U.S. Senate Committee on Energy and Natural Resources
March 4, 2021 Hearing: *The Nomination of David M. Turk to be Deputy Secretary of Energy*
Questions for the Record Submitted to Mr. David M. Turk

Questions from Ranking Member John Barrasso

Question 1: The Unites States has "rejoined" the Paris Agreement. The Agreement has not been ratified by the U.S. Senate. If the Paris Agreement is not ratified, is the Paris Agreement legally binding in any way, including as a basis for regulation?

Answer 1: On January 20, 2021, President Biden signed the instrument to rejoin the Paris Agreement, which took effect 30 days later. If confirmed, I will look to the State Department and the Department of Justice concerning the legal force and effect of the instrument.

Question 2: Is keeping American energy costs low critical to our nation's economic success?

Answer 2: Yes. If confirmed as Deputy Secretary, I will work to ensure that energy costs are low across the country and foster a market that is fair for all Americans.

Question 3: Under what specific circumstances do you believe the federal government should continue to allow utilities to use coal to generate electricity now and in the future?

Answer 3: To reach our net zero emissions goals, the United States will need to employ technology solutions for all fuel sources. If confirmed as Deputy Secretary, I will work with Secretary Granholm to commit departmental resources to carbon management across the fuel and technology spectrum. I am particularly excited by the opportunities for game-changing advances in carbon capture in the next several years.

Question 4: Do you oppose the direct use of natural gas in residential, commercial, and other buildings for the purposes of space heating, water heating, cooking, and clothes drying?

Answer 4: It is my understanding that the Department of Energy does not determine what fuels are to be used in the nation's buildings. Congress has authorized the Department to assess the updated building codes resulting from three-year improvement cycles and to see if these updated codes improve energy efficiency over the prior code as well as to provide technical assistance to state and local jurisdictions as they seek to update their building energy codes. If confirmed, I will see that the Department fulfills its responsibilities.

Question 5: In her answers to the questions for the record from her confirmation hearing, Secretary Granholm stated, "The ability of generation capacity to respond when called upon is one of many important attributes of performance that should be valued in the markets." Do you agree with Secretary Granholm?

Answer 5: Yes.

Question 6: Our nation's civilian electric grids supply power to the vast majority of critical defense facilities. DOE's policies will have a direct effect on the reliability and resilience of the electric grids. If confirmed, how will you ensure that our most critical national security assets have reliable and resilient electric service while confronting cyberattacks and physical threats?

Answer 6: If confirmed as Deputy Secretary, I will review the DOE Office of Cybersecurity, Energy Security and Emergency Response for additional cybersecurity monitoring tools and threat information sharing. It is my understanding that the Office of Electricity is implementing a Defense Critical Electric Infrastructure strategy and program that is focused on strengthening the reliability and resilience of the nation's energy infrastructure, to include a public-private national security capability focused on cyber and physical threats affecting critical defense facilities. The Department is also investing heavily in microgrid technologies that can be used to isolate and self-power discreet areas such as defense facilities in case of attack or natural disaster affecting the power grid. Additionally, the Department's Office of Electricity is collaborating with eight National Laboratories and relevant stakeholders to develop an integrated North American Energy Resilience Model (NAERM) to conduct the systematic identification of threats to the nation's energy infrastructure, the development of market approaches for resilience investments to reduce exposure to these threats, and enhanced situational awareness and sophisticated analytics to minimize the impact of threats and increase resilience as they evolve in real time.

Question 7: On his first day in office, President Biden suspended for 90 days President Trump's Executive Order #13920 on Securing the United States Bulk Power System. This order granted the Secretary of Energy authority to prohibit the acquisition or installation of equipment in the bulk power system that is deemed a threat to national security because of foreign ownership, control, or interest. Given the well-documented threats against our nation's critical infrastructure, and particularly energy infrastructure, how will suspending the order improve our nation's energy and national security? If confirmed, do you commit to briefing the Committee on the president's reasons for suspending the order and any plans to revoke or amend the order?

Answer 7: Yes. If confirmed, I look forward to educating myself further on the particulars of this issue, and would be happy to further discuss with the Committee.

Question 8: Energy supply chains are becoming increasingly reliant on Chinese-manufactured goods, particularly, for example, components for solar and wind energy. How should the Biden administration address energy security threats that can arise from Chinese components?

Answer 8: The increasing complexity of supply chains, coupled with the reduced visibility that comes from proliferating subcomponent suppliers, is an attractive opportunity for adversaries to insert malicious code and hardware during manufacture. The President's Executive Order on Made in America will support the rebuilding of domestic manufacturing. It is my understanding that DOE is supporting supply chain risk assessments to address security threats. If confirmed as Deputy Secretary, I will work with Secretary Granholm to review the Department's work in this area to ensure DOE is adequately addressing the issue of potential energy security threats.

Question 9: The Nuclear Waste Policy Act (NWPA) directs DOE to site, construct, and operate a geologic repository for high-level waste at Yucca Mountain. DOE has failed to fulfill its legal obligation to move forward with the repository. If confirmed, how do you plan to ensure that DOE complies with the NWPA?

Answer 9: I support examining the recommendations from the "Blue Ribbon Commission on America's Nuclear Future", which recommended seeking a consent-based approach to siting our nation's spent nuclear fuel and high-level radioactive waste. If confirmed, I look forward to working with you and other Members of Congress to make progress towards that goal.

Question 10: It is my understanding that DOE's Loan Program Office (LPO) sometimes utilizes appropriated dollars to pay for the credit subsidy costs of loan guarantees, which is the long-term amount the guarantee will cost the federal government. In your view, should taxpayer funds pay credit subsidy costs for LPO projects? Do you support increasing appropriations to cover the credit subsidy costs of loan guarantees? How would you protect taxpayers in the event that a recipient of a loan guarantee goes bankrupt?

Answer 10: In the past, Congress determined it was necessary to appropriate credit subsidy amounts for Advanced Technology Vehicles Manufacturing (ATVM) loans, Tribal Energy Loan Guarantees, and loans for certain renewable energy technologies that qualified for the 2009 American Reinvestment and Recovery Act (the 1705 program). It is my understanding that there is currently $2.4 billion remaining in appropriated credit subsidy for ATVM, $8.5 million for the Tribal Energy Loan Guarantee Program, and $160 million available for renewable energy projects. If confirmed as Deputy Secretary, I will review these programs in order to identify potential improvements and to more closely examine how to protect

American taxpayers in making these investments. I would also be happy to further discuss with you and other interested Senators.

Question 11: Do you consider merchant, as well as small refineries, part of our nation's critical infrastructure? If confirmed, do you pledge to play an active role in the administration to ensure that high Renewable Identification Numbers (RINs) prices will not jeopardize their viability?

Answer 11: Refineries are important to our economic and national security. The DOE's Energy Information Administration (EIA) provides transparent and detailed annual fuel supply and consumption data to the EPA for its analysis of the RINs market. If confirmed, I would support that effort to the extent appropriate.

Question 12: The Experimental Program to Stimulate Competitive Research ("EPSCoR") within DOE's Office of Science is designed to improve energy-related research in 24 largely rural states, including Wyoming. DOE needs to continue to build basic research capacity in EPSCoR states. If confirmed, would you support increasing funding for the EPSCoR program?

Answer 12: As you know, DOE's EPSCoR program strengthens investments in energy research for states and U.S. territories that do not historically have large federally supported academic research programs. Through broadened participation, DOE EPSCoR seeks to grow and strengthen the network of energy-related research performers across the Nation. Expanding investment in support of clean energy research is important for all segments of the DOE research community, including EPSCoR. Partnering among EPSCoR institutions and the DOE National Laboratories is a significant opportunity to promote development of strong research programs in these regions.

Question 13: Direct air capture is one of the technologies that has often been cited as a necessary tool to address climate change. In your view, how important is this technology, and what are the Biden administration's plans for supporting and investing in this technology?

Answer 13: Carbon dioxide removal will be required to address hard to avoid emissions to reach net-zero targets. Direct air capture is one approach (in addition to several others like mineralization, bioenergy with carbon capture, etc.) that must be deployed in order to achieve net-zero by 2050. It is my understanding that DOE is committed to finding the best paths forward and if confirmed as Deputy Secretary I look forward to advancing this important technology.

Question 14: The Senate depends on the Energy Information Administration (EIA) for reliable, non-partisan energy data and forecasts. If confirmed, will you ensure that EIA will not be subject to political pressures to tip the scales in favor of the president's policy preferences?

