House Energy and Commerce (HEC)
Hearing on FY 2024 DOE Budget Requests
May 11, 2023
Questions for the Record for Secretary Jennifer Granholm

QUESTIONS FROM REPRESENTATIVE JEFF DUNCAN

Q1. I want to ask you about the Low Dose Rate Radiation Research Program at the DOE Science Office. This research work has important implications across the board for nuclear power, cleanup standards, and even everyday nuclear medicine. We understand that the DOE is not conducting this program as authorized by Congress and as recommended by the National Academy of Sciences.

Q1a. Will you commit to examining this program and ensuring that it gets implemented in a way that fits with the Congressional Directive and the NAS recommendations?

A1a. Yes, we are committed to implementing a Low Dose Radiation research program. DOE has requested funding for low dose research in the President's Budget Request for FY 2024. The activity is within the Biopreparedness Research Virtual Environment (BRaVE) activity. BRaVE encompasses two separate efforts, one on addressing environmental biothreat scenarios and another on Low Dose Radiation research. Longer term low dose research program planning is now beginning in earnest and will include other agencies. We continue to coordinate with the National Cancer Institute (NCI) on advanced computational techniques for cancer research and adapting these capabilities to low dose radiation research. These efforts could also be expanded to include other agencies, such as NASA, with existing research programs in low dose radiation exposure.

Q1b. Will you report back to us on this within 60 days?

A1b. Yes, we can report back to you within 60 days of the Committee's receipt of this response with any updates on our planned activities for the FY 2024 enacted funding.

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QUESTIONS FROM REPRESENTATIVE TIM WALBERG.

Q1. Electric vehicle (EV) components are less standardized across the industry, requiring auto makers to enable greater flexibility in their EV component manufacturing lines as compared to internal combustion engine (ICE) vehicles. Will the Department of Energy ensure that the Domestic Manufacturing Conversion grant program provides funding for facilities to establish EV research and testing capabilities and small-scale, flexible, manufacturing capabilities?

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A1. The Department released the funding opportunity announcement (DOE-FOA-0003106) "Domestic Manufacturing Conversion Grants" on August 31, 2023. Per the FOA, the grants would strengthen the domestic manufacturing of electrified vehicles of these given types, including light, medium, and heavy-duty vehicles, and create good-paying clean energy jobs with the free and fair chance to join a union. The overall scope in this FOA concerns commercial facilities, including those for vehicle assembly, component assembly, and related part manufacturing. Applicants should consider and identify domestic sources of equipment, feedstock and/or materials as well as potential downstream domestic customers of their parts or product.

Q2. The Department recently issued a proposed rule, *Energy Conservation Program: Energy Conservation Standards for Distribution Transformers.* There are significant concerns that this efficiency rule will further offshore our energy supply chain, raise costs for consumers, increase supply chain problems, and threaten our grid reliability.

Q2a. Why did the Department of Energy decide to push this transformer regulation?

A2a. DOE was required by statute to either publish a proposal to amend the current standards for distribution transformers or finalize a rule not to amend standards by April 18, 2019. DOE has subsequently entered into a Consent Decree which requires issuance of a final rule by June 30, 2024.

Q2b. The proposed amorphous steel (AM) cores are heavier than the current grain oriented electrical steel (GOES) cores. Utilities have found that due to this weight change they will have to replace a significant number of poles. How does the Department plan to address this additional burden if a final rule is issued?

A2b. DOE's analysis factors in the cost of pole replacement where necessary. Even with these costs considered, DOE's analysis concludes that the rule will save $15 billion over 30 years of shipments.

Q2c. There is a significant supply chain shortage of transformers. Please detail how this efficiency standard will impact that shortage.

A2c. Currently there is one domestic supplier of grain-oriented steel (GOES) and one domestic supplier of amorphous steel. In partnership with utilities, the examination of the ongoing distribution transformer supply-demand imbalance has led to the recognition that current GOES supply, a key input for many of today's distribution transformers, is not as readily available for manufacturers, leading to longer wait times and higher prices to produce distribution transformers. Using amorphous steel in distribution transformers will not only reduce losses and improve distribution system efficiency but could potentially result in a more resilient material supply chain for distribution transformers.

Q2d. Will this rule help the electricity system operate as efficiently and inexpensively as possible?

A2d. As required by the Energy Policy and Conservation Act (EPCA), DOE's proposed standards were **developed** using data-driven analyses and seven statutory factors governing the appliance standards rulemaking process. Ultimately, DOE is proposing efficiency levels that are economically justified and technologically feasible for each of the three types of distribution transformers. Over 30 years, the proposed standards are estimated to generate over 10 quads of energy savings and deliver approximately $15 billion in savings to the nation. Additionally, DOE's analysis of the proposed standards **demonstrates** positive life-cycle cost savings that will benefit both utilities and their customers.

Q3. In the rush to green, I fear that the Department is not fully considering cybersecurity. Many "green" technologies are digitized, like solar inverters, EVs, smart meters, and rooftop solar panels. All of these new connections open up more entry points for

cyberattacks that could extend to our entire grid and do irreparable damage. How is DOE prioritizing cybersecurity?

A3. The U.S. Department of Energy's (DOE's) Office of Cybersecurity, Energy Security, and Emergency Response (CESER) leads the Department's efforts to strengthen the security and resilience of U.S. energy infrastructure against all threats and hazards, mitigate impacts from cybersecurity, physical, supply chain, and climate-based events, and assist with response and restoration activities. Cybersecurity is a primary focus for the office and the Department. As we continue to accelerate the clean energy transition, both DOE and CESER are working to ensure the clean energy systems are resilient and cybersecure.

CESER plays a critical role in conducting advanced risk analysis; representing the Department at National Security Council (NSC) meetings on national-level security and resilience policies; mitigating risks by informing Federal and State, Local, Territorial, and Tribal (SLTT) national security and resilience policies; researching, developing, and demonstrating (RD&D) tools and technologies; and supporting energy sector (electricity, oil, and natural gas) emergency preparedness and response efforts. CESER accomplishes its mission through strong partnerships with energy sector owners and operators, States and local communities, intra-agency partners, interagency partners, manufacturers, technology companies, academia, and international partners.

In terms of distributed energy resources (DER) and electric vehicles, CESER has a number of efforts underway to ensure the cybersecurity of those systems. On the policy front, CESER is working closely with industry and States to develop cybersecurity baselines for distribution systems and distributed energy resources. In terms of tools and technologies, CESER works with distributed energy resource (DER) and electric vehicle and associated infrastructure companies on cybersecurity standards, threat information sharing, and designing those systems through testing and emulation.

In September 2023, CESER announced an award of $39 million of funding for nine new National Laboratory projects to advance the cybersecurity of distributed energy resources (DER).

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QUESTIONS FROM REPRESENTATIVE DEBBIE LESKO

Q1. Did DOE test any stoves for compliance with the proposed cooking products rule that were manufactured within the last two years?

