

## **ENERGY AND WATER DEVELOPMENT APPROPRIATIONS FOR FISCAL YEAR 2018**

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**WEDNESDAY, JUNE 21, 2017**

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

The subcommittee met at 2:39 p.m., in room SD-138, Dirksen Senate Office Building, Hon. Lamar Alexander (chairman) presiding.

Present: Senators Alexander, Collins, Hoeven, Kennedy, Feinstein, Murray, Tester, Udall, Shaheen, Merkley, Coons, and Leahy.

### **DEPARTMENT OF ENERGY**

#### **OFFICE OF THE SECRETARY**

#### **STATEMENT OF HON. RICK PERRY, SECRETARY**

#### **ACCOMPANIED BY ALISON L. DOONE, DEPUTY CHIEF FINANCIAL OFFICER**

#### **OPENING STATEMENT OF SENATOR LAMAR ALEXANDER**

Senator ALEXANDER. The Subcommittee on Energy and Water Development, please come to order.

Today's hearing will review the Administration's fiscal year 2018 budget request for the Department of Energy. This is the subcommittee's third budget hearing this year. We have our final hearing on the budgets for the Corps of Engineers and Bureau of Reclamations next week.

Senator Feinstein and I will each have an opening statement. I'll then welcome the other Senators who are here, and I'll recognize each of you for up to 5 minutes for an opening statement, if you'd like to make one after Senator Feinstein and I finish, alternating between the majority and minority.

Our guys must still be at lunch or something.

[Laughter.]

Senator ALEXANDER. Congratulate the democrats for being here.

We will then turn to Secretary Perry, whom we welcome today, for testimony on behalf of the Department of Energy. And at the conclusion of Secretary Perry's testimony, I'll recognize Senators for 5 minutes of questions each, alternating between the majority and minority in the order in which they arrived. I want to make sure that there's—Mr. Secretary, I hope your schedule permits it, but we may have several questions, and my instinct is to let the Senators ask the questions that they want to ask.

First, I'd like to thank Secretary Perry for being here today. He was only confirmed March the 2nd, but he's been able to get into his job very quickly. He's been secretary for less than 4 months, but he's dived into some difficult issues here in Washington that we've been working on. For example, the MOX (Mixed Oxide) situation in South Carolina, the nuclear waste stalemate, he's already begun to provide leadership in that area, and he's taken time to go see the responsibilities under his secretaryship. Yucca Mountain, he's been there, Los Alamos National Laboratory in New Mexico, Senator Udall, he's been there, Idaho National Laboratory, Oak Ridge National Laboratory, he spent a day in Tennessee, Italy for the Group of 7 Ministers meeting, and even visited the Fukushima nuclear complex in Japan. So I congratulate him for that.

And I also thank him and his staff throughout this initial phase of being available to us in Washington DC. When we've had questions, it's been an easy relationship in terms of getting questions and answers. I thank him.

#### FISCAL YEAR 2017 APPROPRIATIONS LAW

I also want to thank Senator Feinstein. I do this whenever I have the opportunity, but it's a great pleasure to work with her again in drafting the Energy and Water Appropriations Bill. We've been able to do that in a bipartisan way. We have our differences, but we know how to resolve differences, if we possibly can. Last year we were able to do it, and not only report it to the full committee, but pass our bill on the floor of the United States Senate, and as a result, we had 87 different Senators of the 100 who had some say, some request, some comment in our bill because it was widely participated in.

That bill provided record levels of funding for the Office of Science that funds the department's 17 national laboratories. It had a record level of funding for the Corps of Engineers, which builds our Nation's locks and dams in dredges our ports, and which is the top priority for more than one-half the Senators that submit requests to this subcommittee. The bill also supported super computing, something the Secretary's talked about, allowing our national laboratories to maintain five of the ten fastest computers in the world, maintain the Nation's nuclear stockpile, cut wasteful spending, and done all of this within the constraints of the Budget Control Act.

#### FISCAL YEAR 2018 BUDGET REQUEST

We're here today to review the Administration's fiscal year 2018 budget request for the Department of Energy. The department has three critical missions: nuclear security, science and energy, and environmental management. The budget request for 2018 is about \$28 billion. This is a decrease of about \$2.9 billion below what Congress provided in the fiscal year 2017, Energy and Water Appropriations Bill, which was just approved a few weeks ago.

The budget request significantly decreases the investments to federally funded research and development. It terminates ARPA-E (Advanced Research Projects Agency-Energy), we'll want to talk more about that, and recommends reducing the Office of Science, which is in charge of our national laboratories, by over \$919 mil-

lion, the Energy Efficiency and Renewable Energy by \$1.45 billion, nuclear energy by \$310 billion, and the Office of Electricity by \$110 billion.

That's why we're holding this hearing, to give Secretary Perry an opportunity to discuss the department's priorities, so Senator Feinstein and I can make informed decisions as we begin to write the fiscal year budget in the next few weeks.

We want to make it clear that governing is about setting priorities and we'll be setting the priorities here within the Congress, but if we find useful suggestions within the President's budget, we'll be glad to consider them.

For fiscal year 2018, under the Budget Control Act spending caps, Congress has slightly less money to appropriate than last year. It would seem to be almost the same. Senate republicans have agreed to markup our appropriations bills to the same overall number that Congress approved in the omnibus appropriations bill we passed in May.

I hope that will permit us to markup our bill in a bipartisan way. Congress may agree to add funds later in the year, and if it does, we can do as we did in 2016, we would add those amounts to what we've already agreed on. In the meantime, our allocation may be as much as 2 percent lower for nondefense spending, which made up about 47 percent or nearly half of the Energy and Water Appropriations Bill last year.

On the defense side, it's not clear what our allocation will be, but the President's budget has proposed about a billion more than last year to continue modernizing our Nation's nuclear weapons stockpile.

Today I'd like to focus my questions on four major areas, which I will do later, all with an eye toward setting priorities. One, prioritizing Federal support for science and energy research. Two, ensuring the department is spending the money Congress provided last year in the 2017 budget as Congress intended and the way Congress intended. Three, oversight and management of large projects, like MOX, and ITER and the uranium facility, and, Senator Udall would want me to say, the planning for the plutonium facility in New Mexico, and solving the nuclear waste stalemate.

#### PRIORITIZING FEDERAL SUPPORT FOR SCIENCE AND ENERGY RESEARCH

Number one, the U.S. continues to produce more than 20 percent of the wealth each year for just about 4 percent of the people. We're a wealthy country. And as researchers have told me, it's hard to think of a major technological advance since World War II that has not involved at least some government sponsored research. Much of that research is done at our 17 national laboratories, which are our secret weapons for innovation research that leads to better jobs and higher family incomes.

Research funding for the Department of Energy labs has produced technologies for unconventional natural gas development, super computing, 3-D printing, nuclear imaging devices used for medical diagnosis, MRI scanners, optical digital recording technology used to make DVDs, batteries, and energy storage systems for cars and trucks and the electric grid, precision detectors and pharmaceuticals.

The department's research programs have made the United States a world leader in science and technology, and these help us maintain our brain power advantage, so we can remain competitive with other countries. And that's why last year Senator Feinstein and I in this committee provided record funding levels in a regular appropriations bills for the department's research programs, including \$5.392 billion for the Office of Science, \$300 million for ARPA-E, and \$1 billion for the Office of Nuclear Energy.

The Federal budget can't be balanced on the backs of national labs, national parks, national institutes of health, and national defense. Those aren't the problems. The problems, we all know it, are the mandatory entitlement funding which is going up. National labs, national parks, national institutes of health, and national defense, has been like this since 2008, and it's projected by the Congressional Budget Office to stay like this. In other words, it's under control. Spending in the trillion dollars that the appropriations committee works on is under control. It's going up at about the rate of inflation. If the rest of the budget was as under control as the appropriations committee part of the budget, we wouldn't have a Federal debt. So maybe we should take over the rest of the responsibility for the rest of the Federal budget, instead of getting lectures from people about balancing the Federal budget on the back of the national labs, national parks, national institutes of health, and national defense.

The Federal debt is not the result of energy and research. The U.S. faces a choice between falling behind China, or advancing technologies can make us more competitive.

In June of 2017, ranking the world's most powerful super computers, China maintains the top two places, Switzerland is third, and Titan at the Oak Ridge lab, which is the fastest super computer in the United States, moved to fourth. That is despite consistent support from the last administration and from a bipartisan group in the United States Congress the last several years.

Now, in 2018, the Oak Ridge lab will complete Summit, which will be five times faster than Titan. Secretary Perry saw Titan. I think he wrote his name on it, right above Al Gore's. And that will help researchers better understand materials and nuclear power and support more energy breakthroughs.

I'm pleased to see that the department's budget request prioritizes super computing and includes \$508 million to deliver the first Exascale machine by 2021.

#### ENSURING THE DEPARTMENT OF ENERGY IS SPENDING ITS MONEY AS CONGRESS INTENDED

Now, my second question later will be about making sure the department spends the money it has in the way Congress intended. We have heard that the department is delaying funding announcements based on objections to climate change and clean energy research. The truth is, increased research and clean energy is important in dealing with climate change, but that is only one reason to do it. It's also important to lower the cost of electricity, which raises family incomes and spurs economic growth. In fact, when we did Rising Above the Gathering Storm 10 years ago, the committee considered making it all about energy because that was such an

important anchor for our economic growth. So I'll be asking you, Mr. Secretary, about ARPA-E, about advanced manufacturing, about biological and environmental research, and I'll need your assurance that you'll continue to fund projects consistent with Congressional intent in the omnibus appropriations bill.

#### OVERSIGHT AND MANAGEMENT OF LARGE PROJECTS

Third, ensuring effective oversight of large construction projects. I'm taking a little time on this, but it's important that we do. Over the past 5 years, Senator Feinstein and I have worked hard with the department to keep costs under control, and we've had some success, especially on the uranium facility in Tennessee, which was once out of control, and as a result of the red team recommendations, is on time and on budget according to General Klotz. It has a target of completion in 2025, at a cost of \$6.5 billion, and the designs of the nuclear facilities will be 90 percent complete later this year.

Your budget requests—Senator Leahy, if you have to leave, I'll be glad to stop my remarks and let you say a few words, if you'd like to. I know you have other commitments.

#### STATEMENT OF SENATOR PATRICK J. LEAHY

Senator LEAHY. Mr. Chairman, I appreciate that. I'm simply going to put the statement in the record, but I'm going to urge the Secretary not to ignore the technological advances we made or the fact that they're going to cost money to continue them, if we're going to, "change the world," as the Secretary said, I agree with him on that, we've got to spend money.

You, Mr. Chairman, have always pushed for money for technological research, as has Senator Feinstein, and we can't turn such research on and off. We have to continue it. But I'll put my whole statement in the record.

[The statement follows:]

#### PREPARED STATEMENT OF SENATOR PATRICK J. LEAHY

I want to thank Chairman Alexander and Ranking Member Feinstein for having this hearing today to discuss the administration's fiscal year 2018 Budget Request for the Department of Energy. Secretary Perry, the Energy Department is one that has a wide array of responsibilities and roles in this country and internationally.

Secretary Perry on your first day on the job you challenged the Department's employees to "go change the world." You remarked how you were quickly learning what a consequential role the Department has to change the world every day. But the budget proposal you are presenting to us today will not move us forward nor will it address our Nation's needs, challenges, or quite frankly our values.

We cannot roll back the important progress that has been made in promoting science, energy efficiency, renewable energy, and climate advancements by failing to invest in America's clean energy economy. That clean energy economy stands to create millions of good jobs in rural communities across the country, and will result in billions of dollars in exports of renewable energy goods. This is a well-documented opportunity to create jobs and invest in the industries of the future to make our economy more innovative, productive, and clean. We have come too far to allow all the progress we have made to be washed away by attempts to reject science and common sense environmental protections.

During your confirmation process, you said that if confirmed you would "look out for the good of all Americans" with respect to the Department's important mission. We cannot achieve that mission if we stop investing in technology and innovation, as this budget proposal would do, or leave thousands of low-income households in the cold by eliminating the Weatherization Assistance Program, as the President in-

tends. Many of the great technological advances and innovative products we see in the marketplace today are the result of Federal research and investments that were made over 20 years ago. This research has a wide-reaching impact and cannot simply be turned on and off like a light switch. The funding cuts and programs eliminated by this budget mean lost American jobs, lost energy savings, and hard times for folks who need help—that is a lose, lose, lose proposition.

Senator ALEXANDER. Thank you, Senator Leahy.

Senator Leahy is the Ranking Democratic Member of the committee. We're delighted to have him here today, and his statement will be made a part of the record.

#### MIXED OXIDE FUEL FABRICATION FACILITY

Your budget request, Mr. Secretary, also proposes shutting down the MOX fuel facility in South Carolina and replacing it with an alternative called dilute and disposal. We've talked about this project many times. Last week General Klotz told us the cost to build the MOX facility will be \$17 billion, including \$12 billion still to go, compared to \$500 million needed for the dilute and dispose option. He also told us the MOX process would cost \$800 million to \$1 billion per year to operate, compared with \$400 million for dilute and disposal.

I'm anxious to hear your views on that. I look forward to learning more about your views on ITER, which we have talked about.

#### NUCLEAR WASTE STALEMATE

Now, finally, solving the nuclear waste stalemate, to ensure that nuclear power has a strong future, we've got to break that 25-year-old stalemate, and we welcome your leadership in helping us to do that. We need to find places to build geologic repositories and temporary storage facilities so the Federal Government can finally meet its legal obligations to dispose of nuclear waste safely and permanently.

This year's budget request for the department includes \$110 million to restart work on Yucca Mountain repository, and \$10 million to study ways to open an interim storage site or use a private interim storage site. I strongly support Yucca Mountain, I believe it ought to be a part of the solution. Federal law designates it as the Nation's repository, and the Commission's own scientists have told us we can safely store nuclear waste there for up to one million years. But even if we had Yucca Mountain, even if it were open today, we would still need to look for another permanent repository.

We have more than enough fuel to fill Yucca Mountain to its legal capacity. So Senator Feinstein and I, along with the leaders of the Committee of Energy, Senator Murkowski, Senator Cantwell, Senator Bingaman, Wyden and now Cantwell, have a bill to implement the recommendations of the President's Blue Ribbon Commission on America's Nuclear Future, which we're working to reintroduce this year.

The legislation complements Yucca Mountain. It would create an agency to find additional permanent repositories and temporary repositories for used fuel, but the quickest and probably least expensive way for the Federal Government to start to meet its used nu-

clear fuel's obligations is for the Department of Energy to contract with a private storage facility for used nuclear fuel.

The former Secretary of Energy, Secretary Moniz, told this committee last year that the department has existing authority to take title to used fuel and contract with a properly licensed private company to store it. Understand that two private companies have submitted applications to the Nuclear Regulatory Commission for consolidated storage facilities, one in Texas, one in New Mexico. I'll be asking questions about that today.

I look forward to working with you, Secretary Perry, and also with Senator Feinstein, who I now recognize for her opening statement.

Senator Feinstein.

#### STATEMENT OF SENATOR DIANNE FEINSTEIN

Senator FEINSTEIN. Thanks very much, Mr. Chairman. And I think you know how much I value our partnership on this subcommittee and our ability to work together, and there's no reason why that won't continue. So thank you very much.

Mr. Secretary, I want to welcome you. We've not had a chance to meet and talk in person, but I hope that will change and we'll have an opportunity to do so. I represent a big State that is very energy conscious, and a lot of good things happening there. So I look forward to the opportunity to share some of them with you.

