

Testimony of Under Secretary of Energy Mark Menezes
U.S. Department of Energy
Before the
Committee on Science, Space and Technology
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Chairman Smith, Ranking Member Johnson, and Members of the Committee, thank you for the opportunity to testify before you today along with my colleague Under Secretary for Science, Paul Dabbar, on behalf of the Administration on the Department of Energy's (the "Department" or "DOE") management and priorities. In mid-December, the Secretary of Energy announced his intention to modernize and realign the Department. The goal of the realignment effort was to align the program offices more efficiently under a reporting framework that would advance the Administration's policy priorities, address the nation's present and future energy challenges, and refocus the Department on its core missions, which are as follows:

- Promoting America's energy security;
- Spurring innovation;
- Reducing regulatory burden;
- Restoring the nuclear security enterprise and enhancing national security through the military application of nuclear science; and
- Addressing the obligation of legacy management and nuclear waste.

The modernization effort returned the Department to its original statutory framework with three separate Under Secretaries. The Under Secretary for Science and Energy, established under the prior secretary, has been separated into two distinct offices: the Under Secretary for Science and the Under Secretary of Energy. The focus of the Office of the Under Secretary of Energy is promoting America's energy security, grid security and modernization, applied energy technologies, and certain DOE-wide management functions. The realignment effort did not change the elements under the Under Secretary for Nuclear Security and Administrator of the National Nuclear Security Administration (NNSA).

This realignment allows the Department to focus on its priority of energy security through energy dominance and economic competitiveness, placing all of the energy offices – Electricity Delivery and Energy Reliability (OE), Energy Efficiency and Renewable Energy (EERE), Fossil Energy (FE), Indian Energy (IE), and Nuclear Energy (NE) – under the direction of the Under Secretary of Energy. The Department is now able to apply the personnel and resources to pursue the President's America First Energy Plan. By utilizing all forms of our nation's energy resources, we can achieve energy security and economic strength at home and energy dominance through exports to markets abroad.

Since I manage a comprehensive energy portfolio at DOE that includes the applied laboratories, collaboration and communication are critical to the success of my mission as Under Secretary of

Energy. Two of the five energy program offices, FE and OE, have Senate-confirmed Assistant Secretaries. The Department and our energy team are working alongside the dedicated career personnel in the program offices awaiting a confirmed Assistant Secretary to make sure that Department priorities and goals are being met. The Secretary and Deputy Secretary have identified exceptional managers within the SES corps and tasked them with the responsibilities in the interim. We are proud of the hard work and dedication shown to the mission, collaboration and coordination within the program offices, and the focus on the priorities of DOE and the Administration.

Along with the energy program offices, the realignment includes renaming the Office of Energy Policy and Systems Analysis the Office of Policy, making the Loan Programs Office report through the Office of the Under Secretary of Energy, and maintaining two DOE-wide management functions within the Office of the Under Secretary of Energy -- the Office of Environment, Health, Safety and Security and the Office of Project Management.

National Laboratories

With the exception of the National Energy Technology Laboratory, the Government owns all DOE laboratories and federal oversight is critical to ensuring efficient, effective, and safe operations. DOE laboratories, including NNSA laboratories, have instituted an Annual Lab Planning Process developed on the Office of Science (Science) model and tailored to the unique missions of each program. To continue strong engagement with the national laboratories, the annual lab planning process has been enhanced and made more consistent throughout the DOE laboratory complex -- a key component for strategic planning. This annual process began in Science in 2006 and is now vital to how the Department engages with its laboratories throughout all program offices.

DOE annually engages in a laboratory planning process that ensures the Department and its national laboratories remain in alignment on research priorities, infrastructure investments, and stewardship of core capabilities. This hands-on process is critical to fulfilling the responsibilities of the national laboratories, which include:

1. encouraging a strong scientific, energy and national security portfolio;
2. building and refreshing world class capabilities; and
3. maintaining laboratory infrastructure.

