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MODERNIZATION: ADVANCING DOE'S MISSION FOR NATIONAL, ECONOMIC, AND ENERGY SECURITY OF THE UNITED STATES

TUESDAY, JANUARY 9, 2018

House of Representatives,

Subcommittee on Energy,

Committee on Energy and Commerce,

Washington, D.C.

The subcommittee met, pursuant to call, at 10:02 in Room 2123, Rayburn House Office Building, Hon. Fred Upton [chairman of the subcommittee] presiding.

Present: Representatives Upton, Olson, Barton, Shimkus, Latta, Harper, McKinley, Kinzinger, Griffith, Johnson, Long, Bucshon, Flores, Mullin, Hudson, Cramer, Walberg, Duncan, Walden (ex officio), Rush, Peters, Doyle, Castor, Sarbanes, Welch, Tonko, Loebsack, Schrader, Kennedy, Butterfield, and Pallone (ex officio).

Staff Present: Ray Baum, Staff Director; Mike Bloomquist,

Deputy Staff Director; Samantha Bopp, Staff Assistant; Allie Bury, Legislative Clerk, Energy Environment; Karen Christian, General Counsel; Kelly Collins, Staff Assistant; Wyatt Ellertson, Professional Staff, Energy/Environment; Margaret Tucker Fogarty, Staff Assistant; Adam Fromm, Director of Outreach and Coalitions; Jordan Haverly, Policy Coordinator, Environment; A.T. Johnston, Senior Policy Advisor, Energy; Ben Lieberman, Senior Counsel, Energy; Mary Martin, Chief Counsel, Energy/Environment; Katie McKeogh, Press Assistant; Brandon Mooney, Deputy Chief Counsel, Energy; Mark Ratner, Policy Coordinator; Annelise Rickert, Counsel, Energy; Dan Schneider, Press Secretary; Peter Spencer, Professional Staff Member, Energy; Jason Stanek, Senior Counsel, Energy; Madeline Vey, Policy Coordinator, DCCP; Andy Zach, Senior Professional Staff Member, Environment; Priscilla Barbour, Minority Energy Fellow; Rick Kessler, Minority Senior Advisor and Staff Director, Energy and Environment; John Marshall, Minority Policy Coordinator; Jon Monger, Minority Counsel; Alexander Ratner, Minority Policy Analyst; Tim Robinson, Minority Chief Counsel; Andrew Souvall, Minority Director of Communications, Outreach and Member Services; Tuley Wright, Minority Energy and Environment Policy Advisor; and C.J. Young, Minority Press Secretary.

Mr. Upton. Good morning. Good morning, everybody. Happy New Year.

Today's hearing begins this subcommittee's work in this session to identify what steps we need to do to make sure that DOE can address the national economic and energy security challenges that are going to be confronting the Nation over the coming number of decades.

Recent years, we have been updating certain agency programs and authorities to shift DOE's mission focus more fully away from the energy scarcity mind-set of its founding back in the 1970s. We have worked to position the agency more appropriately towards the tremendous energy resources now available to our country and the economic and geopolitical benefits of those resources. We have sought to modernize the Department's strategic petroleum reserve and its response capabilities, and we have upgraded DOE's emergency preparedness for energy supply distributions and its authorities to protect critical infrastructure from physical as well as cyber attacks.

But we are reminded almost daily that more needs to be done. Growing nuclear weapons, threats, and tens of billions of dollars needed to maintain the nuclear deterrent underscores the urgency for creating efficient, effective, and durable governance and management of DOE's nuclear security missions.

So increasingly complex interconnections of our modern energy systems propelled by the digital efficiencies of the cyber age present new and growing risks. Getting ahead of these risks require secretarial leadership and coordinated attention across the agency's

many programs and operations. Modernizing the Department of Energy means ensuring it has the appropriate statutory authorities and sound management structures to meet not only the challenges that we know about today, but what may be coming over the horizon. It means ensuring agency leadership can align with the Department's operations and resources to meet those priorities, and it means ensuring the tremendous scientific and technological assets of this agency are effectively focused for the benefit of the long-term security and prosperity of all Americans.

Our two panels today will help look at what is needed to meet current and emerging challenges. We are going to hear from the senior leadership of the Department on the first panel. And with that, who once served this committee very well as its staff director, is the deputy secretary for the Department. He is essentially DOE's CEO. So I look forward to hearing his plans for aligning the Department to meet the administration's priorities and to discuss those priorities.

He is joined by three Department Under Secretaries responsible for the bulk of its missions. Under Secretary of Energy Mark Menezes, also a capable alumnus of this committee, can help us understand what is necessary to enhance the Department's work regarding all of our national energy policy interests, and what more may be needed to enhance DOE's emergency and cyber functions. General Frank Klotz, who heads the Department's nuclear security enterprise, and with several years under his belt at DOE, has important perspective on what is needed for efficient and effective execution of the Department's vital nuclear

and nonproliferation programs and related work across the DOE's enterprise. And finally, Under Secretary of Science Paul Dabbar can help examine how best to deploy and maintain the scientific and technological capabilities at the national laboratory system and its facilities offer to support the Department's missions. He also has new responsibilities for the Office of Environmental Management which oversees complicated environmental cleanup projects that present a host of management challenges.

The second panel offers broader perspectives to help us assess what more is needed to improve execution of the agency's mission and to prepare for future challenges. We will hear from distinguished leaders and scientists on what is necessary to unleash the full benefits of the national lab system. We will hear how to ensure appropriate oversight in management of projects and programs in the national and nuclear security space and across departmental activities. We will hear how better to focus DOE's support of innovation and what our era of the energy abundance means for DOE responsibilities, both here and abroad.

Our testimony today will start a record to inform our modernization efforts and to assist us as we prioritize what program authorizations to tackle in this new session of the Congress.

With that, I yield for an opening statement from my friend and colleague, the ranking member of the energy subcommittee, Mr. Rush, from the good State of Illinois.

[The prepared statement of Mr. Upton follows:]

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Mr. Rush. I want to thank you, Mr. Chairman, for holding this important hearing on modernizing the Department of Energy. I also want to welcome all of the witnesses to this hearing.

Mr. Chairman, for constituents, such as those I represent, one of the most pressing issues regarding DOE involves a matter of ensuring that the agency is representative of all communities, and that the needs of all citizens are being addressed through its energy policy and initiatives including the loan and grant programs as well as through engagement at the national labs, and access to contracting and vendor opportunities. Many of my constituents are constantly seeking ways to break into what has essentially become an onerous, good ol' boys network.

As you are aware of, Mr. Chairman, my office worked extensively with former Secretary Moniz to establish the minorities and energy initiative which was designed to help foster increased minority participation in all sections of the energy industry. And this initiative, Mr. Chairman, was successful in beginning the process of raising awareness and engagement between DOE, industry, and minority communities. However, Secretary Perry did not seem to even be aware of the program, and many of the activities that were established by this initiative seemed to have tapered off.

Mr. Chairman, as we go through this process of modernizing the Department, it is imperative that we examine the leadership profile of the agency and work to ensure that there is diversity at the top where most of the decisions and policies are first enacted. We need

more people of color in the top echelons of the Department from the Secretary's office as well as in the Office of Science, which directs billions of research dollars to higher education institutions.

Mr. Chairman, we need more diversity of people, and so, on the review boards, and the boards and counselors which are responsible for making key decisions regarding the national labs, among many other issues. Mr. Chairman, when it comes to these same national labs, we need more women and people of color running these institutions so that decisions regarding increased inclusion and diversity are made inherently, and not simply as an afterthought or as a checklist, or as an empty token act.

Additionally, Mr. Chairman, we need to ensure that the senior executive staff, or SES, who play pivotal roles in running the Department and making important decisions regarding the agency's policies and priorities also include men and women of color.

Mr. Chairman, it is easy to overlook the importance of these issues if you are not among the groups that have not been -- that have been historically excluded. But when we are using taxpayer dollars to fund the labs or to dole out loans and grants to the same schools, the same universities, or to provide millions of dollars to contractors and vendors, then it must be incumbent upon us, the policymakers here in Congress, to ensure that everyone is given the same opportunity to share in the wealth and to share in the resources.

So, Mr. Chairman, that said, I look forward to working with Mr. Martin as well as other members of this subcommittee to restructure

the Department in a way that addresses the systemic and institutional discrepancies that exist in the agency today.

With that, I yield back.

Mr. Upton. Thank you.

The chair will now recognize the chair of the full committee, Mr. Walden, from Oregon.

The Chairman. Thank you very much, Mr. Chairman. And I want to welcome our panelists here today. This is a really important hearing for the committee, and it is a goal of this committee to begin the process to modernize the Department of Energy, an agency that was created in an era of scarcity. And we find ourselves in an era of abundance but of new challenges involving the environment and energy. And so we look forward to your testimony today. In October, we heard directly from Secretary Perry on his vision for the Department. Today, we will hear from the top leaders of that Department on how the Secretary's vision can be advanced and the role Congress is being asked to play.

We also have a distinguished second panel. This panel features important perspectives on Department of Energy's various operations concerning the national labs, nuclear oversight, research and energy security challenges. And so I appreciate all of your participation today. It is also always a pleasure to welcome back to the Energy and Commerce Committee alumni, including both Deputy Director Brouillette and Under Secretary Menezes, who served this committee with distinction. Dan was staff director and Mark as the Energy and

Environment chief counsel. So we look forward to having you back. It is always fun to question former members of the committee who wrote questions for all of us to ask other witnesses in the past.

I also understand that Under Secretary Dabbar visited the Hanford site this last week. Thank you for doing that. Secretary Perry was kind enough both to come out and visit Hanford as well as take a look at McNary Dam, one of our great hydro energy, noncarbon-emitting energy sources in the northwest earlier this year -- or last year.

Hanford is just up the Columbia River from my home and across from my district. And all of us in the Pacific Northwest are deeply concerned about the cleanup, making sure it says on schedule, on budget, and on time. I also want to recognize Administrator Klotz's long service to our country, sir. General Klotz has served in distinguished positions in both Republican and Democratic administrations throughout his career, including almost 4 years as NNSA administrator. So we are glad for your service and your participation today.

While the domestic international energy posture is substantially different from what it was when Congress established the Department more than 40 years ago, the importance of DOE's role in serving the national and the public interest has only increased. We are reaping the benefits of energy abundance. But legacy challenges remain, such as the cleanup of Cold War sites and permanent disposal of nuclear waste, which my colleague, Mr. Shimkus, has played an incredibly important, strong, and dedicated role toward achieving permanent and interim storage.

New risks have evolved, such as cybersecurity threats, the electric grid, managing and overseeing the modernization of our aging energy infrastructure.

So our responsibility is to ensure that a modernized Department of Energy is fully prepared to meet these 21st century challenges. So as we examine the DOE management and mission priorities today, we should keep in mind the benefits of the interconnected nature of the Department's missions. These missions, national security, energy security, environmental remediation, and mission enabling scientific research across the DOE enterprise, can be difficult and expensive to manage.

I am confident the team of professionals on our first panel today are up to this task. This committee will work through the remainder of this Congress and beyond to ensure the Department's organization and missions are aligned with the energy security challenges of the Nation and that we are nimble enough to meet the challenges of tomorrow. At my direction, the committee has been examining whether DOE resources are focused on its core missions. Going forward, we will review certain DOE authorizations -- by the way, many of which expired a decade ago -- to ensure proper program alignment.

I believe in collaboration with the Department of Energy. Many bipartisan good government policies can be implemented if we work together. So I look forward to continuing a positive working relationship.

The basic scientific and applied energy research conducted

throughout the DOE lab system is the foundation for new technological advances. These advances enable us to remain an international leader in innovation, security, and scientific know-how. This is the fundamental question before us today: How can we best harness the Department's enormous scientific, technical, and world-class capabilities to enhance America's national, economic, and energy security.

So I look forward to your testimony today and your response to our questions, both this panel and the one that follows.

With that, Mr. Chairman, I yield back the balance of my time. And thank you for your leadership on this issue.

[The prepared statement of Mr. Walden follows:]

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Mr. Upton. Thank you.

The chair will now recognize the ranking member of the full committee, Mr. Pallone, from New Jersey, 5 minutes.

Mr. Pallone. Thank you, Mr. Chairman.

As we start a new year, it is nice to finally have a full panel of agency witnesses before us. Last year, I was repeatedly disappointed by the Trump administration's unwillingness to send agency witnesses before our committee. Today, we have an experienced panel of senior leadership officials from the Department of Energy, including two distinguished former Energy and Commerce staffers, Deputy Secretary Dan Brouillette, and Under Secretary for Energy Mark Menezes. I am pleased they are back with us, and I want to welcome them, as well as the other agency officials.

The purpose of this hearing, according to my Republican colleagues, is to weigh whether DOE is in need of modernization, and what parts of its mission are still necessary. Now, publicly, my colleagues have discussed a full-fledged effort to reauthorize the Department, an effort that has not occurred since the creation of DOE over 40 years ago. However, so far, they have been short on details, and I hope to learn more today about what my Republican colleagues want to achieve in this endeavor. Specifically, we need to know what real problems at the Department we are attempting to solve. If my Republican colleagues want to take a targeted look at DOE programs to see where improvements can be made, then I am open to listening to their proposals. We might be able to find the areas of agreement where we

could work together to enact solutions.

However, if the goal is simply to eliminate scores of successful programs and arbitrarily shrink of size of DOE, like the unrealistic and flawed Trump budget proposal last year, then you are going to find opposition on this side of the aisle. Last year, President Trump made his priorities clear by proposing a budget for DOE that gutted or eliminated critical programs that historically had bipartisan support. The President's budget took a hatchet to popular bipartisan programs like energy efficiency, renewable energy, the Loan Programs Office and the Weatherization Assistance Program.

If my Republican colleagues hope to work together on this, they should know in advance that we will not support any reorganization that harms these programs or others which benefit consumers and help combat climate change. And similarly, we will not support any reorganization that attempts to shift some or all of EPA's programs into the Department of Energy. I do believe there are ways that the DOE can improve, and more successfully, fulfill its mission. And I think we can work together to make those improvements. For example, according to the Government Accountability Office, DOE's Office of Environmental Management and the National Nuclear Security Administration have demonstrated limited progress in improving contract management and have struggled to ensure that they have the financial and staffing capacity to mitigate risk. So we can and must develop bipartisan solutions that address these and other critically important issues.

The Department of Energy is a vital part of the executive branch,

playing a critical role in incentivizing the development of clean energy technologies, conducting cutting-edge scientific research, and maintaining our Nation's nuclear security. DOE is also home to a number of other agencies that operate independently and are vital to our Nation's energy policy, including the Energy Information Administration and the Federal Energy Regulatory Commission, or FERC. And it is critical that the independence of these agencies be maintained. I was pleased to see that FERC reaffirmed its independence yesterday when the five commissioners unanimously rejected Secretary Perry's proposal to provide preferential rates to coal and nuclear generation.

So we have two knowledgeable panels of witnesses before us today, and I hope, and I look forward to hearing their perspective. And I yield back the balance of my time. I don't think any of my colleagues want the time, so I will yield back, Mr. Chairman.

Mr. Upton. The gentleman yields back, so we are ready for testimony.

I want to thank you all of you for sending your testimony up in advance. We could look at it half-time between the Alabama and the Georgia game. And we appreciate that. Your testimony will be made part of the record in its entirety, and we will give each of you 5 minutes to summarize that before we do the questions. You know the drill, and we will start with our friend, Dan Brouillette.

Thank you.

You have got to turn that -- we have new switches since you were

here.

STATEMENTS OF HON. DAN BROUILLETTE, DEPUTY SECRETARY, U.S. DEPARTMENT OF ENERGY; HON. MARK MENEZES, UNDER SECRETARY OF ENERGY, U.S. DEPARTMENT OF ENERGY; HON. PAUL DABBAR, UNDER SECRETARY FOR SCIENCE, U.S. DEPARTMENT OF ENERGY; AND HON. FRANK KLOTZ, UNDER SECRETARY FOR NUCLEAR SECURITY, AND ADMINISTRATOR NATIONAL NUCLEAR SECURITY ADMINISTRATION, U.S. DEPARTMENT OF ENERGY

STATEMENT OF DAN BROUILLETTE

Mr. Brouillette. You know, you guys have gotten a little technology since I have been here. And I am more accustomed to being on that side. The view is a little better from over there.

Chairman Upton and Ranking Member Rush and members of the committee, speaking for myself and my three colleagues, who will also testify today, it is on honor to appear before you on behalf of the administration and the Department of Energy. This is my first opportunity to testify before Congress as the Deputy Secretary of Energy, and I appreciate the opportunity to update you on our progress.

I am proud to work for such an outstanding Department, and especially under Secretary Perry, who is a true leadership with exceptional management skills. He has set for us several priorities, and we will walk through this today. But just to run through them really quickly: Promoting America energy security by stressing innovation over regulation; enhancing national security through

nuclear security; addressing the obligation of legacy management and nuclear waste; and the topic of today's hearing, modernizing the Department of Energy. With my full testimony submitted for the record, allow me to briefly discuss these priorities.

Thanks to continued innovation from our national labs, we have ignited a technology revolution which has led to an energy revolution that is advancing our national security and our energy security. Today, we use energy cleaner and more efficiently, we obtain it from a wider diversity of sources, and we produce it more responsibly, affordably, and in greater abundance than previously predicted. We are closing in as a country on full energy independence, and we are on a path to achieving the administration's goal of energy dominance.

For far too long, U.S. energy policy has been hampered by a false choice between two goals: growing our economy or protecting the environment. The result was an overload of regulations that drastically reduced energy production. Our administration and the Department of Energy are working to replace the "or" with an "and." We are reducing unnecessary regulations on American energy, and in so doing, we are allowing our Nation to benefit fully from technological breakthroughs that reduce pollutants while dramatically increasing production.

We are also focused on ensuring the reliable delivery of electrical energy to the American consumer for years to come. America's electrical grid is strong and reliable because it is powered by a diverse mix of energy sources. These sources work together to

mitigate disruptions and increase resiliency when periods of extreme temperatures, like the one we just recently faced, affect supply and demand.

As you know, last fall, Secretary Perry proposed that FERC consider establishing new pricing rules that factor in the important contributions of baseload generation to ensure long-term grid resiliency and reliability. FERC responded yesterday with the unanimous decision to direct regional transmission organizations and independent system operators to proactively evaluate the resilience of the bulk power system. We are encouraged by this action, and we look forward to working with FERC and the individual commissioners on this important issue.

But taking steps to ensure the grid's diverse energy supply is but one aspect of DOE's critical mission. Today, the Secretary of Energy is responsible for a broad range of national security, scientific, and environmental activities. A key challenge for any large enterprise with such a broad mission is that it remain agile enough to adapt to tomorrow's challenges. Last month, the Secretary announced his intention to modernize the Department, to return it to its statutory framework, and to enable us to deploy resources more effectively and efficiently.

The modernization plan directs several key changes. First, we have separated the Office of the Under Secretary of Science and Energy into two Under Secretary positions, and we restored of three Under Secretaries that are outlined in statute. The Under Secretary of

Energy, the Under Secretary of Science, and the Under Secretary of Nuclear Security and administrator of the NNSA, all of whom who are here today to address this subcommittee and respond to your questions.

The new Under Secretary of Energy, Mark Menezes, will focus on energy policy, technologies, security, and reliability, and certain departmental management functions. While the new Under Secretary for Science, Paul Dabbar, will focus on innovation, basic research, and environmental cleanup. General Klotz from NNSA, who will soon be retiring, as was mentioned by the chairman, is here today as well. And I would like to also publicly take this opportunity to thank him for his service to our Nation nearly 40 years, where he has served with honor and distinction, both in and out of uniform.

In addition, elements of the former Under Secretary for Management and Performance portfolio will now fall under my responsibility as the Deputy Secretary. These changes are a vital first step to better organizing the Department to carry out its broad mission and to get much needed results for the American people. We will continue to look at ways to maximize our effectiveness, and we look forward to working with Congress and, in particular, this committee. We look forward to consultations with you toward that end.

In conclusion, I would like to thank this subcommittee once again for inviting us to testify today. I believe each of the Under Secretaries has brief opening statements, and then we will all look forward to answering any questions that you may have.

Thank you, Mr. Chairman.

[The prepared statement of Mr. Brouillette follows:]

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Mr. Upton. Thank you, Mr. Brouillette.

Mr. Menezes, before you start, I just want to again thank you for your time that you spend with us on a bipartisan delegation trip to look at the terrible circumstances of the hurricane impact in both Puerto Rico and the Virgin Islands. You may want to update us from when we went together down last month. But thank you for appearing before us, and we look forward to your testimony and your responses to our questions as well.

Mr. Menezes. Thank you. And I look forward to giving you an update on the Puerto Rico situation, should the committee desire.

STATEMENT OF HON. MARK MENEZES

Chairman Upton, Vice Chairman Olson, Ranking Member Rush, Chairmans Walden and Pallone, and members of the subcommittee, thank you for the opportunity to testify before you today, along with my colleagues, on behalf of the administration and the Department on the Department's modernization and realignment efforts.

Support of the administration's goals of energy dominance and economic competitiveness are realized through this realignment effort, which more carefully aligns the resources and efforts of the Department to promote the responsible development of resources, as well as to ensure the reliability and the resiliency of our electrical grid. Returning to this committee room, I am reminded of the work accomplished on behalf of the American people by the members and the staff of this

committee, some of whom are here today, and with whom I have had the pleasure to work when I served on the staff. In my 2-month tenure as Under Secretary, I have had the pleasure of meeting with and speaking to a number of former colleagues and friends in endeavor to keep the lines of communication open as we continue to evaluate the progress made with this realignment.

As Chairman Upton mentioned in early December, I was invited to travel with Chairman Walden's codel to Puerto Rico. It was my fourth trip to Puerto Rico and the Virgin Islands, along with eight members of this committee. And we saw the damage firsthand, that Hurricanes Irma and Maria brought to these territories. Seeing the devastation to the electricity delivery system as well as to the healthcare and other services, serve as a reminder of the important work that we can do to ensure reliable and resilient electricity delivery which is critical to the lives of so many millions.

The President's America First Energy Plan rightly calls for utilizing all of our energy resources in an all-of-the-above strategy to achieve energy security and economic strength at home and energy dominance through exports to markets abroad.

Let me give a few examples of how the Department is working to promote the responsible development of these resources as well as to ensure the reliability and resilience of our electrical grid. DOE is the lead Federal agency for supporting energy infrastructure owners and addressing cyber threats to the energy sector. We partner with the private sector to prepare for, protect against, and reduce the

impact of cyber threats. We are a member of the National Security Council, and bring the deep technical expertise from our 17 national labs to recognize and respond to cyber threats.

The Office of Fossil Energy's national energy technology laboratory rare earth elements program focuses on developing technologies that be help recover rare earth elements from coal and coal by-products. The development of a domestic supply of rare earth elements that is economically competitive will help fuel our Nation's economic growth, secure our energy independence, by reducing our reliance on foreign rare earth element sources and increase our national security. Additionally, the National Renewable Energy Laboratory has conducted research that has delivered six cents per kilowatt hour utility scale solar 3 years ahead of the Department's goal. This success allows us to focus our research priorities on a more significant and long-term challenge, integrating variable renewables into our electric grid.

Reliability and affordability paired with grid security enhancements will provide a more resilient energy infrastructure for the Nation. Improved policies for the development of energy infrastructure, including gas pipelines, smart grids, small modular nuclear reactors, energy storage, along with public-private partnerships with our national laboratories, bringing research technology to market, will help us address our Nation's energy challenges.

The Department appreciates the committee's interest in our

realignment, and we look forward to continuing to work with you on this and other opportunities to foster and promote responsible energy development and promote energy dominance.

Thank you again for the opportunity to be here today, and I look forward to your questions.

[The prepared statement of Mr. Menezes follows:]

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Mr. Upton. Thank you.

Mr. Dabbar, welcome.

STATEMENT OF HON. PAUL DABBAR

Mr. Dabbar. Thank you, Chairman Upton, Ranking Member Rush, and members of the committee. I am honored to highlight the mission of the Under Secretary of Science, which includes the Office of Science, the Office of Technology Transitions, the Office of Environmental Management, and of Legacy Management. I could say much about our priorities in those areas, but I will instead focus my remarks today on basic research, market-driven innovation, and environmental cleanup.

In the area of basic research, let me highlight two near-term projects and programs. One of the main priorities of the Office of Science is the accelerated deployment of the first U.S. exoscale-capable super computer with the intent to deploy the first of the three machines in 2021, maintaining our global leadership in computing since its inception. Computer modeling and simulations are vital in this era of big data and complex systems. And exoscale computing, which will be at a billion billion calculations a second, that is 10 to the 18th, represents the next step. The evolution of super computing includes advances into physical sciences and high technology areas. This area is of intense international competition, and it is key that this project will maintain our global leadership.

The second project area I would like to highlight is the Long-Baseline Neutrino Facility and the Deep Underground Neutrino Experiment, LBNF DUNE, at Fermilab outside of Chicago. It is another important priority for our Department. Once completed, this international center for neutrinos will study -- will pair the world's highest intensity neutrino beam at Fermilab outside of Chicago with massive cryogenic detectors installed deep in a former mine in south Dakota. Completion of this project will cement U.S. preeminence in neutrino science, one of the frontiers of high energy physics. I can report to you today that America's global leadership in science remains dominant, as it has for the last century. In the area of enhancing technology transitions, the mission of the Office of Technology Transitions is to expand the commercial impact of R&D and the DOE portfolio by facilitating partnerships with industry and investors in close coordination with the DOE programs in the national labs.

Additionally, OTT is responsible for commercialization activities across all the DOE programs. Commercialization is a high priority of mine and the rest of the management team. I look forward to working closely with the Energy Investor Center, as well as with other DOE programs and our national labs to continue facilitating engagement with investors and with industry, and expand the pool of potential investment capital in DOE technologies.

In the area of environmental management, the government's nuclear weapons program has made significant contributions to our Nation's defense. But this legacy includes significant obligations to address

liquid radioactive waste, spent nuclear fuel, special nuclear material, transuranic and mixed low level waste, contaminated soil and water, and thousands of access facilities. As a former radiation control worker, I am particularly sensitive to our obligations in the area, as well as the health and safety of those executing on the program.

