Vapor Assessment Report” (Report). The implementation plan is a formal phased approach to addressing potential chemical vapor exposures and the 47 recommendations within the Report. It is my understanding that \$20 million was committed in fiscal year 2015 funding and that the fiscal year 2016 Budget Request includes \$41 million to support Phase 1 of the implementation plan, which would complete 30 of the 47 recommendations in the Report. Phase 2 would begin in fiscal year 2017, and specific actions would be determined by what is learned in Phase 1.

Secretary Moniz, I commend the actions DOE has already taken and urge you to ensure that DOE does not stop its work upon the completion of Phase 1 of the implementation plan. In addition, I ask that you continue to make funding the implementation plan a priority as you develop the fiscal year 2017 Budget Request and renew my request that you add a specific line item into the fiscal year 2017 Budget Request for this purpose.

The completion of the “Hanford Tank Vapor Assessment Report” resulted in immediate changes by DOE’s contractor in November 2014 to increase protective equipment requirements for the tank farms. Since then, employees must wear supplied-air respirators when work is conducted in the single shell tank farms and under circumstances where chemical vapors are anticipated or known to occur in the double shell tank farms. Since these requirements have been in place, DOE has been successful in reducing chemical vapor exposures for employees. However, on April 2, 2015, five employees working in a double shell tank farm experienced chemical vapor related smells and three of the five experienced symptoms. It is my understanding that the employees were not in supplied-air respirators because the double shell tank farm had an active ventilation system and no waste disturbing activity was occurring.

Secretary Moniz, given this most recent chemical vapor experience in a double shell tank farm I encourage DOE to reevaluate the supplied-air respirator requirements established in November 2014 and determine whether mandatory supplied-air should be extended to double shell tank farms.

Each year DOE works with the Small Business Administration (SBA) to establish small business prime contracting goals for the fiscal year. Section 318 of the fiscal year 2014 Consolidated Appropriations Act made changes to allow DOE to count first tier subcontracts awarded by Management and Operating contractors to small businesses toward this annual small business contracting goal.

Secretary Moniz, has the Department used this new tool in setting its small business prime contracting goals with SBA? If not, has SBA prevented Section 318 from being implemented? Furthermore, I ask that you provide in writing the small business prime contracting goal DOE and SBA set for fiscal year 2014, fiscal year 2015, and fiscal year 2016.

*Answer.* This authority has not yet been used in setting the Department’s small business prime contracting goal. As this is a monumental change to the small business contracting goaling process, DOE continues to work with SBA to implement the

new law. Section 318 of the fiscal year 2014 Consolidated Appropriations Act came into effect through Public Law 113-76 on January 17, 2014. Subsequently, the Department of Energy (DOE) recommended to the Small Business Administration (SBA) that the DOE fiscal year 2014 small business goal be adjusted upward to take into consideration the first-tier small business subcontracts awarded by DOE's Management and Operating (M&O) contractors, as reflected in statute.

In fiscal year 2014, SBA did not account for DOE's M&O contractors in the way the statute intended. SBA has indicated that implementation of this statute is complicated by the data systems used across the Federal Government to collect information about subcontracts; the level and type of data collected about subcontracts is not as detailed as what is collected for prime contracts. DOE, SBA, and the Office of Federal Procurement Policy (OFPP) in the Office of Management and Budget collaborated to develop a plan to implement Section 318 in fiscal year 2015. The plan will enable DOE to receive prime contracting credit for its first tier small business subcontracts awarded by DOE's M&O contractors while addressing SBA's concerns regarding DOE's subcontract data quality and transparency. DOE expects to receive the fiscal year 2016 small business goaling letter in the first quarter of fiscal year 2016. The small business prime contract goal for DOE was 6.59 percent for fiscal year 2014 and 6 percent for fiscal year 2015.