Each laboratory has a unique mix of core capabilities meant to be a resource for the Department's science, energy and national security needs. Participation in the Department-wide planning process ensures the laboratories maintain capabilities needed for current and future Departmental work. Feedback is solicited from other DOE stakeholders in addition to the laboratories' sponsoring offices.

Every year, laboratory staff work with DOE to develop a Performance Evaluation and Measurement Plan that establishes the foundation for an annual evaluation of the contractor's scientific, technological, managerial, and operational performance. This is an essential component of maintaining accountability and transparency across the laboratory system. The final product is an annual "report card" for each of the 16 government owned/contractor operated laboratories, and is posted on the DOE website. DOE uses the results of the process to determine the performance fee that is paid to the Management and Operating (M&O) contractor. At some laboratories, strong performance can result in DOE exercising options to extend a contract. Performance evaluations also provide DOE with input to its decisions on whether to compete M&O contracts when they expire.

These coordinated efforts illustrate the level of transparency that exists between the science and applied labs, as well as NNSA labs. Furthermore, DOE maintains oversight and involvement in the operations of the labs, and benefits from this transparent partnership.

Office of Fossil Energy -- Fossil Fuels and Rare Earth Minerals

The United States has become the world's largest combined producer of oil and natural gas, resulting in an abundance of reliable and affordable energy resources available for domestic use and export. Access to a variety of energy resources is critical to the reliability of our electricity grid. Prioritizing and supporting expeditious approval of natural gas exports provides both economic and strategic benefits to the United States and our allies.

Through the National Energy Technology Laboratory (NETL), we are pursuing early-stage research and development (R&D) on new uses of coal and on clean coal technologies to improve the efficiency and reduce emissions on the existing fleet of coal-fired power plants, as well as developing transformational technologies to help build the coal plants of tomorrow. One example of new use of coal is NETL's leading an effort to assess and develop technologies for the recovery of rare earth elements (REEs) from coal and coal by-products. Due to their unique chemical properties, REEs have become essential components of many technologies including electronics, computer and communication systems, transportation, health care, and national defense. NETL's REE Program aims to provide a pathway to improve the economics and reduce the environmental impact of a domestic coal-based REE value chain. The Office of Fossil Energy's focus on the development of a domestic supply of REEs that is economically competitive will help fuel our nation's economic growth, secure our energy independence by reducing our reliance on foreign REE sources, and increase our national security.

Energy Efficiency and Renewable Energy (EERE) -- Spurring Innovation and Early-Stage R&D

In support of the Administration's goals of energy dominance and economic competitiveness, resources within DOE's energy and science programs are focused on early-stage R&D across a variety of technologies that support American energy independence and domestic job-growth, and ensure the reliability and resilience of our electrical grid. In order to be resilient, the grid requires a diverse mix of fuels and energy sources, from nuclear and conventional fossil sources to renewables such as solar, wind and hydro.

An applied example of the progress being made with early-stage R&D at the labs is the significant advances made at the National Renewable Energy Laboratory (NREL). DOE research has helped reduce the levelized cost of electricity from renewable resources, including wind and solar, resulting in large capacity additions. In 2017, the solar industry met DOE's goal of six cents per kWh for utility-scale solar, three years ahead of schedule. This success allows DOE to focus its research priorities on a more significant, long-term challenge: integrating variable renewables into the electric grid. DOE recently funded three projects to study the integration of advanced forecasting technologies with grid planning and operations systems in partnership with the California Independent System Operator, the Midcontinent Independent System Operator, and the Electric Reliability Council of Texas. This research aims to validate novel approaches and technologies that enable the effective integration of renewables and energy management systems that can enhance grid operation efficiency as well as identify areas that warrant future research.

DOE research also has contributed to technological advances in energy efficiency. From 2008 to 2015, total installations of home LED lightbulbs increased from under 100,000 to over 200 million, while LED costs fell by nearly 90%.¹

Through careful prioritization and ensuring funding goes to the most promising research, DOE, through its national laboratories, will continue to support the world's best enterprise of scientists and engineers whose innovations drive American prosperity, security, and competitiveness for the next generation.