Answer 14: Yes.

Question 15: If confirmed, do you commit to maintain disclosure and conflict of interest policies for our nation's research organizations and institutions? If confirmed, will you work to identify and implement new disclosure and conflict of interest policies to further protect our nation's investments in new technologies, whether they are in energy, science, or national defense?

Answer 15: Yes.

Questions from Senator James E. Risch

Question 1: This Administration has announced big goals for cutting carbon emissions to mitigate the effects of climate change. What do you believe are the most promising nuclear efforts in our nation?

Answer 1: I believe that we need to prioritize our activities to preserve the existing fleet of nuclear reactors, deploy advanced reactor technologies, and expand nuclear energy to markets beyond electricity to enable us to meet our ambitious carbon reduction goals.

Question 2: In 2018, DOE established the Office of Cybersecurity, Energy Security, and Emergency Response, more commonly known as CESER. This office has provided the Department with a focus on the cybersecurity of our energy industrial control systems. Protecting our critical energy infrastructure from is one the nation's most pressing security challenges facing the United States today. As recent incidents have shown, bad actors are persistent in their efforts to access our nation's infrastructure and these efforts are increasing in their number and level of sophistication.

a. How does the cybersecurity work at the Idaho National Lab contribute to increasing our nation's cyber preparedness and response capabilities?

Answer 2a: Several DOE National Laboratories play a critical role in supporting the cybersecurity of the energy sector and our Nation with world-class and interdisciplinary expertise in cybersecurity, as well as other key areas including: energy systems, industrial control systems, modeling and simulation, and data analytics. At INL, DOE's Cyber Testing for Resilient Industrial Control System (CyTRICS) program enables DOE to evaluate software and firmware in energy sector equipment, with state-of-the art, intelligence-informed analytic capabilities from the National Laboratories, to identify and mitigate

cybersecurity vulnerabilities in the supply chain, helping to ensure the integrity and reliability of critical system components nationwide.

b. Can you share your thoughts on the importance of CESER to protecting our nation's critical energy infrastructure?

Answer 2b: DOE established CESER to elevate the Department's energy security responsibilities and safeguard U.S. critical energy infrastructure against growing and evolving cyber and physical threats. This mission is critical to ensuring that our nation can meet its clean energy goals in a secure, reliable, and resilient way.

c. Do you see value in having an Assistant Secretary focused on cybersecurity, energy security, and emergency response?

Answer 2c: Cybersecurity is a very important function within the Department that should be strengthened. If confirmed as Deputy Secretary, I look forward to working with Secretary Granholm and other DOE leadership as well you and other members of the committee on how to further strengthen our work in this critical area.

d. Should you be confirmed, how will you ensure that DOE maintains its leadership as the sector specific agency for energy?

Answer 2d: If confirmed, I will ensure that DOE maintains and advances its leadership as the sector specific agency by continuing to enhance the security of critical energy infrastructure to all hazards, mitigate the impacts of disruptive events and risk through preparedness and innovation, and respond to and facilitate recovery from energy disruptions in collaboration with other Federal agencies, the private sector, and State, local, tribal, and territory governments. DOE cultivates trusted partnerships with the energy sector and provides deep and extensive subject matter expertise from within the Department and from across the National Lab complex. Importantly, this expertise is specific to the uniquely critical and complex nature of the energy system.

Question 3: Last year, the Nuclear Energy Leadership Act was signed into law. This bill is critical to reestablishing U.S. leadership in nuclear energy by developing and deploying the next generation of advanced nuclear reactors.

a. How does the development of advanced nuclear reactors and technologies fit into this administration's climate change plan and how will you implement the Nuclear Energy Leadership Act and other legislation enabling the development of advanced nuclear?

Answer 3a: The development of advanced nuclear reactors and technologies is an important component of achieving our climate goals. The Department's Office of Nuclear Energy has a rich portfolio of advanced nuclear technology development and demonstration underway. If confirmed, I can commit to working with and supporting the Office of Nuclear Energy as the Department moves to implement those portions of the Nuclear Energy Leadership Act that were signed into law in the Energy Act of 2020.

b. These projects are expensive, and require a sustained funding commitment from both the Administration and Congress. What will you do to ensure that DOE seeks the funding necessary to keep these project moving forward?

Answer 3b: If confirmed, I will work you, Secretary Granholm, and our other Congressional partners to ensure an ambitious budget for nuclear energy research, development, and demonstrations.

Question 4: The INL site is storing a range of spent-fuel, including defense-related spent-fuel as well as commercial and research fuel from domestic and foreign reactors. I want to stress the importance of these cleanup activities at the Lab. As you work with DOE's Environmental Management program, can you commit to prioritizing resources to continue and accelerate the cleanup mission at the INL?

Answer 4: I understand the importance of continuing the Department's legacy cleanup activities at INL. If confirmed as Deputy Secretary, I commit to working with you and your staff to help ensure the cleanup of INL is conducted in a safe, effective, and cost-efficient manner.

Question 5: Last year DOE's Office of Environmental Management announced it would re-compete the Idaho Cleanup Project contract at INL. DOE required that contractor teams submit their proposals by July of 2020, and DOE announced that it would select a winner and begin transition by Monday, March 1, 2021.

The March 1st deadline has passed, and DOE has not announced when it will finally make an award decision. As Deputy Secretary, will you ensure that DOE finalizes the Idaho Cleanup Project procurement as quickly as possible, so that the hundreds of employees engaged in this important work can plan for which contractor is in charge, and when they can move forward?

Answer 5: Yes.

Question 6: Reasserting U.S. leadership in nuclear energy is critical for not only our domestic needs, but also for our national security. Russia and China are aggressively pursuing nuclear energy export agreements and

have sought to dominate global nuclear energy markets to extend their global influence. As Deputy Secretary of Energy you would have an important role in both the promotion and control of nuclear energy exports.

a. If confirmed, what actions will you take to support the development of advanced nuclear reactors in the United States?

Answer 6a: As Secretary Granholm has noted, the Department supports robust research, development, and demonstration of advanced nuclear technologies. The Department's Advanced Reactor Demonstration Program will enable the accelerated demonstration of many U.S. advanced reactor designs. If confirmed, I will work to ensure the success of this program and that our advanced nuclear technology development industry has the infrastructure and support needed to achieve demonstrations, licensing, and deployment of advanced nuclear technologies.

b. What are the national security implications of allowing Russia and China to lead the world in nuclear energy exports?

Answer 6b: I believe that energy is a national security issue and the sale of nuclear energy technology and reactors provides 100-year relationships with our international partners. It is imperative that we are successful in the export of U.S. technology to ensure strong safety and non-proliferation standards internationally.

c. What actions can the Department of Energy take to help the U.S. nuclear industry compete against these countries?

Answer 6c: Many countries are looking at nuclear energy to meet their growing energy needs and are interested in technologies developed in the United States. If confirmed, I will work across the Federal Government and with Congress to empower the U.S. nuclear industry to develop, demonstrate, and export American-made nuclear technology.

Question 7: In 2019, the IEA put out a report titled Nuclear in a Clean Energy System. You spoke to the Center for Strategic and International Studies about this report and highlighted the competitiveness of nuclear when lifetime license extensions were factored into the levelized cost of electricity. The report provided a number of recommendations to ensure a sound framework for lifetime extensions, including valuing the nature of nuclear power and clarifying safety requirements for longer life and more flexible operations.

a. Should you be confirmed, will you support lifetime extensions for the existing nuclear fleet?

Answer 7a: I believe that nuclear energy is an important part of carbon free baseload power and, as such, I think it is important that we work with the Nuclear Regulatory Commission on advancing lifecycle extensions of the current nuclear fleet, where appropriate.

b. What actions would you support to prevent premature closure of existing nuclear reactors due to unfavorable electricity markets.

Answer 7b: If confirmed, I would support ongoing research, development, demonstration, and deployment (RDD&D) activities, and work with industry and the Nuclear Regulatory Commission (NRC) where appropriate to improve their competitiveness. I would also work with Congress, the Federal Energy Regulatory Commission (FERC), and regional and state policy makers to explore market reforms that could value the firm low-carbon attributes nuclear energy provides our energy system.

c. Are there non-electrical products that nuclear facilities could utilize to enhance revenue?

Answer 7c: Yes, nuclear facilities could create industrial and chemical products, such as hydrogen, synthetic fuels, and clean water to enhance revenues. For example, it is my understanding that DOE is partnering with industry to demonstrate hydrogen production at two existing nuclear power facilities.

d. What role does nuclear energy research and development play in ensuring the current fleet of nuclear reactors can continue to provide emission free energy?