*Question.* While I support Section 318, I remain concerned it will not cover first tier subcontracts awarded by prime contractors working on nuclear waste cleanup. In my home State of Washington, the prime contractors at the Hanford site are committed to working with small businesses. All of these prime contractors have small business subcontracting goals ranging from 49 to 65 percent and all of them are meeting these goals. Unfortunately, these first tier subcontracts are not counted by DOE or SBA towards the prime contracting goals. Secretary Moniz, I ask that you continue to work with me and SBA to ensure prime contractors working on nuclear waste cleanup receive proper recognition and consideration for their extensive work with small businesses.

*Answer.* The Hanford prime contracts are not M&O contracts, which are a DOE-specific type of contract used for long-term continuing mission accomplishment, as opposed to the cleanup work performed under the Hanford contracts that is aimed at completion of the cleanup. The Hanford prime contractors thus are not covered by Section 318 of the fiscal year 2014 Consolidated Appropriations Act. The Hanford prime contractors' small business subcontracts are taken into account in the overall evaluation of DOE's support to small business because they will continue to be counted toward the DOE's subcontract goal.

*Question.* Secretary Moniz, I understand that several major prime contracts within the Office of Environmental Management are due for re-competition or extension in the next few years. This includes the following contracts at the Hanford site: River Corridor Closure contract held by Washington Closure Hanford, the Plateau Remediation Contract held by CH2M Hill Plateau Remediation Company, and the Tank Farm Contract held by Washington River Protection Solutions. Knowing the complexity of these cleanup projects and accompanying contracts, what steps is DOE taking to prepare for such a sharp increase in contract re-competitions, to ensure qualified contractors submit proposals to DOE for consideration, and to minimize disruption in cleanup work and to local communities?

*Answer.* On average, the acquisition process for large cleanup contracts begins at least 2 years ahead of the date individual contracts must be awarded. A key part of that acquisition planning and process is early outreach to determine if industry is well positioned to meet potential mission needs at particular sites and to encourage qualified contractors to participate. Activities include industry days and site tours that provide opportunities to see the location where work will be performed and an ability to interface with potential teaming members, and quarterly outreach sessions open to any industry participants. EM will continue to work closely with sites and affected communities as these procurements progress.

*Question.* Secretary Moniz, as you are aware, the Office of Environmental Management has been without a confirmed Assistant Secretary for almost 4 years. The Administration's nominee, Dr. Monica Regalbutto, was approved by the Senate Committee on Energy and Natural Resources on June 18, 2014 and by the Senate Armed Services Committee on June 24, 2014 but the full Senate was unable to vote on her confirmation before the end of the 113th Congress. With Dr. Regalbutto's nomination being resubmitted to the Senate for consideration, Secretary Moniz, I urge you to aggressively push her nomination forward with the two committees of jurisdiction and Majority Leader McConnell.

National scientific user facilities like the Environmental Molecular Sciences Laboratory and Atmospheric Radiation Measurement User Facility located at the Pacific Northwest National Laboratory in Washington State play a central role in the

U.S. research ecosystem by providing scientists access to unique instruments, expertise, and facilities. Each year approximately 750 scientists use the Environmental Molecular Sciences Laboratory, while the Atmospheric Radiation Measurement User Facility supports 900 users. As State and Federal budgets endure continued downward pressure in the coming years, the importance of user facilities will continue to grow as they are shared resources available to the entire scientific community.

I am concerned that the fiscal year 2016 Budget Request proposes a \$2 million cut to the Environmental Molecular Sciences Laboratory and an additional \$2 million cut to the Atmospheric Radiation Measurement User Facility. Secretary Moniz, while these cuts seem small they could have significant impacts to the availability of equipment and the number of users that can take advantage of these important resources. How does the fiscal year 2016 Budget Request continue to ensure that scientific user facilities have the funding they need to serve the scientific community and maintain U.S. global leadership in scientific innovation?

*Answer.* The President's fiscal year 2016 Budget Request supports a balance of substantial investments in the Office of Science's research programs, the operations of its existing 27 scientific user facilities, and the construction of several new user facilities and major upgrades to existing facilities. These user facilities are a major component of our national research infrastructure, and were used by more than 32,000 users spanning more than 2,300 institutions in fiscal year 2014. Nearly 1,000 users affiliated with Washington State institutions used the Office of Science user facilities in fiscal year 2014.