The Advanced Research Projects Agency-Energy (ARPA-E)

ARPA-E coordinates with DOE's applied offices and includes them as reviewers of ARPA-E's proposed projects. Moreover, ARPA-E hosted a coordination meeting with participants from all applied offices in advance of the 2018 open program funding opportunity to minimize duplication and maximize projects in white spaces – those that are not currently explored by other offices.

¹ DOE, Office of Energy Efficiency and Renewable Energy, Revolution Now 2016.

https://www.energy.gov/sites/prod/files/2016/09/f33/Revolution%20Now-%20One%20Pager_1.pdf

Nuclear Energy

This Administration recognizes nuclear energy as a key source of electricity generation—providing 60% of our nation’s emissions-free baseload energy around the clock. As the most reliable and resilient source of clean electricity, nuclear energy contributes uniquely to our energy portfolio. Supporting the private sector to maintain the commercial nuclear fleet is fundamental to our domestic energy security, economic prosperity, environmental sustainability, and global security objectives.

We are improving the economics and extending the life of the existing nuclear fleet in private-public partnerships that bring together the Department’s national laboratories with industry. For example, our Nuclear Energy Office is supporting early-stage R&D that will help enable industry to deploy digital, wireless monitoring and control systems and accident tolerant fuels that will improve the economics and extend the life of today’s nuclear fleet.

We are developing improved ways to integrate nuclear and renewable energy sources so we can better manage the mix of variable and distributed energy sources on the electrical grid through hybrid energy systems. We are investing in the research and development of advanced reactor technologies, including small modular reactors, and opening our national labs to the U.S. nuclear industry in unprecedented ways. The Department recently issued a funding opportunity announcement (FOA) of approximately \$30 million to support early-stage R&D of advanced nuclear energy technologies. Through this FOA we are soliciting proposals for cost-shared projects to support early-stage development of innovative reactor designs and accompanying technologies with high potential to advance nuclear power in the United States.

Advanced nuclear technology development is a process that requires unique facilities and materials. The Department is establishing effective private-public partnerships to leverage technology advancements and focus federal investments on priority early-stage research and capability needs so we can accelerate the process of bringing innovative nuclear energy technologies to market. By leveraging these partnerships and our national laboratory system, we are enabling industry to develop the advanced nuclear technologies and encouraging a resilient supply chain, overall helping to promote a strong domestic industry now and for the future.

The Department is also conducting research and development activities related to versatile advanced fast spectrum test reactor concepts that could be used to test and validate advanced materials and components for advanced non-light water reactors.

Electricity Delivery and Energy Reliability

Our economy, national security, and the well-being of our citizens depend on the reliable delivery of electricity. The Department, working with and through our national labs, supports key efforts to improve the resilience and reliability of the nation’s electricity system. These include investing in our transmission system to support resource adequacy and generation diversity; developing and deploying cyber security technology for the energy sector; moving forward with new architecture approaches for the transmission and distribution system to enhance security and resilience; and advancing energy storage. Megawatt-scale energy storage

is becoming a critical system asset that provides a buffer between generation and consumer demand through services such as frequency response, ramping support and bulk load shifting, allowing for greater asset utilization of generation. Initiatives within OE focus on developing new technologies and processes to provide a more resilient and reliable energy system and protecting critical infrastructure.

This office is also the lead for providing energy-related expertise to the Department of Homeland Security's Federal Emergency Management Agency (FEMA), interagency partners, and the Administration as part of DOE's emergency response activities. DOE serves as the lead agency for Emergency Support Function #12 - Energy (ESF-12) under the National Response Framework and as the Sector Specific Agency for Energy under Presidential Policy Directive 21. As the lead for ESF-12, DOE is responsible for providing information and analysis about energy disruptions and for helping to facilitate the restoration of damaged energy infrastructure.