#### NATIONAL LABORATORIES

In a speech at the Idaho National Lab last month, you said, "If you work at a national lab, you are making a difference". And I would certainly agree with that. It seems that you understand how the national labs are improving people's lives. You also seem to understand the important role these labs play in making American industry competitive.

I think you would agree that discovery, invention, and innovation, is what made America the economic power that it did today. Yet this budget drastically cuts up to 70 percent from the four applied energy programs, Energy Efficiency and Renewable Energy, Electricity Delivery and Energy Reliability, number three, Nuclear Energy, which we'll talk more about, and four, Fossil Energy.

It eliminates the ARPA-E program altogether. And as the Chairman has said, it cuts the Office of Science by 17 percent. And this is, of course, the budget for the labs. These programs foster new discovery. They then build on those discoveries by identifying possible uses and collaborating with inventors and industry to develop new products. All of this is decimated by this budget request.

Out of a work force of 29,000 across the non-NNSA (National Nuclear Security Administration) labs, this budget would layoff 6,700 people, or 23 percent of the employees. This includes 41 percent of the people at Ames, 33 percent at Oak Ridge, 29 percent at the Pacific Northwest, 27 percent at Berkeley, and 16 percent of the people at the National Energy Technology Lab. Every non-NNSA laboratory would see drastic employment cuts under this proposed budget.

To make matters worse, the budget also drastically cuts operational run time at all major research machines at the national

labs. These include the light source at Argonne, Berkeley, Brookhaven, and SLAC, neutron sources at Oak Ridge, nanoscale source centers at five national labs, and accelerators at five national labs.

#### ADVANCED LIGHT SOURCE

Now, we've seen the positive aspect of these research machines. For example, the advanced light source at Berkeley was essential to developing the Ebola vaccine. And I would love to take you there. You will not see a busier lab, I'll bet you, anywhere in America, than you will at Berkeley. And so I issue that challenge to you.

The alternative light source uses X-rays to illuminate the smallest but most important players in the battle against disease, viruses and proteins that fight them. The intense X-ray beam is able to produce a detailed map of the protein's structure. Researchers from scripts, in collaboration with Berkeley lab scientists, use this technique to map Ebola antibodies at an atomic resolution. The map guided the scientists in developing ZMapp, one of the first drugs that was successful in combating the Ebola outbreak in 2014. Similar experiments using ALS are essential for developing new drugs for other emerging diseases. Researchers from Indiana University, Texas A&M, and Berkeley, are using the ALS to map a key Zika protein known as NS5. This protein compromises the body's immune system so the virus can't replicate—excuse me, can replicate.

Understanding how these processes work will allow researchers to develop new ways to treat Zika and other health threats. The advanced light source can also be used to research material properties, to understand their structures, and chemical properties on a molecular or even atomic scale. GE Aviation recognized the power of these large-scale scientific tools and entered into a multi-year partnership to use the ALS, the advanced light source. GE is using the machine to study new composite materials that could improve the efficiency and performance of jet engines by allowing them to operate at higher temperatures. Something that it appears with our weather patterns that could really be necessary.

The ALS's X-ray beams and ultra high temperature testing capabilities allow GE researchers to create 3-D microscale maps of composite materials to watch how they perform in real time and under realistic operating conditions, a capability that drew GE Aviation to the ALS in the first place. The results of their studies have already provided insight into the ways to improve the composite materials' performance.

#### IMPORTANCE OF NATIONAL LABORATORIES

So all of these examples highlight how the Department of Energy provides the irreplaceable tools that make American companies competitive and improve countless lives all across this great country. So the message of this budget is clear. Those capabilities and their outcomes are not important to whoever put this budget together, or they wouldn't have done it. It also tells students that scientific research is no longer a priority of the United States. Imagine the irreversible harm we'll do to future industries if we can't

attract students to STEM (Science, Technology, Engineering, and Mathematics) fields today.

I'd like to finish with a statement you made at a recent visit to Oak Ridge. Mr. Secretary, you said, "The Administration's goal to create jobs and wealth, I will suggest to you, are centered in the Department of Energy and the things that we have the capability of dealing with."

We must change this budget. Your quote—you didn't say that, I said that part.

[Laughter.]

Senator FEINSTEIN. Your quotes make it appear that we agree on the importance of the labs to American innovation and competitiveness, but the budget request you're defending doesn't agree with this. So that's a big problem, and we need to square it off. So I hope, Mr. Secretary, that both the Chairman, the members on both sides of this aisle, and I can work with you, and that we can really develop a budget, which is funded to make America proud and keep the entrepreneurship that made this country great in the sciences and related industries continue on.

So thank you very much.

Senator ALEXANDER. Thank you, Senator Feinstein.

And we'll have Senator Kennedy and then Senator Coons. If any Senator has scheduling problems, if you'd let me know. I want to make sure you have a chance to have an opening statement.

Senator Kennedy.

Senator KENNEDY. Thank you, Mr. Chairman. Have we had the opening statement by the Secretary yet?

Senator ALEXANDER. No. We're having opening statements by Senators, if they wish to make them. Then the Secretary will make his statement, and then we'll all have a chance to ask our questions. So you—

Senator KENNEDY. I know, Mr. Chairman, this is heresy, but I don't want to make an opening statement. I'd like to hear what the Secretary has to say.

Senator ALEXANDER. You'll be a very—

Senator FEINSTEIN. Popular man.

Senator ALEXANDER [continuing]. Popular Senator. So thank you, Senator Kennedy.

Senator Coons.

#### STATEMENT OF SENATOR CHRISTOPHER A. COONS

Senator COONS. Thank you, Mr. Chairman, Ranking Member.

You've laid out an important argument in your opening statements. The Chairman recited a long list of American inventions and innovations made possible by federally-funded science. The Ranking Member detailed the advanced light source at Berkeley, which I've also visited, and which has contributed dramatically to our advances.

#### CUTS IN FISCAL YEAR 2018 BUDGET REQUEST

I just want to briefly say at the outset that I am very disappointed with the department's fiscal year 2018 budget request. I understand the importance of making tough budget choices, but I am struck by the breadth and severity of cuts proposed to basic

research. Thirty to 70 percent cuts in R&D, and in particular, eliminating ARPA-E, the State Energy Programs, Manufacturing USA Institutes, energy hubs and more. This isn't just cutting. This is, in my view, giving up on the clean energy race. This is about jobs, this is about clean energy, which creates millions of jobs across our country, including, as we know, in your home State. If we don't support these jobs in this country, we are simply allowing them to go to our competitors around the world, principally China.

I look forward to your presentation and the chance to ask questions later. Thank you for the chance to make a brief opening statement.

Senator ALEXANDER. Thank you, Senator Coons.

Senator Hoeven, Senators may make an opening statement if they wish, and then we'll go to the Secretary, and then we'll have questions. Do you have an opening?

Senator HOEVEN. I would not have an opening statement unless the Chairman of our subcommittee is encouraging it, because I like to support him. So it's entirely up to his call.

Senator ALEXANDER. You know, you're one of the more eloquent United States Senators, but I'd be happy with your questions, if you wanted to wait until then. It's up to you.

Senator Udall.

#### STATEMENT OF SENATOR TOM UDALL

Senator UDALL. Thank you, Chairman Alexander.

And just very briefly, I want to thank Secretary Perry for your recent visit to New Mexico, including Los Alamos and Sandia National Labs, and also the Waste Isolation Pilot Project near Carlsbad, New Mexico. I think those visits raised the morale of the employees, and also let employees know, as Senator Feinstein said, what an important job they're doing at the national labs.

#### STOCKPILE STEWARDSHIP PROGRAM

For decades now, the stockpile stewardship program at the national lab has guaranteed the safety and responsibility of the Nation's nuclear arsenal without testing. It has only improved with the advent of more sophisticated computing and other science based methods. The United States and Russia continue to reduce the number of nuclear weapons as part of the New START while we also work to ensure our remaining deterrent is safe, secure, and effective, a mission charged to the DOE (Department of Energy) and which for over two decades I believe you have met on time that yearly recommendation to the President.

#### TECHNOLOGY TRANSFER

You have many other important missions, I'm not going to go on long here, but I think technology transfer is tremendously important, where you take those good ideas in the lab and move them from the lab bench out into the marketplace, and there are a number of other things that the two laboratories in New Mexico work on, cyber security, legacy waste clean up, and many other initiatives. But I really look forward to working with you.

Thank you very much.

Thank you, Mr. Chairman.

Senator ALEXANDER. Thanks, Senator Udall.

Senator Tester, Senators have an opportunity, if they'd like to make a brief opening statement before the Secretary's comment. And you're next. If you would——

Senator TESTER. No, I'm going to save all my questions for the grilling.

Senator ALEXANDER. Okay. That sounds pretty fearsome.

Senator Merkley.

Senator MERKLEY. I look forward to the Secretary's testimony.

Senator ALEXANDER. Thank you, Senator Merkley.

Senator Shaheen.

Senator SHAHEEN. I also will wait for questions.

Senator ALEXANDER. Thank you, Senator Shaheen.

And we'll have ample opportunity for whatever questions you'd like to ask, and I want to thank the Senators for such good attendance today.

#### SENATOR HELLER'S LETTER REGARDING YUCCA MOUNTAIN

Senator Heller has asked me to include in the record a letter to Senator Feinstein and me about Yucca Mountain. I know he feels strongly about it. I wanted to make sure his views are part of the record today.

[The letter follows:]

DEAN HELLER  
NEVADA  
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United States Senate  
WASHINGTON, DC 20510

COMMITTEES:  
FINANCE  
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VETERANS' AFFAIRS

June 21, 2017

The Honorable Lamar Alexander  
Chairman  
Senate Energy & Water Appropriations  
Subcommittee  
Room S128, The Capitol  
Washington, DC 20510

The Honorable Dianne Feinstein  
Ranking Member  
Senate Energy & Water Appropriations  
Subcommittee  
Room S128, The Capitol  
Washington, DC 20510

Dear Chairman Alexander and Ranking Member Feinstein:

I write today to express my vehement opposition to the Administration's request for \$120 million in the Department of Energy's (DOE's) Fiscal Year 2018 budget to be in part utilized to restart licensing activities at the Yucca Mountain nuclear waste repository. I strongly believe that our nation cannot fully move forward with viable sustainable solutions for spent nuclear fuel and defense high-level waste without moving past Yucca Mountain. The Administration's request simply perpetuates a decades-long fight that has been strongly opposed by Nevadans from the state, done little to solve our nation's waste problem, and wasted billions of U.S. taxpayer dollars.

The Administration purports that this budget request will "address nuclear waste, enhance national security, and reduce future taxpayer burden," yet in practice, it will do the exact opposite. Governor Sandoval has made clear the State of Nevada will contest over 200 elements of any license application, which will take years to resolve and cost the federal government billions of dollars. This is in addition to the DOE's estimates that an additional \$82 billion would be needed to license, litigate, build, operate, decommission, and eventually close Yucca Mountain. With respect to what has already been spent on the repository that adds up to more than \$96 billion for the total system life cycle cost for the project.

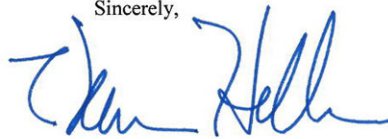
It is clear that U.S. taxpayer dollars would be better spent identifying viable alternatives for the long-term storage of nuclear waste in areas that are willing to house it. In fact in 2012, DOE cost estimates show that all other costs being equal, walking away from Yucca Mountain, and starting with a new repository site in a deep salt bed or a deep shale formation, could save between \$12 billion and \$27 billion over the life of the repository. Before Congress spends any more U.S. taxpayer money on Yucca Mountain, I strongly urge you to ask Secretary Perry as he testifies before your subcommittee to explain what the Department has learned about repository costs in its previous studies. Furthermore, I believe we need new cost studies on geologic disposal in repositories, studies that include the lessons learned from recent progress with repositories in Europe.

Moreover, I am deeply troubled by recent comments made by Secretary Perry stating that the Nevada National Security Test Site could be an option for temporary storage of high-level nuclear waste. Not only do I believe that this comment is irresponsible, but I also remain concerned about the legality of such actions by the Department. As I have repeatedly expressed to the Secretary, Nevada will not be forced against its own will to shoulder the burden of housing our nation's nuclear waste.

The only viable solution to our nation's long-term nuclear waste problem is one that is rooted in consent. I stand behind the DOE's 2005 initiatives regarding consent-based siting as a result of the Blue Ribbon Commission on America's Nuclear Future. This open process ensures all Americans have a meaningful voice in the process if their community is being considered for a future nuclear waste repository. I strongly believe that Secretary Perry should focus his efforts on this worthwhile initiative instead of making Nevada our nation's nuclear waste dump.

I stand with the State of Nevada in staunch opposition to any attempt to restart the repository licensing process, and strongly urge you not to fund the Administration's request. Secretary Perry has referred to a "moral and national security obligation" and I believe that fighting for Nevada against Yucca Mountain is mine. Moreover, I encourage you to devote resources towards DOE's consent-based siting initiative for the storage and disposal of spent nuclear fuel and high-level radioactive waste. Thank you for your attention to this important request.

Sincerely,



Senator Dean Heller

Senator FEINSTEIN. Did you also want to put Leahy's statement in the record?

Senator ALEXANDER. I will also put Senator Leahy's opening statement in the record. Thank you, Senator Feinstein.

We'll now turn to Secretary Perry to provide his testimony. Without objection, your full statement will be included in today's hearing record. I know we've invited Alison Doone, the acting Chief Financial Officer of the department, to sit next to Secretary Perry at the witness table.

Secretary Perry, welcome. You may proceed.

#### SUMMARY STATEMENT OF HON. RICK PERRY

Secretary PERRY. Mr. Chairman, thank you. It's an honor to be here before you, and Ranking Member Feinstein as well, and each of you that are on the dais. Thank you. Thank you for your public service.

I am here today to discuss President Trump's fiscal year 2018 budget request.

And Mr. Chairman, as you stated, it is a distinct privilege for me to be sitting here in front of you. Yesterday was the first time I ever sat on this side of the desk. And I like your side better.

[Laughter.]

Secretary PERRY. But, anyway, it is a privilege to be here. And as a former legislative appropriator and as a governor, I have a very real and deep respect for the budget writing process.

I know the important work that you're about, that we're undertaking together, and I look forward to working with you to finalize a budget that we can all be proud of, and that serves the taxpayers of this country well.

#### NATIONAL LABORATORIES

It's been three and a half months since I took my hand off the Bible and was sworn in as Secretary of Energy, and I have seen firsthand as a number of you have accompanied me to different laboratories and facilities that the department oversees, being involved both domestically and internationally. This department makes a difference. I travel around the country to many of the national labs, some of them based in your districts. I met with the brilliant minds who are driving their missions, and I've look forward to visiting every one of them, Senator. And these labs are truly our national treasures. They are the future of innovation in this country. I have been in absolute awe of the diversity, the scope of the department's mission, the consequential work that we are charged with undertaking.

#### INTERNATIONAL ENGAGEMENT

I've also traveled internationally. Senator Shaheen and I went to G7 in Rome, I went to Beijing to the Clean Energy Mission Innovation Ministerial. I had the opportunity to visit Japan, as you shared, Mr. Chairman, met with their leaders, the stakeholders, about the future of energy in that country. They're our energy partners. On a very somber note, I toured the Fukushima site and recognized the monumental challenge that they have before them.

Coincidentally, the trip to Asia began on the day that President Trump announced that he would officially withdraw the United States from the Paris Agreement, and I delivered his message to the world, that even though the U.S. would no longer be a part of that Paris Agreement, we are still and we will continue to be a leader in clean energy technology, and we're committed to that mission more than ever.