A1. As of February 2023, 15 of the 24 (63%) gas cooktop models and 10 of the 22 (45%) electric cooktop models in DOE's test sample are currently on the market.

Q1a. Did DOE use the results from testing it conducted prior to finalizing the test procedure to develop the proposed energy conservation standards?

A1a. All cooktop testing in support of the proposed rule was performed in accordance with the finalized test procedure.

Q1b. When were the test procedures made available for public comment? Was this before or after the comment period on the rule itself?

A1b. The proposed test procedure was made available for public comment November 4, 2021, through February 17, 2022. The comment period for the proposed standards was open from February 1, 2023, through April 17, 2023.

Q2. How did DOE determine the number of stoves that might comply with the proposed cooking products rule?

A2. In light of the practical limitations of testing every model on the market, DOE used the data from its representative test sample to determine how key product characteristics affect product efficiency. DOE then conducted a model-by-model evaluation of every model currently on the market to determine which models would be expected to comply with the proposed standard based on their product characteristics.

Q3. Which products did DOE analyze in order to determine compliance?

A3. DOE's test sample includes a wide range of products: 24 gas cooktop models and 22 electric cooktop models from 18 different brands. These products span the breadth of the market in terms of product characteristics and features, energy efficiencies, and whether they are standalone or part of a range.

Q3a. What are the serial numbers and model numbers for products analyzed by the Department?

A3a. DOE typically does not release serial numbers of individual models due to the sensitivities expressed by industry with divulging performance-related information publicly on specific models. DOE has released deidentified information regarding the cooking products it tested.

Q3b. Why were those units chosen?

A3b. The models were selected to reflect a wide cross section of the market in terms of product characteristics and features, energy efficiencies, and whether they are standalone or part of a range. DOE's study focused on those products most likely to be impacted by the standards.

Q4. How does the Department come by its claim that only "high end" stoves are impacted by this rulemaking?

A4. DOE tested products spanning the full range of product characteristics. This testing showed that "high end" products were generally less efficient and would therefore be more impacted by the proposed standards. Conversely, DOE's testing showed that non "high end" products generally already meet the proposed efficiency standards, would therefore not be impacted.

Q4a. How does the Department define "high end"?

A4a. For this purpose, DOE defines "high end" as having continuous cast-iron grates and at least 1 high-input-rate burner (which DOE defines as a burner with an input rate greater than or equal to 14,000 Btu/h).

Q4b. Does the department classify "high end" by cost for the unit or by product features?

A4b. DOE defines "high end" by product features. Namely, DOE defines "high end" based on the product feature of having continuous cast-iron grates and at least 1 high-input-rate

burner (which DOE defines as a burner with an input rate greater than or equal to 14,000 Btu/h).

Q4c. Is it the Department's view that it is acceptable to reduce features and functionality on "high end" stoves such that they become essentially the same as "low end" stoves?

A4c. No. DOE deliberately proposed a standard level that would preserve the key features and functionality of "high end" stoves, including continuous cast-iron grates and high-input-rate burners.

Q4d. According to DOE's analysis, which currently available models would comply with the proposed rule and are they ranges or standalone cooktops?

A4d. Although DOE cannot share specific model numbers, nearly half of currently available models on the market would comply with the proposed standard and include both ranges and standalone cooktops.

Q4e. Where are those models manufactured?

A4e. Models that would comply with the proposed standards are manufactured in a range of locations, both within the U.S. and internationally.

Q4f. Has DOE analyzed the impact of its proposal on US manufacturers, retailers, and installers?

A4f. Yes, DOE has conducted extensive analysis into the likely impacts of the proposed rule on manufacturers, retailers, and installers. The results of this analysis are published in the notice and technical support document.

Q5. Secretary Granholm claimed the "fix" to ensure compliance with the rulemaking would cost only $12; how did DOE come to this determination?

A5. DOE conducts detailed reverse-engineering "teardowns" in which DOE analyzes the individual parts of models spanning the whole range of efficiencies on the market. DOE also conducts confidential manufacturer interviews to confirm its cost estimates.

Q6. Please confirm that there is no increased cost from EL1 to EL2 partly because EL2 anticipates manufacturers will further reduce the number of high input rate burners on a cooktop in order to meet a standard at that level.

A6. There being no increased cost from EL 1 to EL 2 is not due to any potential difference in the number of high input rate burners between those two levels, but rather a reflection of DOE's finding that there is no difference in product manufacturing cost between EL 1 and EL 2.

Q7. What product features would be impacted or eliminated under the proposed rule?

A7. DOE deliberately proposed a standard level that would preserve the key features and functionality of "high end" stoves, including continuous cast-iron grates and at least one high-input-rate burner. DOE is currently analyzing comments received in response to the February 2023 supplemental notice of proposed rulemaking (SNOPR) to determine whether any particular features would be impacted or eliminated as a result of the proposal.

Q8. Does DOE believe that looking at photos on the websites is an effective way to understand if a product would meet a DOE standard level for their verification and enforcement purposes?

A8. Any verification and enforcement actions would be based on testing conducted at a certified laboratory.

Q9. Does DOE believe eliminating half of available products on the market constitutes a reduction in consumer choice?

A9. The proposed standard would not limit the availability of products on the market. It would only require a redesign of certain low-efficiency products to be more efficient.

Q10. Does DOE believe this rulemaking and related rulemakings deserve a complete 75-day comment period?

A10. To give stakeholders adequate time to comment on this rulemaking, DOE provided a total of 75 days for comment on the February 2023 SNOPR, between February 1, 2023, and April 17, 2023.

Q11. Does DOE believe the test procedure should be determined prior to the public comment period?

A11. The test procedure was finalized on August 22, 2022. The comment period for the proposed standards opened on February 1, 2023.

Q12. Has DOE tested any ranges (i.e., cooktop with an oven in the same product) that would meet DOE's proposed standards?

A12. DOE testing indicates that both ranges and standalone cooktops have the same efficiency characteristics.

Q13. Does DOE believe a low-input burner for simmering and cooking sauces is a consumer feature that should be protected under EPCA?

A13. DOE is currently analyzing comments received in response to the February 2023 SNOPR to determine whether any particular features would be impacted or eliminated as a result of the proposal.

Q14. Does DOE believe that consumers value savings of less than two dollars per year on their gas bills?

A14. As stated in the February 2023 SNOPR, DOE's analyses indicate that the proposed standards would save a significant amount of energy in the aggregate, as is required by EPCA. DOE estimates that the proposed standards will result in national energy savings of 0.46 quads, the equivalent of 19 million residential homes' annual energy use.

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QUESTIONS FROM THE HONORABLE JOHN CURTIS

Secretary Granholm, in May 2022, the Government Accountability Office (GAO) assessed the functionality of the Strategic Petroleum Reserve, particularly through the lens of regional response capabilities. In the report, GAO considered "Alternative Actions," such as "*different reserve sizes, geographic locations, fuel composition, ownership structure, or release criteria...[and] coordinating with or supporting the efforts of states, other federal agencies, commercial suppliers, and others with key roles in mitigating supply risks.*" (Page 6-7)

Q1. What are DOE's plans for responding to this report, and what steps are you taking to examine the optimal size and configuration of the reserve, particularly as it relates to vulnerable communities and regions, such as Utah, Nevada, Idaho, and other western states?