We look forward to successful completion of key projects around low activity waste vitrification in Hanford, as well as salt waste treatment in Savannah River. This can significantly demonstrate risk reduction and progress in addressing cleanup obligations. The new alignment of the Offices of Science and Environmental Management reporting to the Under Secretary of Science, myself, will create additional momentum in environmental cleanup by further leveraging the experience of the national lab complex, and exploring various potential alternatives for science and environmental management, project management, and contract approaches. And we hope to better manage costs and solve the environmental management challenges while ensuring the highest level of safety for our Federal and contract employees, the public, and the environment.

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

[The prepared statement of Mr. Dabbar follows:]

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Mr. Upton. Thank you.

And Mr. Klotz, welcome.

STATEMENT OF HON. FRANK KLOTZ

Mr. Klotz. Thank you. Chairman Upton, Ranking Member Rush, Chairman Walden, and members of the subcommittee, thank you for the opportunity to represent the women and the men of the Department of Energy's National Nuclear Security Administration. We greatly appreciate your interest in and your strong support for NNSA missions, its major programs, its infrastructure modernization projects, and, most importantly, its people.

As America's highest ranking military leaders have repeatedly said, nuclear deterrence is the bedrock of our national security. NNSA was established by the Congress in the year 2000 as a separately organized agency within the Department of Energy to carry out three vitally important and enduring missions that directly relate to nuclear deterrence. The first of these is maintaining the safety, the security, the reliability, and the effectiveness of America's nuclear weapons stockpile. The second is to reduce the threat of nuclear proliferation and nuclear terrorism at home and abroad. And the third is to provide nuclear propulsion to the U.S. Navy's aircraft carriers and submarines.

NNSA relies heavily upon the scientific, technical, and engineering talent and capabilities at its national laboratories and

its production plants in fulfilling these national security missions. Secretary Perry has described these unique facilities as our Nation's crown jewels. And they have, indeed, done a remarkable job in applying leading-edge science to address the Nation's most urgent security needs.

That said, we continue to face important challenges as an enterprise, and we clearly have work to do. For example, it is absolutely imperative that we repair and modernize NNSA's aging infrastructure, over 50 percent of which is more than 40 years old, and some facilities even date back to the World War II and post-war Manhattan project.

We must also continue to improve project management and conduct of operations by our contractors who manage and operate our sites. Our initiatives, to this end, have been informed to either findings and recommendations of recent congressionally mandated and internal reviews, and include such measures as establishing clear lines of authority and responsibility; adjusting contract incentive structures; holding contractors accountable for safety, security, and performance; and assuring appropriate levels of oversight.

The results, I think, over the last several years, speak for themselves. Since we created an office for project management in NNSA in 2011, the administration has delivered its $1.4 billion capital construction project portfolio, 8 percent under the original budget. And just this year, we delivered the High Explosive Pressing Facility at Pantex in Amarillo, Texas. We delivered the TRU Waste Facility at

Los Alamos in New Mexico. The Deputy Secretary and I cut the ribbon at the construction support building at the Y-12 production plant in Oak Ridge, Tennessee. And we are just about to finish the administrative support complex at Pantex, which will house about a third of the Pantex workforce later this year.

Additionally, I am proud to say all of NNSA's weapons life extension programs are on schedule and on budget despite the fact that we are in one of the busiest periods we have been as an enterprise since the end of the Cold War. It is worth emphasizing that NNSA collaborates closely with other DOE organizations on several fronts to execute its missions. The three national laboratories for which NNSA has responsibility, Sandia, Los Alamos, Lawrence Livermore, not only support NNSA's missions, they also support other DOE programs.

Likewise, the other 14 national laboratories within the DOE complex do substantial work in support of NNSA's missions because of the unique skills and resources they possess. Together, the 17 DOE national laboratories are greater than the sum of their parts creating a world-class scientific complex of unparalleled capability.

One of these areas, as already mentioned by my colleague, is in developing exoscale computing capability. We are doing this jointly with the Office of Science. The project will dramatically advance the Nation's capabilities in science, medicine, applied energy technology, and national security. It will also ensure that America remains a world leader in the highly dynamic and competitive field of computational technologies. For this reason, this exoscale project

ranks as one of the Department's highest priorities.

Again, thank you for your very strong support, and I look forward to answering any questions that you may have.

[The prepared statement of Mr. Klotz follows:]

******** COMMITTEE INSERT ********

Mr. Upton. Well, thank you all for participating and being here this morning. And we wish Secretary Perry well for sure.

Mr. Brouillette, as the DOE's chief operating officer, I know this is the budget time. I am a former OMB official a lot of years ago. And the time frame is a little bit different than it was when I worked for President Reagan in that the budget had already been up by the first week of January, and now since then, Presidents have sent their budgets up a little bit later. Given the huge demand for resources in your important department, I don't know if they have actually done the passback yet from OMB back to DOE, but how is your relationship with those folks down at the old executive office building in terms of their response to the Secretary's budget priorities?

Mr. Brouillette. Well, sir, Mr. Chairman, our relationship --

Mr. Upton. They are not in the room. They are watching.

Mr. Brouillette. They are watching. Yes, I will be graded on this response, I am certain.

Our relationship with Director Mulvaney has been strong. We are fortunate to have him as an OMB Director. As you well know, he is your former colleague, he comes from the Congress, he understands the budget process very, very well.

With regard to our processes internally, we are in active conversations with the OMB. We have not yet completed the budget process. We do expect to see the final product of their work very, very shortly. And we expect it will be sent to Congress very, very shortly as well.

Mr. Upton. The Department's role to maintain the Nation's nuclear deterrent is obviously a very important and vital mission. Recent reviews have found that the structure of the NNSA has sometimes isolated DOE's work from the needed cabinet level leadership. Can you commit to us, and certainly Mr. Klotz as well, that you will be working to ensure appropriate secretarial leadership and management support to enhance that vital mission?

Mr. Brouillette. Yes. Absolutely. You know, as you know, Mr. Chairman, this committee was instrumental in 1999, in the general time frame, in the creation of NNSA. So we understand full well what the direction of the U.S. Congress is toward the Department. It has given us the ability to work closely together. The Department and the NNSA collaborate very, very closely on the national security mission, and as well as other missions, which includes environmental cleanup, the cleanup of those sites.

I will defer if General Klotz has any further comments that he might want to make about that collaboration. But I can assure you and this committee that we are working closely together.

Mr. Upton. General Klotz.

Mr. Klotz. Chairman, I would echo everything that the Deputy Secretary said. I think we have a very close working relationship. We had one in the previous administration. We certainly have one in this administration as well.

One of the things that Congress did in creating the NNSA and the position of the administrator of the NNSA is they made that same

individual also an Under Secretary within the Department which allows that individual to work very, very closely with the colleagues and throughout.

I might add, one of the points that I really want to foot stomp in my oral statement applies to that part of the DOE complex out in the laboratories, the 17 laboratories. And as I indicated, we work very, very closely together. The non-NNSA laboratory support us significantly in our national security work, and we do an awful lot of basic science research that has relevance to the work they are doing as well. So I think this is a win-win organizational structure which has been created.

Mr. Upton. My remaining comment, I would like each of you to respond just briefly with regard to the cyber threats, not only on DOE, but obviously the facilities that you oversee. So we know that there has been -- had a number of briefings, public and private, over the years in terms of the increasing cyber threats. We know that literally hundreds of times daily it is the -- likely attempts. And it just -- what can we do to make -- to ensure the safety for all of our citizens?

Mr. Brouillette.

Mr. Brouillette. Yes, Mr. Chairman. Cybersecurity is one of our highest priorities. The Department of Energy is the sector specific agency responsible for cybersecurity within the energy community, or energy industry, I should say. One of the first steps that the Secretary directed me to take as the Deputy and as the chief

operating officer was to ensure that our own house is in order. We are obviously going to work with the industry, work closely with the -- what is known as the ESCC, the Electric Sector Coordinating Council, to take input from our industry partners. I am aggressively focused at the moment on our inside-of-the-house activities. So working closely with our own CIO to make sure that our Department, our complex is protected on cyber matters.

Mr. Upton. And do you have any recommendations for us in terms of trying to make your job easier?

Mr. Brouillette. I will happily come back to the committee and share with you some additional thoughts once I can get my arms around this complex. But, sir, at the moment, I can't think of anything that I would need from this particular committee or the Congress.

Mr. Upton. I know my time has expired.

Do any of the three -- do you have something you would like to add to that response? If not, go ahead, Mark.

Mr. Menezes. One thing that we are doing, and we were some -- in Office of Electricity, we are actually running a nationwide grid system evaluation, really, if we can continue to supply the national critical assets with the power and eliminate the potential risk of cyber attack. This has not been done, and so this will be done by our Office of Electricity.

Mr. Upton. I think there was an exercise that was supposed to take place not too long ago.

My time has expired. Let me --

Mr. Menezes. Grid X. We did --

Mr. Upton. -- yield to the ranking member of the subcommittee, Mr. Rush.

Mr. Rush. Well, thank you, Mr. Chairman. To all of the witnesses, I want to ask questions. If you don't have answers to the questions in that I only have 5 minutes, will you -- I want to allow you to respond in writing. As a matter of fact, that would be good.

Deputy Secretary Brouillette, last week, my office reached out to staff at DOE in preparation for today's hearing inquiring about the percentage of minorities and seniors -- the senior positions within the agency as well as it is much easier for the agency to consider policies and initiatives that address the needs of minorities when there are minorities at the table when decisions are being made.

Are you prepared today to share some of these figures with the subcommittee? Specifically can you provide a percentage or number of minorities in leadership position within the Secretary's office, the review boards, the boards and council, and among the SES staff?

Also, can you, or Under Secretary Dabbar, share with us a number of minority directors at the 17 national labs and on the percentage of senior minority staffers in leadership positions at those labs?

Mr. Brouillette. Yes, sir, I would be happy to provide those to you. I am aware of the question. I will respond to you formally in writing and make those numbers available to you.

I would also like to share with you, at least, some of my early experiences at the Department. My first impressions --

Mr. Rush. Mr. Secretary, I only have a few minutes.

Mr. Brouillette. Yes, sir.

Mr. Rush. Let me ask Mr. Dabbar.

Mr. Dabbar, can you answer the question? How many minority directors of the 17 national labs, and on the percentage of minority staffers in leadership positions in the labs?

Mr. Dabbar. I apologize. Could you repeat? Someone was coughing.

Mr. Rush. Can you or Under Secretary -- can you share with us the number of minority directors at these 17 national labs and on the percentage of senior minority staffers in leadership positions at those labs?

Mr. Dabbar. Thank you, Congressman Rush.

No. I will be glad to share that information with you. I do not --

Mr. Rush. Okay. Thank you. You don't have them.

All right. Secretary Brouillette, are you familiar with the minorities energy initiatives that were created under former Secretary Moniz?

Mr. Brouillette. Yes, sir, I am.

Mr. Rush. What are your plans for moving forward with that?

Mr. Brouillette. We are going to continue that important program. I understand its importance to not only Congress, but the communities that are served by that program. We have every intention of continuing it.

Mr. Rush. Now, then, the Office of Economic Impact and Diversity have been moved to the Deputy Secretary level.

What are the plans for, in this office, moving forward?

Mr. Brouillette. The same answer, sir. We are going to continue that. It is a very important program. It is vital to the communities that it is serves. And we see its continued importance to the Department.

Mr. Rush. In your response in writing to me --

Mr. Brouillette. Yes, sir.

Mr. Rush. -- be very specific. I would like to know what plans and the implementation schedule, what those are?

Mr. Brouillette. Yes, sir.

Mr. Rush. Secretary Dabbar, your jurisdiction with the office -- within the Office of Science includes responsibility for doling out taxpayer research dollars in the form of grants to institutions of higher learning.

Can you provide this subcommittee with a list of schools, universities that have received funding over the past 10 years from your Department as well as the amount distributed to each institution. Also, do you know the percentage of funding that is loaned to minorities serving institutions, including historically black colleges and universities, and Hispanic-serving institutions over the past 10 years?

Mr. Dabbar. Congressman Rush, yes. About $3 billion a year is distributed through various FOAs out of the Department. It is a very

large portion of the budget. The vast majority of the $3 billion across all our various programs goes to universities, and I would be glad to follow up with the specific information in writing that you are asking for.

Mr. Rush. And I want to know about black-serving institutions and historically black colleges and universities and Hispanic-serving institutions.

Mr. Dabbar. Yes, sir, we will do that.

Mr. Rush. Mr. Chairman, I have just one more question for Mr. Dabbar.

You oversee national labs. Can you provide this subcommittee with the approximate dollar amount of contracts that the labs dole out to private companies and vendors? Is their goal to include minority contractors? Have the labs reached that goal? And if not, is there a plan in place to increase minority participation for contracting and vending opportunities within the labs?

Mr. Dabbar. Yes, we will.

Mr. Upton. Thank you. Thank you all. The gentleman's time has expired.

The chair would recognize the chair of the full committee, Mr. Walden.

The Chairman. Thank you very much, Mr. Chairman. And, again, thank you all for being here. We look forward to your written responses to Mr. Rush's questions.

The Office of Environment Management oversees the environmental

remediation projects at some of our Nation's most contaminated sites, including the Hanford reservation which I referenced earlier, located just up the Columbia River from where I live.

In 2013, then-energy Secretary Moniz moved the environmental management out of the responsibilities of the NNSA administrator to a newly created Under Secretary for Management and Performance. And DOE's recent realignment shifted the office to now be managed by the Under Secretary for Science. So it seems like it has been moving around a bit on who has the responsibility. Those of us in the northwest care deeply about that and even more deeply about getting it cleaned up and protected, especially given some of the failures that have occurred eventually in some of the tanks and all.

So Deputy Secretary Brouillette and Under Secretary Dabbar, will you please describe the reasoning for this shift, and, for example, what expertise is aligned with the Office of Science that may prove beneficial to similar large project management challenges that are associated with the EM's mission and give us an update on the latest at Hanford and where that waste would go if we ever get Yucca open. So, Mr. Brouillette, maybe you'd like to start out.

Mr. Brouillette. Yes, sir. Thank you, Mr. Chairman.

I will give you -- I will share with you some of the thinking that we had behind that particular move. And it starts with some of the first comments that I heard when I became a young staffer on this committee back in 1989. And that was along the lines of Hanford is very complex. Hanford is very complicated. It is a technical issue

and, therefore, we haven't cleaned it up yet.

And Secretary Perry has heard those very same arguments. And the thought process that we went through was how can we figure out how to fix this problem. And we have some of the best, some of the brightest scientists in the world working at the Department of Energy. So we thought that perhaps by combining these programs and forcing some collaboration between the environmental management program and these scientists would allow us to find the technical answers that we need to find to begin the actual cleanup of that site as well as other environmental management sites throughout the country. I will defer to Mr. Dabbar as to what the specific steps that we will take. But that was the initial thought.

From a management standpoint, you should also know, too, that the Office of Science within the Department of Energy stands head and shoulders above many Federal agencies in its ability to conduct proper, efficient, and effective contract management. They do that very, very well. So we want to avail ourselves to those talents as well within the Department of Energy.

The Chairman. Thank you.

Secretary Dabbar.

Mr. Dabbar. Yeah. Chairman Walden, as the Deputy Secretary mentioned, I think there are two major buckets of reasons that -- in terms of the specifics why the coordination can help in the execution of the mission of environmental management upon this reorganization. The first is technology. There is a number of different areas within

the national lab complex that have linkages to the mission of environmental management. As you know, within the BES area, the Office of Science, we have chemistry. And a large portion of the issues associated with environmental management is radiochemistry issues. And obviously, between the chemistry functions as well as the nuclear side, nuclear physics side of the Office of Science, there is an awful lot of technology overlap. On top of that, there are other examples such as computer modeling of various disposition of various radionuclides, which we can use our high performance computing for. So it is a great degree of opportunity.

And then the other bucket is project management. As the Deputy Secretary mentioned, the Office of Science is one of the two major areas of -- one of the three major areas that deal with project management, and it generally executes on time and on budget. And we think that the project management skills associated with other areas including the Office of Science.

The Chairman. So you were just out there, right?

Mr. Dabbar. Yes, sir.

The Chairman. Can you give me, in the 45 seconds left, your update? Are we still on target?

Mr. Dabbar. So there are things that we are moving along with that we are very excited about and we think are very positive. And there are some areas that have challenges. In terms of the positive areas, finally, we are moving down the road of making glass at the plateau. The DF LAW, which is the low activity waste treatment plant,

is coming online. And we are going to make some glass, and we are going to clean up some tanks.

We are also looking at closing out our first tank farm, possibly, first time ever. And we are looking to ship some waste off sight, first time ever. So there is some very positive things that we are executing on.

The Chairman. When and where?

Mr. Dabbar. Well, there is some options around TRU. TRU Waste is the things that we are looking at, and there is a couple different options very specifically that we are looking at. We have not identified exactly which one, but there are specific locations. And for that shipment portion example that we are focused on, we are focused on TRU.

The Chairman. All right. Thank you very much.

Thank you, Mr. Chairman.

Mr. Upton. You are recognized, Mr. Pallone, from New Jersey.

Mr. Pallone. Thank you, Mr. Chairman.

My questions are of Mr. Brouillette.

I was pleased to see FERC yesterday unanimously terminated the grid resiliency rulemaking that Secretary Perry proposed last year. And that flawed proposal would have subsidized certain coal and nuclear plants under the guise of a grid reliability crisis. And this is chiefly a policy matter, in my opinion, that should be left to Congress and to the States.

On October 12 of 2017, I sent a letter to Secretary Perry

requesting additional details regarding the development of this proposed rulemaking, including a list of DOE staff who put together the proposal and a list of all meetings where DOE staff or leadership discussed the proposal with outside organizations. And I saw that photos were published recently showing Murray Energy's CEO Robert Murray handing Secretary Perry a so-called action plan last March, a portion of which states, and I quote, "Immediate action needs to be taken to require organized power markets to value fuel security, fuel diversity, and ancillary services that only base-load generating assets, especially coal plants, can provide," end of quote.

And so, you know, these photos made me question how much outside influence went into the preparation of the proposed rulemaking and who those outside parties were.

Now, Mr. Brouillette, I haven't received response to my letter, which was sent nearly 3 months ago, so I wanted to ask first: Do you know the status of DOE's response to this letter?

Mr. Brouillette. No, sir, I don't, but I will happily look into it and make sure that you are responded to.

RPTR FORADORI

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[11:02 a.m.]

Mr. Pallone. I appreciate that. Obviously you are making a commitment to ensure I receive a total response, and you will do that.

Mr. Brouillette. I was just handed a note, sir. It seems that our lawyers, our GC office is responding to your note, preparing a response, but I will ensure that you receive it.

Mr. Pallone. I appreciate that. Thank you. Now, let me go to the second thing that I want to talk about, and that is this Secretary of Energy Advisory Board panel. I would like to ask about that and its current status. As far as I can tell, the board, which has historically provided advice and recommendations to the Secretary on key DOE issues has not been reconstituted under Secretary Perry; in fact, the DOE website still shows members of the board that served under the Obama administration, including one of the witnesses on our second panel today, Dan Reicher.

Now, Secretary Menezes relied heavily on advice and guidance from this advisory board, which put together several comprehensive reports during his tenure, and it seems to me, my opinion is that Secretary Perry, who had little experience on national energy issues before taking the helm at DOE, and even proposed eliminating the Department all together, when he was a presidential candidate, would benefit from such a group of advisors.

So my question first is, am I correct that the Secretary of Energy Advisory Board has not been reconstituted under Secretary Perry? Is that accurate?

Mr. Brouillette. I think it is accurate to say that it has not been disbanded. The Secretary's advisor board still exists. The Secretary is still in the process of evaluating membership on that board. But at this moment in time, I don't think he has made any decisions with regard to that particular board in terms of its membership. But I can tell you that it is an important component of the advisory function at DOE, and I think he has every intention of maintaining it.

Mr. Pallone. So from what you said, and I don't want to put words in your mouth, you are saying that he does intend to keep it and appoint, you know, some members, it is just that he hasn't gotten around to it.

Mr. Brouillette. I think that is correct.

Mr. Pallone. I mean, so I just -- I just think it important that the Secretary have the guidance of a body like that.

Mr. Brouillette. Yes, sir.

Mr. Pallone. As he makes key decisions.

Mr. Brouillette. Yes, sir.

Mr. Pallone. And obviously, you agree.

Mr. Brouillette. Yes, sir.

Mr. Pallone. And hopefully, he is going to move ahead with that.

Mr. Brouillette. Yes, sir, he will.

Mr. Pallone. Okay. Thank you so much. I yield back, Mr.

Chairman.

Mr. Upton. Mr. Barton.

Mr. Barton. Thank you, Mr. Chairman, and welcome to this subcommittee. Two of you, especially, should be very familiar with this room. You worked with a lot of the portraits that are up on the walls. So it is good to see you all back. I don't know whether to congratulate you on progress or to commiserate with you on regression, but I am glad to see you.

Before I ask my questions, I doubt that too many people -- General Klotz was talking about Pantex, and one of the unknown stories in my life is that in 1972, I was offered a job at Pantex as an industrial engineer with a company called Mason & Hanger, which was a contractor. It is the weirdest plant interview I ever did. They said, we can't let you see the plant. We can't tell you what we make. We can't tell you what you are going to do, but we really want you to come to work. And I asked a couple of questions, and they just said, we can't tell you.

So then when I left the office, out in Amarillo, or outside of Amarillo, I saw this big bomb casing, big, big bomb casing. I said, well, that gives me a clue as to what they do here. But not too many members probably know what Pantex -- I don't know what they do now, but then they actually made some of our nuclear weapons, and maybe they still do or they just maintain those.

Mr. Klotz. Well, two thoughts, sir. One is, your career turned out okay, even though he didn't come work for us. And, two, the Pantex

is the one facility where all the various components that make up a nuclear weapon are shipped, and it is the highly skilled workforce of people in the panhandle region that --

Mr. Barton. Well, I know they are very proud of it. Chairman Thornberry is very proud that that facility is in his district. Well, I have a number of questions in terms of the Department's structure and reauthorization. Chairman Walden has asked that I try to lead an effort to reauthorize the Department on a bipartisan basis. So I just have some kind of general questions I want to ask
Mr. Brouillette -- Deputy Secretary Brouillette. It is hard for me to get that in my vocabulary.

What is the number of direct personnel that is actually working at the Department right now, not contractors, but full-time Federal employees?

Mr. Brouillette. Sir, it is approximately 13,000. Just north of 13,000.

Mr. Barton. How many contract employees does the Department have authority over?

Mr. Brouillette. The approximate number is going to be just north of 100,000.

Mr. Barton. 100,000. Okay.

Mr. Brouillette. Yes.

Mr. Barton. Do you know in terms of the contractors how many of the primary contracts are competitively bid as opposed to no bid contracts, sole source contracts?

Mr. Brouillette. No, sir. In terms of an absolute number, I can't give you that, but I am happy to respond for that on the record. We will do the research and provide that information to your office.

Mr. Barton. Okay. Again, in terms of these contracts, I know some of them are long-term contracts. Do you have any idea what the average length of the prime contracts are?

Mr. Brouillette. It really depends on the work that is being done, but I will defer to the two Under Secretaries who may be able to provide you with a more precise answer. Paul.

Mr. Dabbar. Yes, Chairman Barton. It does depend on which ones, but in a typical science contract, many of them are 5 years with a 5-year extension. That is a typical contract. Obviously, within a lot of our national labs, some have very long-term relationship needs and are linked to universities. Some of them are more engineering and construction jobs, so if you take environmental management or some of the general areas, those are very project specific. So depending on the length of the project, many times they could be 3 or 4 years. And some of the very longer term ones, such as at Hanford, they are a bit longer, given the length of the construction.

Mr. Barton. Could the Department give the committee a list of these large primary contracts and when they are next scheduled to be up for renewal?

Mr. Dabbar. Yes, sir.

Mr. Barton. If we are going to do a reauthorization bill, that is some information we would need.

Mr. Brouillette. Yes, sir, we would be happy to provide that to the committee.

Mr. Barton. One of the things that now Senator, then Congressman, Ed Markey, and I worked on 10 or 15 years ago was the creation of a northeast gasoline reserve in fuel oil reserve. And I notice those have now been established in almost every State in the northeast -- has either/and a fuel oil and a gasoline reserve -- are these facilities similar to tank farms where you actually store fuel onsite, or is it a contractual arrangement where the private sector has to provide the fuel if it is called on to?

Mr. Brouillette. Sir, with regard to the strategic petroleum reserve, we actually retain the fuel onsite.

Mr. Barton. So these gasoline reserves and fuel-off centers, like in Massachusetts and New York and New Jersey, they actually have the fuel onsite?

Mr. Brouillette. I will check on the gasoline reserves in the northeast to ensure that this answer is correct. It is my understanding that at least partially those fuels are stored onsite. But with regard to the strategic petroleum reserve --

Mr. Barton. I know the crude oil is.

Mr. Brouillette. Yes, it is.

Mr. Barton. My last question is. Is the Department and the Trump administration supportive of a Department of Energy reauthorization bill in this Congress?

Mr. Brouillette. Sir, I am sorry, the question is, do we support

a reauthorization bill?

Mr. Barton. I have had informal contact and discussions with Secretary Perry, but I have never asked for a formal response on the record, so I am now doing so.

Mr. Brouillette. Sure. We would be very enthusiastic about working with Congress to reauthorize the programs. With regard to the actual policy, OMB is going to be a part of this process as well. But as a Department, I can assure you that we stand ready to assist the committee if it proceeds.

Mr. Barton. I appreciate that. And I yield back, Mr. Chairman.

Mr. Upton. Thank you. Mr. Peters.

Mr. Peters. Thank you, Mr. Chairman. Thanks to the witnesses for being here. Mr. Deputy Secretary Brouillette?

Mr. Brouillette. Yes, sir.

Mr. Peters. You said something that I have said in my campaign speeches for 20 years, 15 years, however long I have been doing this, which is that the choice between a clean environment and a prosperous economy is a false choice. And I wanted to follow up just in terms of the Department's policy with respect to that.