Answer 7d: Nuclear energy RD&D has an important role in ensuring that the current fleet continues operation by improving performance and increasing revenue streams. RD&D also provides pathways to demonstrate how nuclear energy can be used to generate chemical and industrial products, opening the door to decarbonize other difficult to remediate sectors.

Question 8: Hydrogen technologies are considered an important component in mitigating climate change and supporting domestic energy independence.

a. Can you discuss the integration of blue and green hydrogen into our future energy systems? Do you view hydrogen produced from nuclear energy as "green hydrogen?"

Answer 8a: Hydrogen produced using renewables (wind or solar) has been generally termed "green" while hydrogen produced by nuclear has been generally termed "pink." Regardless of the color – both

routes of hydrogen production are low-carbon when incorporating the life cycle considerations of the renewable and nuclear energy resources from cradle to grave.

b. What role do you see the DOE National Laboratories playing in hydrogen R&D and how do we bring the labs' developments to the market?

Answer 8b: The DOE National Laboratories have major roles to play in fundamental R&D, applied R&D, interactions with academia and industry, and stewardship of world-class user facilities for all of these purposes. Our Labs also play a critical role in de-risking technology deployment through systems integration, demonstration, and strategic analyses to identify gaps and opportunities. In addition, through the Labs and universities, the Office of Science supports transition of fundamental hydrogen R&D to applied R&D and technology, often leading to follow-on awards from DOE technology offices, ARPA-E, or other agencies. The Labs' experimental and computational user facilities also enable these activities by providing instrumentation and expertise to the user communities, including industrial users from major companies and small businesses. All of these areas can be further supported and strengthened.

Question 9: The European Commission is in the process of developing a framework for sustainable financing that will guide EU policy towards technologies that are considered sufficiently clean. This taxonomy is expected to have impacts that will stretch beyond Europe. It is my understanding that this taxonomy is being driven towards an early conclusion before carbon-free nuclear energy can even be considered. How can the US Government as a whole, and you in particular, weigh in to ensure that the largest source of clean electricity is included in such a taxonomy?

Answer 9: It is my understanding that DOE remains very much engaged on the role of nuclear energy in international developmental finance to re-establish U.S. leadership in a critical national security space, promote a level playing field for U.S. industry, and assist partners and allies to meet clean energy goals. With these goals in mind, DOE is closely tracking the evolution of the EU taxonomy negotiations. If confirmed, I would be happy to further engage in those discussions.

Question 10: The Department's nuclear weapons enterprise has long been underfunded and undervalued. Meanwhile, Russia and China has modernized their nuclear weapons enterprises, and improved their capability to produce and sustain their nuclear weapons stockpiles. In recent years, the department has invested in the U.S. enterprise, but sustained and even greater investments are needed to overcome decades of

neglect. Do you commit to ensure appropriate increases are approved and sustained to modernize the nuclear weapons enterprise?

Answer 10: Yes.

Question 11: The Bonneville Power Administration (BPA) plays a pivotal role is providing affordable and reliable electricity to communities in Idaho and the Pacific Northwest.

a. Will you commit to engaging with the Administration to ensure that misguided proposals like these are not included in future budget submissions or other proposals?

Answer 11a: If confirmed as Deputy Secretary, I look forward to working with OMB to ensure that BPA's budget proposals provide the agency the resources it needs to continue its important mission.

b. As a follow-up, will you commit to speaking with me and my colleagues from the Pacific Northwest before pursuing any legislative or administrative actions that could change fundamental BPA operations?

Answer 11b: Yes, I believe that it is important the Department engages its congressional partners before advancing proposals that could fundamentally change the operations of the Bonneville Power Administration, which provides low-cost electricity supplies to ratepayers in portions of eight states in the West and Pacific Northwest.

Question 12: Historically, the Bonneville Power Administration has reported directly to the Deputy Secretary. The past Administration altered the arrangement, with BPA reporting to an Assistant Secretary. I have heard from customers and other stakeholders that this resulted in significant delays in approval of BPA actions and had the interests of Northwest ratepayers represented at a lower level in inter-agency discussions on key issues, such as the Columbia River Treaty. BPA is more than an agency with the Department; it is an operating utility that impacts the economic well-being of individuals and businesses throughout the Northwest. The lack of quick Department approvals or underrepresentation can have a dramatic impact. Will you restore the historic organizational structure with BPA reporting to the Deputy Secretary?

Answer 12: I understand the unique nature of the Power Marketing Administrations (PMAs) and their importance to the regions they serve. If confirmed, I would work with Secretary Granholm and other senior leadership to undertake a review of the organizational structure and make changes as necessary to improve the function of the Department. I look forward to working with you to make the PMAs as effective as possible.

Question 13: During the Obama Administration, the Department sought to drastically expand the mission of BPA to fund, develop and advance renewable energy projects. Fearing that this mission-creep would increase costs and risks, the proposal prompted strong opposition from BPA customers, the Northwest congressional delegation, and others. BPA's authorities and responsibilities are clearly spelled out in its authorizing statutes. Remaining focused on that mission is essential for BPA to remain a competitive power supplier. Will you commit to advance and respect BPA's mission and reject any effort to direct BPA to fund clean energy projects that are outside the agency's legal authority and mission?

Answer 13: The Department's mission is consistent with the priorities of the Bonneville Power Administration and respects all statutory authorities, operational issues, and regional policies. If confirmed, I look forward to maintaining an active dialog with Congress, the Northwest delegation, regional stakeholders, and BPA as we collectively address the challenges facing the region.

Question 14: Hydropower is incredibly important to the Idaho, providing the majority of our state's energy needs. Do you agree hydropower is a clean and renewable resources?

Answer 14: Yes.

Question 15: In bipartisan fashion, Congress has provided generous funding to DOE to support the development and deployment of advanced reactors, and has mandated that DOE be able to provide specialty fuel called High-Assay, Low-Enriched Uranium (HALEU) fuel to reactor developers within the next 5 years. Can I get your commitment that DOE will continue to support these important programs, both to fund these advanced reactors and to provide the specialty HALEU fuel they need to operate?"

Answer 15: If confirmed, I will commit to carrying out Congressional direction and supporting the U.S. nuclear industry with the resources and infrastructure needed to make them successful and help us meet the Administration's climate goals.

Questions from Senator Steve Daines

Question 1: Mr. Turk, American energy independence has led to a more secure domestic supply, strengthened our national security, and helped our allies. The Keystone XL Pipeline and other oil and gas pipelines would strengthen North American energy trade and security while enhancing our trade with European allies. The Nord Stream 2 Pipeline, however, would advance Russian energy dominance in Europe and ultimately negatively affect North American national security. From a national security and secure supply chain point of view, both domestically and with our European allies, what are your thoughts on the recent actions to shut down the Keystone XL Pipeline but not take similar actions regarding Nord Stream 2?

Answer 1: Canada is a key partner of the United States in energy trade, as well as our efforts to address climate change and protect the environment. If confirmed, I would look forward to working with Canada counterparts to meet these challenges together. The Department of Energy does not manage the approval process for presidential permits related to cross-border liquid hydrocarbon pipeline infrastructure. That said, as the Administration continues to work through permitting decisions related to these permits, if confirmed, I would be engaged with the Department of State and the White House to feed into those decisions with the best expertise that DOE has to offer. Regarding Nord Stream 2, I share the Administration's opposition to the project. If confirmed, I look forward to working with you on this issue.

Question 2: Mr. Turk, the Small Refinery Exemption is a congressionally mandated tool that helps provide economic stress relief to the U.S.'s smallest refineries. Will you commit to working with me to ensure DOE follows congressional intent as it relates to the review and approval of exemptions?

Answer 2: Yes.

Question 3: Mr. Turk, DOE hosts the National Quantum Initiative Advisory Committee. This committee was created as part of legislation I helped lead and was signed into law in 2018. As the co-chair of the newly created Optics and Photonics Caucus and recognizing Montana is the home of a growing quantum computing cluster, I believe it is important the U.S. continue its leadership in quantum computing and cutting edge technology. What steps will you take to enhance the role of DOE in quantum research and development?