In formulating its budgets annually, the Office of Science considers the long-range—5-to-10 year strategic planning processes, aimed at identifying scientific leadership directions that demand suites of instrumentation that are generally unavailable elsewhere. The planning also evaluates facility construction needs, facility efficiencies, and operations strategies in a variety of budget scenarios. In fiscal year 2016, Environmental Molecular Sciences Laboratory (EMSL) will address a more focused set of science challenges that respond to needs of DOE biological and environmental research; thus, research activity (and associated instrumentation) outside this scope will be sunsetted and priority given to utilization of unique observing technologies, such as the High Resolution Mass Accuracy Capability (newly available in fiscal year 2016) and new capabilities in the Radiological Annex and Quiet wing. In addition to supporting EMSL at the level necessary to tackle identified biological and environmental needs, we believe that the fiscal year 2016 Request provides the resources for the Office of Science to successfully deliver our highest priority investments in new and upgraded user facilities while continuing to advance today's mission-driven research objectives through our existing facilities.

*Question.* The Department of Energy, through the Bonneville Power Administration (BPA), plays an important role implementing the Columbia River Treaty as a member of the U.S. Entity. Together with the U.S. Army Corps of Engineers Northwest Division, BPA engaged in a multi-year process with domestic stakeholders throughout the Pacific Northwest to reach a regional consensus to modernize the Columbia River Treaty. The "Regional Recommendation for the Future of the Columbia River Treaty after 2024" was presented to the Administration and U.S. Department of State in December 2013. Since then DOE, the Army Corps, and several other Federal agencies have been participating in an Interagency Policy Committee (IPC) process to determine the parameters for negotiations with Canada based on the Regional Recommendation. Secretary Moniz, as a participant in the IPC process, can you share the timeline for formulating a consensus among the Federal partners on these parameters? Furthermore, are there any specific issues preventing the Federal partners from reaching consensus, completing the IPC process, and beginning negotiations with Canada in 2015?

*Answer.* The Department of Energy shares your interest in the Columbia River Treaty review. The Regional Recommendation for the Future of the Columbia River Treaty after 2024 was negotiated by many sovereigns and stakeholders over many years, and reflects a balance of interests that the Department supports. My staff is working with the U.S. Department of State, which has been designated as the lead agency to coordinate and oversee the Federal interagency review process, to assure that this significant Pacific Northwest matter is moving forward and taking into consideration regional recommendations.

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QUESTIONS SUBMITTED BY SENATOR JEANNE SHAHEEN

*Question.* Without the economy-wide investments in energy efficiency made since 1973, it is estimated that today's economy would require 60 percent more energy that we currently consume. In fact, savings from energy efficiency improvements

over the last 40 years have reduced our national energy bill by about \$700 million. Many of these improvements would not have been possible without the research, technical support and market integration efforts from the energy efficiency programs at DOE.

Still, there are large, cost-effective opportunities to increase energy efficiency much further, which will cut energy bills, reduce pollution and encourage economic growth. However, a variety of market failures and market barriers contribute to keeping us from fully realizing our energy efficiency potential. This includes: (1) Imperfect information about available technologies in the marketplace and (2) Split incentives like landlord-tenant relationships where a building owner makes decisions about efficiency investments, but because she doesn't pay the utility bill, there is no incentive to purchase more efficient and cost-effective appliances.

DOE plays a vital role in helping leverage market forces and overcoming these barriers. Can you discuss initiatives within EERE that help with overcoming these types of market barriers when it comes to achieving more national energy efficiency gains?

*Answer.* The Department of Energy plays an important role in helping to reduce market barriers to the adoption of new technologies that are market ready—such as a lack of reliable information and workforce training gaps—through activities that include providing best practice information, stakeholder outreach, sustaining and enhancing the clean energy workforce, and providing reliable, objective data.