I read through the testimony, I saw some stuff about environmental cleanup, but what I didn't see was reference to some of the more current discussion around greenhouse gases. And I just wanted to ask you, is it a policy in any respect of the United States Department of Energy to limit the emission of greenhouse gases and short-lived climate pollutants, including methane and black carbon?

Mr. Brouillette. Is it the policy of the Department to limit it?

Mr. Peters. To limit those emissions.

Mr. Brouillette. Well, we are not the regulator, if that is your question. I mean, we don't regulate those types of emissions, I mean, that falls more to the EPA. But with regard to finding technological solutions, using the scientists in our labs to develop new technologies, that would limit those types or reduce those types of emissions. Absolutely, that is part of the Department's mission.

Mr. Peters. Would that be a reference to carbon capture specifically, or do you mean --

Mr. Brouillette. Yes, it is. The Secretary has been very gauged on that issue. He just returned, as a matter of fact, from overseas, where he was part of a clean energy ministerial. We have been working with our international partners around the world to see that technology further developed and utilized in other countries around the world.

Mr. Peters. Are there any other -- beyond that, are there any other technological solutions the Department is pursuing to reduce or limit greenhouse gas emission?

Mr. Brouillette. I might defer to our Under Secretaries as they run those programs.

Mr. Menezes. Specifically, our Office of Fossil, for example, is developing new technologies on small coal units, for example, where one of the criteria is reduced emissions. So it is actually in the production of electricity is where the technology is focusing on, not just post-combustion where you capture it and store it.

We are developing really, I mean, across the broad spectra, we are looking at fuels that can be produced and used at the front end to lower emissions than during the actual combustion process itself to reduce emissions, and then post-combustion capture and sequestration.

Mr. Peters. Mr. Deputy Secretary, let me just say, is it fair to say that it is not part of your -- in developing resiliency and energy security, it is not part of your calculus to determine which energy sources are cleaner than the other, to be abbreviated about it?

Mr. Brouillette. I think the Nation is served by the all-of-the-above strategy. I don't know that we are going to pick and choose the generation sources or the energy sources, that is where the American people -- for other policymakers. But if your question is related to our support of an all-of-the-above strategy, the answer to that is clearly, yes, we do support renewables, we support wind, we support solar, we also support nuclear, as well as coal and natural gas.

Mr. Peters. Do you have a position on the Tax Code's treatment of any particular energy source?

Mr. Brouillette. No, sir.

Mr. Peters. I guess the other question I have is with respect to energy. First of all, I did -- I was struck by what we all do agree on. We talked a lot in this committee about cybersecurity and grid security, we want solid distribution, and basic research. And I pointed out before that the ARPA-E program, I think, since it was

created in 2009, has provided $1.5 billion in funding to more than 580 projects that has led to the formation of 56 new companies, 68 projects with other government agencies, including Defense that has attracted more than $1.8 billion in additional private sector investment.

Mr. Dabbar, is that the kind of investment you want to see continued when you talk about basic science research?

Mr. Dabbar. Overall, we are very supportive of the programs that we have at the Department around commercialization. ARPA-E is certainly a portion of it. If you think about the large FOA bucket, which is a grant bucket, we have about $3 billion a year across our various different areas. And ARPA-E is about $300 million of that, so it is about 10 percent.

Mr. Peters. I was concerned that the President's initial budget zeroed it out. And I spoke to the Secretary about it when he was here. He indicated that maybe he didn't agree with that, I certainly don't. I want to say that I am sympathetic to all the agencies that come testify for us in the wake of this tax -- so-called tax reform that added at least $1 trillion to our budget deficit -- to a national debt. And we are looking at $1 trillion deficits going forward. I think it puts a lot of pressure on that. But I do want to highlight that as something that I agree deserves our support as a Congress and hope that we can figure out a way to responsibly fund that.

With that, I yield back.

Mr. Upton. Yield to Mr. Olson. Thank you.

Mr. Olson. I thank the chair, and welcome to our four witnesses.

A great panel. Two neighbors from Louisiana, Secretary Brouillette and Secretary Menezes. A Naval Academy graduate, a fellow sailor, a submariner, Mr. Dabbar. And Lieutenant General Klotz, who has the high honor of being a native born Texan, Lubbock, Texas. Welcome.

As a former naval aviator, over 1300 hours of P-3 Orion submarine hunter, I was trained to track, attack, and destroy Russian submarines -- Russian ballistic missile submarines. And while I can never confirm nor deny that I flew with nuclear weapons, we were qualified to drop what is called a B-57 nuclear death bomb. That bomb was designed to destroy Russian submarines where it created a big wave of air on the break and keel by the weight of the boat. That bomb has since been retired. But as you all know, we still have nuclear weapons as part of our strategic deterrence.

My first question is for you, General Klotz. DOE and NNSA has the task of keeping, as you said, our nuclear weapons safe, reliable, and effective. And you have years of experience administrating the nuclear security programs of the Department. You understand the challenges to this complex mission.

My question is, please discuss the role of the national lab system, not only the weapons labs, but the whole system in maintaining our nuclear deterrent and national security?

Mr. Klotz. Thank you, sir. That is a wonderful question. People often ask me what was I most surprised about coming into this particular job 4 years ago, and one of my answers is, I understood how the three national laboratories, which NNSA has responsibility for,

contribute to that mission. What I didn't realize, until I went out and visited all of the other 14 laboratories is how much work is being done throughout the entire system. We use the other laboratories because of the special scientific and engineering skills that are resident in those laboratories, some of the unique equipment that they have. But I would say of all 17 laboratories, we have direct funding going to the vast majority of them. And even those laboratories that we do not directly fund, many times they are subcontractors to other laboratories doing work for the NNSA, both in the weapons activity account, and in the defense nuclear non-proliferation account, as well as naval reactors.

Mr. Olson. Thank you. My next question is for Secretary Brouillette and Secretary Dabbar. Houston, my home town, is the oil and gas capital of the entire world. I am proud of that. As we say in Texas, that ain't changing any time soon. Natural gas is now very abundant, and it has now become the core of electric grids across the country. At the same time, though, the fastest growing jobs in Texas are actually in wind power. We are exploding, number one in America in production of wind power.

We have an important role to play, but some have said that unlocking that source of energy, it is right, will have to have better batteries, better transmission lines, and also the wind is always blowing when we need it and where we need it.

Could you talk about how DOE balances and supports new developments like wind, a crucial source of energy, while moving

forward with research to alternative energy?

Mr. Brouillette. Yes, sir, I can. As you know, sir, as a Texan, and as a part-time resident of Texas myself for 12 years. I was down with USAA in San Antonio, Texas. I understand the record of Secretary Perry, I wanted to call him Governor Perry. But as Governor of Texas, he approached this with an all-of-the-above strategy. Texas is now the largest wind producer, wind energy producer -- one of the largest, I should say, in the United States. It is a very, very important component of our diversity mix for the purposes of generating electricity.

What we are doing at the Department of Energy is trying to find ways to manage the variability of those intermittent sources on the grid, as well as using the science labs to develop the next stage, the next level, if you will, of battery storage, of battery power. And I will let Under Secretary Paul Dabbar speak to the specific activities that he has undertaken as the head of our science labs.

Mr. Olson. Commander Dabbar.

Mr. Dabbar. Thank you, Congressman. As someone who grew up in Oklahoma and saw the wind come over from Texas, I am very much appreciative of that -- we kind of caught the tail end of what wasn't used in Texas.

One particular area of the Office of Science, and this goes back to our previous question around renewables, is in the battery area. One of the big strengths of what the Office of Science does is in the area of battery technology beyond lithium. Actually, at our

laboratory in Oregon, they branded the chemistry area for batteries beyond lithium. So there is at least a little bit of marketing in the science organization.

There is a number of different batteries that we are working on: multiple batteries, including magnesium ion, which includes solid state that we are working on at a very early stage; flow batteries, which can be used for grid applications; and next generation lithium ion, using our light sources and other modeling techniques on the computer side to improve upon existing lithium ion.

We think this is a major idea in terms of being able to take applications from technologies in the Office of Science and really move forward and really leverage renewables from an intermittent source to something that can be more 24 by 7.

Mr. Olson. Thank you, my time has expired. USAA member for life. I yield back.

Mr. Upton. Mr. Doyle.

Mr. Doyle. Thank you, Mr. Chairman. And thank you to the witnesses here today. Secretary Brouillette, in your testimony, you highlight the importance of energy security and explain that this energy security, as well as our economic prosperity depends on continued American ingenuity and innovation. And you continue by saying that Secretary Perry and yourself are very proud of the advancements that DOE's research and development has spurred. That DOE-funded R&D is truly inspirational. I want you to know that we all agree with that statement, however, many of my colleagues and myself

are greatly concerned by the budget request we received from the Department of Energy earlier this year.

And I just have a few yes-or-no questions about the budget proposals for you. For instance, you emphasized the importance of reliable electricity, but the proposal proposes cutting electricity delivery and energy reliability budget from $206 million to a $120 million, which is a decrease of over 40 percent. Can you tell me just yes or no, do you anticipate revising that cut for this year's budget request?

Mr. Brouillette. It is hard for me to answer yes or no, sir, because we are going through the process that is ongoing.

Mr. Doyle. Try your best to do that because our time is limited.

Mr. Brouillette. Sure. I think this office is very important. We are going to work with OMB to find an appropriate number.

Mr. Doyle. Okay. Thank you. Also, President Trump's repeated promises on clean coal throughout the campaign and presidency, I want to point out that many members on both sides of the aisle support technological innovations that aim to achieve that goal.

In fact, my colleague on this committee, Representative McKinley and I, lead a letter each year that would boost funding for that research. Last year, we proposed increasing the funding for fossil R&D by over 30 percent to $829 million. However, the Department of Energy's budget request proposed cutting the fossil energy R&D budget by $352 million. That is an over 55 percent cut down to $280 million. And it is Mr. Reicher's testimony that we will hear when the second

panel gets here highlights, it actually cuts R&D funding for CCUS specifically by nearly 85 percent.

Do you anticipate increasing the Department's budget request for fossil R&D, and specifically, for CCUS next year?

Mr. Brouillette. I anticipate that the Congress will want to support that at a higher number.

Mr. Doyle. Yes. Yes, they will.

Mr. Brouillette. That is exactly right. That is exactly right.

Mr. Doyle. Your testimony also sings the praises of energy and technological innovation. But the budget proposes, as Mr. Peters pointed out, eliminating ARPA-E. This is very perplexing to a lot of us. The nonpartisan National Academy of Sciences, Engineering, and Medicine released a report last year that analyzed ARPA-E, a congressionally-authorized program. And that report says ARPA-E is, in many cases, successfully enhancing the economic and energy security of the United States by funding transformational activities. And it continues to say, importantly at this early stage, the committee has found no signs that ARPA-E is failing to deliver on its mission and goals, or is on a path to failure, or is in need of reform.

Do you plan on revising your budget requests for next year with regards to ARPA-E?

Mr. Brouillette. That is a decision, sir, that is going to be made by OMB. But, you know, there are differences of opinion about whether or not the Department should be in that particular business. We have, you know, we have offered a proposal to the Congress, but I

will assure you the Congress funds the agency or funds ARPA-E, we will execute to the letter of the law.

Mr. Doyle. Yes, we will be doing that, too. Thank you. I want to also highlight a DOE study published in 2016 that highlights the importance of CCUS technologies. In it, the authors describe the industrial CCUS as the low-hanging fruit among CCUS projects, because many industrial processes produce relatively pure streams of CO2.

DOE has previously funded industrial CCUS pilot projects through the American Reinvestment and Recovery Act. And though there have been proposals to delineate natural gas CCUS technology and coal CCUS technologies in the previous administration's budget request, would you support separate R&D funding source for industrial CCUS?

Mr. Brouillette. I would, sir, but again, that is a final decision that is going to be made by OMB and the Congress itself.

Mr. Doyle. Thank you. And let me just finish by saying that I am pleased to participate in an energy efficiency and manufacturing roundtable hosted by Scott Energy Innovation Institute at Carnegie Mellon this coming Friday, and Representative McKinley, a leader on this issue, will be joining me, as will many manufacturers and energy companies in my district.

President Trump has placed a special emphasis on the manufacturing sector, and understandably so, as the industry has been suffering for too long. In this proposed reauthorization of DOE, would you want to change the Advanced Manufacturing Office or the Clean Energy Manufacturing Initiative, and if so, what kind of changes would you

foresee?

Mr. Brouillette. As a former executive at Ford Motor Company, I understand full well and understand keenly the important work that is done by the advanced manufacture and technology folks at DOE, and I happen to support what they do. With regard to future changes, I would like to work with you and this committee to determine what those might be. I have not given it significant thought before you asked me the question, but I will do so.

Mr. Doyle. Thank you. We appreciate you being here today, and we look forward to working with you.

Mr. Brouillette. Thanks.

Mr. Doyle. I yield back.

Mr. Upton. Thank you. Mr. Shimkus.

Mr. Shimkus. Thank you, Mr. Chairman. It is great to have you all here. I am going to try to go quick. I have got four short questions.

First, Dan, Secretary Perry has stated that it is the Federal Government's legal and moral obligation to permanently dispose of spent nuclear fuel and defense waste. If Congress provides the funding, is DOE prepared to reconstitute the Office of Civilian Radioactive Waste Management, which we call OCRWM, and resume its statutorily required regulatory review of the Yucca Mountain license application?

Mr. Brouillette. Yes, sir. If you provide the funds, we will execute to the letter of the law.

Mr. Shimkus. Great. Thank you. Let me go -- and this is kind

of -- I have been flipping around. Mr. Dabbar, just because you mentioned it. I understand what making glass means in this whole Hanford debate. Had we not broken the law with the last administration, and had we kept to the timeframe per the Nuclear Waste Policy Act and its amendments, where would that glass go?

Mr. Dabbar. Thank you, Congressman. So the vitrification I was referring to for DF LAW, which is the new vitrification facility which is coming on line, is low activity waste. That can be stored onsite at Hanford. It does not need to go to --

Mr. Shimkus. What part of the Hanford waste is designated to go to the final repository? And you can name that for me.

Mr. Dabbar. Yes, sir. That would be the high level waste, which that building is still under construction, but that also is planned to be vitrified in the future, and that would need to be disposed of offsite.

Mr. Shimkus. And if we were on schedule, per the law, where are you and DOE designing the cast and the delivery systems to finally go to? There is an easy answer.

Mr. Dabbar. So, in general, there has been, I think, a lot of debate by this House about whether --

Mr. Shimkus. I am not asking about the debate by this House, I am asking about the Department's position and current law.

Mr. Dabbar. Yeah. The previous analysis of where it was supposed to go was to go to the Yucca Mountain site.

Mr. Shimkus. That is where it is supposed to go per law. And

had we not broken the law and not derailed the timeline, that is where it would be going. So, thank you, that was a lot harder than I thought.

Let me go to Mark real quick. Under the Office of Energy Efficiency and Renewable Energy, they are doing a study called Co-Optima. I am not sure if you are aware of that. I would ask you to look into it and report back to me on this. It is basically an energy efficiency in transportation vehicles.

Actually, Secretary Brouillette might know a little bit about it, but it is going to be very, very helpful to us as we try to thread the needle on this RFS debate. And it is really a high-efficiency, high-octane research project that you all are doing. And I need to know when you are going to be done with that, and that will be very, very helpful in this. So could you get back to us?

Mr. Menezes. We will. We will look into it and we will provide the response.

Mr. Shimkus. Dan, do you want to add anything to that since you --

Mr. Brouillette. No, sir. I know that this is an ongoing, you know, conversation between you and the administration and others in Congress, and we will get right back to you on the results of that study, or at least the progress of that study.

Mr. Shimkus. Yeah, because that study I think is really the -- I think it is linchpin on how we can thread the needle on this, if it comes out the way I think a lot of us have hopes and expectations. And I think -- I am going to go back -- Mark, I want to go back to you -- and

maybe there will be some other folks that this kind of addresses some of the other agencies here. Secretary Perry signed a -- this is on the uranium market, and Secretary Perry, let me see the -- I have the Honeywell Conversion Facility in Metropolis, Illinois that is idle because we think -- part of the reason is the DOE's activity and the uranium market through the Uranium Bartering Program, Secretary Perry wrote a letter last year in reference to how that should not affect uranium mining, and our individual processing facility, and our ability. We think it is. Can anybody comment on this because of the idling of that?

Mr. Dabbar. I would be glad to take that, sir. I think, as you know, a previous administration had looked at funding part of the Portsmouth D&D through funding of sales of uranium, and that there is a requirement that the Department does an analysis on the impact of those sales. That current program is expected to be completed in 2021. And the Department earlier this year, and the Secretary signed off on a detailed analysis that took down the amount that we are selling this year to 1200 MTU. And that is the current plan. Once again, the current plan is that it will end by 2021.

Mr. Shimkus. I would just say, it is impacting the jobs and the economic activity in my district in this plan. I would hope you all would take that into consideration.

Mr. Upton. Ms. Castor.

Ms. Castor. Thank you, Mr. Chairman. Secretary Menezes, in Puerto Rico, over 40 percent of the electricity customers have been

without power now for about 4 months. And I understand that that is well over half a million American citizens. I was surprised that in the emergency aid package, what was proposed by the Trump administration, and passed at the end of the year in the House, it did not include a lot of direction and flexibility for the Department of Energy working with FEMA and the Army Corps of Engineers to build the more resilient grid that we discussed in this committee.

Can you give us an update on what is happening right now and the division of labor to help get the power back on, and do it in a resilient way that protects the American taxpayer in the future?

Mr. Menezes. Let me use this as an opportunity to just update with the numbers. We have now -- as of the 6th, we have 80.8 percent of the normal peak load restored, and now we have 60 percent of the customers with power that -- that is 885,000 homes and businesses. We have 87 percent of the substations, you know, that are operating. And we still have 3,000 personnel down there working every day to restore power to the people of Puerto Rico.

With respect to the request for assistance, you know, that is going to be an OMB, I think, agency answer to provide for you. I know we certainly gave them --

Ms. Castor. Do you feel like you have the authority, working with the Army Corps and FEMA, to build a more resilient grid, to not just build back what was there that was outdated and it was bankrupt, but to do something to protect taxpayers in the future?

Mr. Menezes. Yeah.

Ms. Castor. Or do you need additional authority from the Congress to do that?

Mr. Menezes. Well, again, I can't speak for the administration, but from my own personal observations of having been involved in the Puerto Rico efforts since I have been sworn in, it is clear that DOE's expectations of what it can do exceeds its authorities and the resources that are provided to it, particularly --

Ms. Castor. I think I understand your question that you need greater authority.

Mr. Menezes. Particularly on the resiliency, though, however, we are leading the interagency effort to model to determine how when we move towards -- after restoration toward rebuild --

Ms. Castor. I am afraid it might be too late by that point if we are doing the modeling now, because we have the technology. The national labs and industry have all the tools at their disposal. But if we are just going to restore power the way it was, it is not going to work as well.

I want to move on. I heard what you all said, you are committed to innovation, you are committed to diversity of sources, but everything going on at the Department of Energy just belies that fact when you look at the very significant proposed budget cuts by the Trump administration last year. A $2.7 billion decrease, including drastic cuts in clean energy, electric grid operations, next generation energy technologies. That is not a recipe for innovation.

And then, thank goodness, the FERC unanimously rejected Secretary

Perry's proposal yesterday to give financial relief to some sources of energy when we need really a competitive wholesale market. And resiliency and reliability doesn't mean you just double-down on what has been our energy sources of the past, but to look at all the energy sources for the future.

Then you add on the Department of Energy's backpedaling on our very popular and cost-effective energy efficiency appliance standards. That is not a recipe for innovation and diversity of sources. It really seems that -- I hear what you are saying, that the policy is dominance, but I think that these -- all of this added together is taking America backwards at a time when other countries and businesses across the world are investing. Thank goodness America still remains the leader in research and development, and there is fantastic research going on in the national labs, in our higher education institutions, and with business.

But I think when you backpedal, when you say, we are not going to invest in the science that we have in the past, you are just weakening our ability to compete with companies like China. They want to be the world leader now. And it is no secret.

So how do you -- all of that put together, Secretary Brouillette, how do we keep America's competitive edge in all of these sources of energy, all of the technology, when policies of the Trump administration seem to be going backwards?

Mr. Brouillette. Thank you for your question. I hear your concern, I am not sure I agree with every premise, but I do hear your

concern in your argument. With regard -- let's just start with the NOPR, with regard to what the Secretary in proposing a rule to the Federal Energy Regulatory Commission, the point of that rule was not to pick winners and losers as it has been described or to subsidize in certain cases certain forms of energy. What it was proposed for and the rationale behind it was to preserve baseload generation, which provides, in many respects, the resiliency and the reliability that we currently enjoy with our grid.

Ms. Castor. But weren't you then asking customers across the country to pay for more expensive sources of energy, and that would cost customers billions and billions of dollars? That doesn't seem like a path for innovation and diversity sources.

Mr. Brouillette. Sure. Well, in some respect, it wasn't the Department of Energy asking, it was the people who actually run the grid, the PJM folks, in particular, and others who were asking for changes to their market rules because they, themselves, acknowledge, in certain cases, the providers of this type of electricity are not properly compensated for the services that they provide. So they have sought changes as well to their own market rules, and that is what we were participating in, was that conversation to do exactly that.

So it wasn't an effort to subsidize dirty fuels or, you know, to take a step backward, if you will, it was to provide a more appropriate compensation for services that are provided each and every day. So that was the intent behind that rule.

With regard to the budget and the science and the innovation that

the Department is currently undertaking, in certain cases, while we may see some reductions in certain areas of the Department, it is the focus of the Secretary and the focus of the administration to have the Department focus on basic science rather than applied science. So to the extent you see some reductions in areas, it may be that you are looking at reductions in applied science, simply because we want the focal point to be basic research, which we feel is a very strong point of the Department of Energy. We feel that they do that very, very well, and we want to encourage those activities.

Mr. Upton. The gentlelady's time is expired. The gentleman from Ohio, Mr. Latta.

Mr. Latta. Thank you, Mr. Chairman. And thank you very much for our panel for being here, it is very, very interesting and informative, so I appreciate your time here today.

In recent Congresses, this committee has taken steps to give DOE new authorities that modernize its energy security missions. Response for enacting legislation in the FAST Act to give the agency additional critical infrastructure protection authorities, particularly for the electric grid. We also enhance authorities for emergency preparedness for energy supply disruptions.

And in my district, again, to give you an idea, northwest, west central Ohio, I have got 60,000 manufacturing jobs and a couple -- several years ago, not too many years ago, we had a very, very tough winter, and we were fearful that we might have some energy disruptions. When you got 60,000 type manufacturing jobs out there

doing everything from float glass to steel and everything else, you just can't shut down lines. So we are heavily dependent on baseload capacity out there to make sure we can keep things running.

It is also interesting in the last year, year and a half, that they have been out, not only talking with all of my folks from my electric co-ops to my municipal electrics and you go on down the line, that not only talking with customers, but also the individuals that work and run the facilities. There is a lot more concern out there about cyber attacks, and what could be happening out there.

And, Mr. Menezes, you know, I understand that you have received the Cyber and Emergency Energy Supply Responses functions in the Department; is that correct?

Mr. Menezes. With respect to the program in the Office of --

Mr. Latta. Let me ask you this: In your experience with the emergency responses in recent months, do you believe the Department should have a larger role in energy and cyber emergencies at this time?

Mr. Menezes. Again, it has been my experience since being with the Department that the expectations do exceed the authorities that we have. We see it in all emergency response across the board. We are looked at to provide answers and expertise, which we have in support of, you know, rebuild efforts, protection efforts, et cetera, as I mentioned. We are on the NFC, which gives us insight into certain classified information that others do not have. And, yet, when you look at our authorities, it is frankly -- it is limited.

Mr. Latta. All right. Let me ask you this then. As you talk

about that limited authority that you have, are you committed to work with this committee to identify and enhance your authorities, and really work with us to say, you know, what are the tools out there that you need to have to make sure that you can do your job?

Mr. Menezes. Yes, sir. We are committed to working with this committee as long as you let us bring our OMB counterparts with us.

Mr. Latta. Okay. General Klotz, again, as from the other members on the committee, thank you very much for your service to our Nation. And with your responsibilities that you have in covering the emergency response -- your responsibilities to cover emergency response relating to radiological emergencies. Is that correct?

Mr. Klotz. That is correct, Congressman. Although, most of our -- most of the work in terms of emergency response is a responsibility of State and local responders or National Guard. Our primary function is to support them by, one, training them, and two, being there with the tools that are necessary to measure and characterize any radiological or nuclear release.

Mr. Latta. Let me follow up with that then. When you are out there training, especially the National Guard and local responders, because that is, again, who I hear from the most because I am out in my district all the time. Do they feel that they are getting the information that they need to have from you all to make sure that they can, you know, get the tools that they need for these responses that they might have to deal with?

Mr. Klotz. Sir, the feedback I get is very, very positive, that

this is a very useful course. In fact, we usually get asked to come back and either expand the number of people we reach in our particular courses, or go through a program of training the trainer so that they can do that themselves.

I might add, one of the other things we do is because this is the season for large sporting events, we are also the organization that goes out and measures the radioactive characteristic picture of a given community before an event. So if there is an event, we can very quickly hone in on that. So you may see, from time to time, a helicopter or aircraft flying over areas where that is being done, that is the NNSA out there doing that work.

Mr. Latta. With my last 17 seconds that I have left, just to follow up real quick. Now, the cost -- who pays for the local response? Is it through you or --

Mr. Klotz. No, I think that that comes through a different funding stream. What we basically do is we fund the training, as I said. We have teams at each of our national laboratories, and I mean the broader DOE complex of national laboratories, which can be deployed with equipment to support State and local or military responders, and so we fund that part of the process.

Mr. Latta. Well, thank you very much. Mr. Chairman, my time has expired.

Mr. Upton. Yes. Mr. Tonko.