A1. As noted in the GAO report, the Department of Energy continues to analyze alternative options for strategic petroleum reserves. However, in many cases, the existing infrastructure is not adequate. Having the current Strategic Petroleum Reserves located in the area with the largest refinery capacity in the world provides the maximum flexibility to respond to supply disruptions.

Q2. Has DOE examined the cost-effectiveness or feasibility of government-owned or commercial salt dome storage in the West to establish regional reserves?

A2. DOE continues to analyze these options as we continue to work toward replenishing the Strategic Petroleum Reserves.

Q3. Would DOE work with Congress to find solutions to ensure the availability of refined fuels in the West during an emergency or times of refinery outages?

A3. The Department of Energy (DOE) plays a crucial role in ensuring the availability of refined fuels during emergencies or times of refinery outages and is always willing to work with Congress on policy proposals. In many instances, a regional disruption is more of a logistical issue, rather than a supply issue. Adding additional supplies would often not alleviate the disruption, which would normally be mitigated within a few days anyway once the logistical constraints are removed.

In the event of an emergency or refinery outage, DOE works closely with industry stakeholders, such as fuel producers and distributors, to prioritize fuel delivery to affected areas. With support from Congress, DOE facilitates research and development in alternative fuel sources and technologies, aiming to diversify the energy mix and enhance long-term resilience to help build a more sustainable and reliable energy system that can better withstand emergencies or disruptions.

Overall, DOE's continued collaboration with Congress is essential for effectively addressing challenges related to the availability of refined fuels during emergencies or refinery outages in the western region, ensuring the well-being and stability of communities.

Q4. There are some groundbreaking private sector advancements happening in Utah related to radioisotope production that could, among other things, really revolutionize how we treat cancer and dramatically reduce our reliance on foreign sources of radioisotopes. The CHIPS Act makes some major investments – including within the Department of Energy – to ensure we have a reliable domestic supply of radioisotopes.

Where do things stand on implementation of the CHIPS radioisotope provisions and, most importantly, some specific examples of how the Department of Energy is working with the private sector manufacturers to ensure a stable domestic supply and the next generation of research in this critical area?

A4. The Department of Energy Isotope Program (DOE IP) has made great strides in implementing the CHIPS radioisotope provisions. DOE IP continues to work closely with industrial, federal, and academic stakeholders to assess isotope supply and demand, and address disruptions in isotope supply chains exacerbated by the Russian invasion of Ukraine. Coordinated efforts with the Office of Nuclear Energy to assess options for demonstrating isotope production in different types of reactors and accelerators at national labs and universities is advancing. Progress continues on the two projects mentioned in the CHIPS Act, the Stable Isotope Production and Research Center and the Radioisotope Production Facility at a pace aligned with FY 2023 Congressional Appropriations.

There are many examples of how the DOE IP continues to work closely with private sector manufacturers to promote domestic supply chains and related research. DOE IP has provided rare isotope feedstock to industry to enable entry or continuation in the radioisotope market, such as radium-226 for actinium-225 production. When industry is not able to meet market demand due to technical difficulties, the DOE IP has provided a back-up source of materials for certain isotopes; an example is strontium-82 for cardiac heart imaging. The Program has shared technical information with industrial entities to advance commercial efforts in radioisotope production such as making available a "plug and play" target station for the new promising medical isotope, astatine-211. On numerous occasions, the DOE IP has also stepped in to provide critical isotopes to industry when Russian isotope supply chains have been disrupted, such as promethium-147 for nuclear batteries.

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QUESTIONS FROM THE HONORABLE RANDY WEBER

The Department of Energy recently requested information in anticipation of a proposed rulemaking that will, in part, address new standards for gas-fired instantaneous (or tankless) water heaters. See Docket No. EERE–2017–BT–STD–0019 / RIN 1904–AD91. Some advocates have asked the Department to set a standard that essentially cannot be met by any non-condensing gas-fired instantaneous (or tankless) water heaters.

Q1. Is the Department actively considering a proposed rule that would disadvantage or otherwise render uncompetitive non-condensing gas-fired instantaneous (or tankless) water heaters, such as those used in temperate states like Texas? Upon what data sources would such a decision be made? Has that data been subject to the rigorous requirements of the Data Quality Act?

A1. The proposed standards for consumer water heaters, which were presented to DOE as part of a consensus agreement between manufacturers and other stakeholders, were chosen based on data-driven analysis and DOE's seven statutory factors governing the appliance standards rulemaking process. As required by the EPCA, DOE is proposing efficiency levels that are economically justified and technologically feasible for each of the four product classes of consumer water heaters. The proposed standards would generate 27 quads of energy savings and deliver approximately $161 billion in savings to the nation from 30 years of shipments. Additionally, DOE's analysis demonstrates positive life-cycle cost savings for consumers in all four product classes at the proposed energy efficiency levels.

Q2. Is the Department aware that if such instantaneous (or tankless) water heaters became less viable in the marketplace, that particularly middle- or lower-income households or small businesses would be forced to utilize or retain tank water heaters that are significantly less efficient? We request that the Department promptly calculate any such potential efficiency loss and report it to this Committee. Has the Department considered that such a standard may violate the letter and intent of the Energy Policy and Conservation Act (EPCA) (42 U.S.C. **6292(a)**)? Please make any applicable legal analyses available to the Committee as soon as possible.

A2. For gas instantaneous water heaters, DOE's analysis found that low-income households would save more money over the life of the water heater than the general population. See section V.A.1.b of the notice for detailed results of DOE's subgroup analysis.

Q3. Under Executive Order 12866 (1993), the Department is required to "tailor its regulations to impose the least burden on society, including individuals, businesses of differing sizes, and other entities (including small communities and governmental entities), consistent with obtaining the regulatory objectives, taking into account, among other things, and to the extent practicable, the costs of cumulative regulations." Has the Department considered less burdensome mechanisms to ensure overall improvements in efficiency in the water heater market?

A3. As part of its analysis, DOE considered a wide range of alternatives to the proposed rule. The results of this analysis can be found in section V. I.B.6 of the notice.

Q4. Utilities, transformer manufacturers, and homebuilders in my state are raising concerns about a DOE rulemaking on the efficiency of distribution transformers that could further exacerbate existing transformer shortages due to supply chain and labor issues. The Biden administration recognized this was a major issue last year when the President invoked Defense Production Act authorities to include transformers and grid components.

However, the impact of your agency's rulemaking, which I'm told has little efficiency benefits – certainly not the 20 percent DOE asserts – is causing real world impacts. The draft rule would require amorphous steel, which currently accounts for only 5 percent of U.S. supply, and steel suppliers are telling transformer manufacturers they will not invest in new capacity until DOE either delays or finalizes this rule in June 2024. If finalized, companies may also be forced to source amorphous steel from foreign nations, including China.