#### SECRETARY'S GOALS

The Department of Energy does many things very well. America has remained on the forefront of technology for over 40 years because of the amazing men and women that work in our headquarters and our national labs, overseas for that matter. They wake up every day knowing, as you mentioned, that they make a real difference. I told them on my first day that the greatest job I ever had was being the governor of the State of Texas. But after working here, after seeing what these individuals had the opportunity to do, I have come to realize that the Secretary of Energy, job is now the coolest job I've ever had. And under my leadership, our experts at DOE will continue their work for the benefit of every American and our allies as well.

As Secretary of Energy, I am also a member of the National Security Council. This council's supported by DOE and its mission to keep us safe. President Trump's fiscal year 2018 budget request for the Department of Energy provides \$28 billion to advance our key

missions and focuses on important investments, including ensuring the safety and effectiveness of our nuclear weapons arsenal, protecting our energy infrastructure from cyber attacks and other threats, achieving Exascale computing and focusing the amazing network of our national laboratories on early stage research and development.

My goals are straightforward. Advance our Nation's critical energy and scientific R&D missions, strengthen our nuclear security, and fulfill our environmental management commitments.

#### NUCLEAR WASTE

I just painted you a very rosy picture. Pretty bright picture. Lots of good news. But there are other hard conversations that we need to have. As you're well aware, there are approximately 120 sites in 39 States that are storing spent nuclear fuel or high level waste. In fact, all but five members of this committee have that waste in their State. We have a moral and national security obligation to come up with a long-term solution, finding the safest repositories available.

This is a sensitive topic for some, but we can no longer kick the can down the road. As a former legislative appropriator, as an agency head, as a governor, I understand following the rule of law. I've been instructed to move towards that goal. The President's budget requests \$120 million to resume licensing activity at Yucca Mountain, nuclear waste repository, and to initiate a robust interim storage program. Congress has spent \$5 billion taxpayer dollars in another area that I want to specifically address in my opening remarks, and that is, in MOX.

#### MOX FACILITY

This project is way over budget, and from my perspective, no end in sight. The Army Corps of Engineers estimated a cost of \$17.2 billion, total, with a 2048 completion date. The money appropriated for this project is money that we could be using toward other priorities, like national security or cleanup of sites in your States. There's a better, cheaper, proven way to dispose of plutonium. In fact, we're already doing it, and I look forward to having an ongoing dialogue with many of you about these tough but important issues in the days and months to come.

#### FISCAL YEAR 2018 BUDGET REQUEST

This budget proposal makes some difficult choices, but it's paramount that we execute our fiduciary responsibility to the American taxpayer. The President's proposal prioritizes the core mission of the department by consolidating duplications within our agency in order to respect the American taxpayer. He deserves credit for beginning this discussion about how we most wisely spend our scarce Federal resources.

As for me, this isn't my first rodeo. During my 14 years as governor, I managed under some pretty tight budget. Governor—we didn't always have blue skies and smooth sailing in Texas. There were some real challenges from a budget standpoint during my 14 years as governor, but we dealt with that. And I respectfully ask

you to take that experience and that background into consideration as we work towards managing this agency.

When we were faced with limited resources, Texas became a very shiny example of energy growth, of economic growth, of higher educational standards, and important improvements to our environment. We did it by setting clear goals, by managing the best and the brightest to achieve these goals, and by spending those scarce resources wisely. With your help, I believe that we can attain many positive outcomes at the Department of Energy on behalf of the American people.

#### NUCLEAR WASTE

So, Mr. Chairman, in conclusion, I want to add some clarity to a statement I made yesterday in front of the House, if I could, just a short clarification on some remarks I made yesterday about nuclear waste and interim storage. And I want to be crystal clear with this committee and with others that while there are a number of options that we've talked about on how to deal with these issues, no decision has been made at this time with respect to the timing or location, for that matter, of waste storage.

We have no—there are no plans. I think it's appropriate to say, there are no plans for interim storage at this particular time, in New Mexico or Nevada or Texas or any other site, and any such plans would, obviously, require coordination with you, with the Federal, State, and local officials.

The waste issue is a dilemma that we have a responsibility to address. And yesterday what I was doing was attempting to convey my interest in working with Congress to bring resolution to this issue, and you know, that's all I was saying. So my point is, let's work together. Let's find some solutions to these challenges that vex us, that have been in front of us for a while, and I'm eternally optimistic, sir, that we can do that in a way that serves this great country.

[The statement follows:]

#### PREPARED STATEMENT OF HON. RICK PERRY

Chairman Alexander, Ranking Member Feinstein, and Members of the Subcommittee, it is an honor to appear before you today to discuss the President's fiscal year 2018 Budget Request for the Department of Energy ("the Department" or "DOE").

As you know, I was confirmed by the United States Senate on March 2, 2017. It is a privilege and an honor to serve as the 14th Secretary of Energy and fulfill this important role critical to our Nation's energy and scientific pursuits along with assuring our nuclear readiness.

As a former legislative appropriator and Governor, I'm keenly aware of the budget writing process and only wish I had been confirmed by the Senate earlier so I could be a full participant in crafting this proposal.

The President's proposal focuses our priorities and reigns in spending. There is much the Department does well and stays within budget, and unfortunately there are places we need to be better stewards of our financial resources. This budget proposal makes some difficult choices. I look forward to explaining our priorities and working with you to continue the important mission of the Department of Energy.

In short, the President's fiscal year 2018 \$28 billion Budget Request for the Department of Energy ("Budget") advances our key missions through significant investments to modernize our nuclear weapons arsenal, protect our energy infrastructure from cyber and other attacks, achieve exascale computing, and address our moral obligations regarding nuclear waste management and the Nation's nuclear legacy.

The Department's world-leading science and technology enterprise also generates the innovations to fulfill our mission. Through our 17 national laboratories, we engage in cutting-edge research that expands the frontiers of scientific knowledge and generates new technologies to address our greatest challenges. While most of this is in the energy field, the DOE also does work to support the health sector with research and recently launched a program with Veterans Affairs to use our computing ability to assist our Nation's veterans.

The Budget focuses the intellectual prowess of our scientists and engineers on the development of technologies that the ingenuity and capital of America's entrepreneurs and businesses can convert into commercial applications and products that improve the lives and security of all Americans.

#### RESTORING THE NUCLEAR SECURITY ENTERPRISE

The Budget fulfills the President's vision of rebuilding and restoring our Nation's security through robust investments in the Department's nuclear security mission. The Budget provides \$13.9 billion for the National Nuclear Security Administration, \$1 billion or 8 percent above the fiscal year 2017 Enacted level.

As a participant on the National Security Council, the Department has a unique role in our Nation's security. I undertake these responsibilities with the utmost gravity.

One of my key duties as Secretary of Energy is to annually certify to the President that the American nuclear weapons stockpile remains safe, secure, and reliable, without the need for underground explosive nuclear testing. The Budget includes \$10.2 billion for Weapons Activities to maintain and enhance the safety, security, and effectiveness of the U.S. nuclear weapons stockpile. This \$996 million increase over fiscal year 2017 supports modernizing our nuclear weapons enterprise and meets Department of Defense requirements in accordance with the President's Memorandum on Rebuilding the Armed Forces.

The Budget supports our ongoing Life Extension Programs (LEP) and Major Alterations, which includes \$4.0 billion for Directed Stockpile work, a \$669 million increase. Funding for the W76-1 warhead LEP directly supports the Navy and will keep the LEP on schedule and on budget to complete production in fiscal year 2019. An increase of \$172 million, or 28 percent, for the B61-12 LEP will keep us on schedule delivering the First Production Unit (FPU) in fiscal year 2020 to consolidate four variants of the B61 gravity bomb and improve the safety and security of the oldest weapon system in our nuclear arsenal.

The Budget also supports the Air Force's Long-Range Stand-Off program through an increase of \$179 million or 81 percent from fiscal year 2017 Enacted for the W80-4 LEP, to deliver the first production unit in fiscal year 2025 of the cruise missile warhead. We also increase funding by \$51 million or 18 percent for the W88 Alteration 370, to provide the scheduled first production unit in fiscal year 2020.

The Budget for Weapons Activities also increases investments to modernize our nuclear infrastructure. For example, we include \$663 million, an \$88 million increase from fiscal year 2017, for construction of the Uranium Processing Facility needed to replace aging facilities at the Y-12 National Security Complex, as well as \$98 million, up \$83 million from fiscal year 2017 Enacted, to accelerate the replacement of old and unfit buildings at the Albuquerque Complex.

The Weapons Activities Budget request also includes \$161 million, a \$66 million increase, for NNSA collaboration with the Office of Science on the development of capable exascale computer systems, which I address below.

Moving on to NNSA's Naval Reactors program, the Department has the ongoing responsibility to provide militarily effective nuclear propulsion plants for Navy vessels and to ensure their safe, reliable and long-lived operation. The Budget provides \$1.5 billion to support the safe and reliable operation of the Navy's nuclear-powered fleet and continuation of the Columbia-class submarine program, refueling of the Land-Based Prototype reactor, and the Spent Fuel Handling Recapitalization Project.

The Budget also includes \$1.8 billion for the Defense Nuclear Nonproliferation (DNN) program to reduce global threats from nuclear weapons. This critical national security program prevents the spread of nuclear and radiological materials, advances technologies that detect nuclear and radiological proliferation worldwide, and eliminates or secures inventories of surplus materials and infrastructure usable for nuclear weapons.

The Budget proposes to terminate the Mixed Oxide Fuel Fabrication Facility project, providing \$270 million for use toward an orderly and safe closure of the project and \$9 million to develop the pre-conceptual design for the dilute and dispose approach to plutonium disposition. This is an example of a significant cost and

schedule overrun that should have set off alarms earlier in the project and should have been canceled.

We will, in an orderly and responsible manner, begin to wind down the project. My staff, in coordination with other stakeholders, is already reviewing alternative, enduring missions that could potentially utilize existing infrastructure and expertise.

The Budget also provides \$277 million for Nuclear Counterterrorism and Incident Response, \$5 million above fiscal year 2017 Enacted, to work domestically and around the world to improve our ability to respond to radiological or nuclear incidents, in conjunction with other agencies in a broader U.S. Government effort.

Finally, the Budget for NNSA includes \$419 million for the Federal workforce at the NNSA. This \$31 million increase is essential to ensuring our world-class workforce of dedicated men and women can effectively oversee NNSA's critical national security missions.

#### SECURING AGAINST CYBER THREATS

Among the most critical missions at the Department is to develop science and technology that will assure Americans of a resilient electric grid and energy infrastructure. Protecting these assets means it has to be resilient and hardened to defend against the evolving threat of cyber and other attacks. Consumers need to trust when they flip the switch, their lights will come on. Unfortunately, cyberattacks pose an ever-increasing threat to the Nation's networks, data, facilities, and infrastructure.

As utilities and independent power producers and operators have integrated advanced digital technologies to automate and control physical functions in their energy systems to improve performance, sophisticated cyber threats have increased. Nation-States, criminals, and terrorists conduct sophisticated probes of energy systems that can be used to exploit cyber vulnerabilities that disrupt or destroy energy systems.

To ensure robust cybersecurity programs across the energy sector, the Budget provides funding in multiple programs. In the Office of Nuclear Energy, we add a focus in the \$20 million Light Water Reactor Sustainability program to research new technologies to address nuclear power plant cybersecurity, and we provide \$17 million for cybersecurity at the Idaho National Laboratory (INL). In the Office of Fossil Energy, we provide \$8 million for our sensors and controls research program seeking early-stage breakthroughs to help secure power plants against cyber-attacks.

Finally, the Budget includes \$42 million for energy delivery system cybersecurity in Electricity Delivery and Energy Reliability, and a renewed focus to take steps to make a difference within 2 years in the cybersecurity of our Nation's power grid. Our budget funds early stage activities that improve cybersecurity and resilience of the grid in order to harden and evolve critical grid infrastructure. We focus on early stage R&D at national laboratories to develop the next generation control systems and components, devices and systems with engineered-in cybersecurity features; and we fund a new activity to develop a continuous monitoring capability that will significantly increase our awareness and ability to prevent and respond to these types of events.

We also cannot ignore the risks to the Department's own science, technology, and nuclear security infrastructure. Across the Department's programs and sites, we are taking major steps to safeguard our assets against cyber threats. The Budget includes robust funding to secure our own networks. For example, the Budget increases funding for the Chief Information Officer by \$17 million from fiscal year 2017 to modernize infrastructure and improve cybersecurity across the internal DOE IT enterprise. We also increase funding for cybersecurity in the National Nuclear Security Administration to \$150 million to step up security for our nuclear security networks. In the Environmental Management program, we consolidated \$43 million for cybersecurity into a new budget to ensure the security at our nine major cleanup sites.

Cybersecurity is one of my key goals at the Department, and the Budget will help us take concrete steps to harden our systems and our infrastructure.

#### EXASCALE COMPUTING

Turning to the Department's role in science and technology, the United States has long led the way in computing, dating back to invention of the first computers and continuing with world-leading machines at our national laboratories. Our leadership in developing and building the world's fastest computers has faced increasingly fierce global competition in the last decade. Maintaining the Nation's global primacy in high-performance computing is more critical than ever to ensure our national se-

curity, our continuing role as a science and innovation leader, and our economic prosperity.

The Budget includes \$508 million to accelerate development of an exascale computing system, including \$347 million in the Office of Science (Science) and \$161 million in NNSA. This unprecedented investment, which is \$249 million—or 96 percent—above the fiscal year 2017 level, reflects the Department’s intention to deliver an exascale machine in 2021 and a second machine with a different architecture by 2022. To get there, the Science/NNSA partnership will focus on hardware and software technologies needed to produce an exascale system, and the critical DOE applications needed to use such a platform.

By accelerating our progress towards exascale computing, we will take back American primacy in computing science and technology. This world-leading exascale program will bolster our national security by supporting the nuclear stockpile, while also supporting the next generation of scientific breakthroughs not possible with today’s computing systems.

#### ADDRESSING THE OBLIGATION OF NUCLEAR WASTE AND LEGACY MANAGEMENT

The President’s fiscal year 2018 Budget Request for the Department deals with the issue of nuclear waste disposal and supports accelerating clean-up of our Cold War legacy.

#### ADDRESSING THE IMPERATIVE OF NUCLEAR WASTE MANAGEMENT

For too many years, the prior Administration has literally kicked the can down the road on nuclear waste.

The Budget Request takes significant steps forward for the country in other critical areas. First, recognizing that we must move ahead in fulfilling the Federal Government’s responsibility to dispose of the Nation’s nuclear waste, the Budget includes \$120 million, including \$30 million in defense funds, to resume licensing for the nuclear waste repository at Yucca Mountain and initiate a robust interim storage program.

The Budget devotes \$110 million to restart Nuclear Regulatory Commission (NRC) licensing activities for the nuclear waste repository at Yucca Mountain, including funding for management, site operations and maintenance, as well as technical, scientific, legal and other support.

In addition, the Budget includes \$10 million to initiate a robust interim storage program that complements the nuclear waste repository by developing a capability for earlier acceptance of spent nuclear fuel to accelerate removal from sites in 39 States across the country. An interim storage capability also adds flexibility to the system that will move materials from sites across the country to its ultimate disposition.

By restarting the long-stalled licensing process for Yucca Mountain and committing to establishing interim storage capability for near-term acceptance of spent nuclear fuel, our Budget will accelerate fulfillment of the Federal Government’s obligations to address nuclear waste, enhance national security, and reduce future burdens on American taxpayers. This also will increase public confidence in nuclear safety and security, thus helping nuclear energy to remain a significant contributor to the country’s energy needs for generations to come.