Mr. Tonko. Thank you, Mr. Chair. First, I thank all of the Secretaries for being here this morning. Secretary Brouillette, thank

you for reiterating a point that Secretary Perry made when he testified before this subcommittee last year. Spurring energy innovation is an essential part of the Department's core mission.

The national labs are often rightly called the crown jewels of America's research infrastructure. They produce major achievements in advancing science, energy innovation, and national security. Much of their work is cross-cutting and promotes all of these goals. I saw this firsthand when I visited Brookhaven last year.

When Secretary Perry appeared at our hearing earlier, he expressed his support for ARPA-E. However, the budget request from the administration, which included the virtual elimination of ARPA-E and 70 percent cut to the Office of Energy Efficiency and Renewable Energy, did not reflect, in my opinion, the importance of innovation in DOE's role in supporting the next generation energy technology.

So, Secretary Brouillette, do you believe a robust R&D budget, as well as a qualified DOE workforce, are critical to maintaining U.S. leadership in science, energy, and security?

Mr. Brouillette. Yes, I do. Do you want me to elaborate?

Mr. Tonko. Just quickly.

Mr. Brouillette. Sure. Yes, sir, I do. Sir, you know, as you and your colleagues begin this budget process, it is going to be a negotiation between you and the White House, and I just want to assure you that at some point, the Congress and the White House will come to an appropriate funding number for those labs, and we will honor those commitments.

Mr. Tonko. I would hope the message from the agency will be forceful --

Mr. Brouillette. Yes, sir.

Mr. Tonko. -- in making certain that progress is the --

Mr. Brouillette. Yes, sir.

Mr. Tonko. -- is the mission here. As this committee and DOE's leadership consider the future of the Department, can you explain your vision for the R&D portfolio for the next 3 years? What are the goals and what are the priorities?

Mr. Brouillette. Sure. I will also defer to Under Secretary Dabbar, as the new Under Secretary of Science, he has some specific things that he would like to share with you. But I can tell you that we will continue the progress that has already been made by those 17 national laboratories, they are, in fact, crown jewels. I appreciate the fact that you would take the time to visit Brookhaven. I would also like to invite you to attend and to visit the rest of the laboratory system so that you can see firsthand the rest of the work that is being done there.

With that, I will defer to Under Secretary Dabbar.

Mr. Dabbar. I thank you, Congressman Tonko, and I remember following your energy work prior to this particular role throughout New York. Across the whole complex, including New York, the Department is very much focused on innovation. As you know, Brookhaven is one of our premiere laboratories, as well as our other complex that we have through NNSA, SPRU, West Valley through NYSERDA, you know, there is

a lot of focus that we have to the State, and of course, to the whole Nation.

The Office of Science is obviously the preeminent position in the world across all the different areas of physical science. The particular areas that we are focused on, as were mentioned earlier, was on exoscale computing, that has the ability for us to really move the ball forward across a number of the areas of physical science. In the areas of particle physics, we are obviously moving forward, and LBNF/DUNE, which is out of Chicago, as well as a number of other high energy particle physics that spread in Michigan from Chairman Upton's area.

So there is a number of areas that we are focused on. I also mentioned batteries with Brookhaven, the chemistry side, which we think has particular potential advantages across a number of energy areas.

Mr. Tonko. Thank you. Thank you very much. I am particularly concerned about the proposed elimination of the Weatherization Assistance Program, which is among the Department's expired authorizations. And I urge this committee to examine reauthorization as part of this effort. We just experienced dangerous winter conditions throughout much of the country. Wind chills were as low as negative 30 degrees for sustained days in my hometown in upstate New York. In the Adirondack to the north of my district, the temperature, in a number of places, never got above zero degrees for several days. People deserve a response from a weatherization program; those especially who live in poverty, who live paycheck to

paycheck and still have a difficult time providing for, you know, their energy cost.

Not only are the energy efficiency benefits from WAP critical to low income families budgets, but these homes are often unhealthy and unsafe.

Through WAP, DOE provides funding to States, tribes, and U.S. territories. So whether it is the weatherization program or the State Energy Program, do you believe DOE should play a role in supporting State energy offices and the work they do? Senator Brouillette or Senator --

Mr. Menezes. Well, again, just to echo the comments of the Deputy Secretary, we look forward to working with this committee and the appropriators, you know, to reach an appropriate number. The organization is alive and well now at DOE under the CR, and we look forward to working with a number and then carrying out the intent of Congress on that.

Mr. Tonko. Thank you, Secretary. And last year the House passed the reauthorization of State energy programs. Would the Department welcome Congress taking a look at how to improve the weatherization program?

Mr. Brouillette. Yes, sir.

Mr. Tonko. I believe my time is up, but I yield back, Mr. Chair.

Mr. Upton. Time is up. Mr. McKinley.

Mr. McNerney. Thank you, Mr. Chairman. I guess probably, Brouillette, it is to you on this. If I could just get this question

out, where I really want to go. I have been over to the NETL Laboratory in Morgantown. I know Mike Doyle has got a facility up in the Pittsburgh area, and we have one in Morgantown. There has been a request to do a mission alignment study under DOE. Can you give me an update on where that might stand?

Mr. Brouillette. With regard to the structure of the labs or --

Mr. McKinley. Yeah. There was some -- over the years, people talk about consolidation.

Mr. Brouillette. Yes, sir.

Mr. McKinley. And I think the uncertainty is still swirling there to give them comfort. Secretary Chu had said there will not be a consolidation at Morgantown with anyone else. Mooney said the same thing. I am just curious --

Mr. Brouillette. And I am unaware of any plan to consolidate those two facilities.

Mr. McKinley. Okay.

Mr. Brouillette. You know, we are looking at missions throughout the Department. It could be that we utilize NETL's resources in both locations to attack a singular problem, but I am aware of no plan in terms of a reorganization to combine the two organizations.

Mr. McKinley. Thank you. To the core, last month when we had a hearing with DOE, some folks that we were talking, it opened up a different subject, and that was the importing of energy from Canada, particularly in the northeast. I was unaware of that. I think most of the people here in this group in Congress were unaware of the amount;

76 gigawatts of power coming in from that.

My concern was -- that represents -- 76 gigawatts of power, on average, may be 100 power plants that aren't existing in America because of that, bringing in Canadian-subsidized utilities. I want people to understand the impact of that.

Just if you take at NEI's, their own website, with a nuclear, they are talking about, for each nuclear power plant, it generates around $16 million of taxes, local taxes, and to the Federal Government; it is $67 million for each one. We are short about 100 power plants because importing the Canadian-subsidized or government-owned, where they are creating excess electricity.

I am curious, from DOE's perspective, when the negotiations are underway under NAFTA, or when they get taken place, will this be taken into consideration so that we might be able to see some consideration for that where we are supporting Canadian energy producers rather than American?

Mr. Menezes. Well, regarding --

Mr. McKinley. It shifts over to you then.

Mr. Menezes. First of all, I definitely agree with your comments on the amount of energy that we actually import from Canada, it is a huge amount, and it is one of our largest trading partners in energy. Most of it is into the tight power pools in the northeast, I mean, it doesn't surprise anyone where. Regarding --

Mr. McKinley. My concern is that when we do that, that means we are not -- our local tax base is -- it is non-existent. There are the

things that take care of our schools, our roads, our infrastructure. We are supporting the infrastructure of Canada rather than having 100 power plants in the United States.

Mr. Menezes. Yes. And, you know, our research is aimed toward smaller, like small modular nuclear, for example, as well as I had mentioned before, some of the smaller coal facilities, the low emission, zero emission coal facilities. This would allow you to put smaller units closest to the load pocket. And whereas it is difficult to build interstate transmission lines, as we know, but if you can increase transmission -- if you can't increase the transmission lines, you can at least begin to site clean generation closer to the load pocket. That would minimize our dependency on interstate transmission --

Mr. McKinley. If I could reclaim -- I am holding my time here. As long as we are continuing to import something that is government-owned, and it is cheaper when it comes in here, they are competing unfairly with America energy producers.

So I am curious, as long as we -- all I am asking is that when we hit with NAFTA, that we have some discussion about the importing of all of this 76 gigawatts of Canadian power at the expense of American jobs.

Mr. Menezes. You have our commitment, and we are certainly monitoring the NAFTA situation.

Mr. Brouillette. Congressman, if I could add just real quickly. You do have our commitment on that. The Secretary did initiate a

conversation with Minister Carr of Canada and his counterpart in Mexico. Recently, he held a meeting in Houston, Texas, amongst the three energy ministers, I will commit to you that we will ensure that this issue is discussed in those conversations.

Mr. McKinley. Thank you very much. I yield back.

Mr. Flores. [Presiding.] Mr. Loebsack is recognized for 5 minutes.

Mr. Loebsack. Thank you, Mr. Chair. I want to thank all of you for being here today, obviously, and I always learn a lot, I don't get to ask questions until the end here, but it is really great for me to listen to my colleagues ask questions and to hear your answers, I do appreciate that very much. But I want to follow up on what Mr. Tonko asked about weatherization.

First, I just have to say for the life of me, I cannot understand why anybody could possibly propose dramatic, drastic slashes in a weatherization program as this administration did, it is completely beyond me. If anybody has ever, as I have, visited any of the local community action programs, for example, that implement weatherization programs and gone to homes of seniors or low income folks or disabled folks who have benefited from weatherization, and it is not just in the winter, it can be in the summer as well in either the midwest or in the southern parts of our country, we can see that there is job creation. You know, they employ local folks to weatherize homes. Sometimes they have even high school kids, for example, who are trying to learn a trade who participate in this kind of a program.

So for the life of me, I just don't understand why there was this proposed cut on the part of the administration. And, you know, Mr. Brouillette, sorry, I was not here when you were here or on this committee, I should say. Can you give me some justification or rationale as to why those cuts were proposed in the first place?

Mr. Brouillette. Well, I don't think it is because we disagree with the ultimate goal of those programs. You know, but sometimes -- and I can't speak to your specific concern on the specific program or this specific amount that you are proposing -- there are better ways, sometimes there are different ways to achieve the same outcomes. And I can commit to you that we at DOE are attempting to do those things.

I was just fortunate enough attend the solar decathlon out in the western part of the U.S., and I saw many of the kids that you were referencing in your comments. They built homes that were energy efficient; they built homes that were safe; they built homes that were, you know, frankly astounding in their technological advance. We want to continue to support those types of activities.

RPTR ALLDRIDGE

EDTR ZAMORA

[11:58 a.m.]

Mr. Loebsack. Can we get your commitment that you will press as hard as you possibly can --

Mr. Brouillette. Yes, sir. Yes, sir.

Mr. Loebsack. -- on this front?

I realize it won't be -- make the final decision, but --

Mr. Brouillette. It is always a negotiated effort, sir, but you have my commitment.

Mr. Loebsack. Because it is important, you know, as it is with so many other programs, that we get that commitment from you folks as part of the administration.

And with respect to the reorganization that is being proposed, how will that play out when it comes to something like this to make sure that the weatherization program -- let's assume that we do get adequate funding for it -- that it is implemented properly and that it continues as it has been?

Mr. Brouillette. Yes, sir. I don't see any changes. The reorganization does not, you know, fundamentally alter or change the direction of these particular programs that were set up by Congress.

Mr. Loebsack. That is good to know.

Mr. Brouillette. We are simply changing an organizational chart and providing a different structure by which we manage the agency.

Mr. Loebsack. Thank you.

I would like to go back also, if I could, to the question having to do with storage for electricity, if I can, Mr. Dabbar. Is that how you pronounce it?

Mr. Dabbar. Thank you.

Mr. Loebsack. Naval Academy grad, you said? Is that correct?

Mr. Dabbar. Yes, sir.

Mr. Loebsack. Yeah. My stepson and his wife are both Naval Academy grads and Active Duty Marines at the moment. So thank you for your service.

But it is true that Texas does produce the most wind energy of any State. But Iowa produces the largest percentage of its electricity from wind, and it is upwards of 37, 38 percent. Could you give us some kind of a timeframe to follow up on Mr. Olson's question? Because it is great that we are seeing -- you mentioned beyond lithium -- a lot of R&D, a lot of work going into how we are going to store this electricity so that we can do more with respect to wind energy or with respect to solar energy. But can you give us a timeframe down the road what kind of number of years we are talking about?

Mr. Dabbar. Yes, Congressman. The time is now. It is one of the most exciting areas within the Office of Science, is dealing with applied energy in terms of, you know, developments of something that can be sent to the grid.

I mentioned a number of technologies in my previous conversation. I won't go through it. But the list of companies that we are working

with specifically on those various different types of technologies is vast. We are working with big companies such as United Technologies and Dow and Johnson Controls and General Motors. We are working with startup companies. The list that is across our various labs that deal with chemistry in the battery area is, give or take, around 80 different companies today.

And so there is various different types of technologies that have different uses in terms of weight-to-power ratio. And, you know, some are better for transportation. Some are better for utility scale. And so we intend to push that very hard on the basis of what we have been developing, and so we look forward to doing that promptly.

Mr. Loebsack. Thank you so much.

Thank you so much, and I yield back.

Mr. Flores. Mr. Kinzinger is recognized for 5 minutes.

Mr. Kinzinger. Thank you, Mr. Chairman. Thank you all for being here, again, spending some time with us on these important issues.

I would like to start by commending all of you, led by the Secretary, for your renewed focus in the vital role of the DOE, our science and energy workforce, and our energy resources have to play in national security. It has been an area that I think has been way underdiscussed when it comes to issues of countering Russia, countering our enemies overseas, et cetera. It is something I have often stressed in this committee, and I look forward to continuing to work with all of you on it.

To Mr. Brouillette and Menezes, did you guys like get the hardest

names possible to come here? I thought Kinzinger was tough.

In the hearing with Secretary Perry a few months ago, I raised concerns that DOE was not always fully represented or engaged on energy matters pursued by the State Department due to the establishment of an energy bureau at State.

Will you discuss the value of DOE engagement internationally. When the U.S. meets with other nations' energy ministers, why is it important for DOE to be at the table? Either one of you can start.

Mr. Brouillette. Sure. Well, sir, as I leave for Saudi Arabia and UAE tomorrow, I can speak firsthand to the importance of those conversations. I did return from several overseas trips. I represented the President and the Secretary in Kazakhstan; Tokyo, Japan; and Santiago, Chile, just recently.

Each one of those conversations brought new ideas. They brought a richness. And, candidly, I know some concerns were raised here about U.S. interests. It gave us an opportunity to articulate and, in some cases, to protect U.S. interests with regard to energy development and security.

We value those conversations very deeply. The Secretary does. I do. We do have a very robust and a very aggressive international affairs department within our organization. It is led by an assistant secretary. He is not yet confirmed or she is not yet confirmed. I don't know who the nominee will be, but it will come forward shortly to the U.S. Senate. But we hope to have that position filled very, very shortly. We are going to continue these conversations around the

world.

With regard to our State Department colleagues, we interact with them very closely. I never travel internationally without collaborating with the State Department and, in many cases, integrating our work. So that process --

Mr. Kinzinger. I mean, all of us, when we travel, we work with State. But do you send silos? Are there areas we need to break through those silos where there is duplicative action or counter action?

Mr. Menezes. Well, we work closely with our State Department colleagues, as the deputy said. We are trying to enhance our collaboration so that we can have much fuller communications between the two. Because in the past, there really has been a break, at least with respect to the energy component at the State Department. There appears to be sometimes conflicting missions. And so we are now working, taking positive steps to try to see and understand what they do. We know what we do. And so we hope that we can work together to achieve some efficiencies and really gain an understanding of what they are doing and what they hope to accomplish.

Mr. Kinzinger. Good. Thank you. I am also on this committee, but I am also a member of the Foreign Affairs Committee, so I have traveled a lot in that capacity. And it really does blow me away the number of times. And I get that we have a government but that I see sometimes State countering the message of other parts of government. So I think the more you guys can coordinate and work together, the more beneficial it is not for DOE or State, but for America.

General Klotz, and thank you for your service to the greatest branch of the military. On the nuclear security front, I understand that DOE and the National Nuclear Security Administration have done considerable work to enhance detection of radiological smuggling from former Soviet states, along with almost 60 partner countries. Can you provide an update about the process of the Nuclear Smuggling Detection and Deterrence program and what you are doing to ensure that we can safely transition to a model where countries fully fund the sustainment and maintenance of the equipment we supply? And I want to add on that, that is something that people don't think about much anymore because, you know, it is just out of our purview, so --

Mr. Klotz. Well, thank you very much for that question. The nuclear detection and smuggling program is one of the most important ways in which we try to work to make sure that special nuclear materials do not get in the hands of bad guys, whether the bad guys are a rogue nation that wants to develop a nuclear weapon or a terrorist that wants to use nuclear radiological materials in an improvised bomb to sow terror and panic.

We have worked, as you said, with a number of different countries. Our business model, basically, is to go in, work with our national -- deploy technology that has been largely developed through our national laboratories, including the non-NNSA national laboratories, train the individuals who operate this, help them for a period of basically 5 years. And over that 5-year period, the objective is to transition the maintenance, the recapitalization, and

the training necessary to operate that to the host countries.

We have sent a couple reports, since I have been in the seat on, you know, where we are doing that, when the progress is. And I would be happy to make sure your staff gets the most recent copy of that.

Mr. Kinzinger. Again, thank you all for being here.

And I yield back.

Mr. Flores. Mr. Schrader, you are recognized for 5 minutes.

Mr. Schrader. Thank you, Mr. Chairman.

Mr. Brouillette, the administration last year proposed privatizing transmission assets owned by the Bonneville Power Administration. The proposal to sell off BPA's assets represents about three-quarters of the grid in the Northwest, was supposedly a major savings reform effort offered by the administration in its fiscal year 2018 budget. As you can imagine, those of us in the Pacific Northwest are pretty concerned, Chairman Walden, Mrs. McMorris Rodgers, and myself here on the committee.

You know, frankly, BPA manages the majority of the transmission in our neck of the woods. It is clean energy. It seems very misguided since Federal hydropower actually makes us money, doesn't cost us money, some upfront money, but with interest it gets paid back. I don't understand the logic of that. We are totally against that idea, very concerned about that, would hope that your agency as well as the administration might commit here and now not to pursue that in this coming budget.

Mr. Brouillette. Thank you, sir, for that question. I am aware

of the concerns of the delegation throughout the Northwest. I have met with Chairman Walden as well as several Senators to discuss this issue in my confirmation hearings. And as I said there, and I will say here again publicly, the Congress really does control whether or not we actually sell anything with regard to those assets. So without some statutory change by the Congress, I can assure you that nothing will be sold.

Mr. Schrader. All right. I appreciate that. I assume you yourself think it is a wise asset to retain?

Mr. Brouillette. It has provided cheap energy in the Northwest. We enjoy our relationship with the PMAs. We are looking at them very closely, frankly, to learn from them as we address issues like cybersecurity and other matters.

Mr. Schrader. Sure.

Mr. Brouillette. You know, DOE is uniquely positioned with both a science agency and a research agency. We are also an asset manager and owner through the BPA, so -- and others, SWPA and WAPA, and whatnot. But we enjoy our relationship. We look forward to working closely with them.

Mr. Schrader. That seems to fit into all the above energy strategies using different types of components.

Mr. Brouillette. Yes, sir.

Mr. Schrader. Along the same lines, BPA currently reports to you, as I understand it. And given the size of the agency and the importance, as I just outlined, to the 12 million people in the Pacific

Northwest, we consider it very important to have the ear of someone higher up in the agency. There was a proposal, as I understand, to change that. Maybe have BPA report another under secretary or something along those lines. Could you commit today to maintaining the current organizational structure with regard to how BPA reports directly to the deputy?

Mr. Brouillette. Well, sir, I would be hesitant to commit to any future plans we might have simply because I want the opportunity to review the entire department. The PMAs have reported to the deputy secretary for some time. There was a time in the past when they reported actually to an assistant secretary within the Department. So I would like the opportunity to continue reviewing the department and perhaps report to you on my findings and work with you on any future changes that we might make or we may not make.

Mr. Schrader. If you could commit maybe to at least consulting the delegation before you made a final decision --

Mr. Brouillette. Yes, sir. Yes, sir.

Mr. Schrader. -- we could give a little input. Given the nature of energy security these days, it is more and more important, I think, to make sure we have direct access to people and power that make these --

Mr. Brouillette. I can assure you they will always have direct access. And I will give you a commitment to work closely with you.

Mr. Schrader. Thank you.

Mr. Menezes, given the climactic changing events we have had this past year, huge floods, huge hurricanes, the big fires out West from

the -- all the way from the Canadian border down to California, very concerned about grid reliability and the hardening of the grid. There seems to be diverse opinions about what that hardening the grid means. Some would say it is a lot more renewable energy. Others would say making sure we have the redundancy and the assets we have on the ground, as was alluded to in some earlier questions, or rebuilt to withstand some of these huge events, these devastating nature events that we haven't seen in the past.

Where is the Department going with regard to reliability? Where are we going to put most of our efforts and our funding?

Mr. Menezes. Well, currently, what we have is -- you know, we had the modern grid consortium, the laboratory consortium, where we have been modeling how to make grids, you know, more resilient. We are bringing that to bear in Puerto Rico where we are going to make recommendations when we begin to rebuild and restore in Puerto Rico.

The advent of integrated microgrids, for example, is a key component of that. In New York and other States, you know, they have been looking at this. And our labs have been doing modeling. And in Puerto Rico, we are actually going to find three pilot microgrids so that we can bring the actual research that the labs have been doing and put them into action in Puerto Rico. And that is part of -- in my response to Representative Castor, we had run out of time. But I wanted to tell the committee that we are actually using the work of the labs to actually model and to build more resilient grid structure.

Mr. Schrader. Thank you.

I yield back.

Mr. Flores. Mr. Johnson, you are recognized for 5 minutes.

Mr. Johnson. I thank you, Mr. Chairman. And I thank our panel for being with us today.

You know, the United States is currently positioned well to utilize our vast energy resources, including oil, natural gas, and coal, as a positive geostrategic tool to advance our Nation's interests globally. It is also important that we enable domestic nuclear technologies to compete in the international market to assure we have a seat at the table on critical issues relating to peaceful use of civilian nuclear technologies and nonproliferation.

The Department of Energy plays an important role in that process through what is known as the Part 810 approval process. Recently, Secretary Perry affirmed his commitment to streamline the regulatory review process. NNSA is responsible for overseeing the approval, while consulting the Office of Nuclear Energy and the DOE general counsel in addition to interagency coordination.

So, Deputy Secretary Brouillette and Secretary Menezes and Administrator Klotz, do you recognize the importance of U.S. engagement in the global civil nuclear market? And can you assure me that you will continue to implement greater efficiency in this program?

Mr. Brouillette. Yes, sir, on both accounts. We recognize full well. We are engaged in several conversations around the world, in essence to create opportunities for our civil nuclear programs and our industry partners throughout the U.S.

I will defer to General Klotz, perhaps, for a more detailed discussion on 810 and NNSA's role.

Mr. Johnson. Okay.

Mr. Klotz. Congressman, I think the premise of your question is extraordinarily important, and that is if we want to be leaders in nuclear security, nuclear safety, nuclear safeguards, and nonproliferation, then we need to be, you know, one of the -- we need to have a seat at the table. And the only way you get a seat at the table is to be a knowledge leader in this particular industry.

You also touched on, you know, one of the -- we hear the frustrations from the commercial companies about how long it takes to do 810 processing, and we share that frustration. It is true the DOE and the NNSA are the stewards of this process, but we are not the owners of the process. And the long poles and the tent many times are outside our control. In particular for those countries which require a specific authorization, you have to get -- the State Department has to get assurances from the host government that, you know, the requirements will be followed by the host government. Sometimes those take 12, in some cases even 18 months.

So we are working very hard. We continue to work very hard in a process improvement program that you know about for the 810 process. In the areas where we can cut down and make this much more streamline and efficient, we will continue to push on that.

Mr. Johnson. Okay. Good.

Mr. Menezes, do you have any comments to add to that, or do you

concur with what they have said?

Mr. Menezes. I certainly concur with them. I mean, we at the DOE are uniquely positioned to see the importance of maintaining global leadership in this. And that was, frankly, part of our domestic electricity policy. Our 403 letter meant to ensure that our base load nuclear units continued to run economically, because we are losing the leadership certainly on the civilian side. And as we see other countries developing civilian nuclear fleets, we want to be there. We do not want to be on the sidelines.

Mr. Johnson. Can any of you identify further policy and process options to assist our domestic nuclear industry to remain competitive in the international market? And we will just go right down the line with the three of you again.

Mr. Brouillette. Sir, I think Under Secretary Dabbar wants to chime in, being a Navy nuke.

Mr. Johnson. Okay. All right. Go ahead.

Mr. Dabbar. Congressman, one additional point I think addresses that specific question is that the White House has actually convened a cross-agency group, specifically in these particular areas. And we have participated in that. But it also includes Defense, it includes State, and a number of other areas. And there are very specific verticals in the areas that you listed. They are being evaluated by groups. So participation in the fuel chain. Participation and commercialization on an international basis, on security of the fuel chain. And so we are participating and getting very much into the

details, along with other members across agencies on this topic.

Mr. Johnson. Okay. I don't have time to get into my other question, because it is fairly long. Let me just paraphrase it real quickly and get your affirmation.

LNG exports, big, big deal for us, big geopolitical leverage point for the United States. I have got legislation that is designed to help expedite the permitting process. I know the Secretary and I have talked about this. Are you folks committed to working with us to expedite this as well?

Mr. Brouillette. Yes, sir, we are. We have taken some initial steps. We look forward to working with the committee to further refine the permitting processes.

Mr. Johnson. Okay. Great.

I yield back.

Mr. Flores. Mr. Long, you are recognized for 5 minutes.

Oh, Mr. Welch. I am sorry. You are recognized for 5 minutes.

Mr. Welch. Thank you very much, Mr. Chairman.

I wanted to ask Mr. Brouillette and Mr. Menezes a few questions. Energy efficiency, incredibly important, enormous bipartisan support for it on this committee, a lot of leadership on both sides of the aisle. We are going to be hearing, I think from the next panel, about some things like master limited partnerships, like energy saving performance contracts. Mr. Kinzinger has been a big champion of those, along with me. So I will wait for the next panel.