The June 2024 timeline is too far away and creates uncertainty that creates national security, grid reliability, and storm resiliency issues – and is also an impediment to our nation's economic recovery. For example, in Texas this issue is hampering home builder's ability to build more housing stock. While I recognize DOE is under a consent order, it did not have to propose the standards it did. Every day that your department delays resolving this self-made crisis has the potential to impact electric service across the nation.

You have the ability to push this off until 2027. Can you commit to delaying this impractical rule and when can you render a decision? Telling stakeholders that DOE won't have a decision until June 2024 is unacceptable.

A4. The proposed rule, if finalized, would not require compliance with amended standards until 3 years after the publication of the final rule. Based on the consent decree deadline this would not occur until at least May 2027.

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QUESTIONS FROM THE HONORABLE AUGUST PFLUGER

Q1. The Department of Energy recently announced it plans to purchase up to 3 million barrels of oil for the SPR. Please provide the timeline and process DOE will use to fully replenish the remainder of the SPR.

A1. The U.S. Strategic Petroleum Reserve is a valuable tool to protect the American economy and consumers from supply disruptions. As we are thoughtful and methodical in the decision to drawdown from our emergency reserve to provide relief when needed most, we are similarly strategic in replenishing the supply to ensure it remains ready to deliver on its mission.

In January 2023, DOE outlined its comprehensive buyback strategy which includes: (1) Direct repurchases with revenues from emergency sales; (2) Exchange returns that include a premium to volume delivered; and (3) Securing legislative solutions that avoid unnecessary sales unrelated to supply disruptions to strategically maintain volume. In taking these steps, the Administration is focused on replenishing the SPR in a way that provides the best deal for taxpayers by aiming to repurchase crude at a lower price than it was sold for, while providing certainty to the industry in a way that helps encourage near-term production.

These actions will bring in tens of millions of barrels back into the SPR by the end of next year – on top of the 140 million barrels that DOE secured in cancelled sales. The SPR remains the largest known reserve in the world.

Q2. What action is DOE taking to address the maintenance required as a result of the rapid drawdowns?

A2. After extensive research it was determined that the sales that took place in 2022 did not damage our Strategic Petroleum Reserve (SPR) pipelines and caverns. The nation's top geoscientists at the Department of Energy (DOE)'s Sandia National Laboratory continue to closely monitor cavern integrity, and the SPR remains operationally ready to respond to future supply disruptions, should they occur.

It is important that we continue to make investments to modernize the SPR in order ensure it continues to be operationally ready to address global energy supply chain disruptions in addition to future Congressionally mandated sales. DOE continues to prioritize maintenance and life extension project work to maintain the integrity and availability of the SPR for years and decades to come.

Q3. When will DOE restart the Congressionally mandated examination of the SPR, known as Life Extension II?

A3. Construction on Life Extension II began at the Bayou Choctaw SPR site in February 2023 and Bryan Mound SPR site in May 2023.

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QUESTIONS FROM REPRESENTATIVE GREG PENCE

The National Electric Vehicle Infrastructure (NEVI) program through the Joint Office of Energy and Transportation has projected a national network of 500,000 chargers by 2030. In addition, the administration's goal is for electric vehicles to make up at least 50 percent of new car sales by 2030.

Q1. What is your department's projection for the electricity generation needed to maintain a network of 500,000 electric vehicle chargers while maintaining grid reliability?

A1. A 2019 report published by the U.S. DRIVE partnership, a voluntary government-industry partnership, concluded that "based on historical growth rates, sufficient energy generation and generation capacity is expected to be available to support a growing EV fleet as it evolves over time, even with high EV market growth."[1] With this general conclusion in mind, we expect incremental needs will be highly localized and site specific in some cases. Additional research and analysis being completed by DOE and the national laboratories is examining longer-term needs from the electric grid, particularly as medium- and heavy-duty vehicles electrify.

Q1a. Does your department envision a need for states to increase electricity generation to accommodate increased users on the grid?

A1a. Yes, electrification of the transportation sector will increase demand, load, and the required capacity of the grid and its components. Regions and States are evaluating the generation, transmission, and distribution capacities that are currently available and will be needed to meet future demand.

Q2. Has your department analyzed potential charging behaviors and market demand for charging equipment?

A2. Yes, this is an ongoing and continually improving analysis effort. The DOE Vehicle Technologies Office has conducted extensive research on the market for electric vehicles, key supporting technologies and components, and the charging needs of drivers. A

[1] https://www.energy.gov/eere/vehicles/articles/summary-report-evs-scale-and-us-electric-power-system-2019

recently released National Renewable Energy Laboratory study, sponsored by the Joint Office of Energy and Transportation, provides a comprehensive review of the type, use case, and approximate locations of the required charging infrastructure.[2]

Q2a. How, if at all, will your department ensure that funding to construct charging stations through NEVI ensure station locations will be highly utilized over the lifetime of their operation?

A2a. We expect that, like many retail operations, there will be varying demand for EV charging stations based on their location. As part of core EV charging programs at the Department of Transportation, such as NEVI, the Joint Office will receive additional information on the utilization of federally funded charging stations, which will result in increased visibility on overall network needs and performance. The data will also be utilized to inform future technical assistance and to make recommendations on Federal program design.

Q3. The American energy industry faces 12–18-month delays for electrical transformers, an ongoing workforce shortage of electricians, and pre-mature baseload generation retirements. Meanwhile, automotive companies have consistently reported underwhelming EV sales compared to their projections.

How have these issues impacted your administration's timeline of 50 percent of new car sales to be EV's by 2030 and a national network of 500,000 chargers by 2030, or the timeline to finish EV charging infrastructure construction 6 months after a state's procurement of funding through the NEVI program?

A3. While the United States is on a path to achieving the 2030 goals, continued investments in U.S. charging infrastructure are necessary. U.S. electric vehicle sales have increased sharply in recent months and years. The EV share of total light-duty vehicle sales has more than tripled in the last three years, from 2.3% in 2020 to 4.3% in 2021, 7% in 2022, and 8.6% in the first quarter of 2023. Supporting a robust domestic supply chain that supports American manufacturing jobs is a priority of the Biden Administration and has

[2] https://driveelectric.gov/files/2030-charging-network.pdf and https://www.whitehouse.gov/briefing-room/statements-releases/2023/06/27/fact-sheet-biden-harris-administration-driving-forward-on-convenient-reliable-made-in-america-national-network-of-electric-vehicle-chargers/.

been a core consideration in the deployment of Federal EV charging programs. Recent announcements about a nationwide strategy to encourage domestic EV charging equipment manufacturing indicate that the U.S. EV industry is priming for widespread adoption.[3] Since the President took office, companies have announced $700 million in EV charging investments in the United States.[4] The Administration is taking a government-wide approach to ensure a robust domestic supply chain, including the need for key components such as transformers, which are also in high demand due to the surge in solar, wind, and energy storage projects. President Biden has invoked the Defense Production Act (DPA) on transformers and electric grid power components, and Congress may consider the opportunity to appropriate DPA funds for this purpose. Additionally, since the President took office, the private sector has announced more than $30 billion in electric vehicle and component part manufacturing investments spread across more than 80 facilities and more than $100 billion in battery manufacturing investments spread across more than 190 facilities.[5] These significant Federal and private investments will enable infrastructure expansion through the growth of the domestic manufacturing base.