#### FULFILLING LEGACY CLEANUP RESPONSIBILITIES

The Budget also includes \$6.5 billion for Environmental Management (EM), \$89 million above the fiscal year 2017 Enacted level, to address its responsibilities for the cleanup and disposition of excess facilities, radioactive waste, spent nuclear fuel, and other materials resulting from five decades of nuclear weapons development and production and Government-sponsored nuclear energy research.

To date, EM has completed cleanup activities at 91 sites in 30 States and Puerto Rico, and is responsible for cleaning up the remaining 16 sites in 11 States—some of the most challenging sites in the cleanup portfolio.

New in the Budget is \$225 million to address specific high-risk contaminated excess facilities at the Y-12 National Security Complex and the Lawrence Livermore National Laboratory.

The Budget includes \$1.5 billion, \$4 million above fiscal year 2017, for the Office of River Protection at the Hanford Site, for continued work at the Hanford Tank Farms and to make progress on the Waste Treatment and Immobilization Plant. This budget will continue progress toward important cleanup required by the Consent Decree and Tri-Party Agreement to include a milestone to complete hot commissioning of the Low Activity Waste Facility by December 31, 2023. The Budget also includes \$800 million to continue cleanup activities at Richland, including con-

tinued K-Area decontamination and decommissioning remediation and the K-West Basin sludge removal project.

For Savannah River, the Budget provides \$1.4 billion, \$214 million above fiscal year 2017, to support activities at the site including the Liquid Tank Waste Management Program, continued construction and commissioning to achieve startup of the Salt Waste Processing Facility in 2018, continued construction of the Saltstone Disposal Unit #7, and support for facilities that receive and store nuclear materials.

The Waste Isolation Pilot Plant (WIPP) is essential for the disposition of transuranic defense-generated waste across the DOE complex, and the Budget provides \$323 million to safely continue waste emplacement at WIPP. The Budget Request will continue WIPP operations, including waste emplacements, shipments, and maintaining enhancements and improvements, and progress on capital asset projects, including \$46 million for the Safety Significant Confinement Ventilation System and \$19.6 million for the Exhaust Shaft. These steps will increase airflow in the WIPP underground for simultaneous mining and waste emplacement operations.

The Budget includes \$359 million, \$30.9 million below fiscal year 2017 enacted level, to continue major clean-up projects at the Idaho site, such as the Integrated Waste Treatment Unit, and to process, characterize, and package transuranic waste for disposal at offsite facilities. It provides \$390 million for Oak Ridge, \$108 million below fiscal year 2017, to continue deactivation and demolition of remaining facilities at the East Tennessee Technology Park, continue preparation of Building 2026 to support processing of the remaining U-233 material at the Oak Ridge National Laboratory, and support site preparation activities for the Outfall 200 Mercury Treatment Facility at the Y-12 National Security Complex.

For Portsmouth, the Budget includes \$418 million, \$36 million above fiscal year 2017, to continue progress on the deactivation and decommissioning project at the Portsmouth Gaseous Diffusion Plant, safe operation of the Depleted Uranium Hexafluoride Conversion Facility, and continue design and construction activities at the On-Site Waste Disposal facility. And at Paducah, the Budget includes \$270 million to continue ongoing environmental cleanup and depleted uranium hexafluoride (DUF6) conversion facility operations at the Paducah site. In addition, the fiscal year 2018 Budget Request supports activities to continue the environmental remediation and further stabilize the gaseous diffusion plant.

Together, these investments for Environmental Management will make significant progress in fulfilling our cleanup responsibilities while also starting to address our high-risk excess facilities at NNSA sites.

#### REFOCUSING PRIORITIES ON CORE MISSIONS

The Budget refocuses the Department's energy and science programs on early-stage research and development at our national laboratories to advance American primacy in scientific and energy research in an efficient and cost-effective manner. The Budget funds \$6.4 billion in early-stage R&D while reducing later-stage research, development, demonstration, and deployment programs by \$3.1 billion from the fiscal year 2017 Enacted levels.

As part of transitioning later-stage R&D, demonstration, and deployment responsibilities to the private sector and the States, the Budget terminates five Energy Innovation Hubs and five Clean Energy Manufacturing Institutes, which together constitute an annual taxpayer burden of over \$187 million. The Budget eliminates the Supercritical Transformational Electric Power demonstration program and SuperTruck II, together saving \$44 million annually, and terminates deployment activities like Weatherization and the State Energy Program in the Office of Energy Efficiency and Renewable Energy, saving a total of \$265 million.

Also in line with Administration priorities, the Budget terminates the Advanced Research Projects Agency—Energy, known as ARPA-E, and the Department's Loan Programs, while maintaining necessary Federal staff to oversee existing awards and loans. We also close the Office of Energy Policy and Systems Analysis, to avoid duplicative efforts already accomplished by the program offices. Termination of these three programs will save over \$300 million in fiscal year 2018 alone while significantly reducing financial risk to the taxpayer moving forward.

#### FOCUS ON INNOVATION

The fiscal year 2018 Budget focuses its investments on the basic, early-stage R&D conducted by the scientists and engineers at our 17 national laboratories who are constantly on the path to developing the next great innovations that can transform society, and bring forth a new era of prosperity for the American people. The Budget provides \$6.4 billion, \$4.5 billion in the Office of Science and \$1.9 billion in energy

research and development programs, with a renewed focus on cutting-edge innovation and transitioning those breakthroughs to the private marketplace.

The Budget consolidates programs focused on bringing technologies to the market in the Office of Technology Transitions. Through concerted effort and coordination with our labs, this will reduce costs to the taxpayer while at the same time providing a robust technology transfer program to transfer breakthroughs from the national laboratories to the private sector.

#### *Nuclear Energy*

The Budget provides \$703 million for Nuclear Energy, \$313 million below the fiscal year 2017 level, to continue innovating new and improved ways to generate nuclear power. The budget refocuses funding on early-stage research and development, such as the Nuclear Energy Enabling Technologies program, that enables innovation driven by the private sector. While the Budget ends the Consortium for Advanced Simulation of Light Water Reactors (CASL), it increases funds for Nuclear Energy Advanced Modeling and Simulation (NEAMS) by \$7 million to integrate VERA, the virtual reactor developed by CASL, and RELAP-7, a safety analysis and simulation tool developed at the INL, into the existing NEAMS program.

From 2012 through 2017, the Department spent \$390 million on the Small Modular Reactors (SMR) Licensing Technical Support program. With NuScale Power submitting its application to the Nuclear Regulatory Commission and the completion of planned activities in fiscal year 2017, the Department closes the SMR Licensing Technical Support program having achieved its goal to commercialize SMR technology. Given the ongoing promise of SMR technology, the fiscal year 2018 Budget includes \$20 million for early-stage R&D supporting advanced SMR designs.

Finally, the Budget for Nuclear Energy also supports robust safeguards and security funding of \$133 million—a \$4 million increase—for protection of our nuclear energy infrastructure and robust infrastructure investments at INL facilities.

#### *Fossil Energy Research and Development*

The Fossil Energy Research and Development program advances transformative science and innovative technologies which enable the reliable, efficient, affordable, and environmentally sound use of fossil fuels. Fossil energy sources currently constitute over 80 percent of the country's total energy use and are critical for the Nation's security, economic prosperity, and growth. The fiscal year 2018 Budget focuses \$280 million on cutting-edge fossil energy research and development to further our energy security, advance strong domestic energy production, and support America's coal industry through innovative clean coal technologies.

In fiscal year 2018, we invest \$30 million in a new initiative to repower coal-fired plants through research on advanced technologies and systems that improve the reliability and efficiency of existing coal units and incorporate new, advanced technology components and systems. We also will support research on coal combustion to help support potential U.S. coal exports, as well as research on carbon utilization efforts to develop materials and chemicals for new business opportunities, in support of a strong American energy sector and vibrant coal industry.

As part of the Department's effort to operate more efficiently, the Budget proposes the initial stages of footprint consolidation for the National Energy Technology Laboratory. In a phased approach, we propose to consolidate NETL's Albany, Oregon site into the NETL's Eastern sites and initiate a Mission Alignment study in fiscal year 2017 to evaluate alternatives for the consolidation of NETL's eastern sites.

#### *Energy Efficiency and Renewable Energy*

The Energy Efficiency and Renewable Energy budget funds \$636 million to support research at our national laboratories to drive energy innovations in renewable energy, next-generation transportation, and energy efficiency.

The fiscal year 2018 investments support development of battery technologies and advanced combustion engines, and new science and technology for developing biofuels. The Budget funds research into the underpinnings of future generations of solar photovoltaic technology, into the design and manufacturing of low-specific power rotors for tall wind applications, and on wind energy grid integration and infrastructure challenges.

The Budget also funds early-stage R&D for advanced manufacturing processes and materials technologies. These efforts, combined with the research that leverages the unique high-performance computing assets in the national laboratories, we can drive the breakthroughs that will promote economic growth and manufacturing jobs in the United States.

*Electricity Delivery and Energy Reliability*

All power generation, regardless of the fuel, relies on the power grid to deliver electricity to our homes and businesses across the Nation. The Budget provides \$120 million for Electricity Delivery and Energy Reliability to support research and development at the national laboratories to develop technologies that strengthen, transform, and improve energy infrastructure so that consumers have access to reliable, secure, and clean sources of energy.

In addition to the cybersecurity program described earlier, the Budget funds foundational research to ensure the reliability and resiliency of the U.S. electric grid, to support modernization of the distribution of electric power, and to advance the state of the science and technology underpinning grid energy storage, transformers, and other grid components.

## WORLD-LEADING SCIENCE RESEARCH

The Department of Energy is the Nation's largest Federal supporter of basic research in the physical sciences, and the President's fiscal year 2018 Budget provides \$4.5 billion for the Office of Science to continue and strengthen American leadership in scientific inquiry. By focusing funding on early-stage research, this Budget will ensure that the Department's National Laboratories continue to be the backbone of American science leadership by supporting cutting-edge basic research, and by building and operating the world's most advanced scientific user facilities—which will be used by over 27,000 researchers in fiscal year 2018.

We provide \$722 million for Advanced Scientific Computing Research, an increase of \$75 million above fiscal year 2017. This funding will continue supporting our world-class high-performance computers that make possible cutting-edge basic research, while devoting \$347 million in the Office of Science to reflect the Department's intention to accelerate our achievement of exascale computing by 2021. This focused effort will drive the innovations necessary for computing at exascale speeds, resulting in computing systems at unprecedented speeds at Argonne National Laboratory in 2021 and Oak Ridge National Laboratory in 2022.

The Budget also provides \$1.6 billion for Basic Energy Sciences, supporting core research activities and the Energy Frontier Research Centers. We will continue construction of the Linac Coherence Light Source-II at SLAC National Accelerator Laboratory and operations of the light sources across the DOE science complex, supporting research across the Nation and ensuring our continued world leadership in light sources and the science they make possible.

The Budget also provides \$673 million for High Energy Physics, including \$54.9 million for construction of the Long Baseline Neutrino Facility and Deep Underground Neutrino Experiment, \$5 million above fiscal year 2017. By supporting the highest priority activities and projects identified by the U.S. high energy physics community, this program will continue cutting-edge pursuit to understand how the universe works at its most fundamental level.

The Budget for the Office of Science provides \$310 million for Fusion Energy Sciences, including \$247 million for domestic research and fusion facilities and \$63 million for the ITER project. For Nuclear Physics, the budget provides \$503 million to discover, explore, and understand nuclear matter, including \$80 million for continued construction of the Facility for Rare Isotope Beams and operations of facilities, including the newly-upgraded Continuous Electron Beam Accelerator Facility. For Biological and Environmental Research the Budget includes \$349 million to support foundational genomic sciences, including the Bioenergy Research Centers and to focus on increasing the sensitivity and reducing the uncertainty of earth and environmental systems predictions.

## STRATEGIC PETROLEUM RESERVE

In addition to our nuclear security responsibilities, the Department of Energy, in conjunction with other Federal agencies, is responsible for ensuring the Nation's energy security. The Strategic Petroleum Reserve (SPR), one component of that effort, protects the U.S. economy from disruptions in critical petroleum supplies and meets the U.S. obligations under the International Energy Program. The Budget includes \$180 million, \$43 million below fiscal year 2017 Enacted, to support the Reserve's operational readiness and drawdown capabilities.

Looking forward, the President's Budget proposes to sell approximately 270 million barrels of SPR crude oil by 2027, roughly half of the remaining SPR inventory after all sales currently authorized by law are completed, resulting in estimated receipts of \$1 billion by fiscal year 2019 and \$17 billion through 2027. The SPR program will conduct a comprehensive analysis to determine the sites to be decommissioned as the SPR footprint is reduced from four to two sites. The Budget continues

the sale of SPR oil for the Energy Security and Infrastructure Modernization Fund authorized by the Bipartisan Budget Act of 2015 to support an effective modernization program for the SPR, but at half the previous funding level because of the anticipated closure of two SPR storage sites.

Finally, as the Northeast Gasoline Supply Reserve (NGSR) is operationally ineffective and not cost-efficient as a regional product reserve, the President's Budget proposes to liquidate the NGSR and sell its one million barrels of refined petroleum product in fiscal year 2018, resulting in an estimated \$69 million in receipts.

#### POWER MARKETING ADMINISTRATIONS

The Budget includes \$82 million for the Power Marketing Administrations, the same as fiscal year 2016 Enacted. The Budget also proposes the sale of the transmission assets of the Western Area Power Administration (WAPA), the Bonneville Power Administration (BPA), and the Southwestern Power Administration (SWPA). The Budget also proposes to repeal the \$3.25 billion emergency borrowing authority for WAPA authorized by the American Recovery and Reinvestment Act of 2009.

#### CONCLUSION

In conclusion, I reaffirm my commitment to ensure that the Department of Energy, through its National Laboratories, will continue to support the world's best enterprise of scientists and engineers who create innovations to drive American prosperity, security and competitiveness for the next generation. The President's fiscal year 2018 Budget Request for the Department of Energy positions us to take up that challenge while continuing to ensure our national security.

In my opening I mentioned my time as Governor of the State of Texas. Over my 14-year tenure, I proposed seven budgets. Some had spending increases. Others had deep spending cuts to deal with economic downturns and uncertainties. Every one of them directed the spending of billions of dollars of our taxpayer's dollars.

As we move forward over the coming weeks and months, I look forward to working with you and your colleagues in the United States House of Representatives. I am committed to ensuring DOE is run efficiently, effectively, and we accomplish our mission driven goals.

Thank you, and I look forward to answering your questions.

Senator ALEXANDER. Thank you, Mr. Secretary.

We'll now begin a round of 5-minute questions, and I'll begin.

#### FISCAL YEAR 2018 BUDGET

Presidential budgets have a pretty bad record in this Congress, whether they come from democrats or republicans, and this one was especially bad. And what I try to do is look within the budget to see if there's anything good in it at all. Not much here, and I don't know why Presidents send secretaries up here to defend such budgets. I used to be in that shape when I was education secretary, and somebody in the back office somewhere would write the budget and then send me up to defend it, and I never appreciated it. I don't want a response from you on that, but I did find in this budget one area that I want to compliment you for and ask you to comment on.

The budget request prioritizes super computing, recommends \$508 million, including \$347 from the Office of Science, \$161 million from NNSA (National Nuclear Security Administration), and delivery of at least one Exascale system in 2021.

#### SUPERCOMPUTING

As I said before, under President Obama's administration and bipartisan support from this committee, supercomputing was a top priority. Senator Bingaman really got us started on it 10 or 12 years ago, sent me to Yokohama to look at the Japanese computer. And what our government did since then was create a leadership

computing facility, and rather than every little agency having a computer, we put within our laboratories a combined computer strategy, we built some big ones, and we've got some of the best people in the world at many different laboratories who know how to operate them. Despite that, over the last weekend, China—the list of the most powerful supercomputers was released. China maintained two top places, the top two. Switzerland pushed Titan down from fourth to third. We still have five of the top ten.