But one of the questions is about efficiency standards. And

there is some debate on this because it does involve regulations. And there is general skepticism about regulations in the new administration, and some of it well-founded. But it is standards, like applying standards have been extremely helpful to industry and to consumers in saving money. And there is a number of deadlines that Congress had set for efficiency standards, and some estimates indicate that could be about a $43 billion annual savings by 2035. But the latest regulatory agenda, as I understand it that has been released by DOE, removed the target completion date for these standards and put them in a, quote, longterm action section, a category that OMB has said is specifically for rules where no action is really intended. And there has been five deadlines, I think, since 2017.

So my question here is what is your position, and what do you intend to do to comply with the law to complete these rules by the established deadlines?

And, again, the premise of my question is that these rules actually are helpful to industry and helpful to consumers. We might have some debate on it. But if the regulations are well-designed, then I think they achieve the positive goals of energy efficiency. So could you both comment on that?

Mr. Menezes. I am happy to start. Certainly, when I was here with the committee, energy efficiency and applying standards were a key part on, you know, the major legislation that we passed in 2005. And Congress set a lot of the deadlines that the Department had to meet. Some think that they were aggressive or not. But in my 2 months since

being there, a lot of things had been piling up and coming across my desk. And a couple of them are on the mandatory reports to Congress that this committee had put in the legislation back then to provide the very reports that you are probably looking at.

I will be honest, I had not seen them before. And we very clearly set forth those deadlines that we had met, those that we still hadn't meet. And as you had said, we are not shy about it. We actually admit some of the difficulties that we have had. The goal is to, of course, meet the statutory deadlines and obligations.

I know the other body is looking at some legislation that would give us a little flexibility, I think, you know, to look at this to be able to meet those deadlines. But the Department is committed to following the law to have these standards in place, according to the deadlines that are set in the statute. And I know that you have the same report that I just reviewed just probably a few days ago. And I have been in discussions with the general counsel's office on how we can improve this.

Mr. Welch. I think I am being reassured here. You are telling me that full speed ahead on meeting the standards, not a detour to slow walking the standards or not implementing them altogether.

Mr. Menezes. You do have our assurance of that. It is quite stark when you see our very own reports that are very clear on when we have met them and when we haven't.

Mr. Welch. And I am taking from this a full-throated support for efficiency standards and the benefits that they provide in savings to

consumers and, of course, incidental reduction in carbon emissions.

Mr. Menezes. Well, certainly, in meeting our statutory deadlines, you have my full-throated support on that, because the hallmark of this administration is to comply with the laws that are applied in the Department.

Mr. Welch. Okay. Thank you.

I yield back.

Mr. Flores. The gentleman yields back.

Mr. Long, you are recognized for 5 minutes.

Mr. Long. Thank you, Mr. Chairman.

And, Mr. Menezes and Mr. Dabbar, you are responsible for some scientific and nuclear office labs that are examining hardening of the grid from a tax such as electromagnetic pulse, EMP, incidents, which is something I have been harping on ever since I arrived in Congress.

What activities are priorities for the Department to ensure the industry can benefit from your research and infrastructure capabilities?

Mr. Menezes. Well, as we have said in response to other questions on this, our labs are, you know, doing quite a bit of research on making the grid more resilient, particularly with respect to the EMPs, and the GMDs for that matter. We have been working with Oak Ridge and EPRI, for that -- in the industry to identify ways to ensure that we had the sufficient transformers necessary in the event that there be such an event. Our laboratory consortium is also looking at this issue. And that, together with our efforts in cyber, we hope will eventually, you

know, provide us the information to make the grid even more resilient.

Mr. Long. Mr. Dabbar?

Mr. Dabbar. I have nothing more to add on that, sir.

Mr. Long. Okay. EMPs can happen in nature or through malicious acts, correct?

Mr. Dabbar. That is correct.

Mr. Long. Pardon?

Mr. Dabbar. Yes, sir.

Mr. Long. Okay. And, General Klotz, the broad crosscutting nature of the Department's mission is evident in my home State of Missouri. The National Nuclear Security Administration, or NNSA, maintains the Kansas City National Security Campus, which is responsible for manufacturing and procuring components for the nuclear weapons programs. Additionally, the Department of Energy helps support the University of Missouri's MURR nuclear research reactor. The MURR reactor is seeking approval to produce lifesaving medical isotopes in partnership with NNSA and is currently studying a partnership with NNSA to convert the reactor to use low-enriched uranium instead of highly enriched uranium.

Will you please describe NNSA's programs to convert research reactors to this low-enriched uranium?

Mr. Klotz. I would be delighted to. But first of all, thanks for mentioning our Kansas City plant, which produces all the nonnuclear components that go into a nuclear weapon, which is about 80, 90 percent of what goes in there. And for members who have not had a chance to

visit that, it is an example of the kinds of things that can be achieved by recapitalization of this 40-, 50-year-old enterprise that I talked about earlier.

But specifically for the reactor conversion, as I said earlier, sir, one of our strategies is to prevent terrorists from getting their hands -- is to prevent terrorists from getting their hands on special nuclear material or rogue nations getting their hands on special nuclear materials from which they could make an explosive device. One of the ways we do that is to help research reactors and other institutions stop using highly enriched uranium, which can be used in a nuclear weapon, for the research purposes to use low-enriched uranium.

We have already worked with, converted, or verified the shutdown of over 100 facilities worldwide in transitioning either no longer using any uranium or using low-enriched uranium. And our current efforts include close cooperation with Missouri University Research Reactor, MURR, to qualify a new high-density, low-enriched uranium fuel that can be used to convert that particular reactor.

Mr. Long. Okay. And what proliferation challenges keep you awake at night?

Mr. Klotz. I think -- that is a good question, and I think about it a lot. My sense is nuclear terrorism remains among one of the most significant threats to the security of this country, to the security of our allies, and the security of our partners. So making sure that we have done all we can do to lock up, safeguard these materials that

are an important part of our civil nuclear industry, both here and abroad, is one of the things I worry the most about.

Mr. Long. And how does a highly enriched uranium conversion program fit within NNSA's mission relating to nonproliferation?

Mr. Klotz. Well, again, it is one of many arrows in the quiver or one of many of a multifaceted strategy to make sure that those special nuclear materials, like highly enriched uranium, their use is minimized and that people convert to using low-enriched uranium or other types of phenomenon to do their research.

Mr. Long. Okay. Thank you all for being here today.

Mr. Chairman, I yield back.

Mr. Flores. The gentleman yields back.

Dr. Bucshon, you are recognized for 5 minutes.

Mr. Bucshon. Thank you, Chairman.

Secretary Brouillette, the Department's 17 national laboratories are the boots on the ground, so to speak, that execute the activities that enable DOE to fulfill its missions. Have you engaged with the lab directors to assure the Department's alignment, or alignment readjustment, will be able to fully unleash the potential of the national labs?

Mr. Brouillette. Yes, sir, I have. We have done that both directly and as a collaborative group effort. We have within the Department of Energy known as a lab operations board. And we have a smaller executive council made up of lab directors that both advise me and the Secretary. I have consulted with the lab directors, and

I think you will hear from one on another panel about this reorganization plan and perhaps what it should look like. And they have submitted ideas, many of which we have accepted.

Mr. Bucshon. Okay. So then you can probably share some of the recommendations from the lab directors that were provided to you and some of the specifics of that with the committee?

Mr. Brouillette. Sure. Absolutely. Yes, sir, I think I can.

Mr. Bucshon. Just for the record, as we look to maybe, you know, a reauthorization, that is maybe some information on how the labs in the Department --

Mr. Brouillette. Sure. Would you like me to do that formally, sir, in writing? Would you like me to --

Mr. Bucshon. Yeah, that would be great.

Mr. Brouillette. Yes, sir, I will do that. I will follow up with you.

Mr. Bucshon. Thanks.

This is for a number of people, but a frequent concern raised by DOE labs and contractors relates to the burdens of unnecessary oversight that detracts from effective and cost-effective mission performance on the other hand, sound oversights necessary to ensure safety and security and protect taxpayer interests. The development of mature contractor assurance systems has been identified in congressional reports and in this committee's work as critical to enabling a more efficient oversight framework that will help unleash the benefits of the labs and other programmatic work.

So I guess, Secretary Brouillette, you can comment first. What can you tell us about what you are doing to ensure more mature contractor assurance system? I mean, basically, effective and efficient oversight versus onerous and, you know, top-down oversight.

Mr. Brouillette. Well, I think, you know, we have looked at the design standards within the Department. For instance, I will just give you an example. You know, we just went and visited a facility in Oak Ridge that is a multimillion, billion dollar project. What we are looking for are making sure that our processes internally inside of the Department of Energy don't require certain things of contractors that either slow down the process or make things just exorbitant in terms of cost.

So if we are going to build, for instance, a simple office building, something you have seen a million times in your practice, it is simply there to house reception staff, we probably don't need a 90 percent design build plan in place before we allow the contractor to begin the initial stages of that work. If we are going to talk about a nuclear facility, however, we want to be very, very careful. It is looking at simple things like that and working with the contractors directly that we hope to bring some efficiencies and perhaps some better processes toward the Department's efforts.

Mr. Bucshon. Anybody else have any comment?

Mr. Dabbar. Yes, sir. I will go ahead and add the reference that the deputy secretary made about the lab operations board. And one of the initiatives that the Secretary wanted to take onboard and for us

to execute on, and we are now in the second wave of that, is basically a management and an efficiency review at a very specific level along the lines of what he just described. And the lab operations board actually includes lab directors, people from inside DOE headquarters, contractors across all of our various different labs and programs. And what we have been doing is looking at not only general points, but actually very specific points along the lines of what stands in the way of accomplishing the mission.

I will give you an example of one of the things that came up and we have changed. The labs were required to submit 15 different human resources reports a month. And what we decided was do we need all 15 of those or were there some overlap? As you could probably guess, there was some overlap. And we have actually consolidated some of those. And I believe we are down to 10. So it is shorter than 15 a month, and we are now down to 10 a month.

But we are doing that in collaboration, to your particular question, with the lab directors for us to review what is really required in terms of our oversight requirements for, in this case, human resources, but want to make certain that it is not overlapping, that things that had been added over the years were maybe duplicative.

Mr. Bucshon. Yeah. And I would say I know a number of people have talked about budgetary concerns. And from my viewpoint, every Federal agency that does this, that makes themselves more effective and efficient, also utilizes taxpayer resources in a more effective and efficient way. And in that vein may not necessarily need as many

resources.

With that, Chairman, I yield back.

Mr. Flores. The gentleman yields back.

I will recognize myself for 5 minutes.

Secretary Brouillette, one of the questions I want to talk about is budget itemization and micromanagement. The Department has a heavy reliance on outside contractors using M&O contracts to conduct DOE's research and development activities that manage your facilities and perform environmental cleanup projects. Any time you have this government public-private type of relationship, it results in a high degree of transactional activities, both internally within the Department and externally with these outside entities.

Recently, the Commission to Review the Effectiveness of the National Energy Laboratories, or CRENEL for short, identified transactional compliance and budget itemization, as they called it, as a costly burden that inhibits DOE from fully realizing the benefits of the contractor model. According to the CRENEL report, the chief financial officer maintains thousands of control points which, in turn, require management approval and disbursement at the expense of DOE's overall efficiency. This is not something that rose on your watch, but it is something that has crept into the Department over years, if not decades.

So my question is this, Secretary Brouillette: Do you acknowledge that the cost and burdens associated -- or do you acknowledge the costs and burdens associated with budget itemization?

Mr. Brouillette. Yes.

Mr. Flores. Okay. Will you work with the CFO and the relevant program offices to reduce this micromanagement policy?

Mr. Brouillette. Yes, sir, I will. And I am familiar with the CRENEL report and its findings. And I look forward to working with the committee and the Congress overall to help implement those.

Mr. Flores. That was going to be my next point. To the extent that you need additional support from Congress to -- if there is something Congress has done that has created that, then let us know and we will try to help fix that.

Mr. Brouillette. Yes, sir, I will point those out.

Mr. Flores. My next question is for Under Secretary Menezes. This has to do with low-enriched uranium fuel. As you know, the new technology, nuclear reactors may use innovative fuels to improve reactor efficiency and safety. Currently, commercial nuclear fuel that is available is generally enriched below 5 percent. However, these new technology reactors may require fuel that is enriched beyond 5 percent.

Your department maintains a significant stockpile of uranium, and DOE may be able to consider options to provide this enhanced nuclear fuel just as it does with university research reactors. Do you see a role for DOE to steward this type of nuclear fuel to assure that potential fuel access issues will not inhibit technological innovation from our Nation's next generation nuclear engineers?

Mr. Menezes. Yes, sir, we do. And we look forward to working

with you to get your input on how best to accomplish that.

Mr. Flores. Okay. And since we are talking about reauthorization of the Department, I do have sort of a wildcard question as respects energy in this country and as respects reauthorization.

Secretary Brouillette, what keeps you awake at night, and how does it -- with respect to energy, and how should we look at that with respect to reauthorization?

Mr. Brouillette. What keeps me up at night, sir, at the moment is cybersecurity and its relation to the distribution of energy throughout the country. We are facing some significant challenges, both from internal sources here in the U.S. I mean, we are all familiar with the kid in the basement who plays at night. That is certainly a security concern. It is not the highest security concern. What we are seeing across the world increasingly are state actors who are taking very aggressive steps to infiltrate certain security components of our grid as well as our national pipeline infrastructure. And if I had to point to one thing that keeps me up at night, it would be that.

Mr. Flores. Okay. General Klotz?

Mr. Klotz. As I stated to an earlier question, the thing that keeps me up at night is the threat of nuclear terrorism. I mean, the devastating economic psychological consequences of a dirty bomb or a nuclear device set off by a rogue nation would be horrendous. And so everything we can do to make sure that we have safeguarded, locked up, secured special nuclear materials, reduced reliance on highly enriched uranium, plutonium, I think is a positive thing.

Mr. Flores. Okay. Secretary Dabbar?

Mr. Dabbar. In my particular area, it is around Radcon conditions with workers at our environmental management sites. We are decontaminating and decommissioning a number of buildings that have plutonium contamination. We have a number of liquid waste tanks, some of which, you know, have had challenges over the years that we need to clean up and we need to put away into our permanent location. So obviously, handling the environment in those particular locations and making certain that the health and safety of the workers during those very challenging situations is paramount.

Mr. Flores. Secretary Menezes, 10 seconds.

Mr. Menezes. It is cybersecurity, a threat of our secrets and our proprietary information that has given rise to other countries being able to produce more than the very things that we have developed and that we hold the patents to. I find that very disturbing.

Mr. Flores. Thank each of you for your responses.

Mr. Duncan, you are recognized for 5 minutes.

Mr. Duncan. Thank you, Mr. Chairman.

First off, I want to align myself with the comments by Mr. Shimkus earlier. The vitrified waste coming out through EM activities in the Hanford and Savannah River Site needs a longterm stable storage facility, and that stable storage facility is Yucca Mountain. Speaking of waste and residual, DOE's plutonium disposition plan are relative responsibilities that you have regarding the Nation's nonproliferation agreements.

In 2003, the DOE, in my home State of South Carolina, entered into an agreement that DOE would remove one ton of plutonium from South Carolina within a decade. The deadline was repeatedly extended, and the DOE has yet to date fulfilled its legal obligations. In fact, due to a number of the previous administration's policy, the deadline is further out of reach. The South Carolina DOE agreement included a stipulation that provides for financial penalties to be paid to South Carolina up to $100 million a year. The South Carolina attorney general has had to sue the Department of Energy to receive this payment, and further litigation is expected.

Deputy Secretary Brouillette, are you familiar with this issue? And what is the DOE's plan to keep the commitment to the South Carolinians that are affected?

Mr. Brouillette. Yes, sir, I am familiar with it. I have had -- I have known General Wilson for many, many years, and he has raised it to my attention. Unfortunately, as it is the subject to litigation, I am not allowed to comment in detail, but I am happy to follow up with you and your office as we move through this pending litigation.

Mr. Duncan. So talking about waste and talking about plutonium, rather, we spent a lot of money on MOX at Savannah River Site. And there was a report that was issued by the Department transmitted to Congress September 14 of 2016. It was called "An Updated Performance Baseline for the MOX Facility at the Savannah River Site, South Carolina." I say mislabeled because this Department did not file, as

we require in the fiscal 2016 NDAA, its own order 413.3B for setting project baselines and updated baselines.

So do you believe, Mr. Deputy Secretary, that a project that is about 70 percent complete today, which the MOX facility in Savannah River Site is about 70 percent complete today since its construction started in 2007, could still take another 30 years to finish?

Wait a minute. We built the first nuclear weapon at the B Reactor at Hanford in a little over a year.

Mr. Brouillette. Sure. We agree with that. And we would like to see that sort of efficiency brought to the MOX facility in South Carolina. It has taken quite a long period of time to get to this point, and I think that has raised the concern of the budgeteers both here in Congress and in the White House. We have met with the contractors. We are in active conversations with contractors on the ground.

There is, to be quite honest, some disagreement about that 70 percent number and whether or not they are, in fact, 70 percent complete. Folks on the ground in DOE have a different opinion of that, and we have expressed it, and we are in very -- as I said, very candid conversations with the contractor.

I would ask General Klotz or others if they want to opine further on this and perhaps provide you with more information as to where we currently stand.

Mr. Duncan. I appreciate the work that DOE does at sites like Savannah River Site. The nuclear laboratory down there is a valuable asset.

Mr. Brouillette. Sure.

Mr. Duncan. There is also a component Savannah River Site is a valuable asset that was almost mothballed under the Obama administration. That is H Canyon.

Mr. Brouillette. I'm sorry?

Mr. Duncan. The last -- H Canyon.

Mr. Brouillette. Yes, sir.

Mr. Duncan. The last chemical separation facility in the United States. So please assure me that this administration is not going to even consider mothballing H Canyon.

Mr. Dabbar. Thank you for the question. H Canyon we consider very important, and we want to keep it up and running, we think, to process. We think there are actually options that we could use for continued operations. So it is an important part of the portfolio.

Mr. Duncan. Yes, sir.

Mr. Klotz. I would like to echo what you said, Congressman, and that is the importance of Savannah River Site to the entire DOE enterprise. It is particularly important in the NNSA side, because that is where we do our tritium operations, tritium extraction, tritium recycling. Tritium being an extraordinarily important component for all of our nuclear weapons.

The laboratory there, again, having visited all the laboratories in DOE, again, I was astounded to find out how much work they are actually doing in the weapon's activity program for us, NNSA, as well as in the nuclear nonproliferation area.

So I have talked a lot with the people down there, and I think one of the things I can say, maybe as leaving government and looking forward to the future, that is one of the things we ought to think very seriously about is what is the longterm future of the laboratory and of the entire Savannah River Site, and what can it contribute and continue to contribute for decades in the national security. I think this is a fruitful area for discussion.

Mr. Duncan. Yes, sir. Savannah River Site is a valuable asset, and they are looking for more missions. And I hope we can give it to them.

And I yield back. Thanks.

Mr. Flores. Mr. Griffith, you are recognized for 5 minutes.

Mr. Griffith. I thank the chairman. I appreciate you all being here very much. It is an important hearing.

Deputy Secretary Menezes, thank you for mentioning rare earth technologies in your opening statement. I do appreciate that. There is a lot of potential for coal in my district in rare earth and combining the two to create a product that is more profitable than it may be at certain times in the past and in the future.

So can you give me an update? Where do we stand on that? When do we think that the technology will actually be ready for prime time?

Mr. Menezes. Well, I am not sure I can give you a specific timetable, but I am happy to get our program experts on it and give you a briefing so that you can know exactly where we are.

Mr. Griffith. I know there is a lot of research dollars that have

gone into Virginia Tech in my district and in other places. But I also know that I saw a map of slag heaps. And one of the things people may not realize is is that a lot of the rare earth elements or minerals actually exist in the coal, but it is closest to the rock. So in the slag heaps, we can clean up slag heaps and reap a benefit for the United States at the same time and create some jobs, at least in the short run. Short run being a decade. My folks would really appreciate that.

Let me --

Mr. Menezes. The program experts are very excited about the prospect that you can go to, really, the slag heaps, the waste product piles, and be able to extract rare earth elements. And think about it: We would no longer be dependent, you know, on China for a large percentage of our rare earth elements.

Mr. Griffith. Yeah. And what could be better? We are cleaning up something that ought to be cleaned up anyway as a part of our environment, and we are taking business away from one of our largest international competitors. I think that is great.

Along those same lines, but shifting gears a little bit, I want to talk about research on burning coal more cleanly. When you look at the world as a whole, while coal used for producing power in this country is down, it is still accelerating in the rest of the world. There are lots of places it is going to be used when people talk about the ill effects of the pollutants that come from burning coal or have come from burning coal in the past. Many of the countries that are going to be expanding coal facilities don't have the regulations we

have. They are going to continue to use coal. I would like to see us continue to use coal but burning as cleanly as possible.

Can you give me an update on some of the research that is going on? And I am particularly, and always have been, interested in chemical looping. And I understand there has been a little bit of a breakthrough using a different substance as the -- for lack of a more scientific term -- the primer in the chemical reaction.

Can you give me an update on where we stand on that and whether or not DOE is still positive? I know you are on natural gas, and I get that. But also using chemical looping for coal so we can transfer this technology to other parts of the world and burn coal more cleanly, not just here, but worldwide to help the environment.

Mr. Menezes. Again, yes, sir. You know, our national energy lab is doing a lot of the research that you have been discussing. And I think that both of us would benefit from, you know, a briefing from our program people as to timetables and where we are.

In response to an earlier question, though, I did emphasize that the research is no longer limited to, if you will, carbon capture sequestration technologies. While it is important, you know, we are looking again at the front end, you know, where the fuel that is to be combusted and see if there are technologies that we can make it on the front end less emission, more efficient, and then during the combustion itself.

So we have some exciting opportunities. It has been a very top priority for the Office of Fossil. Others have asked about, you know,

our full-throated support of certain issues. We have given a full-throated support, certainly during the budget process, to get the resources to the Office of Fossil to evaluate, engage in studies along the lines that you have been mentioning today.

Mr. Griffith. And I should say that, along these lines, it is not just this administration. The Department of Energy has always been interested in putting research into these areas. And so even though I disagreed with the previous administration on a lot of things, their DOE was doing some good things in this arena, and I appreciate you all continuing to do that good work.

And with that, Mr. Chairman, I will yield back.

Mr. Flores. The gentleman yields back.

Mr. Harper is recognized for 5 minutes.

Mr. Harper. Thank you, Mr. Chairman. And thanks to each of you for taking time to be here with us today.

And this is -- I would like to talk to you, if I could, for a minute, Deputy Secretary Brouillette. You know, the National Nuclear Security Administration was established, you know, as a semiautonomous agency within the DOE in 2000. And as you know, the NNSA administrator reports directly to you as the deputy secretary.

However, when Congress established the NNSA, the statute required an NNSA general counsel, legislative affairs office, and public affairs office separate from those respective functions under you and the Secretary at DOE headquarters. And those offices effectively serve the administrator, not the Secretary.

While establishing separate functions may have been well-intended, review by the congressionally chartered Augustine-Mies Panel in testimony of this committee noted the inherent problem of dual offices that limit and can conflict with the Secretary's leadership over the nuclear enterprise.

So would you agree that there could be problems if, say, the NNSA general counsel considers his client the administrator and not the Secretary of Energy, who is ultimately responsible for the mission?

Mr. Brouillette. That is a loaded question. The short answer to your question, sir, is we respect what Congress did in 1999 with the creation of the NNSA. And until Congress changes that law, we will honor it.

If you are asking me for my personal opinion, however, it does make management of the agency somewhat awkward. We work well together. General Klotz and I have a great both personal and professional relationship, and we work diligently to ensure that the agency speaks with one voice. We try to do that as effectively as we can.

However, as a manager, as a chief operating officer, when I look at the enterprise, I am hard-pressed to make the argument for separate offices and separate parts of the building doing essentially the same functions.

Mr. Harper. All right. Well, let's just talk a little further, then, about that. As we consider those potential reforms to improve DOE's efficiency, give us some observations or your take of what you make regarding the duplicative functional offices in NNSA and DOE,

let's say. Can you elaborate a little more?

Mr. Brouillette. Well, I think you just articulated the most obvious examples of the duplicative offices. Those particular functions are, in my own personal opinion, easily served by one office representing the entire Department. I don't think it is -- I can't speak to any other specific examples.

I can tell you with regard to policy, with regard to execution, particularly with regard to the national -- the nuclear weapons programs, the under secretary, the deputy secretary, and the Secretary decide both the policy and the execution of that policy within the departments, within our authorities, and we execute them with one voice and as one management team. We do so appropriately, as Congress directed us to do. So there are no other folks within the larger DOE complex directing the NNSA. And I think the general would attest to that. All of the instructions are given through the Secretary and the deputy secretary toward the NNSA.

Mr. Harper. Thank you.

And let's talk about maybe streamlining decision-making for just a moment, if we could. You were at a town hall last month, and you were asked about steps that can be taken throughout the Department to improve efficiency and specifically reduce burdensome paperwork that is associated with what is known as the concurrence process. And you acknowledged the need to improve this process. Would you please elaborate the problems with this process and tell us what you see is the impact of your efforts?

Mr. Brouillette. Yes, sir. I was fortunate and privileged to serve in the Department of Energy as an assistant secretary. I was confirmed in 2001. I was confirmed for this position almost 5 months ago now. I was somewhat dismayed to learn, frankly, when I walked back into the building, that the same green folders that we used to achieve concurrence on certain matters, sometimes letters that you sent to us, are still there. They are literally paper folders, green in color. And we circulate them manually by hand throughout the Department for opinion.

In this day and age, it strikes me as odd that we wouldn't do that electronically. A much more efficient way of doing it and, candidly, a very good way of maintaining accountability. Other members of this committee have expressed some dismay and some concern about the lack of engagement or the timeliness of our engagement with this committee. I would suggest to you that that is perhaps part of the problem, that we still do things very manually within the Department.

Mr. Harper. A basic thing that can be corrected.

With that, I yield back.

Mr. Brouillette. Yes, sir.

