U.S. Senate Committee on Energy and Natural Resources
May 20, 2020 Hearing
Questions for the Record Submitted to the Honorable Mark Menezes

Questions from Ranking Member Joe Manchin III

Question 1: It has been reported to me that the President's Executive Orders on federal labor-management relations have led to less communication, cooperation, and joint problem-solving across the government. I think close cooperation with DOE's unions is key to ensuring DOE's management and its employees are moving in the same direction. Can I get your commitment to re-establishing regular joint meetings of labor and management?

Answer: The Department of Energy (DOE) takes seriously its obligation to comply with all federal laws, Executive Orders, regulations, and case law governing federal labor relations, as well as honoring all applicable collective bargaining obligations with its 16 bargaining units across the DOE complex. Management regularly communicates with union representatives about a variety of issues from collective bargaining to individual employee grievances. Moreover, DOE's Employee and Labor Relations specialists frequently communicate with union officers and stewards regarding bargaining unit employee concerns, grievances, and workplace matters. DOE views open and respectful communications with its unions as paramount to fostering a healthy work environment, and DOE Management remains committed to engaging with all applicable bargaining units throughout the complex in order to work through and resolve issues as they arise.

Question 2: I support DOE's efforts to address the threat that supply chain vulnerabilities pose to our nation's grid infrastructure, particularly from foreign adversaries. However, I have heard concerns that Executive Order 13920 is overly broad and that developers may be forced to put their projects on hold absent additional information quickly. Can you provide clarity on what devices will be covered by the Executive Order? Can you provide assurance to those projects already underway that there won't be unnecessary delays on the construction of important energy infrastructure projects?

Answer: Bold action is needed because near-peer adversaries continue to advance asymmetric plans to attack U.S. critical infrastructure. Even now, China and Russia possess the capability to cause localized, disruptive effects on U.S. electrical networks. At the same time, we recognize that the manufacture of bulk-power system (BPS) components is complex and global in nature. Therefore, as we take measures to diminish adversarial actions and opportunity to harm the BPS, we will work closely with industry to avoid any unintended consequences. As you know, Section 4 of Executive Order 13920 defines the types of equipment covered by the Order, but I want to emphasize that we are particularly focused on devices in Defense Critical Electric Infrastructure pathways. The main intent is to ensure that our warfighters can defend the Nation in the face of this growing infrastructural threat.

Question 3: I am also concerned that Executive Order 13920 could inadvertently harm U.S. manufacturing if implemented without input from manufacturers who are experts in cybersecurity and supply chains. What steps is DOE taking to ensure that you receive input from all affected parties, including U.S.- and foreign-parented technology providers with US manufacturing operations and global supply chains?

Answer: We started working with industry immediately after the President signed Executive Order 13920, and will continue to work with industry leadership in the Electricity Subsector Coordinating Council (ESCC) and Oil and Natural Gas Subsector Coordinating Council (ONG SCC). We agree that

there is tremendous expertise among manufacturers in this area, and have every intention to leverage that expertise and experience for the good of the Nation. Eighty-seven percent of our Nation's critical infrastructure is owned and operated commercially, making continuous public-private partnership through the ESCC and ONG SCC, as well as other mechanisms, essential to success.

Question 4: We have seen historic job losses as a result of COVID-19 that have hit the energy sector hard. How can DOE help people in the energy industry get back to work and how do we make sure we aren't leaving some regions behind? What can DOE do to enhance energy workforce development without duplicating the workforce development efforts of the Department of Labor?

Answer: With the events of COVID-19, workforce development for the energy sector has become an even more important area for which we must focus efforts and channel resources.

DOE has built workforce development as a priority in the very fabric of our mission. With initiatives that encompass STEM enhancement, Technical Assistance, and Education & Training, we are ideally suited to work with partners in the industry to substantiate advances in energy workforce development nationwide. Our workforce development programs throughout DOE are specialized in that we are focused on building direct pipelines to the energy sector.

A critical staff office to maximize these goals is our Office of Economic Impact & Diversity (ED). The Equity in Energy Initiative seeks to create opportunities for interest and access to energy sector jobs. The Energy Workforce Division within ED has identified key minority populations across the United States including veteran populations, formerly incarcerated individuals, the African American population, the Hispanic population, women, and other minority communities that can benefit greatly from obtaining work in the energy sector.

The Energy Workforce Division is creating a technical assistance program that works to support the energy sector to build a pipeline of qualified workforce to fill critical positions. This program will support specific workforce development activities.

Work is already underway to build a portal on the DOE ED webpage that will include an energy workforce development map that shows programs by state and territory. ED has also led development of a Diversity Toolkit for utilities that serves as a resource with robust information regarding workforce development in the energy sector. This successful initiative has led to the development of a second toolkit specifically for the oil and gas industry that is currently being developed with key industry partners.

ED has also recently completed the first successful competitive Funding Opportunity Announcement, the Minority Education & Workforce Training (MEWT) awards. These awards are assisting programs that are focused on energy workforce development from around the country. Here are some of the highlights of the MEWT awards:

- $2.7 million in financial assistance to support workforce development of minority businesses and underrepresented communities/individuals (women, returning citizens, and veterans).

- ED's MEWT program will serve over 60 Qualified Opportunity Zones (QOZs).
- MEWT projects will support minority business enterprises applying for Small Business Innovative Research (SBIR) and Small Business Technology Transfer (STTR) programs.
- MEWT projects will help equip energy policymakers with data and analysis that advance policies and forge partnerships that improve underrepresented minorities' access and inclusion in the energy economy.

DOE has also partnered with other federal agencies to leverage resources to enhance workforce development opportunities for minority communities. Specifically, ED is entering into a Memorandum of Understanding (MOU) with the Minority Business Development Agency (MBDA) at the U.S. Department of Commerce to share resources for the benefit of minority business enterprises that will result in improved access to industries and subsectors within the energy sector.

DOE has also entered into an MOU with the U.S. Department of Agriculture that leverages many cross-cutting activities in both agencies, including the area of manufacturing where the two agencies collaborated in "Appalachian Access to Capital Forums" and "Natural Gas and Coal Added Manufacturing." DOE continues to bring attention of the need to geographically diversify our energy economy. In March of this year, DOE hosted a conference in Wheeling, West Virginia, connecting all levels of employees and employers in the energy supply chain.

The Office of Fossil Energy and the Office of Economic Impact and Diversity are collaborating to highlight the importance of preserving our energy resources and maintaining a workforce to support the need for manufacturing products "Made in America". Due to COVID-19, it is clear that the manufacturing of personal protective equipment products, which is made with petrochemicals, must be a priority. In order for it to succeed, DOE is ensuring that there is workforce ready and trained to accomplish this goal.

Question 5: Most captured carbon is used for enhanced oil recovery, but with oil markets struggling due to oversupply and the effects of COVID-19, investments in carbon capture, utilization, and storage (CCUS) may be at risk for delay or not getting deployed at all. This has made it clear that if we want to continue to advance CCUS, we should be working to diversify our uses for carbon and continue to find ways to incentivize adoption of these technologies. What is DOE doing encourage the diversification of captured carbon uses, and what additional actions can DOE take to ensure adoption of CCUS technologies aren't stalled due to the current economic environment?

Answer: DOE has a successful track record of advancing research and development (R&D) on CCUS, and the U.S. is the world leader in this area. DOE made investments in large-scale projects such as: Petra Nova in Texas, which is the world's largest CCUS project associated with a coal-fired power plant; Air Products and Chemicals facility in Port Arthur, Texas, that produces hydrogen; and the Archer Daniels Midland ethanol facility in Illinois. DOE is also investigating ways to utilize CO_2 so that additional economic benefits can be extracted. Enhanced oil recovery is the most near-term application. DOE is also looking into ways to convert CO_2 into building materials, chemicals, and fuels.

DOE has sponsored an array of projects on CO_2 utilization and will soon be announcing a series of new awards in four areas including: synthesis of value-added organic products; production of inorganic materials—solid carbon products; integrated CO_2 capture with algae; and production of inorganic materials—maximizing uptake in concrete and cement.

Question 6: The FY 2020 appropriations process brought ownership of the U.S. Energy and Employment Report back to DOE, which has not produced the report since 2017. Can you provide an update on where DOE is on this directive and when the report will be released next year? How will the report reflect the impacts from COVID-19?

Answer: U.S. Energy and Employment Report (USEER) has been published by the private sector for the past three cycles (2018-2020). With interest and direction from Congress, as well as interest from industry, state and local policymakers, DOE is working to complete and publish the 2021 USEER, which will reflect changes within the energy landscape that have occurred since 2016.

Question 7: I believe we are over reliant on foreign supply chains and manufacturing, which has recently been exacerbated by the COVID-19 pandemic. I was pleased to see that DOE's Advanced Manufacturing Office (AMO) announced $187 million in investments to strengthen domestic manufacturing, but was disappointed that only 3 of the 55 announced projects were in Appalachia and that there is a lack of outreach and engagement with coal communities. What assurance can you give me that AMO will do more to engage with coal communities? Will AMO consider regional investments in the future to help forge region-specific partnerships? Will you consider regional diversity in the next round of funding that was announced by AMO in April?

Answer: One of AMO's strategic goals is to leverage diverse domestic energy resources and materials in U.S. manufacturing, including coal communities in Appalachia. AMO considers regional investments when striving for a geographically diverse portfolio. For FY 2020 Funding Opportunity Announcements, AMO is considering policy factors including the degree to which the proposed project, or group of projects, represent a desired geographic distribution considering past awards and current applications. DOE is committed to engaging with Appalachian communities and look forward to working with you.

Question 8: The FY 2021 DOE budget request did not request funding to resume the licensing process for the potential nuclear waste repository to be located at Yucca Mountain. On February 6, 2020, President Trump signaled to the State of Nevada his commitment "to exploring innovative approaches" and "lasting solutions" to break the impasse on siting, licensing, and constructing a nuclear repository. Please explain in detail what policy path the Department of Energy is considering now to site a nuclear waste repository.

Additionally, I would like to know your thoughts on S.1234 and the proposal to develop a new agency and policy path for restarting a siting path for one or more new repository locations. Do you believe Yucca Mountain is the only place to store America's nuclear waste or should we begin looking at other options?

Answer: The Administration believes the standstill on Yucca Mountain has gone on too long and is looking to identify opportunities for near-term progress on managing the nation's nuclear waste and

consideration of longer-term innovative approaches while recognizing the importance of stakeholders' willingness to participate.

The Department looks forward to working with Congress to break the log jam that has prevented making progress towards the both the consolidated interim storage of spent nuclear fuel and the permanent disposal of such fuel. S.1234 contains some important changes, such as removing the linkage between consolidated storage and the Yucca Mountain repository. The Administration's position is that it is important to move beyond Yucca Mountain and work with states and communities to identify a new repository site. DOE has years of experience in the storage and disposal of nuclear waste and also has the unparalleled scientific expertise of the DOE National Laboratories. DOE, with the support of its National Laboratories is the right agency to solve the complex problem of storing and disposing of spent nuclear fuel and high-level radioactive waste.

Question 9: As we discussed, I am interested in the success of the Title 17 Loan Program and exploring what changes may be needed to more effectively utilize the program. Can you commit to sharing with and briefing Congress on the results of the formal study of the Loan Program that DOE has initiated? What is the timeline for the report's release?

Answer: Thank you for your continued interest in the Title 17 Loan Program. As I mentioned during my confirmation hearing, I have directed the Department's Loan Programs Office to conduct a detailed review of its regulations and policies and make recommendations for changes that may be needed to more effectively utilize the program. I commit to continue working with Congress on this matter.

Questions from Senator John Barrasso

Question 1: I am deeply troubled by EPA's failure to appeal a recent Tenth Circuit ruling on hardship relief for small refineries under the Renewable Fuel Standard (RFS). The ruling threatens to end hardship relief for nearly all small refineries in the country.

If that happens, it will be devastating for small refineries in my home state of Wyoming. The ruling requires that a small refinery must have applied and received hardship relief every year since the start of the RFS in order to remain eligible for hardship relief in the future.

In response to the court's ruling, small refineries are submitting petitions to EPA for prior years during which they had not applied or did not receive hardship relief. I'm told EPA has sent those petitions to DOE to score. When can we expect DOE to complete the scoring of those petitions?