Select examples of activities within EERE that help with overcoming market barriers include but are not limited to:

—*Advanced Manufacturing Office.* Combined heat and power (CHP) is a proven approach to generate on-site electric power and useful thermal energy efficiently from a single fuel source. Through its Industrial Technical Assistance subprogram, the Advanced Manufacturing Office (AMO) supports Combined Heat and Power Technical Assistance Partnerships (CHP TAPs), which promote and assist in transforming the market for CHP, waste heat to power, and district energy with CHP technologies and concepts throughout the U.S. Advanced Manufacturing's CHP efforts support Executive Order 13624, which sets a national goal of deploying 40 gigawatts of new, cost-effective industrial CHP in the United States by the end of 2020. Through these partnerships, the Department supports deployment of these energy efficient technologies through a variety of services, such as education and outreach that provide information on the benefits and applications of CHP to State and local policy makers, regulators, energy end-users, trade associations, and others; and technical assistance to energy end-users and others to help them consider whether CHP is a viable technical and economic opportunity.

—*Building Technologies Office.* The Building Technologies Office (BTO) pursues solutions identification and technology-to-market initiatives through its Commercial Buildings Integration (CBI) and Residential Buildings Integration (RBI) subprograms to help reduce market barriers to widespread adoption of cost-effective advanced building energy efficiency technologies and solutions. Existing market barriers include high first cost, fragmented market segments, lack of uniform data and data formats, and insufficient availability of objective consumer information. These contribute to the building trades' slow acceptance and adoption of new technologies and practices. The CBI and RBI subprograms' approach to reducing these barriers includes partnerships with stakeholders to develop and share validated data and best practices, improvement of building design and audit tools, and the creation of reliable efficiency benchmarks and databases to facilitate energy efficiency financing and to define efficiency's value-add to consumers. The CBI and RBI subprograms' efforts focus on developing, demonstrating, and releasing a suite of cost-effective technologies, specifications, tools, and solutions, as well as analyzing their ability to deliver the intended energy savings.

—*Federal Energy Management Program.* Performance contracting includes both Energy Savings Performance Contracts (ESPCs) and Utility Energy Service Contracts (UESC). ESPCs and UESCs allow the Government to engage a third-party private sector energy company to invest in needed energy projects and pay for the investment through the energy, water, and operations and maintenance (O&M) savings achieved over the life of the contract. Federal ESPC and UESC projects can include energy and water-efficiency improvements, renewable energy technologies, renewable alternative fuel (biomass/landfill), combined heat and power, advanced metering, and power management. These projects must improve site or system-wide energy efficiency and be life-cycle cost effective in order to guarantee the savings needed to pay for the project. Using performance contracts also provides agencies with access to private-sector expertise



in energy efficiency, renewable energy, water conservation, and emissions reductions and can provide a mechanism for smart project management that ensures building efficiency improvements and new equipment without upfront capital costs.

—*Weatherization and Intergovernmental Programs.* States face several barriers in retrofitting their existing buildings to make them more energy efficient, including the lack of requisite data to track energy use in their buildings (imperfect information). DOE's State Energy Program (SEP) has offered several competitively awarded funding opportunities aimed at helping States address market failures and market barriers, such as the deployment of data management programs, promoting information sharing to further the use of innovative financing mechanisms such as energy savings performance contracting, and outreach programs to decision makers. Since 2012, SEP has made 56 Competitive awards to 30 States in many of these areas, developing model solutions, policies and programs that can be replicated by other States and local government agencies.

*Question.* Can you discuss how EERE uses the Building Technologies Program and Advanced Manufacturing Office (AMO) to help deploy technologies once R&D in their respective economic sectors becomes proven and ready for market?

*Answer.* The Department plays an important role in helping reduce market barriers to the adoption of new technologies that are market ready through activities that include providing best practice information, stakeholder outreach, and providing reliable, objective data.