Mr. Flores. Mr. Cramer, you are recognized for 5 minutes.

Mr. Cramer. Thank you, Mr. Chairman. And thanks to all of you for -- really been a fascinating hearing, in my view. I also a want to express the special recognition that the deputy secretary issued on behalf of General Klotz. Those of us from North Dakota, from the -- we are -- as you know, the model at Minot is only the best coal

north. I am very familiar with your leadership, and we are grateful for it. Thank you. And you, by the way, are in the perfect place at this time in your life, at least for the country. So thank you for that.

The first question, the first issue I want to raise, may not surprise those of you who know me well, is I want to talk about what I see as a lack of a research bridge, if you will, for large-scale carbon capture sequestration utilization projects. Basic research, very good. It goes to the utilities where regulators, like I used to be, warn them against investing in things like this, that there is sort of an antirisk culture, certainly among utilities, which I think was highlighted in your grid study, Mr. Deputy Secretary.

And so what I am wondering is can we -- or am I right, first of all, and how can DOE play a role in the demonstration part of carbon capture sequestration technologies that, like I said, find basic research, not quite enough muscle to get it to the commercialization side. Maybe, Under Secretary Menezes, you could help me with that.

Mr. Menezes. Well, this committee has been a key player in getting -- identifying carbon capture sequestration of the clean coal power initiative, for example, and providing the authorization for appropriate levels of funding. Of course, appropriate levels of funding is a key thing. But over time, when you look at what we have done here, the DOE has, over the years, identified several projects, whether it be coal or natural gas, for example, or other uses, to try to figure out how it is, you know, that post combustion you can capture

and then sequester or use the carbon dioxide.

What we have today is we had the Petra Nova plant, for example, in Texas. Of course, you know, Kemper is usually pointed to as, you know, a DOE investment. We have others. We have yet to really figure out how it is that we can have the technology to scale to perform at the efficiency level that we want and then to be able to do with the carbon dioxide that we would like.

We have not stopped funding programs. We have a pilot project in India, for example, which would look to enhance oil recovery. But each of these projects are unique with respect to the combustion, the fuel combustion. So this is not a one size fits all. It is not a one technology that fits all combustion types. So the fuel use is important. And even within coal, the type of coal. As you know, lignite is certainly different from other coal.

Mr. Cramer. It certainly is.

Mr. Menezes. And, you know, your State has had the longest active capture program in use.

So we are committed to it. Sometimes it is a question of resources. I think it is a fair question to ask, have we not sufficiently funded the most promising technologies and perhaps, you know, funded other technologies that may not have been promising when, in fact, they received the moneys. And I think as we -- the knowledge is maturing, and I think we are close to, you know, hopefully figuring out how, in fact, is the most efficient way on a multiple range of fuels to capture and use the carbon.

Mr. Cramer. Well, I know you will find advocates on this committee, as you pointed out. And we will continue to work with you on providing those resources. And I appreciate the very good answer, very thorough answer.

I just, maybe in my last minute, just raise one other issue that is a bit different than probably you might expect. But because General Atomics is -- that is an important corporate citizen at the Grand Forks Air Force Base in North Dakota, and particularly at the Grand Sky UAV park. I have had the opportunity to go down to San Diego a couple of times. In my most recent visit about a year ago, I visited their ITER project. I don't know how familiar you are with it. But, yeah, the International Thermonuclear Experimental Reactor project, which, to me, just seems to present a lot of opportunity with a mega fusion project. And I know it is housed in San Diego. Thirty-five countries are part of this. As I look at sort of the U.S. commitment to it, again, financially, I sometimes think we are coming up a little bit short. And I just want to sort of highlight it, either for comment or, you know, for further discussion as we go forward.

Mr. Dabbar. Thank you, Congressman. Yeah. Quite a different topic than my family's farm in Hazen where they would mine the coal seam, you know, that was surface mined.

Mr. Cramer. Yes.

Mr. Dabbar. The ITER project, you know, is a very interesting project as a part of the Office of Fusion, which is in the Office of Science. The ITER project was negotiated a very long time ago as a

large international consortium. For those of you who don't know, building a 500 megawatt peak fusion plant in the south of France. That would be large. That would be a large normal power plant. It is a very large project in terms of dollar amounts and the contribution from all around the world, including us. Fusion is important to us. General Atomics also has a fusion reactor in San Diego that you visited. So the overall is very important.

The challenges around ITER is project management. I think you have heard a lot before about us as a management team having private sector experience around project management. The biggest challenge around ITER is that it is six times overbudget and it is 10 years late in terms of timing. And so I know that on a very bipartisan basis there has been a big debate about funding of that and how that affects overall budget and the performance.

The performance of the ITER project has improved since they changed out the management team there, and so they are getting back on being able to perform. And we look forward to working with the Congress here on the appropriations side should you want to continue funding it.

RPTR FORADORI

EDTR ZAMORA

[1:02 p.m.]

Mr. Cramer. Appreciate it. Thank you, and I am well over time, Mr. Chairman.

Mr. Flores. Yes, you are. The gentleman's time has expired long ago.

I would like to thank this panel for attending. Seeing that there are no other members wishing to ask questions, this panel is excused and we will move to Panel II.

Mr. Flores. All right. Let's go ahead and get started. We want to thank all our witnesses for being here today and taking the time to testify before the subcommittee. Today's witnesses will have the opportunity to give opening statements, followed by a round of questions from members.

Our second witness panel for today's hearing includes Thomas Zacharia, director of the Oak Ridge National Laboratory; Donald Levy, who is the Albert A. Michelson distinguished service professor emeritus, University of Chicago and co-chair of the Panel to Track and Assess Governance and Management Reforms in the Nuclear Security Enterprise; Sarah Ladislaw is the director of Energy and National Security Program at the Center for Strategic and International Studies; Steve Wasserman is the director of Lilly Research Laboratory Collaborative Access Team, Advanced Photon Source of the Argonne National Laboratory, on behalf of the Society for Science at User Research Facilities; Dan Reicher is the executive director at Stanford University Steyer-Taylor Center for Energy Policy and Finance and Senior Fellow at the Brookings Institution; lastly but not least, Rich Powell is the executive director of the ClearPath Foundation.

We appreciate all of you being here today.

We will begin the panel with Dr. Zacharia, and you are now recognized for 5 minutes to give an opening statement. We would request that each of you adhere to the 5-minute limit. Thank you.

Dr. Zacharia.

STATEMENT OF THOMAS ZACHARIA, DIRECTOR, OAK RIDGE NATIONAL LABORATORY; DONALD LEVY, ALBERT A. MICHELSON DISTINGUISHED SERVICE PROFESSOR EMERITUS, UNIVERSITY OF CHICAGO AND CO-CHAIR, PANEL TO TRACK AND ASSESS GOVERNANCE AND MANAGEMENT REFORMS IN THE NUCLEAR SECURITY ENTERPRISE; SARAH LADISLAW, DIRECTOR, ENERGY AND NATIONAL SECURITY PROGRAM, CENTER FOR STRATEGIC AND INTERNATIONAL STUDIES; STEVE WASSERMAN, DIRECTOR, LILLY RESEARCH LABORATORIES COLLABORATIVE ACCESS TEAM, ADVANCED PHOTON SOURCE, ARGONNE NATIONAL LABORATORY, ON BEHALF OF THE SOCIETY FOR SCIENCE AT USER RESEARCH FACILITIES; DAN REICHER, EXECUTIVE DIRECTOR, STANFORD UNIVERSITY STEYER-TAYLOR CENTER FOR ENERGY POLICY AND FINANCE AND SENIOR FELLOW, BROOKINGS INSTITUTION; AND RICH POWELL, EXECUTIVE DIRECTOR, CLEARPATH FOUNDATION

STATEMENT OF THOMAS ZACHARIA

Mr. Zacharia. Thank you, Chairman Flores, Ranking Member Rush, and members of the committee. Thank you for inviting me to testify.

My name is Thomas Zacharia, and I am director of the Department of Energy's Oak Ridge National Laboratory. As you heard from the earlier panel, Department of Energy is responsible for the missions of science, energy, national security, and then LANL legacy cleanup.

The role of the national labs is to provide the science and technology capabilities and solutions the Department needs to accomplish these missions. My written testimony provides several examples of how Oak Ridge have leverage capabilities and resources and work with other national labs, industry, and universities to meet DOE's mission needs. In the interest of time, I will speak to only one of these.

The Summit supercomputer, which will begin operating at ORNL later this year, will surpass what is now the world's most powerful computer in China. Summit resulted from CORAL, the Collaboration of Oak Ridge, Argonne, and Livermore, meant to streamline the procurement process and maximize the government buying power. Six labs are partnering with an extensive network of American companies, academia, and laboratories on the Exascale Computing Project to ensure that U.S. researchers will have access, not only to the computing systems with 50 times the power of today's most capable machines, but also to the

applications and software that they will need to use these machines effectively.

This partnership shows how the national labs individually and collectively play a pivotal role in developing new tools for science and technology, to include reliable and resilient infrastructure in applying those tools to DOE's mission needs and in sustaining U.S. competitiveness.

Most DOE national labs are GOCO facilities, government-owned/contractor-operated. The relationship between DOE and the contractors who manage and operate the labs is ideally a partnership in which DOE determines what is to be done and contractors determine how to achieve it.

Many aspects of the GOCO model work very well. However, some reviews have identified problems in program execution and increased costs. In 2015, the Commission to Review the Effectiveness of the National Energy Laboratories made several recommendations for improving lab management, many focused on rebuilding the GOCO partnership. DOE is responding by working to drive fundamental change in its management of the national labs.

First, DOE has adopted a planning process that is improving the strategic alignment of the labs and enabling them to work more effectively to focus on national priorities. In terms of governance, DOE is working with its contractors to streamline contract mechanisms, while ensuring that contractors are held accountable.

DOE's lab appraisal process has become a useful tool for

evaluating and incentivizing contractor performance and for informing decisions on whether to extend or compete expiring contracts. Contractor assurance systems are providing new tools for determining the proper level of oversight. For example, ORNL offers a fast-track CRADA program. This program streamlines execution of cooperative research agreement and major technology of transfer mechanism by exploiting robust contract assurance processes. Our partnership with DOE's ORNL site office was a key factor in implementing this new mechanism.

DOE's regulatory reform task force identified regulations governing lab operations as a target of opportunity. The task force embraced several proposals from the National Laboratory Directors' Council that focused on these regulations. Cross-functional teams are implementing some welcome changes, as described in my written testimony.

This process has fostered an alignment in which DOE and its contractors are working together on common goals. Continuing efforts along these lines should produce additional savings and operational improvements.

With regard to policy reform, Secretary Perry is realigning the Department to advance its policy goals consistent with the statutory requirements. At ORNL we look forward to working with our DOE sponsors to support them in the execution of their missions.

Finally, DOE is encouraging the national labs to work with industry to turn early-stage innovations into products. New

approaches include the agreements for commercializing technology mechanisms now available to all labs and support for early-career innovators.

The actions that DOE has taken to make the national labs more efficient and effective will enable these institutions to focus on delivering the science and technology needed to ensure our energy security, national security, and global competitiveness in the 21st century.

The M&O contractors are committed to working with DOE to build and maintain a culture of trust and accountability that will ensure the greatest possible return on the Nation's investment in the national labs. Thank you, again.

[The prepared statement of Mr. Zacharia follows:]

******** INSERT 4-1 ********

Mr. Upton. [Presiding.] Thank you.

Dr. Levy. You need to hit that button on the --

STATEMENT OF DONALD LEVY

Mr. Levy. Chairman Upton, Ranking Member Rush, members of the committee, I am Donald Levy, professor of chemistry emeritus at the University of Chicago. The University of Chicago is a management and operating contractor for the Department of Energy, operates two Office of Science Laboratories: Argonne National Lab and Fermi National Accelerator.

Mr. Upton. Would you mind just pulling that mike just a little closer.

Mr. Levy. Is that better? Good.

Ten years prior to my retirement in 2016, I was vice-president for research and national laboratories at the university and the person responsible for executing our M&O contract.

I am a member of the National Academy of Sciences, and I am here today as co-chair of the joint panel of the National Academy of Sciences and the National Academy of Public Administration, which is charged to monitor the efforts of the National Nuclear Security Administration, NNSA, to address issues raised in several reports concerning NNSA's management and governance of the enterprise. I also wish to acknowledge my NAPA co-chair for the study, Jonathan Breul of Georgetown University. I very much appreciate your giving me the

opportunity to discuss insights we have gained so far in the course of our panel's study.

Our study was requested by Congress in the National Defense Authorization Act of fiscal year 2016, being carried out by a very strong panel whose membership has extensive experience and excellent credentials in both nuclear security and public administration. It is supported by the NNSA, which has gone out of its way to provide the panel with full information relevant to its tasks.

The congressional request that formed our panel came about because of the long series of reports that identified serious concerns in the operation of the nuclear security enterprise. By one count there were more than 50 critical reports over two decades. In spite of all those reports, problems persisted. The concerns in these reports are not about the safety and security incidents you may occasionally read in the paper, and certainly not about the quality of the work being done. Rather, they arise from serious and systemic management and governance problems which have persisted for many years and were perceived as an eventual threat to the national security mission of the NNSA.

Our first report was released last March and the second is in preparation. Our work will run through the fall of 2020. The Authorization Act asked in particular that NNSA create a plan to address concerns raised in the most recent critical report, which was produced by a panel co-chaired by Norman Augustine and Admiral Richard Mies.

The Augustine-Mies report identified five serious concerns,

which are called, and I quote from the report, systemic problems in both management practices and culture that exist across the nuclear enterprise, close quote.

These are: Number one, a lack of sustained national leadership, focus, and priority. Number two, overlapping DOE and NNSA headquarters staffs and blurred ownership and accountability for the nuclear enterprise missions. Number three, lack of proven management practices, including dysfunctional relationship between the program line managers and mission support staffs. Number four, dysfunctional relationships between the government and its management and operating contractors, which has led to burdensome transactional oversight rather than management focus on mission execution. Number five, insufficient collaboration between NNSA and Department of Defense weapons customers, resulting in misunderstanding, distrust, and frustration.

These concerns are not merely vexations or opportunities for improvement. Rather, they each represent a risk, which if not addressed, would eventually erode the Nation's ability to provide adequate nuclear security. Each of the concerns in the Augustine-Mies report mirror similar findings in many previous reports.

Our studies found, through multiple site visits, numerous meetings and phone calls with NNSA staff members and study of relevant documents, that NNSA has initiated a large number of changes in response to the Augustine-Mies report and others. But as noted in our first report, quoting from that report, it has not identified success and

it lacks qualitative or quantitative metrics to identify and measure change, close quote.

Moreover, the changes that have been made seem piecemeal and not as part of a larger strategic plan intended to address longstanding problems. Our panel continues to press for measures, quantitative or qualitative, that can indicate whether progress is being made against the serious and persistent concerns.

In our upcoming report, we will provide a more detailed analysis of some of NNSA's more promising changes. But the panel has also heard first-hand from the laboratory staff that in spite of these changes, problems persist.

More broadly, NNSA is embarking on a large-scale program of change management in order to alter practices and attitudes that have settled in over decades. In its first report, our panel explained that the experience of many organizations have revealed some common steps that are necessary for effective and lasting change to take root. Not all of those steps are in place at NNSA, and our upcoming report will delve into this.

Successful change management, especially this scale, also requires buy-in and leadership from the top. It is important for the next NNSA administrator and DOE leadership to recognize the magnitude and persistence of the problems and take on this challenge.

Thank you again for the opportunity to testify today. I remain at your disposal for questions.

[The prepared statement of Mr. Levy follows:]

******** INSERT 4-2 ********

Mr. Upton. Thank you.

Ms. Ladislaw.

STATEMENT OF SARAH LADISLAW

Ms. Ladislaw. Chairman Upton, Ranking Member Rush, and members of the committee, it is a pleasure to be here to speak with you today about DOE modernization.

I run the CSIS Energy and National Security Program. It is one of the largest -- the country's oldest and most well-known think tank program focusing on energy policy and geopolitics. It was created around the same time as the Department of Energy and for many of the same reasons. The views I express today are my own.

The Department of Energy was created in the late 1970s during an inflection point in America's energy history. Today, the United States faces a new energy inflection point. Unlike the scarcity atmosphere of the 1970s, the United States has been leading the world in a new age of perceived energy abundance and rapid technological change. With it come new challenges and opportunities.

For example, while the United States is now the world's largest producer of oil and gas, we are still vulnerable to energy supply disruptions in a globally integrated market. Electric power systems are becoming more distributed and complex, which brings enormous benefits but also operational and security challenges.

Efforts to create and manufacture new technologies or capture

market share in developing economies is leading to stiff competition and creating new trade relationships and geopolitical dynamics. Concerns over air pollution, water resources, and the global climate challenge are fundamentally altering the investment environment for energy companies and the policy decisions taken by governments around the world. The United States is blessed with many advantages in this environment, but the potential for disruptive change is higher than ever.

The Department of Energy has an important role to play in addressing all of these challenges. First, the DOE should take a leadership role in conducting analysis regarding the safety, reliability, and optimization of the Nation's energy infrastructure. As we continue to witness, abundant supply does not in and of itself provide energy security. Transmission, delivery, and distribution infrastructure is critically important to ensuring adequate supplies of energy.

Second, the DOE should continue to maintain emergency preparedness planning and response functions. Most notably, DOE manages the Nation's strategic petroleum reserves, the world's largest government-owned and managed emergency stockpile of crude and home heating oil. The DOE should modernize and Congress should safeguard this important asset.

Third, energy efficiency promotion should remain a core mandate at the Department of Energy. One of the original mandates of the Department of Energy was to enact efficiency standards. The role that

the Department plays in setting those standards is often overlooked or criticized, but has paid important economic and security dividends over the years.

Fourth, scientific research and innovation are essential to meeting DOE's mission across the board and should be strengthened. The role that DOE and the national laboratories play in national research and development ecosystem are critical. Government does not constitute the entirety of the U.S. innovation landscape, but makes important contributions to funding research not undertaken by private interests, feeding into the personnel and intellectual supply chain of the research community, and working collaboratively with the private industry and universities to catalyze important areas of research.

Fifth, energy strategy and analysis are more important than ever, so the DOE should maintain and strengthen its energy policy and analysis function. It is critically important for DOE to have a strong energy policy and analysis function in order to play an active and authoritative role in the interagency policymaking process and to engage with industry and other stakeholders.

Sixth, independent and impartial energy information is essential. For decades, the country has benefited from the data collection, reporting, and analytical function of the Energy Information Administration. EIA provides unbiased, market-relevant research on a regular basis through reports, and provides an important policy neutral voice in the energy policymaking process.

Seventh, DOE should increase its capabilities when it comes to

understanding, managing, and engaging in global energy issues. DOE plays an underreported role in managing international affairs in geopolitics as they relate to energy. The International Affairs Office should be strengthened and expanded to have a stronger analytical function designed to inform DOE leadership and thinking about global energy trends and the emerging challenges we face.

The Department of Energy has a long history of supporting the Nation's security, economic, and environmental priorities and objectives. It was born during a time when the Nation's energy outlook was dangerous and uncertain. Today's energy outlook is no less uncertain as the country prepares for more interconnected and interdependent energy systems driven by new consumers, new priorities, and stiff competition. Preparing for this future requires the same amount of dedication and commitment that the DOE has delivered for the last 40 years.

Thank you for the opportunity to provide my thoughts on DOE modernization. I look forward to taking your questions.

[The prepared statement of Ms. Ladislaw follows:]

******** INSERT 4-3 ********

Mr. Upton. Thank you.

Dr. Wasserman.

STATEMENT OF STEVE WASSERMAN

Mr. Wasserman. Chairman Upton, Ranking Member Rush, and members of the subcommittee, my name is Stephen Wasserman. It is a pleasure to be at this hearing on modernization of the Department of Energy to discuss part of the Department's science mission: the DOE scientific user facilities. DOE's creation and operation of these facilities, an important part of its support of research and energy and the physical sciences, is a major success story of the Department.

This morning, I appear on behalf of the Society for Science at User Research Facilities, SSURF, on whose board of directors I currently serve. SSURF is a new scientific association, founded in 2016. It continues efforts that began 27 years ago to foster cooperation between the large research facilities of the U.S. Government, as well as between the facilities and the scientists who use them.

As we peer into the Department of Energy's future, it is useful to briefly look back at the path that has led to today. In 1945, Dr. Vannevar Bush, the director of the Office of Scientific Research and Development during World War II, issued a report, "Science, the Endless Frontier," in response to a Presidential request a year earlier. In his text, Dr. Bush stated that, "research involving expensive capital

facilities beyond the capacity of private institutions should be advanced by active government support." The current DOE user facilities are the result of such support.

The facilities are the Nation's shared toolbox for research and innovation. The individual tools are large, often extremely so. Access to them is merit-based, with each operating an independent review system for proposed experiments.

The DOE Office of Science operates 26 user facilities. Additional ones support the security missions of the National Nuclear Security Administration. No other nation has the number and variety of scientific capabilities that U.S. scientists can avail themselves of here at home.

The user facilities are embedded in our scientific psyche. Over 30,000 scientists from university, industry, and government laboratories currently perform experiments at one or more facilities. These researchers come from all 50 States and from every continent, except Antarctica. 375 companies use the DOE facilities, including more than 50 members of the Fortune 500. In addition, most Federal agencies which have a scientific component to their mission sponsor or perform research at DOE locations.

Today, I would like to highlight two examples of the impact of the facilities. These represent only a minute sample of the thousands of research projects that are pursued each year within the DOE facility network.

The first example comes from the Oak Ridge Leadership Computing

Facility, OLCF. General Electric manufactures large turbines fueled by natural gas for the generation of electrical power. In 2015, GE used the Titan supercomputer at OLCF to simulate two turbine designs: one current, the other then underdevelopment. The simulations reproduced observations from the current system and predicted successful performance in the new model. Full scale tests of the new turbine later confirmed the simulations. The first of the new turbines, which increased efficiency by 2 percent, a major improvement in the field of power generation, were installed in Texas in mid-2017.

The second example is from the DOE X-ray sources. These sources are vital to research and development in human health. Virtually every major pharmaceutical company in the U.S. uses these sources to probe the structures of proteins implicated in human disease. This area is one in which I have been involved for 20 years, currently at Eli Lilly and Company.

Scientists in the pharmaceutical industry continually investigate how potential new medicinal compounds interact with their biological targets. These efforts have aided the development of drugs to treat cancer, diabetes, hepatitis, and autoimmune diseases, as well as ongoing research to find approaches to the treatment of Alzheimer's.

New medicines whose developments included experiments at one of the DOE synchrotron sources can be found in each year's approvals by the Food and Drug Administration. In a recent example that is for me close to home, in September, the FDA approved abemaciclib, a new treatment for certain forms of breast cancer that was developed by

Lilly. I and my co-workers at Lilly performed experiments at the Advanced Photon Source as part of the research that lead to this medicine.

Today, our country is focused on the need to upgrade the Nation's infrastructure. The user facilities are a type of infrastructure that, like transportation and utilities, needs to be maintained and improved. The DOE Office of Science has been an admirable steward of this infrastructure. However, the office has been handicapped by budgets whose buying power has significantly decreased over the last decade.

Current fiscal constraints mean that renewal often occurs at the slower pace than the facility's age and that timelines for upgrades are lengthened or delayed. The current levels of support have already left our Nation behind in the capabilities available at a small subset of the facilities. Continuing this trend risks a gap in innovation and technology between the United States and other nations.

In conclusion, I would like to return to "Science, the Endless Frontier." Near the end of his summary, Dr. Bush observed that responsibilities for scientific research are the proper concern of the government where they vitally affect our health, our jobs, and our national security. We at SSURF and our colleagues in the user facility community could not agree more. The user facilities are a critical part of the greatness of the U.S. scientific endeavor. We need them for our economy, security, and quality of life. Thank you.

[The prepared statement of Mr. Wasserman follows:]

******** INSERT 4-4 ********

Mr. Upton. Thank you.

Mr. Reicher, welcome.

STATEMENT OF DAN REICHER

Mr. Reicher. Thank you.

Chairman Upton, Ranking Member Rush, and members of the subcommittee, I am pleased to share my perspective on the DOE's mission.

I have spent more than a decade at the Department under four secretaries and have a deep respect for the agency. So it pains me to say that DOE, under the Trump administration, is heading in a problematic direction when it comes to the innovation, commercialization, and deployment of U.S. clean energy technology.

The administration has sought unprecedented cuts in DOE's budgets for energy efficiency and renewable energy, electricity reliability, fossil energy, and nuclear power. It has proposed to eliminate the Loan Programs Office, ARPA-E, the State Energy Program, and the low-income weatherization program. It has begun putting the brakes on energy efficiency standards and has not reestablished the Secretary of Energy Advisory Board.

Let me be clear, DOE continues to make progress in critical areas, but this progress is slowing as important programs keep personnel, longstanding advisory functions, and related funding are hollowed out. These challenges come at a time when worldwide investment in clean energy is growing, roughly $750 billion annually today, and there is

a global race for dominance in this massive market.

The Chinese have a well-organized plan to dominate clean energy. From wind, solar, hydropower, and storage, to nuclear power, advanced vehicles, energy efficiency, carbon capture, and transmission, China is not only leading in manufacturing and deployment, but increasingly in R&D and commercialization, the traditional U.S. strong suits.

This committee should look at the risk posed by these trends and ensure that DOE's applying a full set of resources. We preceded our peril in hobbling the U.S. Government's work with industry to advance our Nation's competitive position in clean energy, a sector where much energy innovation has come from the U.S., often at taxpayer expense.

My testimony addresses several issues. First, Congress should resist the administration's proposed 69 percent cut in funding for energy efficiency and renewable energy or EERE, and urge the administration to propose robust funding in fiscal year 2019. In a June letter, all seven of us who are EERE assistant secretaries, both Republicans and Democrats, emphasized that cuts of this size would do serious harm.

Second, this committee should resist the pending rescission of funds by House appropriators that would effectively end the work of DOE's Loan Programs Office, LPO. LPO, originally authorized by this committee, is carrying out its emissions well, helping to commercialize advanced nuclear fossil and renewable energy as well as transportation technologies, and managing the existing $36 billion investment portfolio.