Answer 3: I am aware that since enactment of the National Quantum Initiative Act (NQI) in 2018, the Department has announced five National Quantum Information Science (QIS) Research Centers (Centers) in FY2020. The Department also has strong partnerships with both the National Science Foundation (NSF) and the National Institute for Standards and Technology (NIST) and works closely with other agencies in this area. I am aware that DOE supports the National Quantum Initiative Advisory Committee (NQIAC) to provide advice on the trends and developments in quantum information science and technology. If confirmed as Deputy Secretary, I will review DOE's quantum efforts to help best position the Department to meet the goals set out in the Act and also work with you and other congressional leaders to ensure DOE is best positioned to attain success in this endeavor.

Question 4: Mr. Turk, as we discussed in the hearing, CCUS technology is an important tool for the reduction of carbon emissions. This committee has passed and signed into law numerous CCUS related bills that have

direct instructions to DOE. One of those bills created a large-scale pilot project at an existing coal or natural gas plant. I believe Montana is uniquely qualified to host one of these DOE projects. Will you commit to working with me on finding ways for DOE to be more involved with CCUS development in Montana?

Answer 4: Yes.

Question 5: Mr. Turk, what remaining hurdles do you see CCUS technology needing to get over before it can be commercially available throughout the U.S.? What role will DOE play in removing those hurdles?

Answer 5: DOE is working on taking carbon capture out of its silo and dedicating efforts to low-carbon supply chains for private and public procurement of products. More and more corporations are making net-zero targets and are looking for opportunities to purchase sustainable and low-carbon products. If confirmed, I will help the Department further engage in public-private partnerships where we can assist in coupling front-end engineering and design studies to deployment with shared financing – similar to some of the projects currently funded in the Office of Fossil Energy.

Question 6: Mr. Turk, grid reliability and sustainability remains a major concern and priority especially in light of the recent rolling blackouts we have seen in California, Texas and other states.

a. What actions do you think DOE and Congress should take to ensure lights stay on when they are most needed?

Answer 6a: Grid reliability and sustainability is a major concern, especially in California, Texas and New England. Congress, the Department, FERC, NERC and the states all have important roles to play. If I am confirmed, I will recommend the Department review results of the inquiry by FERC, past recommendations from the previous reliability events, and within DOE's jurisdiction work with industry to address the weather and cyber threats facing our electric system.

b. What role do you believe baseload power plays in grid reliability?

Answer 6b: The electric grid is a modern machine and system that requires generation to provide essential reliability services and allow for grid operators to dynamically manage supply and demand. Baseload power is an essential component of grid reliability.

Question 7: Mr. Turk, pumped hydro-storage can be used to help make intermittent energy act more like baseload and help stabilize the grid. How can DOE promote storage technologies like pumped hydro to better secure the grid?

Answer 7: Energy storage, such as pumped hydro, is a critical component of the U.S. energy system because it gives grid operators flexibility to balance supply and demand, enables both systems and facility resilience, and supports increased penetrations of renewable and other clean energy technologies that are essential for meeting our nation's goal of decarbonized power sector by 2035 and a net-zero economy by 2050. DOE has a wide range of basic and applied research activities across the Department to help support storage technologies, including work to develop the next generation of pumped storage hydropower. Supporting and strengthening these activities could bring about transformational change.

Question 8: Mr. Turk, hydropower and nuclear energy have provided the vast majority of carbon-free electricity for the United States for decades. Both also provide consistent baseload power. Unfortunately, for many, when they discuss 'green-energy' they mean only 'wind and solar', forgetting the role that nuclear and hydro already play in carbon-free electricity generation. Further, we have already seen certain areas move to close nuclear plants or propose to breach hydro-dams. What role do you think nuclear power and hydropower should play in the future of energy production?

Answer 8: I agree that hydropower and nuclear energy are a critical part of our energy future, especially as a source of carbon free energy. If confirmed as Deputy Secretary, I will actively support the Department's substantial hydropower and nuclear RD&D efforts, including the newly announced Energy Transitions Initiative Partnership Program, and the continued development and demonstration of advanced nuclear technologies to ensure these critical sources of power generations are available to provide energy supplies while helping to meet our emissions reductions goals.

Question 9: Mr. Turk, do you believe we should increase hydropower production?

Answer 9: Yes.

Question 10: Mr. Turk, what advancements or innovation do you see in hydropower production in the future?

Answer 10: With the advent of greater levels of variable renewable generation on the U.S. grid, hydropower's role as a flexible and renewable generation source takes on even greater importance. At the same time, it is essential that hydropower is developed and operated in a way that supports healthy

rivers and the communities that depend on them. As such, I understand DOE will be investing in new innovative technologies such as new turbines and control systems that can enhance hydropower's flexibility to help maintain grid reliability and resilience, while improving the environmental impacts of all water power technologies. In addition, we are exploring ways to use advanced manufacturing concepts to lower costs associated new hydropower projects and replacement parts for the existing fleet.

Question 11: Mr. Turk, in-stream hydrokinetic power allows for small scale, low impact hydropower generation. How can DOE work to increase the use of in-stream hydrokinetic power?

Answer 11: DOE has a significant research effort underway to continue to improve in-stream hydrokinetic power technologies and demonstrate their use, from the East River in Manhattan to the Kvichak in Igiugig, Alaska. In-stream hydrokinetic, as well as small-run-of-river hydropower, are important sources of clean energy and have particular value in smaller, more remote communities and microgrids. Like with all hydropower, it is important that systems are designed with minimal environmental impacts, and DOE supports significant research to improve the environmental performance of all water power technologies. DOE will also continue to work directly with coastal and rural communities to facilitate deployment of all forms of water power technologies.

Question 12: Mr. Turk, the Bonneville Power Administration (BPA), under DOE, relies on hydropower for the bulk of their energy market. Recently there have been calls to breach hydropower dams in the Columbia Snake River system. Do you support any breaching of dams as part of BPA's electricity market?

Answer 12: The federal hydropower system on the Columbia and Snake Rivers provides clean, renewable, and low-cost baseload and flexible hydropower to the Pacific Northwest and throughout the west in times of surplus power. This existing hydropower is critical to meeting our nation's decarbonization goals. The Biden Administration's goal is to maintain as much existing clean energy as possible to continue to meet our decarbonization goals and I commit to supporting this goal.

Question 13: Mr. Turk, administrations from both parties have suggested to sell or privatize BPA. I have long opposed these proposals and believe BPA plays an important role in Montana's electricity market. When advising the President or drafting DOE's budget, will you suggest that BPA be sold or privatized?

Answer 13: No.

Question 14: Mr. Turk, it is my opinion that the Paris Agreement should have been sent to the Senate for ratification, as is required for international treaties under the Constitution, and that congress should continue to be consulted in these matters. It is my understanding the Administration is in the process of developing Nationally Determined Contributions (NDCs).

a. If confirmed, what role do you believe DOE should play in developing NDCs?

Answer 14a: DOE is the solutions agency and is responsible for developing technologies that will help us meet our emissions targets. DOE also has the capabilities to model emissions under different deployment scenarios. If confirmed, I look forward to working with Congress and the Administration on this issue.

b. Will you commit to providing the Senate with a briefing on NDCs before they are submitted?

Answer 14b: If confirmed, I would advocate within the U.S. interagency process for this to happen.

Question 15: Mr. Turk, according to IEA, in 2019 the United States saw the largest decline in energy-related CO2 emissions on a country basis. In the most recent report (2020) released a few days ago, the U.S. continues to be a world leader in emissions reductions. China and other signatories to the Paris Agreement, on the other hand, continued to see emissions rise in recent years. Much of the U.S. reductions over the years have been driven by innovation and the free-market, not heavy handed regulations.

a. If confirmed, how will DOE prioritize innovation over regulation when advising the Administration on NDCs and other climate-related policies?

Answer 15a: DOE is the solutions agency and is responsible for developing technologies that will help us meet our emissions targets. DOE also has the capabilities to model emissions under different deployment scenarios. DOE's important work helps to provide options to public and private sector players seeking to reduce emissions.

b. When considering costs vs. benefits, how will you factor in job loss and the challenges faced by rural communities when advising on national climate policies?

Answer 15b: As the world invests in the clean energy economy, millions of good-paying union jobs are being created that have the ability to lift up communities that have been left behind – whether that's communities facing pollution from nearby fossil industry, or whose workers are facing economic uncertainty. If confirmed, I will work with Secretary Granholm to fulfill her pledge to make sure those

hardest-hit places benefit from these clean energy solutions. This is an issue to which I am very personally committed.

Questions from Senator Martin Heinrich

Question 1: Temporary Consolidated Storage Facilities for Spent Nuclear Fuel and High-Level Waste

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 1: Yes.