#### *Advanced Manufacturing*

—The Advanced Manufacturing Office (AMO) orients activities in each of its three subprograms to align with this investment strategy. In the Advanced Manufacturing R&D Projects subprogram, AMO takes into account down-stream R&D challenges to better facilitate the ultimate transition of various technologies into domestic industrial production facilities. Facilities supported under the Advanced Manufacturing R&D Facilities subprogram, such as Clean Energy Manufacturing Innovation Institutes, are designed to both accelerate the development and the implementation of cutting-edge energy efficiency technologies applicable to energy-intensive and energy-dependent industries and materials and technologies broadly applicable to the manufacturing of clean energy products. In addition, the AMO Industrial Technical Assistance subprogram helps manufacturers utilize energy-saving, market-ready technologies, such as combined heat and power, through various activities, including market assessments, outreach and information dissemination, and technical assistance.

#### *Commercial Buildings Market Deployment*

—The Building Technologies Office (BTO) has developed a model for spurring market uptake of new technology through its High Impact Technology (HIT) Initiative. The HIT is designed to promote the voluntary uptake of emerging, cost-effective energy-saving building technologies through partnerships with the commercial buildings industry via the Better Buildings Alliance, Federal leaders, regional non-profits, utilities, and efficiency organizations. HIT technologies are high potential technologies identified by DOE through scoring criteria based on national energy saving potential, cost, technology readiness, stakeholder interest, and help achieve the Commercial Building Integration's (CBI) goals to promote adoption and market uptake of energy efficiency technologies in the commercial building sector. From there, CBI then designs and conducts strategic deployment, dissemination and technical assistance activities using stakeholder input regarding the largest, most persistent barriers to adoption and can include partnering with manufacturers to innovate based on demonstrated industry demand, field testing, development of guides on how to use or select of high-performing technologies, or cost-shared technical assistance.

One example is the Lighting Energy Efficiency in Parking (LEEP) Campaign, which BTO launched in 2012, building on several years of BTO technology research, development, and demonstration and the development of tools to drive high-efficiency lighting and controls into the market. More than 100 organizations have joined the campaign, and, with technical assistance from BTO, have installed high-efficiency lighting or controls in over 445 million square feet of parking space. BTO's efforts to engage market leaders to demonstrate high-efficiency lighting in parking lots and structures has created momentum for further market adoption.

*Residential Buildings Market Deployment*

—BTO's Building America Program advances technology deployment through applied demonstration projects that cost-effectively integrate innovative technologies and construction practices into new and existing residential buildings systems, working directly with builders and home improvement contractors. Currently, the Building America Program is focusing on highly efficient wall systems that minimize the transport of heat, low load cooling equipment that effectively dehumidifies the home, and proper ventilation levels for efficient homes. Building America works directly with builders and contractors in the market place to demonstrate the market viability of these technologies. In addition, these innovative technologies and building practices are highlighted in BTO's Building America Solution Center, a web-based information source for these technologies that contractors can access from the field.

BTO also deploys these innovations into the new homes market through the DOE Zero Energy Ready Home Program, a voluntary partnership program for builders, architects, utilities, energy efficiency programs, lenders, and more. The DOE Zero Energy Ready Home label signifies a whole new level of home performance, with rigorous requirements that ensure outstanding levels of energy savings, comfort, health, and durability. BTO also works with EPA's ENERGY STAR New Homes Program to bring these technologies to the marketplace. Many innovations demonstrated by Building America have been included in codes over the years.

Within the existing homes market, the Better Buildings Residential Program (BBR) works with State and local energy efficiency program partners to deploy proven whole-house and staged upgrade solutions into our Nation's communities. Through the Home Performance with ENERGY STAR Program and the Better Buildings Residential Network, BTO utilizes market partnerships and network effects to increase the deployment of energy efficient, building science-based home performance improvement opportunities among builders, contractors, and homeowners. Home Performance with ENERGY STAR (HPwES) is a public-private voluntary partnership which works with program partners to promote and implement whole-house upgrade solutions for improved, energy-efficient homes. The Better Buildings Residential Network connects energy efficiency programs, contractors, financial institutions, State and local governments, nonprofits, and utilities to share best practices and learn from one another.