Answer: We have received petitions from EPA and expedited our analysis. Due to the volume of petitions, we currently expect to provide our findings to EPA within approximately six weeks.

Question 2: At the outset of this pandemic, Saudi Arabia and Russia locked themselves into a price war that resulted in Saudi Arabia ramping up oil production and dumping huge amounts of crude oil on the global markets.

The U.S. was a key player in the subsequent OPEC+ negotiations. We've been the largest producer of oil for some time, but our involvement in OPEC+ production cuts was unprecedented. It sealed our status as an energy superpower. Do you expect continued U.S. engagement with OPEC+? How does safe, stable energy production here at home factor into global energy security?

> **Answer:** While the Department of Energy (DOE) has a long history of engagement with our counterparts in oil producing nations, the United States position as the number one producer of crude oil – a feat achieved in 2018 – has amplified U.S. leadership in our dialogues with producers and anchored our country's influence over the energy security of the United States, as well as that of our allies and partners. Our sustained commitment to a market-driven energy sector that rewards innovation and thrives on entrepreneurial instinct has empowered DOE's energy diplomacy and has rooted America at the epicenter of global energy trade. The United States is a global energy leader and we intend to remain one as we look ahead.

Question 3: The nation's electric power grid is losing coal-fired and nuclear power, which provide reliable and affordable power. According to the Energy Information Administration (EIA), coal-fired and nuclear electric generating capacity together will make up less than one-third of the nation's total electric generating capacity this year. By 2030, coal and nuclear will provide only 17% of our electric generating capacity. What are the consequences if our electricity generating mix is not diverse?

> **Answer:** Reducing our reliance on fuel-secure generation from 30% to 17% will put the nation's electricity system, and thus its economy, at the whim of the weather, and at the adequacy of security associated with "just-in-time" fuel infrastructures to deliver the natural gas necessary to both power generation and heat our homes. Projected levels of variable renewables pay scant attention to the billions of dollars of investment in transmission and distribution equipment necessary to begin to handle both long distance and two-way variable power flows. State-level mandates have distorted energy markets to the extent that capacity to serve growing load is devalued. It is quite likely that the delivered cost of energy will rise as the competitive restraint imposed on markets by baseload plants dissipates, and the costs of balancing and of "back-up" must be finally be borne by ratepayers.

Question 4: The Department of Energy's (DOE) "Strategy to Restore American Nuclear Energy Leadership" supported the Department of Commerce extending and reducing how much Russian uranium can be imported into the United States nuclear fuel market. Do you support this recommendation?

> **Answer:** Yes, I support the U.S. Nuclear Fuel Working Group recommendation to extend the Russian Suspension Agreement beyond 2020 and the consideration of further lowering the cap on Russian uranium imports under future terms of the agreement.

Question 5: You testified that DOE is currently putting programs in place to feed into the establishment of the uranium reserve proposed in the fiscal year 2021 budget request.

a. What specific programs is DOE establishing?

Answer: Pending approval of funding to establish the Uranium Reserve, as proposed in the Department's FY 2021 Budget, the Office of Nuclear Energy is undertaking a number of initial planning activities that are aimed at allowing the Department to "hit the ground running." These activities include identifying critical path items to be pursued in the event that Congressional approval for creating the Uranium Reserve is given, such as: considering a Request for Information (RFI) to help define technical parameters related to the procurement of uranium and conversion as well as the operation of the Reserve; evaluating approaches to compliance with the National Environmental Policy Act (NEPA); and initiating discussions across Departmental organizations (Office of General Counsel and National Nuclear Security Administration (NNSA)) related to potential governance and administration of the Reserve, particularly lessons learned from operation and governance of the NNSA's American Assured Fuel Supply.

b. Is the Department coordinating with our nation's uranium miners to ensure these initial activities are sufficient to salvage this critical industry?

Answer: Absolutely, the Department has been working closely with our nation's uranium mining community to help ensure that DOE's activities support this industry. For example, Assistant Secretary of Energy for Nuclear Energy Dr. Rita Baranwal met with the members of the Uranium Producers of America (by conference call) on May 14, 2020. In addition, staff from the Office of Nuclear Energy have communicated with the U.S. uranium mining industry to discuss the dire status of U.S. production, the challenges facing the U.S. uranium production industry, and actions recommended by the U.S. Nuclear Fuel Working Group in the strategy, Restoring America's Competitive Nuclear Energy Advantage.

In addition, the Office of Nuclear Energy published an RFI in the Federal Register (85 FR 10424) on February 24, 2020, seeking comments on key challenges in reconstituting uranium mining and conversion capabilities within the United States. Public input was sought in recognition of the importance of the uranium mining and conversion industries to the United States and to support the Congressional request in the Joint Explanatory Statement of the Energy and Water Development Committees in H.R. 1865, the FY 2020 Energy and Water Appropriations Act, to contract with an independent organization to work with industry to identify key challenges in reconstituting mining and conversion capabilities in the United States. Although not specifically directed at the establishment of the Uranium Reserve, the responses to this RFI provides the Department with a wealth of information on the market-related, technical and regulatory, financial, human resources and other challenges facing the U.S. uranium industry, as well as recommendations for addressing these challenges. This information provides a strong foundation from which we can initiate the Uranium Reserve, once approved by Congress. (Responses to the RFI can be found on Regulations.gov, Docket ID: DOE-HQ-2020-0016.)

c. Given the urgent need to sustain our nuclear fuel supply chain, has the Department sought authorization from Congress to use existing funding to establish the uranium reserve this year? If not, why not?

Answer: The Department has not formally sought authorization from Congress to use existing funding to establish the Uranium Reserve this year. As noted in 5a and 5b, the Department is taking the necessary steps this year to prepare for establishing the Uranium Reserve (UR) should it be included in FY 2021 appropriations. This includes planning for the critical path items such as an RFI, NEPA compliance, and discussions within the Department on the governance and administration of the Reserve. In addition, the Department has reached out to the U.S. uranium mining and conversion industry to develop a strong foundation from which we can initiate the Reserve. The Department is also continuing this year to discuss with Congress about the potential implementation of a Uranium Reserve. Prior to the release of the U.S. Nuclear Fuel Working Group report, the Senate and House Appropriations Committee staff were briefed on the findings, including the urgency of action to support the domestic uranium mining industry in the near-term. During the course of the discussions with the appropriations staff, the Department was discouraged from taking any formal actions in FY 2020 that could place the FY 2021 funding for the UR at risk.

Question 6: DOE's Office of Nuclear Energy (DOE-NE) is supporting the Department of Defense's (DoD) effort to demonstrate micro-reactors. These advanced reactors will create a market for high-assay, low-enriched uranium which will contribute to the revitalization of our domestic nuclear fuel supply chain. DoD is making use of other transactional authority (OTA) to contract with industry in support of micro-reactor demonstration. DOE's OTA expires at the end of this fiscal year.

a. Could utilization of OTA enhance DOE's advanced nuclear reactor demonstration programs? If so, how?

Answer: As noted in your question, DOE's OTA is set to expire, limiting its use by the Department. Additionally, although the OTA granted to DOE is quite broad, DOE's implementation of it is actually quite narrow; DOE's current OTA is limited to technology investment agreements (TIA), as defined in the Code of Federal Regulations, Title 10 Part 603 (CFR 10 Part 603). Given the current implementing limitations of this authority and the imminent expiration date, DOE has opted to conduct the Advanced Reactor Demonstration Program using financial assistance rules, but taking advantage of current financial assistance rules' flexibilities related to intellectual property. Financial assistance cooperative agreements provide the ability to tailor the oversight and management of selected projects to assure that the Department's programmatic goals and objectives will be met.

b. If reauthorized, what actions could be taken to enable the Department to better utilize its OTA?

Answer: Pending confirmation by the U.S. Senate, and assuming OTA is reauthorized, I will seek input from across the agency on whether the Department's implementation of its OTA authority should be broadened beyond TIAs.

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Questions from Senator James E. Risch

Question 1: The Cyber Solarium Commission Report called out the Idaho National Lab for its industrial control system expertise, and pointed to this as a capability that should be elevated to a Critical Technology Security Center. The President's recent Executive Order on securing the bulk power system also seems tailor made to use INL's capabilities to assess the security and resilience of the nation's critical infrastructure.

This is a very dynamic and evolving challenge. Could you please explain how the Department of Energy and its National Labs can help defend the nation from these national security threats?

Answer: You are correct to link the Cyber Solarium Commission Report and the unique expertise at Idaho National Laboratory to Executive Order 13920. Idaho National Laboratory is playing a pivotal role in this space, particularly as we move to test and evaluate critical components of the bulk-power system (BPS) and seek to identify, isolate, monitor, and potentially replace compromised equipment. We also agree that this is a dynamic and evolving challenge. In part to respond to this challenge, section 3 of Executive Order 13920 establishes the Task Force on Federal Energy Infrastructure Procurement Policies Related to National Security, to be chaired by the Secretary of Energy and comprised of heads of the following agencies, or their designees: the Departments of Defense, Homeland Security, the Interior, and Commerce, the Director of National Intelligence, and the Director of the Office of Management and Budget, among others. This body will meet regularly to help track evolving threats affecting the BPS and adjust policies and processes as appropriate. We fully expect that adversaries will pursue workarounds requiring vigilance to mitigate their growing capabilities and harmful intentions.

The DOE's Office of Cybersecurity, Energy Security, and Emergency Response, Office of Electricity, and Office of Intelligence and Counterintelligence collaborate effectively to continuously improve the broad range of cybersecurity services the Department provides the energy sector, often with National Lab support. The support often takes the form of superior intelligence, engineering, and outreach products and services. The DOE works seamlessly with the National Labs to provide the nation with expertise on Industrial Control Systems and Operational Technology security. Furthermore, DOE directly funds annually over $70 million of energy-related cybersecurity research at the National Labs and universities, research that consistently improves the cybersecurity of the nation's energy infrastructure.

Question 2: Over the past 6 months, the Department of Energy and state of Idaho have entered into multiple agreements related to the treatment of spent nuclear fuel at the INL site. These agreements provide a framework for getting nuclear waste out of the state, while also advancing the mission of the INL as a world leader in nuclear research. This is a big deal for Idaho, and I want to thank you and the Department for reaffirming your commitment to the state and Lab.

As you know, pursuant to the 1995 Settlement Agreement the DOE is responsible for removing all waste from the INL site by 2035. My Idaho colleagues and I sent Secretary Brouillette a letter last month requesting that the Department take additional steps to get the waste "road ready" for shipments to a permanent repository. As Deputy Secretary, will you commit to adhering to the deadlines in the 1995 Settlement Agreement, and can you please provide an update on the status of a response to our letter?

Answer: The Department takes seriously the obligations contained in the 1995 Settlement Agreement, and has been and will continue to make every effort to meet them, consistent with the funds appropriated by Congress to support this effort and consistent with legal requirements. I understand that a response to your April 8, 2020, letter is in the final stages of the review process, and you should be receiving it in the near future.

Question 3: The Federal Columbia River Power System plays a pivotal role in providing affordable and reliable electricity to communities in Idaho and the Pacific Northwest. The U.S. Army Corps of Engineers, Bureau of Reclamation and Bonneville Power Administration (BPA) have been working to complete an environmental impact statement for system operations, and the public comment period for the draft EIS ended in April.

Can you please provide me with an update on the status of reviewing those comments, and in your oversight role over the BPA can you commit to me that you will dedicate all necessary resources to ensure that a Record of Decision is issued in September of this year as planned?

Answer: The Columbia River System Operations interagency staff meet daily to address public comments and finalize the Final EIS. The agencies are on track to complete the Final EIS and then complete the Record of Decision by September 2020. During the public comment period, the co-lead agencies received approximately 56,000 comment submittals. The Bonneville Power Administration (BPA) has been diligent in ensuring that these efforts stay on track, and BPA has the resources to do so. By delegation, the Department's Office of Electricity, headed by Assistant Secretary Bruce Walker, exercises this oversight authority. The Assistant Secretary and his team continue to engage with BPA and I will continue to support BPA in its efforts to conclude these documents in September, consistent with applicable legal requirements.

Questions from Senator Maria Cantwell

Question 1: Hanford Funding. Undersecretary Menezes, are you aware of the gap between the level of funding necessary to meet the legal requirements of the TriParty Agreement, as calculated by DOE officials working at Hanford, and the President's budget request? What is that gap and how does it compare to the budget requests Administrations have submitted to Congress over the past decade?