Question 2: Los Alamos National Laboratory Cleanup

New Mexico is host to three important DOE facilities: Los Alamos National Laboratory (LANL), Sandia National Laboratories (SNL), and the Waste Isolation Pilot Plant (WIPP). Assuring these facilities are managed in a manner that is protective of New Mexico's citizens and the environment is paramount. There is a growing concern in New Mexico with the slow progress of the clean-up of legacy contamination at Los Alamos National Laboratory. The previous administration proposed to cut the funding by almost 50%, and the ongoing COVID-19 pandemic has also impacted the work. Under the existing consent order, milestones are determined each year based on the funding level instead of the long-range risk to the environment. If you are confirmed, will you commit to working with New Mexico to determine appropriate risk-based annual milestones and ensure the budget requests for the clean-up work at LANL are sufficient to complete the full achievable scope of work for each year?

Answer 2: I understand the importance of continuing the Department's legacy cleanup activities at LANL. If confirmed as Deputy Secretary, I commit to working with you and your staff to help ensure the cleanup of LANL is conducted in a safe, effective and cost-efficient manner. I also understand the frustration with previous budget requests, and, if confirmed, I look forward to working to make sure that funding and budgeting can be helpful in advancing our shared priorities.

Question 3: Transportation Routes to WIPP

The Waste Isolation Pilot Plant (WIPP) is vital to clean-up and waste disposal across the entire DOE complex. To serve WIPP, New Mexico's road infrastructure and all transportation routes to WIPP must be properly

maintained and safe. Historically, DOE provided funding through the Land Withdrawal Act directly to New Mexico to improve and maintain WIPP transportation routes, but funding has not been provided for several years. If you are confirmed, will you commit to working with New Mexico to restore annual funding to ensure WIPP transportation routes in New Mexico are well maintained and safe?

Answer 3: The Department is committed to the safe transportation of defense-related transuranic waste to WIPP. It is my understanding that the Department has examined how to potentially support appropriate economic assistance to ensure safe highways and infrastructure in New Mexico for shipments to WIPP. If confirmed, I look forward to learning more about this issue and to working with you and the state of New Mexico to continue to ensure safe transportation in your state.

Question 4: Green Hydrogen

I'm increasingly excited by the prospect of electrolyzers powered by renewable electricity to produce green hydrogen to decarbonize the transportation, industrial and power sectors.

What are your views on the prospects for green hydrogen and what do you see as the critical barriers to increased use of hydrogen to offset fossil fuels, especially in hard-to-decarbonize industries?

Answer 4: I believe green hydrogen can be a versatile part of our clean energy future, especially in hard-to-decarbonize industries and long-distance freight. Reducing cost is a priority, and I understand DOE has launched a new consortium (H2NEW) to help reduce the cost of electrolyzers to produce green hydrogen and reach a goal of $2 per kilogram to make green hydrogen competitive with conventional hydrogen using natural gas. If confirmed, I very much look forward to working further with you and your staff on this critical technology.

Question 5: Transmission

I believe the country needs to do a better job of developing new power transmission capacity to help unlock our best large-scale wind and solar energy resources needed to support full electrification. Clearly, FERC plays a central role in transmission planning and incentives to build new capacity.

What more can DOE be doing to help stimulate additional investment in new transmission capacity, including offshore, to support widespread deployment of renewable energy?

Answer 5: The Department of Energy has and continues to work on reducing the cost of technologies (dynamic line ratings, power flow control, power transformers) and supporting coordinated integrated

resource planning approaches and modeling capabilities for transmission development and deployment in order to effectively increase transmission capacity that could be applied to developing an optimized off-shore transmission network. Additionally, the Department is investigating innovative approaches for permitting transmission projects. Our Power Marketing Administration also have the authority to construct transmission projects that benefit the customers in their region.

Question 6: Clean Energy Standard

President Biden has expressed support for achieving a carbon pollution-free power sector by 2035. A well-structured Clean Energy Standard would greatly advance the emissions reductions needed to meet this type of robust target.

What are your views on a Clean Energy Standard as a method of driving decarbonization in the energy sector and helping achieve this 2035 goal?

Answer 6: In order to realize the administration's goal of a fully decarbonized power sector by 2035, we will have to accelerate the deployment of clean and renewable electricity generation while at the same time ensuring the grid is reliable and resilient to physical and cyber threats. This will require a comprehensive approach of policy and technology support to drive innovation, manufacturing and installation of clean energy and grid modernization technologies. A clean energy standard is one of many potentially powerful tools to consider. If confirmed, I look forward to working with you as you and other Members of Congress in considering all potential tools.

Question 7: Smart Grid

I am very excited about the opportunities for smart grid technologies to improve the capacity and efficiency of the existing transmission grid. And I was pleased to support Sec. 8001 of the Energy Act of 2020, which directs the Secretary to establish a smart grid regional demonstration initiative. Commercial smart grid technologies that can deliver more power over existing lines or reduce transmission congestion include power flow control, dynamic line ratings, and storage-as-transmission.

What are your thoughts on smart grid technologies and how best to expand deployment?

Answer 7: Smart grid technologies including smart sensors, power electronic devices, switches, power flow technology, dynamic line ratings and storage-as-transmission technologies are great opportunities to increase the capacity of transmission lines, flexibility of the electric grid, and allow more clean energy

deployment across the system and improved operations. Expanding deployment can be done through partnerships with utilities and federal/state regulators on deployment programs that will achieve the maximum benefit for the nation.

Question 8: Energy Storage

For several years, I've led bipartisan legislation to provide a modest tax incentive for energy storage.

a. What do you see are the top research priorities at DOE for energy storage technologies, including long-term storage?

Answer 8a: There are many complementary research initiatives being pursued across Department programs. For example, in the DOE Office of Science (SC), among the highest priorities in energy storage research are the scientific foundations, including new battery materials and chemistries, that will enable next-generation storage for both transportation and the grid. Key topics include higher energy capacity and power, use of recyclable materials from a secure supply chain, long cycle life, safety, and lower cost. Advances have been enabled by integrating experimental and theoretical research with data science, including machine learning, and with the help of DOE user facilities for real-time high-resolution characterization of batteries and other energy storage systems during operation.

b. Do you also see a role for DOE to support domestic manufacturing of energy storage systems?

Answer 8b: Yes. Through coordination with DOE technology offices, SC supports communication of industrial drivers to the basic research community and supports the transition of basic energy storage R&D to applied R&D and technology, often leading to follow-on awards from DOE technology offices, ARPA-E, or other agencies. The transition mechanisms include Energy Frontier Research Centers (EFRCs) and the Batteries and Energy Storage Energy Innovation Hub, which have substantial interactions with industry. Small Business Innovation Research (SBIR) topics related to energy storage have been successful in attracting a domestic industrial base for key research areas.

Questions from Senator Lisa Murkowski

Question 1: I was encouraged to see President Biden issue last week's Executive Order to review the global supply chains for critical minerals and large-capacity batteries, among others. Now we have to turn these

reviews into actions to improve not only our domestic supply of minerals, but also the processing of these minerals to turn the raw material into commercially valuable products. What do you know about our nation's mineral security, and how do you suggest we address the lack of supply and processing of minerals here in the U.S. to make us more competitive with Asian and European markets?

Answer 1: I agree with you that this is a very important opportunity for the United States. DOE can support responsible domestic production and processing of critical materials, and assist in supporting methods that make increased production and processing more sustainable. If confirmed as Deputy Secretary, I look forward to further discussing this issue with you and your staff, and to learning more about the ongoing efforts in both the Office of Fossil Energy and ARPA-E to investigate new approaches to mining that will increase the efficiency of extraction with minimal waste, while simultaneously using the waste as a feedstock for mineralizing CO2, which could serve as a feedstock to building materials.

Question 2: Are there any resources or insights that you can take away from the previous administration's efforts to secure our mineral supply chain?

Answer 2: Yes. Waste products from mining (e.g. stockpiled tailings) can be used for the extraction of minerals. This was work heavily funded in the last Administration.

Question 3: Alaska has the second-highest capacity for geothermal energy in the country and is one of eight states that generates electricity from geothermal resources. We have a real opportunity to grow geothermal energy in Alaska to displace existing diesel generators with emissions-free energy through the Makushin geothermal project in Unalaska.

Answer 3: I fully agree that growing geothermal resources are a critical part of our nation's energy future.

Question 4: What is your long-term vision for the Arctic Energy Office and the Cold Climate Housing Research Center's partnership with NREL?