*Question.* Another important component of DOE's work is ensuring that relevant stakeholders in the business and advocacy communities have the opportunity to engage with EERE to identify the right types of R&D that DOE should be focusing on.

What processes are in place to ensure that the Building Technologies and the Advanced Manufacturing Offices effectively target and fund the type of technology research needed and wanted in the private sector?

*Answer.* The Advanced Manufacturing Office (AMO) funds technologies and processes that enable energy cost reduction and efficiency for the Nation's most energy-intensive and energy-dependent industries, and funds materials and enabling technologies with cross-cutting impact for cost reduction and performance improvement broadly applicable to the manufacturing of clean energy products. The Program identifies topical thrusts within each of these two categories and uses them as organizing priorities for existing and proposed technical work.

These thrusts are identified through extensive consultation with private sector firms, non-profit, university and National Laboratory partners through various forums, including technology analyses, workshops, and by soliciting input from stakeholders through requests for information prior to planning of the funding opportunity announcements. Funded topics will be selected based on the consideration of potential energy, environmental, and economic impacts, as well as overall relevance to the private sector, including a topic's additionality relative to existing public and private sector investments, degree of technical uncertainty and risk associated with a topic which limit potential private sector investment, whether investment in a topic can be a catalyzing influence, and the opportunity for long term impact of that topic on domestic manufacturing.

Similarly, input from industry stakeholders is a critical component of the Building Technology Office's (BTO) multi-year R&D and market transformation strategy. BTO primarily seeks industry input through three methods: Requests for Information (RFIs), which are delivered to over 25,000 building energy efficiency stakeholders; Technology R&D Roadmap Workshops; and events such as BTO's Annual Peer Review and Merit Review, where independent experts provide robust, docu-

mented feedback on BTO lab and FOA projects' alignment with our mission and goals. Each major technology area that BTO works in—lighting, HVAC, windows and building envelope, sensors and controls (in development)—has a roadmap that guides and prioritizes our research over the coming years. These roadmaps are developed with considerable input from scientists, engineers, academia, and industry experts. Typically, we invite these industry stakeholders to an all-day workshop that informs the development of the roadmap, and will then seek their review throughout its development. Similarly, the High Impact Technology Catalyst, mentioned in response to Question #2, issues an RFI every year to seek input from technology providers and technology end-users (such as building owner/operators) on which technologies should be considered for the Catalyst, and which market transformation methods may prove the most effective.

*Question.* The success of the U.S. manufacturing base is vital to our country's long-term economic well-being. Many of our domestic companies, including those in New Hampshire, face real challenges when it comes to remaining competitive in a global economy.

One of the most promising breakthroughs in helping companies deal with these pressures is the concept of smart manufacturing. New information and communications technologies (ICT) and supercomputing simulations allow manufacturing companies to optimize their production and supply networks by bringing together islands of information found throughout the manufacturing chain in order to achieve significant energy savings and increase productivity.

These types of technological innovations can help U.S. manufactures become and remain cost effective, efficient, and sustainable. However, there remain significant challenges to deploying these technologies more widely.

In particular, how can DOE make sure that smart manufacturing tools are made available to all manufacturing firms, particular small and medium-sized companies who may have more limited technical and financial resources?

*Answer.* While many Smart Manufacturing technology elements exist in some form and level of maturity today, the scale of the required industry collaboration and development needed for Smart Manufacturing technology integration, open and interoperable platforms, and widespread cost-effective adoption of these technologies is beyond the scope of most individual private sector organizations, including small- and medium-sized enterprises (SMEs). AMO supports the development of innovative next generation manufacturing processes and production technologies through the creation of collaborative communities with shared research, development and demonstration (RD&D) infrastructure, including Clean Energy Manufacturing Innovation Institutes, such as the proposed Smart Manufacturing Institute. At the technical core of these Institutes is shared RD&D infrastructure that contains equipment and resources accessible to external parties for technology development that would otherwise be cost prohibitive, particularly for SMEs. It is expected that the Smart Manufacturing Institute will engage the manufacturing community at all levels of the supply chain, including large companies, potential end users, researchers, and SMEs involved in critical development work and who will support the transition to commercial applications, to ensure the Institute is focused on industry relevant problems and increase likelihood of success.