Answer: The President's Budget Request reflects an effective allocation of available resources, given other national priorities, to continue making strong progress in the Department's cleanup mission at Hanford. Cleanup of Hanford continues as one of the Office of Environmental Management's (EM) highest priorities; this is reflected in the total site accounting for approximately one-third of EM's total budget request. The President's Budget Request focuses on the top priority at Hanford – completing and commissioning the facilities and infrastructure needed to commence the vitrification of low activity tank waste using the Direct Feed Low Activity Waste approach. While EM will continue to make significant progress at Hanford in FY 2021, the budget as proposed would defer some cleanup work for one year. The Department plans to continue moving forward on the deferred work, however, as soon as funding is available.

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Question 2: 2009 Recovery Act Funding for Hanford. Undersecretary Menezes, the American Recovery and Reinvestment Act provided $1.96 billion in funding to accelerate cleanup at the Hanford reservation. Could you please provide a summary of what was accomplished with that funding and the various milestones that were met and your thoughts about what could be accomplished if Congress made a similar level investment in Hanford cleanup?

I understand that the Department's Office of Environmental Management has at least $7.2 billion of projects that could be completed over the next three to five years, could you please provide a list of those projects and what milestones could be reached if each project was fully funded?

Answer: The American Recovery and Reinvestment Act provided $1.96 billion for Hanford that was spent over a two-year period, from 2009-2011. These funds allowed DOE to complete many projects in addition to the over $2 billion per year of work that was accomplished under the normal appropriations for Hanford in that same time period. Hanford workers were able to demolish 64 excess facilities totaling nearly 300,000 square feet. Workers removed 170 gloveboxes from the Plutonium Finishing Plant. In addition, 850 cubic meters of transuranic waste was packaged for certification for shipment to the Waste Isolation Pilot Plant, 65 waste sites were remediated, two new groundwater pump and treat facilities were constructed, and 265 groundwater wells were installed. Infrastructure in the Hanford tank farms, 242-A Evaporator and 222-S Laboratory was upgraded to enhance reliability and operability.

If Congress were to provide funding in addition to the regular appropriations, DOE will provide a detailed list of projects and milestones. Just like when the American Recovery and Reinvestment Act was passed, the first months were used to get funding obligated to contracts and to develop detailed execution plans before the final work scope was decided. Some of the projects at Hanford that could be accelerated include remediation of the 300/296 waste site under Building 324, demolition of the K-Basin and other excess facilities, upgrades to the 242-A Evaporator, and improvements to tank farm and site infrastructure to support Direct Feed Low Activity Waste operations.

Question 3: Renewables Now Supplying More Power Than Coal. Undersecretary Menezes, the spring marked another major clean energy milestone which is that for the first time U.S. renewables produced more electricity than coal. This trend actually started pre-COVID, but accelerated when our economy shut-down and needed less electricity. The Energy Information Administration's (EIA) May 2020 Short-Term Energy Outlook projects that this year coal generation will drop by 25%, natural gas generation will remain flat, while renewable generation will grow by 11%, accounting for the largest portion of new capacity. The EIA also notes that, quote, "renewable energy is typically dispatched whenever it is available because of its low operating cost."

- Do you agree with the reports that market forces are shifting the U.S. generation capacity away from coal and towards renewable generation and gas?

Answer: Today, the U.S. is producing more affordable and cleaner energy from a wider range of resources than ever before. Indeed, the Energy Information Administration's 2020 Annual Energy Outlook forecasted that 76% of all new generation in the U.S. in 2020 will be wind and solar. DOE's

Office of Energy Efficiency and Renewable Energy (EERE) is focused on making the technologies in its portfolio more affordable and reliable, as well as making the grid more resilient. Thanks to innovation, clean energy technologies are becoming more economically competitive. Some examples include: utility-scale PV solar achieved the DOE goal of 6 cents/kWh in 2017, three years ahead of schedule and the cost of onshore wind has declined by 55% since 2008. As renewable and gas generation has become more affordable and plentiful, they have increased in percentage of dispatched hours. Nonetheless, current market signals are distorted with both the presence of renewable subsidies and the absence of any valuation attributable to fuel security. Without addressing those issues, "market forces" are an inaccurate measure of true consumer demand.

The Trump Administration has long argued that renewable energy would undermine the U.S. electric grid's reliability.

- When renewable energy provided more electricity than coal during February, did we encounter reliability issues?

Answer: The electric system is normally very reliable because it is supported by a diversity of generation that provides essential reliability services in addition to energy that is marketed to consumers. The Department and Administration would like the electric system to be more resilient. Events such as a polar vortex, coordinated attack against the natural gas pipeline system, or a heat wave with minimal wind production (the Electric Reliability Council of Texas' concern for next summer) are scenarios in which grid operators need to be prepared for and have capacity that is able to respond on demand to these conditions.

Question 4: Executive Order Banning Foreign Power Grid Devices. Undersecretary Menezes, as you know President Trump signed an Executive Order on May 1, 2020 that will ban the use of some power grid devices imported from foreign countries. As someone that has long been concerned about cybersecurity and the vulnerability of our grid to attack by foreign actors, I appreciate and share the goals of this Executive Order. However, I have heard many concerns about the ambiguity and broad nature of the language included in the order. This could result in delays to critical infrastructure projects and create unnecessary bureaucracy.

As I understand it, the Executive Order requires the Department to develop a "white list" or pre-qualification of vendors and equipment. I am concerned that this will stifle innovation because one type of technology will be mandated over the other.

- How will the Department avoid choosing one technology over another through the bulk power system equipment pre-qualification process?

Answer: Your concerns about cybersecurity and foreign adversary capabilities and intentions to attack the U.S. electric grid are warranted. This is why the President decided bold action is needed. Even now, China and Russia possess the capability to cause localized, disruptive effects on U.S. electrical networks. We recognize that the manufacture of bulk-power system (BPS) components is complex and global in nature. DOE intends to take a phased, thoughtful approach, working closely with industry, to avoid any unintended consequences. The President's Executive Order requires the

establishment of an interagency task force which is required to consult with industry to protect against choosing one technology over another. Pre-qualifications will serve to diminish malicious foreign adversary actions and opportunity to compromise the most critical, impactful components essential to BPS operations. By overlaying evidence-based intelligence with existing manufacturing and supply chain processes, the intent is to identify more resilient pathways to mitigate this growing challenge. The identification of more resilient alternatives will likely spur technological innovation, leading to urgently needed "whole of Nation" public-private partnering to help keep critical infrastructure and the American people safe from this increasingly sophisticated threat.

- How will wind turbines that have hundreds if not thousands of components that are sourced world-wide be able to comply with this Executive Order?

  Answer: The Executive Order is limited to electric equipment that has a nexus with a foreign adversary and poses an undue risk of harm to our bulk power system. The Executive Order does not apply to all component parts of generation equipment. In line with the 2015 Fixing America's Surface Transportation Act, we are particularly focused on components in Defense Critical Electric Infrastructure (DCEI) pathways here at home. Near-peer foreign adversaries are advancing plans to impede our warfighters' ability to flow assets, including personnel and critical platforms, as a way to diminish U.S. warfighting capabilities and create strategic advantages that are harmful to our Nation's security. These DCEI pathways are limited, making the execution of this Executive Order manageable, and initially focused on the growing sophistication of nation-state hybrid warfare intended to impede our warfighters' critical missions.

- How does the Department plan to balance the additional regulation included in this order while encouraging innovation in bulk power equipment?

  Answer: We will continue to work closely with industry to balance the risk-management required to protect the BPS. As 87% of the nation's critical infrastructure is owned and operated by the commercial sector, working closely with industry through the Electricity Subsector Coordinating Council (ESCC) and the Oil and Natural Gas Subsector Coordinating Council (ONG SCC), and other mechanisms, is crucial. Our approach will effectively protect the BPS while thoughtfully avoiding any consequences. The identification of more resilient alternatives will likely spur technological innovation, leading to urgently needed "whole of Nation" public-private partnering. We will look at ways to incentivize manufacturing opportunities to both improve supply chain risk-management and create jobs here at home.

Companies like Schweitzer Engineering Laboratories, who make automation and control systems for the power grid in Washington State, have prioritized security, including supply chain security for over 30 years. There is a wealth of knowledge there on how to manage supply risks throughout the bulk power systems equipment industry.

- Does the Department intend on collecting information on supply chain security best practices from equipment manufacturers during the rule drafting process?

Answer: Yes, the Department is already discussing the Executive Order in detail with manufacturers, leveraging the considerable expertise and experience in industry, and identifying best practices to inform the way forward. We fully recognize that there is a careful balance required as we work to improve the security of the BPS while also working closely with manufacturers who are managing within the complex, global nature of BPS-related manufacturing and supply chains.

- Would the Department be open to submitting a request for information (RFI) to equipment manufacturers prior to issuing the proposed rule so that they can better understand what industry is currently doing on their own to manage supply chain security risks?

  Answer: Yes, the Department is pursuing an RFI to manufacturers. We are taking a phased, thoughtful approach intended to leverage public-private partnership and engagement, identify best practices, and look for practical, effective ways to diminish foreign adversary actions and influence intended to compromise the bulk-power system and U.S. national security.

Given the fragile state of our economy, utilities and manufacturers alike are concerned about the extended timeline for the Department to draft, notice, and open for public comment on the rules that will impact nearly all equipment procurement and acquisition for the bulk power grid.

- The Department has 150 days from May 1 to submit draft rules for comment, do you anticipate the Department will take the full amount of time to promulgate the rules?

  Answer: We are working as expeditiously as possible to issue the RFI and to promulgate the proposed rules. It is essential that we take a thoughtful, comprehensive approach accounting for the nature of the threat and global complexity of these particular manufacturing and associated supply chains.

  Furthermore, we recognize these concerns and continue to work with industry leadership to address their concerns, clarify the prioritization and intent of the Executive Order, and work expeditiously to avoid any unintended consequences. As we look to identify more resilient pathways that diminish foreign adversary actions and opportunity to compromise the bulk-power system, we intend to pursue incentives that may spur economic opportunities here at home as well.

- What is the Department's plan to mitigate potential unintended consequences that may come from a long rulemaking process for bulk power system equipment?

  Answer: We started working with industry immediately after the President signed Executive Order 13920, and will continue to work with industry leadership in the ESCC and ONG SCC. We recognize that this effort is complex, requiring thoughtful engagement every step of the way to obtain success.

Question 5: Commitment To Working With DOE Inspector General. Undersecretary Menezes, I am very concerned about President Trump recent firing of Inspector Generals of several key federal agencies. Currently, DOE Order 221.2A, issued in February 2008, requires all Energy Department employees to cooperate fully and promptly with requests from the DOE Office of Inspector General. That includes

requests for interviews and briefings. The order specifies that the DOE Inspector General is not required to give advance notice nor seek approval of any official in DOE before conducting investigations, a key component to ensure the OIG's independence. The order also explicitly states that, quote, "DOE Managers must ensure that reprisals are not taken against employees who cooperate with or disclose information to the OIG."

- Will you commit to doing everything you can as Deputy Secretary to ensure the DOE Inspector General receives the full support and independence required by law and by DOE order 221.2A?

  Answer: Yes, as legally appropriate.

- Will you commit to ensuring all DOE employees fully and promptly cooperate with requests from the Inspector General and that DOE employees will not face any reprisals for cooperating or disclosing information to the Inspector General?

  Answer: Yes, as legally appropriate.

Question 6: U.S. Manufacturing Capacity in Energy Storage. Undersecretary Menezes, I believe that energy storage will play a crucial role in ensuring America's electricity grid will be able to continue to provide continuous and reliable energy.

- Do you support a manufacturing grant program similar to the 2009 program managed by the Office of Energy Efficiency and Renewable Energy to help ensure that the U.S. remains a leader in energy storage and lithium-cell technology, while at the same time creating much needed jobs as the country emerges from this pandemic and economic crisis?

  Answer: The U.S. has been and remains a leader in battery technologies, in part due to the on-going work in the DOE's Vehicle Technology Office (VTO). This past year, 2 of 3 Nobel Laureates in Chemistry, Dr. John Goodenough from University of Texas–Austin and Dr. Stanley Whittingham from Binghamton University, were awarded for their leading edge research that enabled the lithium Ion battery. Both researchers have been and continue to be active researchers in the DOE funded battery work.