[3] https://www.whitehouse.gov/briefing-room/statements-releases/2023/02/15/fact-sheet-biden-harris-administration-announces-new-standards-and-major-progress-for-a-made-in-america-national-network-of-electric-vehicle-chargers/
[4] https://www.whitehouse.gov/briefing-room/statements-releases/2023/06/27/fact-sheet-biden-harris-administration-driving-forward-on-convenient-reliable-made-in-america-national-network-of-electric-vehicle-chargers/
[5] https://www.energy.gov/invest

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QUESTIONS FROM REPRESENTATIVE FRANK PALLONE, JR

Q1. In the Energy Act of 2020, Congress passed a provision authorizing the re-establishment of a low-dose radiation research program at the Department. Research into low-dose radiation has important implications across the board for nuclear power, cleanup standards, and potentially everyday medicine. Congress appropriated $20 million in FY23 to support this research – can you provide a status update on the Department's low-dose radiation research efforts, and how the Department is implementing the recommendations contained within the National Academy of Sciences report on low-dose radiation that was published last year?

A1. DOE has supported national laboratory led efforts at Argonne National Lab, Brookhaven National Laboratory and Oak Ridge National Laboratory in Fiscal Years (FY) 2020-2023.

These projects expand funding to include a separate DOE-funded effort in low dose radiation research within an existing DOE - National Cancer Institute (NCI) collaborative effort to use high performance computing (Artificial Intelligence and Machine Learning) capabilities to help advance the understanding and treatment of cancer. These techniques are now being adapted to the understanding of low dose radiation exposure. The projects are developing an enabling capability for low dose radiation exposure research that could place new findings in the context of known published literature and datasets in this field, point to new directions for radiation biology research and aid development of new epidemiological studies.

The National Academies of Sciences, Engineering, and Medicine (NASEM) produced a report that will be used by many agencies, including DOE, to help guide research efforts in this area. The computational efforts DOE has funded so far in connection with an existing collaborative effort with NCI relevant to low dose research are aligned with the NASEM's recommendations but encompass only a small part of the much larger NASEM plan that will require collaborative efforts with other agencies.

DOE has requested funding for low dose radiation exposure research in the President's Budget Request for FY 2024. Longer term program planning is beginning in earnest and

will include other agencies. We are continuing interactions with NCI and could also include other agencies with basic research programs in low dose radiation, such as NASA.

Furthermore, we have charged the Biological and Environmental Research Advisory Committee (BERAC) to examine existing community-based plans, like the NASEM study, in the context of DOE mission needs and capabilities. The report will help define our future research direction. We anticipate that the report will be completed and approved by BERAC in May 2024.

Q2. The Inflation Reduction Act that we passed last year included a number of tax provisions designed to spur investments in clean energy. How is the Department of Energy working with the Treasury and the IRS to ensure that the tax credits, including the clean hydrogen production credit and the zero-emission nuclear power production credit, will maximize the production of clean energy while not disadvantaging legacy clean energy assets?

A2. The Department of Energy is working closely with Treasury and IRS to provide energy-related technical and analytical expertise to support the implementation of tax provisions included in the Inflation Reduction Act. This includes leveraging the technology specific expertise within the Department of Energy to support the implementation of the Section 45U Zero-emission Nuclear Power Production Credit and the Section 45V Clean Hydrogen Production Credit.

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QUESTIONS FROM REPRESENTATIVE PAUL D. TONKO

Hydrogen and Fuel Cell Technologies:

Q1. President Biden's Fiscal Year 2024 Budget Request includes $163 million for Hydrogen and Fuel Cell Technologies Offices activities in the Office of Energy Efficiency and Renewable Energy with additional cross-cutting hydrogen initiatives across a variety of other offices.

Q1a. How will these investments continue to support growth in hydrogen and fuel cell technology adoption?

A1a. These investments are a key pillar of our national clean hydrogen strategy—as laid out in the *U.S. National Clean Hydrogen Strategy and Roadmap*[6]—and they are aligned with the priorities of the Hydrogen Interagency Task Force,[7] which is coordinating a whole-of-government approach to advancing clean hydrogen. The *Strategy and Roadmap* was required by the Bipartisan Infrastructure Law and sets annual domestic clean hydrogen demand targets of 10 million metric tons (MMT) by 2030, 20 MMT per year by 2040, and 50 MMT by 2050.

The investments will further strengthen and grow the essential foundation of research, development, and demonstration (RD&D), which continues to drive down the cost of clean hydrogen toward the Hydrogen Earthshot goal of $1 per kilogram within a decade. In addition to these RD&D efforts, this funding will support activities focused on enabling deployments, which together will help DOE (in partnership with other agencies) execute on key strategies, including (1) targeting strategic, high impact uses for clean hydrogen; (2) reducing cost through technology innovations and scaling; and (3) focusing on regional networks. The outcome of these investments will be to help to catalyze both innovation and growth in scale, stimulate private sector investments, spur development across the fuel cell hydrogen supply chain, and reduce the cost of clean hydrogen—all of which are critical to accelerate the adoption of hydrogen and fuel cell technologies.

[6] https://www.hydrogen.energy.gov/national-strategy
[7] https://www.hydrogen.energy.gov/interagency

Q1b. In addition to the ongoing implementation of the H2Hub program, how else will DOE continue to invest in infrastructure needed to support growing hydrogen demand?

A1b. In addition to the H2Hubs, DOE will continue to support advancement of the underlying technologies that will be essential for the success of the H2Hubs and other large-scale deployments. For example, DOE will continue developing critical components for fueling stations, materials for pipelines, and other critical H2 storage, delivery, and utilization technologies. Advances in these areas will ensure that the H2Hubs and other large scale domestic deployments have the best technology not just today, but over the near-, mid-, and long-term. In addition to developing cutting-edge technologies, DOE will also continue to pursue important work to enable the deployment of infrastructure, including advancing safety practices, facilitating technically sound codes and standards, and supporting workforce development. DOE will also continue to engage with other agencies to drive broad and robust advancements in this sector. For example, the Joint Office of Energy and Transportation (which combines the expertise of DOE and the U.S. Department of Transportation) will continue to support the development of fueling corridors that include hydrogen and work with the EPA to develop hydrogen infrastructure at ports.