Answer 4: The Arctic Energy Office is an incredibly important office that is too small right now. If confirmed as Deputy Secretary, I look forward to working with you on how we can expand this office and expand on our commitments to addressing energy challenges for communities in Alaska.

Question 5: It is clear that President Biden is taking steps to address climate change here in the U.S. and abroad. And I fully support this renewed interest in U.S. climate policy, but recent executive actions threaten the economic recovery of my State. How can we address climate change in a way that helps - not hurts - economies and communities that depend on responsible resource development?

Answer 5: I am committed to working with you and other members of the committee to ensure we are creating good-paying jobs in the clean energy sector in communities that are in transition. I believe that the United States is blessed with an abundance of talent as it relates to energy jobs. DOE is committed to working to capitalize on the talents of our American workforce taking into account their skills and abilities in advancing place-based jobs initiatives. We need to look closely at where we have a strategic advantage including clusters of skilled workers and take advantage of those skills in advancing technologies like CCUS and carbon dioxide pipelines, among other opportunities.

Question 6: Will you commit to meeting with Alaskan stakeholders to understand our unique social and geographic challenges to producing and delivering affordable and reliable energy across the State?

Answer 6: Yes. I would very much look forward to doing so.

Question 7: During your time with the State Department, you mentioned working closely with the Arctic Council and where you had the opportunity to visit some of the Arctic countries. I hope you recognize that the Arctic is a region rich with resources, opportunities, and responsibilities and is of increasing importance as the polar sea routes open up, technologies advance, and global demand for resources rises. Will you accept my invitation to visit Alaska to see some of our innovative projects?

Answer 7: Yes. I would be very eager to further work with you, your staff, and your constituents.

Question 8: Can you tell us what other Arctic countries are doing to coordinate and advance research and development in the Arctic, and what your plans are to grow DOE's work in the Arctic?

Answer 8: The principal forum for international Arctic cooperation is the Arctic Council, which, as you know, consists of the United States and the 7 other Arctic states. I have had the good fortune to work on Article Council issues while previously at the State Department. While the State Department leads U.S. participation in the Arctic Council, DOE engages through its program offices and laboratories. Most Arctic states have created, or are in the process of creating, new Arctic strategies and offices to provide greater support for Arctic research and development. In addition, DOE is an active partner in the multiple research centers, sites, and field campaigns across the Arctic.

The Arctic Energy Office (AEO) manages DOE Arctic activities. AEO is conducting an arctic research gap analysis for DOE and is coordinating with the Interagency Arctic Research Policy Committee, the U.S. Arctic Research Commission, and other stakeholders to enhance the effectiveness of DOE and U.S. arctic research. It also convenes the Arctic Lab Partnership collaboration forum to enhance situational awareness of ongoing DOE research between the national labs and university partners.

Question 9: There is a significant long-term economic and security value to U.S. LNG, particularly in Alaska. We have trillions of proven natural gas reserves, we are uniquely situated for LNG exports, and there is no domestic market we would be competing in. As you may know, the Alaska LNG project received a final export license from DOE in August of last year, a major milestone in developing infrastructure to support Alaska's LNG exports. Do you agree that U.S. LNG will continue to be an important part of the global energy mix?

Answer 9: Yes. Natural gas is an important part of our energy mix. We must work hard to reduce methane emissions associated with natural gas production as well as emissions that come from burning natural gas. The Department of Energy has an important role to play in helping to develop technologies that help reduce emissions in order to help ensure that our energy supplies continue to help meet our energy needs in domestic and international markets.

Question 10: Can you commit to using the Department of Energy's authority to approve and support projects to commercialize Alaska's natural gas?

Answer 10: Where appropriate, I look forward to applying the Department's authorities toward a cost and benefit assessment on natural gas and other projects. If confirmed, I would always be available to further discuss these important issues with you and your staff.

Question 11: Will you advocate for natural gas as a bridge fuel to support carbon-intensive economies' transition to cleaner sources of power generation?

Answer 11: If confirmed, I look forward to exploring any and all pathways that will help reduce global greenhouse gas emissions.

Question 12: What role will U.S. natural gas play in the nation's energy transition, and what is the impact of U.S. natural gas on developing countries to meet their climate targets?

Answer 12: Natural gas can play an important part of nations' energy transition strategies provided we strive to reduce emissions that are produced from extracting, transporting, and burning natural gas.

Question 13: The Energy Act supports carbon capture, utilization, and storage to make these technologies commercially viable for power generation and industrial facilities. I want to ensure that CCUS will be used to support not only renewable energy sources but the production of low-emission fossil fuel resources. If confirmed, will you commit to advancing CCUS technologies at fossil fuel producing facilities in the U.S. and particularly in Alaska?

Answer 13: Yes. CCUS holds great potential on newer natural gas fired power plants. If confirmed, I look forward to working with you on this critical technology.

Question 14: My Nuclear Energy Leadership Act supports the development of advanced reactors and small modular reactors, which have the potential to transform energy systems in rural Alaska by providing affordable, reliable energy while decreasing emissions from diesel generators. Can you discuss the importance of advanced nuclear technologies for rural applications and how the Department of Energy will ensure the success of the advanced reactor demonstration program?

Answer 14: The development of advanced nuclear reactors and technologies is critical to achieve the Administration's climate goals, including reducing emissions from diesel generators in rural communities. The Department's Office of Nuclear Energy has a rich portfolio of advanced nuclear technology development and demonstration underway. If confirmed, I can commit to working with and supporting the Office of Nuclear Energy as the Department moves to implement your NELA.

Question 15: A key provision of the Nuclear Energy Leadership Act requires that the Department of Energy provide High-Assay, Low-Enriched Uranium to support the deployment of advanced reactor designs. DOE currently has in place a three-year program to demonstrate the production of HALEU using a domestic enrichment technology. Will you consider expanding this program to ensure that a U.S. HALEU capability exists to meet the demands of the U.S. advanced reactor community?

Answer 15: If confirmed, I will commit to carrying out Congressional direction and supporting policies that will help advance America's leadership in the nuclear space. If confirmed, I would also be happy to further discuss the particulars of your question with you and your staff.

Question 16: High assay, low enriched uranium (HALEU) is vital for a new generation of advanced nuclear reactors – including nine out of the 10 designs selected for the Department of Energy's Advanced Reactor Demonstration Program. The Department of Defense is considering deploying microreactors that would require

HALEU and have an effort underway, called Project Pele, to build a prototype in the next three years. The problem is that HALEU is only commercially available today from one source – Russia. Our intent should be to provide a fully-American source of materials such as HALEU, an idea that has bipartisan, bicameral support. Do you agree that DOE should develop a robust domestic HALEU enrichment capacity so that the United States can reclaim leadership in advanced nuclear fuels and not depend on any form of foreign supply?

Answer 16: If confirmed, I will commit to carrying out Congressional direction and supporting policies that will help advance America's leadership in the nuclear space. If confirmed, I would also be happy to further discuss the particulars of your question with you and your staff.

Questions from Senator James Lankford

Question 1: During the extreme cold weather event in mid-February, the grid in Oklahoma and other states in the region experienced significant challenges with regard to keeping the power on. Over about a week, wind generation dropped precipitously and coal generation provided sustained high levels of power to the grid. While this event certainly put a spotlight on wind's ability to nearly instantaneously plunge its generation level, this is not a new or rare occurrence. As an intermittent source, wind did during this event what wind does: it behaved in a manner that is completely detached from electricity demand. If we replaced every coal facility with wind generation before storage technology exists at commercial scale, in your opinion what would be the impact on reliability of the system?

Answer 1: All forms of generation were impacted by the polar vortex in ERCOT. Going forward, weatherizing all our energy assets and ensuring better interconnection will help to make the grid more resilient.

Question 2: The Biden Administration has taken many different actions to try to limit development of traditional fuels, such as suspending and limiting leasing and permitting actions for oil and natural gas on federal lands. While these actions may reduce production from those lands, it will not do anything to reduce demand for the product in the near-term. However, it could jeopardize the energy independence that we have worked hard to earn. It also could put us in a position where we cannot help our strategic partners secure their energy needs.

a. An IEA report from March 2, 2021, credited natural gas, in part, for reducing emissions. In your opinion, does natural gas have a role to play in lowering our emissions? If so, what is the scope of that role?