  At the same time, DOE recognizes the need to maintain our competitiveness in the energy storage technologies of the future, particularly in manufacturing. This is why Secretary Brouillette announced the Energy Storage Grand Challenge in January 2020. The Grand Challenge is a comprehensive program to accelerate the development, commercialization, and utilization of next-generation energy storage technologies and sustain American global leadership in energy storage. One of the five tracks in the Grand Challenge is Manufacturing and Supply Chain, with a goal of developing new technologies to strengthen U.S. manufacturing and recyclability, and to reduce dependence on foreign sources of critical materials. To advance this goal, in addition to developing new battery chemistries, DOE's VTO and Advance Manufacturing Office (AMO) are working closely with industry to develop new manufacturing technologies that can be lower cost, more efficient and also enable all new battery designs, such as solid state batteries.

By maintaining research and development (R&D) leadership, the U.S. can help ensure a role for U.S. manufacturing as the battery storage market grows. Recent announcements from key industry stakeholders underscore the planned expansion of U.S. lithium ion battery manufacturing capacity using private capital resources.

- Are you concerned that China may capture a large share of the world energy storage and lithium-cell market, as they previously did in solar panel manufacturing market?

Answer: The Administration's trade policies regarding China are aimed to level the manufacturing and trade playing field, increase the competitiveness of U.S. industry at home and abroad, and encourage domestic manufacturing. Prior market trends and the just-in-time nature of automotive manufacturing indicate that battery manufacturing is likely to occur in the U.S. as demand for EVs increase. As electric vehicles (EV) sales in the U.S. increase, it is expected that battery manufacturing in the U.S. will also increase.

The installation of large lithium ion battery manufacturing plants requires substantial capital investment. Matching installed battery production capacity with expected demand is the biggest challenge. High and consistent factory utilization is a key driver for reducing battery manufacturing cost and achieving market competitiveness. Large scale, lithium ion battery manufacturing plants require highly automated facilities due to the manufacturing precision and quality required to meet the durability, life, and safety requirements of EV components. Under the Energy Storage Grand Challenge, DOE's AMO and VTO are working to develop many of these advanced manufacturing technologies so that American manufacturing can become more competitive as demand for energy storage continues to rise.

Questions from Senator Bernard Sanders

Climate Change

Question 1: Do you agree with the vast majority of scientists that climate change is real and caused by human activity, and that we must aggressively transition away from fossil fuels to energy efficiency and sustainable energy like wind, solar, and geothermal?

Answer: I believe the climate is changing. Some of it is naturally occurring and some from our activities. I believe a strong, vibrant economy is the best way to mitigate any impacts from climate change. If confirmed as Deputy, I will continue to implement policies at DOE that will empower innovative approaches and technologies to mitigate climate change.

Question 2: President Trump has suggested in the past that climate change is a hoax. Do you agree with the President that climate change is a hoax?

Answer: I believe the climate is changing. Some of it is naturally occurring and some from our activities.

Question 3: In November 2018, the U.S. Global Change Research Program released the Fourth National Climate Assessment (the Assessment), which found that human activity is the primary cause of climate change and that climate change will cost hundreds of billions of dollars and cause thousands of premature deaths each year in this country alone unless we take action now to drastically reduce our greenhouse gas emissions.

As you know, the stated mission of the Department of Energy (DOE) is to "ensure America's security and prosperity by addressing its energy, environmental and nuclear challenges through transformative science and technology solutions."

a. Do you agree that the possibility of thousands of premature deaths each year due to climate change represent a threat to America's prosperity? If not, why not?

Answer: I cannot speak to the specifics of where and how the way people live may be changing, nor how human health, quality of life, the economy, nor natural systems are changing. I do believe that the climate is changing, which will pose challenges. One of the many important areas of research we are pursuing at the Department of Energy is in the Office of Biological and Environmental Research, focusing on improving our understanding of basic environmental and Earth systems science. It is important that we continue to better understand changes in our environment.

b. Do you agree that the possibility of hundreds of billions of dollars of economic damage each year due to climate change represents a threat to America's security? If not, why not?

Answer: I cannot speak to the findings of the report, but I believe the important question is how we address climate change in a thoughtful way that doesn't compromise economic growth, the affordability of energy, or American jobs.

Question 4: The vast majority of scientists agree that greenhouse gas emissions from the burning of fossil fuels such as natural gas are the main drivers of climate change. Natural gas extraction and production, in particular, releases significant amounts of methane, a greenhouse gas which traps more than 86 times the heat of carbon dioxide. In fact, Oil Change International estimates that leaked methane from U.S. oil and gas expansion could increase total U.S.-enabled climate pollution by up to 24 percent between 2018 and 2050. These methane leakages alone would represent more carbon pollution than 59 other countries will emit overall, and would make it impossible for us to avoid the catastrophic climate damage predicted by the Fourth National Climate Assessment.

Given that continuing to extract and produce natural gas could result in thousands of premature deaths and hundreds of billions of dollars of economic damage due to climate change, please outline your plan, including a timeline, for fulfilling DOE's stated mission of ensuring America's security and prosperity by drastically reducing U.S. fossil fuel extraction and production activities, including drastically reducing U.S. extraction and production of natural gas.

Answer: DOE's oil and gas research program is focused on increasing the safety and operational efficiency associated with oil and gas development, transportation and storage while also mitigating related environmental impacts. These activities include infrastructure research on advanced materials and new sensor technologies to mitigate and detect methane emissions. DOE is also accelerating the development of modular technologies that can convert gas to high-value, easily transportable products, as an alternative to flaring and venting. Additionally, DOE has a robust field laboratory program focused on the prudent development of unconventional fossil energy resources, as well as research on alternatives for the reuse of produced water.

Question 5: While you discussed solar and wind energy in your testimony, you did not lay out your proposed plan for DOE to take the aggressive actions necessary to combat the global crisis of climate change. Please provide your plan to address this grave threat to our nation.

Answer: I believe renewable energy should be part of an "all-of-the-above" energy strategy. The Department of Energy should continue to invest in the research that will spur the innovation that will keep America's economy, including its wind and solar industries, competitive. If confirmed, I will support these programs and their missions of producing clean, reliable, and affordable energy.

Renewable Energy

Question 6: During the 2018 American Council on Renewable Energy Policy Forum, you stated that "renewables play a key role" in our energy future, and that technological revolutions will help us "produce renewables more affordably and efficiently at a faster time frame than many experts are predicting."

In fact, the renewable energy and energy efficiency sector already employs more Americans than the fossil fuel sector, and the U.S. Bureau of Labor Statistics predicts that renewables will be one of the most robust U.S. job sectors going forward. Given that the renewable energy and energy efficiency sector is already the most prosperous sector of American energy generation, and that this sector improves American security more than the fossil fuel sector due to the latter's role as the primary driver of the catastrophic impacts of climate change found by the Fourth National Climate Assessment, please outline your plans, including a timeline, for fulfilling the DOE's stated mission to "ensure America's security and prosperity" by aggressively transitioning away from fossil fuels, including natural gas, to renewable sources of power like wind and solar.

Answer: I envision the Department continuing to develop technologies that produce energy more efficiently and in an environmentally friendly way that will lead to lower costs. Indeed, as forecasted by the Energy Information Administration's (EIA) 2020 Annual Energy Outlook, wind and solar will account for 76% of all new U.S. generation in 2020 and 50% in 2021. I believe that the U.S. energy portfolio can include energy from both renewable and fossil fuel sources.

U.S. Senate Committee on Energy and Natural Resources
May 20, 2020 Hearing
Questions for the Record Submitted to the Honorable Mark Menezes

Fracked Natural Gas

Question 7: In a May 28, 2019 Department of Energy press release, you made the following statement:

> "Increasing export capacity from the Freeport LNG project is critical to spreading freedom gas throughout the world by giving America's allies a diverse and affordable source of clean energy. Further, more exports of U.S. LNG to the world means more U.S. jobs and more domestic economic growth and cleaner air here at home and around the globe. There's no doubt today's announcement furthers this Administration's commitment to promoting energy security and diversity worldwide."

a. Do you stand by your characterization of liquid natural gas as "freedom gas"?

Answer: The Department of Energy has been steadfast in its support for U.S. LNG exports and the benefits it brings both domestically and to our allies and trading partners. The presence of U.S. LNG in the global market over the last few years has been a disruptive market force which is making a real difference to the energy security of our allies. In just four years of exporting U.S. LNG from the lower-48 states, the U.S. has become the third largest supplier of LNG and last year, the U.S. was the top LNG supplier to Europe. Poland used to only be able to obtain natural gas via pipeline from Russia and now, they have a number of LNG import contracts, and mostly with U.S. exporters. With the new and reliable supply that U.S. LNG brings to the global market, touting the freedom it brings to a market previously dominated by few players is appropriate.

b. According to a study published in *Environmental Health*, the natural gas extraction process, known as hydraulic fracturing or "fracking", releases dangerous amounts of air pollutants like benzene and formaldehyde, which raise the risk of cancer, hydrogen sulphide, which causes eye and respiratory tract irritation, fatigue, loss of appetite, headache, irritability, poor memory and dizziness, and fine particulate matter that increases the risk of death from respiratory diseases like COVID-19.

Given that natural gas extraction and production significantly reduces air quality, especially compared to renewables like solar and wind, would you like to amend your statement that U.S. liquid natural gas means "cleaner air here at home?" If not, please describe how increased quantities of toxic substances like benzene, formaldehyde, and hydrogen sulphide in our nation's atmosphere represent "cleaner air"?

Answer: We have continued to take an aggressive stance in using our research and development (R&D) and advanced technologies used to mitigate emissions the production and use of natural gas, and the U.S. continues to make strides in reducing emissions from natural gas. Over the last decade, a major factor in recent reductions in the carbon intensity of electricity generation in the United States is the increased use of natural gas, which emits less CO_2 for the same amount of electricity generated. Between 2005 and 2018, the EIA has calculated that cumulative U.S. CO_2 emissions reductions attributable specifically to shifts from coal to natural gas totaled 2.823 billion metric tons.

c. Given that Fourth National Climate Assessment's findings that carbon emissions from activities like natural gas extraction and production will likely result in hundreds of billions of dollars in economic damage each year, do you wish to amend your claim that increasing U.S. natural gas production and exports means "more domestic economic growth"? If not, please describe how the hundreds of billions of dollars that will result each year from climate change represents economic growth.

Answer: Multiple studies conducted by the current and prior Administrations have shown that LNG exports contribute to domestic economic growth.

Question 8: During your keynote address at this year's Washington Auto Show, you made the following statement:

> "This year, we'll also build on our record levels of natural gas production. We've been a net exporter of natural gas for more than two years, and that trend seems likely to continue through 2050. Today, we export LNG to 37 nations and counting. And by the close of 2020, we will have doubled our LNG export capacity in two years. This means more than just energy. It means jobs, prosperity and opportunity."

According to a recent article, "America's Radioactive Secret," oil and gas extraction activities, including fracking for natural gas, produce nearly one trillion gallons of a waste product known as "brine," which can contain cadmium, benzene, and arsenic, which are all known human carcinogens that can cause kidney and brain damage. Additionally, in some cases, fracking waste byproducts contain radioactive substances like radon and uranium in concentrations hundreds of times more radioactive than the legal limit for nuclear power plant discharges. Workers involved in the extraction, transportation, and production of natural gas, as well as communities near fracking sites, especially low income communities, communities of color, and indigenous communities, are regularly exposed to these toxic substances in concentrations that are extremely dangerous to human health.

a. Given that poisoning our fracking workers and their families and contaminating our nation's communities clearly does not represent "prosperity", do you wish to amend your statement? If not why is the prosperity of fracking workers and frontline communities not part of our nation's prosperity?

Answer: The increased development and exports of U.S. oil and natural gas have added hundreds of thousands of jobs and induced billions in U.S. infrastructure investment that bring jobs and economic benefits to communities who otherwise would not have such opportunities.

b. Given the Fourth National Climate Assessment's findings that climate change will result in thousands of premature deaths each year unless we drastically reduce greenhouse gas emissions from activities like the extraction and production of natural gas, do you wish to amend your statement that increased natural gas production means "prosperity and opportunity"? If not, please

describe how natural gas will impact the opportunities of the thousands of Americans who die prematurely due to natural gas-driven environmental pollution and climate change.