Carbon Dioxide Removal:

Q2. The Explanatory Statement of the Fiscal Year 2023 Omnibus Appropriations bill included the following: "The Department is directed to establish a competitive purchasing pilot program for the purchase of carbon dioxide removed from the atmosphere or upper hydrosphere, in support of carbon dioxide removal projects authorized in section 969D of the Energy Policy Act of 2005."

Q2a. Can you please provide an update on DOE's response to this direction?

A2a. DOE has briefed the House and Senate Appropriations Subcommittees on Energy and Water Development on a proposed implementation plan to establish a competitive purchasing pilot program for carbon dioxide removal (CDR). DOE is actively working to leverage available funds from the Infrastructure Investment and Jobs Act and annual base

appropriations to develop a prize competition for CDR purchasing. The design and implementation of the program will be consistent with the Explanatory Statement of FY23 Omnibus Appropriations bill and official prize rules will likely be issued early in FY24.

Q2b. Has DOE begun work to develop a procurement program (or alternative program structure) to spur demand for carbon dioxide removal services?

A2B. Yes. As of September 29, 2023, DOE has established a competition for Carbon Dioxide Removal (CDR) Purchase Pilot Prize. The purchase pilot will provide demand-side support for commercial CDR technologies, enable assessment of the CDR market, and allow DOE to evaluate how it can most impactfully deploy available funds for CDR deployment and commercialization. The CDR pilot purchasing competition will also leverage private sector resources to enhance DOE's CDR development efforts, while also establishing best practices and methods for vetting and purchasing CDR credits.

Mesonet:

Q3. The New York Independent System Operator (NYISO) is already leveraging weather forecasts and data from Mesonet to support the operation and reliability of New York's electricity system. New York Mesonet's 126 stations throughout the state make more than one million observations each day, providing a powerful tool to assess and plan for the impacts of weather conditions on wind and solar energy generation, availability, and reliability.

Q3a. Has DOE provided any technical or financial assistance in support of weather-related data collection and forecasts to support greater integration of variable energy resources into the electricity mix?

A3a. DOE has over a decade of experience supporting the development of forecasting tools that enable grid operators to safely and reliably balance electricity demand and generation to maintain a healthy grid.

- The **Wind Forecast Improvement Project** (WFIP) is a DOE-led multi-project research program whose overarching goals are to improve the accuracy of short-term wind energy forecasts and to demonstrate the economic value of these improvements.

Data collected during field campaigns between 2011 and 2018 led to significant improvements in the main weather forecasting model used by the National Weather Service. In the latest project phase, DOE is funding the collection of first-of-its-kind high-quality wind resource datasets off the coasts of Massachusetts and Rhode Island to reduce uncertainty in offshore wind resource assessment and forecasting.

- DOE and NYSERDA created the **National Offshore Wind Research & Development Consortium**[8] in 2018 to produce industry-focused research to advance U.S. offshore wind. Related projects[9] include using artificial intelligence to predict wind plant output and facilitate grid integration; developing more accurate hurricane prediction models to mitigate risks; and creating a 20-year atlas of U.S. offshore wind resources.
- The **Atmosphere to Electrons to Grid Project** [10] (2019–2022) combined forecasting tools with aerodynamic and economic models to allow wind power plant operators to maximize grid services and energy production.
- The **Dynamic Line Rating**[11] program (2013–present) developed tools to optimize transmission capacity, reduce congestion and minimize curtailment using sensors and weather forecasts.
- The **National Inter-Hour Wind Power Production Database** (2021–2023) is combining wind turbine models and atmospheric models to improve wind power forecasts.
- The **Solar Forecasting funding program**[12] (2012) improved the accuracy of solar generation forecasts.

[8] National Offshore Wind R&D Consortium | Department of Energy (https://www.energy.gov/eere/wind/national-offshore-wind-rd-consortium)
[9] https://nationaloffshorewind.org/wp-content/uploads/NOWRDC-Project-List-3.pdf
[10] https://www.nrel.gov/docs/fy23osti/84826.pdf
[11] Dynamic Line Rating (https://inl.gov/national-security/dynamic-line-rating/)
[12] https://www.energy.gov/eere/solar/improving-accuracy-solar-forecasting-funding-opportunity

- The **Solar Forecasting 2 funding program**[13] (2017) developed forecasts for solar irradiance and power production that enable grid operators to calculate the reserve power needed to maintain a reliable and resilient electric grid.
- The **SETO FY2020 funding program**[14] (2020) developed behind-the-meter solar forecasts using artificial intelligence and machine learning techniques.
- The **Solar Forecasting Prize**[15] (2021) incentivized solar forecast providers to develop and commercialize tools to forecast solar irradiance and power availability.
- The **American-Made Net Load Forecasting Prize**[16] (ongoing) is designed to promote the widespread adoption of state-of-the-art in net load (load minus distributed solar generation) forecasting tools to design more efficient and resilient power systems.

These tools build on DOE-supported resources like the National Solar Radiation Database and Wind Integration National Dataset (WIND) Toolkit,[17] maintained by the National Renewable Energy Laboratory. Similarly, the National Solar Radiation Database provides critical measurements of solar irradiance nationwide and has done so for over 25 years.

Q3b. Has DOE partnered with the National Weather Service or the National Mesonet Program as part of these efforts?

A3b. Yes. The National Weather Service is a partner in DOE's Wind Forecast Improvement Project, along with NOAA laboratories and partners from the private sector and universities.

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[13] https://www.energy.gov/eere/solar/solar-forecasting-2
[14] https://www.energy.gov/eere/solar/solar-energy-technologies-office-fiscal-year-2020-funding-program-seto-2020
[15] https://www.energy.gov/eere/solar/american-made-solar-forecasting-prize
[16] https://americanmadechallenges.org/challenges/net-load-forecasting
[17] Wind Integration National Dataset (WIND) Toolkit (https://www.nrel.gov/grid/wind-toolkit.html)

- In collaboration with Brookhaven National Laboratory and other partners, DOE has developed and deployed sky-imager technology for solar forecasting, which complements data from New York's Mesonet.

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QUESTIONS FROM THE HONORABLE ANN M. KUSTER

Q1. Solar power will be critical in the U.S. clean energy transition. It is cheap and renewable, but it is not without its drawbacks. Floating solar solves many of traditional solar's problems, saving land, increasing energy efficiency, and conserving water. With the U.S.'s 264,837 square miles of water, this power source seems ideal for accelerating our path to a greener energy system. What does the Department of Energy see as the potential of floating solar in the US? What is the Department doing to expand research into this electricity source?

A1. The National Renewable Energy Laboratory has estimated that floating photovoltaic (FPV) systems on suitable human-made U.S. water bodies could produce almost 10% of current national electricity generation.[18] When deployed on bodies of water, FPV systems can reduce evaporation and leverage otherwise unused space, reducing land-use concerns. FPV on wastewater bodies can also create on-site energy to treat the contaminated water. In drought-stricken regions with underutilized hydro-generating capacity, floating PV can leverage existing transmission infrastructure and remove supply and transmission constraints. DOE's FPV investments advance U.S. competitiveness in the emerging floating solar market.[19]

Q2. In NH and Northern New England, we have long been at 'the end of the pipeline.' We've faced a unique dependence on delivered fuels that tend to come from far away and are subject to price volatility. NERC has warned that New England could face reliability challenges on the coldest days. How is your department directing investments to solve these problems, and deliver affordable, reliable, clean energy to the Granite State?