So my first question about computers is could you talk about your strategy for funding them, and my second is, while you were at Oak Ridge, you were told that 20 percent of our supercomputer time is spent helping other agencies. And one proposal, one example of that was helping Veterans Administration. Another proposal was to help CMS, Center for Medicaid and Medicare Services, to apply the same techniques we apply when we look for terrorists, and look through Medicare and Medicaid claims and find waste, fraud, and abuse, since the Economist magazine has said that one out of four dollars billed for Medicare and Medicaid is swindled, and that drug smugglers are moving in to Medicare and Medicaid fraud and abuse because it is safer and more profitable.

So those are my two questions in—you have two minutes.

Secretary PERRY. Yes, sir.

Senator ALEXANDER. What can you say about funding in the future and what can you say about using the computers to help with waste, fraud, and abuse?

Secretary PERRY. Yes, sir.

Well, Mr. Chairman, having been a governor, you understand the—I think governor's budgets and President's budgets a lot of times have the same challenges. So I understand that. But, more importantly, having been an appropriator, I just want to, again, remind folks that I've had that experience, too, and that I know this is a starting point, and that this process is one that I respect and I will follow and work very, very closely with you, going forward.

So let me just address this issue of Exascale computing, and I think it is——

Senator ALEXANDER. Just so you know, I'm going to try to keep to five minutes, my time——

Secretary PERRY. Yes, sir.

Senator ALEXANDER [continuing]. So others do as well. So please go ahead.

Secretary PERRY. Yes, sir.

I think it's important for us around this room and outside of this room to understand the importance of America maintaining its super computing capability. Attaining this Exascale, this next level, is incredibly important. And the idea that China has the two fastest, and quite frankly, it is pretty disappointing to me, as an American, that the Swiss are number three. And no offense to the Swiss, but the idea that somehow or another we don't even get on the podium, so to speak, when it comes to our ability to be in the super computing game. And you know, five of those, I think six of those—of the top ten, we have. But our commitment to that is clear. This budget makes it clear. Having talked to the members of the committee and the members of Congress, and the Administration, they understand how important this is, and it is not just about being

able to stand up and wave the flag and say we've got to—you know, we're number one. It's about being able to address the challenges.

Our computing capacity and the speed of which we're able to do that is going to be the difference in whether we, you know, find the next big issues that challenge us as a country or not. So the commitment to Exascale, 2021 we'll be going to Argonne, 2022 we'll be coming to your home State and to Oak Ridge. And it's completely different architecture. This is the—this is the next generation past Exascale. So I think what's important—

Senator ALEXANDER. Maybe we can come back to that, Mr. Secretary. As I said, I want to keep to the five minutes for each Senator.

Secretary PERRY. Yes, sir.

Senator ALEXANDER. So, Senator Feinstein.

#### NUCLEAR WASTE

Senator FEINSTEIN. Mr. Secretary, I'm going to raise my favorite subject, which is the most difficult, and you touched on it, and that's the spent nuclear waste that's piling up all over this Nation, in 78 reactor sites, in 33 States. We have 77,000 metric tons of waste. We have four sites in California, 3,000 metric tons. Our two big power companies, Southern California Edison and Pacific Gas and Electric, each of whom has two 1,100 megawatt reactors, are closing them down.

There is no place for the waste to go. Yucca holds everything hostage. In the House, if you don't do Yucca, you get nothing, and the American people get nothing by way of secure storage of waste.

And the Chairman, we have gone over, we have talked to the four major figures in the authorizing and the appropriating committees. For about 5 years we put a measure in our budget that would permit a pilot nuclear waste site. We sat down with the heads of the energy committee, we drafted overall voluntary legislation that would constitute a nuclear waste policy for this country that after talking with every expert we could find, that we believed was workable and doable. There's tens of millions of dollars held up in payments because there's no place to put waste. And it goes on and on and on. And seemingly, no energy secretary has been able to break this logjam. And I'm getting more and more beside myself because I think it is a real hazard to our people.

In California, we are on what's called the rim of fire. We're on the Pacific coast, where big quakes, look at where—Fukushima, Indonesia, Argentina, Alaska, California. Big quakes. We have to secure this waste. It's all hot waste. And I don't know quite what to do because the issue is Yucca, and there are two schools of thought. I met with one of the Senators and we talked about Yucca the other night, and she was saying how it is dripping water right down through the whole thing. If that's true, it's not a good place. I haven't been there, I haven't seen it.

So I would like to ask you this question. The Department of Energy has to take the lead here. We have to break the stalemate. We have to develop some pilot projects because Yucca would be filled tomorrow.

Are you willing to take on that leadership? And what will you do? How do we solve this problem?

Secretary PERRY. Senator, thank you. I will disagree with you with one thing, that because of a Secretary of Energy, singularly, we're going to be able to either move forward or not. I will tell you, I will be a very willing participant as a partner in this, understanding how this process works, and have extraordinary respect for the United States Congress and the process of how we create statutes and go forward working with the Administration and being a part of the Administration.

As a bit of a—just a touch of levity here, I'm learning that there's a real difference between being a secretary and being a governor, and in the sense of that we have a partnership here. And I think you know in my both public and my private statements, that I think it is a moral imperative for this country to move forward and find the solution to this waste issue, both the high level waste and the interim. And I will throw a lot of Jello at the wall, if that's what is required to stimulate conversations, to, you know, to try to truly come up with the solution to this.

But I don't think this is one individual's—and changing one individual's going to—in its finality be the solution. But I think we can have an open conversation and talk—I mean, the idea that we've got a site that has—

Senator ALEXANDER. Mr. Secretary, we're about at five minutes, if you—

Secretary PERRY. Yes, sir.

Senator ALEXANDER. We can come back to that subject, and I have an idea we will.

Senator FEINSTEIN. I think so.

Senator ALEXANDER. Thank you, Senator Feinstein.

Senator Kennedy.

#### FISCAL YEAR 2018 BUDGET REQUEST

Senator KENNEDY. Thank you, Mr. Chairman.

Mr. Secretary, after you got over at energy and had a chance to get settled in, you looked at the budget, did you find any waste in the budget?

Secretary PERRY. Oh, I can find duplications in the budget. I can find places that—I haven't seen a budget that's ever been written, in my 30 years of being either an appropriator, an agency head, or a governor, that there wasn't a place somewhere that I could—or anybody else for that matter, could point to and say that we can do without.

Senator KENNEDY. Okay. You talked a little bit about MOX. Maybe we'll come back to that. Other than MOX, what other waste did you see in the budget?

Secretary PERRY. Well, again, I think that's in the eye of the beholder. So, you know, I go back and tell you that—

Senator KENNEDY. Well, you're the beholder.

Secretary PERRY. Okay. I'd tell you that there are areas, whether it is in public relations, whether it's in different agencies or different departments, I should say, where you have duplication of services and you can consolidate them and do it at a, you know, more efficient and effective way.

Senator KENNEDY. Let me put it another way. What I'm trying to get my arms around is you went from \$31 billion to \$28 billion,

as I understand it, in your budget. And I assumed that you decided the \$3 billion wasn't a priority. Look, I applaud you for your fiscal responsibility. You did it as governor, and I appreciate that approach now.

Where'd you find the savings, is what I'm trying to get to.

Secretary PERRY. Well, one of the things that I would like to bring to your attention, sir, I got here on the 2nd day of March, and that budget was already written.

Senator KENNEDY. Yes.

Secretary PERRY. My job is to sit here in front of you and to robustly defend it, which is what I'm doing.

[Laughter.]

Senator KENNEDY. Okay. I appreciate your candor. So this is not your budget. I get it. I understand.

#### MOX FACILITY

Tell me, if you would, being mindful of our time here, Mr. Secretary, tell me what your objections are to MOX.

Secretary PERRY. Well, there are multiple areas of MOX that I think it would do well for us to have a good understanding of.

This is a project that was put into place some years ago. I think back in the Clinton Administration was when it was first moving forward. In the mid 2000s it got kicked off, and it is vastly beyond I think anyone's wildest dreams of a budget of what we would be faced with.

Senator KENNEDY. So you think it is too expensive?

Secretary PERRY. Yes, sir.

Senator KENNEDY. Okay. Do you think—putting the cost aside for a second, do you think the purpose of it is worthwhile?

Secretary PERRY. I can discuss it and debate it. I think if the question is, is there a better way to do this?

Senator KENNEDY. Yes, sir.

Secretary PERRY. Then I would say, yes, sir, there is a better way. There's a cheaper way, there's a faster way, and there's a lot of side issues and vagaries out there that I'm not going to get into today. But if you want to know, this is over budget by massive amount, the end in sight is 2048, and there is an option that is acceptable, that is substantially less expensive, and more expeditious.

#### METHANOL FACILITY

Senator KENNEDY. Okay. Thank you for that.

Let me ask you about your thoughts about the methanol plant. There's a proposed petcoke-to-methanol facility in my State, Lake Charles, very close to Beaumont. What's your thinking about that? I noticed that in your budget, I realize you haven't really had a chance to get completely settled in, but your budget request eliminated this program.

Secretary PERRY. Yes.

Senator KENNEDY. And it was a loan guarantee, if I recall, and I wanted to know your thinking on that.

Secretary PERRY. Yes. Well, I talked to your other Senator, Senator Cassidy, about that as well, and we have discussed it. I'm not at this particular point in time going to tell you that it's completely off the table to continue the conversation. It's not. This budget

does, in fact, do that. But I think it's something that we can continue to have a conversation on.

Senator KENNEDY. Is there anything in particular about it that concerned you in terms of it being taken out?

Secretary PERRY. No, sir. Not that I can tell you here in the committee without further detail.

Senator KENNEDY. Okay. All right. I'm going to yield my last two seconds.

Senator ALEXANDER. Thank you.

Senator KENNEDY. Thank you. Thank you, Mr. Secretary.

Secretary PERRY. Yes, sir.

Senator KENNEDY. Nice to meet you. I've watched you on TV, and Louisiana, next door to Texas, I've watched you be a fine——

Secretary PERRY. I had to compete against your governor over there, Bobby Jindal. He's a good competitor.

Senator ALEXANDER. Thank you, Senator Kennedy.

Senator Udall.

#### LOS ALAMOS NATIONAL LABORATORY

Senator UDALL. Thank you, Chairman Alexander.

In 2013, Los Alamos paused plutonium production following compliance and safety concerns. A recent report was published in the Washington Post detailing safety issues, which have been covered well by the defense nuclear facilities safety board.

Both Los Alamos National Lab and General Klotz have responded to these issues, identifying the work they have done to correct the infractions, and I'd like to enter both the memo from Los Alamos and the statement from General Klotz in the record.

Mr. Chairman, I'd like to enter—Chairman Alexander, I'd like to enter two statements in the record from General Klotz and from Los Alamos on the issue of responding to safety issues.

Senator ALEXANDER. It will be done, Senator Udall. Thank you.

Senator UDALL. Thank you.

In your opinion, in the opinion of DOE, is Los Alamos making acceptable progress to fix all identified issues with its plutonium pit program?

Secretary PERRY. The short answer is, yes, sir. If I can expand just a moment. It's made significant progress with hiring new criticality safety analysts since that 2013 pause in operations. They're back, you know, operating at an appropriate level, and we have a conscientious and a safety-based decision to pause that back in—the PF4 back in 2013. And anyway, the reviews were done, the readiness assessments were very deliberately and appropriately accomplished, and it's been safely brought back online, and so I'm just satisfied that——

Senator UDALL. No, thank you for that, and that's consistent with both the Los Alamos memo that I put in and General Klotz's memo that I put into the record.

#### PLUTONIUM PIT PRODUCTION

Is the Department of Energy still on schedule to meet the Department of Defense requirements for pit manufacturing?

Secretary PERRY. Yes, sir.

Senator UDALL. And the current contractor was penalized for safety problems with the contract, will be going out for—that contract will be going out for re-bid soon. Will DOE commit to make safety improvements and accountability key parts of the re-bid process at Los Alamos?

Secretary PERRY. Yes, sir. I think somewhere north of \$80 million were withheld from that contractor in their fees, and they didn't earn 4-year contract extension either. So from my perspective there were some pretty good teeth in this and a clear message sent. NNSA is conducting very thorough and transparent annual reviews now to hold those M&O partners accountable.

So, and again, when safety of the operation's at our labs, I don't think there is anything more important, from my perspective.

Senator UDALL. Thank you, Secretary Perry for that answer.

An analysis of alternatives is currently ongoing for the plutonium mission at Los Alamos, and I understand this analysis is expected to be complete sometime this summer. Can you provide a more specific time estimate for completion, and will you assure us that the analysis will be objective and free from political interference?

Secretary PERRY. Yes, sir. I think you need a little more than a single word answer, though. The analysis that's being done is going to look at what is in the best interests of this country, what's this country's needs from the standpoint of plutonium pit production, what is the timeline of which we would be required, if the DOD tasked us with that, and do we have the appropriate facilities and the volume, if you will, to be able to handle that.

By this summer, which we're quickly approaching, we should have that AOA (analyses of alternatives) finalized, and you and the committee will be notified appropriately.

#### MOX FACILITY

Senator UDALL. And just—I know my time's almost up here.

The final question had to do with MOX and where the waste goes. And as you know, there are very specific requirements in the law as far as the Waste Isolation Pilot Project. So I hope that you will work with us and work with the State of New Mexico to make sure that we have some agreement on that, because that's an issue that's very important to New Mexico.

With that, I would yield back. Thank you, Mr. Chairman, and thank you, Mr. Secretary.

Senator ALEXANDER. Thank you, Senator Udall.

Senator Hoeven.

Senator HOEVEN. Thank you, Mr. Chairman.

Secretary Perry, thanks for being here.

Secretary PERRY. Yes, sir.

#### CARBON CAPTURE UTILIZATION AND SEQUESTRATION

Senator HOEVEN. Thanks for your service. We appreciate it, and you bring a tremendous amount of experience in the energy world to the job, as well as, obviously, leadership in government. I appreciate the fact you've committed to come out to North Dakota and see what we're doing with carbon capture and sequestration.

We have the only full scale plant that I know of that actually takes lignite coal, turns it into synthetic natural gas, captures the

CO<sub>2</sub>, and compresses it, puts it in a pipeline, ships it to the oil fields for secondary oil recovery. We're working to build on that. We want to show you that. It's a pretty massive, amazing operation. And then at the Energy Environmental Research Center, University of North Dakota, they're doing, I think, the foremost or among the foremost research in carbon capture and storage.

We have two projects that we're working on that we want your help with. One is Project Tundra, where we're developing retrofit equipment to put on coal plants, back-end scrubbers, if you will, that will capture CO<sub>2</sub> for storage, maybe for secondary oil recovery or maybe just storage. So that's on existing plants to reduce CO<sub>2</sub>. And that's Project Tundra. The other is what we call an Allam Cycle, which is actually developing a plant, a front-end process, building a plant that would capture carbon or be very low carbon emission.

Both of those have not only consortiums of companies behind them with funding, but also funding from the State of North Dakota through research funds we have. We want to partner with some of the funds that you have in your budget for pilot and demonstration projects. Now, you're doing one of these down in Texas—I think down in Houston, I'm not sure, but you would know——

Secretary PERRY. Petra Nova.

Senator HOEVEN. Petra Nova.

Secretary PERRY. It's actually in production now, sir.