In a June 4 letter to this committee that I would like to submit for the record, 17 CEOs wrote that the LPO is often the only way to get innovative energy technologies commercially deployed. LPO has $41 billion in remaining loan-making capacity that would be a big down payment on the trillion dollar infrastructure program that Congress may soon take up.

Third, DOE's Appliance Standards Program was one of the most effective approaches to saving energy, and has long enjoyed bipartisan support. Unfortunately, DOE recently put work on most new standards on hold, and could end up violating statutory deadlines. This committee should ensure that DOE does not advocate its important standard setting role.

Fourth, a bipartisan effort over the last several years would open up congressionally authorized investment vehicles, master limited partnerships, private activity bonds, and real estate investment trusts to clean energy technologies, and thereby lower the cost of financing energy projects. The House should adopt the bipartisan MLP Parity Act, sponsored by Representatives Poe and Thompson, as well as Congressman Welch, and the bipartisan Carbon Capture Improvement Act sponsored by Representatives Curbelo and Veasey.

Fifth, the need for electricity storage is growing fast with the significant increase in solar and wind. Congress and the administration should help advance both utility scale and distributed storage through R&D funding, grants, tax credits, loan guarantees, MLPs, and other tools. In this regard, Congress should resist the

Trump administration's proposed 61 percent cut in DOE energy storage R&D.

Sixth, carbon capture and storage can cut emissions in both power generation and heavy industry. Over the past 20 years, DOE has relied on a variety of Federal tools -- R&D funding grants, Federal tax credits, private activity bonds, and loan guarantees -- to advance CCS and made good progress. The House should resist the Trump administration's proposed 85 percent cut in DOE's CCS R&D funding and adopt pending legislation that would improve the current CCS 45Q tax credit and authorize both master limited partnership and private activity bond funding.

Seventh, the U.S. Government is the single largest energy user in the Nation, with an energy bill to taxpayers exceeding $23 billion. The committee should take note of a 2016 task force by a report of the Secretary of Energy Advisory Board that proposes many ways to cut this bill and expand the deployment of clean energy on Federal lands. It should also resist the proposed 63 percent cut to the budget of DOE's Federal Energy Management Program.

Finally, this committee should encourage Secretary Perry to reactivate the Secretary of Energy Advisory Board that has long provided important expert input into the Department's programs and operations. Thank you very much.

[The prepared statement of Mr. Reicher follows:]

******** INSERT 4-5 ********

Mr. Upton. Thank you.

Mr. Powell.

STATEMENT OF RICH POWELL

Mr. Powell. Good afternoon, Chairman Upton, Ranking Member Rush, and other committee members. My name is Rich Powell, executive director of the ClearPath Foundation.

ClearPath develops conservative policies that accelerate clean energy deployment. We advocate for innovation over regulation, educating policymakers and conducting and supporting independent policy analysis. A note, we receive no funding from industry.

I appreciate the opportunity to address the subcommittee on DOE modernization. Refocusing the Department's key research and development programs is crucial to securing American clean energy dominance internationally and facilitating a cleaner, more reliable, and affordable domestic energy supply.

Our Nation is rapidly approaching a crossroads. Coal makes up a third of American power production, and the average plant will likely retire by 2030. Half of U.S. nuclear plants could close by 2040. Refurbishing or replacing these facilities presents a once in a century opportunity to develop domestic advanced industries.

Meanwhile, global energy demand is projected to grow by 28 percent by 2040. The market in India alone is estimated at $2.7 trillion. A homegrown, U.S. advanced energy economy can seize

this opportunity. If our Nation does not rise to that challenge, we run the risk of falling behind. In fact, we already are.

China, in particular, is already outflanking us on next generation technology. It is bringing an advanced nuclear reactor online this year at a time when the U.S. is struggling just to keep its existing fleet afloat and doesn't even have a fast test reactor available for American entrepreneurs to test new designs. China is already the global leader in solar manufacturing and superefficient coal technology and is rapidly advancing in batteries and electric vehicles.

The best way for America to outcompete in future energy markets is to develop increasingly advanced technologies that can best rival offerings, as we did with the fracking revolution for our shale resources. We may not be able to beat China with cranes and concrete, but we can win in high-skilled manufacturing of carbon capturing fuel cells, printable solar panels, and modular advanced reactors.

But these breakthroughs do not happen overnight. Hydraulic fracturing and today's solar and wood technologies took decades and significant investment from both private and public sources before their widespread deployment.

The private sector is often ill-positioned to pioneer new and capital-intensive technologies alone. DOE must remain central to America's clean energy innovation dominance, linking academic research and commercial products. Too often, however, we think of DOE's R&D role in terms of research capabilities or dollars spent, rather than

delivering disruptive new technologies to solve particular problems or address market challenges. Spending more with a business-as-usual approach will not win the global energy innovation race.

The Department should reorient itself towards moonshot technology goals that empower industry to tackle the challenges of breakthrough technologies. Clearly articulated, longterm research priorities could insulate critical RD&D efforts from changing political winds. Used appropriately, they would leverage limited Federal resources towards the most important priorities.

Big goals at DOE have worked before. The 2011 SunShot Initiative aligned secretary-level resources to reduce the cost of solar power by 75 percent within 10 years. Last year, DOE reached the goal ahead of schedule. More such goals are needed. For example, an advanced nuclear MoonShot could implement Secretary Perry's call for an increased emphasis on the development of new nuclear technologies.

For ambitious technology development goals to succeed, the Department should implement a few systematic reforms. First, DOE should adopt more private sector management practices. Major Moonshots and interim subgoals could provide yardsticks to evaluate progress. If specific bets don't meet milestones, dollars should be redirected; a practice common today at ARPA-E.

Second, a soup-to-nuts approach to energy research is needed, especially for capital intensive technologies such as carbon capture and advanced nuclear. Striking a balance of supporting demonstration while avoiding market interference is a delicate one, but is necessary

to maintain international competitiveness. Prematurely ending private-public research projects raises the risks that our rivals will commercialize them instead.

China has no philosophical objection to funding applied science. They are happy to take American basic research and add applied dollars to demonstrate and commercialize them, reaping the benefits of our creations.

In conclusion, America has an opportunity to lead the global market for clean, reliable, and affordable energy. But without a more focused and nimble government partner, American entrepreneurs are likely to lose the clean energy race. A recommitment to leading global energy innovation would not only improve our geopolitical position, it would reduce emissions and maintain low consumer prices, while seizing a multitrillion dollar opportunity.

ClearPath applauds the committee for taking on this important and overdue task and stands ready to assist its legislative efforts. Thank you again for the opportunity to provide remarks.

[The prepared statement of Mr. Powell follows:]

******** INSERT 4-6 ********

Mr. Upton. Well, thank you all for your testimony. I know it has been a long hearing, and you were here promptly when the gavel came down at 10 o'clock. I have a couple of questions, as I know the members do here.

Dr. Wasserman, I was pleased to hear you talking about some very positive things, particularly relating to what Lilly has been doing and the funding to offset some of the buying power for new drugs and devices. As you know, this committee passed, every one of us, passed on a 51 to nothing vote in the last Congress, 21st Century Cures, which accelerates breakthrough drugs to address disease. We worked hard to make sure that there were the appropriate offsets for more funding for the NIH and other resources.

Have you at all looked at what we did as it relates to the advancement of new technologies in the medical side?

Mr. Wasserman. Only slightly, Chairman. As we look at new technologies, as a company, we are always looking for ways to improve our goal of getting medicines to the patients who need them as soon as possible. So the things that the government has done to foster that, including our use of the facilities, developing other new technologies, leveraging the things that both that NIH and DOE have created for us to improve our efficiency in the laboratory.

As you know, it is a long slog to get a drug to market. And, for example, the experiments that I mentioned today on breast cancer were done, I think, 7 years ago, and the approval came down. But, again, we know it is difficult to get a drug to market, and every advantage

that we can come up with sponsored by the government or with the own initiative within the industry.

Mr. Upton. We worked very closely with Dr. O'Neese, particularly as it related to the DOE user facilities as part of that legislation. He was a very constructive partner as we worked together.

Dr. Zacharia, you have watched our committee's action and you know that we have been very involved in cybersecurity. And I guess the question that I have for you is, what do you see as we try to avoid unnecessary duplication but still ensure breakthroughs in cyber defenses and response capabilities, in particular, in regard to advanced supercomputing capabilities to address those challenges?

Mr. Zacharia. Chairman Upton, thank you very much. So cybersecurity clearly is a challenge for a system like ours or a society like ours because the adversary only has to succeed once, whereas we have to be 100 percent foolproof. And so the approach that we have taken working with the Department is to make sure that the cost of penetrating critical assets is increasingly higher. So just like if your own home, the higher the walls, gates, et cetera, the alarm systems, it forces the people to go look elsewhere. And so cybersecurity, broadly speaking, is focused on new tools and technologies and software solutions, building on the computing capabilities that we have, the supercomputing capabilities that we have. But also within the DOE space, we also focus on the cyber physical systems where you are also not just focused on the penetration of computing and information technology, but really the gateway into

grid and energy grid systems, which is a big challenge, as was noted in the previous panel.

And, Mr. Chairman, if I can just add one more comment about the question about the Cures Act, is that, as you -- the DOE supercomputer systems are used effectively in working with a joint program between NCI and DOE and working with a private sector, in this particular case, GlaxoSmithKline, in developing a pilot project where the computing capability and the data analytics are being brought forward to look at much more targeted personalized medicine initiatives.

Mr. Upton. Thank you.

Mr. Rush.

Mr. Rush. Good morning. Thank you, Mr. Chairman.

Mr. Reicher, I am quite interested in your influent overall proposal -- your influent program, but in general, I am interested in your whole thrust here, and I think you have been pretty specific, and that means a lot to this committee in terms of some of your recommendations. But I only have 5 minutes, so I want to zero in on the weatherization program and the EERE recommendations in general.

We are in the midst of extremely cold weather throughout the Nation, and has this weatherization program -- has it been effective, and has there been a return on the investment? I mean, what is the cost of the investment, in your opinion, into the weatherization program?

And, secondly, how will low income families be impacted if this program were completely phased out? And what would the effect be on

local jobs if this program were to phased out?

Mr. Reicher. Mr. Rush, the Weatherization Assistance Program has been a very successful program. More than 7 million homes have been weatherized around the United States to date. I think it is every $1 of Federal investment leverages between $4 and $5 of outside investment, so it is a good government leverage in that way. It comes at a moment when it is not only cold out, but we are seeing a pretty big increase in the cost of heating fuels, as oil prices increase, as natural gases prices increase. So it does a lot in that way. I think much of the review of that program, and I know Oak Ridge has done some of it, has been fairly positive about the program, to date.

And there is some great job production in this program. It really puts local people to work going in and, first, measuring what is leaking in a house, and secondly, blowing in insulation and fixing windows. So it has got all the right hallmarks. So I really, really hope that we don't see the elimination of this program. It has been supported for decades. Forty years anniversary, I think, was last year. So I am a big fan.

Mr. Rush. From your previous work at Argonne, can you speak to the some of the innovative works that have taken place in the energy storage field? This is for Dr. Levy, I am sorry.

Dr. Levy, you worked at Argonne. Can you share any insight into some of the most promising potential breakthroughs in the beyond lithium program? What are some of the possibilities that can help move us forward into the future in regards to storing energy and developing

a more resilient and efficient 21st century electricity grid?

Mr. Levy. Thank you, Mr. Rush. First of all, I must confess, I have been away from Argonne for 2 years, and I am a couple of years out of date. And I think in the battery business, that is an important 2 years.

They were having very promising results in improving storage, and of course, that is important for two reasons. It is important in order to use intermittent sources of energy. It is also important for all sorts of other applications. So there is nothing but gain to be had there.

I think the best I can offer you in terms of specifics is to get back to you after talking to some of the people at Argonne.

Mr. Rush. Okay. Mr. Chairman, I yield back.

Mr. Upton. Mr. Shimkus.

Mr. Shimkus. Thank you, Mr. Chairman. And I appreciate you all being here.

You know, what the intent of what I think the administration is trying to do is, and what we are trying to do, is look at the Department of Energy after 40 years, and how do you update it? How do you modernize it? How do you make it efficient? And really how do you tell the story? I think part of the problem is the public really doesn't know the story, and that is part of our challenge too.

I have been to Argonne and I have been to Oak Ridge, but those are special trips that people have to make. And if you are not a member from that area -- if you are not a member from that area, then you just

don't get there. So we have got great scientists, they work real hard.

And then the other part is, you know, Members of Congress easily can go back to why did we create the Department of Energy? And if you go back to the history, remember, there was -- it was the energy crisis of the 1970s, which some of us were a lot younger then. And then we get to Congress and we still have an energy crisis.

So the creation of the Department of Energy in the 1970s didn't solve the crisis. And I would argue that it is individual investment. And right now, it is the fracking technology that really has transformed this whole world's view now, not just within the continental United States, but really the international energy markets. I also do a lot in eastern European freedom issues, so the energy extortion by the Russians is real.

So having that -- that is kind of the intro into my questions. I want to go to Ms. Ladislaw first in addressing the SPRO. I was a big SPRO supporter when we were importing a lot of crude oil, and we are, but we are also exporting. So we are having that debate, right, $2 million to modernize it, and then what, right? I have been quoted as saying, I am not even sure why that should be part of our portfolio anymore. I think in your statement you disagree with that, and I would ask why.

Ms. Ladislaw. Thanks very much for the question and for your interest in the Strategic Petroleum Reserve. I find you are right, a lot of people don't know about its existence in addition to all the things that the Department of Energy has done over the years. I think

that the -- one of the interesting things -- I was not around the Department's creation. I have worked with --

Mr. Shimkus. Let's go to someone else then. No.

Ms. Ladislaw. I have worked with people that were, though. And what I find really interesting is that, as we remember it, the Department was created during a time of crisis, and we thought it was going to get much worse. And a lot of it had to do with deregulating our domestic environment and making a whole suite of challenges and deciding that we were going to commit to this internationally connected and efficient market for oil and gas and things like that. And we have pursued that for 40 years. And I actually think that the Department and the United States should take a lot of credit for that system that we have created. It is what is going to allow us to sell a lot of the oil and gas resources that we have in a free and open market, and I think that is a huge advantage.

Mr. Shimkus. Let me just go -- yeah, go ahead, real quick, because I am running out of time.

Ms. Ladislaw. I was just going to say, I think that the reality, though, is that we have, as forecasters, been wrong, time and time again over that 40-year period about near-term market changes, whether we are going to have enough resources or not have enough resources. And a lot of that has to do with situational type of things that we couldn't foresee, like Hurricanes Katrina and Rita and things like that.

Mr. Shimkus. Let me -- just because I want to be respectful of my colleagues' time. So, I mean, we have got the Bakken now and we

have got the Pennsylvania shale, we have got, obviously the oil sands, we have got Keystone, and hopefully eventually we will get Keystone XL Pipeline. So -- and we now, after much consternation, export crude oil, which I think has been a huge benefit. It has been a benefit for our identification location recovery, keeping the prices at a place where we still have people looking in the continental United States, and so I think that has been a net plus for the country and for jobs and the economy.

I get from your testimony, and correct me if I am wrong. I think that is true for LNG too. And I would like to hear your comments on that. Do you believe that that would be the same type of response if we were more active in LNG exports?

Ms. Ladislaw. Sure. I think LNG exports are certainly good for the U.S. economy.

Mr. Shimkus. Okay. Great.

Mr. Chairman, that is all I have. I yield back.

Mr. Upton. Ms. Castor.

Ms. Castor. Thank you, Mr. Chairman. Thank you to all the witnesses for your very interesting testimony.

I have to say, Mr. Reicher, I share your concern that the Trump administration's policies they are putting forth in the beginning of the administration appear to want to hollow out our Department of Energy, and that would be to the detriment of this great country. At this time, it just doesn't seem like the way they are thinking matches the challenges that we face and takes advantage of all of the fantastic

technological advances and natural gas revolution, and as Ms. Ladislaw said, the energy abundance that we have at this point.

You, Mr. Reicher, you pointed to the drastic cuts in clean energy, the electric grid operations, the next generation energy technology. You pointed to the inexplicable back peddling on energy efficiency standards for household appliances. But you have particular expertise as the former secretary -- or assistant secretary for EERE. Will you explain the consequences of such drastic diminishment of energy efficiency and renewable energy under what the Trump administration has put forward?

Mr. Reicher. So I think it hurts us in a variety of ways. I think it hurts us in terms of people's pocketbooks, you know, if we really do pull back, if we don't take advantage of the savings that we can achieve, if we don't take advantage of a variety of other things, weatherizing people's homes. So I think it hits there.

It obviously hits from an environmental standpoint. We have made a lot of progress in cutting carbon emissions, both because of the rise of natural gas, but also because of the deployment of a variety of renewables. It definitely hits us in terms of our competitiveness. And I will have to tell you, I am very worried about what we are doing.

We published a major report at Stanford that actually DOE funded, looking at the Chinese solar industry and how it is that it has gotten so very strong. And it has gotten so very strong because there is a highly organized effort in China, industry and government, in each of these major energy technology categories to begin to, essentially, own

these energy industries. You know, they now make 70 percent of the world's solar panels. And it is not just cheap manufacturing, it is also now R&D.

The Chinese are getting very good at solar R&D. They are getting very good at nuclear R&D. They are getting very good in carbon capture, in transmission. And I really worry that, from a competitiveness standpoint, we're going to really hurt ourselves. And it is, in fact, this industry government partnership that has been active for the last 40-50 years that has really kept us in the ball game.

And, lastly, I will say, much of what China is moving forward with was technology invented in the United States, and a lot of that at government expense, taxpayer expense. So I really think we need to think from a competitiveness standpoint where we are headed.

Ms. Castor. And your point is not lost on me on how much it is costing the rise in carbon pollution because I come from the State of Florida, and I think the insurance industry earlier yesterday or at the end of last week released the totals for the damages from hurricanes. Now, the direct link isn't there, but what the consensus is that these extreme weather events are intensified because of higher carbon levels. We have the best scientists in the world and we have the technological edge, why would we cede that to China?

Ms. Ladislaw, you also highlighted the importance of energy efficiency. You said it is important to the economy and it pays great dividends for security. Could you expand on your concerns about receding in America's leadership on energy efficiency and renewables?

Ms. Ladislaw. Sure. You know, working for a security organization, I think people think, in particular at this time of abundance, that the way that you are secure is you have more, right? If you just have more, then you are thereby secure.

I think the original sort of mandate for the Department of Energy was to use less and produce more, more in variety and more in quantity, and that use less piece has been huge. The Alliance to Save Energy has remarkable figures that I included in my testimony about how much the U.S. has saved. And I think that what we are finding now is, around the world, countries, developing countries that don't want to develop along the same lines that the United States did, want to benefit from purchasing those technologies or making those technologies themselves. It is a very competitive marketplace out there for additional energy efficiency.

And we shouldn't, you know, forget that part of the reason why the United States has enough oil to export today is not just because we produce it, but it is because we use so much less of it than we thought we were going to. And so I think that energy efficiency just struggles from being one of those untold stories with really big strategic advantages both today and that we can pay forward to the future as well.

Ms. Castor. Thank you. I yield back.

Mr. Upton. Mr. Flores.

Mr. Flores. Thank you, Mr. Chairman. I also thank the panel for joining us today. It has been enlightening testimony.

Mr. Powell, you and I both agree that as Congress looks to allocate

scarce resources, that investment in basic research has great value in terms of translating into the seed corn of future economic opportunity.

In that regard, I was enthused by your talk about setting MoonShot approach. Can you expand on how setting technology moonshots can ensure the efficient use of taxpayer dollars versus the status quo?

Mr. Powell. Sure. Thanks very much for the question. So I think we should remember that the sort of energy miracle of this past decade, the shale gas revolution, was heavily influenced by research conducted at the Department of Energy, on hydraulic fracturing, horizontal drilling, diamond-headed drill bits. It is very possible the shale gas revolution would not have occurred without that research at DOE in partnership with private industry.

And so the question is, how do we produce more of those miracle technologies? In our view, it is very hard to get somewhere if you don't know where you are going. And so one first step is simply to establish the sorts of performance benchmarks that we are looking for for new sort of miracle technologies. So what does an advanced reactor look like that would actually be right for today's energy market. So smaller, more modular to build, probably a much lower cost point for energy. And then aligning resources at DOE to overcome bottlenecks to achieve a goal like that.

Again, in the SunShot Initiative, they put a very aggressive time-based, cost-based goal out there. They broke down every part of the cost of grid scale solar systems, and they subjected each of those

parts of the costs to very rigorous research and analysis and found ways to overcome them, and then helped rapidly bring them down.

So we think that this kind of approach could be applied to advanced carbon capture technologies, grid scale storage, advanced nuclear, certainly in the transportation space, and certainly in the industrial emissions space as well.

Mr. Flores. That takes me to the second part of my question. You said that ClearPath engages collaboratively with outside organizations, businesses, and think tanks about the future of energy in this country. And in that regard, can you share with us any insights you have as to examples of moonshots that Congress and the DOE should be considering --

Mr. Powell. Sure.

Mr. Flores. -- when it comes to the energy space?

Mr. Powell. Well, I think one that is low-hanging fruit is grid scale storage. So we have talked a lot across this hearing about grid scale storage today. The nice thing about grid scale storage is actually you have a lot of dollars, a lot of bang for the buck in expanding. So if were to set a goal of, say, grid scale storage systems at less than $100 per megawatt hour, that would be a disruptive change. Right? It would greatly improve the ability for grid stale storage to compete with peaker power plants. It would also be very good for the further expansion of solar and wind technologies.

And to accomplish a goal like that might only be incremental 10 of millions of dollars in appropriations in a year. But it is simply

having that focus and increasing that level of ambition.

Mr. Flores. What is another example? I mean, you and I have talked about advanced nuclear in the past.

Mr. Powell. Yeah. Certainly, advanced nuclear. So if we were to set a goal, a very ambitious performance-based goal to say, empower the private sector to demonstrate four advanced nuclear reactors within a decade, we are actually on track with a number of our programs already, like the Advanced Reactor Concepts Program, that is working with two advanced reactor developers right now, X-energy and the Southern-TerraPower collaboration on Molten Chloride Fast Reactor.

So we have a new scale power as well that could certainly qualify for something like that. So we have a number of horses already in the race, and this would encourage us to get more advanced reactor developers into collaboration with DOE and hopefully get four of those demonstrated.

RPTR ALLDRIDGE

EDTR ROSEN

[1:59 p.m.]

Mr. Flores. Thank you. Ms. Ladislaw, as you discussed in your testimony, and as many of us on this panel know, the change in the U.S. energy profile has really had huge geopolitical impacts. And the State Department's primary mission is diplomacy, but the Department of Energy has a critical role there to play as well, whether it is to authorize exports or provide technical assistance on trade energy flows. In your view, what should Congress do to support the Department of Energy's international affairs mission, in 30 seconds or less?

Ms. Ladislaw. Thanks very much for your question.

I think, first and foremost, it is really important to recognize the work that the Department is doing, both in science and technology and on policy evaluation in an international affairs realm. So the Department of Energy Bureau is a wonderful department, and I fully support that as well. I think that sometimes it leads to an either/or; should it be at the State Department or at the Department of Energy, they should be complements to each other. There is enough to analyze and act on out there that they should be able to be both very robust and complementary offices.

Mr. Flores. Okay. Again, I thank the panel for their testimony.

I yield back the balance of my time.

Mr. Upton. Mr. Tonko.

Mr. Tonko. Thank you, Mr. Chairman.

Ms. Ladislaw, I really appreciated your written testimony. You highlighted the original congressional intent from the findings of the DOE Organization Act. I think it is clear that Congress intended for DOE's mission to evolve alongside our Nation's energy challenges. We need to face the issues of our time. In the 1970s, it was oil use and reliance on foreign oil. Today, we should be considering our Nation's current and future energy needs.

So, Ms. Ladislaw, in the spirit of DOE Organization Act, is support for renewable energy and energy efficiency R&D consistent with the original goals of the Department?

Ms. Ladislaw. I believe so.

Mr. Tonko. As I mentioned during the first panel, I think DOE's role in supporting innovation is essential. And based on everyone's testimony, it sounds like you would likely agree with that assessment. I think that, obviously, there is great opportunity for job growth with R&D and energy efficiency.

Dr. Zacharia, the Grid Modernization Lab Consortium is a great example of DOE working with public and private stakeholders and making significant R&D investments in order to solve energy challenges and make the U.S. a global leader. Integrating new technologies into our electricity system is one of the challenges to fostering a cleaner and more reliable grid.

Can you explain the role that national labs play in fulfilling DOE's mission, and how grid modernization fits into those priorities?

Mr. Zacharia. Thank you very much.

So the national labs clearly sit between academia industry in maturing important technology. In this area, the Grid Modernization Lab Consortium is a consortium of a number of laboratories. We work closely together. And as we deploy a number of intermittent sources, one of the key challenges is really being able to make sure that the grid is resilient and reliable. And the way we have done that is actually both in terms of doing research, but also working in partnership with industry. Let me give you an example.

Oak Ridge National Laboratory has worked very closely with electric power board in Chattanooga, which is a, you know, small city scale utility. And we worked very closely in deploying power electronics such that the grid system can be managed very effectively. And today, as a result of that, the citizens of Chattanooga, when there is a -- a storm come through, and they only see a blip because the grid is obviously be able to manage and work around that.

One of the challenges in doing that is that, as you make the system much more interconnected, there is also the concern about security. And so we are also working very closely with them to make sure that it is secure.

Mr. Tonko. Thank you.

And as I mentioned, DOE must address the energy issues of our times, along with grid modernization and the seamless integration of more clean energy resources into our energy mix. I believe DOE has a critical role to pay in one of the greatest environmental, economic,

and national security challenges of our lifetime, that being climate change.

Does anyone on the panel wish to comment on the responsibility that the Department has in helping to develop climate solutions?