A2. The Department of Energy's Office of Cybersecurity, Energy Security, and Emergency Response (CESER) has been tracking the issue of New England energy security and has been working directly with all New England states, including New Hampshire, to collaboratively identify solutions that ensure the reliability of the electric grid through all operating conditions.

[18] Floating Photovoltaic Systems: Assessing the Technical Potential of Photovoltaic Systems on Man-Made Water Bodies in the Continental United States | Environmental Science & Technology (acs.org)
[19] Dual-Use Photovoltaic Technologies | Department of Energy

Section 40108 of the Infrastructure Investment and Jobs Act, also known as the Bipartisan Infrastructure Law, introduced a new requirement for states to submit State Energy Security Plans to receive federal financial assistance under the Energy Policy and Conservation Act Title III Part D.

State energy security plans (SESP) are an essential part of energy security planning. SESPs describe the state's energy landscape, people, processes, and the state's strategy to build energy resilience. More specifically, the plans detail how a state, working with energy partners, can secure their energy infrastructure against all physical and cybersecurity threats; mitigate the risk of energy supply disruptions to the State; enhance the response to, and recovery from, energy disruptions; and ensure that the state has secure, reliable, and resilient energy infrastructure.

CESER, in coordination with the Office of State and Community Energy Programs, has been working directly with States, including New Hampshire, to develop plans that meet the requirements identified within statute.

Additionally, CESER has coordinated and convened monthly discussions with energy stakeholders in New England to identify issues and work through identified challenges and will continue to facilitate and convene discussions ahead of the 2023-2024 winter.

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QUESTIONS FROM THE HONORABLE KIM SCHRIER

State Energy Offices:

Q1. The state energy offices are just starting to receive their formula allocations from the $500M that Congress provided on a bipartisan Basis from the IIJA. The bill was passed in the Fall of 2021. Can you explain what efforts you are undertaking to speed the release of funds?

A1. DOE released guidance documents outlining the IIJA formula allocations, application process and deadlines on August 26, 2022, and requested that the state energy offices submit their applications by December 5, 2022. The review process for the IIJA awards entails thorough programmatic, technical, and financial information reviews, and can involve iterative discussions after submission with each state energy office to ensure the application is complete. At this time, DOE has made IIJA awards to 42 of the 56 state energy offices. While DOE is working to complete the IIJA awards, it is also managing a separate set of applications for the annually appropriated State Energy Program funding before each state energy office's program year start date.

Building Energy Codes and IRA:

Q2. Congress provided $1 billion for building energy codes in the Inflation Reduction Act. These funds were directed through the State Energy Program. We understand your preliminary determination is to conduct a competitive solicitation. However, in light of the delays on competitive funding and your shortages of personnel, would you consider allocating a substantial portion of these funds to the states via formula?

A2. On March 20, 2023, DOE published a request for information and a notice of intent seeking comment on a variety of topics with regards to program design and administration supporting the $1 billion in building energy code support from the Inflation Reduction Act. DOE received feedback from a number of different stakeholders that emphasized the importance of streamlining the grant application process and reducing administrative burden. DOE is incorporating this feedback and is actively working on a streamlined approach to the grant application process to support adopting

the latest building energy codes, zero energy codes, or equivalent energy codes and building performance standards.

Q3. Is DOE supporting BPA's engagement in the litigation stay extension discussions, protecting the region's interests in BPA's role to supply low-cost, emission free hydropower for our growing economy?

A3. The Department of Energy, including BPA, is engaged in the litigation stay extension discussions. The Department understands the important role of hydropower in a region that is decarbonizing from any remaining fossil fuels as low-cost as possible, expanding electrification, attracting large load industries, and attracting green hydrogen among other renewable and carbon-free industries. The Department supports the region's decarbonization goals and is participating in the stay extension discussions.

Q4. Will you urge State Department and the Administration to avoid any attempts to subsidize the cost of flood risk management from power ratepayers?

A4. BPA has conveyed to State Department and other Administration officials that it has no authorization for flood risk management, and thus is statutorily unable to pay any costs of flood risk management.

Fusion:

Q5. What is DOE doing to support the commercialization of fusion and how can research institutions, including research universities support your efforts?

A5. The Office of Science (SC) Fusion Energy Sciences (FES) program has been supporting the growing U.S. private fusion sector in multiple ways. In FY 2019, FES established the Innovation Network for Fusion Energy (INFUSE) voucher program which enables private fusion companies to access and leverage the world-class expertise and capabilities in fusion science available at the DOE national laboratories and, since FY 2022, at U.S. universities. Under this program, FES has made 90 awards, totaling $19.3 million, enabling 10 DOE national laboratories and 10 universities to collaborate with 26 private

fusion companies. In addition, FES launched the Milestone-Based Fusion Development program in FY2022 in response to the Administration's Bold Decadal Vision for commercial fusion energy. In May 2023, FES announced awards to eight companies totaling $46 million. Funding will be provided only after the companies demonstrate that they meet pre-negotiated milestones. Within the first 18 months of the program, these awards will enable the companies to develop preconceptual designs of fusion pilot plants and technology roadmaps as well as demonstrations of significant performance improvement of their fusion concepts. Key partners in these awards include DOE national laboratories and U.S. research universities. Finally, in the FY 2024 Budget Request, FES proposed the establishment of four fusion energy R&D centers in the areas of materials science, fusion nuclear science, enabling technologies, and advanced simulations. These centers will foster strong collaborations among research universities, national laboratories, and private fusion companies to resolve critical fusion science and technology challenges that will help accelerate the path toward commercial fusion energy as well as contribute to the development of a diverse workforce for this emerging clean energy technology.

Q6. **Higher Education and IRA Applicability:**

The IRA represents a great opportunity to address climate change problems. Yet, there remain a lot of questions about who is eligible for the different programs. For example, the higher education sector is potentially a tremendous partner in fighting climate change but questions remain about whether institutions of higher education, both public and private, are even eligible entities for many of the new opportunities, and if so, which ones. In so many locations across the country, campuses function as mid-sized cities. Are you willing to work with the higher education community to maximize their potential contributions?

A6. Yes, the Department is currently working with institutions of higher education, including universities, community colleges, and trade schools, to deploy investments provided by Congress in the Bipartisan Infrastructure Law (BIL) and Inflation Reduction Act (IRA) and stands ready to continue that work in partnership with Congress. As you note, institutions of higher education have a key role to play in our nation's clean energy

transition. These institutions are eligible to apply for many of the funds from IRA and BIL that are relevant to the development and expansion of the clean energy transition as they consider the buildout of relevant infrastructure and facilities within their campuses.