Senator HOEVEN. Yes. And so that's exactly what we've got ready to go with corporate—with, you know, corporate partners that will put up capital. And these are all players that are doing this already to some degree. And then with the State of North Dakota. So to get you out there to see these things, and then see how you as the leader of the Department of Energy is really important for actually doing it instead of just talking about it.

Secretary PERRY. Yes, sir.

Senator HOEVEN. Right?

So I'd just like you to respond to that in terms of this budget, you've got funds in there. Let's put them to work and actually do it instead of just listening to folks talk about it all the time. What do you think?

Secretary PERRY. Yes, sir. I think it's important for us to prioritize these types of expenditures, where we can see a real return on our investment, so to speak.

Senator Feinstein, one of the things that I was able to do on my trip to China, to the Clean Energy Ministerial, was to get them to agree to highlight carbon capture utilization and sequestration in some of the projects that they're going to do. We talked to the Chinese about this and I think it is really important for us to go forward with these projects in the United States because then we will have the technology that the rest of the world can use and can buy. We can help in Europe, for instance, who, you know, are in a bit of a quandary as they move away from some historic uses of energy, whether it is coal or nuclear, and they're having a really difficult time being able to have the energy for their citizens.

So, you know, whether it's China or Europe, these technologies have the potential to pay great dividends. And again, this goes right back to what you talked about, the Department of Energy,

and the technology and the innovation that we come up with in our labs that are then commercialized, and this is a great example of it.

Senator HOEVEN. But this is really a key piece, and that's why it's important that this funding's in our budget, and I'm also addressing this to our Chairman and to our Vice Chairman, this is how we go from the lab—we have to go from technical viability to commercial viability. So we need to do this. We need to do these pilot projects and these demonstration projects to get the industry to commercial viability on CO<sub>2</sub> capture and storage because then they'll not only adopt it in this country, but in other countries.

Secretary PERRY. Yes, sir.

Senator HOEVEN. So we can't cut that—I would ask, we can't cut that piece out. We actually have to do it. We have to take it—we can do it—it's technically feasible. We've got to make it commercially viable. You're a key piece or part of that process to get to commercial viability. Aren't you?

Secretary PERRY. I'm going to follow your lead very closely, sir.

Senator HOEVEN. Good deal. Thanks again for your service. Appreciate it.

Secretary PERRY. Yes, sir.

Senator ALEXANDER. Senator Hoeven, sounds like a pretty good answer you got, to me.

Senator HOEVEN. Outstanding answer.

Senator FEINSTEIN. That was the best of the afternoon.

Senator ALEXANDER. Yes.

Senator Merkley.

#### WIND ENERGY

Senator MERKLEY. Thank you, Mr. Chairman, and thank you, Mr. Secretary.

I want to start by—wind energy. Wind energy has become such a big part of the economy in many States, providing 30 percent of Iowa and South Dakota's total electricity generation, 20 percent in three other States, Texas, of course, is the biggest wind generator in the country. And so I was a little surprised to see that with this powerful force for economic development and clean energy that the wind program was cut by 60 percent. You have a short thought as to why we should cut it 60 percent? Shouldn't we keep advancing this—by the way, in rural America, this is a powerful driver in my rural counties of economic development.

Secretary PERRY. I guess if there was anybody in the room that has any more history, and experience with wind energy, that would be me. Over the course of my time as the governor of Texas, we became the number one wind energy producing State in the Nation. As a matter of fact, we produced more wind than—

Senator MERKLEY. Congratulations, but I only have a little bit of time.

Secretary PERRY. Yes, sir. I'm sorry.

Senator MERKLEY. I appreciate the background.

Secretary PERRY. Give me a crack to talk about Texas, and I'm going to do it, sir.

Senator MERKLEY. It's a great opportunity.

Would you support—

Secretary PERRY. More than five other countries, but—

Senator MERKLEY [continuing]. Doing more for wind than is in the initial budget?

Secretary PERRY. Well, here's what I will say about that, and this is my experience with it. I think the States have a substantially more important role to play than the Federal Government when it comes to an industry that is reached a maturity level that it is either going to stand or fall on its own. And from the standpoint of this budget and what it's looking at there are more and new technologies from the wind side, I'm certainly open to our national labs looking at those and funding them.

Senator MERKLEY. Mr. Secretary, thank you. I will just make a few comments on it, which is that if there's anything that's mature, it's fossil fuels. Wind is evolving very, very rapidly, and so slashing both the funds that are designed to improve its integration into the grid and the R&D on it seems to me like a mistake as well as slashing the energy storage budget by 75 percent, which is massively important to the stability of our bridge.

#### BONNEVILLE POWER ADMINISTRATION

And speaking of mistakes, selling Bonneville Power, and I'm just going to make the comment, because if I let you talk, I'll lose my last two minutes.

So selling Bonneville Power would be a huge mistake. Look at what happened with the parking meters in Chicago, where it is now \$6 per hour after they sold off their parking meters. The company recouped its entire investment of about \$1.15 billion in the first 15 years, and they've got 60 years to go, and so the citizens are paying far more. And if you put the electric power of the northwest up to sale for—hold the entire northwest economy hostage, it would be a phenomenal mistake, and I can guarantee to you, every single Senator and House member in the entire northwest will lay themselves down on the track to make sure that that doesn't happen, trying to destroy the economy of a good section of the Nation.

#### HANFORD SITE

I'm also concerned about the cutting of the funds to Hanford. I was pleased in your nomination hearing to hear that you're committed to, "prioritizing one of what is the most dangerous, most polluted sites in this country," but it has \$190 million slash to the Hanford budget for this most dangerous, most polluted site in the country. Can we keep working to clean this up?

By the way, a tunnel just recently collapsed that was a tunnel into the PUREX facility. That thing hasn't been used since 1980, and we haven't gotten a thing cleaned up yet. Can't we get the site cleaned and not slash the funding for cleanup at Hanford?

Secretary PERRY. I think you bring up a very important issue that I hope we can have a conversation with going forward, and that is, the cost of Hanford and the projected cost on the out years. I think there is some real questions that need to be asked as we go forward about the return on the investment that we're getting, and making sure that the dollars that we do spend, Senator, are, in fact, delivering the results that the people of the country and certainly of the northwest deserve.

Senator MERKLEY. I absolutely agree with that. And the point is, that we built all these nuclear plants, made a big mess, and the Federal Government should clean it up, and then go decade after decade with doing virtually nothing out there. And you're right. I don't think the money's getting—that there's not enough of action on the ground for the amount of money we're spending, but apparently it's an extraordinary difficult issue and undercutting the existing programs I'm concerned about.

And my time's up, and thank you very much.

Secretary PERRY. Yes, sir.

Senator ALEXANDER. Thank you, Senator Merkley.

Senator Collins.

Senator COLLINS. Thank you, Mr. Chairman.

And welcome, Secretary Perry.

#### OFFSHORE WIND

I want to talk to you about a different kind of wind power than Senator Merkley brought up, and that is offshore wind capacity.

I want the United States to be the global leader in this cutting edge technology. I don't want it to be China or even Europe or Japan or South Korea. I want it to be our country. By the end of 2016, nearly 14,000 megawatts of offshore wind capacity had been installed in 14 markets across the world, including the areas and countries that I just mentioned. In comparison, only 30 megawatts of offshore wind capacity had been installed in the United States. We are way behind in the global race to harness clean renewable offshore wind energy, yet within 50 miles of our shores, there is enough offshore wind capacity to power our country four times over.

I'm a strong supporter of the department's Offshore Wind Advanced Technology Demonstration program, Maine has been a real leader in this area. Do you believe that the United States should prioritize advancing this kind of wind energy, the offshore wind space?

Secretary PERRY. Senator, as you know better than anyone in the room, the University of Maine has been the Department of Energy's partner in this, and each of those two offshore wind projects have received I think about \$11 million to date for the R&D on this very cutting edge design, as you bring to our attention. And they're eligible for up to \$40 million for construction, if they complete the very rigorous criteria along the way, which I suspect they are going to do and I will help you as well, keep them on line and on track.

Moving forward, our budget includes some \$32 million to focus on early stage R&D, to address the improvement side of the performance and reliability of the wind technology. So I think it is important, I was going to tell Senator Merkley that, you know, I think it's important that although there's reductions in the budget, and I understand that, I hope you all will trust that I have some experience, pretty good experience in dealing with having to manage big projects and big entities when there is a reduction in the budget, and that I can win your support and your trust going forward, but on this, you have, I think, a pretty clear indication from my remarks here that we're going to be continuing to be supportive in those areas.

Senator COLLINS. Thank you.

COLLABORATION BETWEEN NATIONAL LABORATORIES AND  
UNIVERSITIES

The second issue that I want to bring up is an exciting new research collaboration between the Chairman's national lab, the Oak Ridge National Laboratory, and the University of Maine that was announced earlier this year. And this collaboration, which is a formal agreement, will bring together the lab's expertise in additive manufacturing with the University's focus on forest bio based composites and other composite structures.

You highlighted in your testimony the importance of our national labs, and this project really has such potential for producing, to revolutionize our composite of low cost energy systems, automotive manufacturing, airplanes and pressure vehicles for compressed gas storage while lowering the energy use and creating jobs.

Would you elaborate on how the department will encourage and support research collaborations between the national labs and our universities to bring American leadership to the forefront in advanced composite materials manufacturing?

Secretary PERRY. Senator, I had the opportunity to go out to Oak Ridge with the Chairman, and we toured through the advanced manufacturing facility out there. There 3-D printing, and it's pretty fascinating, and as a matter of fact, we drove a Jeep that they had 3-D printed. Those partnerships with universities and our national labs, and I might add, the private sector, those public-private partnerships are going to play a very important role. I think as we are looking for innovative ways to fund or maybe to be able to find some funding that we think is important as we go along. Again, I'm not afraid to get outside of the box and talk about different ways to fund things that nobody's ever done before, that you all obviously would checkoff on and approve, but let's have these conversations because I agree with you that the technology and innovation that is going to be coming out of those labs and those partnerships are world changing.

Senator COLLINS. It is very exiting. Thank you.

Senator ALEXANDER. Thank you, Senator Collins.

Senator Tester.

Senator TESTER. Thank you, Mr. Chairman.

PARIS ACCORD

I want to thank you for being here, Secretary Perry. I do appreciate your style. I do. And I want to thank you for being in the position of Secretary of Energy. I will tell you that American leadership is something I've been very, very proud of my whole life, and I don't think it came by accident. I think it came by way of the greatest generation in this country to have vision and foresight. And I will just say, this is not a question. I think pulling out of the Paris Accords was an incredibly stick-your-head-in-the-sand move. There were no mandates there. And I think it allowed us to be associated with Syria and Nicaragua, while China could come in and take away that American leadership and replace it with their solar panels and their technology. And I just think it's the wrong message.

But that aside, I do want to associate myself with the Chairman's remarks on budgets and statements. You talked and you painted a really good picture. Unfortunately, the budget doesn't back up what you were saying, and I think that's unfortunate, because I think you have a very, very similar vision as I do. R&D is critically important in this budget.

#### FOSSIL FUEL ENERGY RESEARCH AND DEVELOPMENT

And the R&D is cut fossil fuel energy research and development by nearly \$400 million. We have a little town called Colstrip, Montana. It's called Colstrip for a reason.

Secretary PERRY. Yes, sir.

Senator TESTER. And R&D is going to be critical for that town to stay in existence. It is just going to be critical. And I don't think coal's going away in the near future. I think that it's going to be on the decline for a while. But it's going to still be around for a while. And if we don't have research and development to develop coal plants, coal-fired plants that, you know, take into account carbon capture and how we deal with it, I think it's making a mistake.

Would you tell me what the thought process was into cutting the R&D when you said multiple times during your opening statement how important R&D was. In fact, I think it was the first thing you said of importance in your job as Secretary of Energy.

Secretary PERRY. Yes, sir. I think we have some work to do on this budget, and I know that. And I'm going to spend the time and the hours, you know, working with you all to find, you know, find a budget that we can—

Senator TESTER. Okay. Okay. Good.

Secretary PERRY [continuing]. Both agree on and get the job done.

#### POWER MARKETING ADMINISTRATIONS

Senator TESTER. Thank you. My crack staff tells me that Senator Merkley talked to you about selling off power marketing administrations—

Secretary PERRY. Yes, sir.

Senator TESTER [continuing]. Such as BPA. What they didn't tell me is what your answer was. I think that we have heard that there is the potential of selling off the power marketing administrations, BPA, and I'll tell you how important it is for a whole bunch of things.

Where are you at on that?

Secretary PERRY. I would—

Senator TESTER. Are you going to be advocating for selling those, or are you going to be saying stay the course?

Secretary PERRY [continuing]. Tell you, sir, that that has been offered up in a number of budgets before.

Senator TESTER. And where are you at on that issue?

Secretary PERRY. I would tell you that I'll be working with you all on finding the solutions to the challenges we face.

Senator TESTER. So I will tell you this, okay. You're pretty good, okay. You've been a governor for 14 years, and you're pretty good. But here's the bottom line. We've got to have leadership. You know what that's like. I mean, you wouldn't have been governor for

Texas for 14 years if it wasn't about leadership, and you know very, very well that in your position, we can do what we want, but you can do a lot of things we can't stop. And I just need a commitment you're not going to do that because it would be horrific for my folks. I'll just tell you.

Secretary PERRY. I think the message has been sent, sir.

Senator TESTER. Okay. All right. Sounds good.

#### RENEWABLE ENERGY

Energy is critically important for this country, affordable energy. So you're going to maintain a position of economic viability, affordable energy, as part of that equation.

We have made incredible advancements in solar and wind, and there are pretty significant cuts to the DOE's wind account, and I'm—if we truly are going to be at all of the above, which I think we need to be, because I don't think you want to throw away any opportunities, we should be doing whatever we can do to increase those opportunities, especially those opportunities that don't contribute to climate change. They have their other challenges, by the way, wind does, and you know that, too.

But my question is, why we would be cutting our renewable portfolio component that is, I think, going to become more important in the future, not less.

#### SMALL MODULAR REACTORS

Secretary PERRY. Senator Tester, I think you bring up a really important issue that we need to talk about as a country, and certainly starts right here in the appropriation's room. And that is a technology that is zero emission, that we have the potential to lead the world in, and that is small modular reactors. I don't think there is an issue that I think has any more potential for this country, and for the world, from an emissions standpoint, and I think that these—

Senator TESTER. So you're talking nuclear?

Secretary PERRY. Very much so.

Senator TESTER. Okay. So then that—and I'm going past time, and you can cut me off, Mr. Chairman, because I know you might.

But then what do you do with spent fuel? I mean, how do you—that's one of the things you brought up in your opening statement?

Secretary PERRY. Oh, yes, sir.

Senator TESTER. How do we deal—I agree with you, but how do we deal—I mean, you got CO<sub>2</sub> is a problem on one, you got spent fuel is a problem on another, its half life is long past anybody in this room and a whole bunch of their ancestors are going to be around—

Secretary PERRY. I think the technologies are available to deal with the spent fuel.

Senator TESTER. There are technologies to be able to nullify the impacts of the spent fuel. Okay.

Senator ALEXANDER. Senator, I think we're—

Secretary PERRY. I think there are ways to deal with the spent fuel that are appropriate from the standpoint of how you deal with nuclear energy.

Senator TESTER. And I would love to hear what those are.

Secretary PERRY. Okay.

Senator TESTER. I would. And so I look forward to carrying on this conversation.

Thank you, Mr. Chairman.

Senator ALEXANDER. We will have plenty of time for a second round of questions.

Senator Shaheen's been waiting patiently.

Senator Shaheen.