Mr. Reicher. Mr. Tonko, I think the Department has a great opportunity to develop climate solutions. It has been working on them for decades. And I think we are at a moment, though, where I think we have got to keep the pedal to the metal in terms of investment. And I say this with a very broad range of technologies in mind. It is everything from renewables and efficiency to nuclear to carbon capture, energy efficiency technology. We talk a lot about standards, but there is a lot that can be done.

So I think this is both a great opportunity. And I think if we are going to both succeed at addressing climate -- but we are always going to profit as a country in addressing the climate problem, we have two very strong reasons we should be moving forward.

Mr. Tonko. Thank you.

And Ms. Ladislaw.

Ms. Ladislaw. I just wanted to second that last point of Dan's. I do think that it is a shortcoming of our political process that on one -- you know, on one hand, we discount a bunch of fuels. On the other hand, we discount a bunch of fuels. There is a lot of benefit that can come to the U.S. economic system, to our national security, to all of our strategic objectives from leaning forward into some of the climate challenge issues. And I think that the Department would

be well served in doing that.

Mr. Tonko. Thank you.

Mr. Reicher, I was struck by your comments about EERE and weatherization. And I think they do meet both social and economic goals being able to provide for sound-paying jobs and addressing a more energy friendly environment. I know that in upstate New York, a weatherization assistance program is critical. Some of the coldest weather that comes into upstate, and we just saw it, subzero for days in a row. It is some of the toughest, poorest areas of the State with lowest household income. And it is a social economic justice thing that we can advance. So thank you for your comments.

Mr. Reicher. I just want to say. I grew up in upstate New York. I not only know how cold it is, but I also know how snowy it is.

Mr. Tonko. Thank you. It has been both this year. So thank you very much.

And I yield back, Mr. Chair.

Mr. Upton. Thank you.

Mr. Duncan.

Mr. Duncan. Thank you, Mr. Chairman.

I would like to take this opportunity to highlight some of the work the Clemson University is doing with their Duke Energy eGRID. I am proud to represent my alma mater, Clemson University, as it is in my district, and the research work they are doing at facilities all the across the State of South Carolina in partnership with other universities, funding agencies and industry partners is extremely

impressive.

At Clemson's Restoration Institute in Charleston, South Carolina at Clemson has what may be considered the world's largest and most capable electric grid emulator called the Duke Energy eGRID. EGRID has the ability to dynamically model electrical power grid conditions anywhere in the U.S. or the world. With this world class and unparalleled facility, Clemson's technical staff and students are making great advances in grid modernization and grid security through their work at eGRID.

The eGRID is a key enabler of testing half-hour devices that are critical components of the power grid infrastructure, such as extra high voltage transformers. Failure of components such as these transformers will likely cause widespread power outages, which can be very difficult to recover from due to lack of spares, logistics of moving them, and long lead times for their construction. Critical components like these transformers can be damaged from attacks such as EMPs, geomagnetic disturbances from solar activity and cyber attacks. Clemson has acquired one of these high voltage, high power transformers at eGRID further positioning Clemson with the unique capabilities.

Through R&D and testing of these critical components and systems, Clemson University's eGRID facility will be instrumental in modernizing and securing the U.S. grid. And I invite anyone on the committee that would love to go and see that drivetrain facility and eGRID facility in Charleston, it is worth the trip.

So, Mr. Powell, you mentioned in your testimony the importance of the DOE working with private sector to meet mutual goals. The Clemson-Duke Energy eGRID is a prime example of successful collaboration with the private sector to advance innovation by not solely depending on taxpayer dollars. Can you provide other examples of collaboration with the private sector to advance the goal of modernizing the DOE?

Mr. Powell. Sure.

Well, the one that has most consequential in the past decade, or the past two decades, was probably Mitchell Energy collaborating with the Office of Fossil Energy to develop shale technologies. That is probably the one that was the most and best known. I think another one that has very, very successful has been the collaboration between NuScale Energy and the Department of Energy, particularly the Office of Nuclear Energy, in developing a small modular reactor technology. So that collaboration has now resulted in a successful filing for a license with the NRC.

Mr. Duncan. Do you see MSRs as a really viable nuclear energy alternative?

Mr. Powell. Well, in the United States, we see smaller reactors as the only viable nuclear energy alternative --

Mr. Duncan. But at any given time, we have got 100 nuclear reactors floating around the seas of the world and the United States Navy without a single mishap. And, you know, I believe, and one that believes, that that SMR or type technology is a solution for powering

small cities, or even large communities, so --

Mr. Powell. Absolutely.

Mr. Duncan. Do you have other examples?

Mr. Powell. Just to finish on that. Our power grid today really -- really rewards smaller power plant technologies. And so the smaller that we can make the reactors, the more points that applicability that those will be, that those will be around the country.

I think we have seen very successful development in the wind sector in public-private partnerships, in the Wind Technology Center at the National Renewable Lab that has really brought down the price further for very large wind turbine technologies as well as.

Mr. Duncan. Right. And speaking of SMRs, which kind of piqued an interest of mine in thorium or molten salt reactors.

Is DOE working the private sector at all on thorium reactors, to your knowledge?

Mr. Powell. I will have to get back to you on that. I am not sure that there is any current thorium work underway. They are working on molten salt reactors, so that is where the fuel is also the coolant, and it circulates through the reactor. There is currently several active points of research and an active collaboration between DOE and Southern Company and TerraPower, which is the Bill Gates'-backed nuclear development company.

Mr. Duncan. Yeah. Thank you for that.

Mr. Chairman, I don't have anything further. I yield back.

Mr. Upton. Thank you.

Mr. Griffith.

Mr. Griffith. Thank you, Mr. Chairman. I appreciate it. I appreciate the testimony of all of our witnesses here today. I particularly liked the testimony of Mr. Powell talking about researching and figuring out new ways to use the fuels that will power the world, not just the United States, in the future.

But with that, I will yield my time to Mr. Shimkus of Illinois.

Mr. Shimkus. Thank you, Morgan. I appreciate that. And I really want to make sure I took the time. I appreciate you being here. And also, you are an important panel. Again, as I said earlier, we are trying to figure out should we look at reauthorizing the DOE and what should be its assigned roles. And I do a lot of stuff in the nuclear space, too. And I want to ask a question. It is going to go to Dr. Levy first. And it is really about organization.

So the NNSA, the National Nuclear Security Administration, is a semi-autonomous agency within the U.S. Department of Energy responsible for enhancing national security through the military application of nuclear science. That is kind of the -- but there are some people who question the efficiency of that, since it is semi-autonomous.

In fact, Admiral Richard Mies noted the separation of DOE's support functions from the NNSA created a problem concerning the Secretary's governance over the nuclear security mission. They noted, and I quote, "What CEO of the successful company would permit one of the largest, most demanding and unforgiving missions to be quarantined

from the headquarters' staff. Or to use an operational metaphor, how could the commander of a ship at sea fulfill his or her duty if 40 percent of the crew were, quote/unquote, 'separately organized'? That would be both inefficient and risky."

Do you agree with that?

Mr. Levy. I don't think I do, although I am not sure the present implementation of the separation is ideal. I think there is a way to do it. This is an issue that the Augustine-Mies panel took up in great detail. They came to the conclusion -- one of the suggestions was that NNSA just be a separate agency. And their conclusion was they really needed -- for a mission that important, they needed cabinet level support and cabinet level input.

My own personal opinion, and it is my personal opinion, the panel hasn't come to a conclusion on this, is that it is a doable thing, but it will take a lot of attention at the highest levels of the Department of Energy, primarily the Secretary, the Deputy Secretary and the administrator, the Under Secretary, operating together very well.

Right at the moment, there is a lot of overlap. There is a lot -- certainly, the Secretary of Energy -- I am not sure one looks at the Secretary of Energy as the commander of the ship, or the chairman of the Joint Chiefs. There has to be somebody responsible for it, and he is responsible to somebody. At the moment, I think there is overlap, which is not a very good situation, and I think that is one of the things that is important to clear up.

Mr. Shimkus. I think that is good.

Ms. Ladislaw, have you looked at this from your think tank arena?

Ms. Ladislaw. It is not an area of expertise for me.

Mr. Shimkus. Okay. And I would raise it to the chairman as something we should look at as we move in this direction.

The last thing I wanted to also address is -- I mean, because there is such a different -- a broad breadth is this, Dr. Wasserman, on the supercomputing issue, because we -- I know that we -- we are not Kim Il Jong II, so we don't blow off our nuclear weapons anymore because we supercompute, and we trust it, which is hard for many of us to believe. But we do.

And so in this -- but I got confused, and that is why I ask questions, because that is the best way to find out the answers. DOE is moving to an exoskeleton larger supercomputing ability. Is that separate than what the National Science Foundation is doing on it? Doesn't it operate in conjunction with other universities' supercomputing operations?

Mr. Wasserman. The exoscale effort, and I am not directly involved in it, but one of my colleagues at Lilly is, actually, as part of a DOE advisory panel. It is a partnership with lots going into it.

Let me pause for a minute. You said it is hard to believe that you can believe the simulation. In the example in GE I gave you, which admittedly is not, you know, a national security -- you know, weapons type of simulation. But in this simulation, they could look at things that they could not measure in the real world. And so they could make a lot of progress in the simulation because you could do that. To build

the actual test mock-up and try to do it physically would have not only been cost-prohibitive, but would have required a whole doubling of their infrastructure. So the exoscale is partnership. And as you can tell, if you look at the statistics, the U.S. leapfrogs with other countries. You know, currently China is ahead. We will catch up. I am sure they will change that in the future.

But the ability to use this to look at things. When I started my scientific career, the type of simulations we look at would have been fantasy. And today, the exquisite nature of not only the computer hardware, but the software developments the people have found to use that hardware as efficiently as possible are exquisite.

Mr. Shimkus. I appreciate. I yield back my time.

The University of Illinois has Blue Waters, which is part of the NSF grant, and it is an awesome facility.

And I yield back.

Mr. Upton. Mr. Welch.

Mr. Welch. Thank you, Mr. Chairman. And I thank the panel.

I am going to direct my questions to Mr. Reicher, because he has got Vermont roots, and I want to acknowledge the good work everyone has done. But none of you made the wise decision to spend as much time in Vermont as he did. But thank you.

You heard, I think, the first panel, and there was some discussion in that panel about the standard setting process. And could you just -- I am going to ask you three questions, so I want you to be brief on each one. But can you just address that process and what you think

makes sense to do and what the dangers are if we fall behind in what has been, I think, a bipartisan commitment to the standards?

Mr. Reicher. So very quickly, Mr. Welch, there is two things going on. One, there is concerns that DOE is not going to move ahead. They kind of put a hold on issuing standards. The second thing they are doing is reevaluating the standard setting process. We did that back in the 1990s, made a lot of improvements. Improvements have been made since. I am hopeful that they won't go ahead and do more than they need to do at this point, because it is a pretty good process.

Mr. Welch. All right. Next thing is there is a bipartisan effort to have master limited partnership status apply to clean energy projects. We have got Republican and Democratic sponsors to that, and I am one of the lead sponsors.

Can you just offer your thoughts on the benefits that that would provide to the clean energy sector?

Mr. Reicher. So master limited partnerships have been a very important tool for financing oil and gas infrastructure to the tune of about $500 billion. When the law was passed, though, by Congress in the 1980s, renewables and lots of other things were not included. You, Mr. Poe, others, Mr. Portman, and Mr. Moran in the Senate have introduced legislation that would open up these MLPs to all these other things. CCS, storage renewables efficiency, and it would be a big step because it would cut the cost of financing for these major energy projects. And as we ramp down the tax credits for solar and wind, we should ramp in this master limited partnerships approach.

Mr. Welch. Okay. I hope that is something we can work on, Mr. Chairman. We have got a Ted Poe from Texas and Peter Welch from Vermont, so there is some bipartisan and strange bedfellow situations there, so let's see if we can do something.

On Federal energy management, the Federal Government's energy bill, as you know, is $23 billion a year. And a number of us on this committee, Republicans and Democrats, have been really trying to extend energy saving performance contracts. We have had a knotty problem on the scoring where it is a Byzantine process to try to get there to be resolution between OMB and this CBO.

Can you comment on what the opportunities are if we go very aggressively in pursuit of energy savings performance contracts, which, as my colleagues know, don't cost taxpayers any money. The companies that bid on doing retrofitting of our Federal buildings put the money up to do that, and then they get repaid from the energy savings that benefit them with the payback, and benefit the taxpayers.

Mr. Reicher. Yeah. Very quickly. It is a great alternative to appropriating funds to upgrade Federal buildings. There are 350,000 buildings. We could do a lot to cut this $23 billion energy bill. But there are these difficulties in scoring, the disagreements between OMB, CBO, and the Hill. So I think -- we put out a report, the Secretary of Energy Advisory Board, in 2016, on Federal energy management. We looked at a whole number of issues, a big number of opportunities. And one of them that we explored were ESPCs. And we have suggested some ways that you might fix that process, so I would encourage you to take

a look at that report.

Mr. Welch. All right. Thank you.

I yield back. Thank you all.

Mr. Upton. Mr. Barton.

Mr. Barton. Well, thank you, Mr. Chairman.

I appreciate our scientists being here. We have still with us the ranking Democrat on Mr. Upton's subcommittee, the ranking Democrat on Mr. Shimkus' subcommittee -- Mr. Shimkus was here until I walked in. He left -- myself as vice chairman. And we have all been tasked with the chairman, Mr. Walden, to perhaps do a DOE reauthorization bill, which we have had a number of questions about. Part of that is going to be to look at the role of the national laboratories.

I think it is fair to say that if we were starting from scratch we wouldn't have 17 national laboratories, but we do. Some of those are pretty obvious. Los Alamos, Sandia, some of our weapons laboratories. I think some of them show the need for more robust research. The renewable energy laboratory would fall into that category. I know Mr. Tonko is a big supporter of that. But some of them are not so obvious.

I don't know who to ask this question of, maybe Mr. Reicher. Do we need 17 national laboratories today?

Mr. Reicher. Mr. Barton, I think I am outside of my area of expertise right now.

Mr. Barton. Well, I just poked kind of at random. If you don't feel qualified --

Mr. Reicher. I will tell you this, that there is just an amazing breadth of strength in those labs. And so I think -- and, obviously, you know better than I, the politics of shutting down labs is --

Mr. Barton. Not good.

Mr. Reicher. -- not good.

Mr. Barton. It depends on your point of view. From the point of view of keeping it open, it is very good.

Mr. Reicher. Right. But I guess what I would say is I would take a look at the missions of each and really assess what they are doing, because I think they have all developed areas of expertise. Argonne, for example, is really one of the world leaders in advanced battery technologies, looking at things other than lithium. And, you know, you go across the board, there is just so much there. So missions should come first as you do on your analysis.

Mr. Barton. Well, let me give an example that I know a little bit about. Once upon a time, there was a national laboratory in process called the Superconducting Super Collider. It was going to be in my congressional district. In fact, the main campus would have been about 10 miles from where I live right now. And obviously, if we would have built it, I would have been a big supporter of it. But we didn't build it. We decided to go a different path. And we are putting quite a bit of money over in Europe at CERN, but we still have the Stanford Linear Accelerator. We still have Fermilab. We still have Brookhaven. Do we need all of those national laboratories studying high energy physics given the fact that we decided to put most of our

eggs in the European basket at CERN?

Mr. Wasserman. Mr. Barton, if I may. The people at the national labs are incredibly creative. And as the example of the Stanford Linear Accelerator. Its original for which it was built around 1962 when it started, is no longer part of the DOE. It has been repurposed. And instead of a particle accelerator to smash things into each other to look at the fundamental forces of nature, it is now the basis of the Linac Coherent Light Source, which is an x-ray source rather than an atom smasher.

And so this creativity, even though the infrastructure is still there, people can -- things that have outlived their life have now found a new use. And, in fact, the linear accelerator there, the LCOS, is an example of interlaboratory cooperation. For example, there is a device called an undulator -- we won't go into that today -- which is the basis of it. Much of the development work for those undulators were done at Argonne, where they had a lot of expertise at the advanced photon source on this type of device.

So this creativity means that we can repurpose things. It also means that we can take multiple approaches to a difficult problem. As scientists, we wish that innovation were a linear path, but it is not. And often finding the best solution requires looking at several different ways to do it and finding the best one at the end.

Mr. Barton. Well, my time has expired. I understand the quality of our scientists and our researchers. I don't deny that. I also understand the political reality that DOE has facilities in 30

different States. So that is 60 percent of the States. So any time you try to change something, it is going to be, especially in the Senate, a political difficulty.

But I do think if we are going to reauthorize the Department it is only fair to the taxpayers that we do take a quick look, a serious look at the existing laboratories. Again, I do not deny that they can be repurposed. I don't deny that they do good work. I mean, I know for a fact from my experience with the Super Collider, we got a lot of brainpower that came to Texas. And most of it stayed. Not all of it but most of it. And it has benefited our State. So I am good for that. But I just think we owe it, if we are really going to do this reauthorization, that we ought to take a look at the existing structure.

Mr. Powell. And my time's expired, so I am at the mercy of the chairman here.

Mr. Powell. I will say very, very quickly.

I think the key thing to look at is not whether we need 17 labs, but whether we need 17 labs, all of whom say they can do almost anything, right? I think because the mission of the labs has shifted back and forth, they have gotten themselves -- Dr. Zacharia might kill me for saying this -- have gotten themselves into a posture where they are ready to go for any administration with any set of priorities. And I would just build on Mr. Reicher's point that we should be much clearer about what each lab is excellent at and then align those centers of excellence with, you know, top-down direction and goals.

Mr. Barton. I guess my final question. Did we find the

top-quark yet? That was the whole purpose of the Super Collider was to find the top-quark.

Did we find it?

Mr. Levy. Yeah.

Mr. Barton. We did find it.

Well, good.

Mr. Zacharia. Mr. Chairman, if I -- since my name was -- if you will give me a little bit of time.

The laboratories are really where the integration of the missions occur. And so if you look at Oak Ridge National Laboratory, it is one of the largest science and energy laboratory, about $1.5 billion. It is funded through 1,000 proposals that RPIs have to compete. So in some sense, laboratories bring core capabilities, a combination of people, unique facilities, and programs. And we competed for the best ideas that funded. So in some sense, the labs thrive in a meritocracy. And so what I would say is that if you -- if one focuses on the mission of the Department, then the laboratories will self-select based on their capabilities and abilities to support the missions of the Department.

Mr. Barton. I appreciate the chairman's discretion. Thank you. And I appreciate you all being here.

Mr. Upton. Yield now to a very patient Mr. Costello.

Mr. Costello. Thank you.

Mr. Powell, the eastern power grid has been experiencing some extreme stress due to what is still now a very cold weather, although

today's not so bad. Part of the reason the grid has maintained its reliability has been -- and I am getting to the issue of fuel diversity -- has been the diversity of fuel sources on the grid. Share with me your perspective on what DOE's role should be to ensure grid reliability. And obviously this comes on the heels of a report and a FERC 5-0 decision yesterday, I think there is a lot of innings left in this game, and I am just curious on your perspective?

Mr. Powell. So obviously, this has become a pretty contentious topic about whether there is a diversity or a resiliency problem on the grid as it currently stands.

I think the reality, as it stands today, is that we are headed towards a grid dominated by natural gas power generation. And so the question that we have to ask ourselves is, is that a problem? Most of the modeling says it is not a problem. In this cold snap, for example, you know, this winter, the natural gas system has worked well, and there hasn't been a resiliency problem with the grid. But we can imagine events where an attack on a pipeline or especially a major hub could make that a significant issue over reliance on one type of fuel. And we can imagine events where even if there is not a supply disruption, you could have significant price spikes to that fuel source, and that might result in sort of economic pain.

And so I think now the discussion is, is there some other characteristic, diversity or resilience or something like that that we need to find and define and quantify, and should that be worked into the authority of FERC to ensure that, in addition to reliability and

affordability, this resiliency characteristic is there as well.

We do think that there are ways that we can define and value that resiliency characteristic that would not be overly disruptive to the existing order of the wholesale markets. The wholesale markets have delivered a lot of benefits to the country in terms of reliability and affordability. And so we think that it can be defined in a way. An added benefit of defining it would be nuclear generators are a particularly resilient power source, and so, we think that adding that into the power mix would go a long way to helping support our existing nuclear fleet.

Mr. Costello. We have heard some discussion here about China and its role in the energy technology research development and deployment space. What do you believe we need to do as a country? And what is DOE's proper role in order to ensure that we don't play second fiddle to China?

Mr. Powell. Thanks for that. I was pleased to participate in that event together discussing this more deeply a few weeks back.

So I think the first and most important thing is that we need to signal that we are going to make a deep commitment to some of these technology areas where China is also making a very deep commitment.

Mr. Costello. Is that RPE? Is that somewhere else? Is that purely within DOE? Where else does that come about?

Mr. Powell. So much of it is in DOE. We discussed a bit today about making sure that our trade standards are correctly putting the right burden on industry so that we are actually able to compete in

places like Saudi Arabia to build nuclear reactors there. I think we need to make a clear commitment at DOE through the continuation of RPE and through, you know, major mission-oriented goals and commitments to these technologies that we are actually going to put the resources into these technologies so that our innovators don't then need to go over to China to get the commercialization benefits.

If you look at, you know, just one company, for example, UET, it is a vanadium flow battery technology that was developed at the Pacific Northwest National Laboratory, spun out of it by some of our best researchers. China identified the technology and its commercial applications, and so now they are sort of funding the commercialization and spin-up. And they are buying, I believe, the largest flow battery in the world which will be deployed in China and not in the United States.

And so finding ways where we can make similar commitments and actually show our innovators that we are serious about that, we will make investors and we will make innovators sort of not flee to China but, you know, develop a scale for innovation here at home.

Mr. Costello. Final question for everyone. We have a potential for an infrastructure bill. Let's just say $50 billion is allocated to energy infrastructure.

Where is that best deployed? Anyone?

Mr. Zacharia. Well, I will take the $50 billion since no one else will.

So there are a number of areas where there are both science

infrastructure, but also infrastructure such as small modular reactor that have been discussed.

You know, in some instance, this discussion becomes academic in terms of whether you are going to have a nuclear Renaissance or not, because if the supply chain goes away, it becomes very, very difficult to reboot the nuclear energy industry. And we are only a few years away, in my view, that, if there is not a procurement of some sort, then that industry will go away. And this is somewhat analogous to the supercomputing industry.

About 10 years ago, the intelligence community was really concerned that the supply chain was going to go away. And the Nation stepped in and basically did the investments in leadership computing and the procurements that ensued that kept the supply chain.

Likewise, with SMR, one of the opportunities that you have is that, for example, in places like Oak Ridge and Idaho where we have a baseload and need between Oak Ridge National Laboratory and Y-12 of about 150 megawatts. That is two units of small modular reactor. One way to incentivize the specific client adoption would be for the government to say is at least explore whether that is a good use of investment in infrastructure to actually buy down the risk of first applying deployment in small modular reactor. But also there are signs, shovel-ready signs infrastructure, that is again looking for resources. And so those are some of the areas that I would consider for investment.

Mr. Reicher. Mr. Costello, if I could quickly give you an

answer.

There is already $41 billion available today in the DOE loan program. It is allocated $12.5 billion for advanced nuclear, $8.5 billion for advanced fossil, $4.5 billion for renewables, and then a big chunk in the transportation side. It is about to be rescinded -- we are about to see a rescission by appropriators in both the Senate and the House that would prevent us -- prevent major companies from getting access to that $41 billion.

So that is available today. It is going to cost a couple hundred million that already was appropriated by the Congress a number of years ago. And if that -- if we could avoid that rescission, that $41 billion across the board would be available. It goes directly to what you just heard, because sitting over at the DOE right now in the loan program office are applications, both part 1 and part 2, for the Vogtle reactor, the NuScale reactor, the Terrestrial reactor, the -- and a couple of more.

So you don't need to find $50 billion. You need to make sure that 200- or $300 million is not rescinded by appropriators that would basically shut down the loan program office at DOE. And I can't say this strongly enough to all of you. Put that $200 million, $300 million back into effect, and you are going to have tens of billions available in the form of loan guarantees for nuclear, for fossil, and for renewables.

Mr. Costello. Very helpful. I waived on, and I am 3 minutes over. So I don't know if I am going to ever get back on this

subcommittee again.

Thank you, Mr. Upton.

Mr. Upton. I want to thank all of you for being here. Seeing no other members wishing to ask questions, we are almost ready to adjourn.

I am going to ask you unanimous consent to submit two letters into the record, a letter on EERE and a letter on the loan program itself.

[The information follows:]

******** COMMITTEE INSERT ********

Mr. Upton. And pursuant to committee rules, I will remind all members that they have got 10 business days to submit additional questions for the record. And I would ask that witnesses submit the response, if you can, within 10 business days. Certainly, for the first panel, Mr. Rush had a number of questions we would like the answers back.

Mr. Rush. No. Mr. Chairman, I just want to ask you a question. Based on Mr. Reicher's passionate request concerning the $41 million loan program, do you have any reaction to --

Mr. Upton. Well, I wish we were appropriators. That is not a role that we have. Sometimes we can take over. This is the most powerful committee and the oldest, and we don't have that authority. I have supported the loan program, I would say that. I have supported the appropriations.

Mr. Rush. Mr. Chairman, I think maybe it might be in order for a bipartisan effort on both sides of this committee to make our concerns heard at the -- with the Appropriations Committee. And I would be willing to join with you and other members of the committee to have a meeting or send some letters, but I think we should -- our voices should be heard.

Mr. Upton. Well, and I know that we are all anxious to see the administration's budget. We are going to have the opportunity to ask Secretary Perry questions about that as it gets submitted and take action on the floor. So I appreciate the gentleman's interest.

Mr. Welch.

Mr. Rush. Thank you.

Mr. Upton. Mr. Welch.

Mr. Welch. Well, I think we need to do something as a committee. You know, that is a very compelling loss. If we forego these loan guarantees, it is really going to hurt the collective efforts of both sides of this aisle.

And you have done this before, but this committee really needs to speak out, I think.

So thank you.

Mr. Upton. And if there are no further questions, we stand adjourned.

Thank you all for being here.

[Whereupon, at 2:40 p.m., the subcommittee was adjourned.]