Cybersecurity – Increasing Efforts Enterprise-wide

A 2015 amendment to the Federal Power Act established DOE as the sector-specific agency for cybersecurity in the energy sector. As the only statutorily defined sector-specific agency, DOE is the lead sector-specific agency for supporting energy infrastructure owners and ensuring cyberattacks do not have a catastrophic impact on the energy sector. DOE is unique in this respect given that we experience these threats as energy infrastructure owners and bring deep technical expertise from 17 national labs to our work with industry. Private industry owns or operates the vast majority of the Nation's energy-sector assets, so strong partnerships with industry as well as our Federal colleagues are essential.

Our national and economic security depend on the reliable function of the Nation's energy infrastructure in the face of the threat posed by a malicious cyberattack. Cybersecurity is one of DOE's top priorities and we are addressing it in a number of ways. By creating an enterprise-wide threat management capability through our cyber operations center, the Department is prepared to respond to the risks to our science, technology, nuclear security and energy infrastructure and to that end, we are focused on improving enterprise cybersecurity risk management by bolstering organizational structures and supporting a culture of cybersecurity.

In coordination with the Department of Homeland Security and other Federal agency partners, we are working with the private sector to prepare for disasters, reduce vulnerabilities of cyber infrastructure, and mitigate the impacts from such incidents. We also seek to enhance visibility and situational awareness. We are working to improve preparedness, planning and response capabilities for cyber incidents and to align them across state, local, tribal, territorial, and Federal jurisdictions. Finally, we are seeking to leverage the cutting-edge power of DOE's national labs to drive cybersecurity innovation across the energy sector. We are investing in our infrastructure to reduce our exposure to threats and manage cybersecurity risks holistically.

Indian Energy

DOE's Office of Indian Energy Policy and Programs (IE) promotes Indian energy development to increase efficiency, reduce costs, and strengthen tribal energy and economic infrastructure and electrification on tribal lands. To achieve this mission, IE offers education, technical assistance, and competitive grants to assist consenting Indian tribes and Alaska Native villages in overcoming regulatory and economic challenges to developing their vast energy resources.

Loan Programs

Congress authorized the Loan Programs Office (LPO) in the Energy Policy Act of 2005, and subsequent amendments, to help American innovative energy and advanced auto manufacturing projects overcome hurdles in obtaining loans to help bring new technologies to commercial deployment. LPO manages a portfolio comprising more than \$30 billion of loans, loan guarantees, and conditional commitments covering more than 30 projects. LPO supported the latest generation of nuclear power facilities by conditionally committing additional loan guarantees to Vogtle Units 3 & 4, the only new nuclear reactors under construction in the United States today.

Environment, Health, Safety and Security

The Office of Environment, Health, Safety and Security is the Department's environmental, health, safety and security office, and is responsible for safety analysis, security programs, and policy development to ensure the protection of DOE workers, the public, the environment and national security assets. This responsibility is accomplished through the maintenance of corporate-level policies and standards and by providing technical assistance for the implementation of those policies. The Office also provides assistance across the complex by sharing operating experiences, lessons learned and best practices and subject matter expert services to successfully manage its operations.

Project Management

The Office of Project Management Oversight and Assessments (PM) supports the Department's goal to increase its focus on efficient and effective project management across the enterprise and improve performance in the areas of environmental cleanup, construction management, and cybersecurity. Project Management is a separate oversight office focusing on our largest programs -- namely Environmental Management, Science, and the National Nuclear Security Administration -- and strives to improve objective Departmental project management governance, project execution, and evaluation to increase cost savings and reduce schedule delays while meeting performance standards.

Conclusion

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 and energy storage, along with public-private partnerships with our national laboratories, bringing research and technology to market, will help us address our nation's energy challenges.

The Department appreciates the Committee's interest in our realignment and priorities, and we look forward to continuing to work with you on these matters and on other opportunities to foster and promote responsible energy development and promote energy dominance. Thank you again for the opportunity to be here today. I look forward to your questions.