#### ENERGY EFFICIENCY AND RENEWABLE ENERGY

Senator SHAHEEN. Mr. Chairman, thank you.

Mr. Secretary, I appreciate you being here. But I have to say, I share the Chairman's negative view of this budget proposal, and I was especially disappointed that the President's budget calls for a 70 percent, seven-zero, cut to DOE's Office of Energy Efficiency and Renewable Energy. That, when energy efficiency is America's largest energy resource, it contributes more to our Nation's energy needs over the last 40 years than any other fuel source, including nuclear and fossil fuels, and it is also the largest sector within the U.S. clean energy economy. It employs nearly 2.2 million Americans, the majority of whom work for small businesses.

#### WEATHERIZATION ASSISTANCE PROGRAM

Now, one of the programs that is zeroed out as part of that office is the Weatherization Assistance Program, which has done a tremendous benefit, provided a tremendous benefit to people in New Hampshire and across the country. And by comparison, the cost of this program is relatively low when compared to much of what the DOE does, and it helps people like Neal and his wife from Manchester, New Hampshire, our city's—our State's largest city. They're both over 50, they're disabled, and they were granted assistance to insulate their home through the Weatherization Assistance Program, and Neal writes about that. He says, "We feel as if we've won the lottery. No words can express how our home has been made more comfortable and so much more efficient. We hate to even think of where we would be today had we not been recipients of these services."

People who use the Weatherization Assistance Programs are working Americans who are trying to stay in their homes, trying to take care of their families. These dollars help them do that. So can you please explain to this committee why we should cut support for critical energy efficiency programs that are creating jobs, stimulating the economy, and helping to reduce energy bills for American families and businesses?

Secretary PERRY. Senator, I think from a former governor's standpoint, I would share with you that the Administration's view of this is that that program, programs like that, particularly in time when we do have to make decisions about how to rein our spending in, could best be made by the States. I know that the Administration's focus here is on activities that are properly performed by, whether it's the Federal Government's responsibility or the State's responsibility. And I would argue that this is a program where the States, giving them, and to the extent practical and as desired, will re-prioritize their spending to deal with those. If those

programs are as important as what, you reference, and I certainly think they are, then the States will pick up their fair share of those.

#### SPENDING FUNDS CONSISTENT WITH APPROPRIATIONS LAWS

Senator SHAHEEN. Well, Mr. Secretary, I've heard that response from a number of secretaries now within the President's cabinet. And you know, I think you have a saying in Texas that we also agree with, that dog just won't hunt. The fact is——

Secretary PERRY. I know what you mean by that.

Senator SHAHEEN. You know, we rely on resources that the Federal Government has promised us, we send more tax dollars to Washington DC than we get back. And we think that these programs that make a difference for people in New Hampshire are very important.

I have another question for you, Mr. Secretary, because I'm deeply concerned by reports that DOE has delayed awarding funds, and in some cases is refusing to release funds altogether for various activities for which Congress has already provided appropriations. And on May 4, your chief of staff, Brian McCormack, sent a memo to department heads within the agency, stating that all pending and future funding opportunities would undergo additional review by DOE's Office of Management to ensure the grants are consistent with the President's priorities.

Now, Mr. Secretary, I know, because you have been a governor that you know that the authority of funding the Federal Government is held by Congress and Congress alone. So can you commit that DOE will spend funds according to the appropriated line items and report language included in the fiscal year 2017 omnibus budget passed by Congress and signed into law by the President?

Secretary PERRY. Senator, I have some new information just today on that issue that I want to share with you. And in totality, we have now announced \$595 million in awards to 489 different projects across our energy and science R&D programs, and we've also announced some \$35 million that are going to be available through five new funding opportunities, FOAs. I think it is common practice when a new administration comes in to review ongoing programs and ensure consistency with the Administration's policies. And in this matter, we did initiate a full review, and that has been done, and we're issuing awards, and will issue funding opportunities as they move through the process. And you're absolutely correct, as a former appropriator and as a governor, I understand the process. I know who has the strings to the money.

Senator SHAHEEN. So I know my time is up, Mr. Chairman, but can I just—do I then understand that you are saying that for dollars that have been appropriated under the fiscal year 2017 omnibus budget, that the department will get those dollars out the door by the appropriate timelines that are in that budget?

Secretary PERRY. That is my intent.

Senator SHAHEEN. Thank you.

Senator ALEXANDER. Thank you, Senator Shaheen.

We welcome Senator Murray.

Senator MURRAY. Thank you, Mr. Chairman, and thank you for your patience. There's a lot of hearings going on this afternoon.

## HANFORD SITE

Secretary Perry, thank you for being here. Let me start with the Hanford site. It's in my State, central Washington, as you well know.

The Federal Government has a moral and a legal obligation to clean up that nuclear waste site, yet President Trump's proposed budget is very shortsighted, and it is inadequate when it comes to Hanford.

I want to ask you, does DOE support completing the low activity waste facility and hot commissioning it by December 2023?

Secretary PERRY. Yes.

Senator MURRAY. Okay. Well, you tell me how you will meet that. It's a legally binding consent decree requirement with this budget request that essentially holds the Office of River Protection flat, despite a very clear demonstrated need for increasing resources to meet those obligations.

Secretary PERRY. Senator, you were not here a little bit earlier, and I talked about Hanford in a global sense. I talked about how I hope we can have a conversation. I know I'm coming out hopefully this summer, and we can walk across the Hanford site together.

Senator MURRAY. You can't walk across it. It is really big.

Secretary PERRY. Yes, ma'am. I'll attempt to travel it however you choose.

But the point is, I'd like to come out there with you, and we can talk about the cost, and are we getting a good return on our dollars. And I think you share that.

Senator MURRAY. Well, of course, I do.

Secretary PERRY. Yes, ma'am.

Senator MURRAY. And I did hear about your comments earlier. And let me just say this: Thousands of projects on cleanup have been already done.

Secretary PERRY. Yes.

Senator MURRAY. But there is a lot of work left to do.

Secretary PERRY. A lot left to do.

Senator MURRAY. And this is a legal obligation, it's a moral obligation. And we can't just say, well, we're not going to do this. It is going to be done, it has to be done. Of course, we're all interested in saving costs. But you also have to protect all the workers there. This is a nuclear waste site.

Secretary PERRY. Yes.

Senator MURRAY. So safety has to come first. And you can't just throw out decrees and consent decrees and legal obligations that are there. And there is a lot more work to do. So I just want you to know, this is not a simple project, you just don't land there—

Secretary PERRY. It is not a simple project. And I think of all the challenges that I face as a secretary that are going to be here after I'm gone, it is Hanford. How we deal with it, how we address it, looking at new ways to address it, getting outside of the box, and maybe how historically the government has looked at it I think is worth a conversation. That's not to say that I have any new piece of information, but I will work with you every day, if that's what's required, so that the people of Washington State and the citizens

of this country know that we are committed. I totally agree with your observation that this is a moral and legal imperative that we have as a country to clean that site up, and I'm committed to it. I just want to make sure and use my experiences of a lifetime of managing some pretty big entities as the governor of Texas, that we do it in a way that we get the best result for our expenditures.

Senator MURRAY. I appreciate that, but this is a nuclear waste site. It is extremely dangerous.

Secretary PERRY. I understand that.

Senator MURRAY. And it has to be cleaned up. And if it doesn't clean up, it is going to leak into the Columbia River and will be a problem much bigger than it is now. And I've heard a lot of secretaries come before us that are going to go back and re-look at it and do something different. I've been here for 25 years, and I'll just tell you this. My dad was there when it was first built. And when he went to war in World War II and came back, and there was a site next to him, he didn't even know what it was. Well, we know what it was. Now we know what happened. We've had years of work to get it done. And that is a community that helped our country win a world war. And they do not deserve to have a nuclear waste site behind them, nor do they deserve to have people come in every 4 years and say I'm going to do something different. There's a lot of complex agreements that are in place to get it done, and the Federal Government's responsibility is to provide the dollars for that.

So we need the Secretary to understand that. I appreciate you're trying to understand it. But I also want you to know that there's no cheap way to do this. There's absolutely no cheap way to do this, and it has to get done. And I really appreciate this committee, Senator Alexander, Senator Feinstein, who do understand, that have worked with us for a long time. None of us like to write checks for a lot of money, but the alternative is just not viable.

So I appreciate your being here, and I appreciate you, Mr. Chairman, for accommodating me.

Senator ALEXANDER. Thank you, Senator Murray, and thank you for being here.

We'll go to a second round of questions. And I'll begin.

#### SPENT NUCLEAR FUEL

Mr. Secretary, let me go to the subject that Senator Feinstein says she's beside herself about. And my passion for it is right up there with hers, which is used nuclear fuel. And let me ask you some questions that don't necessarily require a long answer.

Do you support building a permanent repository at Yucca Mountain?

Secretary PERRY. Yes, sir.

Senator ALEXANDER. Do you also support storing used nuclear fuel in a private consolidated interim storage site until Yucca Mountain is ready to accept the used fuel?

Secretary PERRY. I think that is an option that is viable.

Senator ALEXANDER. Do you believe we would be able to place used nuclear fuel in a private consolidated interim storage site more quickly than it could be disposed of in Yucca Mountain?

Secretary PERRY. I think your theory is correct. I think there's some questions that get asked about that, but your—my instinct is that you are correct in the speed of which you could—you could store.

Senator ALEXANDER. That the private consolidated interim site would be able to more quickly take, for example, used nuclear fuel from California than Yucca Mountain—the private site could be opened more quickly than Yucca Mountain could be finished?

Secretary PERRY. As a general rule, I think you're correct.

Senator ALEXANDER. Do you believe we should work on all options for used nuclear fuel at the same time, and if progress on one stalls, should we continue to work on the other options?

Secretary PERRY. Yes.

Senator ALEXANDER. Secretary Moniz testified before this committee last year that he had authority under existing law to take title to used fuel and contract with a private facility to store it. Do you agree with that?

Secretary PERRY. As a general matter, I agree that the DOE has the authority to take title to spent nuclear fuel, but I think there's a more specific question as to whether DOE has the authority to store such nuclear fuel at a private facility away from a nuclear reactor, and that requires statutory interpretation, clarification, if you will, and I think the more explicit Congress can be about our authority, the DOE's authority to store nuclear fuel at a private site, I think the clearer that authority will be.

Senator ALEXANDER. Thank you for that.

If we specifically appropriate general appropriation funds this year for you to continue the work needed to be prepared to take title to use nuclear fuel and store it at a private site, will you be able to use those funds to make progress on private consolidated interim storage?

Secretary PERRY. Yes, sir.

Senator ALEXANDER. Mr. Secretary, there's two or three other questions I'll just send by letter. We're trying to get as accurate information as we can about how long will it take to open Yucca Mountain so that we can put used fuel there, or how long might it take to open a private consolidated interim facility so we can put used fuel there, or how long would it take to open an interim storage site such as the one that Senator Feinstein and I have put in the appropriations bills so we can compare that? I know there's some variables there, and I don't need—

Senator FEINSTEIN. Expanding WIPP (Waste Isolation Pilot Plant).

Senator ALEXANDER. Or expanding WIPP, would be a fourth site. So getting good advice from the Department of Energy about how long it will take, because we're really getting down to practical decisionmaking here. I mean, if it is really true that there are a couple of sites that are private, that have applications before the Nuclear Regulatory Commission, and the Nuclear Regulatory Commission did tell us in the hearing here that absent extraordinary circumstances, those facilities might be licensed within 3 years, and then if the construction is finished pretty quickly, we might be talking about getting used nuclear fuel out of California in 5 or 6

years, as compared with putting in Yucca Mountain in 10 or 15 years or longer.

Now, I don't know that those years are exactly right, but if they're even close to right, we ought to know that so that we can think in a practical way, how are we going to get this stuff from where it is to where it needs to go, at least on an interim basis. So if we can write you—and I think Senator Feinstein and I will write that letter jointly, I will ask her if she would like to, so we can begin a narrow—see if we can get some agreement on the time there.

Secretary PERRY. You very clearly touched on a lot of different options there that I think all should be on the table to discuss. Again, no decisions have been made yet, and we're obviously going to follow your lead at the DOE, but we will be as helpful as we can be, and we will be as inventive as we can be, and we will be as flexible as you need us to be to accomplish what is a very important duty that the DOE has for the country.

Senator ALEXANDER. I think we're fortunate to have you in this job at this point because this is a job that we two politicians haven't been able to solve yet and we could use the advice and leadership from someone with 14 years of experience as a governor of Texas. So we look forward to working with you on that.

Senator Feinstein.

Senator FEINSTEIN. Thank you very much, Mr. Chairman. And I think your questions were precise and targeted and really effective.

And, Mr. Secretary, I have tried for so long to solve this problem, but it is a real conundrum, and it really does need you to help us solve it. There's a difference of opinion with the House. That has to be reconciled. We have to look at Yucca. I mean, I have taken the position that Yucca does have faults. The NRC (Nuclear Regulatory Commission) sat here and said that's not right.

I listened to others who know, say water's coming down through the place, and obviously, salt is better geologically than water. So that we don't really know who to believe, and it's very difficult. There's six million people living right around Southern California Edison, which is a huge company, as you know, and there's 3,300 hot plutonium rods sitting in spent fuel pools right over a beach. I mean, it's a problem. So we need to get them out of there, get them in transportation casks and be able to take them. PG&E is beginning to do this and putting them in transportation casks so they're ready to go somewhere in their decommissioning.

#### WORKFORCE RESTRUCTURING PLANS

But let me ask you something about detailed work force restructuring plans.

I went through the concerns, the huge concern about cutting 6,700 jobs from really good labs, and what that will do. It is my understanding that the managers of those labs are now preparing for potential layoffs and developing detailed work force restructuring plans.

My staff has been informed that one lab sent its work force plan to DOE. We're told that your office not only sent it back, but told other labs to no longer work on such plans. Question: Is that true?

Secretary PERRY. Not that I'm aware of.

Senator FEINSTEIN. Well, could you find out?

Secretary PERRY. Yes, ma'am, I will. Absolutely.

Senator FEINSTEIN. And let us know. Because it's clear the labs don't know.

Secretary PERRY. Yes.

Senator FEINSTEIN. So that would really be appreciated.

Secretary PERRY. What I've shared with the lab directors and those that have been both directly and indirectly, is that we're going to do everything that we can to make sure our labs are maintaining and doing the work that they've been tasked to do.

You know, now, did I stand up and say, you know, do not worry, nobody's going to lose their job? I did not. Because I'm a realist and I've managed some pretty big entities before when budget restrictions have been in place. But I want you to know that we're going to do everything we can working with you and your members to make sure that—particularly those 17 national labs that we have, and the incredibly important work that we do. We've talked about a lot of things this afternoon. We haven't even discussed cyber and cyber security and the work that's going on at Idaho National Labs, dealing with our grid and making sure that our grid is secure. Literally, the security of this country is intricately intertwined in our national labs. And we are going to perform in a way that I think you will be respectful of and supportive of, Senator, when this process is over with.

Senator FEINSTEIN. Well, I really appreciate that. We've gone through this once before in another Administration. I forget whether it was Democratic or Republican, but we went through the same thing. And the havoc and the fact that we lost good people that went to other places and the insecurity that it set forth really was problematic. So I hope that you'll take a special involvement. We want to work, I think I speak for the Chairman, we want to work with you. We don't want to see massive disruption in good projects that are going on in these labs. If there's duplication, if there—you know, if there's a need in one place and not in another, if there can be transfers, and really, if there's waste, we don't want that either.

So a lot of this depends on you, and I guess what I want to say is as the Ranking Member, I'd like to work with you, and I know the Chairman has been fantastic on virtually every issue. I think we can solve this problem.