*Question.* I was very pleased to see that the DOE released a Notice of Intent (NOI) in December 2014 to propose its 3rd Nationwide Network for Manufacturing Innovation (NNMI), the Clean Energy Smart Manufacturing Innovation Institute. I also understand that the AMO hosted an Industry Day workshop in February 2015 held in Atlanta, GA, to provide an opportunity for potential proposers to understand the concept, vision and technology needs for the potential smart manufacturing Institute.

Undoubtedly, the announcement and recent workshop has created excitement among manufacturers, academic institutions, national labs and State and local governments, all of whom welcome real-time control of energy, productivity and costs for manufacturing facilities and the benefits these advancements will bring to the sector. I understand the issuance of the Funding Opportunity Announcement (FOA) for the Institute was expected in March 2015, but an official FOA from DOE has not yet been issued.

My concern is that the delay of the issuance of the FOA coincides with the Department of Defense's announcement of their NNMI, competing for an overlapping resource base for non-Federal cost sharing. For furthering our joint interests and priorities for making smart manufacturing a common practice and asset throughout the U.S. and driving transformational gains in energy productivity with overall improved manufacturing performance, issuing the FOA quickly is important for aligning resources and partners adequately.

What are DOE's plans for the issuance of the FOA to ensure strong participation in the Clean Energy Smart Manufacturing Innovation Institute?

*Answer.* DOE's Smart Manufacturing Institute funding opportunity announcement (FOA) is planned for release in mid-2015. The DOE hosted an Industry Day on the Clean Energy Manufacturing Innovation Institute on Smart Manufacturing in February 2015, which allowed potential proposers to hear presentations from government officials about the framework for a potential Institute, specific technical topic areas of interest, and anticipated proposal requirements. The Industry Day was strongly attended, and the Department anticipates strong interest in the Institute FOA.

*Question.* I was pleased to hear about your commitment to ensuring that the benefits of thermal biomass will receive more focus within the Department of Energy. As we discussed during the hearing, I read with interest the President's recent Executive Order, "Planning for Federal Sustainability in the Next Decade," and was pleased to see that it recognizes the importance of thermal power by including it in the Federal government's renewable energy procurement requirements. This is of significant interest to me since I have long been a proponent of thermal biomass.

What is DOE's role in assisting Federal agencies comply with the new sustainability requirements pursuant to the President's recent Executive Order "Planning for Federal Sustainability in the Next Decade?"

*Answer.* The DOE's Federal Energy Management Program (FEMP) works with key individuals within agencies to improve the sustainability, energy and water use of the Federal Government, which facilitates the Government's ability to Lead by Example—encouraging establishment of energy goals, facilitating innovative technologies and creating change in the energy sphere. This mission helps serve the intent of the recent Executive Order 13693, which is to maintain Federal leadership in sustainability and greenhouse gas emission reductions. FEMP will continue assisting agencies with proven strategies to achieve sustainable reductions in greenhouse gas emissions. FEMP will be expanding its support for thermal renewable energy through two major types of assistance FEMP provides to agencies: technical assistance and alternative financing. For technical assistance, FEMP is already working with agencies to identify their largest energy-consuming campuses and then using FEMP's national laboratory experts and software screening tools to comprehensively analyze their most promising renewable energy, clean energy and energy efficiency opportunities. In financing these projects, agencies will now try to incorporate thermal renewable energy into on-site project acquisitions, energy purchase agreements with third-party developers, energy savings performance contracts and utility energy service contracts. FEMP will continue to advise agencies on the issues involved with all of these financing options, and provide agencies access to qualified energy service companies.

*Question.* Will DOE—through the Federal Energy Management Program (FEMP)—work with agencies on best practices for compliance? If so, how can FEMP help ensure that thermal power options like biomass have a viable opportunity to be used as a compliance option?