Answer: As oil and natural gas, including natural gas liquids, enable reliable energy supplies and also provide manufacturing inputs for a broad range of essential daily products, including medical equipment and personal protective equipment (PPE), their value to Americans is incalculable. Yet we know we can always do better to reduce and mitigate the environmental impacts of oil and gas production, and via our R&D programs, we continue to do so. Over the last several years, total methane emissions from natural gas operations have decreased, even while the amount of natural gas delivered has increased. Between 2005 and 2017, natural gas methane emissions decreased from 6,856 to 6,624 kt/year (Source: EPA Greenhouse Gas Inventory, 2019). Over the same period, the amount of natural gas delivered to U.S. consumers increased from 20.3 to 24.8 trillion cubic feet (Source: EIA, Natural Gas Consumption by End Use).

Solar Workforce Development

Question 9: DOE's Solar Energy Technologies Office (SETO) workforce initiatives are a vital component of the federal government's efforts to prepare the solar industry for a digital future and modern grid while also increasing the number of veterans and other participants in the solar industry. If confirmed, do you commit to supporting these SETO workforce initiatives, including by supporting robust funding asks to Congress in future budget requests?

Answer: A highly skilled workforce is vital to America's energy needs. If confirmed, I look forward to ensuring workforce training is appropriately prioritized. If confirmed, I also commit to effectively and responsibly execute the funding provided by Congress.

Questions from Senator Steve Daines

Question 1: Over the last couple of years the Nation's and Montana's energy portfolios have drastically changed with base load coal-fired generation plants retiring or being forced to retire. In Montana Colstrip Units 1&2 have been retired and the Lewis and Clark Station in Sidney, Montana, is planned to be retired soon. As the U.S. and Montana continue to close base-load coal generation what is DOE doing to ensure that we can continue to provide reliable energy when we need it the most, such as when it's too cold for wind turbines or other issues that may arise?

Answer: Wide-scale retirements of the Nation's existing fleet of coal-fired power plants – without replacement – may lead to a significant undermining of the resiliency and reliability of America's electricity supply. Much of the jurisdiction for these issues lies with the Federal Energy Regulatory Commission, Independent System Operators, and the States. However, DOE plays a critical role in developing technologies to enable more grid resiliency and reliability. DOE also has a critical role in helping mitigate cyber risks potentially affecting the grid.

For example, DOE's Office of Fossil Energy continues to advance the Coal FIRST initiative to develop a next generation of small modular coal plants that can be integrated into an evolving grid hosting increasing amounts of intermittent renewables. DOE is also investing heavily in carbon capture, utilization and storage (CCUS) technologies that can extend the lifetime of existing coal fleet assets while addressing environmental concerns, and in some cases, providing supplemental revenue through enhanced oil recovery and products derived from CO_2.

Question 2: With air and surface travel reduced our small refiners are struggling to get by, especially in Montana. And with the tenth circuit court ruling on the Small Refinery Exemption looming over their heads Montana refiners are worried. What more can DOE be doing to work with EPA to make sure our refiners get the relief they have gotten year after year from RFS mandates?

Answer: Since the Tenth Circuit ruling in *Renewable Fuels Association v. EPA*, EPA has provided the Department with over 40 additional Small Refinery Exemptions for prior years. We have expedited our analysis and currently expect to provide our findings to EPA within approximately six weeks. Additionally, the EPA has been asked to waive or decrease the Renewable Volume Obligations (RVO) for the 2020 compliance year pursuant to section 211(o)(7) of the Clean Air Act (CAA). The CAA requires the EPA to consult with the Secretary of Agriculture and the Secretary of Energy, and accordingly, the Department's input will be part of the analytical process in EPA's determination.

Question 3: As part of the National Quantum Initiative Act and the Department of Energy Quantum Information Science Research Act, both of which I strongly supported, the DOE announced proposal for a number of new Quantum Centers. As you may know, Montana has a booming quantum computing industry with research happening on our campuses and businesses growing throughout the state. What's the status of establishing these new centers?

Answer: The final proposals for the National Quantum Information Science Research Centers were received on April 17, 2020, and are currently under review at the Department. We anticipate making the final award for the establishment of the new centers by the end of September, consistent with applicable requirements.

Questions from Senator Martin Heinrich

Question 1: I hope it is abundantly clear that your FY21 budget request for the cleanup work as Los Alamos is completely unacceptable. There is simply no justification for a cut of nearly 50 percent. Have you reviewed the budget request for environmental cleanup work and can you explain how the site office's planned scope of work for FY21 at Los Alamos can be executed with about half of the expected funding?

Answer: The President's Budget Request reflects an effective allocation of available resources to support all national priorities with increased investments in our nuclear deterrent and continuing to make progress in the Department's cleanup mission at Los Alamos. The President's Budget Request maintains safe operations, continues successful management of groundwater contamination, and

continues legacy waste management operations. DOE will plan the scope of work for FY 2021 based on the amount of funds available, which will include any prior year carryover and the FY 2021 Congressional appropriations.

Question 2: There continues to be a lack of clarity about how much, if any, prior-year carryover funding will be available to sustain cleanup work at Los Alamos next fiscal year. Can you provide the amount of available carryover as of April 2020 and the amount of expected carryover into FY21?

Answer: The total amount of carryover at the beginning of the fiscal year obligated on multiple contracts is $140.2 million. Based on the current spend rate of these contractors as of April 2020, DOE projects that there will be $97 million of carryover going into FY 2021. However, spending for the balance of the year is difficult to predict due to the impacts of the COVID-19 stop work order.

Question 3: Nothing is more important at our national security laboratories and sites than assuring the safety of the public and workers. I believe the Defense Nuclear Facility's Safety Board plays an important role in protecting public health and safety at defense nuclear facilities, including Los Alamos and Sandia National Laboratories and WIPP. If you are confirmed, will you commit to ensuring the DNFSB has full access to the information it needs to fulfill its statutory oversight responsibilities?

Answer: Yes, the DNFSB will continue to have full access to the information it needs to fulfill its statutory oversight responsibilities in accordance with the law.

Question 4: I worked in the FY20 Defense Authorization Act on several provisions that reversed the effects of DOE's Order 140.1, which limited the board's access to workers, information, and facilities. I was pleased to hear Secretary Brouillette testify recently the order is being rewritten. Can you tell me when the revised Order 140.1 will be finalized and released?

Answer: We are in the final phase of revising the Order to comply with the FY 2020 NDAA. We provided a draft of the Order to the DNFSB. As you are aware, the Board responded to Secretary Brouillette on February 28, 2020, stating "…if approved as it is currently drafted, [the Order] will satisfactorily resolve the statutory concerns we expressed in our September 17, 2018, correspondence to Secretary Perry." We will continue to share any future draft revisions with the Board as well.

Question 5: Is DOE working with DNFSB to develop a bilateral memorandum of understanding to address other operational or staff interface issues that are not addressed by a revised Order 140.1?

Answer: The Department is always open to continuous improvement opportunities regarding transparency and communication with the DNFSB, and continues to work with the DNFSB concerning other operational or staff related interface issues. At this time, I am not aware of any such issues that are not being addressed.

I am also unaware of any request by the DNFSB that a memorandum of understanding be prepared. As interface issues will occur from time-to-time between DOE and DNFSB, based on interactions

over the last 30 years, I do not view them as uncommon, unresolvable, or related to any existing or future Order.

Question 6: I have been impressed with the incredible response from DOE's National Laboratories with computer modeling and technical assistance to support the nation and local communities during the covid-19 pandemic. I was pleased Congress included direct funding to DOE in the Cares Act to support the response to the coronavirus. However, I would be interested in your assessment of how the National Laboratories have also applied funding set aside for Laboratory Directed Research and Development to help support the nation's immediate response to covid-19.

Answer: The Laboratory Directed Research and Development (LDRD) program at the DOE National Laboratories provides the flexibility to select and conduct innovative and cutting-edge research, as well as the ability to respond very quickly to the changing needs of the Department and the Nation. Specific examples of LDRD funded activities at Los Alamos National Laboratory (LANL) and Sandia National Laboratory (SNL) are included below, and encompass both the nation's immediate response as well as our ongoing rapid response efforts.

- Creating a new multiplex assay design to increase COVID-19 testing bandwidth, with the goal of being able to test an average of three times more patient samples in response to challenges resulting from lab infrastructure being unable to keep up with the demand for testing.
- Activities related to detection tools and medical countermeasures; specifically through the utilization of smartphone-based diagnostics to aid in screening for SARS-CoV-2 infection, as well as working to develop therapeutic antibodies that neutralize SARS-CoV-2 and modulate local immune responses.
- Creating the missing computational tools necessary to plan the optimal production, stockpile, and distribution scheduling (supply chain) for health care supplies; to provide decision makers with the capability to manage, in time and space, existing health care supplies to confine the catastrophic impacts of COVID-19.
- Research and design of reusable smart personal protective equipment for use to fight the next pandemic.

The flexibility provided by the LDRD program to pursue these activities and many others has allowed the laboratories to utilize the unique expertise and vast scientific resources available to them to help the nation respond to the current pandemic.

Question 7: According to DOE data, the typical US household will spend about $500 less per year on their utility bills because of the national appliance, lighting and equipment efficiency standards on the books today. Current law requires DOE to review efficiency standards periodically so that the levels keep pace with technological developments and the market. However, under this administration, DOE has failed to meet a single statutory deadline to review efficiency standards. In fact, the number of missed statutory deadlines has ballooned from three in January 2017 to 26 today. This is unprecedented. What is your plan to eliminate this backlog of 26 appliance standards and restore progress toward improving energy efficiency?

Answer: DOE is striving to meet its legal obligations under the Appliance Standards Program and has made substantial progress to address missed deadlines. As the following summary shows, DOE's progress on appliance standards has accelerated since 2019, and the Department plans to take action on numerous test procedures and energy conservation standards in the next 12 months, including multiple proposed and final rules.

- Since January 1, 2019, DOE has published 37 notices relating to energy conservation standards, including 8 final rules (current as of May 26, 2020).
- Since January 1, 2019, DOE has published 17 notices relating to test procedures (current as of May 26, 2020).
- In the next 12 months, DOE plans to issue 48 notices related to energy conservation standards, including 6 final rules.
- In the next 12 months, DOE plans to issue 46 notices relating to test procedures, including 10 final rules.

As the Department continues to make progress, DOE's recent changes to the Process Rule will provide an Appliance Standards program that is transparent, predictable, and helps DOE meet its statutory deadlines. Notably, the amended Process Rule has the potential to streamline DOE's rulemaking using an early assessment, which can better enable the Department to satisfy its statutory time constraints. The early assessment review consists of a more focused, limited analysis of a specific set of facts or circumstances that would allow DOE to determine that, based on one or more statutory criteria, a new or amended energy conservation standard or amended test procedure is not warranted. This early review will help avoid committing resources, from both DOE and stakeholders, to rulemakings that will not satisfy the requirements in the Energy Policy and Conservation Act (i.e., that a new or amended energy conservation standard save a significant amount of energy, and be economically justified and technologically feasible; and that an amended test procedure more accurately measure energy (or water) use during a representative average use cycle, or reduce testing burden).

DOE is also implementing a revised priority-setting process to increase stakeholder input early in the rulemaking process. This additional input will better inform the Department in its decision-making process concerning priority-setting and developing its rulemaking plan. The Department recently published a Request for Comment (85 FR 20886; April 15, 2020) concerning prioritization of rulemakings. The modernized Process Rule provides that stakeholders will have the opportunity to provide input on the prioritization of rulemakings as DOE begins its preparation of the Spring Regulatory Agenda. Through the publication of the Request for Comment stakeholders can offer input concerning which appliance rulemaking proceedings should be in particular action categories for the Spring Agenda. In making recommendations, stakeholders can utilize the regulatory text in the modernized Process Rule, Section 4, entitled, Setting Priorities for Rulemaking Activity that sets forth the factors the Department considers in making its priority-setting.

Question 8: There are two pending applications with the NRC to site a consolidated temporary storage facility for commercial spent nuclear fuel. One of the proposed sites is in New Mexico. I continue to be concerned that without an approved site for permanent geologic disposal, any proposed "temporary" storage

facility could easily turn out to be de facto "permanent" storage. Do you support the recommendation of the Blue Ribbon Commission to require state approval of any temporary consolidated storage facility for spent nuclear fuel and high-level waste?