Secretary PERRY. I do, too.

Senator FEINSTEIN. So let's do it. Thank you.

Secretary PERRY. Senator, I do, too. And let me just share with you. There's \$4 billion of unspent DOE funds. If it could be used, there are ways to skin this cat, so to speak.

Senator FEINSTEIN. Thank you.

Secretary PERRY. And we will spend the time and the effort and be as inventive as we need to be to make this work.

Senator ALEXANDER. Thank you, Senator Feinstein.

Senator Coons.

Senator COONS. Thank you, Chairman Alexander, Ranking Member Feinstein.

Thank you Secretary Perry. I reviewed your testimony in written form and appreciate the chance to question you today.

Secretary PERRY. Yes, sir.

Senator COONS. You've had a long hearing——

Senator FEINSTEIN. 4 billion.

Senator COONS [continuing]. And I appreciate the chance to raise my concerns.

#### FISCAL YEAR 2018 BUDGET REQUEST

Over the last decade, the United States has become dramatically more energy secure and grown the economy, expanded jobs, and reduced greenhouse gases, all at the same time, broadly speaking. We've shown that we can be more environmentally responsible and support new jobs, and that's in no small part because of the Department of Energy's groundbreaking work that has supported a wide range of new energy technologies. That's why I think we need to stay committed to a previous goal of doubling investments in energy research. This would dramatically accelerate American innovation, confront challenges like climate change, increase jobs, ensure economic competitiveness, national security, and our environmental vitality.

This budget, at least as presented, is the antithesis of that commitment. The forward leaning research model that the United States has championed for decades would be reversed, and there could be, as you've discussed at length with other members, significant cuts and jobs losses at our national labs, research university startups, and more.

So let's be honest. We need to address our infrastructure grid reliability, climate change, and other challenges, and the Department of Energy has a critical role to play. Every energy resource in technology today has been nurtured, supported, and advanced in some small part or some significant part by Federal research as Chairman Alexander laid out at the beginning of the hearing, from hydraulic fracturing to solar power. We need to continue to invest in these partnership between DOE and the private sector.

Mr. Secretary, this budget approach, if fully adopted, sends a clear message to China and the rest of the world that they will become the world's economic engine for clean energy, and the U.S. will become the caboose. It's my hope that we can work together in a bipartisan way to blunt some of the impact of this proposed budget.

#### ADVANCED MANUFACTURING

Let me talk about advanced manufacturing. I was in manufacturing in the private sector for 8 years. I have some real concerns about the cuts to the Advanced Manufacturing Office in this budget, and I'm not the only one raising this concern. All seven former assistant secretaries for EERE, from George H.W. Bush to President Obama, sent a letter raising concerns about the 70 percent cut to this office. It seems to me this request is inconsistent with President Trump's agenda of supporting manufacturing. It's surprising there's \$146 million cut to the Advanced Manufacturing Office, including the \$70 million to fund the Manufacturing USA Institutes. The strategy that produced the Manufacturing USA Institutes was led by the CEO of Dow and was led by a private sector initiated outside effort.

I am concerned about this message to industry and to manufacturing. How do you justify this kind of a cut, this depth and breadth of a cut, in a manufacturing focused investment sector where it was broadly supported by industry partners from its outset and is critical to our long-term competitiveness? Help me understand your reasoning?

Secretary PERRY. Senator, I think the challenge that we always have when we have restrictions in our budgets is how we're going to manage the resources that we have. And again, I'm not asking you to take a complete pig in a poke here. I've got a history and a record of being able to manage some pretty big entities during some period of time that were challenges. I mean, billions of dollars of shortfall in my home State back in the early 2000s. And I'm not going to sit here and tell you it's going to be fun, it's going to be easy, but I'm going to tell you that if you've got to have somebody managing the DOE at a time when there may be some challenges from a financial standpoint, I may be a pretty good person to have at the helm of that.

Senator COONS. I appreciate that response, Mr. Secretary. My question really wasn't about managing, it was more about priorities——

Secretary PERRY. Yes, sir, but I think——

Senator COONS [continuing]. And the fact that the President ran on supporting manufacturing. This is part of a thoroughly thought out well developed strategy for supporting manufacturing, one that's been supported in the Senate on a bipartisan basis. So my hope is that the critical investments DOE's making in manufacturing will get a reconsideration.

#### QUADRENNIAL ENERGY REVIEW

Let me move to the Quadrennial Energy Review. It could be a valuable policy review process. The Defense Department follows the same approach. I've worked with Chairman Alexander on authorizing legislation that would require the Federal Government to undertake a periodic and analytically driven review process of energy policy.

Can you assure me you'll continue to carry out with public input the Quadrennial Energy Review that's required to be done once every 4 years?

Secretary PERRY. Senator, I'm going to follow the law, and if that is statutorily in the law, you better believe it, we're going to be doing it. So if it's statutorily required, I'll be addressing it.

Senator COONS. Well, I certainly hope you'll consider it as a potentially helpful tool in achieving the overall mission of the department.

#### CLIMATE CHANGE

Let me just last say that in an interview recently, you denied the idea that carbon dioxide is a main driver for climate change, that human generated carbon dioxide is the main driver for climate change.

What more do you need to hear from scientists or military leaders, business leaders, anyone, to be convinced that man-made

greenhouse gas emissions pose a serious threat to our economy and our future?

Secretary PERRY. Senator Coons, I think it's a great opportunity for this country to have a conversation about the climate and get the politics out of it and bring the scientists together. As a matter of fact, the undersecretary for President Obama, the Undersecretary of Energy for President Obama, Steven Koonin, has said he needs a theoretical physicist and was over at the department and knows this issue rather well. And he says it is probably time for us to have a conversation with all the politics out of the room and let the scientists sit.

And so he was actually offering up the idea of having a red team come in and have this conversation. And I would dearly love to be in the room when they're having that, not to be one of the experts, but to really listen and have that opportunity to have the conversation. Because my perspective is that it is not settled science, and the idea that, if you don't believe it is settled science, you're somehow or another, a Luddite, is just a little bit out of the realm of—I don't mind being skeptic about things. But I think we ought to be honest about it, that there are some pretty substantial, including, President Obama's own undersecretary at DOE that says this science is not settled.

And so, Senator, I hope we can agree that maybe it's time for us to have a red team approach to this, sit them in the room, and let's listen to what they come up with.

Senator ALEXANDER. Okay. We're way over time.

Senator COONS. I just want to say thank you for that response, and the openness.

And, thank you, Mr. Chairman, for the chance to bring up my concerns.

Senator ALEXANDER. Thank you, Senator Coons.

And let me acknowledge Senator Coons' leadership over the last few years in a bipartisan way on American competitiveness, both in legislation and his actions, and I know he would be a valuable partner to the Secretary, as he has been to Senator Feinstein and to me.

#### MOX FACILITY

Let me go to another subject that Senator Feinstein and I consider maybe a number one priority, or at least tied for number one, and that's the MOX facility in South Carolina.

I mean, we find ourselves in the middle of an unpleasant situation there. But let me ask you, Mr. Secretary, some of the same questions I asked General Klotz, the head of NNSA, when he testified here, just so that we can be clear about your position on this as we work together to try to solve the problem with respect to the commitments that were made to South Carolina over the last several years.

Last year, we did not know if WIPP would actually open or when. Since then it has re-opened in New Mexico, and has resumed operating. Is that correct?

Secretary PERRY. Yes, sir.

Senator ALEXANDER. Let's talk about the dilute part of dilute and disposal first. There were some questions last year about whether

dilute and disposal method was a proven process. Last year the department started to process plutonium, not the plutonium that was part of the agreement with Russia, using the dilute and disposal method; isn't that true?

Secretary PERRY. That is correct.

Senator ALEXANDER. And where will that plutonium go after it is diluted?

Secretary PERRY. It will go to New Mexico to WIPP. As a matter of fact, I think there are five shipments that have already been received and processed there.

Senator ALEXANDER. I know at least four. But thank you.

So WIPP can accept—

Secretary PERRY. You're correct, Mr. Chairman, it is four.

Senator ALEXANDER [continuing]. The diluted plutonium. There is about 13 tons of plutonium in South Carolina that's not needed for the weapons program, about half of that was included in the agreement with Russia. Last week General Klotz testified before this committee that all of the excess plutonium in South Carolina could be sent to WIPP under the current law; do you agree?

Secretary PERRY. That is my understanding.

Senator ALEXANDER. General Klotz testified that operating the MOX project would cost at least twice as much as operating the dilute and disposal method; does that sound right to you?

Secretary PERRY. Yes, sir. The estimates, I believe this is Corps of Engineer estimates, operational costs between \$800 million and \$1 billion for MOX, and D&D was \$400 million a year for operational costs.

Senator ALEXANDER. So that's operating. Now, how about construction costs? How do you compare the construction costs of the MOX project and the dilute and disposal project?

Secretary PERRY. Again, the Corps of Engineers estimates, about \$17 billion for MOX total. We've already put five into it.

Senator ALEXANDER. Okay.

Secretary PERRY. And the dilute and dispose facility would be approximately \$500 million to construct it.

Senator ALEXANDER. And General Klotz said, testified, that the dilute and disposal method gets the plutonium out of South Carolina much sooner. He said the difference was between the late 2020s for dilute and disposal, and the early 2050s for the MOX procedure. Does that sound right to you?

Secretary PERRY. Yes, sir, that is correct.

Senator ALEXANDER. I understand there's a considerable amount of excess plutonium in Texas. Can we dispose of that material using dilute and disposal method, and when could that begin?

Secretary PERRY. Yes, sir, you could, and it's my understanding that 2035 is the date.

Senator FEINSTEIN. The beginning?

Senator ALEXANDER. No, the date for the disposal of the excess plutonium in Texas could begin in 2035.

Secretary PERRY. Yes. That is correct.

Senator ALEXANDER. That's 34 tons, if I'm not mistaken, in Texas?

Secretary PERRY. Yes.

Senator ALEXANDER. The remainder of the 34 tons?

Secretary PERRY. Yes, sir.

Senator ALEXANDER. Now, that's not the South Carolina plutonium, that would go—now, to sort of summarize, we know the dilute and disposal method works, it costs less, it gets the material out of South Carolina sooner, and the material can go to WIPP under current law. Could it go anywhere else?

Secretary PERRY. There're a lot of options, and again, I don't want to put on anybody's plate that there is a plan to go anywhere with this, but there are obviously other options. Maybe some that we haven't even talked about yet. But, yes, there are other options.

Senator ALEXANDER. Thank you, Mr. Secretary.

Senator Feinstein, do you have other questions?

Senator FEINSTEIN. No, I'm fine. Thank you, Mr. Chairman.

#### ADVANCED RESEARCH PROJECTS AGENCY—ENERGY

Senator ALEXANDER. Well, I would like to ask one or two more pretty quickly, and then I think we have a vote. And if you're—I want to ask you about ARPA-E. And I'm going to accept your comment earlier that the budget was written before you got here, and your job is to robustly defend the budget, and I'm not interested in making that awkward for you. But the budget proposes to eliminate ARPA-E, and that's not what we're going to do. And let me talk about why.

Twelve years ago, over a 2-year period, we had a bipartisan effort in the Senate, and we had legislation introduced first by Senator Frist, and I guess it was Senator Reid, even then, but the democratic and the republican leader, when the democrats were in control and the republican and democratic leader when the republicans were in control, we had 50 or 60 cosponsors, President Bush strongly supported, we called it Rising Above the Gathering Storm, and it was an effort created by some of the most distinguished Americans, led by Norm Augustine, the head of Lockheed Martin, to give us 20 things that we could do to help make America more competitive in the world and raise our family incomes.

And as time went on, President Obama's appropriations were a major part of that. That bipartisan effort got most of those 20 things done and funded. One of the most important was ARPA-E. It was a strong recommendation from this distinguished committee, headed by Norm Augustine that we take a look at DARPA, the Defense Advanced Research Projects Agency, which has led to the invention of the Internet, GPS, stealth aircraft, the first weather satellite, and the first computer mouse, and see if we can do the same thing with energy.

What was different about DARPA and is different about ARPA-E, is that instead of just a government grant, or the government trying to be a developer, it brings in to DARPA-E and into ARPA-E promising technologies, works with them 2, 3 years and sends them back out into the marketplace to see if they can survive.

My view, and that view of other Senators, is that ARPA-E's been a big success. Its budget's much smaller than DARPA, \$306 million last year, DARPA's ten times bigger. But it includes grid scale batteries, energy efficient materials for refrigeration, pipelines and shipping, radiative cooling, and entirely new and innovative way to

cool industrial buildings, and engineering bacteria to convert carbon dioxide into fuel.

Now, I emphasize that, Mr. Secretary, because I think the rap against ARPA-E is by some people who don't believe in climate change who think all it does is work on a climate change. If it does that, that's not all it ought to be doing. It ought to be working on clean energy, which has a lot more to do with things other than climate change and clean air. For example, I've always thought the holy grail of energy will be to find some commercial way to take the carbon out of smokestacks and do something commercial with it. We talked about that with carbon recapture. You know all about that. But that has proved a little bit cumbersome and limited in its use. So I've always thought that some scientist would find some way to do that, and then we can use all the coal in the world all we wanted to, because we could remove the sulfur, the nitrogen, the mercury, we know how to do that, and if we could also do it with carbon, then we could use the coal, we could lower the cost of energy, we could eliminate a lot of poverty. And here they are over at ARPA-E engineering bacteria to convert carbon dioxide into fuel. Now, it may or may not become commercially viable, but it might.

So what I'd like to ask you to do is take a new look at ARPA-E and the work being done there. And maybe even invite Norm Augustine, who's still around and very much interested in this, to come talk with you sometime and say why the group that recommended the Rising Above the Gathering Storm thought this was so important 10 years ago, and what they think has worked, and if there's some areas where they think it hasn't worked, to take those criticisms into account.

And if you find out that all it has been doing has been with an unnecessary emphasis on climate change, well, then you can correct that. But clean energy is at the center of the research effort that we ought to be doing in the United States, and ARPA-E may be the very best way we have to do it. So I wanted to just bring that to your attention while you're here this afternoon.

Secretary PERRY. It is fully in my attention, sir.

Senator ALEXANDER. Mr. Secretary, you've been an effective witness for a difficult budget, and I look forward to working with you here. I think you bring a set of skills to problems such as MOX and used nuclear fuel that could use those skills. I found you to be an excellent student, as I followed you through the day at the Oak Ridge National Laboratory, and I've watched your leadership in Texas, so we won't agree on everything, but I thank you for being here today.

I ask Senator Feinstein if she has any closing comments, and then we'll close the hearing.

Do you have any closing words you'd like to say, Senator Feinstein?

Senator FEINSTEIN. I think, Mr. Chairman, that you are a ten. Thank you. I mean, that was very impressive, and I think very convincing.

Don't you, Mr. Secretary?

[Laughter.]

Secretary PERRY. I was going to say, at least an 11.

[Laughter.]

Secretary PERRY. The first liar never has a chance, Senator.

Senator FEINSTEIN. Just say you're convinced.

Secretary PERRY. Yes, ma'am, I am.

Senator ALEXANDER. And I'm going to——

Secretary PERRY. I am convinced.

Senator ALEXANDER [continuing]. Thank you both and stop while I'm ahead.

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 be provided within 30 days.

Thank you, Mr. Secretary.

#### SUBCOMMITTEE RECESS

Senator ALEXANDER. The subcommittee will stand adjourned.

[Whereupon, at 4:50 p.m., Wednesday, June 21, the subcommittee was recessed, to reconvene subject to the call of the Chair.]