Answer 2a: Per unit of power generated, natural gas emits half the CO2 as coal. We also need to reduce methane emissions during production and transmission of natural gas to ensure its overall climate

benefits when compared to coal. DOE will continue to work on efforts to make natural gas cleaner. If confirmed as Deputy Secretary, I will make sure the Office of Fossil Energy continues to invest in approaches that minimize the leakage of the natural gas supply chain in addition to retrofits of CCS on natural gas fired power plants.

b. Over a few short decades, we have gone from having concerns about not having enough natural gas resources to support domestic consumption to being able to counter the geopolitical threats posed from countries looking to use their exports as a weapon, such as Russia. Do you agree that we should use our energy resources to help our allies? Do you believe that it is in the public interest to continue exporting our abundant natural gas?

Answer 2b: Our allies have greatly benefited from U.S. leadership on energy, and we should continue to use our energy resources to help them. The Department has specific Congressional authorities when it comes to exporting natural gas, specifically the Natural Gas Act. If confirmed, I look forward to being a part of the effort to make individualized determinations of public interest on particular applications.

Question 3: Mr. Turk, in the past you have shared that job losses as a result of companies downsizing or shuttering is very personal to you because of your experience seeing the impact of a local steel mill downsizing in your community growing up. You have also said that you have high confidence in the Biden Administration's ability to reduce emissions in the near term and address the job losses that would undoubtedly come with any policies targeting specific sectors or industries.

a. Mr. Turk, do you believe that we are currently positioned to provide renewable energy jobs to every individual whose job gets cut as a result of this Administration's executive actions, like the one that halted the Keystone XL Pipeline or another that halted some energy development on federal lands?

Answer 3a: DOE needs to be at the forefront of scaling up a wide variety of clean energy technologies that will put Americans in construction, skilled trades, and engineering to work building a new American infrastructure and clean energy economy. Directly supporting workers affected by the energy transition will be a critical part of this. This is not going to be easy, and it will require day-in-and-day-out focus and a sense of urgency to create the jobs our communities need today and well into the future as well.

b. Do you believe the skillsets are transferrable between jobs that already have been lost as a result of this Administration's executive actions and those jobs you hope will spring up in their place?

Answer 3b: The United States is blessed with an abundance of talent as it relates to energy jobs. DOE is committed to working to capitalize on the talents of our American workforce taking into account their skills and abilities in advancing place-based jobs initiatives. We need to look closely at where we have a strategic advantage including clusters of skilled workers and take advantage of those skills in advancing key technologies like CCUS and carbon dioxide pipelines, among other opportunities.

c. Do you believe these jobs are in the same geographic location? If not, how would you advise President Biden to deal with this very real, very personal consequence of this Administration's agenda?

Answer 3c: If confirmed as Deputy Secretary, I look forward to working with Secretary Granholm, others in the Administration, and our congressional colleagues to advance a unified strategy to claim those jobs, achieve emissions reductions, and secure opportunities moving forward. As you note in your question, it is very important that we take a place-based approach. If confirmed, I very much look forward to working further with you and your staff on this vital effort, which, as you note, is very personal for me.

Question 4: 2020 was historic in many tragic ways, but it was also historic in that domestic greenhouse gas emissions dropped an estimated 10.3 percent – the largest single year decline in the post-World War II era. While many other nations also saw reductions in emissions driven by the economic slowdown, there is one notable exception: China. Despite a decline in emissions in the first half of 2020, their emissions ramped up so significantly in the second half of the year that their emissions in 2020 actually *increased* by about 1.5 percent over 2019. This is reportedly in part due to increased coal demand, particularly in the second half of 2020. It is concerning to me that even in the middle of a global pandemic, the largest emitter could notch an increase in emissions – this portends even higher emissions to come as we continue to see more light at the end of the tunnel regarding reopening the US economy and economies around the world.

a. If confirmed, how would you advise the President to approach nations that have a large emissions footprint – particularly those whose emissions are still rising year-over-year?

Answer 4a: As you rightfully note, all countries around the world will need to be aggressive on greenhouse gas emission reductions in order for the world to meet our shared climate goals, and it is certainly the case that many countries around the world – including China – need to do much more. The United States needs to play a strong leadership role, and we need to have an aggressive, eyes-wide-open strategy with regard to other top emitters, especially China. If confirmed, I would look forward to working with the full DOE team to continue innovating a wide range of clean energy technologies. DOE

can also play an important role in helping – and in many cases pressuring – other countries to deploy additional clean energy technologies and to reform their processes to drive down emissions. DOE also has extensive modeling capabilities that can be helpful as part of this robust international strategy. If confirmed, I look forward to further discussing these important issues with you and your staff at your convenience.

b. Given that we are currently taking steps to reduce emissions domestically while also allowing other nations to continue increasing their emissions, are you concerned that we are simply exporting our emissions and jobs overseas without achieving a net reduction? Why or why not?

Answer 4b: When it comes to climate change, we need to have both an ambitious domestic strategy and an ambitious, eyes-wide-open international strategy. Moreover, the fundamental premise of this Administration's approach to climate change is that solving this problem also represents an unparalleled opportunity to create jobs and to capture clean energy markets around the world. If confirmed, I look forward to working with you and other members of the Committee to help ensure those job opportunities are maximized for all Americans.

Question 5: The past year has demonstrated that we must not be ignorant to the location from where we are sourcing the goods and materials that we depend on for our health and livelihood. Mr. Turk, should you get confirmed, something you will be tasked with on day one will be assessing the risks of our battery supply chains pursuant to the President's executive order on supply chains. And at DOE, you will be responsible not only for pointing out the problems, but delivering some of the solutions to this critical issue.

a. Mr. Turk, what tools do you believe DOE has at its disposal to strengthen our domestic expertise and manufacturing of these types of goods? How do you intend to use these tools?

Answer 5a: The DOE has multiple efforts aimed at strengthening the U.S. battery supply chain, including conducting RD&D to improving the domestic supply and manufacturing capability for critical materials used in batteries; developing substitute materials; and improving reuse and recycling. If confirmed, I will work to ensure that DOE applies its competencies and emerging capabilities to the needs of the U.S. critical supply chains, including lithium-ion battery manufacturing and recycling. I would also explore whether DOE's Loan Program Office can also play an expanded role in supporting the domestic battery supply chain within existing authority.

b. Securing supply chains does not just mean ensuring we have the ability and capacity to produce certain goods here; it also means working with our allies to secure their supply chains, and diversifying sourcing to guard against unforeseen disasters. Mr. Turk, your experience is heavily in international cooperation on a variety of issues. How would you advise the President on how best to bolster our cooperation and coordination with our allies specifically regarding supply chain security?

Answer 5b: The President has indicated his intent to work with partners and allies on supply chains through his recent Executive Order, especially on products that are critical to our future energy needs. While we look for every opportunity to build and strengthen domestic manufacturing and production, we cannot do it all by ourselves. In confirmed, I would look to coordinate with others in DOE and throughout the U.S. government to continue to work with partners and allies to diversify supply chains, mitigate single points of failure, find alternatives to suppliers of concern, and prevent potential market manipulations.

Questions from Senator Catherine Cortez Masto

Question 1: When you came before the Senate Energy and Natural Resources Committee in June last year, you highlighted the IEA's *Sustainable Recovery Plan*, which shows that in planning for recovery from the pandemic, governments have the opportunity to boost economic growth, create millions of new jobs, and reduce global greenhouse gas emissions.

a. If confirmed, will you be looking to incorporate any aspects of this plan in DOE's efforts to Build Back Better?

Answer 1a: If confirmed as Deputy Secretary of Energy, I would certainly look to take any lessons I have learned at the IEA and, where applicable, look to apply them in to the U.S. context. Many of the IEA's recommendations are already featured in President's Biden's Build Back Better plan.

b. Are there particular recommendations you would like to see adopted in the U.S.?

Answer 1b: The IEA's Sustainable Recovery Plan provides a whole host of suggestions for governments around the world to incorporate into their respective stimulus plans. I would particularly highlight the wide variety of energy efficiency measures highlighted in the IEA analysis that provide substantial jobs, economic benefits and greenhouse gas emissions.

Question 2: Nevada's utility-scale electricity generation from geothermal resources contributed roughly one-third of the state's total renewable generation in 2019. Moreover, Nevada ranks second in the nation for geothermal production, and the industry accounts for more than 400 jobs in the Silver State.

Geothermal energy has a key role to play in Nevada's and the nation's energy future; but as with many renewable technologies, the large-scale deployment of geothermal will require additional, reliable transmission.

a. In your opinion, what more can the U.S. be doing to accelerate transmission upgrades across the country to better facilitate the expansion of renewable energy technologies, like geothermal?