> **Answer:** I understand your concern and can assure you that the Department is committed to fulfilling the Federal Government's legal and moral obligations to properly manage and ultimately dispose of the nation's spent nuclear fuel and high-level waste. We are working to develop a durable, predictable yet flexible plan that addresses the nation's nuclear waste challenges efficiently and effectively, and will ensure that appropriate consultation occurs with affected state and local communities, Indian tribes, and private entities when siting decisions are made concerning temporary storage facilities and repositories.

Question 9: What authority does DOE currently have to fund or contract with a private company for storage of spent nuclear fuel?

> **Answer:** As a general matter DOE does not currently have the authority to contract with a private company to store spent nuclear fuel.

Question 10: I believe renewable hydrogen could play a central role in reducing carbon pollution from the industrial, power and transportation sectors. What work is DOE doing to improve the efficiency and reduce the cost of producing green hydrogen using electrolysis and wind or solar electricity?

> **Answer:** DOE's Hydrogen and Fuel Cell Technologies Office (HFTO) in the Office of Energy Efficiency and Renewable Energy (EERE) has been funding research and development (R&D) of water splitting technologies, including electrolysis, and helped reduce the cost of electrolyzer stacks by over 80% since 2002. By establishing the National Lab-led HydroGen consortium, unique and world-class resources are made available to industry and university partners to accelerate progress and avoid duplication of capabilities. In FY 2019, fourteen competitively selected projects were awarded funds to help reduce the cost of hydrogen production. In FY 2020, a funding opportunity announcement included $15 million specifically for electrolyzer manufacturing R&D to help enable domestic manufacturing and drive down costs. Selections are anticipated in Summer 2020.

Question 11: What in your view are the prospects for converting hydrogen to synthetic liquid fuels, such as diesel or kerosene, for transportation applications?

> **Answer:** DOE's HFTO as well as Bioenergy Technology Office (BETO) have been investigating the use of hydrogen with carbon dioxide (CO_2) to produce synthetic methane as well as liquid fuels. The first and simplest approach is to produce methane (or CH_4); longer chain molecules like kerosene or diesel are more challenging at a cost that is affordable. We funded approximately $2.5 million for the first power to gas project in the U.S. that produces methane through a bioreactor, using hydrogen from electrolysis along with CO_2, and it is now being demonstrated at our National Renewable Energy Laboratory in Colorado by Southern California Gas Company. As part of this and other effects, HFTO and BETO work with the Fossil Energy Office on these types of Carbon Utilization projects. BETO has also been pursuing R&D in direct CO_2 reduction technologies, leveraging work

from and coordinating with DOE's Office of Science. In FY 2020 BETO issued a funding opportunity with covers both biological and electrocatalytic approaches to CO_2 utilization, totaling up to $22 million. These approaches could be used to form chemical intermediates which can then be upgraded to transportation fuels. In addition, hydrogen from renewables-powered electrolysis can be used to produce diesel, jet and other transportation fuels through hydrotreating of bio-oil. In support of all these efforts, in 2019 we formed a new Technical Team on Net Zero Carbon Fuels under our U.S. DRIVE partnership with automakers, energy companies and utilities to identify the most promising R&D strategies to produce liquid fuels.

Question 12: I have been impressed with the incredible response from DOE's National Laboratories in support of the nation and local communities with computer modeling, vaccine research and technical assistance during the covid-19 pandemic. I was also pleased Congress included direct funding to DOE in the Cares Act to support the response to the coronavirus. However, I would be interested in your assessment of how the National Laboratories have also applied funding set aside for Laboratory-Directed Research and Development to help the nation respond more rapidly to covid-19.

Answer: The Laboratory Directed Research and Development (LDRD) program at the DOE National Laboratories provides the flexibility to select and conduct innovative and cutting-edge research, as well as the ability to respond very quickly to the changing needs of the Department and the Nation. Specific examples of LDRD funded activities at Los Alamos National Laboratory (LANL) and Sandia National Laboratory (SNL) are included below, and encompass both the nation's immediate response as well as our ongoing rapid response efforts.

- Creating a new multiplex assay design to increase COVID-19 testing bandwidth, with the goal of being able to test an average of three times more patient samples in response to challenges resulting from lab infrastructure being unable to keep up with the demand for testing.
- Activities related to detection tools and medical countermeasures; specifically through the utilization of smartphone-based diagnostics to aid in screening for SARS-CoV-2 infection, as well as working to develop therapeutic antibodies that neutralize SARS-CoV-2 and modulate local immune responses.
- Creating the missing computational tools necessary to plan the optimal production, stockpile, and distribution scheduling (supply chain) for health care supplies; to provide decision makers with the capability to manage, in time and space, the existing health care supplies to confine the catastrophic impacts of COVID-19.
- Research and design of reusable smart PPE for use to fight the next pandemic.

The flexibility provided by the LDRD program to pursue these activities and many others has allowed the laboratories to utilize the unique expertise and vast scientific resources available to them to help the nation respond to the current pandemic.

Question 13: I have been pleased with the department's increased emphasis on development and application of artificial intelligence and machine learning, including the establishment of a new AI Technology Office.

Where do you see the near-term opportunities to apply AI and machine learning in the nation's energy sector?

Answer: DOE recognizes the power of big data and artificial intelligence (AI) to make us more efficient and deliver on our core missions. I am fully committed to ensuring DOE leads by example in this area, which is why we created the Artificial Intelligence and Technology Office (AITO) to synchronize and accelerate the research, development, delivery and application of AI. DOE recently announced an opportunity to provide up to $40 million over three years for new research in data, AI, and machine learning (ML).

The combination of American leadership in science, big data, and analytics are crucial to a positive future impact on the global energy sector. Digital data is the oxygen that fuels AI, but AI solutions are only as useful as the data that feeds it.

In order to be useful, data must be constantly curated, cleaned, properly labeled and secured. The end product of that complex process are reliable datasets that are ready for analysis by an AI algorithm which can reveal new, verifiable insights. Today, energy companies and other enterprises are creating that process as they go in effect building the car as they drive it. A more effective process would be for companies to develop forward-looking data strategies that anticipate the needs of AI, allow them to collect the right kinds of data in the right formats, secure it and ensure the appropriate level of privacy.

Developing sound Data Strategies that collect the right data in the right format that is securely stored, used ethically and that take advantage of the power of AI for analytics, could provide huge benefits to the energy industry from upstream exploration to the optimization of delivery.

For example, grid operators can utilize AI to incorporate energy sources in a stable and more predictable way. Used wisely, and fueled by accurate and useful data, AI can transform a company's business operations to potentially achieve cost savings and enhance productivity.

A second example includes the National Renewable Energy Laboratory (NREL), which is developing a novel control scheme to provide a software platform that gives utility companies the capability to seamlessly dispatch both legacy devices and energy resources to achieve system-wide performance and reliability targets—such as minimizing loss, reducing voltage violation, and correcting imbalance.

Finally, another example includes developing a database of geothermal drilling information in a wide range of geologic settings through the formation of an innovative collaboration with geothermal operators, developers and researchers worldwide, including world-leading expertise from the oil and gas industry. The knowledge of the human experts, in combination with AI employing ML methods, will be applied to create an Expert System to automate the process of assimilating and classifying new well and drilling data with minimal human interaction. This will facilitate continuous improvement in the ability of the AI/ML algorithms to identify factors that govern drilling

success. The goal of these projects is to achieve a 50% reduction in non-productive time in geothermal drilling.

I look forward to working with you to in order to develop near-term opportunities to apply AI and ML in the nation's energy sector.

Question 14: In what specific roles do you anticipate the national security laboratories to contribute to the department's AI initiative?

Answer: The national security laboratories will investigate and develop AI and ML methods associated with running high-fidelity, multiscale physics simulations on NNSA's supercomputers. More effective, faster-turnaround predictive simulations will in turn lead to increased agility in responding to changing threats, the ability to rapidly explore options, and ultimately inform an accelerated decision-making process. In addition, the labs will accelerate advances in physics-informed data science techniques to enable predictive simulations in areas where the scientific theory is not yet fully understood.

Question 15: I understand DOE's Loan Program Office now has a substantial backlog of applications and only a single new loan under the Title 17 Innovative Energy Loan Guarantee Program has been awarded under your purview as Under Secretary. LPO also manages the Advanced Technology Vehicles Manufacturing Program and the Tribal Energy Loan Guarantee Program. What in your view are the key impediments to DOE's review and processing of new loans and do you have specific recommendations on how Congress could improve the program to meet its intent of helping the nation deploy additional large-scale energy infrastructure projects?

Answer: The President's FY 2021 budget request proposes to eliminate the Title XVII Innovative Technology Loan Guarantee Program, the Advanced Technology Vehicles Manufacturing Loan Program, and the Tribal Energy Loan Guarantee Program, because the private sector is better positioned to finance the deployment of commercially viable energy and advanced vehicle manufacturing projects.

LPO has a number of projects in its transaction pipeline and there are parties who are still interested in applying. During the remainder of FY 2020, the LPO will continue to work with applicants to any of its programs.

The programs administered by the LPO are intended to not compete with the private sector, therefore the projects that engage with LPO are typically complex in nature. There is inherent complexity in commercializing new and innovative technology, developing energy infrastructure on Tribal lands, and building large, commercial-scale projects. The result is longer development timelines than conventional energy projects financed by the private sector.

As I mentioned during my confirmation hearing, I have directed the Department's Loan Programs Office to conduct a detailed review of its regulations and policies and make recommendations for

changes that may be needed to more effectively utilize the program. I commit to continue working with Congress on this matter.

Question 16: Under section 3119 of the FY 17 National Defense Authorization Act (Public Law 114-328; 50 U.S.C. 2791 note, as amended), DOE was required by February 15th to submit to the Armed Services Committee a report on the impact of assessing G&A overhead on the Laboratory-Directed Research and Development program at the National Laboratories. What is the status and timeline for submitting the required report?

Answer: The report has been developed and is currently in the final stages of the Department's concurrence process. It is expected to be delivered to Congress soon.

Question from Senator Mazie K. Hirono

Question: I am a co-sponsor of the Better Energy Storage Technology Act (S. 1602), which was part of the Chair and Ranking Members' American Energy Innovation Act that the Senate considered in March. It authorizes $1.4 billion over five years for energy storage research and demonstration projects. Energy storage will play an important role in helping homes and businesses in Hawaii enjoy the benefits of renewable power as the state transitions to 100% renewable power by 2045. Hawaii is also suffering through 34 percent unemployment right now and there are many people who would like a well-paying job helping to build and install energy storage systems.

Do you agree energy storage is a critical component of a resilient, reliable grid, and if so, what steps will you take to as Deputy Secretary to speed up the demonstration and deployment of energy storage?

Answer: Energy storage is a critical component of a resilient and reliable grid. The reliability and physical security of our grid are essential to our Nation's national security, and ensuring this reliability is a crucial role of DOE. If confirmed, I am committed to advancing energy storage research and development (R&D) in an effort to strengthen our grid security. Earlier this year, the Secretary announced the Energy Storage Grand Challenge, a cross-cutting initiative which integrates DOE's energy storage efforts across the Department's programs, and will accelerate the development, commercialization, and utilization of next-generation energy storage technologies and sustain American global leadership in energy storage. While R&D is the foundation of advancing energy storage technologies, DOE recognizes that global leadership also requires addressing associated challenges. This is why DOE established the Grand Challenge with a series of goals that address a comprehensive suite of challenges:

1. Technology Development: Establish ambitious, achievable performance goals, and a comprehensive R&D portfolio to achieve them;
2. Technology Transfer: Accelerate the technology pipeline from research to system design to private sector adoption through rigorous system evaluation, performance validation, siting tools, and targeted collaborations;

3. Policy and Valuation: Develop best-in-class models, data, and analysis to inform the most effective value proposition and use cases for storage technologies;
4. Manufacturing and Supply Chain: Design new technologies to strengthen U.S. manufacturing and recyclability, and to reduce dependence on foreign sources of critical materials; and
5. Workforce: Train the next generation of American workers to meet the needs of the 21st century electric grid and energy storage value chain.