*Answer.* FEMP has and will continue to provide support for agencies in meeting their clean energy goals, including both renewable electric and thermal energy, as described in EO 13693. This support includes project technical assistance, project procurement assistance, guidance documents, training, and reporting. FEMP is responsible for tracking progress towards the achievement of Federal clean energy goals, and as such, advises agencies on how to report their renewable electric and thermal energy data to ensure compliance with Federal laws and requirements. FEMP will continue to help agencies identify existing and new incentives and programs either the agency or developers can use to reduce the cost of renewable energy and will continue to develop best practices for compliance.

*Question.* You may recall that I sent a bipartisan letter to you and EPA Administrator McCarthy regarding EPA's recently proposed regulation to phase out certain hydrofluorocarbon substances having a relatively high global warming potential under EPA's Significant New Alternatives Policy Program, or "SNAP" program. Specifically, my concern relates to the likely impact of the proposal on energy efficiency. As you know, the proposal would require a change in the blowing agent used to make several types of building insulations. As a result, the energy efficiency gains provided by these products could be negatively impacted because the alternatives are both less efficient and more costly to manufacture, which would increase the price for consumers.

My interest is ensuring that the EPA's rule does not have unintended consequences that results in achieving lower greenhouse gas emission reductions than expected. Can you please tell me whether DOE has reviewed the EPA proposal to

identify how it may impact energy efficiency in the insulation sector? Is there close coordination between DOE and EPA on this rule?

*Answer.* DOE is aware of the concerns expressed by some parties regarding SNAP rules and potential impacts upon energy efficiency. We consulted with the EPA to ensure that they were aware of our perspective on these issues. EPA has now issued their final rule in this matter.

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QUESTION SUBMITTED BY SENATOR CHRISTOPHER A. COONS

*Question.* Major issues—As you know, Delaware is an EPSCoR/IDeA State, and the EPSCoR/IDeA programs have been beneficial for many universities around the country. It has been brought to my attention that there are some general concerns about how much the Department of Energy is seeking for this program and how it is operating its EPSCoR program in terms of the grant award process.

In fiscal year 2013, the 25 States and three territories eligible for DOE EPSCoR received about 9 percent of all Office of Science research award dollars. There are two individual non-EPSCoR States that, on their own, were awarded more funding by the Office of Science than all of the EPSCoR States combined. In fact, one of these non-EPSCoR States' funding is more than double what half the States in the Nation receive through the Office of Science. This year, your fiscal year 2016 request once again keeps DOE EPSCoR flat while the EPSCoR programs at the National Science Foundation and the IDeA program National Institutes of Health continue to grow.

I am also concerned about how DOE EPSCoR handled last year's Implementation Grant award process. The University of Delaware and two other applicants were told in the fall that their proposals were being held over for possible fiscal year 2015 funding consideration. The University of Delaware was then informed, a few months later, that they were no longer being considered for the award and that DOE EPSCoR would only be considering funding of one additional proposal instead of all three.

Can you explain why the DOE is not seeking additional funds for its EPSCoR program while other agencies have continued to make larger requests for their own programs? Can you also explain what happened between the time when the University of Delaware was informed about their potential award in the fall and subsequently when they were told that they were no longer in consideration a few months later? As you know, Congress provided \$10 million last year for DOE EPSCoR, about \$1.5 million more than was requested. Why is only one award now being made with those additional funds?

*Answer.* Year-to-year changes in the DOE Experimental Program to Stimulate Competitive Research (EPSCoR) request are consistent on a percentage basis with changes in the core research portfolio in Basic Energy Sciences. The decision for declining the subject applications was due to the consideration of the available budget and the desire to have a future funding opportunity announcement with longer lead times. The additional funding provided in fiscal year 2015 is being used to minimize mortgages in future fiscal years of existing awards so as to increase funding available for potential new awards under a future funding opportunity announcement.

SUBCOMMITTEE RECESS

Senator ALEXANDER. Thank you for being here today. The subcommittee will stand adjourned.

[Whereupon, at 4:11 p.m., Wednesday, March 25, the subcommittee was recessed, to reconvene subject to the call of the Chair.]