Answer 2: Transmission is one of the key technology advancements that will allow for increased access to renewable energy resources, including geothermal. Upgrading existing transmission line voltages/reconductoring is a near-term opportunity. Especially important opportunity would be to increase Direct Current (DC) transmission capacity along the interconnection seams of the Eastern-Western-ERCOT interconnections. Accelerating transmission will require state and federal coordination for siting and permitting, methods for cost allocation and the development interconnection-wide transmission planning processes.

Question 3: The Biden Administration has underscored the need for smart investments and incentives in energy efficiency. Our nation's school buildings represent an excellent opportunity for these investments not only to make communities healthier and improve learning conditions for our students, but also to reduce energy costs for our school districts. For instance, simply updating a school's lighting is projected to save the school district thousands of dollars over time.

I will be reintroducing the *Renew America's Schools Act* this Congress to help schools invest in energy efficiency, build-out renewables, and purchase zero-emission buses and charging equipment. The bill would also be complementary to the work being done through the DOE's Better Buildings Challenge.

a. Will you commit to supporting policies that ensure we as a nation are investing in energy efficiency to reduce emissions, protect the health of our communities, and cut costs for essential public services, such as education?

Answer 3: Yes.

U.S. Senate Committee on Energy and Natural Resources
March 4, 2021 Hearing: *The Nomination of David M. Turk to be Deputy Secretary of Energy*
Questions for the Record Submitted to Mr. David M. Turk

Questions from Senator Bill Cassidy

Question 1: In your opinion, what is the biggest challenge DOE faces in commercializing emission reduction technology and if you are to be confirmed, how would you work to solve the "valley of death problem" i.e., the gap between academic-based innovations and their commercial application in the marketplace?

Answer 1: While we have technologies that can be used to achieve deep decarbonization, too few real-world projects exist, especially at scale. For example, there is limited economic incentive today to capture CO2 and store it deep in the earth. In addition, as you point out, many promising technologies can't pass the "valley of death". The combination of Research and Development, funding opportunities, tax incentives, and the use of programs such as the Department of Energy's Loan Program Office can all help to support the commercialization of promising energy technologies. If confirmed, I would be eager to further discuss these important issues further with you and your staff.

Question 2: What actions will you take to ensure DOE can effectively partner with the private sector to accelerate the deployment of clean energy technologies such as nuclear energy, carbon capture, direct air capture, and others?

Answer 2: More and more companies are making net-zero targets and are looking for opportunities to purchase sustainable and low-carbon products. Through engaging in public-private partnerships we can assist in coupling front-end engineering and design studies to deployment with shared financing – similar to some of the projects currently funded by the Office of Fossil Energy.

Question 3: The Energy Act of 2020 that was passed at the end of last year authorizes funding for more than 20 technology demonstration projects, including advanced nuclear energy, carbon capture, geothermal, energy storage, hydropower, direct air capture, and fusion.

Will you prioritize the success of these ambitious technology moonshot demonstration projects that are essential to meeting our objective here at home and to cost-effectively driving down global emission?

Answer 3: Yes.

Question 4: In 2015, Congress authorized the creation of a modernization fund to construct, maintain, repair and replace SPR facilities. The Secretary was authorized to draw down and sell crude oil from the SPR up to $2 billion between fiscal years 2017 through 2020 to carry out a SPR modernization program. My staff tells me the Department will soon be issuing a decision memo to cap the fund at $1.4B rather than ask Congress for more time to fill the fund to the authorized amount. I know you are not at the Department, but I am concerned about this. We are short changing efforts to modernize assets at the SPR.

a. How can we ensure the safe storage of energy resources in the future if we are not making the maximum investments possible?

Answer 4a: I completely agree with you that the security of the SPR should be a priority. We should also examine strategies that will make these sites more resilient to severe weather impacts. If confirmed, I look forward to further working with you and your staff.

b. Will you work with Secretary Granholm to request Congress further extend DOE's authority to sell crude oil in order to further fund the SPR modernization fund?

Answer 4b: My understanding is that DOE is heeding the modernization sales, but there have been delays due to the COVID-19 pandemic. If confirmed, I look forward to working with you and with Secretary Granholm further on this issue.

Question 5: Over the past several years, Beijing has brought online more new coal power plants than the rest of the world combined. In 2020, China's government approved plans to build twice as many more-

How might the global impacts of China's energy production improve if it used American LNG to meet the country's energy needs?

Answer 5: I agree with you that China needs to do much more to reduce its greenhouse gas emissions. A priority of DOE is to decrease the leakage of the natural gas supply chain, which is necessary to ensure that natural gas maintains its edge with respect to coal when it comes to greenhouse gas emissions. Assuming we take care of this methane emission leakage problem, U.S. produced natural gas can lead to lower emissions when displacing coal both domestically and overseas.

Question 6: Many experts believe that the advent of United States as a natural gas exporter has made global natural gas markets more competitive, diminished the ability of countries like Russia do use energy supply as a coercive tool, and lowered the cost of decarbonization for countries transitioning to lower carbon economies.

Do you believe this to be true, and do you support the continued exports of US liquefied natural gas (LNG) as a useful tool that strengthens US foreign policy?

Answer 6: The Natural Gas Act requires the Department of Energy to make determinations if export applications to non-FTA countries are in the national interest of the United States. As you know, each application is unique and needs to take into account the full circumstances surrounding that particular

application. That all said, it is certainly true that it is a good thing for other countries to receive energy supplies and technologies from the United States as opposed to countries whose interests do not align with our own.

Questions from Senator Cindy Hyde-Smith

Question 1: In a recent Washington Post article, you stated, "Growing up in a small Midwestern town, I saw up close our community struggle when the local steel mill downsized and laid off more and more workers. If confirmed, I'll carry this experience to my work at the Department of Energy to make sure we listen to the voices of workers and families impacted by changing economic conditions so the clean energy future we build creates good-paying jobs in all corners of our country." As I am sure you are aware, halting production of essential fossil fuels in my state alone would leave families without a source of income, thousands of jobs in our ports, refineries, and processing plants will be heavily affected. Although listening is an important component to help in a time of crisis, what would be your detailed plan to help my constituents who have lost their jobs to the Biden energy policy?

Answer 1: Growing up in Rock Falls, Illinois, I saw firsthand the impacts that communities and families faced from industry transitions. Through my experience at IEA and elsewhere, I am a firm believer that energy is good – it powers livelihoods and fuels our nation; it is emissions that are the challenge. If confirmed, I would be committed to working with you and other members of the committee to ensure we are creating good-paying jobs in communities that are in transition. The United States is blessed with an abundance of talent as it relates to energy jobs. DOE is committed to working to capitalize on the talents of our American workforce taking into account their skills and abilities in advancing place-based jobs initiatives. We need to look closely at where we have a strategic advantage, including clusters of skilled workers and take advantage of those skills in advancing technologies like CCUS, carbon dioxide pipelines, hydrogen (whether so-called "blue" or "green"), among other opportunities. I also look forward to supporting the scientific work being done at the DOE's National Labs and in federally partnered projects across the country and taking that research to scale and deploying it to scale to create jobs for Americans.

Question 2: On January 20, 2021, President Biden rejoined the Paris Agreement. After the Trump Administration left the agreement, America achieved energy independence from foreign competitors and began exporting natural gas for the first time in 60 years. How do you foresee the U.S.'s involvement with the Paris Agreement when studies have concluded that by rejoining the Agreement, there would be an overall loss of nearly 400,000 jobs, half of which will be in manufacturing, energy prices will be driven higher for the vast

majority of Americans, and some of the world's largest polluters, countries like China, India, Pakistan, and Russia, will continue polluting without true consequence?

Answer 2: As you rightfully note, all countries around the world will need to be aggressive on greenhouse gas emission reductions in order for the world to meet our shared climate goals, and it is certainly the case that many countries around the world – including China – need to do much more. The United States needs to play a strong leadership role, and we need to have an aggressive, eyes-wide-open strategy with regard to other top emitters, especially China. While I am not familiar with that particular report you reference, the analyses that I have seen suggests that action on a broad range of clean energy technologies presents the United States with a major opportunity to be a global leader in developing clean energy technologies that can be used in the United States and sold around the world. This outcome could bolster our manufacturing sector and create good-paying jobs for American workers. If confirmed, I look forward to further discussing these important issues with you and your staff at your convenience.