The Energy Storage Grand Challenge is a cross-cutting effort managed by DOE's Research and Technology Investment Committee (RTIC). The Department established the RTIC in 2019 to convene the key elements of DOE that support R&D activities, coordinate their strategic research priorities, and identify potential cross-cutting opportunities in both basic and applied science and technology. In September 2018, Congress passed the "Department of Energy Research and Innovation Act" codifying the efforts of the RTIC.

Since launching the Energy Storage Grand Challenge in January, DOE has hosted a series of workshops to gather public feedback as the Department works to develop a comprehensive roadmap that coordinates DOE's resources to advance the goals of the Grand Challenge. DOE intends to issue a Request for Information in the coming weeks, and our goal is publish a final roadmap by the end of the fiscal year.

Questions from Senator Cindy Hyde-Smith

Question 1: There is significant interest at the Department of Energy regarding the testing and research for NQA 1 certification of filters for nuclear processing facilities. It has been determined that the next generation of containment ventilation technologies, along with a trained scientific workforce, is critical for the safety of nuclear energy going forward. The Department has also expressed a strong interest in the need to establish infrastructure to advance and fill a void in the filtration testing area. In order to most effectively and efficiently achieve this goal, I believe it is necessary to implement and designate a federally-funded research and development center to provide federal agencies with research and development capabilities that cannot be met effectively by the federal government or the private sector alone. Currently, 13 federal agencies sponsor or cosponsor a total of 42 federally-funded research and development centers to provide research and development capabilities in support of a broad range of federal mission areas.

Does your agency currently have the authority to establish additional federally-funded research and development centers, and will you work with me to determine a path forward to establish this designation in order to accomplish the goal of advancing the work of nuclear filtration containment and filtration testing?

Answer: The Department has the general authority to establish facilities and offices as necessary to carry out Departmental missions, consistent with applicable law and the availability of appropriations. Should I be confirmed, I'd be happy to work with you and your staff to chart a path forward to accomplish the goal of advancing the work of nuclear filtration containment and filtration testing.

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Question 2: I want to discuss the Department's role in innovation of energy infrastructure. As you discuss in your testimony, the Department has been taking many steps to enhance the security of the grid system. On May 1, the President also issued an executive order on the safety and security of the Bulk Power System.

President Trump's Executive Order captured the attention of many in my home state of Mississippi, including utilities. What is the Department's plan to engage with the utility sector as you move to implement the President's Executive Order?

Answer: President Trump's Executive Order, Securing the United States Bulk Power System, will greatly diminish the ability of foreign adversaries to target our critical electrical infrastructure and is vital to the Nation's energy security, supporting national defense, emergency services, critical infrastructure, and the economy. The Department of Energy started working with industry immediately after the President signed Executive Order 13920, and will continue to work with industry leadership, including with the Electricity Subsector Coordinating Council and Oil and Natural Gas Subsector Coordinating Council. These engagements will include Entergy, Southern Company, and the Tennessee Valley Authority (TVA), among others. TVA, specifically, is anticipated to be a critical partner with the Task Force on Federal Energy Infrastructure Procurement Policies identified in the Executive Order.

I am committed to maintaining and strengthening public-private partnership and engagement at DOE as we implement the Executive Order. I look forward to continue to work with Congress and industry in these efforts should I be confirmed as Deputy Secretary of Energy.

Question 3: Undersecretary Menezes, the Department's Isotope Program has long asserted that it complies with the direction in the Atomic Energy Act that DOE facilities should not directly compete with the U.S. private sector. Specifically, where the private sector is capable of meeting the market demand for isotopes, it should be allowed to do so without competition from DOE.

a. What specific due diligence does DOE's Isotope Program perform to determine whether there is a commercial supplier of an isotope available when it receives a request to supply a particular isotope?

Answer: The DOE Isotope Program does not compete with domestic industry, but rather complements our industry partners. The DOE Isotope Program assesses the adequacy of supply from the private sector in consideration of factors specified in the Department's "Policies and Procedures for Transfer of Commercial Radioisotope Production and Distribution to Private Industry" (30 Fed Reg 3247), such as demonstrable and reliable production capability, effective market competition, adequacy of product capacity, and reasonableness of pricing, to ensure that domestic users have reliable supplies of critical isotopes.

b. Does DOE contact known domestic suppliers of particular isotopes to confirm their inability to meet particular supply requests that the Department receives?

Answer: When the DOE Isotope Program receives orders for isotopes available from domestic commercial suppliers, the DOE IP obtains confirmation from the customer that domestic commercial

suppliers cannot fulfill those orders; otherwise, the Isotope Program would not sell the isotope to the customer. The DOE's Isotope Program maintains close communications with new domestic isotope producers to remain current with their ability to meet the demands of the nation.

c. What other specific sources of information does DOE rely upon in determining whether commercial supply of isotopes is not available in the United States?

Answer: The Isotope Program continuously monitors isotope production domestically and worldwide using information from customer/stakeholder interactions, global trade data, professional societies, trade organizations, and independent market assessments and research.

Question 4: Undersecretary Menezes, as you are aware the appropriate pricing of isotopes is a critical part of ensuring that DOE allows private sector suppliers of isotopes to prosper.

d. Can you please describe in detail the process DOE uses to set prices for sales of isotopes to for-profit entities?

Answer: The Department sets prices for its isotopes consistent with applicable law and Departmental policies to assure reasonable compensation and not be discriminatory. Prices for sales of isotopes to for-profit entities are based on full cost of production and distribution or market value of the isotope, whichever is higher. Detailed cost estimates for isotope production are prepared annually or when there is a change in production process. Market value is assessed considering factors such as market (other suppliers) prices and value of the isotope to the recipient.

e. Does DOE set fees related to the Isotope Program in such a manner as to provide full cost recovery for the Department? If the answer is no, how would DOE's isotope pricing change if full cost recovery was required?

Answer: The Department sets fees for the sale of isotopes to for-profit entities based on full cost of production and distribution or market value of the isotope, whichever is higher. Cost estimates for isotope production are comprehensive, capturing direct and indirect (allocable) costs of producing and selling the isotopes as provided for in DOE's Financial Management Handbook Chapter 15, Cost Accounting.

f. If you are confirmed by the Senate to serve as Deputy Secretary of Energy, what actions would you take to ensure the Department refrains from improperly competing with the domestic isotope supply industry?

Answer: In accordance with applicable law and Departmental policies and orders, the Department does not improperly compete with the domestic isotope supply industry. If confirmed as Deputy Secretary of Energy, I will ensure that all applicable laws and Departmental policies and orders will continue to be upheld and followed.

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Questions from Senator Catherine Cortez Masto

Question 1: Is the Administration pursuing Yucca Mountain as a permanent high-level nuclear waste disposal site?

Answer: No. The Administration believes the standstill on Yucca Mountain has gone on too long and is looking to identify opportunities for near-term progress on managing the nation's nuclear waste and consideration of longer-term innovative approaches while recognizing the importance of stakeholders' willingness to participate.

Question 2: Does the Administration intend to pursue Yucca Mountain as a nuclear waste interim storage site?

Answer: The Administration is seeking to shift direction from funding the licensing of Yucca Mountain to the development and implementation of a robust interim storage program and research and development on storage, transportation, and disposal alternatives, with a focus on solutions deployable where there is a willingness to host.

Question 3: As this Administration commits to look for alternative short- and long-term solutions to address the nuclear waste issue, will you commit to working with me and my colleagues in Congress to establish a consent-based process for interim and long-term nuclear waste storage and disposal?

Answer: The Administration believes the standstill on Yucca Mountain has gone on too long and is looking to identify opportunities for near-term progress on managing the nation's nuclear waste and consideration of longer-term innovative approaches while recognizing the importance of stakeholders' willingness to participate. I look forward to working with you and your colleagues to find both short term and long term solutions for the storage and disposal of spent nuclear fuel.

Question 4: In 2012, the Blue Ribbon Commission on America's Nuclear Future recommended that an agreement be reached between the Department and the governor, local governments, and affected tribes before pursuing an interim or long-term nuclear waste storage facility. Many in Congress have proposed legislation to establish such a consent-based siting process.

A. Have you reviewed my bill, the Nuclear Waste Informed Consent Act (S. 649)?

Answer: I have reviewed the Nuclear Waste Informed Consent Act, which would require DOE to enter into an agreement with state before it could site a repository in that state. The Administration believes the standstill on Yucca Mountain has gone on too long and is looking to identify opportunities for near-term progress on managing the nation's nuclear waste and consideration of longer-term innovative approaches while recognizing the importance of stakeholders' willingness to participate. I look forward to working with Congress to craft legislation that finally makes progress on the consolidated storage of spent nuclear fuel, as well as its permanent disposal.

B. Would the Department support the bill or any aspects of S. 649?

Answer: As mentioned above, the Administration believes the standstill on Yucca Mountain has gone on too long and is looking to identify opportunities for near-term progress on managing the nation's nuclear waste and consideration of longer-term innovative approaches while recognizing the importance of stakeholders' willingness to participate. I look forward to working with Congress to craft legislation that finally makes progress on the consolidated storage of spent nuclear fuel, as well as its permanent disposal.

C. Have you reviewed Chairman Murkowski's bill, the Nuclear Waste Administration Act (S. 1234)?

Answer: I have reviewed S.1234 and I applaud Chairman Murkowski's dedication to developing a legislative solution for the challenges associated with the storage and disposal of spent nuclear fuel.

D. Given the Administration's acknowledgement of Nevada's opposition to the Yucca Mountain project, would the Department support Senator Rosen's and my efforts to ensure Nevada is treated the same as every other state by allowing Nevada to participate in the consent-based siting process established in S. 1234?

Answer: The Administration is looking to identify opportunities for near-term progress on managing the nation's nuclear waste and consideration of longer-term innovative approaches while recognizing the importance of stakeholders' willingness to participate, which would include Nevada along with every other state.

Question 5: While the Administration has stated that it no longer intends to pursue the Yucca Mountain project, there are still efforts to force the project on my home state. The risks this ill-conceived project pose to Nevadans are all the more concerning following the recent seismic events in the area. As you may know, on May 15, 2020, Nevada experienced a 6.5 magnitude earthquake near the town of Tonopah. This was the third earthquake within 150 miles of the proposed Yucca Mountain site to measure above a magnitude 6 in less than a year.

A. Is the Department committed to reassessing the seismology of Yucca Mountain before there could be any further consideration of the site being used to store nuclear waste?

Answer: I want to assure you that the Administration would not pursue any site for interim storage or permanent repository of nuclear waste without adequate seismological evaluations.

Question 6: The Department of Energy (DOE) previously shipped a half-metric ton of plutonium to the Nevada National Security Site (NNSS) from the Savannah River Site in South Carolina. Secretary Brouillette has committed to honor the agreement I secured with DOE, as codified in an April 24, 2019 letter, to remove the plutonium from NNSS beginning in 2021 and completing removal by 2026.

A. Will you also commit to begin removal of the one-half metric ton of plutonium from NNSS in 2021 and complete removal by 2026?

Answer: I am committed to commencing removal of this material from Nevada beginning in calendar year 2021, and completing the removal by the end of 2026, pursuant to the terms of the April 24, 2019, letter signed by Secretary Perry.

Question 7: In July 2019, the State of Nevada and the Nevada Congressional Delegation were notified that the DOE violated its waste acceptance criteria agreement by shipping misclassified waste from the Y-12 National Security Complex in Oak Ridge, Tennessee to the Nevada National Security Site. Last month, the DOE completed its initial assessment of radioactive waste management at the Y-12 Complex.

A. What are the next steps the DOE will take to ensure the Department does not violate its contracts in the future and prevent misclassified waste from being transported on our nation's roadways?

Answer: After a detailed characterization review of the materials shipped to the Nevada National Security Site (NNSS), the Y-12 National Security Complex (Y-12) determined that the materials were appropriately characterized as low-level waste and did not include a hazardous waste constituent of concern. However, to strengthen waste characterization protocols prior to offsite shipment, Y-12 developed a corrective action plan. This corrective action plan has been accepted by the NNSS and is being implemented. Y-12 will implement processes to fully characterize nuclear weapons-related materials and radioactive waste prior to shipment to disposal facilities. Additionally, real-time radiography will be added at Y-12 to detect improper materials or free liquids, thereby providing technical capability to reliably characterize at the source. It is anticipated all Y-12 corrective actions and NNSS reauthorization of shipments will be complete by the end of FY 2020. NNSS will re-audit the Y-12 waste certification at that time.