In particular, BIL allocated $150 million to expand the Industrial Research and Assessment Centers (IAC) Program. Small- and medium-sized manufacturers are eligible to receive a no-cost energy assessment provided by DOE IACs. Teams located at 37 universities around the country conduct these energy assessments to identify opportunities to improve productivity, reduce waste, and save energy. On average, IACs identify more than $130,000 in potential annual savings opportunities for every manufacturer assessed, nearly $50,000 of which is implemented during the first year following the assessment. Over 20,000 IAC assessments have been conducted since the program's inception.

IAC assessments are in-depth evaluations of a manufacturing facility conducted by engineering faculty with upper class and graduate students from a participating university. After a remote survey of the plant, the team conducts a one or two-day site visit to take engineering measurements. The team performs a detailed process analysis to generate specific recommendations with estimates of costs, performance, and payback times. Within 60 days, the plant receives a confidential report detailing the analysis, findings, and recommendations. In six to nine months, the IAC team calls the plant manager to verify what recommendations have been implemented.

By involving students in this process, IACs train the next generation of energy-savvy engineers, more than 60 percent of whom pursue energy-related careers upon graduation.

Through the Office of Manufacturing and Energy Supply Chains (MESC), the Department has announced five new Regional IAC Centers of Excellence at institutions of higher education across the country. As Centers of Excellence, these institutions and their partners will help to coordinate and enhance the IAC Program's efforts to train

regional clean energy workforces while identifying best practices and energy-saving opportunities for small- and medium-sized manufacturers.

In addition, the **National Laboratory Education Directors (NLED)** council was established in September 2020 to coordinate national lab STEM education activities that advance STEM outreach and K-12, university, and workforce development programming. This program concretely advances the diversity, equity and inclusion goals of DOE's National Laboratories. The NLED established a working group to develop a portal for National Lab educational resources, in response to a recommendation by the Secretary of Energy's Advisory Board. This portal will make valuable educational resources more widely available to stakeholders. Two examples of labs proactively focusing on building a pipeline into STEM are the apprenticeship programs at Princeton Plasma Physics Laboratory (PPPL) and high school internships at Idaho National Laboratory (INL).

"Section 45V" Hydrogen Production Tax Credit:

Q7. Consistent with congressional intent, permit the acquisition and retirement of renewable energy credits (RECs) for "unspecified" purchases that comprise up to 12% of electricity to load under the program's standards. RECs could be purchased by the utility or the hydrogen producer.

For hydrogen producers using RECs, power purchase agreements or similar mechanisms to lower their carbon intensities, we encourage USDOE and Treasury to require annual matching of resources to electrolysis load, making space for future refinements as necessary and as markets and technologies mature.

Many utilities in the Pacific Northwest provide electricity to customers using a generation mix that is almost completely free of carbon dioxide emissions, except for a limited amount of unspecified wholesale power purchases made in western markets or from the Bonneville Power Administration mostly for balancing to ensure that electricity supply

constantly matches power demand. Despite using some of the lowest carbon electricity anywhere in the world, electrolytic hydrogen production powered by these clean utilities may narrowly miss qualifying for the full value of the 45V production tax credit.

The tiered incentive rates in I.R.C. § 45V(b)(2) establish a standard of less than 0.45 kilograms (kg) of carbon dioxide equivalent (CO2e) per kg of produced hydrogen to qualify for 100 percent of the production tax credit (PTC). The feasibility of qualifying for the full PTC for hydrogen from electrolysis hinges on the carbon intensity (CI) of electricity.

Much of the "carbon ledger" for Northwest utilities is driven by their participation in the wholesale electricity market, which enhances regional grid reliability and resiliency. As an example, depending on how the Department of Energy (USDOE) and the Department of Treasury (Treasury determine the carbon intensity (CI of a utility's electricity, a green hydrogen producer using electricity from a utility that is typically 97 or 98 percent carbon-free – could narrowly fail to qualify for the full PTC.

Q7a. Will your department commit to working with me and my colleagues to identify implementation solutions that meet the intent of Congress on the Section 45V Production Tax Credit?

A7a. Implementation of the Section 45V Hydrogen Production Tax Credit is under the purview of the Department of Treasury. DOE is committed to continue providing technical and analytical guidance to accelerate progress to Treasury on this topic and appreciates your input. DOE would be pleased to provide points of contact at the Department of Treasury and facilitate technical discussion which allows stakeholders to provide feedback.

Q7b. Can you provide the Committee with your best information as to when the final guidance for the Section 45V tax credit will be available?

A7b. The Treasury Department has purview over release of the final guidance for Section 45V tax credit.

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QUESTIONS FROM THE HONORABLE YVETTE D. CLARKE

Q1. As we look towards the clean energy future, it's important that we also prioritize maximizing benefits for consumers, the environment, and our climate. One key metric that stands out for this purpose is efficiency. Electric vehicles are inherently more efficient than their gas counterparts, but some EV models are continuing to push the limits of what's possible. Higher levels of efficiency mean that EVs can travel further while using less energy and fewer critical minerals per each mile traveled. The American-made Lucid Air, which achieves an unprecedented EPA-rated 140 miles-per-gallon electric equivalent (MPGe), demonstrates how technological innovation and an efficiency focus can enable EVs to increasingly maximize on energy stored within the battery.

Q1a. From DOE's perspective, what are the important benefits of more energy efficient EVs that can travel further distances while using less energy, and how could this help to achieve the Administration's ambitious goals around EV adoption, renewable energy deployment, and grid reliability/resilience?

A1a. Improving the per mile energy efficiency of Electric Vehicles (EVs) increases the EV's range per charge, reducing the cost per mile of driving, and enables the reduction of the onboard battery's size and weight, which could result in further cost reductions and efficiency improvements. Vehicle efficiency improvements also support the development of charging infrastructure and integration with the grid by enabling traveling farther per charge.

Q1b. What research or policy efforts are being considered or currently underway at DOE to better understand and support the benefits of further increases to EV efficiency?

A1b. The Department continues to fund research to improve the per mile efficiency of all EVs. For example, DOE is funding:

- Advanced battery research and development (R&D) to improve battery performance while reducing cost, weight, volume, and the need for critical materials;
- The EVs@Scale Laboratory Consortium to develop advanced high-power charging solutions and integrated on-board charging/drivetrain systems;
- R&D on lightweight materials to reduce energy requirements; and

- The SuperTruck 3 projects with Ford, GM, Volvo, Daimler Trucks, and PACCAR to improve the energy efficiency of medium- and heavy-duty electric drive vehicles.

Q2. In FY23, report language was included to require the Joint Office of Energy and Transportation (Joint Office) to complete a nationwide assessment on EV charging infrastructure in underserved & disadvantaged areas and provide a briefing to the Senate & House Appropriations Committees on that assessment. Will DOE and the Joint Office commit to providing a briefing to interested members of the E&C Committee on the progress and findings of the assessment?

A2. Yes, the Joint Office commits to providing a briefing on the findings when the assessment is complete.