Question 8: In the FY 2020 Appropriations Act, Congress directed DOE to provide the House and Senate with a report within 90 days that analyzes innovative solutions for the disposition of high-level waste and spent nuclear fuel, with priority given to technological options that are cost effective, can be implemented in the short-term, and consider stakeholders in the siting process.

A. What is the current status of this report?

Answer: The Office of Nuclear Energy led the development of that report which analyzed innovative solutions for the disposition of high-level radioactive waste and spent nuclear fuel. The report is in the final concurrence review and I expect to be able to deliver it to the House and Senate in the near future.

B. Do you anticipate that the report will address consent-based siting of nuclear waste storage and disposal facilities, geologic repository programs in other countries, and alternative geologic disposal technologies, such as deep borehole disposal?

Answer: The Conference Report specifically requests that the DOE report to "consider siting stakeholder engagement", and the draft DOE report does. The technological options considered in the draft report reflect the experience of other countries, and borehole disposal is also considered in the draft report.

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Question 9: As the nation recovered from the 2008 financial crisis, the clean energy sector demonstrated that it can play an important part in boosting the economy. Clean energy projects throughout the country have supported hundreds of thousands of jobs and provided communities with affordable clean energy solutions.

A. What role do you see clean energy playing in the nation's recovery from the COVID crisis?

Answer: I believe the nation's recovery from the COVID-19 crisis will include an all-of-the-above approach to energy investment that includes clean energy technologies.

B. What DOE programs and initiatives would benefit from added support to better equip the Department's contributions to the nation's recovery?

- **Answer:** DOE's Office of Energy Efficiency and Renewable Energy (EERE) fulfills its mission by conducting cutting-edge research and development (R&D) to improve the affordability of clean energy technologies. These valuable efforts have a positive impact on the economy, and energy affordability and will contribute in the recovery from the COVID-19 crisis. For example, EERE continues to announce new Funding Opportunity Announcements (FOA) supporting the R&D of renewable energy technologies during the COVID-19 pandemic and continues to select and announce winners of innovative competitions.

    - On March 31, EERE's Water Power Technologies Office announced up to $22M for marine energy foundational R&D and testing infrastructure upgrades.

    - On April 1, EERE's Wind Energy Technologies Office announced a $20M FOA to support offshore wind development by improving the ability to forecast energy production, and by demonstrating innovative technologies not yet deployed at commercial scale.

    - On April 6, three EERE technology offices, led by EERE's Solar Energy Technologies Office (SETO), announced $4.5M in funding for training programs that target professionals who are newly interacting with distributed energy resources, such as solar energy systems, energy storage systems, efficient building technologies, and alternative-fuel vehicles.

    - On April 6, SETO announced the Solar Desalination Prize, a $9 million prize competition designed to accelerate the development of low-cost desalination systems that use solar-thermal power to produce clean water from salt water.

    - On April 27, EERE's SETO announced the winners of the Solar District Cup via webinar. The Solar District Cup challenges multidisciplinary student teams to design and model optimized distributed solar energy systems for a campus or urban district. Instead of holding an event in person, the finalists presented their projects to a panel of expert judges in a live video conference.

Question 10: I understand that the Department has released its four-phase plan to reopen its facilities in Washington, DC, and throughout the country, including NNSS.

A. What processes are in place to ensure that the concerns of workers are being heard, understood, and addressed during this phased transition back to normal operations?

Answer: The health and safety of DOE workers is paramount and guides all actions to return the workforce to DOE facilities. DOE's phased plan will follow local guidelines to identify gating criteria to enter the different phases for reopening. Decisions to return additional employees to work at a DOE facility will be based on a risk analysis that includes consideration of the criteria for progression through phases as outlined in the OMB memo M-20-23, or any superseding guidance. DOE will maintain transparent communication with the workforce and key external stakeholders as it plans and initiates remobilization activities. DOE will continue to use a variety of communication methods to help connect the workforce to information about the phased return to normal operations. DOE and supervisors are communicating our current status, along with weekly updates on a DOE wide basis for COVID related news. Additionally, DOE has a COVID-19 hotline that is staffed to take in feedback, and answer questions via telephone or email to employees with concerns, questions, or suggestions.

Question 11: The FY 2021 Budget Request once again proposes a drastic cut (of more than $2 million) to the Office of Energy Efficiency and Renewable Energy. These cuts would threaten Nevada's clean energy economy and future growth.

A. Are you supportive of these proposed cuts?

Answer: I support the President's budget and recognize the crucial role Congress plays in determining the Department's funding levels.

Question 12: As we all know, our cybersecurity efforts will only be successful if we actively cultivate a skilled and technical workforce. Finding, training, and retaining those individuals is a challenge, which is only heightened in the midst of the pandemic.

A. Has the pandemic affected the Departments efforts in cybersecurity?

Answer: DOE has been keenly focused fulfilling our Primary Mission Essential Functions during the ongoing pandemic, including our cybersecurity support to the energy sector. DOE has coordinated continuous monitoring of classified information sources for our internal and external stakeholders throughout this time and has published formal reports, Analysis of Risk to the Energy Sector (ARES), to highlight ongoing cybersecurity issues of note for the sector. These items have been shared via the energy-focused Information Sharing and Analysis Centers (ISACs) as well as communicated by DOE leadership directly to the sector during our Electricity Subsector Coordinating Council (ESCC) and Oil and Natural Gas Subsector Coordinating Council (ONG SCC) engagements each week. The ongoing approach to mitigate impacts to the workforce due to COVID-

19 has slowed some of our ongoing developmental efforts with industry, but these should rapidly accelerate as we enter the phased reopening of our DOE sites.

B. What is the Department doing to boost cybersecurity during this critical time?

Answer: In addition to ensuring that critical cybersecurity services are available during the pandemic, the DOE team has continued to bring additional industry partners online within our information sharing platform, Cybersecurity Risk Information Sharing Program (CRISP), and has engaged with service providers in this field to identify opportunities to pilot new tools and capabilities to further situational awareness. Additionally, DOE has engaged with stakeholders at all levels of government (State, Local, Tribal, and Territorial) and all segments of industry to clearly identify new and emerging risk that has presented itself during this pandemic. DOE has also independently and jointly authored products to directly communicate on specific risk items that have been identified throughout the global energy community. We have recently released a Cybersecurity Best Practices for Industrial Control Systems infographic along with our partners at the Department of Homeland Security's Cybersecurity and Infrastructure Security Agency and the United Kingdom's National Cyber Security Centre (link: https://www.cisa.gov/sites/default/files/publications/Cybersecurity_Best_Practices_for_Industrial_Control_Systems.pdf). Lastly, multiple offices that support DOE's cybersecurity mission space have redoubled their planning efforts for the DOE Integrated Security Center (DISC) which will allow for DOE to more quickly and effectively collaborate during peacetime and a crisis, in an appropriately secured environment, to perform analysis, modeling, and operational coordination to protect the DOE Enterprise and energy sector from cyber threats.

C. Is there anything Congress can do to help?

Answer: We have enjoyed great support from Congress and look forward to your continued support in the area of cybersecurity.

Question 13: The National Academies of Sciences (NAS) *Review of the Department of Energy's Plans for Disposal of Surplus Plutonium in the Waste Isolation Pilot Plant* report recommends that DOE "should implement a new comprehensive programmatic environmental impact statement (PEIS) to consider fully the environmental impacts of the total diluted surplus plutonium" disposal program for up to 48.2 metric tons. "… [A] PEIS for the whole of surplus plutonium that considers all affected sites as a system is appropriate to address the intent and direction of the National Environmental Policy Act and would better support the need for public acceptance and stakeholder engage by affording all the opportunity to contemplate the full picture."

A. Has DOE accepted this recommendation?

Answer: DOE intends to prepare a new Environmental Impact Statement (EIS) for disposal of surplus plutonium that holistically evaluates the impact of the proposed action under all reasonable alternatives, including the dilute and dispose strategy. This would include potential impacts at all relevant sites in the DOE Complex supporting the program.

B. What actions are being taken by DOE to implement this recommendation?

Answer: To date, DOE has prioritized actions to expedite removal of surplus plutonium from South Carolina in response to Congressional expectations. However, we expect that an EIS for disposition of surplus plutonium will be initiated in the near future.

Question 14: The NAS report cites a cost estimate of $18.2 billion in FY 2017 dollars for dilution and disposal of 34 metric tons.

A. What is the Department's level of confidence in the $18.2 billion cost estimate for 34 metric tons cited in the report?

Answer: The $18.2 billion cost estimate is at the 50% confidence level. The 80% confidence level estimate is $19.9 billion.

B. What is the Department's estimate for these costs in FY 2020 dollars?

Answer: The $18.2 billion cost estimate in the report is in Then-Year dollars, which accounts for inflation and not in FY 2017 dollars, which would remove the effect of inflation. In FY 2017 dollars the equivalent cost is $10.6 billion and in FY 2020 dollars the estimate is $11.7 billion.

C. What is the Department's estimate for the cost of disposing 48.2 metric tons in FY 2020 dollars?

Answer: NNSA has not developed a lifecycle cost estimate for the 48.2 metric tons of surplus plutonium referenced in the NAS report because the disposition approach has not been determined for that entire quantity of material.

Question 15: While DOE's previous MOX fuel program for disposing surplus weapons plutonium has now been abandoned, current statute appears to require DOE to remove from South Carolina by January 2022, all of the remaining weapons plutonium shipped into South Carolina for use in the MOX plant. The amount of plutonium requiring removal has been estimated to be more than 10 metric tons.

A. Is 10 metric tons an accurate estimate of the remaining plutonium originally intended for use at the MOX plant?

Answer: As of September 2019, there was approximately 9.5 metric tons of surplus plutonium remaining in storage at Savannah River Site that was brought to the site after 2002 and is subject to the MOX legislation.

B. How does DOE plan to comply with the requirement to remove the remaining plutonium from South Carolina?

Answer: DOE continues to pursue the dilute and dispose strategy to permanently dispose of surplus weapons-useable plutonium as quickly and efficiently as possible. The removal of plutonium from SRS is a priority for the Department.

Question 16: The President's FY 2021 Budget Request includes $97 million for the Department's Energy Storage Grand Challenge (ESGC). In the Budget in Brief, the ESGC vision "is to create and sustain global leadership in energy storage utilization and exports, with a secure domestic manufacturing supply chain that is independent of foreign sources of critical materials, by 2030."

A. It is my understanding that this program will be looking beyond existing lithium-ion technologies, but what role do you expect lithium to continue to play in ESGC research and development in battery and domestic critical mineral production?

Answer: DOE's Energy Storage Grand Challenge, announced by Secretary Brouillette in January 2020, takes a holistic view of energy storage, coordinating work across multiple offices in pursuit of a comprehensive strategy to position the U.S. for global leadership in the energy storage technologies of the future. Lithium will continue to play a role in energy storage technologies and domestic critical mineral production. In the short to medium term, lithium battery technologies are the preferred energy storage technology for electric vehicles. In addition to electric vehicles, these batteries have low cost, fast charge capabilities, and large energy density which have the potential to be used by other energy storage sectors.

Thus, the Energy Storage Grand Challenge will include research and development in many technologies, including lithium battery technologies. AMO and VTO are pursuing R&D for (1) enhanced lithium-ion batteries (2) next-gen lithium-ion batteries and (3) next-gen lithium-based battery technologies. Advances in these lithium battery technologies can enhance features including high energy capacity, extreme fast charging compatibility, low temperature performance, improved abuse tolerance, and high voltage stability while also meeting aggressive cost targets. In addition, the new advance battery technologies DOE is researching are intended to be low to no cobalt so as to reduce the need for this imported critical material.

B. Will there be opportunities for the Department to engage with Nevada, a domestic lithium producing state, in helping to increase our critical mineral security and make advancements in lithium-based battery technologies?

Answer: There are opportunities to engage DOE on research and development on lithium-based battery technologies. EERE (AMO, GTO and VTO) will host a workshop on Battery Critical Materials Supply Chain Opportunities. A virtual open meeting is scheduled for this summer. Followed by an in-person workshop with interactive breakout sessions planned for this fall. On May 14, AMO released a $30 million Funding Opportunity Announcement to advance next-generation technologies and field validation of technologies for critical materials extraction, separation and processing including lithium.